

## APPLICATION ON RE-NOTIFICATION – CROWN DEVELOPMENT

<b>Applicant:</b>	RES Australia Pty Ltd
<b>Development Number:</b>	415/V013/18
<b>Nature of Development:</b>	The 'Pallamana Solar Farm and Battery Storage Facility'. The proposal comprises a 176 MW solar farm (approximately 690,000 solar photovoltaic panels mounted on single axis tracker structures) and ancillary structures (including inverters, transformers, underground cabling and security fencing); a 66 MW (140 MWh) Lithium Ion battery facility and ancillary structures (including inverters and transformers); control building; storage shed; switch yard; 132kV overhead transmission line connection to an existing substation and a temporary construction compound. Access to the site would be established off Monarto Road.
<b>Type of development:</b>	Crown sponsored development
<b>Zone / Policy Area:</b>	Primary Production Zone (Policy Area 5 – North Central Area) – Rural City of Murray Bridge Council.
<b>Subject Land:</b>	166 and 229 Hillview Road, Pallamana (approximately 4 km NW of Murray Bridge) comprising Certificate of Title Volume/Folio numbers 5858/256, 5858/257, 5858/258, 5858/259, 5487/88 and 5802/294
<b>Contact Officer:</b>	Lee Webb
<b>Phone Number:</b>	7109 7066
<b>Start Date:</b>	22 November 2018 (Note original start date 1 November)
<b>Close Date:</b>	<b>Friday 21 December 2018 (Note this is an extension of the previous 30 November deadline)</b>
<p><b>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 Street, Adelaide during normal business hours. Application documentation may also be viewed during normal business hours at the Rural City of Murray Bridge Council office, 2 Seventh Street.</b></p>	

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 pdf 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](mailto:scapreps@sa.gov.au)

Fax Number: (08) 8303 0753

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

<b>Applicant:</b>	RES Australia Pty Ltd
<b>Development Number:</b>	415/V013/18
<b>Nature of Development:</b>	The 'Pallamana Solar Farm and Battery Storage Facility' - 176 MW solar farm and ancillary structures (including inverters, transformers, underground cabling and security fencing); a 66 MW (140 MWh) Lithium Ion battery facility and ancillary structures (including inverters and transformers); control building; storage shed; switch yard; 132kV overhead transmission line connection to an existing substation and a temporary construction compound. Access to the site would be established off Monarto Road.
<b>Zone / Policy Area:</b>	Primary Production Zone (Policy Area 5 – North Central Area) – Rural City of Murray Bridge Council.
<b>Subject Land:</b>	166 and 229 Hillview Road, Pallamana (approximately 4 km NW of Murray Bridge) comprising CT's 5858/256, 5858/257, 5858/258, 5858/259, 5487/88 and 5802/294
<b>Contact Officer:</b>	Lee Webb
<b>Phone Number:</b>	7109 7066
<b>Close Date:</b>	<b>Friday 21 December 2018 (Note this is an extension of the previous 30 November deadline)</b>
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 Street, Adelaide during normal business hours. Application documentation may also be viewed during normal business hours at the Rural City of Murray Bridge Council office, 2 Seventh Street.	

My name: \_\_\_\_\_

My phone number:

PRIMARY METHOD(S) OF CONTACT:      Email address: \_\_\_\_\_

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 in support of your submission.**

My interests are:

- ☐ 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.....

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

.....

---

.....

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

by ☐ appearing personally  
☐ being represented by the following person : .....  
 (Cross out whichever does not apply)

Date: ..... Signature: .....

**Return Address:** The Secretary, State Commission Assessment Panel, GPO Box 1815, Adelaide, SA 5001 or [scapreps@sa.gov.au](mailto:scapreps@sa.gov.au)



## 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 **Res Australia Pty Ltd** for consent to develop the 'Pallamana Solar Farm and Battery Storage Facility' (as previously sponsored by the Department of Premier and Cabinet and then amended by the Department of Energy and Mining under Section 49 of the Development Act 1993).  
**Development Number: 415/V013/18.**

The proposal comprises a 176 MW solar farm (approximately 690,000 solar photovoltaic panels mounted on single axis tracker structures) and ancillary structures (including inverters, transformers, underground cabling and security fencing); a 66 MW (140 MWh) Lithium Ion battery facility and ancillary structures (including inverters and transformers); control building; storage shed; switch yard; 132kV overhead transmission line connection to an existing substation and a temporary construction compound. Access to the site would be established off Monarto Road.

The development site is situated at 166 and 229 Hillview Road, Pallamana (approximately 4 km NW of Murray Bridge and 60 km SE of Adelaide) comprising the following land parcels: Section 192, HP170700 (CT 5858/256); Section 196N, HP170700 (CT 5858/257); Sections 193 and 196s, HP170700 (CT 5858/258); Section 197, HP170700 (CT 5858/259); Section 166, HP170700 (CT 5487/88) and Allotment 285, FP168052 (CT 5802/294).

The subject land is located within the Primary Production Zone (Policy Area 5 - North Central Area) of the Murray Bridge Council Development Plan (Consolidated on 23 January 2018).

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 the Rural City of Murray Bridge Council, 2 Seventh Street, Murray Bridge. Application documentation may also be viewed on the SCAP website [http://www.saplanningcommission.sa.gov.au/scap/public\\_notices](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 30 November 2018**. Representations may also be emailed to: [scapreps@sa.gov.au](mailto: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 their representation.

Representations may be made available for public inspection.

Should you wish to discuss the application and the public notification procedure please contact Lee Webb on 7109 7066 or [lee.webb@sa.gov.au](mailto:lee.webb@sa.gov.au)

Alison Gill  
**SECRETARY**  
**STATE COMMISSION ASSESSMENT PANEL**  
[scapreps@sa.gov.au](mailto:scapreps@sa.gov.au)

PN3343

[www.sa.gov.au](http://www.sa.gov.au)

PN3343

19x3 (96mm)

Adelaide Advertiser, Murray Valley Standard  
1 November 2018

**APPROVAL REQUIRED BY COB MON 29.10**

# SECTION 49 & 49A – CROWN DEVELOPMENT DEVELOPMENT APPLICATION FORM

PLEASE USE BLOCK LETTERS

COUNCIL: Rural City of Murray Bridge

APPLICANT: RES Australia Pty Ltd

ADDRESS: Suite 4, Level 1, 760 Pacific Highway, Chatswood NSW 2067

CROWN AGENCY: Department for Energy and Mining

FOR OFFICE USE

DEVELOPMENT No: \_\_\_\_\_

PREVIOUS DEVELOPMENT No: \_\_\_\_\_

DATE RECEIVED:        /        /

## CONTACT PERSON FOR FURTHER INFORMATION

Name: Julie Jansen, MasterPlan SA Pty Ltd

Telephone: 8193 5600 [work] 0413 832 616 [Ah]

Fax: \_\_\_\_\_ [work] \_\_\_\_\_ [Ah]

Email: juliej@masterplan.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

☐ Merit

☐ Public Notification

☐ Referrals

Decision: \_\_\_\_\_

Type: \_\_\_\_\_

Finalised:        /        /

	Decision required	Fees	Receipt No	Date
Planning:	_____	_____	_____	_____
Land Division:	_____	_____	_____	_____
Additional:	_____	_____	_____	_____
<b>Minister's Approval</b>				

EXISTING USE: Primary production

DESCRIPTION OF PROPOSED DEVELOPMENT: To develop a 176MW solar farm (solar photovoltaic arrays) and battery storage facility with ancillary infrastructure

LOCATION OF PROPOSED DEVELOPMENT: 166 and 229 Hillview Road (and Monarto Road), Pallamana

House No: 166 and 229 Lot No: Various Street: Hillview Road Town/Suburb: Pallamana

Section No [full/part] \_\_\_\_\_ Hundred: Mobilong Volume: 5858 Folio: 256 and others

Section No [full/part] \_\_\_\_\_ Hundred: \_\_\_\_\_ Volume: \_\_\_\_\_ Folio: \_\_\_\_\_

### LAND DIVISION:


Site Area [m<sup>2</sup>] \_\_\_\_\_ Reserve Area [m<sup>2</sup>] \_\_\_\_\_ No of existing allotments \_\_\_\_\_

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

DEVELOPMENT COST [do not include any fit-out costs]: \$ 350 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](http://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:  \_\_\_\_\_

Chris Gosling, for and on behalf of RES Australia Pty Ltd

Dated: 23 / 08 / 2018





# **ATTACHMENT B**

## **CERTIFICATES OF TITLE**

REAL PROPERTY ACT, 1886



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.



## Certificate of Title - Volume 5487 Folio 88

Parent Title(s) CT 4178/773  
Creating Dealing(s) CONVERTED TITLE  
Title Issued 05/01/1998 Edition 2 Edition Issued 12/10/2017

## Estate Type

FEE SIMPLE

## Registered Proprietor

BRUCE ROBIN KUCHEL  
JOYLEEN AVIS KUCHEL  
OF PO BOX 110 MURRAY BRIDGE SA 5253  
1 / 2 SHARE AS JOINT TENANTS

IAN NEVILLE KUCHEL  
DEBBIE GAYLE KUCHEL  
OF PO BOX 1280 MURRAY BRIDGE SA 5253  
1 / 2 SHARE AS JOINT TENANTS

## Description of Land

SECTION 166  
HUNDRED OF MOBILONG  
IN THE AREA NAMED PALLAMANA

## Easements

SUBJECT TO EASEMENT(S) OVER THE LAND MARKED B TO THE ETSA CORPORATION (T 4742100)

## Schedule of Dealings

Dealing Number	Description
4947314	HERITAGE AGREEMENT PURSUANT TO SOUTH AUSTRALIAN HERITAGE ACT, 1978 COMMENCING ON 14/8/1981 AND EXPIRING ON 13/8/2011

## Notations

Dealings Affecting Title	NIL
Priority Notices	NIL
Notations on Plan	NIL

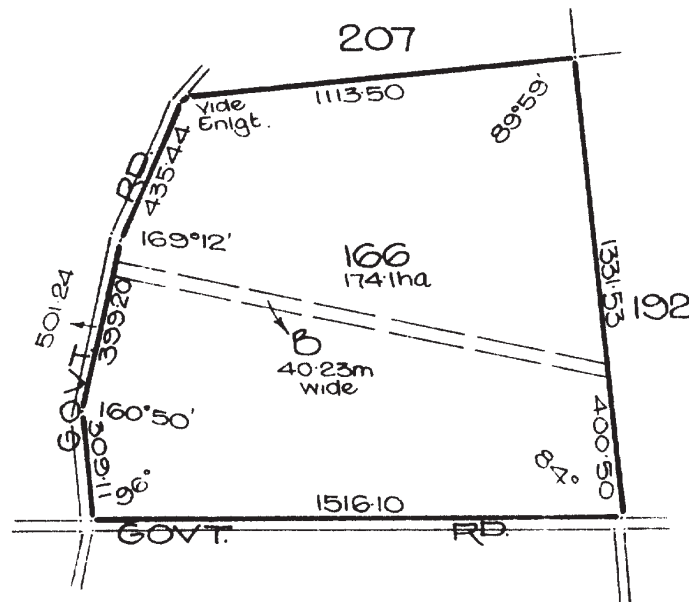
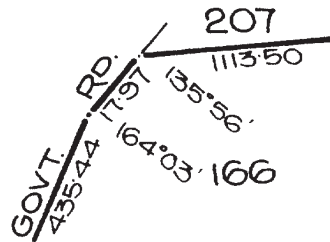
## Registrar-General's Notes

COMPARE ADDRESS FOR SERVICE OF NOTICE WITH 4947314

Administrative Interests	NIL
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Enlargement  
(not to scale)



0 200 400 600 800 Metres

REAL PROPERTY ACT, 1886



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.



## Certificate of Title - Volume 5802 Folio 294

Parent Title(s)	CT 3366/159			
Creating Dealing(s)	CONVERTED TITLE			
Title Issued	29/08/2000	Edition	2	Edition Issued 25/09/2001

### Estate Type

FEE SIMPLE

### Registered Proprietor

ROBINVILLE PTY. LTD. (ACN: 007 951 091)  
OF 52 PAYNEHAM ROAD STEPNEY SA 5069

### Description of Land

ALLOTMENT 285 FILED PLAN 168052  
IN THE AREA NAMED PALLAMANA  
HUNDRED OF MOBILONG

### Easements

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

### Schedule of Dealings

Dealing Number	Description
4947314	HERITAGE AGREEMENT PURSUANT TO SOUTH AUSTRALIAN HERITAGE ACT, 1978 COMMENCING ON 14/8/1981 AND EXPIRING ON 13/8/2011

### Notations

Dealings Affecting Title	NIL
Priority Notices	NIL
Notations on Plan	NIL

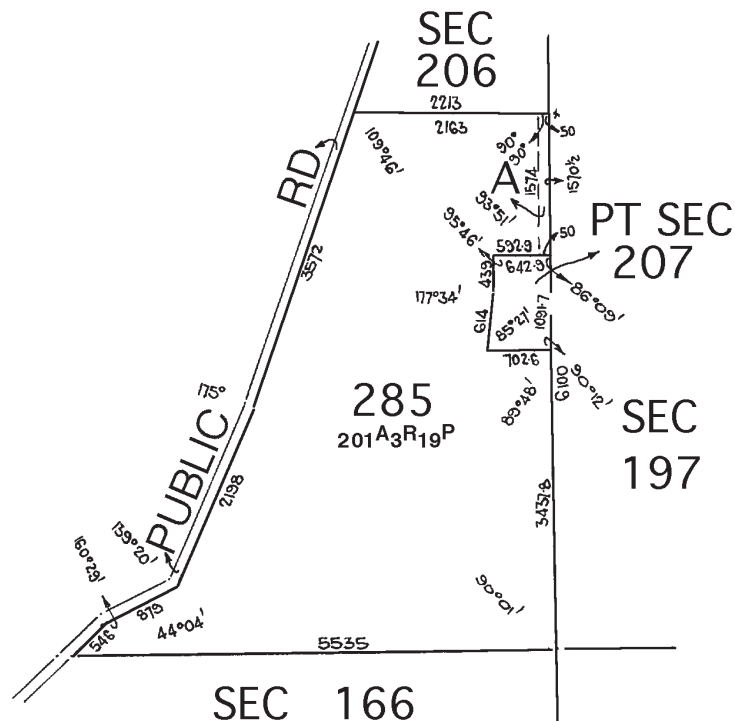
### Registrar-General's Notes

COMPARE ADDRESS FOR SERVICE OF NOTICE WITH 4947314

### Administrative Interests

NATIVE VEGETATION HERITAGE PLACE HA 9045

THIS PLAN IS SCANNED FOR CERTIFICATE OF TITLE 3366/159  
SEE TITLE TEXT FOR EASEMENT DETAILS



**FOR METRIC CONVERSION**

1 LINK = 0.201168 METRES  
1 CHAIN = 100 LINKS  
1 ACRE = 0.404686 HECTARES  
1 ROOD = 1011.7 m<sup>2</sup>  
1 PERCH = 25.29 m<sup>2</sup>

NOTE: SUBJECT TO ALL LAWFULLY EXISTING PLANS OF DIVISION



REAL PROPERTY ACT, 1886



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.



## Certificate of Title - Volume 5858 Folio 256

Parent Title(s)	CT 5487/89			
Creating Dealing(s)	TG 9115450			
Title Issued	31/10/2001	Edition	2	Edition Issued 12/10/2017

## Estate Type

FEE SIMPLE

## Registered Proprietor

BRUCE ROBIN KUCHEL  
JOYLEEN AVIS KUCHEL  
OF PO BOX 110 MURRAY BRIDGE SA 5253  
1 / 2 SHARE AS JOINT TENANTS

IAN NEVILLE KUCHEL  
DEBBIE GAYLE KUCHEL  
OF PO BOX 1280 MURRAY BRIDGE SA 5253  
1 / 2 SHARE AS JOINT TENANTS

## Description of Land

SECTION 192  
HUNDRED OF MOBILONG  
IN THE AREA NAMED PALLAMANA

## Easements

SUBJECT TO EASEMENT(S) OVER THE LAND MARKED D (SL 3255035)

SUBJECT TO EASEMENT(S) OVER THE LAND MARKED E TO THE ETSA CORPORATION (T 4742100)

SUBJECT TO EASEMENT(S) OVER THE LAND MARKED H TO DISTRIBUTION LESSOR CORPORATION (SUBJECT TO LEASE 8890000) (TG 9115450)

## Schedule of Dealings

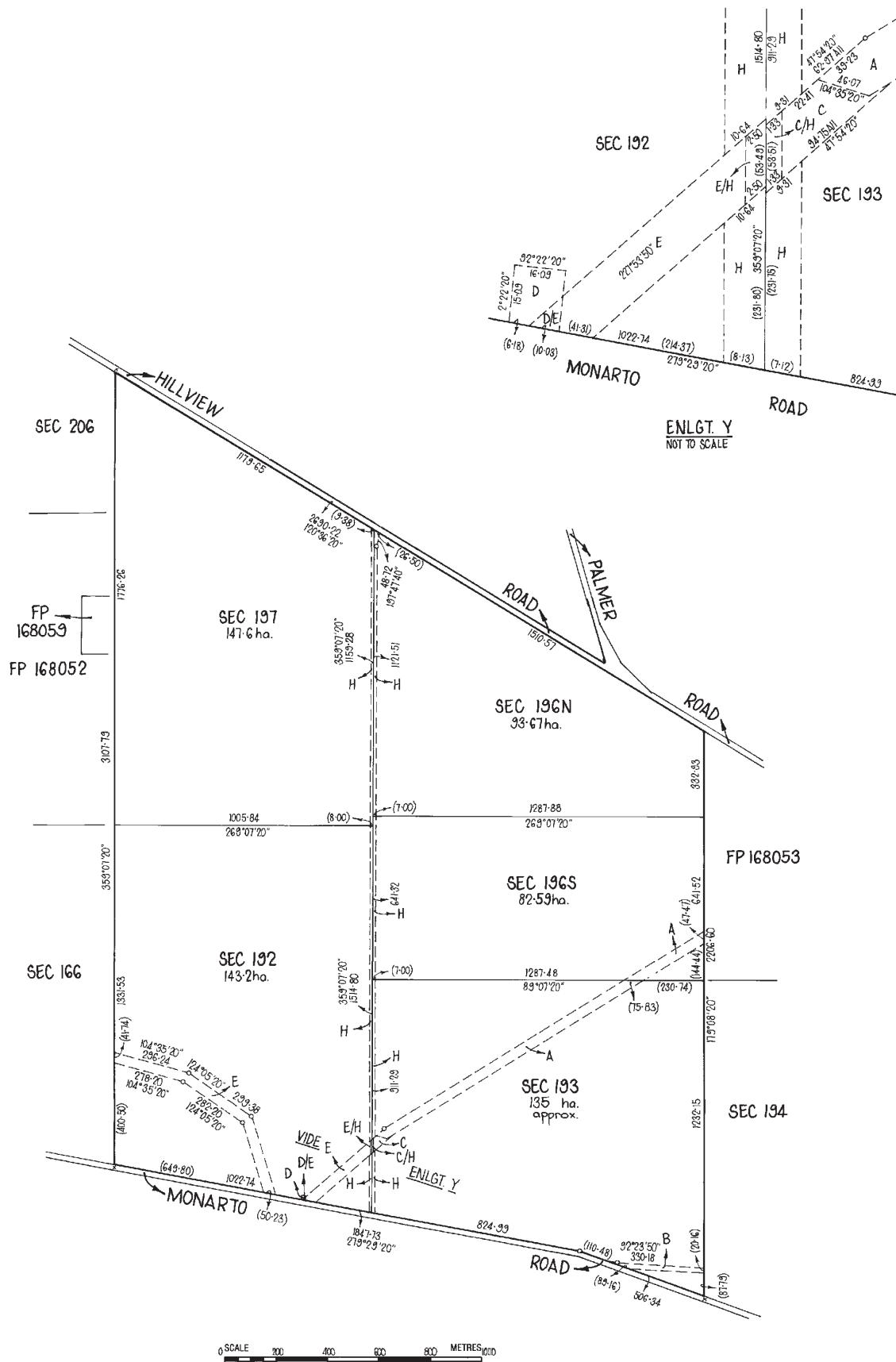
NIL

## Notations

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



Register Search (CT 5858/256)  
14/12/2017 11:46AM  
50359  
20171214004717  
\$28.25



REAL PROPERTY ACT, 1886



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.



## Certificate of Title - Volume 5858 Folio 257

Parent Title(s)	CT 5812/844			
Creating Dealing(s)	TG 9115450			
Title Issued	31/10/2001	Edition	2	Edition Issued 12/10/2017

## Estate Type

FEE SIMPLE

## Registered Proprietor

BRUCE ROBIN KUCHEL  
JOYLEEN AVIS KUCHEL  
OF PO BOX 110 MURRAY BRIDGE SA 5253  
1 / 2 SHARE AS JOINT TENANTS

IAN NEVILLE KUCHEL  
DEBBIE GAYLE KUCHEL  
OF PO BOX 1280 MURRAY BRIDGE SA 5253  
1 / 2 SHARE AS JOINT TENANTS

## Description of Land

SECTION 196N  
HUNDRED OF MOBILONG  
IN THE AREA NAMED PALLAMANA

## Easements

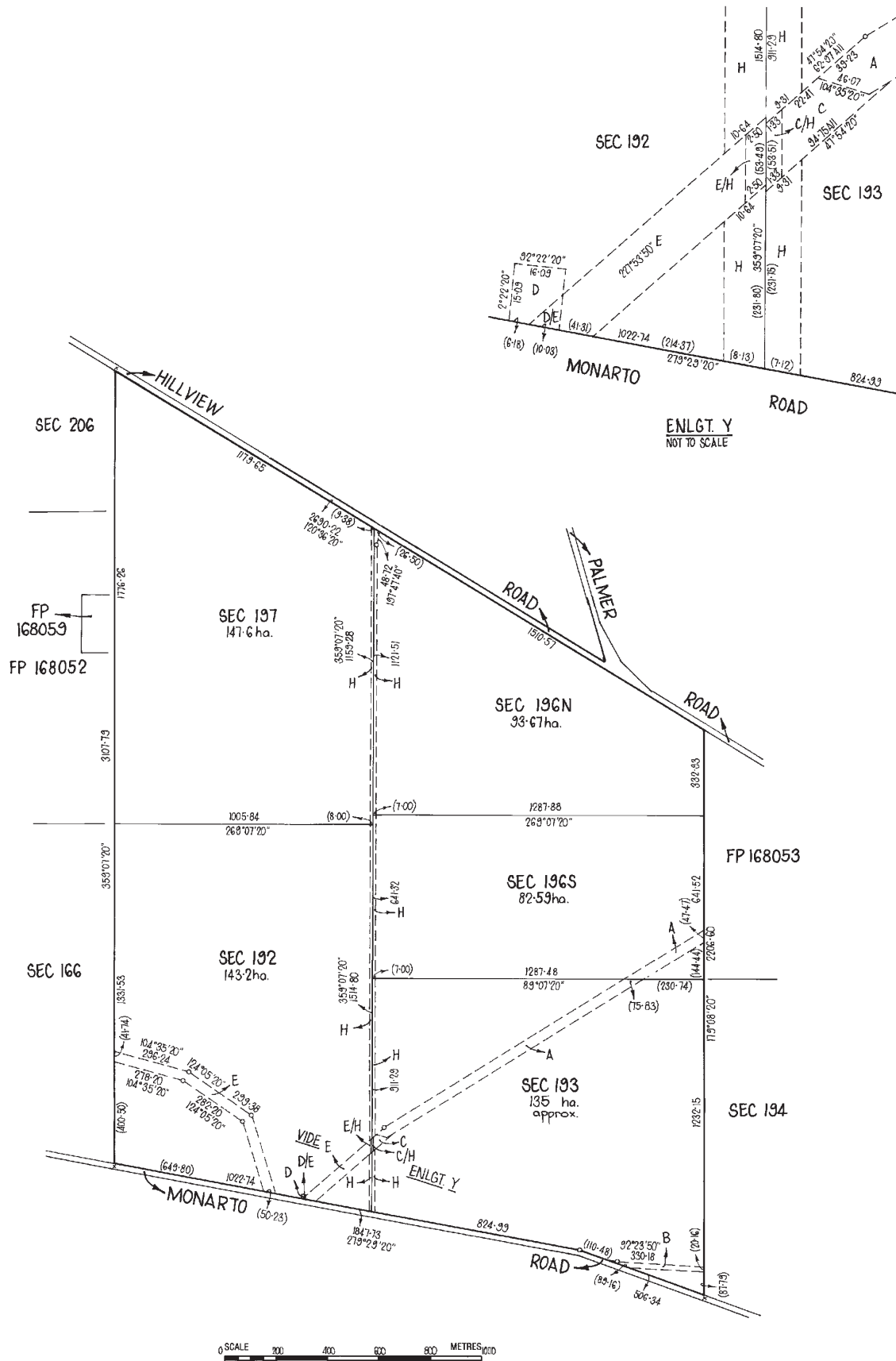
SUBJECT TO EASEMENT(S) OVER THE LAND MARKED H TO DISTRIBUTION LESSOR CORPORATION (SUBJECT TO LEASE 8890000) (TG 9115450)

## Schedule of Dealings

NIL

## Notations

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



REAL PROPERTY ACT, 1886



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.



## Certificate of Title - Volume 5858 Folio 258

Parent Title(s)	CT 5855/664			
Creating Dealing(s)	TG 9115450			
Title Issued	31/10/2001	Edition	2	Edition Issued 12/10/2017

## Estate Type

FEE SIMPLE

## Registered Proprietor

BRUCE ROBIN KUCHEL  
JOYLEEN AVIS KUCHEL  
OF PO BOX 110 MURRAY BRIDGE SA 5253  
1 / 2 SHARE AS JOINT TENANTS

IAN NEVILLE KUCHEL  
DEBBIE GAYLE KUCHEL  
OF PO BOX 1280 MURRAY BRIDGE SA 5253  
1 / 2 SHARE AS JOINT TENANTS

## Description of Land

SECTIONS 193 AND 196S  
HUNDRED OF MOBILONG  
IN THE AREA NAMED PALLAMANA

## Easements

SUBJECT TO EASEMENT(S) OVER THE LAND MARKED B TO THE MINISTER FOR INFRASTRUCTURE (T 3225095)

SUBJECT TO EASEMENT(S) OVER THE LAND MARKED H TO DISTRIBUTION LESSOR CORPORATION (SUBJECT TO LEASE 8890000) (TG 9115450)

SUBJECT TO EASEMENT(S) OVER THE LAND MARKED A AND C TO THE ETSA CORPORATION (T 2958738 AND T 3251995 RESPECTIVELY)

## Schedule of Dealings

Dealing Number	Description
4947314	HERITAGE AGREEMENT PURSUANT TO SOUTH AUSTRALIAN HERITAGE ACT, 1978 COMMENCING ON 14/8/1981 AND EXPIRING ON 13/8/2011

## Notations

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





Register Search (CT 5858/258)  
14/12/2017 11:49AM  
50359  
20171214004785  
\$28.25



REAL PROPERTY ACT, 1886



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.



## Certificate of Title - Volume 5858 Folio 259

Parent Title(s)	CT 5855/665			
Creating Dealing(s)	TG 9115450			
Title Issued	31/10/2001	Edition	2	Edition Issued 12/10/2017

## Estate Type

FEE SIMPLE

## Registered Proprietor

BRUCE ROBIN KUCHEL  
JOYLEEN AVIS KUCHEL  
OF PO BOX 110 MURRAY BRIDGE SA 5253  
1 / 2 SHARE AS JOINT TENANTS

IAN NEVILLE KUCHEL  
DEBBIE GAYLE KUCHEL  
OF PO BOX 1280 MURRAY BRIDGE SA 5253  
1 / 2 SHARE AS JOINT TENANTS

## Description of Land

SECTION 197  
HUNDRED OF MOBILONG  
IN THE AREA NAMED PALLAMANA

## Easements

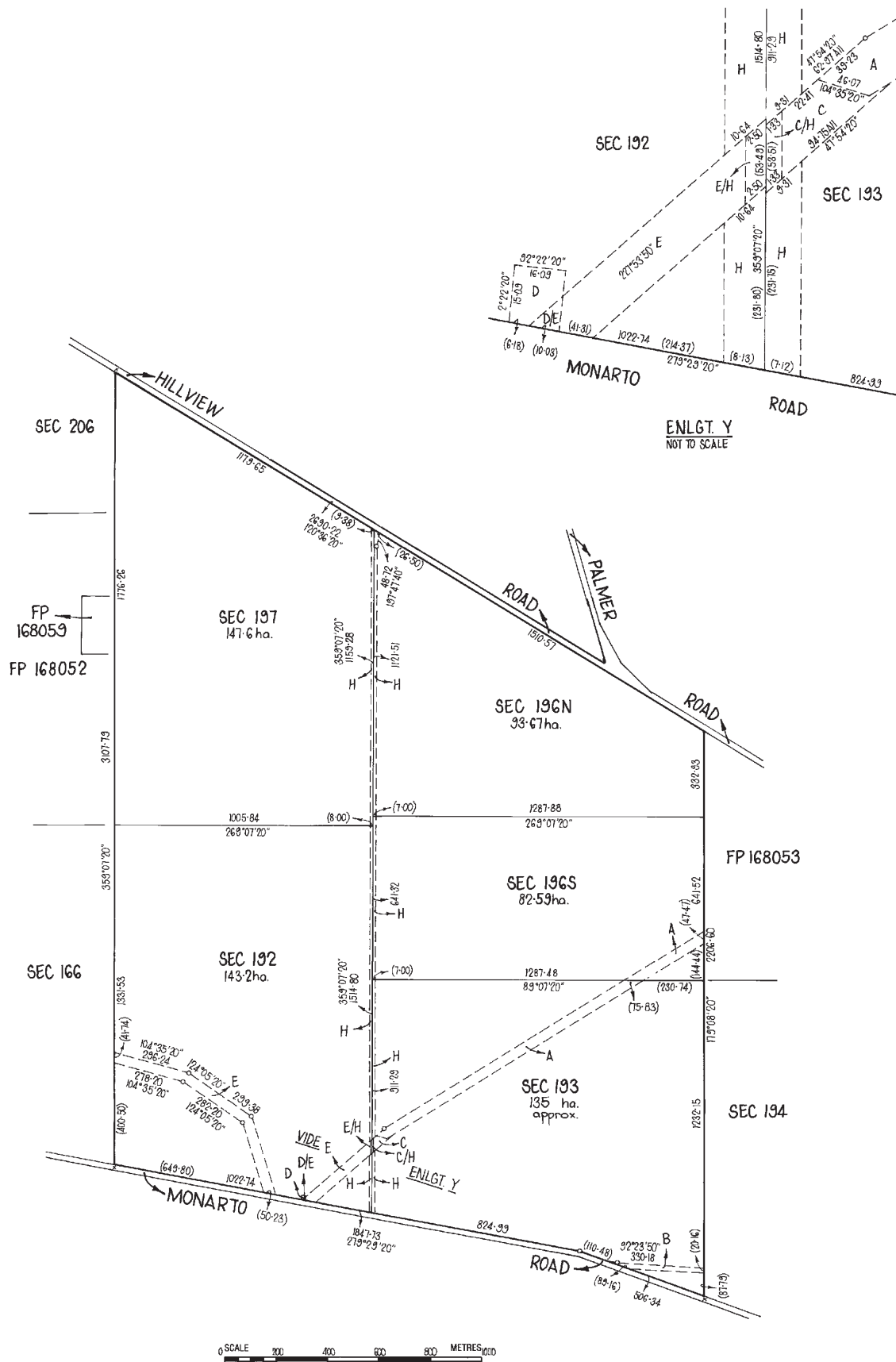
SUBJECT TO EASEMENT(S) OVER THE LAND MARKED H TO DISTRIBUTION LESSOR CORPORATION (SUBJECT TO LEASE 8890000) (TG 9115450)

## Schedule of Dealings

NIL

## Notations

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





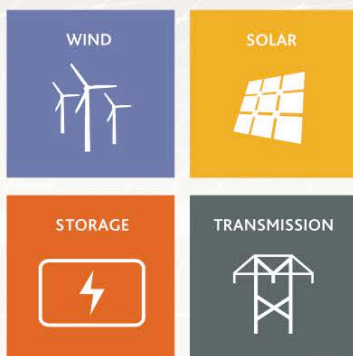
# PALLAMANA SOLAR FARM AND BATTERY STORAGE FACILITY

Development Application

AUGUST 2018

VOLUME 1

PROJECT SUMMARY



# **PROPOSED PALLAMANA SOLAR FARM AND BATTERY STORAGE FACILITY**

**VOLUME 1**

## **PROJECT SUMMARY**

**FOR RES AUSTRALIA PTY LTD**

166 and 229 Hillview Road, Pallamana



**August 2018**



Version	Author	Reviewer
Draft for Review	Julie Jansen 08 February 2018	Laudie van den Bogaert and Chris Gosling, RES
Draft for Review	Julie Jansen 04 April 2018	Chris Gosling, RES
Draft for Review	Julie Jansen, 07 June 2018	Chris Gosling, RES
Final Draft	Julie Jansen, 31 July 2018	Chris Gosling, RES
Final Draft v2	Julie Jansen, 20 August 2018	RES
Final	Julie Jansen, 30 August 2018	Chris Gosling, RES
Final v1	Julie Jansen, 31 August 2018	Chris Gosling, RES
Final	Julie Jansen, 03 September 2018	



Prepared by  
 MasterPlan SA Pty Ltd  
 ABN 30 007 755 277, ISO 9001:2015 Certified  
 33 Carrington Street, Adelaide SA 5000  
 Telephone: 8193 5600, [masterplan.com.au](http://masterplan.com.au)  
 MasterPlan File Ref: 50359

## **DEVELOPMENT APPLICATION DOCUMENT STRUCTURE**

This is volume one of four volumes comprising the development application for the Pallamana Solar Farm and Battery Storage development. The application comprises:

Volume 1 – Project Summary

Volume 2 – Technical Reports

Volume 3 – Drawings, Maps and Figures

Volume 4 – Draft Construction Environmental Management Plan

## Contents

<b>1.0</b>	<b>INTRODUCTION .....</b>	<b>1</b>
<b>2.0</b>	<b>APPLICATION STRUCTURE .....</b>	<b>2</b>
<b>3.0</b>	<b>PROJECT OVERVIEW .....</b>	<b>4</b>
3.1	Applicant Details .....	4
3.2	Land Security .....	5
3.3	Project Timing .....	5
3.4	Section 49 – Crown Sponsorship .....	6
<b>4.0</b>	<b>DESCRIPTION OF THE LAND AND LOCALITY .....</b>	<b>7</b>
4.1	Subject Land .....	7
4.2	Locality .....	11
<b>5.0</b>	<b>DETAILED DESCRIPTION OF THE PROPOSED DEVELOPMENT .....</b>	<b>16</b>
5.1	Development Components Overview .....	16
5.2	Plans and Details .....	18
5.3	Construction and Operation .....	18
5.4	Buildings and Structures .....	20
<b>6.0</b>	<b>PROJECT CONTEXT .....</b>	<b>22</b>
6.1	Global Context .....	22
6.2	National Context .....	22
6.3	State Context .....	23
6.4	Local Energy-System Security .....	24
6.5	Integration of Solar Farm and Battery Energy Storage into the National Electricity Network .....	25
6.6	Greenhouse Gas Emissions .....	26
6.7	Local Economic Benefits and Community Enhancement Programmes .....	26
6.8	Summary of Project Benefits .....	27

<b>7.0</b>	<b>LEGISLATIVE CONTEXT</b>	<b>28</b>
7.1	Section 49	28
7.2	Development Plan	28
7.3	Referrals and Additional Requirements	28
7.4	Approvals Pursuant to Other Legislation	30
<b>8.0</b>	<b>PROJECT ASSESSMENT</b>	<b>32</b>
8.1	Flora and Fauna Assessment	32
8.2	Visual Impact Assessment	36
8.3	Access and Movement of Vehicles	41
8.4	Aeronautical Impact Assessment	42
8.5	Geology, Topography and Soils Assessment	44
8.6	Surface Water and Hydrology	45
8.7	Economic Impact Assessment	47
8.8	Land Capability Assessment	49
8.9	Development Plan Assessment	49
<b>9.0</b>	<b>COMMUNITY ENGAGEMENT</b>	<b>54</b>
9.1	Overview of Communication Methods	54
9.2	Consultation Comments	56
9.3	Amendments Post-Consultation	57
<b>10.0</b>	<b>CONCLUSIONS</b>	<b>58</b>

## EXECUTIVE SUMMARY

RES Australia Pty Ltd (**RES**) propose to develop a 176MW solar farm (solar photovoltaic arrays) and battery storage facility on part of the land at 166 and 229 Hillview Road (and Monarto Road), Pallamana (**Project Site**), known as the Pallamana Solar Farm (**Project**).

The Project is a commercially viable project. At a national level, the Project will contribute to Australia's emissions reduction commitment under the Paris Agreement through reduced reliance on non-renewable resources. The Project will produce approximately 420,000 Mwh of electricity per annum. This generation is equivalent to the electricity needs of approximately 82,000 South Australian homes each year, assuming the average annual household electricity use is 5,200 kWh per annum<sup>1</sup>.

The Project Site has excellent exposure to South Australia's abundant solar resources and proximity to connection to the national electricity grid, making it an ideal location for a renewable energy project. The proposed location of the Project satisfies the development control principle set out in the Murray Bridge Council Development Plan that renewable energy facilities should be "located in areas that maximize efficient generation and supply of electricity".

The Project will include battery storage with an indicative capacity of 66 MW (140MWh). The inclusion of battery storage aligns with the South Australian Government's Energy Plan, which identifies a goal to "[p]rovide South Australia with large-scale storage for renewable energy so power is available when it is needed".

The project will have a direct and tangible contribution to both the Australian and South Australian Governments' emissions reduction schemes. The Federal Renewable Energy Target encourages investment in renewable power stations to achieve 33 000 gigawatt hours of additional renewable electricity generation by 2020<sup>2</sup> and South Australia has a legislated target to reduce its greenhouse gas emissions by at least 60% by 31 December 2050<sup>3</sup>. The value of reduction of carbon emissions is an estimated 140,160 tonnes (rounded) in carbon dioxide (CO<sub>2</sub>) emissions on an annual basis compared to the same level of electricity generation using fossil fuels.

The Project Site comprises approximately 780 hectares. The current use of the land is primarily grazing and cropping. Significantly, the land will be utilised for energy production, which is envisaged by the Murray Bridge Council Development Plan. One of the objectives of the Development Plan is to facilitate the "[d]evelopment of renewable energy facilities that benefit the environment, the community and the state".

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<sup>1</sup> *Renewable Energy (Electricity) Act 2000 (Cth)*, section 40.

<sup>2</sup> Economic Impact Assessment by Essential Economics – refer Volume 2 of Development Application page 29.

<sup>3</sup> *Climate Change and Greenhouse Emissions Reduction Act 2007 (SA)*, section 5(1).



The Project will provide for a range of positive flow-on economic effects for the local community, particularly during the construction phase of the Project, including income to local service providers, employment of a large temporary workforce, improvements to local infrastructure, and benefits to the landholders of the Subject Land who will receive rental income from the Project.

The Project has been designed to avoid the clearing of vegetated areas which provide important habitat as far as possible, and micro-siting of project elements will further assist in avoiding vegetated areas. The Project is unlikely to diminish biodiversity values of the region, and has been assessed as unlikely to impact threatened species/communities.

In a broader sustainability sense and in relation to the broader 'public interest', the Project will assist in addressing global concerns about climate change, and assist in ensuring inter-generational and social equity through reducing society's consumption of finite resources.

Whilst there will be some impacts to the region as a result of the Project, it is considered that any adverse impacts from the development of the Project will be relatively minor and will be outweighed by the positive longer term environmental, social and economic benefits of the project.

## 1.0 INTRODUCTION

RES is the world's largest independent renewable energy company, with the expertise to develop, engineer, construct, finance, and operate projects around the globe. It has deployed over 13GW of utility-scale renewable energy projects across 250 projects in 12 countries over 35 years, involving wind, solar and energy storage technologies.

RES has been developing renewable energy projects in Australia since 2004. Our recent Australian projects include: the Emerald Solar Farm (72MW) in Queensland, which is currently under construction; the operational Ararat Wind Farm (75 turbines, 235 MW) and the approved Murra Warra Wind Farm (116 turbines, 418 MW) in Victoria; and the Taralga Wind Farm (51 turbines, 107 MW) in New South Wales.

RES has also submitted a development application to the South Australian State Planning Commission to develop the Twin Creek Wind Farm and Energy Storage project in the Mid North region of South Australia.

RES' contracted energy storage portfolio exceeds 240 MW (275 MWh), with over 200 MW in development. It has partnered with over nine utilities across these projects and is recognised by Navigant Research as one of the top two global integrators of energy storage.

This Project is located in the Rural City of Murray Bridge Council area and the South Australian Murray Darling Basin Natural Resources Management region.

The Project will consist of the following components:

- approximately 690,000 solar photovoltaic (PV) panels to be installed on a single axis tracker mount structure, with a total installed generating capacity of 176MW;
- battery energy storage facility with an indicative capacity of 66MW;
- electrical substation including step up transformer stepping up the voltage to 132kV;
- underground and overhead electrical cable reticulation;
- electrical inverter and transformer enclosures and associated electrical equipment;
- overhead transmission connection into the 132kV transmission line;
- operations and maintenance building and compound; and
- associated access roads.

## 2.0 APPLICATION STRUCTURE

The development application for the Project is contained within four volumes and comprises:

Volume 1 – Project Summary

Volume 2 – Technical Reports

- 2.1 Economic Impact Assessment – Pallamana Solar Farm Project by Essential Economics (Ref: 17205b – July 2018)
- 2.2 Pallamana Solar Array and Battery Storage Project, Ecological Assessment by EBS Ecology (Ref E70503 dated July 2018)
- 2.3 Landscape Character and Probable Visual Effect Assessment – Pallamana Solar and Energy Storage Facility by Wax and BGLA (final dated 6 August 2018)
- 2.4 Pallamana Solar Farm Aeronautical Impact Assessment by Aviation Projects (Ref: 101807-01 – final dated July 2018)
- 2.5 Aeronautical Impact Assessment – Monarto Solar Farm by Landrum & Brown (Ref: LBo0097 dated October 2017)
- 2.6 Geology, Topography and Soils – Pallamana Solar Farm by AECOM (Ref: 60577009 dated 11 July 2018)
- 2.7 Surface Water and Hydrology – Pallamana Solar Farm by AECOM (Ref: 60577009 dated 11 July 2018)
- 2.8 Traffic Safety Assessment – Proposed Solar and Battery Storage Facility Project, Pallamana by MFY (Ref: 17-0089 dated July 2018)
- 2.9 Development Plan Assessment – Proposed Pallamana Solar and Battery Storage Facility by MasterPlan (Ref: 50359 dated August 2018)
- 2.10 Land Capability Assessment – Proposed Pallamana Solar and Battery Storage Facility by MasterPlan (Ref: 50359 dated August 2018)

Volume 3 – Drawings, Maps and Figures by RES:

- Site Location Plan Drawing No. 03791D2204-04
- Site and Locality Plan Drawing No. 03791D2102-01
- Site Layout Drawing No. 03791D1001-04
- Site Layout Enlargement Drawing No. 03791D1002-01
- Technical Figure 1 – Single Axis Tracker Drawing No. 03707D2206-01
- Technical Figure 2 – Typical Access Track Detail Drawing No. 03707D3501-03
- Technical Figure 3 – Typical Temporary Construction Compound Drawing No. 03707D3502-03
- Technical Figure 4 – Typical Conversion Unit – PCU Drawing No. 03707D4001-03
- Technical Figure 5 – Typical Fence Detail Drawing No. 03707D2204-03
- Technical Figure 6 – Typical Security Lighting & CCTV Support Detail Drawing No. 03707D2201-03
- Technical Figure 7 – Indicative Utility Facility Layout Single Transformer Drawing No. 03707D4004-01
- Technical Figure 8 – Typical Control Room Drawing No. 03707D4003-01
- Technical Figure 9 – Typical Storage Shed Drawing No. 03707D3503-01

- Technical Figure 10A – Storage Building Site Plan Drawing No. 03791D3403-01
- Technical Figure 10B – Battery Storage Building Elevations Drawing No. 03791D3404-01
- Technical Figure 11 – Typical 33KV Overhead Line Poles Drawing No. 037074101-02
- Technical Figure 12 – Typical Infill Plant Layout Drawing No. 03791D2204-01

Volume 4 – Draft Construction Environmental Management Plan

### 3.0 PROJECT OVERVIEW

Table 1 – Project Overview	
<b>Applicant</b>	RES Australia Pty Ltd
<b>Proposed Development</b>	Renewable energy facility incorporating 176MW solar farm and battery storage facility and ancillary infrastructure
<b>Project Site</b>	The Project Site is located at 166 and 229 Hillview Road, Pallamana.
<b>Subject Land</b>	<p>The titles comprising the “<b>Subject Land</b>” on which the Project Site is located are as follows:</p> <ul style="list-style-type: none"> <li>• Section 192, Hundred of Mobilong, in the area named Pallamana, Certificate of Title Volume 5858 Folio 256</li> <li>• Section 196N, Hundred of Mobilong, in the area named Pallamana, Certificate of Title Volume 5858 Folio 257</li> <li>• Sections 193 and 196S, Hundred of Mobilong, in the area named Pallamana, Certificate of Title Volume 5858 Folio 258</li> <li>• Section 197, Hundred of Mobilong, in the area named Pallamana, Certificate of Title Volume 5858 Folio 259</li> <li>• Section 166, Hundred of Mobilong, in the area named Pallamana, Certificate of Title Volume 5487 Folio 88</li> <li>• Allotment 285, Hundred of Mobilong, in the area named Pallamana, Certificate of Title Volume 5802 Folio 294</li> </ul> <p>Refer Certificates of Title in <b>Attachment B</b>.</p>
<b>Valuation No’s.</b>	<p>166 Hillview Road, Pallamana – Valuation No: 4141300419</p> <p>229 Hillview Road, Pallamana – Valuation No: 4141300400</p>
<b>Land Tenure</b>	Freehold
<b>Zoning</b>	Primary Production Zone – Policy Area 5 – North Central Area, Murray Bridge Plains, Murray Bridge Council Development Plan consolidated version dated 23 January 2018
<b>Land Use</b>	Primary Production – Cereal and Grazing with associated dwelling and outbuildings

### 3.1 Applicant Details

RES Australia Pty Ltd (ABN 55 106 637 754)  
 Suite 4, Level 1, 760 Pacific Highway  
 Chatswood NSW 2067  
 Website: [www.res-group.com](http://www.res-group.com)

### Project Contact Details

Mr Chris Gosling  
 Project Development Manager  
 RES Australia Pty Ltd  
 Phone: 02 8440 7400  
 Email: [chris.gosling@res-group.com](mailto:chris.gosling@res-group.com)

Further details regarding RES and its projects can be found in **Attachment A** and on the company website <http://www.res-group.com>.

### 3.2 Land Security

The land for the development has been secured by RES through an option to lease.

### 3.3 Project Timing

At the time of submitting the development application, RES seeks a period of five years in which to substantially commence the development of the Project from the operative date of the consent, and for substantial completion to occur eight years after the operative date of the consent.

**Table 2** outlines the likely timetable for construction and operation of the Project.

Table 2 – Project Timing	
PHASE	DURATION
Pre-construction, project planning and development approval	12 months
Construction and commissioning	18-24 months
Operation	30 years
Maintenance	Periodic and as required
Decommissioning or replacement	At completion of project life

Following determination of the development application for Development Plan Consent, RES will undertake a tender process to confirm the equipment supplier and contractors for construction and pre-construction purposes and finalise the Construction Environmental Management Plan (**CEMP**) and Operational Management Plan.

### 3.4 Section 49 – Crown Sponsorship

In accordance with the definition of “public infrastructure” in Section 49 of the *Development Act 1993* (SA) (**Development Act**), the Project is infrastructure being developed for the supply of electricity, as identified in part (a). Electricity proposed to be generated by the Project will be distributed to the national grid.

***public infrastructure means—***

- (a) *the infrastructure, equipment, structures, works and other facilities used in or in connection with the supply of water or electricity, gas or other forms of energy, or the drainage or treatment of waste water or sewage;*

...

Crown sponsorship has been granted by the Department of the Premier and Cabinet by letter dated 7 February 2018. Following an amendment in the boundary of the Project Site, the Department for Energy and Mining confirmed Crown Sponsorship on 19 July 2018. Both letters are included in **Attachment C**.

Pursuant to Section 49 (4a) of the Development Act, the State Commission Assessment Panel must give notice containing particulars of the Project to the Rural City of Murray Bridge for consideration and report.

Notification in the form of a public advertisement is required under Section 49(7d) of the Development Act as the development has a value exceeding \$4 million.

## 4.0 DESCRIPTION OF THE LAND AND LOCALITY

### 4.1 Subject Land

The Project Site is located approximately 4.0 kilometres north-west of the outskirts of the urban area Murray Bridge and 60km south east of Adelaide. The Project Site is bounded by Monarto Road to the south and Reedy Creek Road and Hillview Road to the north.

The Project Site has a total area of approximately 780 hectares. The Project Site covers only a portion of the Allotments/Sections which comprise the Subject Land as shown on the plans in **Attachment D**.

The Subject Land comprises a variety of infrastructure, including overhead 132kV electricity lines, 33kV and 19kV electricity lines, a SEAGas underground pipeline and dwelling and outbuildings. The principal dwelling on the Subject Land is outside of the Project Site.

The land is undulating and contains scattered vegetation adjacent to fence lines and in patches within the site. EBS Ecology (EBS) (in the Ecological Assessment report dated July 2018) note that:

*"most of the project site has very low ecological value. The overall remnant vegetation communities have the following qualities:*

- *Most vegetation is present as narrow strips or small remnant blocks;*
- *The remnant patches were intact overstorey dominated by one or more Mallee eucalyptus species;*
- *Hollow bearing limbs were prevalent with most assessment quadrats scoring high in this functional attribute;*
- *There was no or very low mid storey representation with almost all representation provided by one of two melaleuca species;*
- *Understorey was either absent or present as degraded or disturbance resistant species;*
- *There was little to no natural regeneration; and*
- *Pest species such as rabbits were well established.*

*As a result, the retention of vegetation stratus is important from a landscape context point of view, as these act as connective pathways to areas of large intact patches or areas formally protected. They also provide nesting habitat for species such as parrots in an otherwise highly fragmented habitat.*



*The priority in any planning should be the retention of as much of this vegetation as possible while also making an effort to enhance what remains. Fencing of many of these strips will aid regeneration if coupled with other management actions such as rabbit control. Under the current management practices, the vegetation in ecological terms is largely already dead as without any regeneration, the vegetation can only continue to decline. This is further enhanced with potential additional stressors such as climate change. Evidence of dieback in several intact patches indicates that potentially the lifespan of the existing vegetation is <100 years.*

*Given the surrounding landscape is primarily equivalent or similar to this area, it is unlikely that significant additional weed invasion would be likely to occur although events such as the recent Orobancha (Branched Broomrape) show that there is potential for significant economic cost when new exotic species are introduced. (page 28)."*

WAX Design, in the Landscape Character and Probable Visual Effect Assessment dated July 2018, describe the landscape character of the site as follows:

*The subject land and the immediate locality to the north are formed by an undulating tableland with numerous local ridges and creeks. The underlying land cover is predominantly cropped agriculture. This rural landscape is punctuated by shelter belts of trees and woodland areas that form defined vegetated elements in the landscape. Four transmission lines run through the site, which reflect existing infrastructure elements within the locality.*

*The topographic variation in combination with the existing areas of vegetation create a visually enclosed landscape character with a degree of visual complexity that results in pockets of landscape with contained views extending for a few kilometres before being the surrounding ridgelines, and vegetation belts contain the visual character forming defined viewsheds.*

*The site extends across an elevated plateau that forms the highest point of the Monarto tablelands between Murray Bridge and the Bremer River corridor. The site is defined by several local undulations that form localised basins and depressions that limit the degree of visibility within the wider locality.*

*Extensive revegetation and conservation parks associated to Monarto zoological park and Kinchina provide substantial screening, scale and visual enclosure to the sub regional character.*

*The combination of vegetation and landform creates an enclosed visual character to the site with fragmented views towards the subject land between existing tree groups. To the east, the site slopes gently towards the residential edge of Murray Bridge. The orientation of the slope offers a greater degree of visibility over part of the subject land (page 17).*



Photograph taken from Monarto Road, looking in a westerly direction, with the subject land to the right of the photograph. Some of the 33kV and 132kV infrastructure on the subject land is evident in the photograph, as is existing roadside vegetation.



Photograph taken from Monarto Road looking in a north easterly direction across the subject land. The largest patch of vegetation on the subject land (in the south-eastern area of the site) is evident in the right of the photograph.



**View of the subject land from Monarto Road looking in a northerly direction and illustrating the vegetation planting adjacent the western fenceline.**



**View of the subject land to the right of the photograph, taken from Hillsview Road and looking in a south-easterly direction. Areas of roadside vegetation are evident in this photograph.**



## 4.2 Locality

The urban settlement of Murray Bridge is located on the River Murray approximately 4.0 kilometres to the south-east of the Project Site.

The locality of the Project Site is characterised by primary production activities, particularly cropping and grazing, along with associated scattered dwellings and farm buildings. Within the wider locality there are also intensive animal keeping activities, the Monarto Zoological Park, Pallamana Airfield, Kinchina Conservation Park, a quarry on Maurice Road, and to the south-east on the edge of Murray Bridge is the Mobilong Prison.

The Murray Bridge Council Development Plan describes the policy area within which the site is located as "... characterised by a range of farming activities on relatively large properties, including grazing and cropping, some intensive animal keeping involving meat and wool production, and rural industries. The area contains the Pallamana Airfield. It is desirable that these activities continue, and development other than that associated with general farming and primary production activities takes into account the existing character of the area".

As stated above, the locality contains the Pallamana Airfield (also referred to as the "Murray Bridge aerodrome"). The airfield is located to the north of Reedy Creek Road and north of the subject land. Pallamana Airfield is utilised for general aviation and flight training. The aerodrome has both a gravelled runway and grassed runway. The airfield is an "uncertified aerodrome", which Landrum and Brown define in their Aeronautical Impact Assessment for Monarto Solar Farm (October 2017) as follows:

*An Uncertified Aerodrome ... is referred to as an Aeroplane Landing Area (ALA). These range in capability and size from having a sealed runway with lighting capable of accommodating corporate jet aircraft to a grass paddock that is smooth enough to land a single engine light aircraft or a purpose built aerial agricultural aircraft.*

Monarto Zoological Park is a large non-agricultural land use to the south east of the Project Site. The northern boundary of the free range zoo is Monarto Road. Public access to the zoo is not in the vicinity of the subject land, but rather from Old Princes Highway. The Monarto Zoological Park Zone, as defined by the Murray Bridge Council Development Plan is diagonally opposite the south-western corner of the subject land.

On the southern side of Monarto Road opposite the Project Site is an SA Water pumping station and substation. Further south of the pumping station is Kinchina Conservation Park and a quarry on Maurice Road, and to the south-east on the edge of Murray Bridge is the Mobilong Prison.

The Landscape Character and Probable Visual Effect Assessment (at page 20) describes the locality in the following manner:

### *Land Use and Land Cover*

*The land use and land cover across the proposed development site and the immediate locality (<3km) of the proposed solar and energy storage facility is defined by a mixture of large open paddocks, vegetation belts, isolated tree groups and some areas of revegetation. Cropping is the dominant land use with occasional residential properties and farming buildings located in the landscape. This is representative of the Murray Plains and creates a distinctly agricultural landscape character.*

*The land use of the local, sub-regional and regional landscape is predominately agricultural, this underlying agricultural character changes as it transitions into the adjacent regional urban settlement of Murray Bridge, the Kinchina Conservation Park, Monarto Zoological Park and Murray River Basin.*

### *Landform and Geomorphology*

*The underlying topography of the locality is defined by a number of distinct landforms and topographic features. These include the escarpment of the Murray River flood plain to the east which forms a defined elevation change. To the south, are a series of defined ridgelines that are formed by the Narrinyeri Hills, White Hill and Gifford Hill. The orientation of the ridgelines extends west from the Southern Mount Lofty Ranges.*

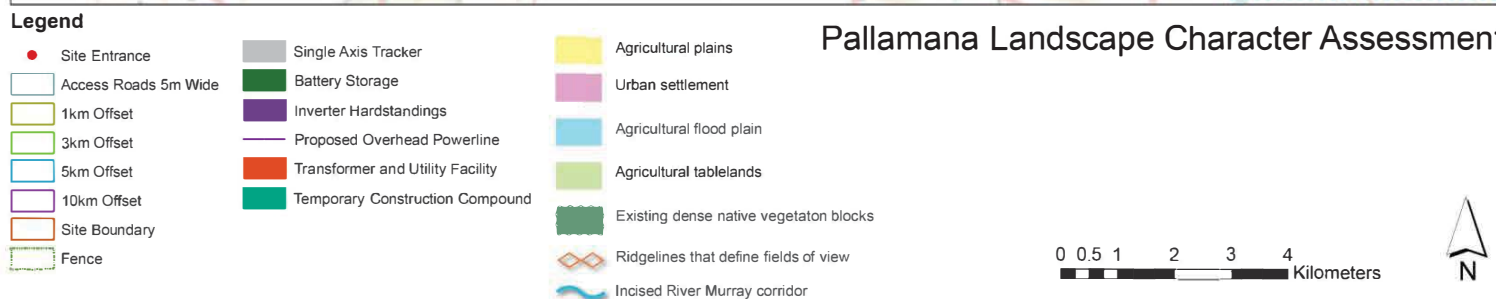
*To the west and north are the undulating tablelands of the Southern Mount Lofty Ranges. The tablelands extend between the Murray River and the Bremer River and are punctuated by numerous local landforms and creeks including Preamimma Creek and Rocky Gully.*

### *Landscape Character Units*

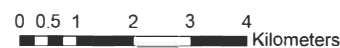
*The regional landscape context surrounding the project contains four (4) landscape character areas which are;*

- 1. Agricultural Tablelands.*
- 2. Agricultural Plains.*
- 3. Agricultural Flood Plains.*
- 4. Urban Settlement (Murray Bridge).*

These landscape character units are shown in the Figure below.



## Pallamana Landscape Character Assessment







View of the SA Water pumping station on the southern side of Monarto Road, opposite the subject land.



View of SA Water pipeline adjacent Monarto Road and opposite the subject land.



Photograph of the Pallamana Airfield taken from Hillsview Road.



## 5.0 DETAILED DESCRIPTION OF THE PROPOSED DEVELOPMENT

### 5.1 Development Components Overview

The Project will consist of the following components:

- solar panels with a generating capacity of approximately 176MW;
- approximately 690,000 solar photovoltaic (PV) panels (such as a multi-crystalline silicon, mono-crystalline silicon, thin film or similar panels). The expected power rating is likely to be in the range of 320W to 400W per panel;
- the panels (installed on a single axis tracker mount structure) are approximately 4.0 metres in height, with each PV panel having a variable tilt angle of approximately 60 degrees;
- the panels may be constructed either portrait or landscape, depending on the final panel and mounting infrastructure selected;
- the panels are constructed in rows that comprise approximately 84 modules. The rows are typically 4.0 to 8.0 metres apart (between structural poles), which at its closest point would result in panels approximately 2.0 to 6.0 metres between PV panels. All PV panels will have anti-reflective coating;
- the panels are connected to inverters and subsequently a transformer prior to connection to the substation (which may include a step up transformer to step up the voltage to 132kV);
- underground cabling between solar arrays and inverters;
- overhead transmission line connection to the substation (which is located on the SA Water site on southern side of Monarto Road), including a 132kV tee-off pole;
- two temporary construction and laydown compounds;
- fencing of the site (2metre cyclone fencing);
- retention of existing screen landscaping;
- supplementary vegetative screening along road boundaries;
- vehicular access from Monarto Road; and
- electrical inverter and transformer enclosures and associated electrical equipment.

The following photographs of a solar farm illustrates a typical solar farm with solar arrays.



Photograph of a typical array of single axis tracker photovoltaic panels in a solar farm.



Photographs of construction and installation of single axis photovoltaic panels at RES' Emerald Solar Farm in Queensland.



Photographs of construction and installation of single axis photovoltaic panels at RES' Emerald Solar Farm in Queensland.

The Project may be developed in stages. Staging of the Project will be critically assessed in the final design stage to ensure the Project is justified by reference to the market conditions at the relevant time.

## 5.2 Plans and Details

Plans of the proposed development are included in Volume 3 of the application documents.

Details of PV panels, inverter and storage infrastructure RES anticipates to be installed at the Project Site are contained in **Attachment E**.

## 5.3 Construction and Operation

The Project has two phases, namely the construction phase and the operational phase.

### 5.3.1 Construction Phase

The construction phase would incorporate the following elements:

- construction traffic for transportation of all component parts to the site;
- semi-trailers and other smaller commercial vehicles will be utilised in the movement of component parts;
- delivery of the components is anticipated to be via the South Eastern Freeway and exit freeway to Ferries McDonald Road, Schenscher Road and Monarto Road;
- infrastructure materials such as concrete, reinforcement, pavement and surfacing material will be sourced locally from quarries and suppliers;
- the construction period is anticipated to be approximately 12-18 months;
- site preparation for the Project would involve earthworks to prepare the site of the temporary construction compound and internal roads and surfaces;
- all excavated material would be stored and used on-site. Removal of material off site is not anticipated;
- preparation of concrete pads for foundations for plant, equipment and site buildings would then occur, followed by installation of these structures. Subsequently excavation for, and the installation of, the solar arrays would occur;
- the solar PV panels would be installed and all electrical infrastructure connected;
- construction occurring between the hours of 7am and 7pm Monday to Saturday, with no work on Sundays or Public Holidays;
- it is anticipated that up to 200 people being directly employed during the construction phase of the solar farm.

### 5.3.2 Operation Phase

The ongoing operation of the Project will involve monitoring and maintenance of the solar arrays and associated infrastructure and the wider Project Site and administration of the regulatory requirements associated with supplying the electricity generated to the national grid. It is anticipated that 2 - 4 FTE staff would be required for the Project during its operation. Operational activities are expected to include remote monitoring of equipment on a daily basis, full servicing of inverters and substation equipment on a quarterly basis and cleaning of the solar panels at regular intervals. In addition to operational and maintenance staff at the Project Site, there would be employment (potentially at RES' head office) to carry out remote monitoring of the solar panels and administrative tasks associated with supplying the electricity generated by the Project to the national grid.

## 5.4 Buildings and Structures

In addition to the solar arrays, ancillary buildings and structures required for the Project will be located on the Project Site.

- **Control Building** – this building is transportable and will have an area of approximately 40 square metres (10 metres x 4.0 metres). The control building would comprise amenities and storage components and also accommodate telecommunications, operations and security system infrastructure and equipment required for the Project.
- **Inverters and transformers** – inverters are similar to large shipping containers and convert the direct current (DC) electricity that is generated from the solar panels into alternating current (AC). Within or adjacent to these containers will be transformers stepping up the voltage to an internal reticulation voltage within the solar farm typically to 11,22 or 33kV. Depending on the final inverter selected, in the vicinity of 35 inverters are proposed to be installed on the site and located to the south of the solar arrays. The inverters are typically installed on a concrete pad footing or raised steel frames.
- **Transformer** – a main grid connection transformer is proposed to be located within the construction and operations compound adjacent the Monarto Road boundary, so that a direct connection can occur via an overhead transmission line to the existing 132kV Electranet network that transverses the site and the substation adjacent to the SA Water plant on Monarto Road. The transformer will be installed on a concrete pad. This transformer will step up the voltage from the internal reticulation voltage to 132kV.
- **Underground Cabling** – underground cabling will be utilised for cables connecting the inverters to the transformer. Cable trenches will typically be installed along access roads and tracks.
- **Transmission Line** – The connection to the SA Water substation to the south of the site.
- **Security Fencing** – permanent security fencing in the form of approximately 2.0 metre high chain mesh will be constructed around the perimeter of the solar arrays and ancillary infrastructure.
- **Temporary Construction Compound** – during the construction phase of the Project it is proposed to develop a compound for the delivery and storage of materials. A site office in the form of a transportable building would be located within the compound. The temporary construction compound would be fenced for security purposes for the construction period and along with the site office then removed upon completion of construction.



- **Battery Storage** - The development also includes a battery energy storage facility. The key uses of batteries include helping to lower consumer costs by providing cheaper renewable generation in periods of higher demands. Batteries can also provide security and stability services to the grid by injecting bursts of power into the network to help balance load and supply over very short time scales. Externally the battery storage facility looks like one large purpose built building, with inverters located on the outside of the building. These buildings will contain racks of Lithium Ion (li-ion) batteries which will be connected to the inverters and then on to the grid transformers at the terminal station through a small switch yard.
- **Site Access** – access to the site will be from a new access point from Monarto Road.
- **Internal vehicle tracks** – post construction internal vehicle access driveways will be retained throughout the solar arrays for access to key equipment. These internal access tracks will be gravel (unsealed) and generally up to 5.0 metres in width. Solar PV module rows will be spaced approximately 4.0 metres to 6.0 metres apart to allow access for service and cleaning. The spaces between module rows will generally not be gravelled and will allow for regeneration of groundcover.
- **Earthworks** – the site requires minimal site work, other than construction of a hardstand area for the construction compound and operations/control building and level bases for the inverters/transformers. Earthworks associated with the construction of the solar panels involves a post driver for the construction of the posts which support the steel frames of the solar panels.

## 6.0 PROJECT CONTEXT

The Project is a development of economic and environmental significance and represents an important contribution to renewable energy generation in South Australia.

The Project provides additional generating capacity of approximately 420,000 Megawatt hours (MWh) every year over the operating life of the solar farm. This generation is equivalent to the electricity needs of approximately 82,000 South Australia homes each year, assuming the average annual household electricity use is 5,200 kWh per annum. In addition to the solar generation, the energy storage facility has a storage capacity of 140 MWh.

The solar farm and battery storage will provide electricity for use by electricity customers within the National Electricity Market (**NEM**).

### 6.1 Global Context

There is overwhelming evidence that carbon emissions are having a detrimental effect on the environment through climate change and that if such emissions continue to increase there will be serious consequences for biological and social systems worldwide. It is recognised that the use of renewable energy sources will displace greenhouse gas emissions arising from fossil fuel electricity generation. Policies have been put in place at the international, national and state level to proactively support the establishment and use of renewable energy.

At the United Nations Climate Change Conference held in Paris in 2015, all 196 delegate countries including Australia agreed to reduce greenhouse gas emissions as soon as possible and to keep global warming to below two degrees as measured against preindustrial levels.

As discussed in the Essential Economics report in **Volume 2** of the development application documents:

*"the Paris agreement sets out a global consensus to limit temperature increases to below two degrees Celsius when compared to pre-industrial levels; an additional goal is to maintain this increase at less than one and a half degrees Celsius. Nationally determined contributions (NDCs) do not have any set lower limit but are required to progress over time (beginning with the intended NDC pledged during the Paris conference), and to be 'ambitious'. Australia's current targets are a reduction of emissions by five percent from 2000 levels by 2020, and by 26-28 percent below 2005 levels by 2030".*

### 6.2 National Context

The Essential Economics report also discusses the Federal Renewable Energy Target, as follows:

*The Renewable Energy Target (RET) is an Australian Government scheme designed to reduce emissions of greenhouse gases in the electricity sector and encourage the additional generation of electricity from sustainable and renewable sources.*

*The RET works by allowing both large-scale power stations and the owners of small-scale systems to create certificates for every megawatt hour of power they generate. Certificates are then purchased by electricity retailers who sell the electricity to householders and businesses. These electricity retailers also have legal obligations under the RET to surrender certificates to the Clean Energy Regulator, in percentages set by regulation each year. This creates a market which provides financial incentives to both large-scale renewable energy power stations and the owners of small-scale renewable energy systems.*

*In June 2015, the Australian Parliament passed the Renewable Energy (Electricity) Amendment Bill 2015. As part of the amendment bill, the large-scale RET was reduced from 41,000 GWh to 33,000 GWh in 2020, with interim and post-2020 targets adjusted accordingly.*

Investment in energy projects post achievement of the current RET remains uncertain and may be dependent on government policy.

### 6.3 State Context

The South Australian Government has an active programme to deliver reductions in greenhouse gas emissions.

South Australia's Strategic Plan (**SASP**) establishes targets and priorities as a blueprint for the future of South Australia. First prepared in 2004, the SASP has been updated twice since that time and currently comprises seven strategic priorities, 10 economic priorities and 100 measurable targets.

The Project is directly aligned with the SASP target for renewable energy to: "support the development of renewable energy so that it comprises 33 percent of the state's electricity production by 2020". In addition to establishing a target for renewable energy, the SASP has a goal to reduce greenhouse gas emissions. The SASP Target in relation to greenhouse gas emissions reduction is to "achieve the Kyoto target by limiting the state's greenhouse gas emissions to 108 percent of 1990 levels during 2008-2012, as a first step towards reducing emissions by 60 percent (to 40 percent of 1990 levels) by 2050". South Australia has achieved its Kyoto target of restricting emissions levels to less than 36.4 Mt CO<sub>2</sub>-e through to 2012 and is now working towards the 2050 target. Continuing to provide alternative energy sources to coal-fired generation is an important means of ensuring a reduction in greenhouse gas emissions.

In addition to strategic targets relating to renewable energy and greenhouse gas emissions, the SASP contains a number of goals relating to economic growth. A number of these are outlined below in terms of the anticipated benefits of the Project.



*VISION: A strong, sustainable economy that builds on our strengths.*

*GOAL: We develop and maintain a sustainable mix of industries across the state.*

*Target 66 Emissions Intensity: Limit the carbon intensity of total South Australian electricity generation to 0.5 tonnes of CO<sub>2</sub>/MWh by 2020.*

The generation of renewable energy from the Project will provide stable and affordable electricity over the long term allowing predictable growth and expansion whilst also contributing to the State's goal to minimise carbon intensity associated with electricity generation.

*VISION: We have a skilled and sustainable workforce.*

*GOAL: All South Australians have job opportunities.*

*Target 47: increase employment by 2.0 percent each year from 2010 to 2016*

In March 2017, the South Australia Government released an "Energy Plan" with a vision "to source, generate and control more of South Australia's power supply in South Australia so we can increase self-reliance and provide reliable, competitive and clean power for all into the future." The Energy Plan contains the following goals which the Project will help to achieve:

- provide South Australia with large-scale storage for renewable energy so power is available when it is needed, beginning the transformation to next-generation renewable technology;
- create new investment in cleaner energy to increase competition, put downward pressure on prices and provide more energy system stability;
- create more electricity generation to increase competition and put downward pressure on prices.

#### **6.4 Local Energy-System Security**

RES have obtained a certificate of compliance pursuant to Clause 70 and Schedule 5, Item 12(1) of the *Development Regulations 2008* (SA) from the Office of Technical Regulator in relation to the security and stability of the State's power system (**Attachment F**).

RES recognise the licensing and registration requirements of a generator on the NEM and as a generator within the State of South Australia. These require satisfaction of requirements from entities such as ElectraNet, Australian Electricity Market Operator (**AEMO**) and Essential Services Commission of South Australia (**ESCOSA**). There are further registration requirements as a renewable energy generator over and above registration as a generator.

RES also recognises ESCOSA's directive around integration of new generation sources into networks in seeking to provide network support. These requirements, as well as potential future requirements, will be accommodated in the project design.

RES will work with the statutory bodies in relation to an agreed set of performance standards applicable for the facility, to the satisfaction of all appropriate parties through the standard connection process.

## 6.5 Integration of Solar Farm and Battery Energy Storage into the National Electricity Network

RES is experienced in the process in connecting generation plant to the NEM, having developed the now operating 107 MW Taralga Wind Farm in NSW and the 242 MW Ararat Wind Farm in Victoria, which have been registered by AEMO and are supplying electricity to the NEM.

The Project will be registered as a Semi-Scheduled Generator under the National Electricity Rules (the **Rules**), due to its capacity exceeding the threshold of 30MW. A connection enquiry has been lodged with ElectraNet as the responsible Transmission Network Services Provider and RES has received advice that the connection point is suitable for the Project.

The next step is to progress to the connection application phase and associated studies. This will include detailed static and dynamic modelling to confirm the technology capability with respect to the access standards, ultimately arriving at a set of negotiated generator performance standards. Simultaneously, ESCOSA requirements will also be assessed for the selected technology.

Although the technical performance standards of the battery energy facility will be negotiated as part of the suite of grid connection agreements, RES have extensive experience in implementing utility scale grid connected battery energy storage facilities in a range of functions which include:

1. Generation - Frequency Regulation, Renewable Integration, Spinning Reserve, Ramp Rate Management, Renewable Firming.
2. Transmission - Voltage Support, Substation & Line Upgrade Deferral, Renewable Integration, Loss Reduction, Constraint Relief, Reliability & Grid Stability.
3. Distribution - Disaster Recovery / Relief, Microgrid & Island Grid Support, Distribution Upgrade Support, Peak Load Reduction, Power Quality, Reactive power and voltage Support.

The battery functions are dispatchable in automatic and manual modes using RES's proprietary RES control software 'RESolve'.

The facility design will incorporate the communications requirements of both ElectraNet and AEMO to ensure network and Supervisory Control and Data Acquisition signals are received in the required timeframes, ensuring integration of the facility with the broader network operation controls.

## 6.6 Greenhouse Gas Emissions

The electricity produced by the Project will be fed into the NEM. Increased generation of electricity using renewable energy will inevitably result in greenhouse gas emissions savings from electricity generation.

Essential Economics have calculated that once fully-operational, the Project will result in the reduction of an estimated 140,160 tonnes (rounded) in carbon dioxide (CO<sub>2</sub>) emissions on an annual basis compared to the same level of electricity generation using fossil fuels. This calculation is based on an assumption that the equivalent generation to that produced by the Project would otherwise be sourced from brown coal with a carbon factor = 0.33372 tonnes per MWh.

This reduction on CO<sub>2</sub> emissions is the equivalent of taking approximately 50,000 cars off the road annually, based on an average of 14,000km travelled with CO<sub>2</sub> emissions of 200g/km (or 2.8 tonnes of CO<sub>2</sub> emissions per car, per annum).

## 6.7 Local Economic Benefits and Community Enhancement Programmes

The Project will provide local economic benefits to the community through the employment of local contractors and increased business opportunities as flow-on effects in nearby townships. In total, the Project will involve approximately \$200 million in investment during the construction phase. Further information relating to the social and economic aspects of the project is provided in the Essential Economics Economic Impact Assessment report in **Volume 2** of this application.

RES will also commit to a voluntary community enhancement programme as a benefit to the community, to offset residual impacts in the local area in which the Project is proposed. The programme would be established to benefit the community across the Rural City of Murray Bridge Council area.

RES has established various community enhancement programmes at their operating wind and solar farms elsewhere in Australia and internationally.

Key stakeholders will be consulted in establishing the community enhancement program, including the Rural City of Murray Bridge Council and local community and sporting groups. It is anticipated RES would seek nominations from the community to establish a 'board or committee' to operate and manage the program. RES would have a member on the board/committee, without any specific decision making role. Applications for grants will be sought from the community for sponsorship of sporting clubs, community events or physical enhancement projects in the community.

The final structure and amount of funds to be made available for the community enhancement programmes will be finalised prior to construction of the Project, with the benefit of input from a diverse range of community members.

## 6.8 Summary of Project Benefits

The key benefits of the construction and operation of the Project are as follows:

- contribute to the achievement of the National and State objectives for the sustainable production of energy and the abatement of greenhouse gas emissions;
- the provision of an additional energy source for electricity retailers to meet the obligations of the Federal Government's RET Scheme;
- additional electricity generation in the order of 420,000 MWh/year to assist the NEM to be able to satisfy forecast electricity demands, being enough clean energy to provide for approximately 82,000 South Australian homes each year;
- the development will assist in adding stability to the energy sector in South Australia via the inclusion of battery storage in combination with the solar farm, providing further renewable energy for the State;
- the displacement of energy from fossil fuels, with the value of carbon emission savings conservatively estimated to be 140,160 tonnes (rounded) in carbon dioxide (CO<sub>2</sub>) emissions on an annual basis;
- local economic benefit, particularly to the land owners of the Subject Land who will receive rental income from the Project and also to the wider community. The construction phase of the project in particular will involve the employment of local contractors and increased business opportunities as flow-on effects in nearby townships;
- during construction the solar farm would generate an estimated 200 direct and 320 indirect positions over the 12-month construction period. Once operational, 4 direct and 12 indirect jobs will be supported by the facility on an ongoing basis;
- the Project will involve approximately \$200 million in investment during the construction phase.

The benefits of the Project as outlined above are considered to outweigh any potential impacts of the Project. The potential impacts of the Project are outlined within this volume of the application (Chapter 8) and in detail in the technical reports contained in **Volume 2**.

## 7.0 LEGISLATIVE CONTEXT

### 7.1 Section 49

In accordance with the definition of “public infrastructure” in Section 49 of the Development Act, the Project is infrastructure being developed for the supply of electricity, as identified in part (a). Electricity proposed to be generated by the Project will be distributed to the national grid.

*public infrastructure means—*

- (a) *the infrastructure, equipment, structures, works and other facilities used in or in connection with the supply of water or electricity, gas or other forms of energy, or the drainage or treatment of waste water or sewage;*

Crown sponsorship has been granted by Department of the Premier and Cabinet by letter dated 7 February 2018 and supplementary letter dated 19 July 2018 - **Attachment C**.

Pursuant to Section 49(4a) of the Development Act, the State Commission Assessment Panel must give notice containing particulars of the Project to the Rural City of Murray Bridge for consideration and report.

Notification in the form of a public advertisement is required under Section 49(7d) of the Development Act as the development has a value exceeding \$4million.

### 7.2 Development Plan

The development is within the Rural City of Murray Bridge Council and is located within the Primary Production Zone of the Murray Bridge Council Development Plan (consolidated 23 January 2018). A solar farm and battery energy storage facility is neither a complying nor a non-complying land use within the Primary Production Zone. An assessment of the merits of the Project against the relevant provisions of the Development Plan is outlined in Section 8.9 and detailed in the MasterPlan Development Plan Assessment in **Volume 2**.

### 7.3 Referrals and Additional Requirements

#### 7.3.1 State Heritage

A search of the State Heritage Register indicates that there are no places of State Heritage significance within the Project Site, or within the proximity of the Project. Accordingly, the Project will not directly affect any State Heritage Place nor materially affect the context within which the State heritage place is situated. Consequently, the application does not require referral under Schedule 8 of the *Development Regulations 2008* to the Minister administering the *Heritage Places Act 1993*.

### 7.3.2 Commissioner of Highways

Schedule 8 of the *Development Regulations 2008* require that if an application for consent or approval relates to certain development impacting an arterial road (for example, to create a new access) must be referred to the Commissioner of Highways.

The Project Site adjoins Reedy Creek Road, which is a designated arterial road. Access to the Project Site is not proposed from Reedy Creek Road, and subsequently the application would not require the formal referral to the Commissioner of Highways. However, it is at the planning authority's discretion to refer the application to the Commissioner of Highways for informal comment.

### 7.3.3 River Murray

The Project Site is not located within the River Murray Water Protection Area, shown as the River Murray Protection Area - Tributaries Area (in accordance with Concept Plan Map MuBr/16 - Development Constraints Water Management Areas) in the Murray Bridge Council Development Plan. Consequently, the application does not require formal referral to the Minister for the time being administering the *River Murray Act 2003* (SA).

However, it is at the planning authority's discretion to refer the application to the South Australian Murray-Darling Basin Natural Resources Management Board and the Adelaide and Mount Lofty Ranges Natural Resources Management Board for informal comment.

### 7.3.4 Country Fire Service (CFS)

The Murray Bridge Council Development Plan contains Bushfire Protection Area maps of bushfire risk. The Project Site is within the General Bushfire Risk area.

Referral to the CFS is required for certain forms of development, particularly dwellings, tourist accommodation and other forms of habitable buildings in a High Bushfire Risk Area of a Bushfire Protection Area. Given the proposal does not involve any of these forms of development, formal referral to the CFS is not required. However, it is at the planning authority's discretion to refer the application to the CFS for informal comment.

RES will liaise with the CFS during the detailed design phase of the Project regarding the implementation of bushfire management measures.

## 7.4 Approvals Pursuant to Other Legislation

The nature and scale of renewable energy projects requires a range of approvals, licences and permits under various State and Commonwealth legislation. It is for proponents of renewable energy projects to concurrently seek approval in relation to other legislation concurrently with the development approval process. In addition, further approvals, licenses and/or permits may be required under other legislation post approval and prior to construction, and these may include the following.

### 7.4.1 Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act)

The EPBC Act is Commonwealth legislation that requires 'controlled actions', including actions which are likely to have a significant impact on matters of national environmental significance (**MNES**), to be subject to assessment and approval under that Act. An 'action' includes a project. The referral and determination under the EPBC Act is independent of the development approval process.

Investigations undertaken to inform this application have not identified the need to submit a referral to the Commonwealth Department of the Environment and Energy for consideration under the EPBC Act as the Project will not have a significant impact on any MNES.

### 7.4.2 Aboriginal Heritage Act 1988 (SA)

Section 23 of the *Aboriginal Heritage Act 1988* provides that authority from the Premier, as the Minister responsible for Aboriginal Affairs and Reconciliation, is required to damage, disturb or interfere with an Aboriginal site, object or remains.

A search of the Register of Aboriginal Sites and Objects, administered by the Department of the Premier and Cabinet Aboriginal Affairs and Reconciliation has no entries for Aboriginal sites within the Project Site. RES is currently engaging with Ngarrindjeri Aboriginal Corporation in relation to the Project.

RES are aware of their responsibility under section 20 of the *Aboriginal Heritage Act 1988* in the event of the discovery of an Aboriginal site or object, to stop any work that may impact the site or object and notify the discovery to the Department of the Premier and Cabinet.

Approvals required pursuant to the *Aboriginal Heritage Act 1988* (SA) are independent of the development approval process.

#### 7.4.3 Native Vegetation Act 1991 (SA)

Clearance of native vegetation will require approval from the Native Vegetation Council under the *Native Vegetation Act 1991* (SA) unless it is permitted by exemptions from approval under the *Native Vegetation Regulations 2017* (SA). Approval for clearance of native vegetation is independent of the development approval process. The *Native Vegetation Regulations 2017* (SA), allows for the clearance of native vegetation in relation to specific activities as set out in Schedule 1, Parts 4, 5 or 6. The clearing of vegetation in connection with the Project will be permitted in accordance with Schedule 1, Part 6, section 34 (1) (b), provided development authorisation for the Project is granted under the Development Act:

##### *34 - Infrastructure*

##### *(1) Clearance of vegetation—*

...

- (b) required in connection with the provision of infrastructure or services to a building or proposed building, or to any place, provided that any development authorisation required by or under the Development Act 1993 has been obtained.*

The majority of the native vegetation within the Project Site will not be cleared. It is estimated that the clearance of native vegetation required for the construction of the Project will be limited to 3.68 ha of *Eucalyptus socialis*, *E. dumosa*, *E. incrassata*, *E. gracilis* Mixed Mallee over exotic grass and herbaceous sp. +/- *Melaleuca acuminata* / *Melaleuca lanceolata* and 34 scattered trees. Removal of this vegetation will require offsetting to provide a Significant Environmental Benefit (SEB) equivalent to 207.71 SEB points or 15.70 ha.

#### 7.4.4 Environment Protection Act 1993 (SA)

Developments that are also activities of prescribed environmental significance under the Environment Protection Act 1993 (SA) must obtain a licence from the Environmental Protection Authority. As neither a solar farm nor battery storage are prescribed activities of environmental significance, a licence is not required.

There is a general environmental duty under the *Environment Protection Act 1993* (SA) not to undertake an activity that pollutes, or might pollute, the environment unless it takes all reasonable and practicable measures to prevent or minimise any resulting environmental harm. RES proposes to undertake appropriate mitigation and management measures to prevent any pollution.

#### 7.4.5 Native Title Act 1993 (Cth)

The Subject Land falls within the Ngarrindjeri Native Title Claim (SCD2017/002) which was determined by consent on 14 December 2017: *Sumner v State of South Australia (Ngarrindjeri Native Title Claim Part A)* [2017] FCA 1514. The certificates of title comprising the Subject Land are listed in Schedule 6(5) to the orders made in that case, confirming that native title has been extinguished over the Subject Land.



## 8.0 PROJECT ASSESSMENT

This chapter provides a summary of the investigations and assessment of the likely impacts of the Project.

A variety of investigations have been undertaken and assessment reports prepared to examine the existing conditions at the Project Site, the likely impacts of the Project, and appropriate mitigation and management measures for those impacts. These technical assessments have included visual impact (including glare), flora and fauna, traffic and transport, land use, aviation, water resources and stormwater management, and the economic impact of the Project.

Copies of the full technical reports are contained in **Volume 2** of this application.

### 8.1 Flora and Fauna Assessment

EBS Ecology (EBS) was engaged by RES to assess the potential flora and fauna constraints for the Project. The following is a summary and extracts of the investigations, findings and recommendations made by EBS. The complete “Pallamana Solar Array and Battery Storage Project Ecological Assessment” report dated July 2018 is contained within **Volume 2** of the application documents.

#### 8.1.1 Investigations Undertaken

Investigations, findings and recommendations of EBS have informed the design, siting and layout of infrastructure (solar panels, battery storage, transmission line and associated infrastructure) for the Project.

EBS notes that the majority of the native vegetation within the Project Site will not be cleared following early advice during the conceptual planning phase of the Project. EBS have estimated that the clearance of native vegetation required for the construction of the solar farm will be limited to 3.68 ha and 34 scattered trees.

EBS undertook a desktop assessment of Commonwealth and State databases to identify threatened species potentially occurring in and surrounding the Project Site, as well as field surveys in August 2017 and July 2018.

The field surveys were undertaken in accordance with the Bushland Assessment Method and Scattered Tree Assessment Method devised by the Department for Environment and Water.

#### 8.1.2 Vegetation Associations

EBS recorded 3 vegetation associations with the Project Site which are described as follows:

## Overall summary of vegetation associations

Vegetation Association		Condition
1	<i>Eucalyptus socialis</i> +/- <i>E. dumosa</i> Mixed Mallee over Chenopod shrubs	<p>The <i>Eucalyptus socialis</i> +/- <i>E. dumosa</i> Mixed Mallee over Chenopod shrubs vegetation association was recorded on the northern boundary of the Project area. The 0.55 ha patch of vegetation contained 13 flora species including 11 native and two weed species. Some areas of vegetation had remnant understorey of disturbance resistant species such as <i>Enchylaena tomentosa</i> (Ruby saltbush) and <i>Maireana brevifolia</i> (Bluebush). Other understorey was dominated by annual grasses, emergent exotic herbaceous species such as <i>Mesembryanthemum</i> (Iceplant), <i>Rumex</i> (Dock), <i>Oxalis pes-caprae</i> (Soursob), <i>Asparagus asparagoides</i> (Bridal Creeper) and woody exotic shrubs such as <i>Lycium ferocissimum</i> (Boxthorn).</p> <p>Within these areas, habitat value was high with hollows present in most (if not all) trees with openings from 50-200mm prevalent. There were numerous examples of fallen timber of sizes from branches right through to entire trees.</p> <p>There is no vegetation clearance required within the 0.55ha patch of <i>Eucalyptus socialis</i> +/- <i>E. dumosa</i> Mixed Mallee over Chenopod shrubs vegetation association under the current project infrastructure footprint.</p>
2	<i>Eucalyptus socialis</i> , <i>E. incrassata</i> , <i>E. gracilis</i> , Mixed Mallee over exotic grasses	<p>This vegetation association covers an area of approximately 16.76 ha. There were 16 flora species recorded within the vegetation association which included 10 native and 16 weed species.</p> <p>This association was in generally very poor condition with an almost complete absence of native understorey. The few redeeming features of these patches of vegetation were that the overstorey was generally intact although there was evidence of significant die back. Hollow bearing limbs were relatively prevalent which gave these patches some habitat value.</p> <p>Eight patches of the <i>Eucalyptus socialis</i>, <i>E. dumosa</i>, <i>E. incrassata</i>, <i>E. gracilis</i> Mixed Mallee over exotic grass and herbaceous sp. +/- <i>Melaleuca acuminata</i> / <i>M. lanceolata</i>, totalling 3.68 ha will require clearance for the construction of the Project.</p>
3	<i>Eucalyptus odorata</i> Low Open Woodland	<p>The <i>Eucalyptus odorata</i> Low Woodland over Exotic grass and herbaceous sp. vegetation association covered an area of 1.55 ha. The patch of vegetation, located in the centre of the Project area is very linear as it borders a fence line. The structure of the overstorey is representative of an intact strata however the understorey layer was largely absent other than the highly disturbance resistant native species <i>Enchylaena tomentosa</i> (Ruby saltbush) and <i>Maireana brevifolia</i> (Bluebush).</p> <p>The vegetation association contained 19 flora species, including eight native and 11 weed species. One conservation rated species was recorded within the vegetation association. This was <i>Maireana excavata</i> (Bottle Fissure-plant) (SA:V) and declared weed species.</p> <p>There is no vegetation clearance required within the <i>Eucalyptus odorata</i> Low Woodland over Exotic grass and herbaceous sp. vegetation association under the current project infrastructure footprint.</p>

### 8.1.3 Ecological Findings

Investigations undertaken by EBS resulted in the following findings:

- remnant vegetation within the Project Site is restricted to relatively small and isolated patches;
- the majority of remnant vegetation is in very poor condition;
- there are three vegetation associations on the Project Site and approximately 51 scattered trees;
- no threatened species or threatened ecological communities listed under the EPBC Act occur within the Project Site;
- the Project will have no impact on wetlands of national importance;
- no fauna species of State or National conservation significance were recorded within the Project Site;
- there were 26 bird species and three mammal species recorded within the Project Site;
- six invasive species (two bird, two mammal and two plant species) were recorded during field surveys within the Project Site;
- six fauna species (five bird species and one mammal species) listed under the *National Parks and Wildlife Act 1972 (SA) (NPW Act)* have the potential to occur within the Project Site. However, habitat present on the Project Site is likely to be non-preferable for a range of bird species that are moderately or highly sensitive to remnant size and isolation. Threatened species that are likely to be present are those which are highly mobile and would only be present on the Project Site temporarily;
- a total of 44 flora species were recorded within the Project Site, including 22 native and 22 introduced species;
- 22 weed species were recorded within the project area *Maireana excavate* (Bottle Bluebush) which has a conservation rating of vulnerable under the NPW Act was recorded on the Project Site. This area of vegetation is retained as part of the Project.

### 8.1.4 Vegetation Clearance

EBS have estimated that development of the Project would require the clearance of approximately 3.68ha of native vegetation (*Eucalyptus socialis*, *E. dumosa*, *E. incrassata*, *E. gracilis* Mixed Mallee over exotic grass and herbaceous sp. +/- *Melaleuca acuminata* / *Melaleuca lanceolata*) and 34 scattered trees.

The eight patches of the native vegetation that require clearance for the construction of the Project are shown in the figure below and noted as areas 1b-1, 1b-2, 1c, 1c-1, 1d, 1d-1, 1d-2 and 1e.

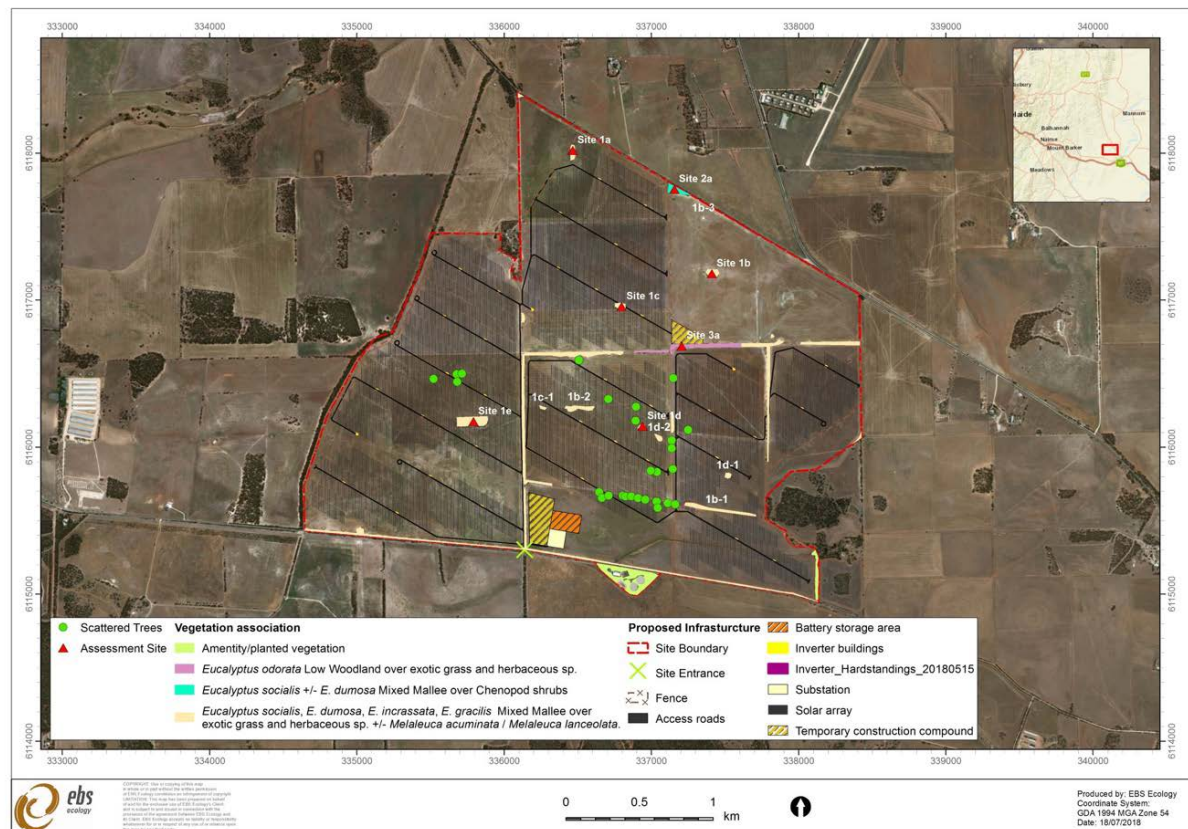


Figure 6. Vegetation associations, scattered trees and BAM sites within the Project area.

The areas of remnant vegetation on the Project Site are generally of poor quality. The footprint of the development has been considered to minimise vegetation clearance and as a result the Project proposes to clear 3.69ha of the 18.86ha of remnant vegetation. Due to the distribution of the scattered trees on the site and the form of infrastructure proposed, 34 of the 51 scattered trees are currently proposed to be removed. However, during detailed design and micro-siting of the infrastructure, it may be possible for additional scattered trees to be retained.

### 8.1.5 Findings

EBS note that the majority of the native vegetation within the Project Site will not be cleared and thus retained due to the adjustment of the infrastructure footprint during the early stages of planning. It is estimated that the clearance of native vegetation required for the construction of the project will be limited to 3.68 ha of *Eucalyptus socialis*, *E. dumosa*, *E. incrassata*, *E. gracilis* Mixed Mallee over exotic grass and herbaceous sp. +/- *Melaleuca acuminata* / *Melaleuca lanceolata*.

The development does not impact on threatened species or threatened ecological communities (or other MNES) listed under the EPBC Act. *Maireana excavata* (Bottle Bluebush) which has a conservation rating of vulnerable under the NPW Act was recorded within the Project Site. The area in which the Bottle Bluebush was recorded (BAM Quadrat 3a) is retained as part of the Project.

Approval under the *Native Vegetation Act 1991* from the Native Vegetation Council is required for clearance of native vegetation unless it is permitted under the *Native Vegetation Regulations 2017*. The Project will be required to offset the removal of the native vegetation in a way that provides a Significant Environmental Benefit equivalent to 207.71 SEB points or 15.70 ha. This could be achieved by managing and conserving areas of native vegetation, undertaking native vegetation restoration activities or making a payment into the Native Vegetation Fund.

## 8.2 Visual Impact Assessment

Wax Design and Brett Grimm Landscape Architect (**Wax**), were engaged by RES to assess the potential visual impact of the Project. A copy of the “Landscape Character and Probable Visual Effect Assessment” dated July 2018 is contained within Volume 2 of the application documents. The following summary describes the landscape character of the area surrounding the Project Site and the visual impact of the Project from various viewpoints.

### 8.2.1 Methodology

The landscape character and visual effect assessment undertaken by Wax comprises of two separate assessments, firstly a landscape character assessment and secondly a visual impact assessment. The landscape character assessment described in the report considers the existing character of the landscape and the site locality. The potential visual impact was assessed using the Grimke matrix methodology (described in detail in the report) and involves onsite assessments, GIS modelling, consultation with relevant stakeholders and interested parties, the preparation of photomontages and a detailed visual impact assessment to illustrate the predicted visual effect of the Project within the defined locality.

Wax discuss the “site locality” as the areas around the Project from which the solar panels and associated infrastructure are likely to be visible in the landscape. The report notes that a 20 kilometre site location around the Project was defined for assessment purposes. The landscape character assessment and mapping within the report discusses existing character in relation to the local (0-3km), sub-regional (3-10km) and regional (>10km) context.

Wax also used the Zone of Theoretical Visual Influence (ZTVI) mapping, which provides an indication of the extent or the likely degree of visibility of the Project based on the topography of the surrounding area (excluding vegetation and built form screening). Utilising the ZTVI mapping and following ground truthing and consultation with stakeholders and the public, a total of 4 viewpoints were selected around the locality of the site, from which a detailed visual assessment of the potential visual effect was made. Each viewpoint represents a typical location where the greatest probable degree of visual change that will be experienced as a result of the proposed development is likely to occur within the existing landscape.

Figure 6 of the Landscape Character and Probable Visual Effect Assessment (as shown below) illustrates the selected viewpoints and the local, sub-regional and regional areas around the proposed solar panels and associated infrastructure.



## 05 Visual Impact Assessment



Pallamana Viewpoint Locations

0 0.5 1 2 3 4 Kilometers



Figure 16: Viewpoint locations and Infrastructure Identification

## 8.2.2 Landscape Character

Section 3.4 of the Landscape Character and Probable Visual Effect Assessment describes the locality as having four distinct landscape character areas, which are summarised in the following table and shown in Figure 10 of the report.

Landscape Character Area		Description
1	Agricultural Tablelands	<p><i>The agricultural tablelands extend from the base of the Southern Mount Lofty Ranges and transition into the Murray Plains and Murray Basin further east. There is a number of rolling local hills and landforms across the tablelands running southwest which create defined viewsheds. The proposed development site is located on the eastern edge of the tablelands as it transitions to the agricultural plains.</i></p> <p><i>The tablelands are predominately defined by large agricultural properties mainly used for cropping, grazing and some horse agistment with scattered dwellings and associated agricultural storage and processing facilities. Established belts of vegetation line road corridors and cadastral boundaries and there are a number of larger remnant and re-vegetation areas across the tablelands.</i></p> <p><i>The vegetation pattern coupled with undulating topographic form fragments and contains views to distances of less than 1 kilometre, the landscape character of the agricultural tablelands provides substantial visual absorption properties.</i></p>
2	Agricultural Plains	<p><i>The agricultural plains landscape character area is very similar in land use and land cover to the agricultural tablelands. The key variation is the lower lying elevation of the landscape character unit as it transitions towards the Murray River as well as a slight reduction in vegetation of tree clusters.</i></p> <p><i>The local landforms create a gently rolling landscape before a further drop in elevation to the Murray River floodplain. The field sizes reduce across the agricultural plains as the rural land use changes into more urban settlements. At the same time, land use remains agricultural.</i></p> <p><i>Immediately south of the proposed development site is the Kinchina Conservation Park and Monarto Zoological Park. These areas are defined by densely vegetated landscapes, with limited development.</i></p> <p><i>The undulating topography associated with Rocky Gully which becomes more complex to the south and is punctuated with rocky outcrops and the incised gullies of the Narrinyeri Hills. These areas form distinct local landscape features within the wider landscape character area of the Agricultural Plains.</i></p>
3	Agricultural Flood Plains	<p><i>The Agricultural Flood Plains include the Murray River corridor and the immediate area surrounding the watercourse. This area includes areas which flood when the river has a season of high flow. Within this area are a number of agricultural cropping properties as well as rural townships scattered along the banks of the Murray River.</i></p> <p><i>The river edge varies with some areas having gentle slopes towards the water and other areas having a steep slope or cliff face which alters the visual character of the area.</i></p>

Landscape Character Area		Description
4	Urban Settlement (Murray Bridge)	<p>The urban settlement of Murray Bridge is located on the edges of the Murray River and forms a large urban settlement which services the wider regional area. The residential edge of the city is defined by single storey standalone dwellings on larger allotments. Around the northern and western edges of the city are a number of light industrial and agricultural processing properties. These land uses reinforce the peri-urban edge of the city. To the west of Murray Bridge is the Mobilong Prison which is integrated to the fringe of Kinchina Conservation Park.</p> <p>The local ridgelines along the western edge of the city restrict views to the wider landscape area. Views within the city are contained due to the surrounding development and the shallow slope of the underlying topography towards the Murray River. The main centre of the town is close to the banks of the Murray River with a concentration of development linear to the main street, which aligns east west perpendicular to the River Murray.</p>

### 8.2.3 Visual Impact Assessment

Section 5.0 of the Landscape Character and Probable Visual Effect Assessment, discusses the potential visual impact of the solar farm and associated infrastructure from 4 selected viewpoints. The potential visual impact of the Project is summarised below:

Viewpoint 1	Near the intersection of Reedy Creek Road and Hillview Road
Context	Viewpoint 1 is located along Reedy Creek Road within one kilometre of the north eastern corner of the proposed development site. The viewpoint is representative of the anticipated visual effect that will occur to the northeast particularly in relation to the adjacent residential properties along Reedy Creek Road.
Potential Visual Impact	<p>The proposed development is seen as a narrow horizontal band of infrastructure extending across the undulating agricultural landscape. The vegetation associated with the Monarto Road corridor to the south of the development provides a degree of back screening to this section of the proposed development from this viewpoint.</p> <p>To the north, the proposed development will appear more prominent due to the proximity of the panels to the viewpoint due to the elevation of the ridgeline, resulting in a more of the solar arrays being visible. The absence of vegetation to the top of the plateau increases the visibility and potential visual impact.</p> <p>When travelling along Reedy Creek Road towards Palmer, the visual effect is likely to increase due to the proximity and oblique angle of views towards the solar panels. However, when travelling towards Murray Bridge, the existing northern vegetation buffer along the road corridor will fragment the view of the development, limiting or completely screening the potential visual effect.</p> <p>The most prominent visual effect produced by the proposed development will be experienced from this viewpoint looking south due to the topography of the site and the absence of roadside vegetation. However, suitable management and the adoption of landscape treatments to the site boundary would significantly reduce this visual effect and increase the vegetation cover that surrounds the development site.</p>



Viewpoint 2	Reedy Creek Road
Context	<i>Viewpoint 2 is located to the north of the proposed development site along Reedy Creek Road within the agricultural plains just north of the agricultural tablelands. The location is representative of the visual effect that is anticipated when travelling north/south between Palmer and Murray Bridge and adjacent dwellings.</i>
Potential Visual Impact	<p><i>From this viewpoint, the local ridgeline of the tablelands limits views towards the development. Also, existing vegetation screening is provided along Hillview Road to the north of the development. There is a potential for the solar panels to be seen as glimpsed elements through the existing vegetation screen.</i></p> <p><i>The proposed colouration and scale of the solar panels will be similar to existing vegetation that extends along the northern boundary of the site. The height and colour of the solar panels are likely to become recessive elements set behind the canopy layer. The shadowing of the trees will further add to the visual screening of the proposed development with the existing vegetation increasing the potential mitigation of the visual effect.</i></p>
Viewpoint 3	Intersection of Guerin Road and Mannum Road
Context	<i>Viewpoint 3 is located at the intersection of Guerin Road and Mannum Road. This viewpoint represents the peri-urban edge of the urban settlement of Murray Bridge and the main approach into the city from Mannum. The viewpoint represents the anticipated visual effect from the outskirts of the township.</i>
Potential Visual Impact	<i>From this viewpoint, the development will not be visible. It is anticipated, that due to the surrounding topography, the pattern of vegetation cover and distance to the development, the visual effect from Viewpoint 3 will be typical for most of the western edge of Murray Bridge.</i>
Viewpoint 4	Monarto Road
Context	<i>Viewpoint 4 is located along the Monarto Road close to the north eastern corner of the Monarto Zoological Park. This viewpoint is located on the agricultural tablelands with views to the north towards cropped agricultural properties and large stands of vegetation.</i>
Potential Visual Impact	<p><i>There will be no visual effect experienced from the viewpoint. Views towards the proposed development site are removed due to local landforms and existing densely planted stands of vegetation.</i></p> <p><i>The northern boundary of the Monarto Zoological Park is framed by the existing Murray Bridge to Onkaparinga water pipeline; this forms a defined infrastructure edge to the zoological park. The northern edge of the Monarto Zoological Park is densely vegetated which forms a buffer between the existing infrastructure. It is anticipated that there will be very little visual change experienced from within the park due to this existing edge and vegetation.</i></p>

In addition to the visual effect of the solar arrays, Wax undertook an assessment of the anticipated visual effect of any associated infrastructure including the collector substation, proposed battery storage facility, and site office. It was noted that *“the proposed height of associated infrastructure including the Control Room, Storage Shed, Substation and On-site Collector Station will be approximately 3.0 to 4.0 metres in height. Also, these infrastructure elements are set within the solar arrays. With the solar arrays surrounding these elements, the utility zone and substation, battery units will be seen as part of the larger development rather than individual elements in the landscape. The existing belts of vegetation to the north and west and the existing roadside vegetation along most of Monarto Road will reduce the visibility of these pieces of infrastructure from the road corridor and other areas to the south (page 45).”*

In conclusion the Landscape Character and Probable Visual Effect Assessment (at page 53) states that *“based on the visual assessment, this report concludes that the degree of visual change that will result from the development of the Pallamana Solar and Energy Storage Facility will be slight with isolated areas of moderate impact. In addition, the existing landscape has the capacity to accommodate the proposed development. It is our interpretation and evaluation that the degree of visual change associated with the proposed development will be acceptable retaining the existing regional rural character, defined by the development plan principles”.*

### 8.3 Access and Movement of Vehicles

A Traffic Safety Assessment was undertaken by MFY to inform the design of the Project, particularly in relation to the site access point and potential for driver distraction. MFY also reviewed and advised on the proposed traffic route for delivery vehicles during construction of the Project. Advice provided by MFY informed the design so that the facility will not impact the safe functionality of the road network. This report is contained in **Volume 2** of the application documents.

Reedy Creek Road to the north of the Project Site is an arterial road. Hillview Road and Monarto Road are both local roads. Access is proposed to the site via Monarto Road and MFY have assessed the access to be suitable and satisfy Austroads guidelines. Emergency access for the site will be available via the existing gate/access on Hillview Road.

MFY identify that the key issues that relate to safety for the development are driver distraction and provision of an adequate clear zone. More specifically MFY examined whether the proposed solar panels and infrastructure are located within a clear zone; and whether the panels are located within the cone of vision for drivers from adjacent roads.

In relation to the clear zone, MFY note that the required clear zone would be 11 metres for the arterial road (Reedy Creek Road) and 8.0 metres for local roads (Hillview Road and Monarto Road). The assessment undertaken notes that the solar panels and other infrastructure will be installed outside of the clear zone and the Project will meet the clear zone requirement.

MFY have reviewed the principles of Austroads (GRD Part 6B) in relation to road safety and the visual amenity for drivers to assess the potential for driver distraction. This assessment, referred to as a “cone of vision” assessment provides guidance as to the area adjacent the road that could be in a driver’s general field of vision. MFY undertook this assessment for drivers travelling on Hillview Road, Reedy Creek Road and Monarto Road. The assessment notes that *“the proposed solar panels would be outside the cone of vision along Hillview Road and for most of the length of Monarto Road. However, there would be isolated locations where the panels will extend into the cone of vision along Monarto Road. In accordance with Austroads GRD Part 6B, therefore, screening should desirably be located on the subject site, adjacent the sections of Monarto Road where the panels will include into the cone of vision”* (page 8). Screening in the form of infill landscaping is proposed along Monarto Road to ensure the infrastructure of the Project, in this case some of the solar (PV) arrays, is not viewed as a distracting or confusing element by a driver travelling along Monarto Road.

In discussions with Rural City of Murray Bridge Council, a preferred transport route for construction traffic for the Project was identified as the South Eastern Freeway, Schenscher Road and Monarto Road. Delivery of components for the construction of the Project will be via general access vehicles (up to 19.0 metre semi-trailer in length) and the proposed route is one of a number of arterial road alternatives that could be used which are designed to accommodate heavy vehicles.

In summary, MFY state that *“the proposal will satisfy the safety criteria of Austroad road design guidelines and will have minimal impact on the operation of the road network, subject to screening of the infrastructure in specific locations”* (page 11).

#### 8.4 Aeronautical Impact Assessment

The Project is proposed to be located immediately south of Pallamana Aerodrome (also known as Murray Bridge airport). The aerodrome is uncertified and referred to as an aircraft landing area.

Landrum and Brown Worldwide were engaged to prepare an Aeronautical Impact Assessment for the proposed solar farm. This assessment was undertaken prior to the finalisation of the layout of the project and community consultation. Subsequently, RES engaged Aviation Projects to undertake consultation with the owners of the Murray Bridge airport and prepare a supplementary aeronautical impact assessment.

In relation to the proposed development, the aviation assessments note the Project:

- will not penetrate any Obstacle Limitation Surfaces;
- will not affect any instrument procedures;
- will not impact on nearby designated air routes;

- will not have an impact on designated airspace;
- is wholly contained within Class G airspace; and
- is outside the clearance zones associated with aviation navigation aids and communication facilities.

During consultation with the owners of the Murray Bridge aerodrome, concerns were expressed in relation to the possibility that an aircraft suffering a loss of power on departure from runway 19 and having no ability to avoid landing on or into the solar panel array, would suffer much more serious consequences than in the current circumstances. As a result, although not a mandatory obligation, RES has modified the proposed solar farm layout to incorporate a forced landing area that mitigates this risk. This forced landing area is the north eastern areas of the Project Site that does not contain any permanent infrastructure.

RES identified the need to undertake a solar glare analysis and this analysis was undertaken by both aviation consultants. The results of the analysis on the final site layout (undertaken by Aviation Projects) found that:

- analysis time interval and eye characteristics used are acceptable; and
- flight path receptor(s) do not receive yellow (unacceptable) glare.

The proposed use of an anti-reflective coating will serve to further reduce any potential glare issues.

The conclusions of the aeronautical impact assessment reports are that the proposed solar farm will not have an adverse impact on aviation safety.

## 8.5 Geology, Topography and Soils Assessment

AECOM Australia Pty Ltd (AECOM) have prepared a Geology, Topography and Soils assessment of the Project Site. That assessment identifies issues including the potential for erosion and sedimentation through construction and operational phases of the Project. It also identifies potential geotechnical issues with anticipated ground conditions. A copy of this assessment is contained in **Volume 2** of the application documents.

The AECOM report describes the natural features of the site as follows:

- *The topography of the site is hilly. The hills are generally rounded and the site generally slopes from west to east down towards the River Murray.*
- *The elevation of the site varies from approximately 100 m AHD on the western site boundary to approximately 60 to 70 m AHD on the eastern site boundary.*
- *An overland drainage line is present from near the centre of the southern boundary, which discharges from the adjacent SA Water Pumping/Transfer station, under Monarto Road and then drains across the south eastern corner of the site and appears to discharge on the south eastern boundary of the site. This is a tributary and within the Preamimma Creek catchment.*
- *The site is located within the Eastern Mount Lofty Ranges Prescribed Water Resource Area, which covers groundwater, water courses and surface water.*
- *The proposed solar farm is located on top of both a fractured rock aquifer in Cambrian and Precambrian rocks (western portion of the site) and a sedimentary rock aquifer in limestone, sandstone, sand shale and clay (eastern portion of site).*
- *A reduced standing water level of 44.84 m AHD has been reported for well number 6727-611.*
- *Soils observed were Quaternary deposits of sands and clays. Some calcrete gravels were observed that could be consistent with the Bakara calcrete cap unit.*

Section 6.0 of the AECOM report discuss the potential impacts of the construction of the Project. According to AECOM, the "potential impacts are expected to involve clearing and associated earthworks for the solar panel, substation, battery storage, access roads and other ancillary works. During operation, land management considerations will include ongoing erosion and sedimentation controls and storage. Potential impacts identified as a result of the development include:

- *Increased risk of erosion and sedimentation due to ground disturbance, potential lack of vegetative cover, and areas of concentrated flow.*
- *Exposure of soils to wind and rain erosion during construction and/or operation with potential for impacts to water quality, sedimentation and air quality impacts from airborne dust.*
- *Soil transport off site through construction vehicles.*
- *Physical impacts to soil structure due to compaction from earthworks equipment.*
- *Soil contamination from chemical spills.*
- *Land degradation in the event that subsurface saline or sodic soils (if present) are exposed to form the new ground surface.*

*All of the above issues should be included in the construction environment management plan”.*

A draft CEMP has been prepared as part of the development application and this is included in **Volume 4** of the application documents. This draft CEMP includes methods to address these potential impacts.

## 8.6 Surface Water and Hydrology

AECOM have prepared a Surface Water and Hydrology assessment report, which is contained in **Volume 2** of the application documents. This report identifies issues including the increased potential for erosion and sedimentation through the construction and operational phases of the Project.

In addition to the natural features of the site identified in the Geology, Topography and Hydrology assessment discussed above in Section 7.5, the following hydrology and hydrogeology features are noted in the Surface Water and Hydrology assessment report:

- the Project is situated in a semi-arid region of South Australia. The rain gauge at Murray Bridge indicates a mean annual rainfall of 350 millimetres.
- the Project Site is located within the Preamimma Creek Catchment. Preamimma Creek has a catchment of approximately 75.19 km<sup>2</sup>. Most of the catchment is used for agriculture. Runoff from the Project Site generally flows from west to east towards the River Murray as indicated from the surface contours.

- there is an existing water course in the south east of the Project Site that appears to be used as a discharge swale for an SA Water Pumping / Transfer Station. This water course flows in a north east direction away from the pumping station. The surface contours indicate that a small portion of the south east region of the Project Site grades towards this drainage swale.
- a drillhole has been historically drilled in the south western portion of the Project Site (MS23). This was to a depth of 6.9m and no groundwater was struck. Given that there are no excavations to this depth as part of this Project, it is expected that there will be no impact on the existing groundwater given the implementation of standard controls to prevent the leakage and spills of contaminants.

Section 6.0 of the AECOM report discuss the potential impacts of the construction and operation of the Project, which are identified as follows:

- construction of the Project will likely require earthmoving for access roads, contouring, and installation of site infrastructure. This will reduce the vegetation coverage on-site and may increase erosion in the surrounding area;
- any alteration to existing flow paths throughout the Preamimma Creek catchment may lead to changes in surface runoff and impact the water quality due to increased sediment discharge;
- the use and storage of fuels and chemicals for vehicles and plant on-site has the potential to contaminate the surrounding environment;
- on-site staff during construction phases will generate wastewater. If not properly treated and stored, the wastewater generated on-site has the potential to contaminate surface or groundwater through spills and leaks;
- the Project will alter the existing catchment conditions by increasing impervious surfaces through the solar panels, roofed areas and hardstand. While the amount of impervious area of the solar farm is expected to be relatively low, localised impervious areas (hardstand and building) may lead to an increased concentration of runoff. There is the potential for increased erosion at these locations;
- if the type of land cover is changed under the solar panels (i.e. reduced vegetation coverage), surface runoff and peak discharge may increase significantly. There is also potential for erosion of the soil at the base of the solar panels;
- due to rainfall collecting on the panels, the kinetic energy of the water draining from the solar panels can be significantly greater than that of rainfall. It is possible that soil below the base of the solar panel could erode due to the concentrated flow of water off the panel (Cook & McCuen, 2013).

To mitigate the impacts listed above, the CEMP will address sediment, erosion control and management, as well as bunding and containment of any fuels stored on site given the stormwater from the site flows into Preamimma Creek. These measures will manage the water quality from the construction site and ongoing operation of the Project.

In summary, AECOM state that *“based on the existing environment and recommended mitigation measures, the Project is not expected to have an unacceptable impact on the hydrology and hydrogeology. The Project will not have any major excavations and hence will not impact on the existing groundwater with the implementation of standard controls to prevent spills of contaminants. The Project will not introduce a substantial amount of impervious area and will not significantly increase the runoff from the site”* (page 15).

## 8.7 Economic Impact Assessment

RES commissioned Essential Economics Pty Ltd to prepare an Economic Impact Assessment (EIA) in relation to the proposed solar farm. A copy of this EIA is included in **Volume 2**.

Essential Economics notes that *“the Pallamana Solar Farm project will involve approximately \$200 million in investment during the construction phase and will support 200 direct and 320 indirect positions over the 12-month construction period. Once operational, 4 direct and 12 indirect jobs will be supported by the facility on an ongoing basis”*. The main findings of the EIA are:

- *The Study Area (which includes the Local Government Areas of Mount Barker, Mid Murray and Murray Bridge) has a resident population of around 64,000 persons (2016), and this is expected to reach approximately 76,400 persons by 2031, representing annual growth of 1.2% pa over the period; this growth is higher than the forecast State growth of 0.8% pa over the next 15 years. However, the Mid Murray Council area is projected to decline in population at a rate of -0.5% pa over the coming 15 years, and therefore new infrastructure projects which provide local economic stimulus should be welcomed.*
- *The Study Area currently has an unemployment rate of 7.0% (involving 2,330 persons), which is above the unemployment rate for South Australia of 6.7%. Thus, construction of the Pallamana Solar Farm would provide new short-term employment opportunities for the region’s labour force participants, with a small amount of ongoing employment also supported once the facility is operational.*
- *The Study Area’s occupational and business structures indicate that a good base exists to service the needs of the solar farm project, including approximately 10,300 construction-related workers (based on occupation) and 830 construction and transport businesses.*



- *Mount Barker, Murray Bridge and Mannum, given their relatively close proximity to the subject site, will underpin most project needs in view of their supply of labour, commercial, accommodation (300+ rooms), trade supplies and transport services, machinery hire and repairs, retail services, emergency services and so on.*
- *Accessing adequate labour supply should not present a major issue for the project, noting the peak local employment requirement for the project (140 workers) represents less than 1% of workers occupied in construction-related activities in the Study Area (10,260 workers).*
- *The project will provide significant participation opportunities for businesses and workers located in the Study Area, having regard for the good match of skills and resources available. In this regard, the proponent and organisations such as the Industry Capability Network might be involved in ensuring maximum local inputs are secured.*
- *The 'external' project labour requirement is expected to generate an accommodation need for 60 project workers at the peak of the project. This represents 18% of total commercial accommodation rooms (hotels and motels) in the Study Area and would provide a boost to local accommodation operators, noting room occupancy rates were just 56% during the June Quarter, 2016. Other providers such as houseboat owners, caravan parks operators and the like may also benefit in terms of increased accommodation revenues.*
- *Construction workers are expected to inject approximately \$2.7 million in additional spending into the regional economy over the construction phase, supporting around 13-14 jobs in the service sector in the Study Area.*
- *Approximately 350ha of productive agricultural land will be lost to accommodate the solar farm. However, this is negligible in a regional context (4.3 million ha of farm land exists) and noting the land can potentially be used for agricultural purposes at the end of the solar farms lifecycle.*
- *Ongoing economic stimulus associated with new local wage spending and returns to the host landowner are estimated at \$22.9 million over 25 years (adjusted for CPI).*

- *Council rates revenue associated with the solar farm will be subject to negotiations between Murray Bridge Council and the operator (who will be responsible for payments). however, based on preliminary figures, rates revenue to Council is estimated at \$290,000 over the 25-year project lifecycle (including CPI adjustment) based on the exiting Capital Improved Value (CIV) of the site. However, CIV will increase significantly through the development of the solar farm, and a corresponding uplift in CIV and Council rates can be expected.*
- *The proposed Community Fund would contribute annual ongoing payments, worth \$1.2 million over 25 years (including CPI adjustment), which can be directed to new community infrastructure and programs.*
- *The project has the capacity to supply sufficient clean energy to power approximately 82,000 homes and, in the process, to reduce Co2 emissions by 140,000 tonnes per year.*
- *Once operational, the Pallamana Solar Farm will present a new environmental experience for the region which could potentially support small-scale tourism and educational opportunities in the future.*

## 8.8 Land Capability Assessment

The Subject Land has historically been utilised for dryland farming and cropping and grazing continue on the land.

As discussed in the Land Capability Assessment contained in **Volume 2**, the Subject Land has a higher land use potential for the growing of barley (moderately high to moderate potential) relative to the moderate to moderately low potential for wheat production.

As a result of the Project, up to 780 hectares of the primary production land used for agriculture will be unavailable for cropping. This equates to approximately 0.02% of the cropped land in southern South Australia.

There is still potential for stock to be grazed on the subject land during the life of the project and the land to be reverted to cropping activities following decommissioning of the Project.

## 8.9 Development Plan Assessment

The Project Site is located within the Primary Production Zone – Policy Area 5 – North Central Area, Murray Bridge Plains, Murray Bridge Council Development Plan consolidated version dated 23 January 2018.

The Project, being a “solar farm and battery storage facility with ancillary development such as substations, maintenance sheds, access roads and connecting power lines (including to the National Electricity Grid)” is neither a complying nor a non-complying form of development within the Murray Bridge Council Development Plan.

An assessment of the merits of the Project has been undertaken against the relevant provisions of the Murray Bridge Council Development Plan (as outlined in the report contained in **Volume 2**).

Renewable energy facilities, such as solar farms are a form of development that the Development Plan envisages being located in the Rural City of Murray Bridge Council area to harvest natural resources for the efficient generation of electricity, as stated in the Objectives and Principles of Development Control (**PDCs**) for “Renewable Energy Facilities” extracted below.

#### **Renewable Energy Facilities**

- |                    |  |
|--------------------|--|
| <b>Objective 1</b> | <b>Development of renewable energy facilities that benefit the environment, the community and the state.</b>   |
| <b>Objective 2</b> | <b>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.</b> |
| <b>Objective 3</b> | <b>Location, siting, design and operation of renewable energy facilities to avoid or minimise adverse impacts on the natural environment and other land uses.</b>  |
| <b>PDC 1</b>       | <b>Renewable energy facilities, including wind farms and ancillary development, should be:</b>   |
| (a)                | <b>located in areas that maximize efficient generation and supply of electricity; and</b>  |
| (b)                | <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.</b>   |

The Development Plan does not expressly envisage renewable energy facilities in the form of solar farms and battery storage developments within any specific Zone. The Primary Production Zone anticipates renewable energy facilities specifically in the form of wind farms and provides design and siting criteria for that form of development beyond the objectives and PDCs outlined above. The same level of policy is not included in the Development Plan for solar and battery storage renewable energy facilities and subsequently these are assessed against the relevant general provisions of the Development Plan, which as stated previously anticipate renewable energy facilities.

General provisions of the Development Plan under the heading of “Energy Efficiency” support on-site power generation including photovoltaic cells. The “Energy Efficiency” policies apply to proposed developments which are not large scale commercial in nature. The “Energy Efficiency” requirements in the Development Plan recognise that photovoltaic cells are a form of power generation that requires appropriate solar access for efficient generation. The proposed development has been designed and sited to maximise solar access and electricity generation.

## Energy Efficiency

- Objective 1:** Development designed and sited to conserve energy and minimise waste.
- Objective 2:** Development that provides for on-site power generation including photovoltaic cells and wind power.

## Energy Efficiency

- PDC 1** Development should provide for efficient solar access to buildings and open space all year around.
- PDC 2** Buildings should be sited and designed:
- (a) To ensure adequate natural light and winter sunlight is available to the main activity areas of adjacent buildings
  - (b) so that open spaces associated with the main activity areas face north for exposure to winter sun.
- PDC 3** Development should facilitate the efficient use of photovoltaic cells and solar hot water systems by:
- (a) taking into account overshadowing from neighbouring buildings
  - (b) designing roof orientation and pitches to maximise exposure to direct sunlight.
- PDC 4** Public infrastructure, including lighting and telephones, should be designed to generate and use renewable energy.

In addition to the provisions of the Development Plan relating to Renewable Energy Facilities and Energy Efficiency, the general provisions of the Development Plan contain policy that supports economic growth and provision of appropriate infrastructure, as quoted below.

## Orderly and Sustainable Development

- Objective 1:** Orderly and economical development that creates a safe, convenient and pleasant environment in which to live.

- PDC 3** The economic base of the region should be expanded in a sustainable manner.

## Infrastructure

- Objective 1** Infrastructure provided in an economical and environmentally sensitive manner.
- Objective 2** Infrastructure, including social infrastructure, provided in advance of need.
- Objective 3** Suitable land for infrastructure identified and set aside in advance of need.
- Objective 4** The visual impact of infrastructure facilities minimised.
- Objective 5** The efficient and cost-effective use of existing infrastructure.
- PDC 2** Development should only occur only where it provides, or has access to, relevant easements for the supply of infrastructure.
- PDC 3** Development should incorporate provision for the supply of infrastructure services to be located within common service trenches where practicable.
- PDC 8** Electricity infrastructure should be designed and located to minimise its visual and environmental impacts.

- PDC 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.
- PDC 11** Utility buildings and structures should be grouped with non-residential development where possible.
- PDC 12** Development in proximity to infrastructure facilities should be sited and be of a scale to ensure adequate separation to protect people and property.

The Project Site is within the North Central Policy Area. The Desired Character Statement of the Policy Area (which is extracted below) recognises that the majority of the area is utilised for a range of farming activities and there are areas of native vegetation to be protected.

Development should be undertaken in a manner which is consistent with the Desired Character statement (of the Zone and Policy Area), which in this case is farming and preservation of vegetation. Development of a solar farm, by its nature limits land from farming activities, however it does provide infrastructure in the form of renewable energy which is an envisaged land use by the Council-wide provisions of the Development Plan.

#### **Primary Production Zone – North Central Policy Area 5**

##### **Desired Character**

This policy area is characterised by a range of farming activities on relatively large properties, including grazing and cropping, some intensive animal keeping involving meat and wool production, and rural industries. The area contains the Pallamana Airfield. It is desirable that these activities continue, and development other than that associated with general farming and primary production activities takes into account the existing character of the area...

The area comprises stands of native vegetation protected by way of Heritage Agreements which will be protected.

- PDC 2** Development should not be undertaken unless it is consistent with the desired character for the policy area.

##### **Primary Production Zone**

**Objective 1** Economically productive, efficient and environmentally sustainable primary production.

**Objective 3** Protection of primary production from encroachment by incompatible land uses and protection of scenic qualities of rural landscapes.

The appropriateness of the Project should be assessed against all of the relevant provisions of the Development Plan relating to siting and design and interface between land uses. Viewing the appropriateness of the land use in a holistic manner, the site of the development satisfies the “Renewable Energy” criteria in the following manner:

- the Project is of significant benefit via the generation of sustainable and stable electricity;
- the Project will benefit the State by providing storage of renewable energy for distribution into the national electricity grid at peak periods;

- Pallamana is an appropriate location for a solar farm given its climate and solar access;
- the Project Site is located with physical access to existing overhead electricity infrastructure that can accommodate efficient connection to the electricity grid;
- the Project Site varies the productive capacity of the land from dryland farming to harvesting solar energy;
- the area of land removed from productive dryland farming, approximately 780 hectares, is not the highest yielding farming land within the Primary Production Zone;
- development of a solar farm and battery storage facility does not preclude the continuation of other primary production activities in the locality;
- construction and layout of the Project has been designed to minimise environmental impacts by retaining areas of vegetation previously protected by a now expired Heritage Agreement;
- the Project does not create conditions which create unreasonable nuisance or disturbance to adjoining land owners and occupiers;
- visual change to the landscape is an outcome of the Project, but the design and siting of the facility minimises the impact on adjoining land owners and occupiers and adjacent road users by:
  - retention of roadside vegetation;
  - retention of onsite patches of vegetation;
  - inclusion of additional areas of new vegetation planting;
  - avoidance of PV panels within the 'cone of vision' adjacent arterial roads; and
  - incorporation of anti-reflective coating on the PV panels.
- the development does not impact on the safety of water or air transport and the operation of ports, airfields and designated landing strips;
- predicated noise levels from infrastructure are compliant with relevant noise criteria for sensitive receivers;
- the proposal contains suitable methodology that minimises impacts such as dust, noise and vibration through the construction phase;
- the proposal contains suitable methodology for managing traffic movements, particularly during construction; and
- the proposal contains suitable methodology for managing bushfire risks.

On balance, the Project is a suitable form of development within the Primary Production Zone.

## 9.0 COMMUNITY ENGAGEMENT

RES has undertaken consultation with the community during the design phase of the Project. RES are cognisant of the need to provide accurate information to inform all landholders, stakeholders and the wider community and to obtain comment/feedback on the design of the Project prior to the lodgement of any development application.

Consultation undertaken as part of the Project was guided by the principles of community engagement set out in the International Association for Public Participation and the State Government Community Engagement Charter. The first phase of the consultation is to “inform” the community of the Project, that is to provide the public with balanced and objective information to assist them in understanding the Project. Feedback from the public has also been sought to inform the design of the Project as part of the consultation or second phase of public participation.

### 9.1 Overview of Communication Methods

A range of communication tools have been utilised in the project planning phase of the Project and have included:

- personal Communication: RES and its consultant team has held numerous meetings (face to face) and telephone conversations with associated landowners; adjoining landowners and interest groups/stakeholders. RES has visited all residences adjacent to the Project;
- meetings and Briefings: RES and its consultant team have conducted briefings with Rural City of Murray Bridge Council staff and Elected Members. RES has also provided a personal briefing to various State and Federal authorities (as relevant to the Project);
- website: RES have established a dedicated website that provides a direct line of communication. The website: <http://www.pallamana-solarfarm.com> contains a “have your say” mechanism for submission of comments. The website also contains contact details for the RES project manager as a direct line of communication;
- mailout: RES provided information on the project via the Australia Post unaddressed mail service to approximately 1,000 properties within the postcode 5254. Information was also provided electronically and in print to a range of community groups. The flyer (shown below) provided information on the project and contained an invitation to the Community Information Session;



## PALLAMANA SOLAR FARM COMMUNITY CONSULTATION

### PALLAMANA SOLAR FARM & ENERGY STORAGE PROJECT

**RES Australia is proposing a solar farm and energy storage development at Pallamana.**

This flyer provides you with information about the proposed project and invites you to a Community Information Session at:

**Murray Bridge Town Hall**  
17 Bridge Street, Murray Bridge  
Tuesday 29 May 2018  
3pm - 7pm.



RES Australia (RES) is a private, family owned company with headquarters in the UK and 35 years of experience in planning, building and operating renewable energy projects.

RES is the world's largest, independently owned renewable energy company with a project portfolio over 13GW across wind, solar and battery energy storage.

RES has been established in Australia since 2004. RES's recent projects in Australia include Taralga Wind Farm in New South Wales, Azarat Wind Farm in Victoria, Emerald Solar Farm in Queensland and Murra Warra Wind Farm in Victoria.

### WHAT ARE WE PROPOSING?

We are proposing to develop a solar farm and battery storage facility at Pallamana, approximately 6km north west of Murray Bridge.

Pallamana is an ideal site for a solar energy project as it has excellent exposure to Australia's world class solar resources and excellent access to the grid transmission system.

The project incorporates:



A generating capacity of up to 176 MW or 420,000 Mwh per annum with a site area of approximately 730 hectares.



Approximately 690,000 solar photovoltaic (PV) panels.



Generating electricity for approximately 82,000 homes each year.



In addition to the electricity generation, the proposal improves SA's energy security with the inclusion of up to 66MW (140MWh) of battery storage.

### WHAT ARE THE BENEFITS?



The project will involve approximately \$200 million in investment during the construction phase.



During construction the solar farm would generate an estimated 200 direct and 320 indirect positions over the 12-month construction period.



Once operational, 4 direct and 12 indirect jobs will be supported by the facility on an ongoing basis.



A saving of an estimated 140,160 tonnes in carbon dioxide (CO2) emissions on an annual basis.



### WOULD YOU LIKE TO KNOW MORE?



As part of our commitment to keep the local community informed of the project, RES is holding a Community Information Session where members of the public can drop in and get information.

This information session is not a formal presentation, but an open-house format – call in at a time that suits you. We will have project information on display and members of the project team will be in attendance to answer any

questions you may have. If you're unable to attend the Community Information Session, details on the project can be found on the following website or by calling the free phone number:

[www.pallamana-solarfarm.com](http://www.pallamana-solarfarm.com)  
1800 118 737

A "Have Your Say Form" is also available on the website. We look forward to receiving your views on the project.

### PALLAMANA SOLAR FARM - COMMUNITY INFORMATION SESSION

**MURRAY BRIDGE TOWN HALL**  
17 Bridge Street, Murray Bridge

**TUESDAY**  
**29 MAY 2018**  
3pm - 7pm



Suite 4 Level 1, 760 Pacific Highway, Chatswood, NSW 2067

- Community Information Session: a drop in community information session was held on Tuesday 29 May 2018 between 3.00 pm and 7.00 pm at the Murray Bridge Town Hall. The community information session was advertised in the Murray Valley Standard on Thursday 17th and 24th May 2018 and the Rural City of Murray Bridge council website. Posters (as contained in **Attachment G**) and plans illustrating the project, its location, the benefits, visual impact and findings of expert analysis of the site were on display for review by interested members of the public. Members of RES staff and the project team were available to discuss the Project with interested people who attended. Approximately 40-50 attended the community information session including landowners, adjoining landowners, councillors and members of the broader community.
- newspaper: articles have been written in the Murray Valley Standard newspaper on the Project.

## 9.2 Consultation Comments

Consultation with landowners, adjoining owners and occupiers, the Rural City of Murray Bridge Council and the wider community have resulted in a variety of comments both positive and negative being made in relation to the Project.

Comments received by adjoining land owners/occupiers have included:

- Concerns regarding the impact on safe ongoing operation of the Murray Bridge airport (to the north of the site) with respect to glare, forced landing/safety areas for aircraft and changes to thermal conditions;
- Visual impacts from adjoining properties, including but not limited to the Monarto Zoological Park to the south of the site;
- Property devaluation;
- Impacts and access in event of bushfire;
- Positive economic effects, particularly employment opportunities within the region;
- Positive environmental effects regarding greenhouse gas emissions;
- Positive effect of stability to the electricity supply in South Australia.

Following discussions with representatives of the Monarto Zoological Park, the potential visual effect of the Project from within the boundaries of the zoo have been further explored. Imagery has been prepared and supplied to the zoo which illustrates the potential visual effect of the project to enable further discussion regarding the future screen landscaping.

During the preparation of the aviation assessment of the project discussions were held with the owner of the Murray Bridge Airport. Following these discussions the site layout was amended to incorporate a forced landing corridor within the boundaries of the subject land. The siting, design and adequacy of the forced landing corridor was the subject of substantial discussion at the community information session and subsequent comments by various flying school operators and instructors and private pilots via the RES website.

### 9.3 Amendments Post-Consultation

Post consultation with the community, the following amendments were made to the site layout and design:

- Inclusion of additional properties immediately to the west as part of the Subject Land;
- Relocation of solar (PV) panels from the north east corner of the Project Site to the land to the west;
- Retention of an open farm paddock in the north east corner of the site as a larger forced landing area;
- Incorporation of additional screen landscaping along Monarto Road;
- Alteration of the proposed delivery route for components of the Project during construction in response to comments by the Rural City of Murray Bridge Council.

## 10.0 CONCLUSIONS

The following provides an overview for the acceptability of the environmental and other impacts of the Project, as detailed throughout this **Volume 1** summary of the development application.

The Project is a commercially viable project. At a national level, the project will contribute to Australia's emissions reduction commitment under the Paris Agreement through reduced reliance on non-renewable resources. The Project will provide close to an additional 420,000 Mwh of electricity per annum, over the operating life of the solar farm. This generation is equivalent to the electricity needs of approximately 82,000 South Australian homes each year, (assuming the average annual household electricity use is 5,200 kWh per annum).

In addition to the electricity generation, the battery storage with an indicative capacity of 66 MW (140MWh) aligns with the South Australian Government's Energy Plan to ensure that energy can be dispatched as it is needed to provide energy security.

The Project will have a direct and tangible contribution to both the Australian and South Australia Governments' emissions reduction schemes. The Federal Government's Large-scale Renewable Energy Target encourages investment in renewable power stations to achieve 33 000 gigawatt hours of additional renewable electricity generation by 2020<sup>3</sup> and South Australia has a legislated target to reduce its greenhouse gas emissions by at least 60% by 31 December 2050<sup>4</sup>. In accordance with the goals of the South Australian Energy Plan, the Project will assist South Australia to provide reliable, competitive and clean power into the future.

The value of reduction of carbon emissions is an estimated 140,160 tonnes (rounded) in carbon dioxide (CO<sub>2</sub>) emissions on an annual basis compared to the same level of electricity generation using fossil fuels.

The Project Site comprises approximately 780 hectares, the majority of which is used for grazing or cropping. Development of the Project will result in the loss of cropping potential of the land, however the loss of productive land equates to approximately 0.02% of the cropped land in southern South Australia. The land will be utilised for energy production, which is envisaged by the Murray Bridge Council Development Plan.

The Project has been designed to avoid vegetated areas which provide important habitat as far as possible, and micro-siting of Project elements will further assist in avoiding clearing of vegetated areas. The Project is unlikely to diminish biodiversity values of the region, and has been assessed as unlikely to impact threatened species/communities.

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<sup>3</sup> Renewable Energy (Electricity) Act 2000 (NSW), section 40.

<sup>4</sup> *Climate Change and Greenhouse Emissions Reduction Act 2007* (SA), section 5(1).

Although there will be some visual impacts from the Project, the degree of visual change that will result from the Project will be slight with isolated areas of moderate impact. The Project is not expected to be detrimental to the landscape and wider amenity of the region. Infill vegetation screen planting along roadsides will assist in minimising visual impacts. The existing landscape has the capacity to accommodate the Project and the degree of visual change will be acceptable to retain the underlying regional rural character.

There are unlikely to be any unreasonable impacts to soil, water and air quality as a result of the Project, as the Project has been designed with regard to the physical features of the Project Site. A range of mitigation and management measures will be incorporated into the CEMP to minimise airborne dust events, erosion, and soil discharge into watercourses.

A search of the Register of Aboriginal Sites and Objects, administered by the Department of State Development, Aboriginal Affairs and Reconciliation has identified no entries for Aboriginal sites within the Project Site. There are no items of European heritage within the boundaries of the Subject Land.

The Project will satisfy the safety criteria of Austroad road design guidelines and will have minimal impact on the operation of the road network, subject to screening of the infrastructure along Monarto Road. A Traffic Management Plan will be prepared as part of the Construction Management Plan to ensure the works can be undertaken safely and with minimal disruption to local traffic. Once operational, the traffic entering the Project Site will be negligible.

The potential impacts on aircraft safety have been reviewed in detail, given the location of the Murray Bridge aerodrome immediately north of the Project Site and concerns that have been expressed during the consultation phase of the Project. Although not a mandatory obligation, RES has modified the Project layout to incorporate a forced landing area. In addition, the potential for solar glare is considered to be acceptable and the use of an anti-reflective coating on the PV panels will serve to further reduce any potential glare concerns. The conclusions of the aeronautical impact assessment reports are that the Project will not have an adverse impact on aviation safety.

A mix of positive and negative opinion has been expressed in relation to the Project to date from the public consultation processes undertaken. Some amendment to the design of the Project has occurred as a direct result of the consultation process. The proponent is aware of the necessity for an effective and genuine ongoing public consultation programme, and will continue to liaise with neighbours and community stakeholders, provide updates to local media, notices to community, and liaison with local government regarding the future stages of the Project.

The project will provide for a range of positive flow-on economic effects, particularly during the construction phase of the Project, including income to local service providers, employment to a large temporary workforce, improvements to local infrastructure, and benefits to the landholders of the Subject Land who will receive rental income from the Project

In a broader sustainability sense and in relation to the broader 'public interest', the Project will assist in addressing global concerns about climate change, and assist in ensuring inter-generational and social equity through reducing society's consumption of finite resources.

Whilst there will be some impacts to the region as a result of the Project, it is considered that any adverse impacts will be relatively minor and will be outweighed by the positive longer term environmental, social and economic benefits of the project.



# ATTACHMENT A

RES PROJECTS





The world's largest independent renewable energy company



12

GIGAWATTS = 250  
PROJECTS DELIVERED

35

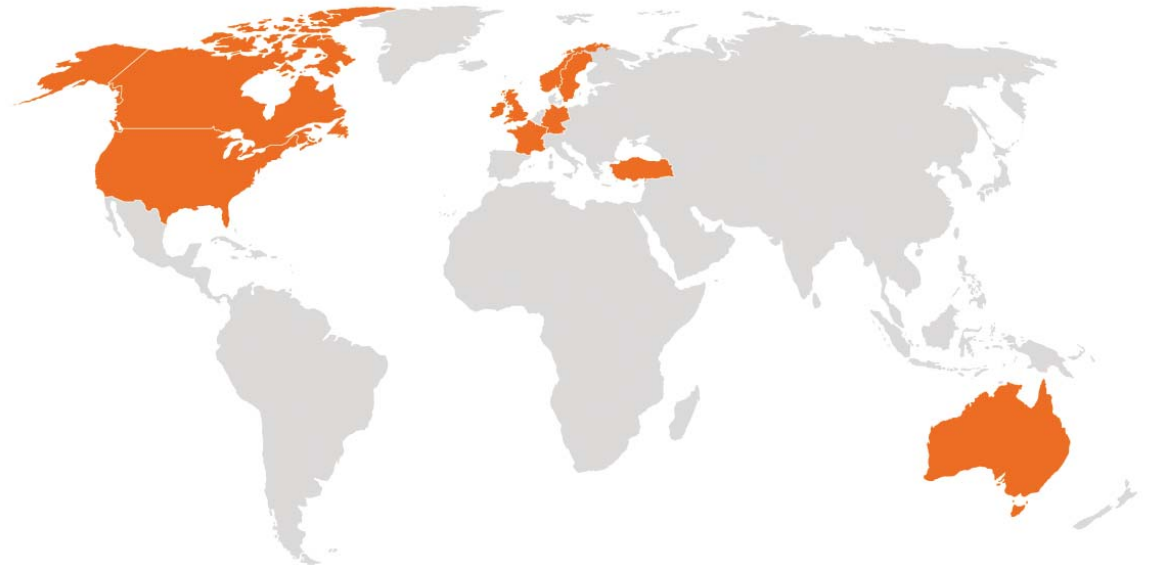
YEARS OF  
EXPERIENCE

2.8

GIGAWATTS UNDER  
ASSET MANAGEMENT

1,400

EMPLOYEES



#### ACTIVITIES



DEVELOPMENT



CONSTRUCTION

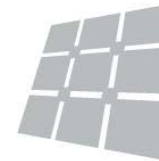


SUPPORT  
SERVICES

#### TECHNOLOGIES



WIND



SOLAR

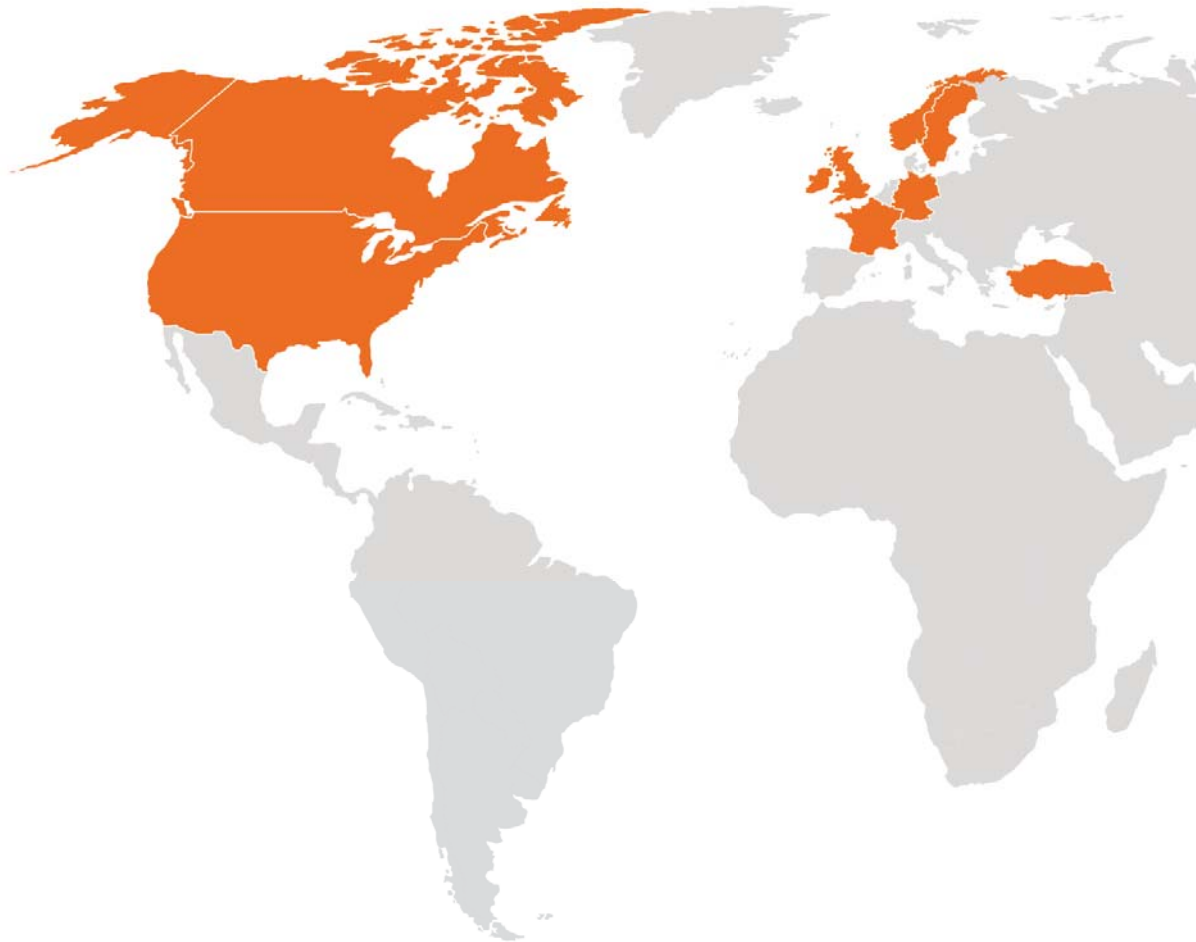


STORAGE



TRANSMISSION &  
DISTRIBUTION

## RES Offices Worldwide



**UK & IRELAND**  
Head Office - Kings Langley  
with offices in Scotland,  
Northern Ireland and Wales

**FRANCE**  
Avignon  
Lyon  
Paris  
Bordeaux  
Dijon  
Beziers

**SWEDEN**  
Gothenburg  
Östersund

**NORWAY**  
Oslo

**GERMANY**  
Stuttgart  
Berlin  
Aachen  
Leer  
Mainz  
Schonach

**TURKEY**  
Istanbul

**USA**  
Colorado  
California  
Connecticut  
Texas  
Minnesota

**CANADA**  
Montreal  
Ontario

**AUSTRALIA**  
Sydney

## RES Energy Storage services



55<sup>+</sup> MW

CONTRACTED  
IN THE UK

240<sup>+</sup> MW

CONTRACTED  
GLOBALLY

275 MWH

CONTRACTED  
GLOBALLY

17 

PROJECTS

10<sup>+</sup>

STORAGE  
APPLICATIONS

6



BATTERY  
SUPPLIERS

60<sup>+</sup> MW

UNDER ASSET  
MANAGEMENT

NAMED

#2

BY   
IN STORAGE GLOBALLY

# ENERGY STORAGE OVERVIEW

Utilities, independent power producers (IPPs), network service providers (NSPs), industrial and commercial organisations can benefit from energy storage systems that are more than “demonstration” or “experimental” projects; they need economical equipment that can be relied upon for years to come. RES’ energy storage solutions are a safe ,rapid, and reliable utility asset that are concurrently providing multiple energy services to customers.

## RES STORAGE SOLUTION APPLICATIONS

### GENERATION

- Frequency Regulation
- Renewable Integration
- Spinning Reserve
- Ramp Rate Management,  
Renewable Firming

### TRANSMISSION

- Voltage Support
- Substation & Line Upgrade Deferral
- Renewable Integration
- Loss Reduction
- Constraint Relief
- Reliability & Grid Stability

### DISTRIBUTION

- Disaster Recovery / Relief
- Microgrid & Island Grid Support
- Distribution Upgrade Support
- Peak Load Reduction
- Power Quality
- Volt / VAR Support









# **ATTACHMENT B**

## **CERTIFICATES OF TITLE**



REAL PROPERTY ACT, 1886



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.



## Certificate of Title - Volume 5487 Folio 88

Parent Title(s)	CT 4178/773		
Creating Dealing(s)	CONVERTED TITLE		
Title Issued	05/01/1998	Edition 2	Edition Issued 12/10/2017

## Estate Type

FEE SIMPLE

## Registered Proprietor

BRUCE ROBIN KUCHEL  
JOYLEEN AVIS KUCHEL  
OF PO BOX 110 MURRAY BRIDGE SA 5253  
1 / 2 SHARE AS JOINT TENANTS

IAN NEVILLE KUCHEL  
DEBBIE GAYLE KUCHEL  
OF PO BOX 1280 MURRAY BRIDGE SA 5253  
1 / 2 SHARE AS JOINT TENANTS

## Description of Land

SECTION 166  
HUNDRED OF MOBILONG  
IN THE AREA NAMED PALLAMANA

## Easements

SUBJECT TO EASEMENT(S) OVER THE LAND MARKED B TO THE ETSA CORPORATION (T 4742100)

## Schedule of Dealings

Dealing Number	Description
4947314	HERITAGE AGREEMENT PURSUANT TO SOUTH AUSTRALIAN HERITAGE ACT, 1978 COMMENCING ON 14/8/1981 AND EXPIRING ON 13/8/2011

## Notations

Dealings Affecting Title	NIL
Priority Notices	NIL
Notations on Plan	NIL

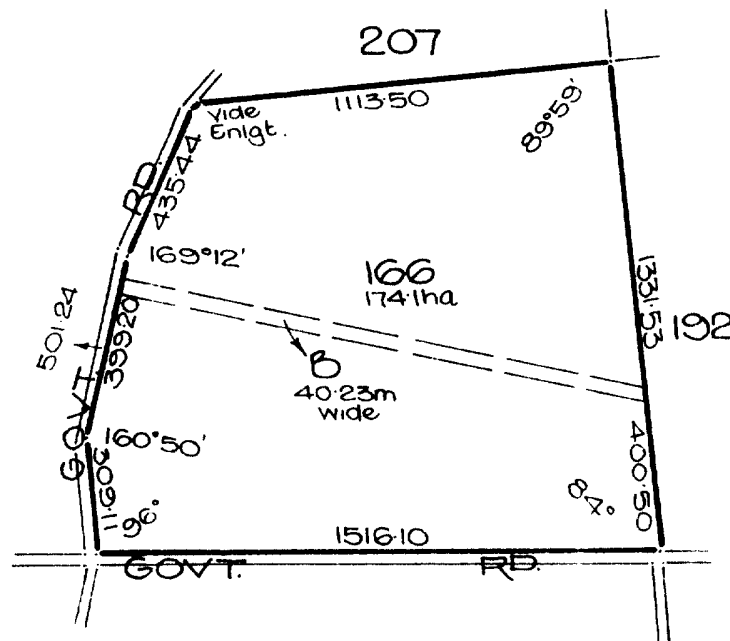
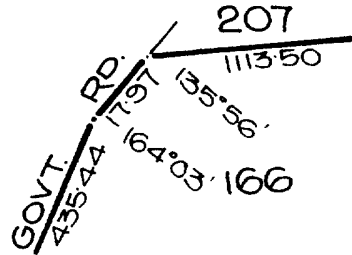
## Registrar-General's Notes

COMPARE ADDRESS FOR SERVICE OF NOTICE WITH 4947314

Administrative Interests	NIL
--------------------------	-----



Enlargement  
(not to scale)



0 200 400 600 800 Metres



REAL PROPERTY ACT, 1886



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.



## Certificate of Title - Volume 5802 Folio 294

Parent Title(s)	CT 3366/159		
Creating Dealing(s)	CONVERTED TITLE		
Title Issued	29/08/2000	Edition 2	Edition Issued 25/09/2001

## Estate Type

FEE SIMPLE

## Registered Proprietor

ROBINVILLE PTY. LTD. (ACN: 007 951 091)  
OF 52 PAYNEHAM ROAD STEPNEY SA 5069

## Description of Land

ALLOTMENT 285 FILED PLAN 168052  
IN THE AREA NAMED PALLAMANA  
HUNDRED OF MOBILONG

## Easements

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

## Schedule of Dealings

Dealing Number	Description
4947314	HERITAGE AGREEMENT PURSUANT TO SOUTH AUSTRALIAN HERITAGE ACT, 1978 COMMENCING ON 14/8/1981 AND EXPIRING ON 13/8/2011

## Notations

Dealings Affecting Title	NIL
Priority Notices	NIL
Notations on Plan	NIL

## Registrar-General's Notes

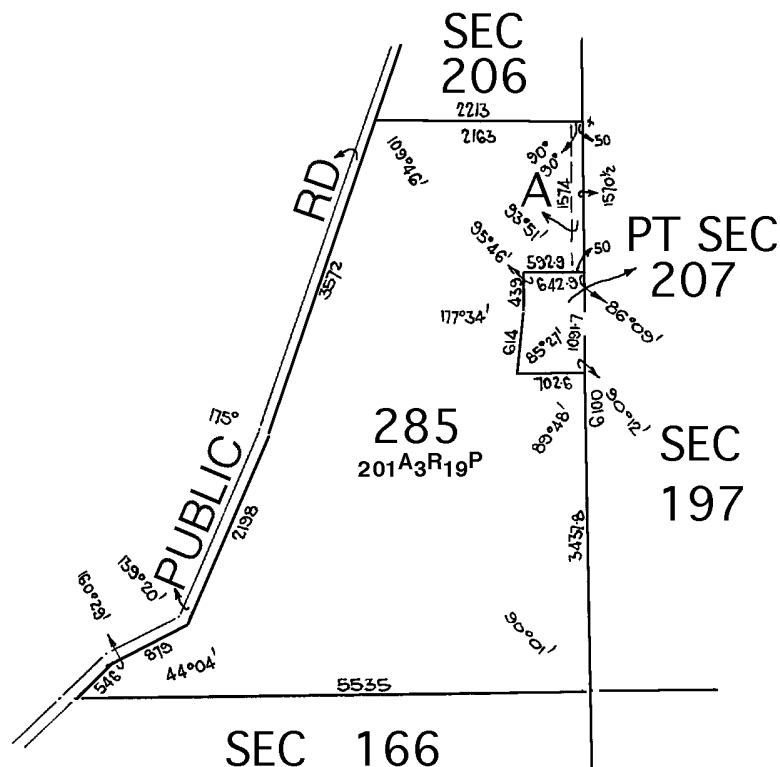
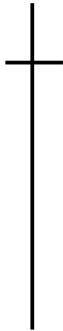
COMPARE ADDRESS FOR SERVICE OF NOTICE WITH 4947314

## Administrative Interests

NATIVE VEGETATION HERITAGE PLACE HA 9045



THIS PLAN IS SCANNED FOR CERTIFICATE OF TITLE 3366/159  
SEE TITLE TEXT FOR EASEMENT DETAILS



20 10 0 20 Chains.

FOR METRIC CONVERSION

1 LINK	=	0.201168 METRES
1 CHAIN	=	100 LINKS
1 ACRE	=	0.404686 HECTARES
1 ROOD	=	1011.7 m <sup>2</sup>
1 PERCH	=	25.29 m <sup>2</sup>

NOTE: SUBJECT TO ALL LAWFULLY EXISTING PLANS OF DIVISION

REAL PROPERTY ACT, 1886



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.



## Certificate of Title - Volume 5858 Folio 256

<b>Parent Title(s)</b>	CT 5487/89			
<b>Creating Dealing(s)</b>	TG 9115450			
<b>Title Issued</b>	31/10/2001	<b>Edition</b>	2	<b>Edition Issued</b> 12/10/2017

## Estate Type

FEE SIMPLE

## Registered Proprietor

BRUCE ROBIN KUCHEL  
JOYLEEN AVIS KUCHEL  
OF PO BOX 110 MURRAY BRIDGE SA 5253  
1 / 2 SHARE AS JOINT TENANTS

IAN NEVILLE KUCHEL  
DEBBIE GAYLE KUCHEL  
OF PO BOX 1280 MURRAY BRIDGE SA 5253  
1 / 2 SHARE AS JOINT TENANTS

## Description of Land

SECTION 192  
HUNDRED OF MOBILONG  
IN THE AREA NAMED PALLAMANA

## Easements

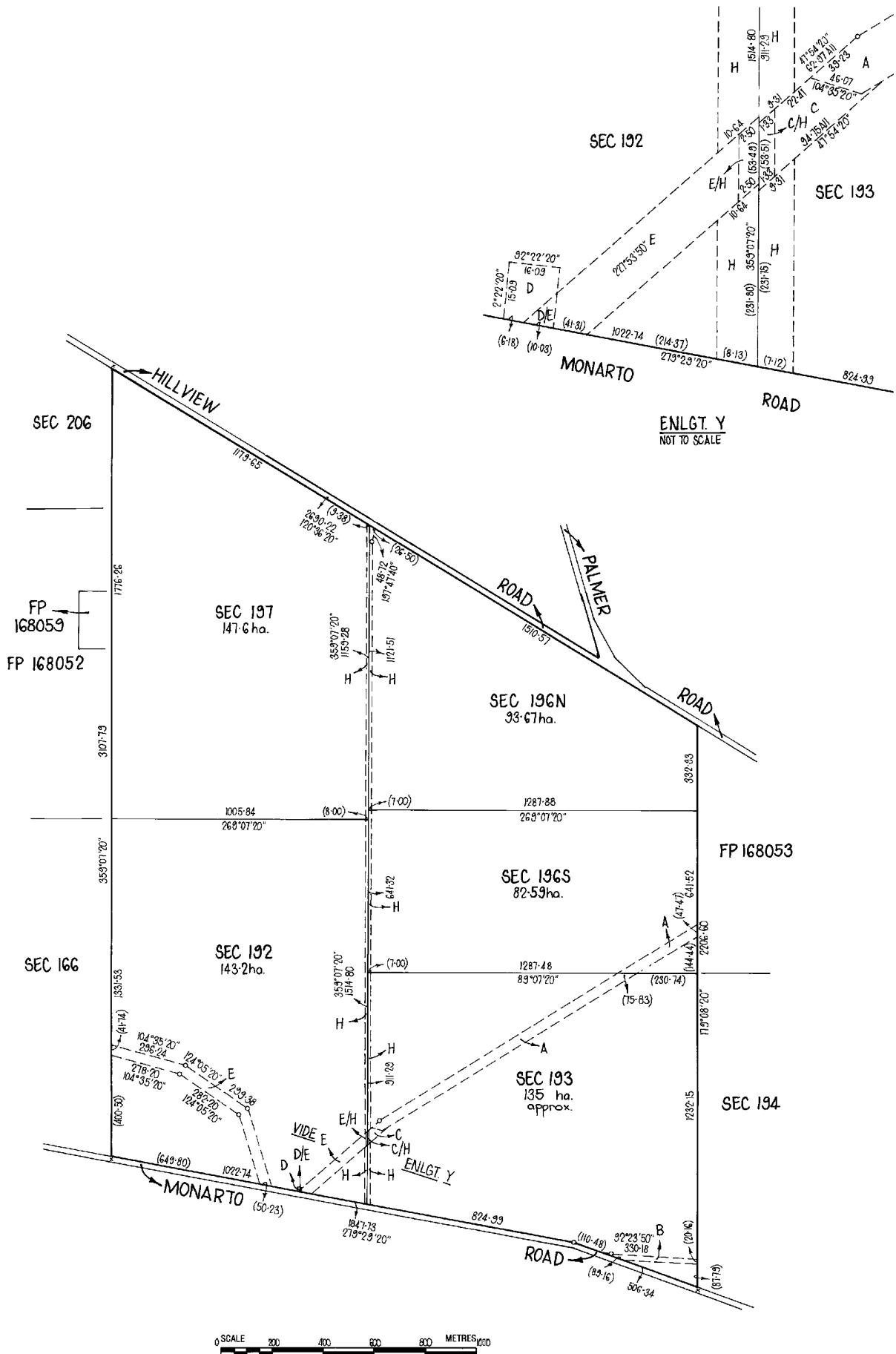
SUBJECT TO EASEMENT(S) OVER THE LAND MARKED D (SL 3255035)  
SUBJECT TO EASEMENT(S) OVER THE LAND MARKED E TO THE ETSA CORPORATION (T 4742100)  
SUBJECT TO EASEMENT(S) OVER THE LAND MARKED H TO DISTRIBUTION LESSOR CORPORATION (SUBJECT TO LEASE 8890000) (TG 9115450)

## Schedule of Dealings

NIL

## Notations

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







REAL PROPERTY ACT, 1886



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.



## Certificate of Title - Volume 5858 Folio 257

Parent Title(s)	CT 5812/844			
Creating Dealing(s)	TG 9115450			
Title Issued	31/10/2001	Edition	2	Edition Issued 12/10/2017

## Estate Type

FEE SIMPLE

## Registered Proprietor

BRUCE ROBIN KUCHEL  
JOYLEEN AVIS KUCHEL  
OF PO BOX 110 MURRAY BRIDGE SA 5253  
1 / 2 SHARE AS JOINT TENANTS

IAN NEVILLE KUCHEL  
DEBBIE GAYLE KUCHEL  
OF PO BOX 1280 MURRAY BRIDGE SA 5253  
1 / 2 SHARE AS JOINT TENANTS

## Description of Land

SECTION 196N  
HUNDRED OF MOBILONG  
IN THE AREA NAMED PALLAMANA

## Easements

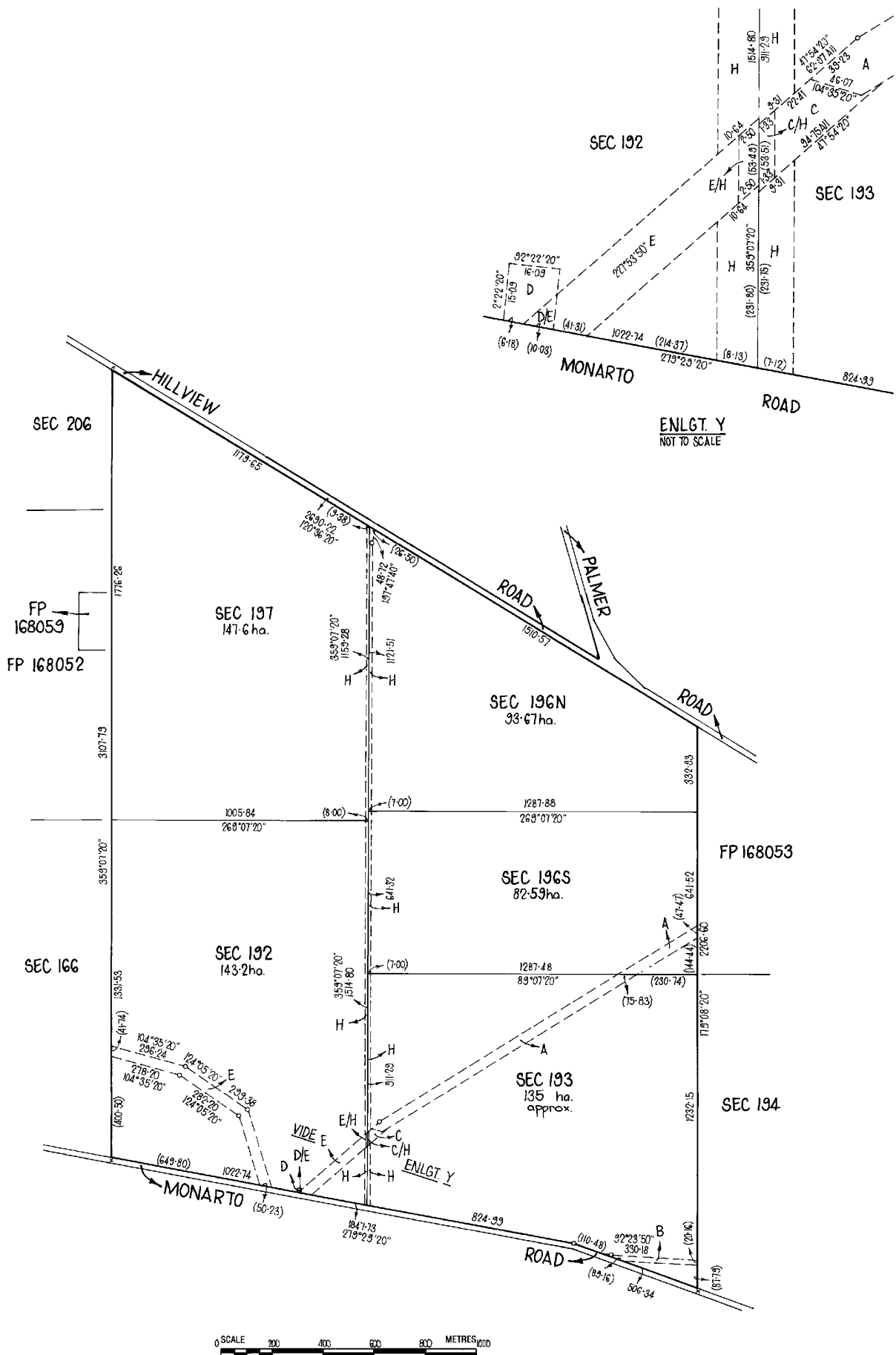
SUBJECT TO EASEMENT(S) OVER THE LAND MARKED H TO DISTRIBUTION LESSOR CORPORATION (SUBJECT TO LEASE 8890000) (TG 9115450)

## Schedule of Dealings

NIL

## Notations

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



REAL PROPERTY ACT, 1886



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.



## Certificate of Title - Volume 5858 Folio 258

Parent Title(s) CT 5855/664

Creating Dealing(s) TG 9115450

Title Issued	31/10/2001	Edition	2	Edition Issued	12/10/2017
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## Estate Type

FEE SIMPLE

## Registered Proprietor

BRUCE ROBIN KUCHEL  
JOYLEEN AVIS KUCHEL  
OF PO BOX 110 MURRAY BRIDGE SA 5253  
1 / 2 SHARE AS JOINT TENANTS

IAN NEVILLE KUCHEL  
DEBBIE GAYLE KUCHEL  
OF PO BOX 1280 MURRAY BRIDGE SA 5253  
1 / 2 SHARE AS JOINT TENANTS

## Description of Land

SECTIONS 193 AND 196S  
HUNDRED OF MOBILONG  
IN THE AREA NAMED PALLAMANA

## Easements

SUBJECT TO EASEMENT(S) OVER THE LAND MARKED B TO THE MINISTER FOR INFRASTRUCTURE (T 3225095)

SUBJECT TO EASEMENT(S) OVER THE LAND MARKED H TO DISTRIBUTION LESSOR CORPORATION (SUBJECT TO LEASE 8890000) (TG 9115450)

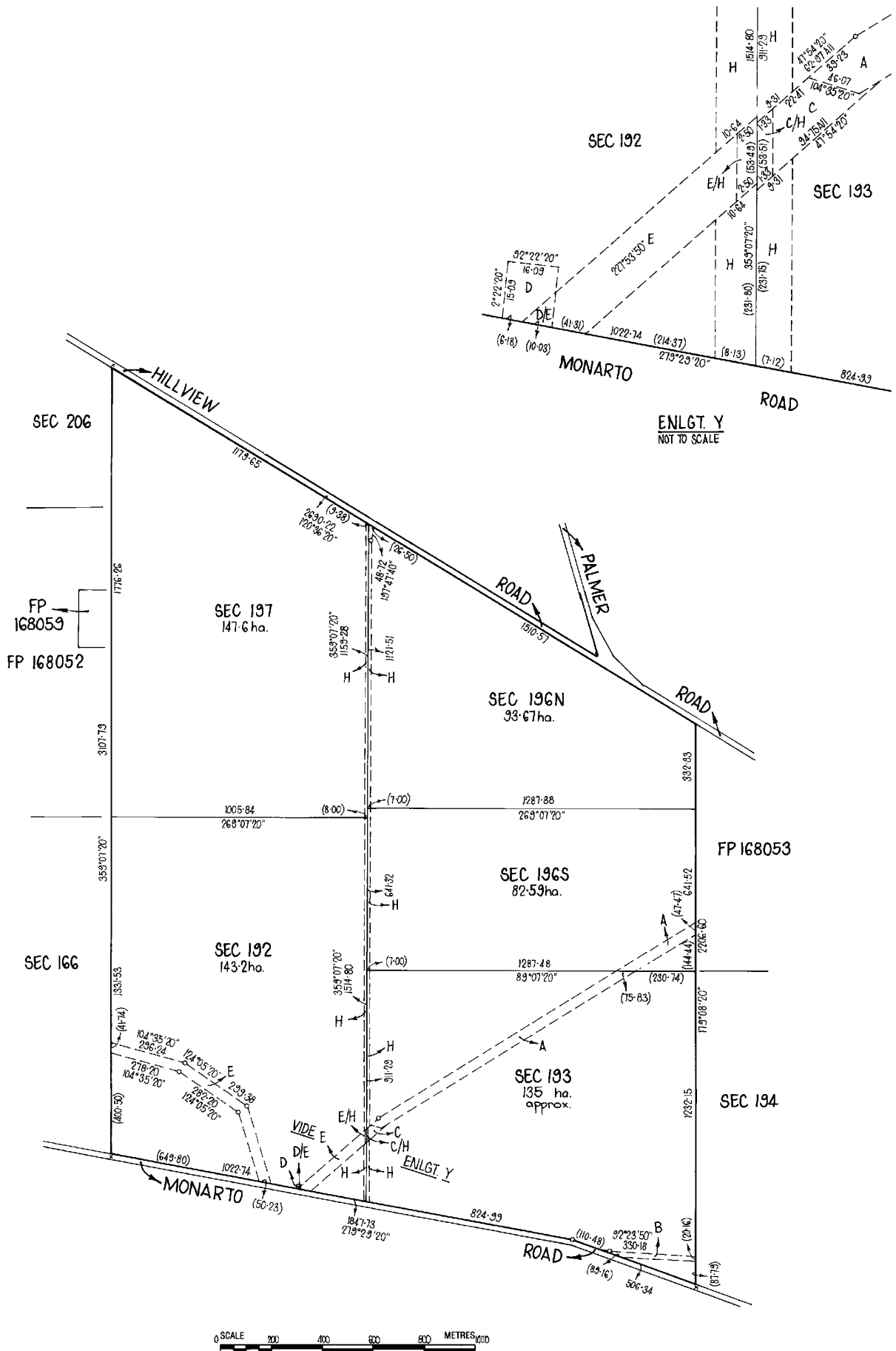
SUBJECT TO EASEMENT(S) OVER THE LAND MARKED A AND C TO THE ETSA CORPORATION (T 2958738 AND T 3251995 RESPECTIVELY)

## Schedule of Dealings

Dealing Number	Description
4947314	HERITAGE AGREEMENT PURSUANT TO SOUTH AUSTRALIAN HERITAGE ACT, 1978 COMMENCING ON 14/8/1981 AND EXPIRING ON 13/8/2011

## Notations

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





REAL PROPERTY ACT, 1886



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.



## Certificate of Title - Volume 5858 Folio 259

Parent Title(s)	CT 5855/665			
Creating Dealing(s)	TG 9115450			
Title Issued	31/10/2001	Edition	2	Edition Issued 12/10/2017

## Estate Type

FEE SIMPLE

## Registered Proprietor

BRUCE ROBIN KUCHEL  
JOYLEEN AVIS KUCHEL  
OF PO BOX 110 MURRAY BRIDGE SA 5253  
1 / 2 SHARE AS JOINT TENANTS

IAN NEVILLE KUCHEL  
DEBBIE GAYLE KUCHEL  
OF PO BOX 1280 MURRAY BRIDGE SA 5253  
1 / 2 SHARE AS JOINT TENANTS

## Description of Land

SECTION 197  
HUNDRED OF MOBILONG  
IN THE AREA NAMED PALLAMANA

## Easements

SUBJECT TO EASEMENT(S) OVER THE LAND MARKED H TO DISTRIBUTION LESSOR CORPORATION (SUBJECT TO LEASE 8890000) (TG 9115450)

## Schedule of Dealings

NIL

## Notations

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



<b>Product</b>	Register Search (CT 5858/259)
<b>Date/Time</b>	14/12/2017 11:50AM
<b>Customer Reference</b>	50359
<b>Order ID</b>	20171214004811
<b>Cost</b>	\$28.25



# ATTACHMENT C

## CROWN SPONSORSHIP CORRESPONDENCE





B234044  
DPC16/3528

GPO Box 320  
Adelaide SA 5001  
DX 541  
Tel 08 8303 2298  
[www.energymining.sa.gov.au](http://www.energymining.sa.gov.au)

19 July 2018

Ms Julie Jansen  
Planner  
MasterPlan SA Pty Ltd  
33 Carrington Street  
ADELAIDE SA 5000

Email: [juliej@masterplan.com.au](mailto:juliej@masterplan.com.au)

Dear Ms Jansen

## **VARIATION TO THE PALLAMANA SOLAR FARM AND BATTERY STORAGE FACILITY**

Thank you for your letter of 16 July 2018 seeking approval to make a variation to RES Australia Pty Ltd's (RES) proposed Pallamana (Monarto) Solar Farm and Battery Storage Facility Project that was previously granted Crown Sponsorship on 7 February 2018.

The Pallamana Solar Farm and Battery Storage Facility Project (Project) was provided with Crown Sponsorship noting it has the potential to benefit South Australia and can be considered to be public infrastructure. The approved Crown Sponsorship covered the construction of up to 176MW of solar PV capacity and up to 66MW of battery storage at a site approximately 4km north west of Murray Bridge. Since this time, I understand that feedback obtained from community consultations has caused RES to refine to the proposed layout of the Project. As a result, RES is now seeking to relocate the solar PV panels from their original planned location to a new site on adjoining land to the west. This will require an expansion of the Project boundary.

I have considered your request and believe it to represent a minor amendment to your Project. Furthermore, I note that it does not change the nature of the Facility, its scale or alter its anticipated economic and employment impacts, business case or technical requirements.

Accordingly I, as the Chief Executive of the South Australian Department for Energy and Mining, approve RES's request to amend the Project boundary of the proposed Pallamana Solar Farm and Battery Storage Facility and to relocate the solar PV panels onto the new parcel of land under the terms of the existing Crown Sponsorship.

This approved variation to the Project under the existing Crown Sponsorship does not change the period of time that the Crown Sponsorship remains valid. A Development Application must be lodged in respect of the Project with the State Planning Commission on or prior to 8 January 2019. If this is not achieved by that time, my support under Section 49(2)(c) of the Act for RES's Pallamana Solar Farm and Battery Storage Facility will lapse.

If you have any questions regarding the preparation of the material to support this section 49 variation application, please contact Mr Mark Jackson on (08) 8429 2722 or via email [mark.jackson@sa.gov.au](mailto:mark.jackson@sa.gov.au).

Yours sincerely



Dr Paul Heithersay  
**CHIEF EXECUTIVE**



B138335

GPO Box 2343  
Adelaide SA 5001  
DX 56201  
Tel 08 8226 3500  
Fax 08 8226 3535  
[www.dpc.sa.gov.au](http://www.dpc.sa.gov.au)

7 February 2018

Ms Julie Jansen  
Planner  
MasterPlan SA Pty Ltd  
33 Carrington Street  
ADELAIDE SA 5000

Email: [juliej@masterplan.com.au](mailto:juliej@masterplan.com.au)

Dear Ms Jansen

## **CROWN SPONSORSHIP MONARTO SOLAR FARM PROJECT**

Thank you for your letter of 22 December 2017 requesting Crown Sponsorship under section 49 of the *Development Act 1993* to assist with RES Australia Pty Ltd's (RES) proposed Monarto Solar Farm project.

This project has been considered within the Department of the Premier and Cabinet with input from the Department of Planning, Transport and Infrastructure, the Department of Environment, Water and Natural Resources, 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 RES's Monarto Solar Farm project has the potential to benefit South Australia and can be considered public infrastructure. Accordingly I, as the Chief Executive of the Department of the Premier and Cabinet, will support the development and specifically endorse the development application to construct the Monarto Solar Farm project comprising 176 MW of solar PV capacity and 66 MW of battery storage as a development of public infrastructure as required by section 49 of the *Development Act 1993* (the Act).

It is the responsibility of RES 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 RES.

The Department of the Premier and Cabinet 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 RES'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 on or prior to 8 January 2019. If this is not achieved by that time, my support under Section 49(2)(c) of the *Development Act 1993* for RES's Monarto Solar Farm project will lapse.

If you have any questions regarding the preparation of the material to support this section 49 application, please contact Mr Mark Jackson on (08) 8429 5082 or via email: [mark.jackson@sa.gov.au](mailto:mark.jackson@sa.gov.au).

Yours sincerely

A handwritten signature in black ink, appearing to read 'Dr Russell', with a large, stylized initial 'D'.

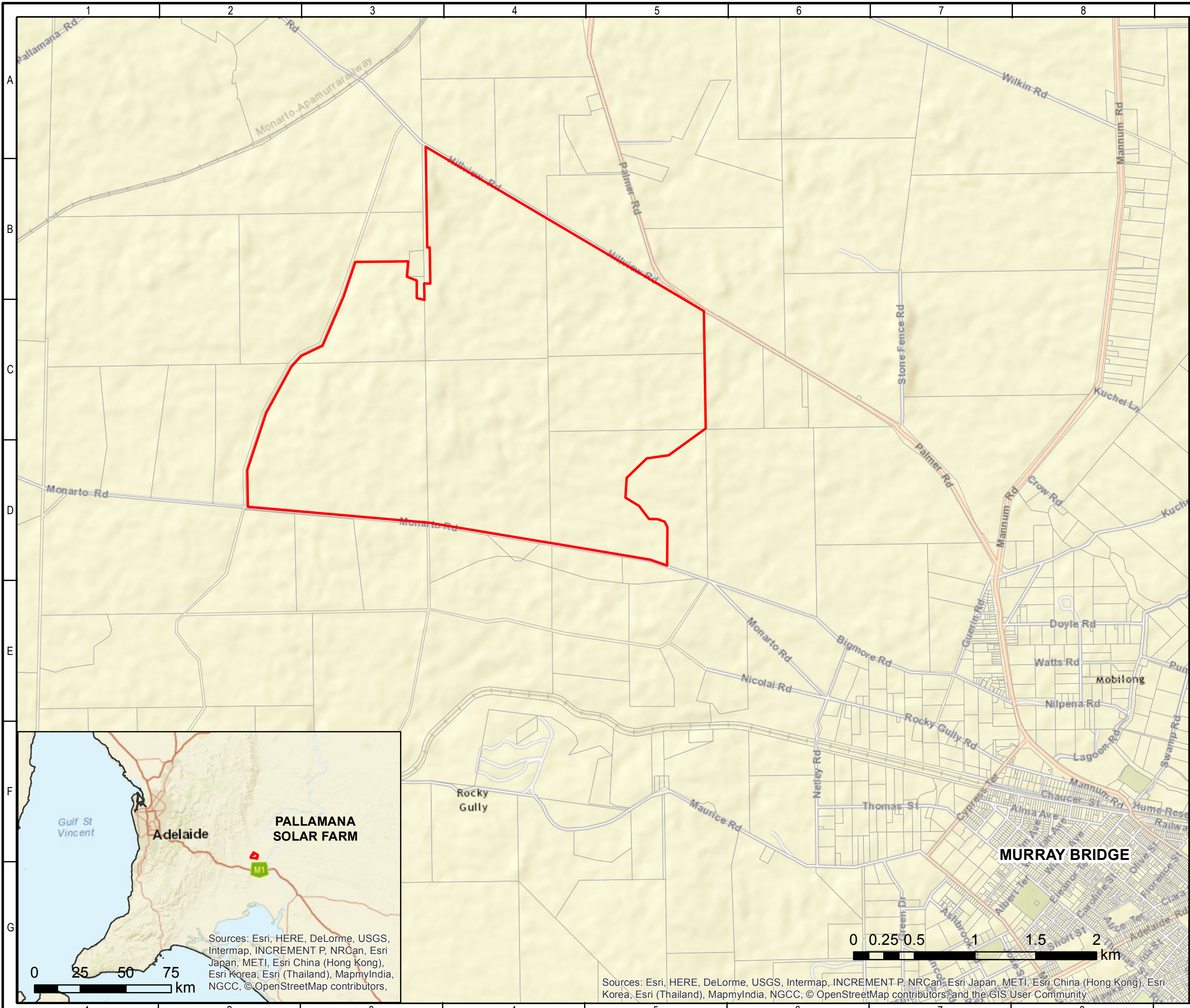
Dr Don Russell  
**CHIEF EXECUTIVE**




# ATTACHMENT D

## PLANS









# PALLAMANA SOLAR FARM


## SITE LOCATION PLAN

MAP COPYRIGHT OF THE STATE OF SOUTH AUSTRALIA DEPARTMENT OF ENVIRONMENT WATER AND NATURAL RESOURCES 2018.

**LEGEND**

 SOLAR FARM SITE BOUNDARY

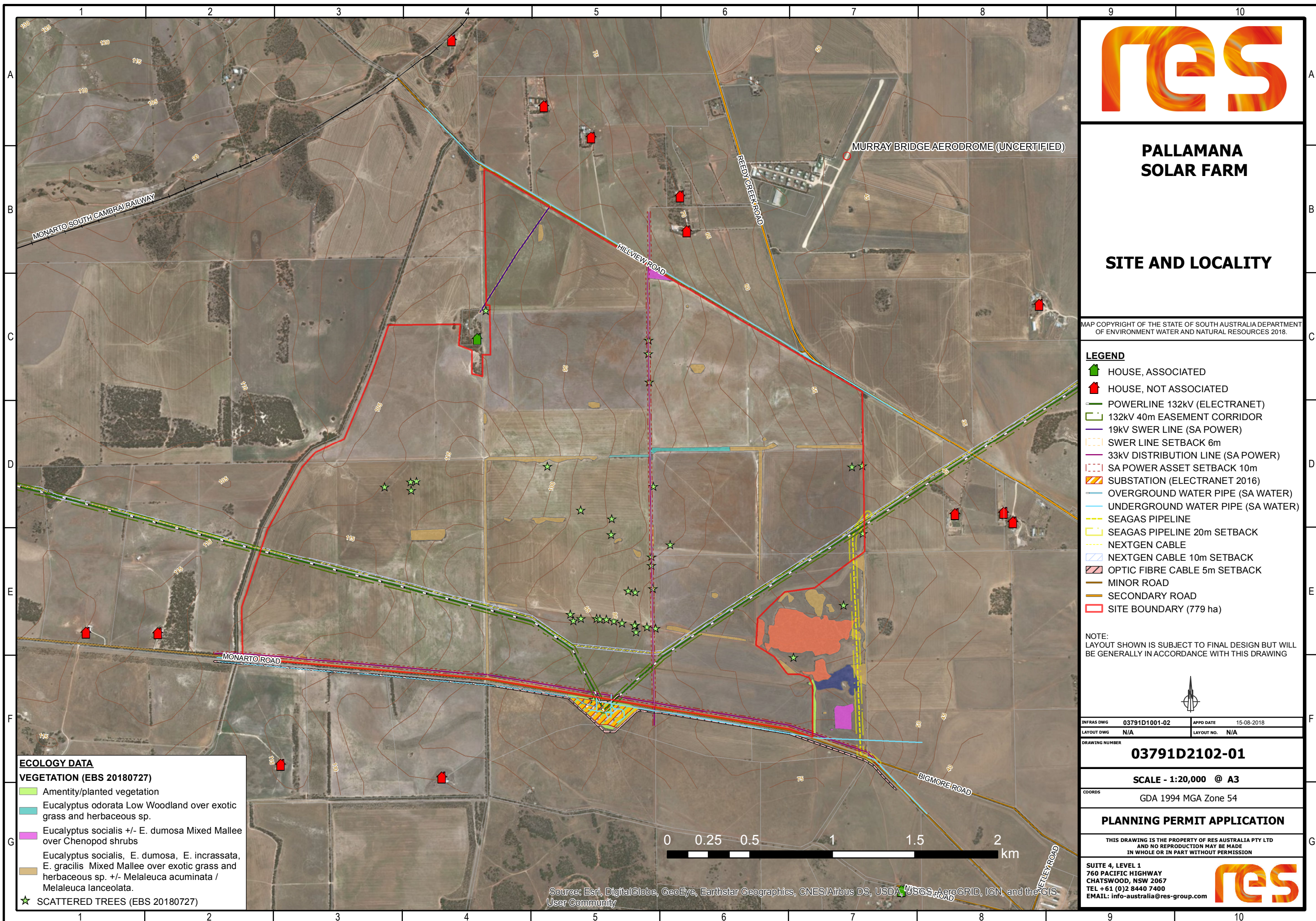


INFRAS DWG	N/A	APPD DATE	15-08-2018
LAYOUT DWG	N/A	LAYOUT NO.	N/A
DRAWING NUMBER		<b>03791D2202-04</b>	
SCALE - 1:2,000,00@ A3			
COORDS		GDA 1994 MGA Zone 54	
<b>PLANNING PERMIT APPLICATION</b>			
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SUITE 4, LEVEL 1 760 PACIFIC HIGHWAY CHATSWOOD, NSW 2067 TEL +61 (0)2 8440 7400 EMAIL: info-australia@res-group.com			

Sources: Esri, HERE, DeLorme, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), MapmyIndia, NGCC, © OpenStreetMap contributors,

Sources: Esri, HERE, DeLorme, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), MapmyIndia, NGCC, © OpenStreetMap contributors, and the GIS User Community





## PALLAMANA SOLAR FARM

### SITE AND LOCALITY

MAP COPYRIGHT OF THE STATE OF SOUTH AUSTRALIA DEPARTMENT  
OF ENVIRONMENT WATER AND NATURAL RESOURCES 2018.

#### LEGEND

- HOUSE, ASSOCIATED
- HOUSE, NOT ASSOCIATED
- POWERLINE 132kV (ELECTRANET)
- 132kV 40m EASEMENT CORRIDOR
- 19kV SWER LINE (SA POWER)
- SWER LINE SETBACK 6m
- 33kV DISTRIBUTION LINE (SA POWER)
- SA POWER ASSET SETBACK 10m
- SUBSTATION (ELECTRANET 2016)
- OVERGROUND WATER PIPE (SA WATER)
- UNDERGROUND WATER PIPE (SA WATER)
- SEAGAS PIPELINE
- SEAGAS PIPELINE 20m SETBACK
- NEXTGEN CABLE
- NEXTGEN CABLE 10m SETBACK
- OPTIC FIBRE CABLE 5m SETBACK
- MINOR ROAD
- SECONDARY ROAD
- SITE BOUNDARY (779 ha)

NOTE:  
LAYOUT SHOWN IS SUBJECT TO FINAL DESIGN BUT WILL  
BE GENERALLY IN ACCORDANCE WITH THIS DRAWING



INFRAS DWG	03791D1001-02	APPD DATE	15-08-2018
LAYOUT DWG	N/A	LAYOUT NO.	N/A

DRAWING NUMBER  
**03791D2102-01**

SCALE - 1:20,000 @ A3

COORDS  
GDA 1994 MGA Zone 54

#### PLANNING PERMIT APPLICATION

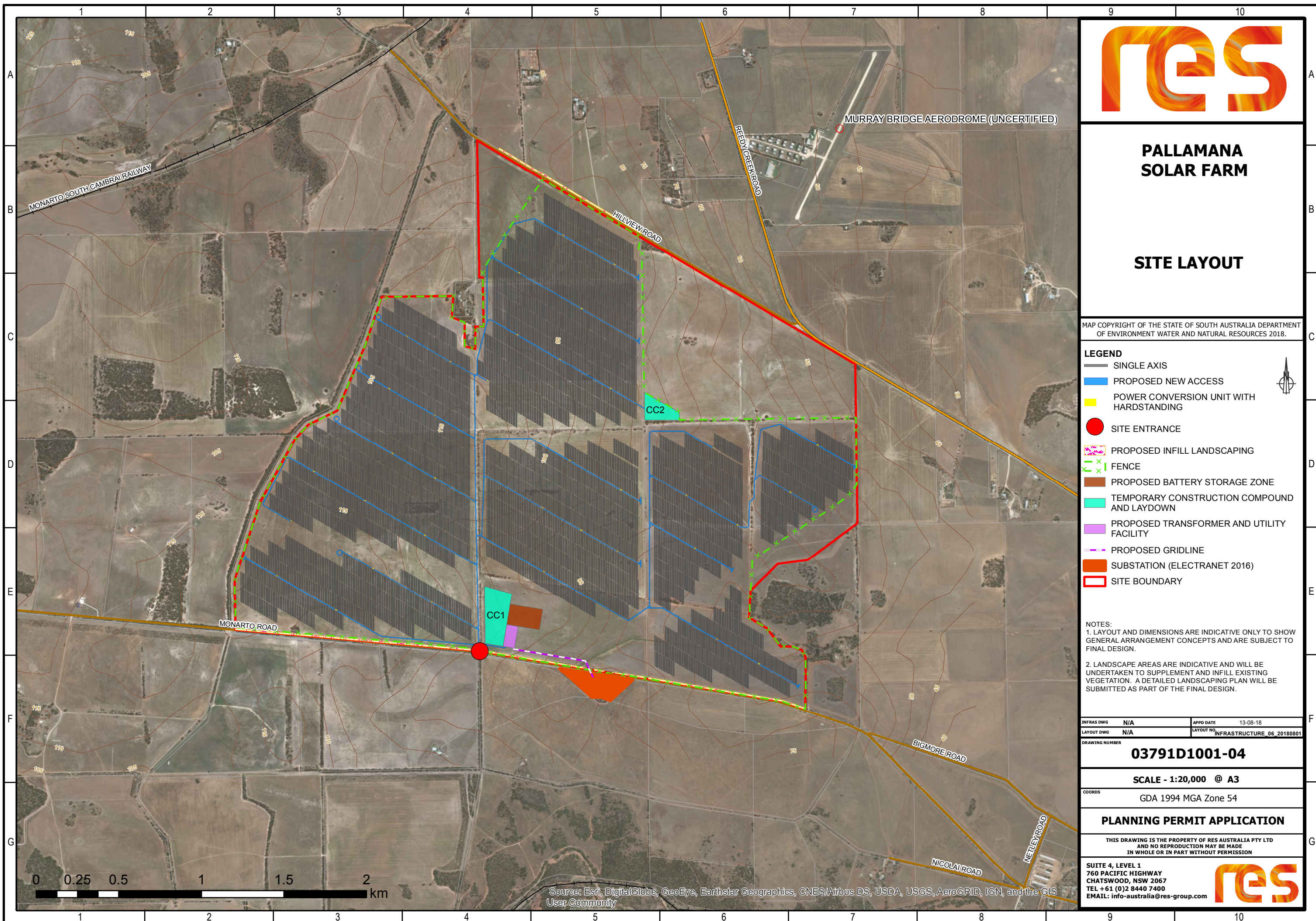
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Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community





## PALLAMANA SOLAR FARM

### SITE LAYOUT

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#### LEGEND

- SINGLE AXIS
- PROPOSED NEW ACCESS
- POWER CONVERSION UNIT WITH  
HARDSTANDING
- SITE ENTRANCE
- PROPOSED INFILL LANDSCAPING
- FENCE
- PROPOSED BATTERY STORAGE ZONE
- TEMPORARY CONSTRUCTION COMPOUND  
AND LAYDOWN
- PROPOSED TRANSFORMER AND UTILITY  
FACILITY
- PROPOSED GRIDLINE
- SUBSTATION (ELECTRANET 2016)
- SITE BOUNDARY

NOTES:  
1. LAYOUT AND DIMENSIONS ARE INDICATIVE ONLY TO SHOW  
GENERAL ARRANGEMENT CONCEPTS AND ARE SUBJECT TO  
FINAL DESIGN.

2. LANDSCAPE AREAS ARE INDICATIVE AND WILL BE  
UNDERTAKEN TO SUPPLEMENT AND INFILL EXISTING  
VEGETATION. A DETAILED LANDSCAPING PLAN WILL BE  
SUBMITTED AS PART OF THE FINAL DESIGN.

INFRAS DWG	N/A	APPD DATE	13-08-18
LAYOUT DWG	N/A	LAYOUT NO.	INFRASTRUCTURE_06_20180801

DRAWING NUMBER  
**03791D1001-04**

SCALE - 1:20,000 @ A3

COORDS  
GDA 1994 MGA Zone 54

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Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS  
User Community







**PALLAMANA  
SOLAR FARM**

**SITE LAYOUT  
ENLARGEMENT**

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**LEGEND**

- SINGLE AXIS TRACKER
- PROPOSED NEW ACCESS TRACKS
- POWER CONVERSION UNIT WITH  
HARDSTANDING
- SITE ENTRANCE
- PROPOSED INFILL LANDSCAPING
- FENCE
- PROPOSED BATTERY STORAGE ZONE (REF.  
TECHNICAL FIGURE 10A)
- TEMPORARY CONSTRUCTION COMPOUND  
(REF. TECHNICAL FIGURE 3) AND LAYDOWN
- PROPOSED TRANSFORMER AND UTILITY  
FACILITY (REF. TECHNICAL FIGURE 7)
- PROPOSED GRIDLINE
- SUBSTATION (ELECTRANET 2016)
- SITE BOUNDARY

NOTES:

1. LAYOUT AND DIMENSIONS ARE INDICATIVE ONLY TO SHOW  
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FINAL DESIGN.

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SUBMITTED AS PART OF THE FINAL DESIGN.

INFRAS DWG	N/A	APPD DATE	15-08-2018
LAYOUT DWG	N/A	LAYOUT NO.	INFRASTRUCTURE_06_20180801

DRAWING NUMBER

**03791D1002-01**


SCALE - 1:3,000 @ A3

COORDS GDA 1994 MGA Zone 54

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## SOLAR FARM

### TECHNICAL FIGURE 1

#### SINGLE AXIS TRACKER

NOTES:

1. GROUND CLEARANCE WILL VARY AS REQUIRED BY TOPOGRAPHY;
2. ROW LENGTH WILL VARY DEPENDING ON ELECTRICAL DESIGN;
3. INDICATIVE ROW LENGTH COULD BE UP TO 100m;
4. PV MODULES COULD BE INSTALLED IN PORTRAIT OR LANDSCAPE. ORIENTATION AND NUMBER WILL DEPEND ON THE MODULE AND TRACKER TYPE;
5. THE PILE DEPTH SHALL BE DETERMINED FOLLOWING DETAILED GEOTECHNICAL SITE INVESTIGATION, TYPICALLY UP TO 2.4m. PILE HEIGHTS WILL CHANGE TO ACCOMMODATE THE GRADE, SUBJECT TO GEOTECHNICAL DESIGN;
6. ACTUATOR TYPE AND LOCATION MAY VARY;
7. THE FINAL CONFIGURATION MAY BE SUBJECT TO CHANGE IN THE DETAILED DESIGN PHASE, BUT WILL BE GENERALLY IN ACCORDANCE WITH THIS DRAWING;
8. ACTUATOR TECHNOLOGY SUBJECT TO FINAL DESIGN.

INFRA DWG	N/A	APPD DATE	02/08/2017
LAYOUT DWG	N/A	T-LAYOUT NO.	N/A

DRAWING NUMBER **03707D2206-01**

SCALE - N.T.S @A3

COORDS	N/A
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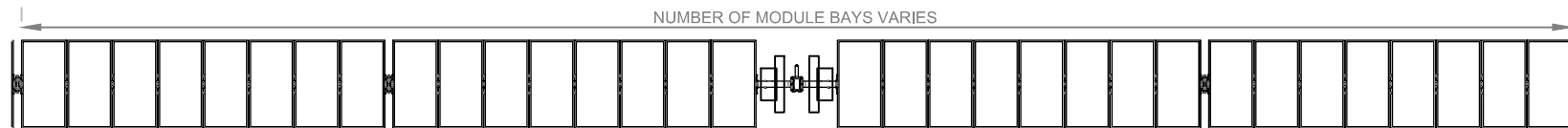
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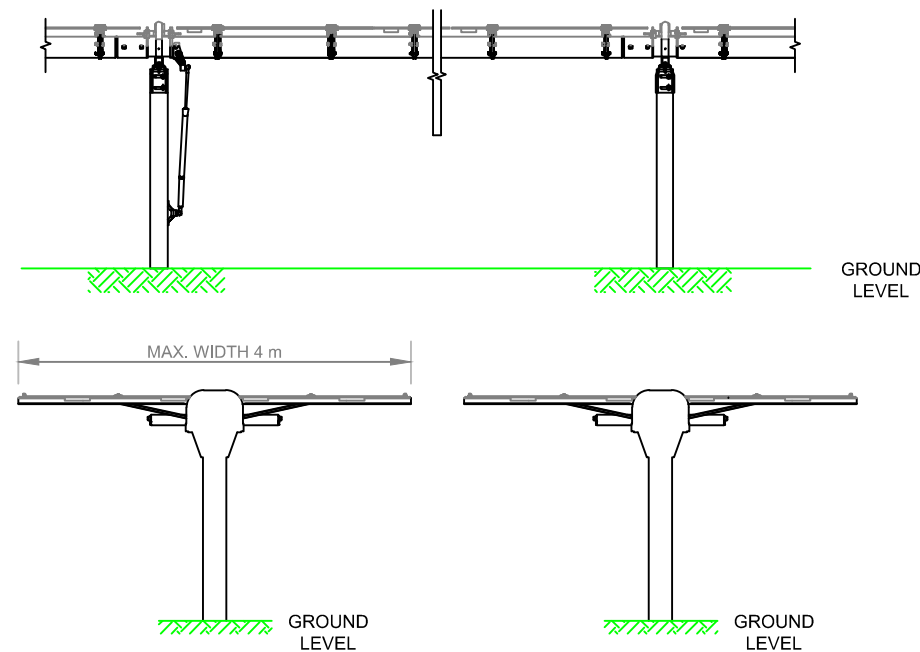
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## TYPICAL TRACKER ROW

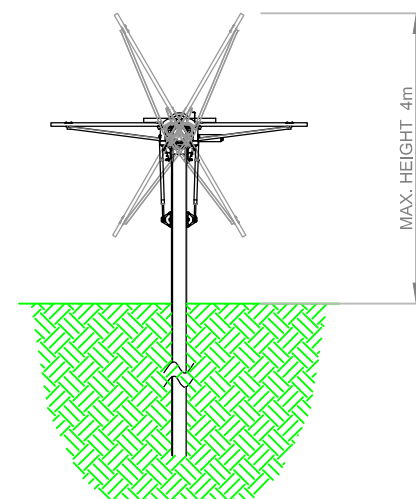
NUMBER OF MODULE BAYS VARIES



## TYPICAL SOLAR ARRAY TABLE NORTH AND EASTERN ELEVATION



TYPICAL RACKING  
MAXIMUM HEIGHT





**SOLAR FARM**

**TECHNICAL FIGURE 2**

**TYPICAL ACCESS TRACK DETAIL**

**LEGEND**

- EXISTING GROUND PROFILE
- FINISHED GROUND PROFILE
- ENGINEERED FILL
- CRUSHED STONE PAVEMENT
- EXISTING GROUND
- RESPREAD TOPSOIL

**NOTES**

GENERAL SITE ROAD DETAILS SHOWN, WHERE POSSIBLE AREAS OF FILL TO BE AVOIDED, ADDITIONAL WIDENING OF TRACK REQUIRED ON CORNERS AND PASSING BAYS TO ACCOMMODATE TRAFFIC;

ADDITIONAL TEMPORARY TRACK: WIDENING MAY BE REQUIRED FOR CRANE MOVEMENTS, WIDENED AREAS TO BE REMOVED AT THE DISCRETION OF THE REGULATING AUTHORITY;

TRACK WIDTH WIDENED LOCALLY TO PROVIDE PASSING BAYS & TURNING HEADS;

ALL MEASUREMENTS ARE INDICATIVE BUT FINAL DESIGN WILL BE CONSISTENT WITH WHAT IS SHOWN.

INFRA DWG	N/A	APPD DATE	02-08-2017
LAYOUT DWG	N/A	T-LAYOUT NO.	N/A

DRAWING NUMBER

**03707D3501-03**

SCALE - N.T.S

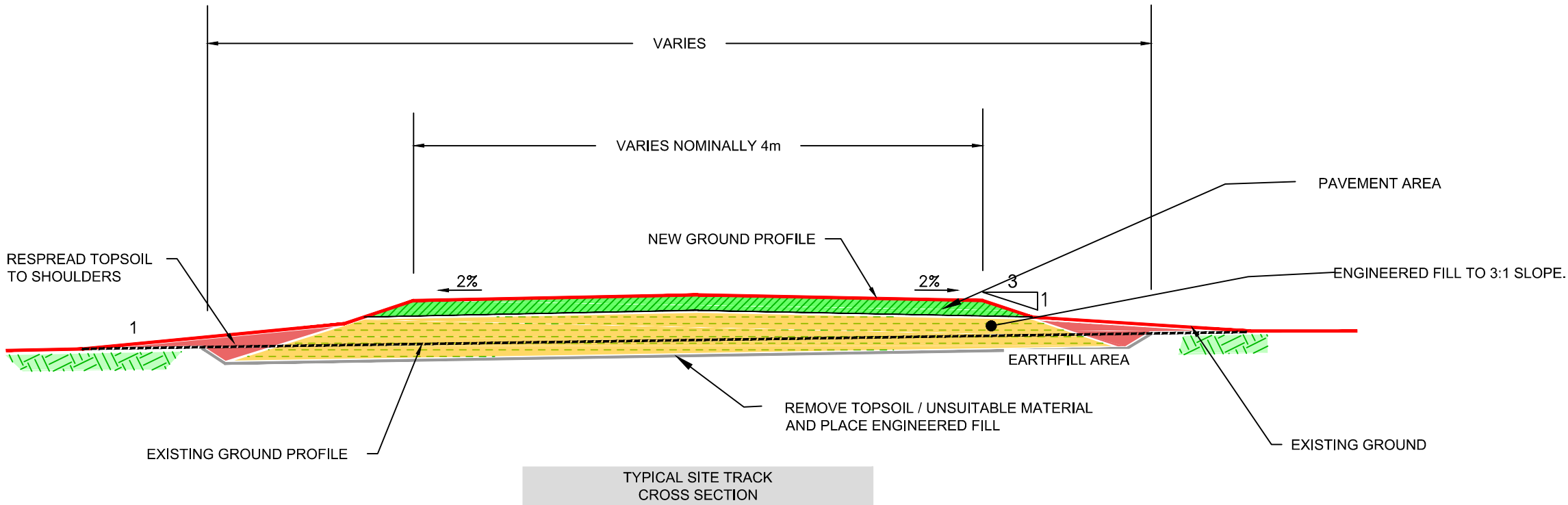
COORDS

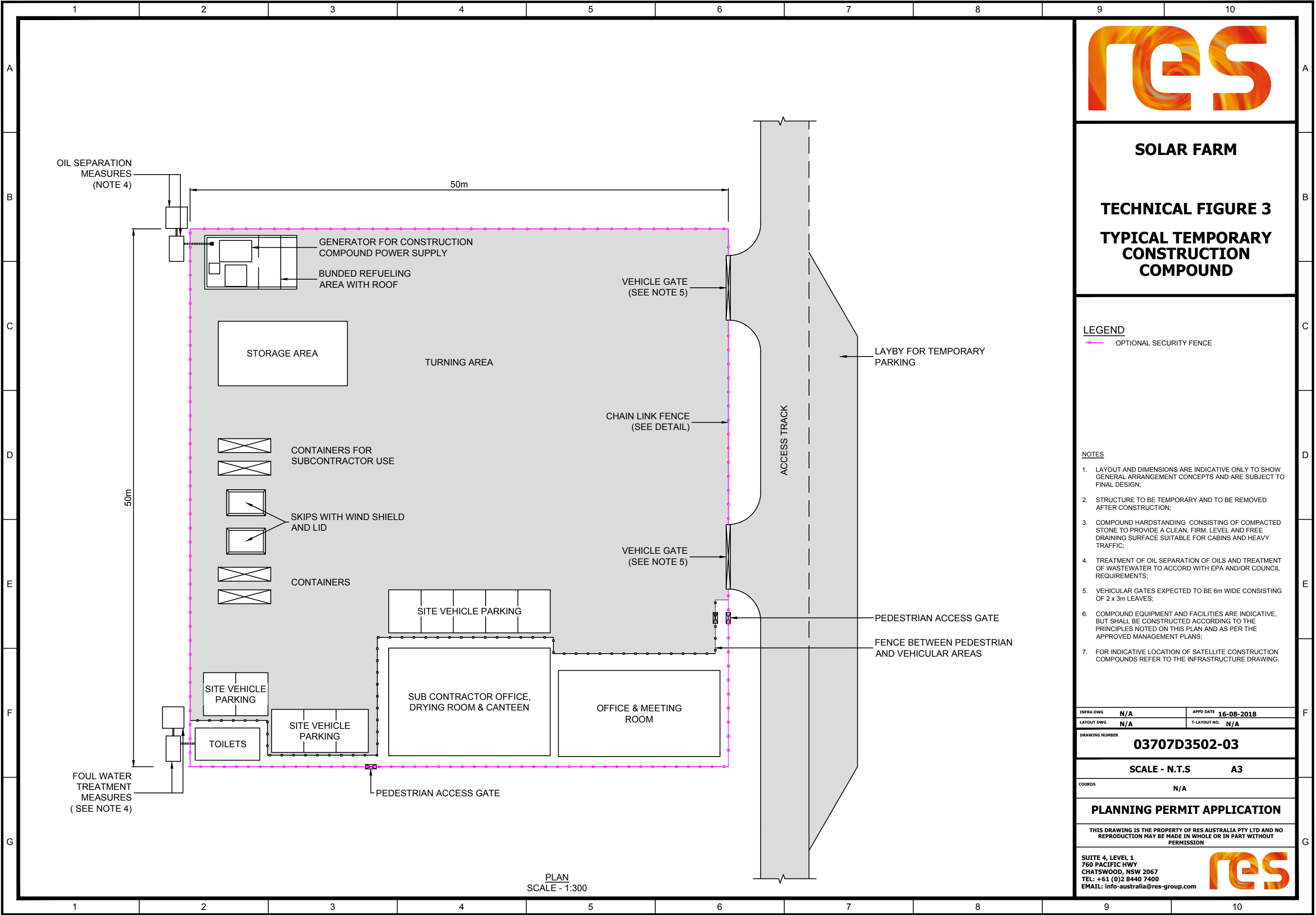
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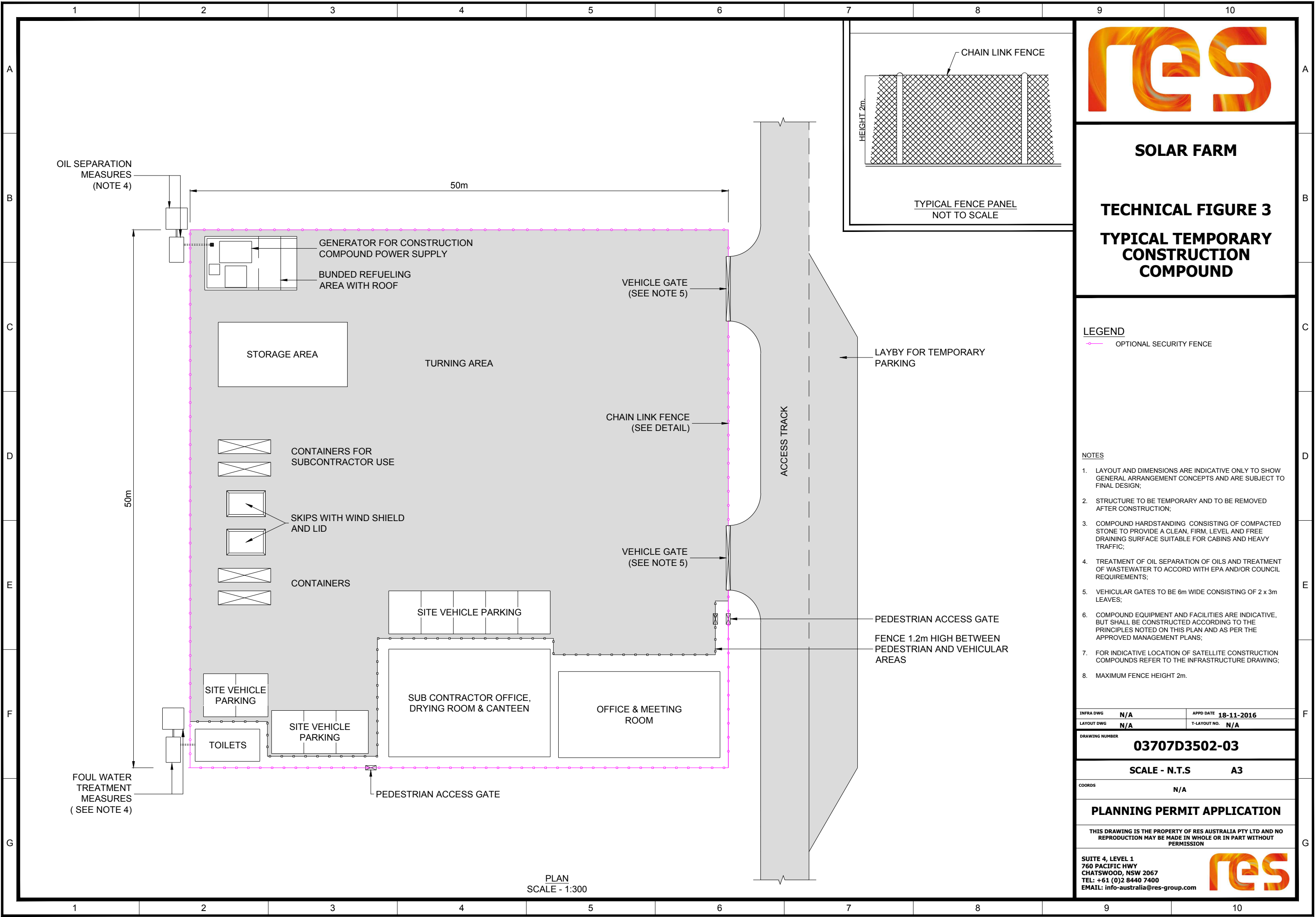
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## SOLAR FARM

### TECHNICAL FIGURE 3 TYPICAL TEMPORARY CONSTRUCTION COMPOUND

**LEGEND**  
OPTIONAL SECURITY FENCE

- NOTES**
- LAYOUT AND DIMENSIONS ARE INDICATIVE ONLY TO SHOW GENERAL ARRANGEMENT CONCEPTS AND ARE SUBJECT TO FINAL DESIGN;
  - STRUCTURE TO BE TEMPORARY AND TO BE REMOVED AFTER CONSTRUCTION;
  - COMPOUND HARDSTANDING, CONSISTING OF COMPACTED STONE TO PROVIDE A CLEAN, FIRM, LEVEL AND FREE DRAINING SURFACE SUITABLE FOR CABINS AND HEAVY TRAFFIC;
  - TREATMENT OF OIL SEPARATION OF OILS AND TREATMENT OF WASTEWATER TO ACCORD WITH EPA AND/OR COUNCIL REQUIREMENTS;
  - VEHICULAR GATES TO BE 6m WIDE CONSISTING OF 2 x 3m LEAVES;
  - COMPOUND EQUIPMENT AND FACILITIES ARE INDICATIVE, BUT SHALL BE CONSTRUCTED ACCORDING TO THE PRINCIPLES NOTED ON THIS PLAN AND AS PER THE APPROVED MANAGEMENT PLANS;
  - FOR INDICATIVE LOCATION OF SATELLITE CONSTRUCTION COMPOUNDS REFER TO THE INFRASTRUCTURE DRAWING;
  - MAXIMUM FENCE HEIGHT 2m.

INFRA DWG	N/A	APPD DATE	18-11-2016
LAYOUT DWG	N/A	T-LAYOUT NO.	N/A

DRAWING NUMBER  
**03707D3502-03**

SCALE - N.T.S      A3

COORDS      N/A

#### PLANNING PERMIT APPLICATION

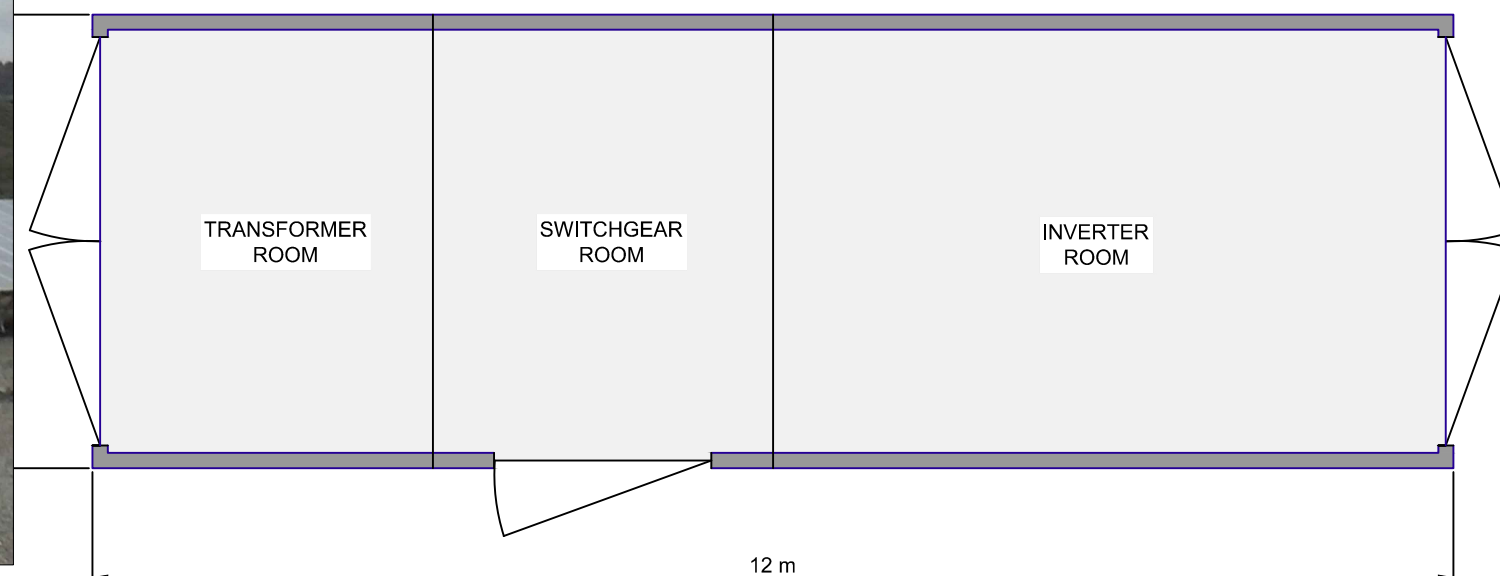
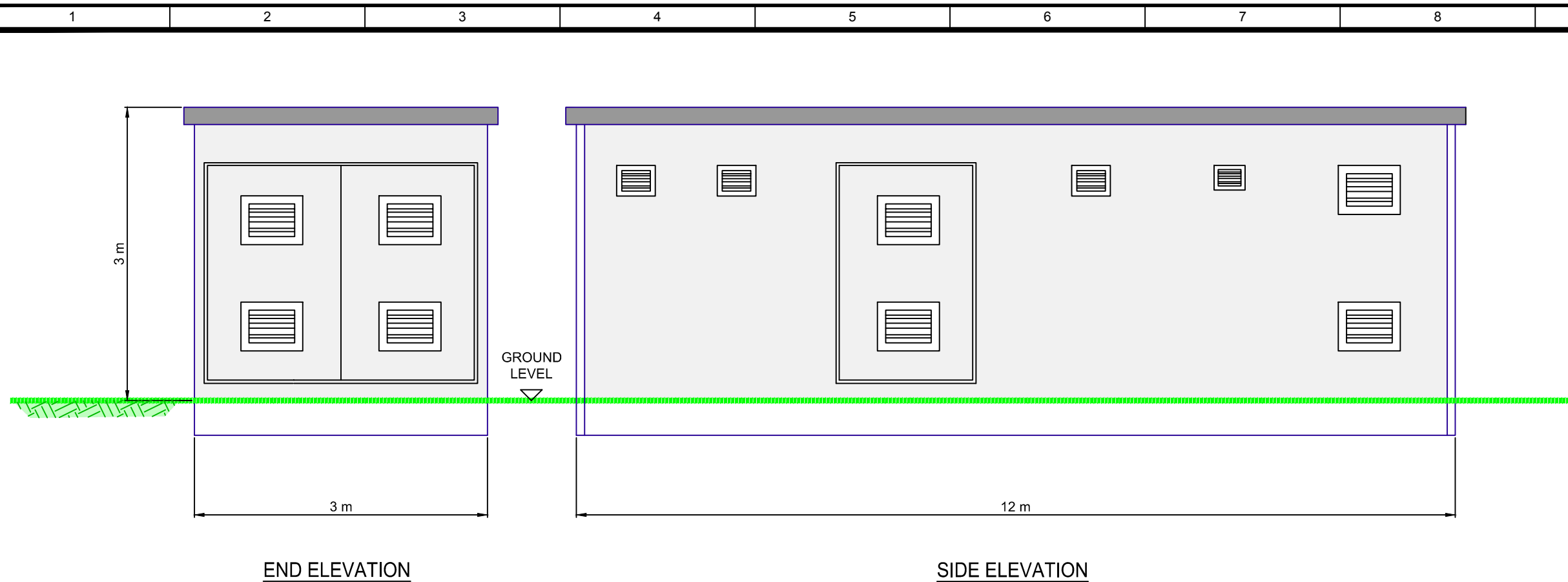
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PLAN  
SCALE - 1:300





## PLAN



**SOLAR FARM**

**TECHNICAL FIGURE 4**

**TYPICAL POWER  
CONVERSION UNIT - PCU**

NOTES:

1. ALL DIMENSIONS ARE MAXIMUM ANTICIPATED AND SUBJECT TO DETAILED DESIGN, BUT WILL BE GENERALLY IN ACCORDANCE WITH THIS DRAWING;
2. ROOM AND DOOR POSITIONS ARE INDICATIVE AND SUBJECT TO DETAILED DESIGN;
3. APPROXIMATE FINISHED FLOOR LEVEL 300mm ABOVE EXISTING GROUND;
4. FINISHES WILL NOT UNDULY CONTRAST WITH SURROUNDINGS.

INFRA DWG	N/A	APPD DATE	03-08-18
LAYOUT DWG	N/A	T-LAYOUT NO.	N/A

DRAWING NUMBER **03707D4001-03**

**SCALE - N.T.S** **A3**

COORDS	N/A
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## PLANNING PERMIT APPLICATION

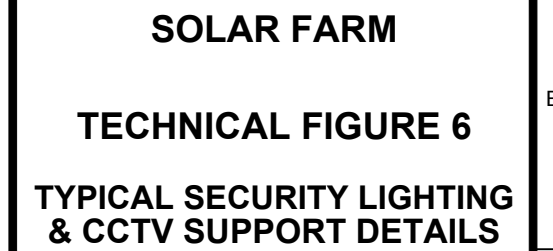
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1. ALL DIMENSIONS ARE MAXIMUM. ANTICIPATED AND SUBJECT TO DETAILED DESIGN, BUT WILL BE GENERALLY IN ACCORDANCE WITH THIS DRAWING;
2. SECURITY LIGHTING MAY BE INFRARED;
3. LIGHTING AND CCTV SUPPORTS TO BE LOCATED ADJACENT TO SECURITY FENCING;
4. CAMERAS MAY BE INSTALLED WITH PAN FUNCTION;
5. TO BE INSTALLED IF REQUIRED BY INSURERS.

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GENERAL ARRANGEMENT



SOLAR FARM

TECHNICAL FIGURE 7

INDICATIVE UTILITY  
FACILITY LAYOUT  
SINGLE TRANSFORMER

NOTES:

- 1. INFRASTRUCTURE TO CONFORM TO AUSTRALIAN STANDARDS, BCA/NCC AND LOCAL GOVERNMENT REGULATIONS;
- 2. LAYOUT AND DIMENSION ARE INDICATIVE ONLY - SUBJECT TO DETAILED DESIGN AND NOT FOR CONSTRUCTION;
- 3. DIMENSION ARE IN MILLIMETRES;
- 4. LAYOUT AS SHOWN SUITED FOR ≤ 132kV ;
- 5. COMMS TOWER DESIGN TO BE FINALISED THROUGH DISCUSSION WITH NETWORK PROVIDER.

EQUIPMENT SCHEDULE:	
EQUIPMENT No.	DESCRIPTION
1	POLE C/W LIGHTNING FINIAL AND AREA LIGHTING
2	MAIN TRANSFORMER C/W SURGE ARRESTORS
3	INSULATED POST
4	CIRCUIT BREAKER C/W CURRENT TRANSFORMERS
5	DISCONNECTOR
6	VOLTAGE TRANSFORMER
7	SURGE ARRESTOR
8	INCOMING LINE GANTRY
9	COMMS TOWER

BUILDING AREA (GROSS)

Ground Floor	
33kV SWITCH ROOM	162 m²
CONTROL ROOM	72 m²
STORAGE SHED	300 m²
VERANDA/ RECREATION AREA	37 m²
Grand total	572 m²

PAGE 1 OF 2

INFRA DWG	N/A	APPD DATE	08-02-2017
LAYOUT DWG	N/A	T-LAYOUT NO.	N/A

DRAWING NUMBER	03707D4004-01
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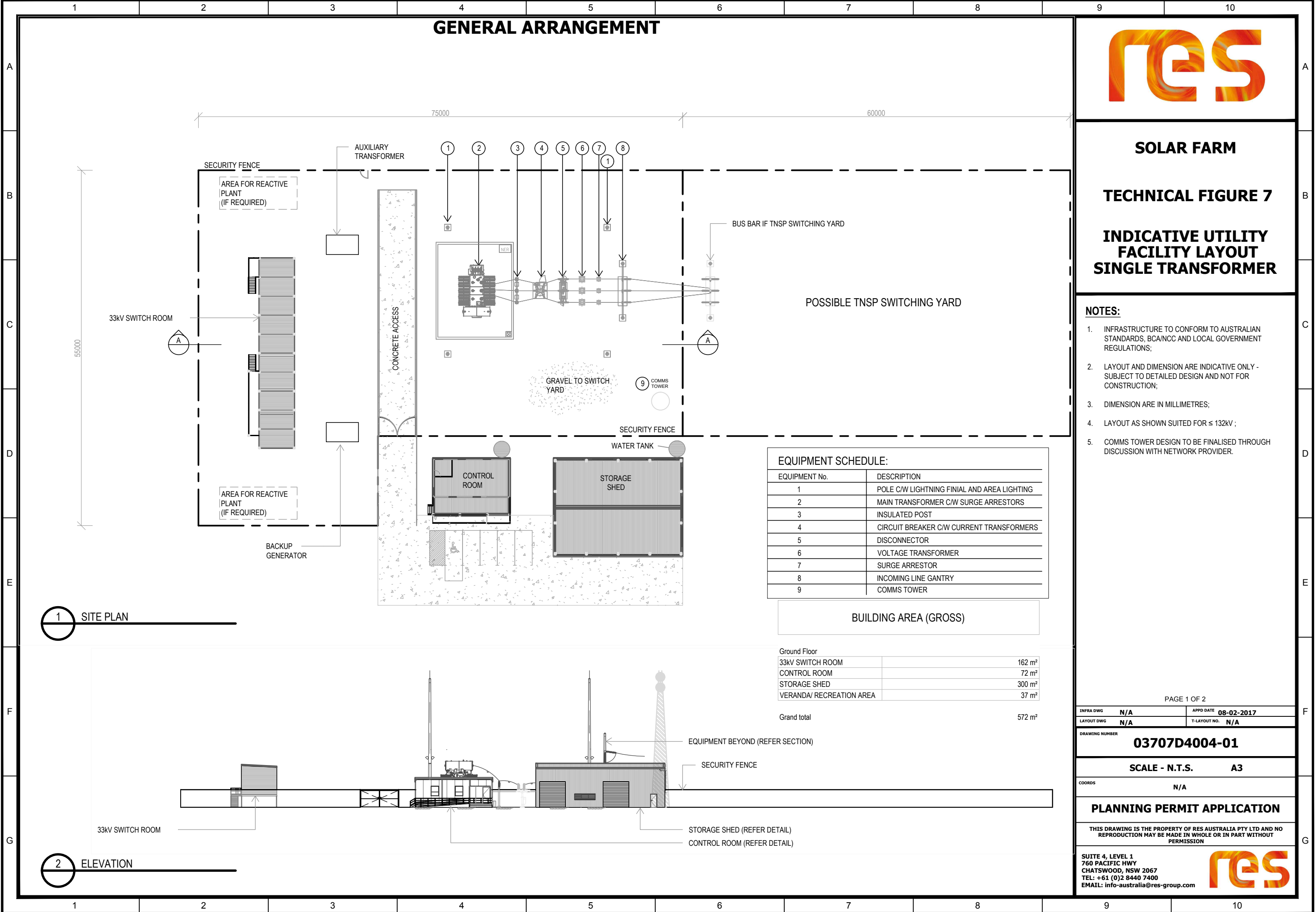
SCALE - N.T.S.	A3
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COORDS	N/A
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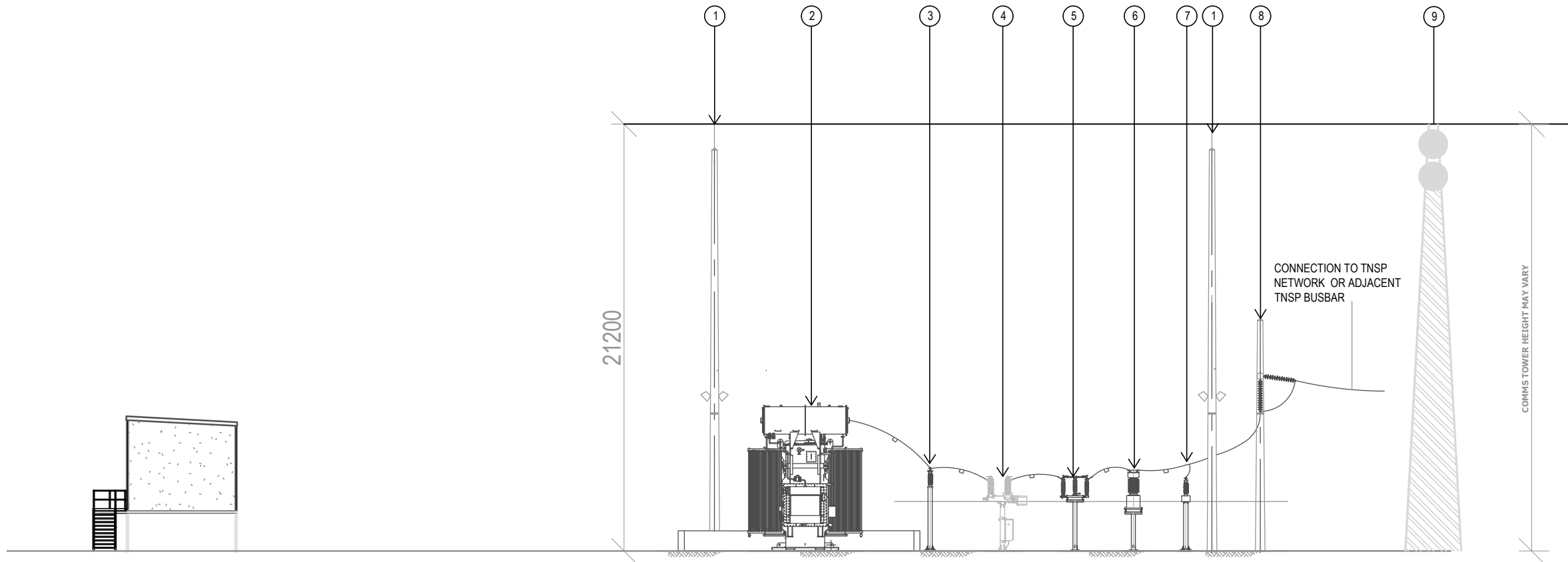
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GENERAL ARRANGEMENT  
SECTION



A SECTION

EQUIPMENT SCHEDULE:	
EQUIPMENT No.	DESCRIPTION
1	POLE C/W LIGHTNING FINIAL AND AREA LIGHTING
2	MAIN TRANSFORMER C/W SURGE ARRESTORS
3	INSULATED POST
4	CIRCUIT BREAKER C/W CURRENT TRANSFORMERS
5	DISCONNECTOR
6	VOLTAGE TRANSFORMER
7	SURGE ARRESTOR
8	INCOMING LINE GANTRY
9	COMMS TOWER



SOLAR FARM

TECHNICAL FIGURE 7

INDICATIVE UTILITY  
FACILITY LAYOUT  
SINGLE TRANSFORMER

- NOTES:
- INFRASTRUCTURE TO CONFORM TO AUSTRALIAN STANDARDS, BCA/NCC AND LOCAL GOVERNMENT REGULATIONS;
  - LAYOUT AND DIMENSION ARE INDICATIVE ONLY - SUBJECT TO DETAILED DESIGN AND NOT FOR CONSTRUCTION;
  - DIMENSION ARE IN MILLIMETRES;
  - LAYOUT AS SHOWN SUITED FOR  $\leq 132\text{kV}$  ;
  - COMMS TOWER DESIGN TO BE FINALISED THROUGH DISCUSSION WITH NETWORK PROVIDER.

PAGE 2 OF 2

INFRA DWG	N/A	APPD DATE	08-02-2017
LAYOUT DWG	N/A	T-LAYOUT NO.	N/A

DRAWING NUMBER  
03707D4004-01

SCALE - N.T.S      A3

COORDS      N/A

PLANNING PERMIT APPLICATION

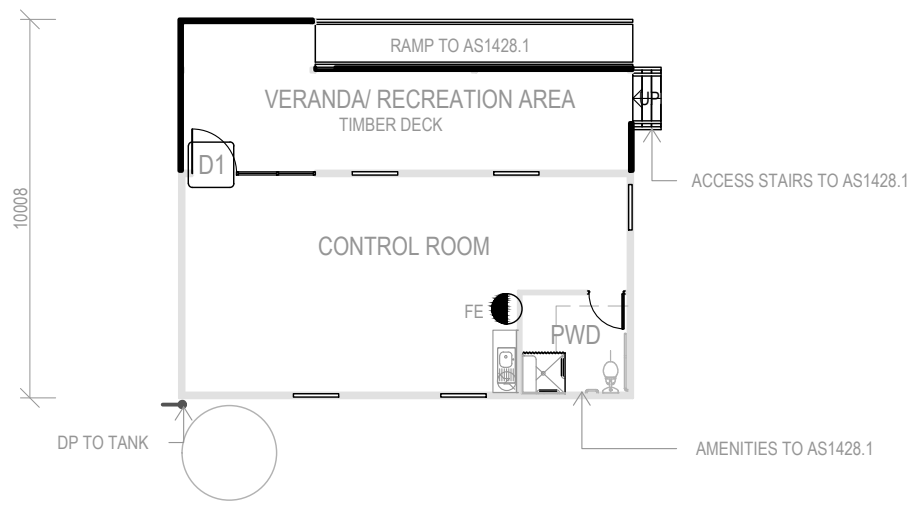
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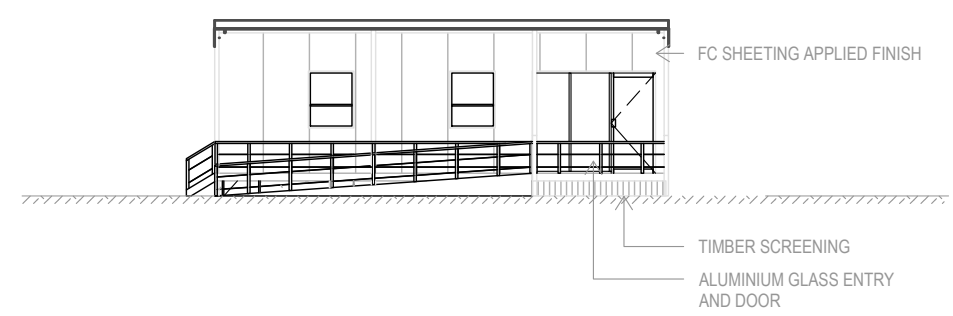


CONTROL ROOM LAYOUT

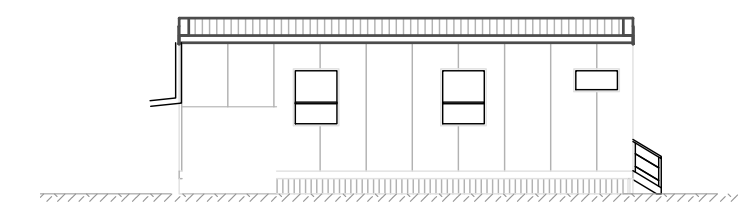
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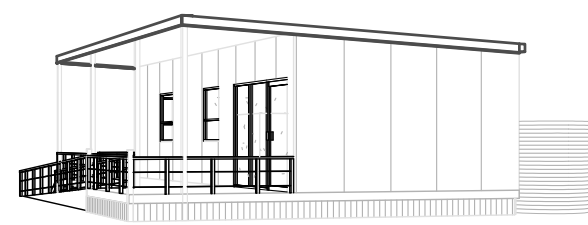
1 GROUND FLOOR PLAN



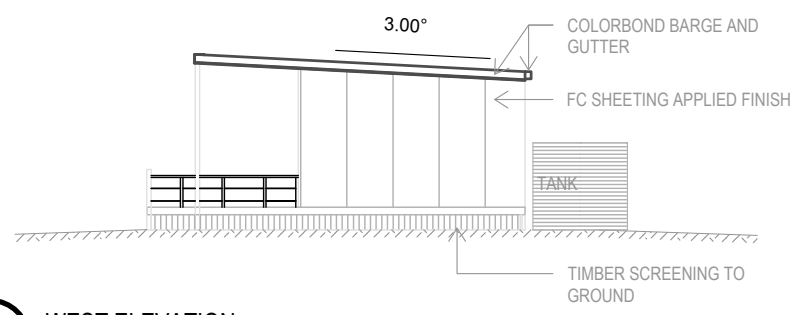
3 NORTH ELEVATION



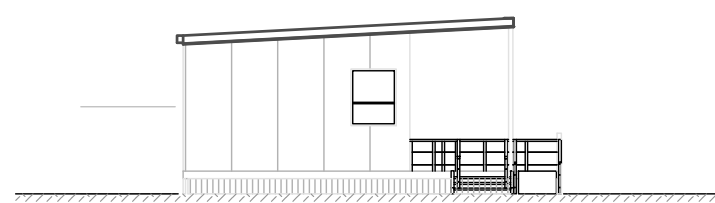
4 SOUTH ELEVATION



6 PERSPECTIVE



2 WEST ELEVATION



5 EAST ELEVATION



SOLAR FARM

TECHNICAL FIGURE 8  
TYPICAL CONTROL ROOM

ROOM SCHEDULE		
NAME	FLOOR FINISH	AREA
GROUND FLOOR		
CONTROL ROOM	VINYL	60 m²
PWD	VINYL	7 m²
VERANDA/ RECREATION AREA	TIMBER DECK APPLIED FINISH	36 m²
Grand total		103 m²

- NOTES:**
- INFRASTRUCTURE TO CONFORM TO AUSTRALIAN STANDARDS, BCANCC AND LOCAL GOVERNMENT REGULATIONS;
  - LAYOUT AND DIMENSIONS ARE INDICATIVE ONLY - SUBJECT TO DETAILED DESIGN AND NOT FOR CONSTRUCTION, BUT WILL BE GENERALLY IN ACCORDANCE WITH THIS DRAWING;
  - DIMENSION ARE IN MILLIMETRES;
  - LAYOUT AS SHOWN SUITED FOR  $\leq 132\text{kV}$ ;
  - FINISHES WILL NOT UNDULY CONTRAST WITH SURROUNDINGS.

PAGE 1 OF 2

INFRA DWG	N/A	APPD DATE	03-08-2018
LAYOUT DWG	N/A	T-LAYOUT NO.	N/A

DRAWING NUMBER  
**03707D4003-01**

SCALE - N.T.S. @A3

COORDS  
N/A

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SWITCHROOM DETAIL



SOLAR FARM

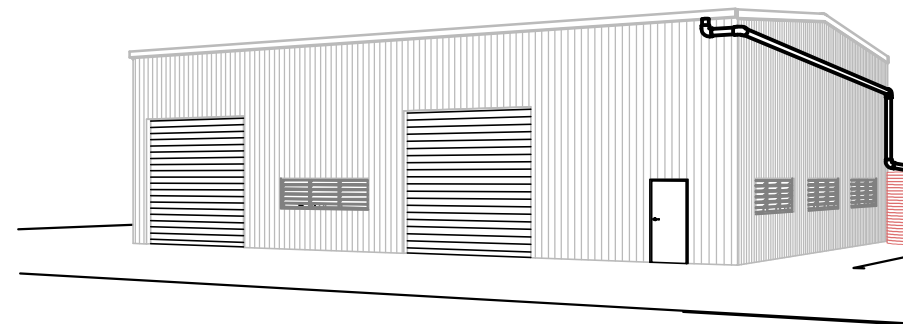
TECHNICAL FIGURE 8  
TYPICAL CONTROL ROOM

NOTES:

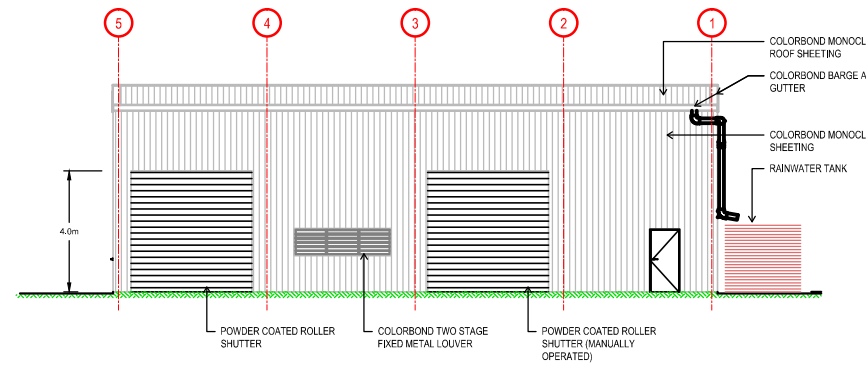
1. INFRASTRUCTURE TO CONFORM TO AUSTRALIAN STANDARDS, BCA/NCC AND LOCAL GOVERNMENT REGULATIONS;
2. LAYOUT AND DIMENSION ARE INDICATIVE ONLY - SUBJECT TO DETAILED DESIGN AND NOT FOR CONSTRUCTION, BUT WILL BE GENERALLY IN ACCORDANCE WITH THIS DRAWING;
3. DIMENSION ARE IN MILLIMETRES;
4. LAYOUT AS SHOWN SUITED FOR  $\leq 132\text{kV}$ ;
5. FINISHES WILL NOT UNDULY CONTRAST WITH SURROUNDINGS;
6. COMMS TOWER DESIGN TO BE FINALISED THROUGH DISCUSSION WITH NETWORK PROVIDER.

PAGE 2 OF 2

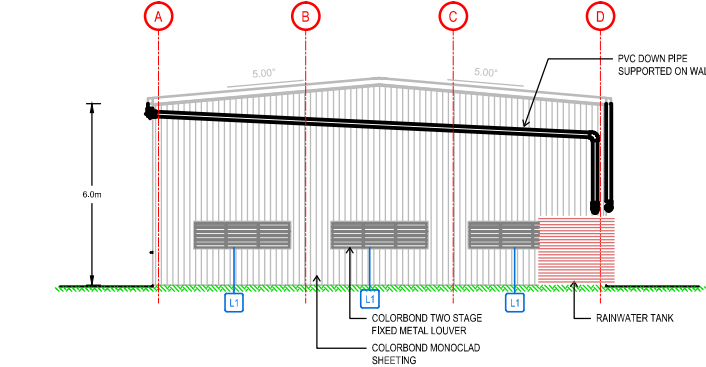
INFRA DWG	N/A	APPD DATE	03-08-2018
LAYOUT DWG	N/A	T-LAYOUT NO.	N/A
DRAWING NUMBER			
03707D4003-01			
SCALE - N.T.S.		@A3	
COORDS			
N/A			
PLANNING PERMIT APPLICATION			
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PERSPECTIVE  
3D STORAGE SHED



N STORAGE SHED NORTH ELEVATION



W STORAGE SHED WESTERN ELEVATION



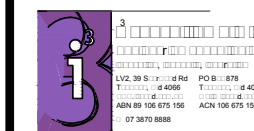
## SOLAR FARM

## TECHNICAL FIGURE 9

## TYPICAL STORAGE SHED

## NOTES

LAYOUTS AND DIMENSIONS ARE INDICATIVE ONLY TO SHOW GENERAL ARRANGEMENT CONCEPTS AND ALL DETAILS ARE SUBJECT TO FINAL DESIGN.



BASED ON I<sup>3</sup> DRAWINGS

INFRA DWG	N/A	APPD DATE	03-08-2018
LAYOUT DWG	N/A	T-LAYOUT NO.	N/A

DRAWING NUMBER **03707D3503-01**

**SCALE - N.T.S** **@A3**










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## LEGEND - FLOOR PLAN

	PROPOSED WALL
	REFER WALL SCHEDULE FOR TYPE
	CIRCULATION SPACE TO AS1428-1:2009 MIN. 920 DOOR TO AS1428-1:2009 (MIN. 850 CLEAR) WALL CIRCULATION SPACE TO AS1428-1:2009
FHR 	36m x 19mm ID FIRE HOSE REEL INSTALLED IN ACCORDANCE WITH AS2441
FE 	4.5kg 4A/50B(E) DRY CHEMICAL FIRE EXTINGUISHER INSTALLED IN ACCORDANCE WITH AS2444-1990
⊙ <sup>B</sup>	BOLLARD
⊙ <sup>DP</sup>	DOWNPIPE
	REFER STORMWATER PLAN FOR SIZE
	WALL TAG, REFER WALL SCHEDULE FOR WALL TYPE, INSULATION AND FINISH
	DOOR TAG, REFER DOOR SCHEDULE FOR DETAILS
	WINDOW TAG, REFER WINDOW SCHEDULE FOR DETAILS
	CURTAIN WALL TAG, REFER NON-STANDARD WINDOW SCHEDULE FOR DESCRIPTION, REFER ELEVATION AND PLAN FOR MILLION SEER

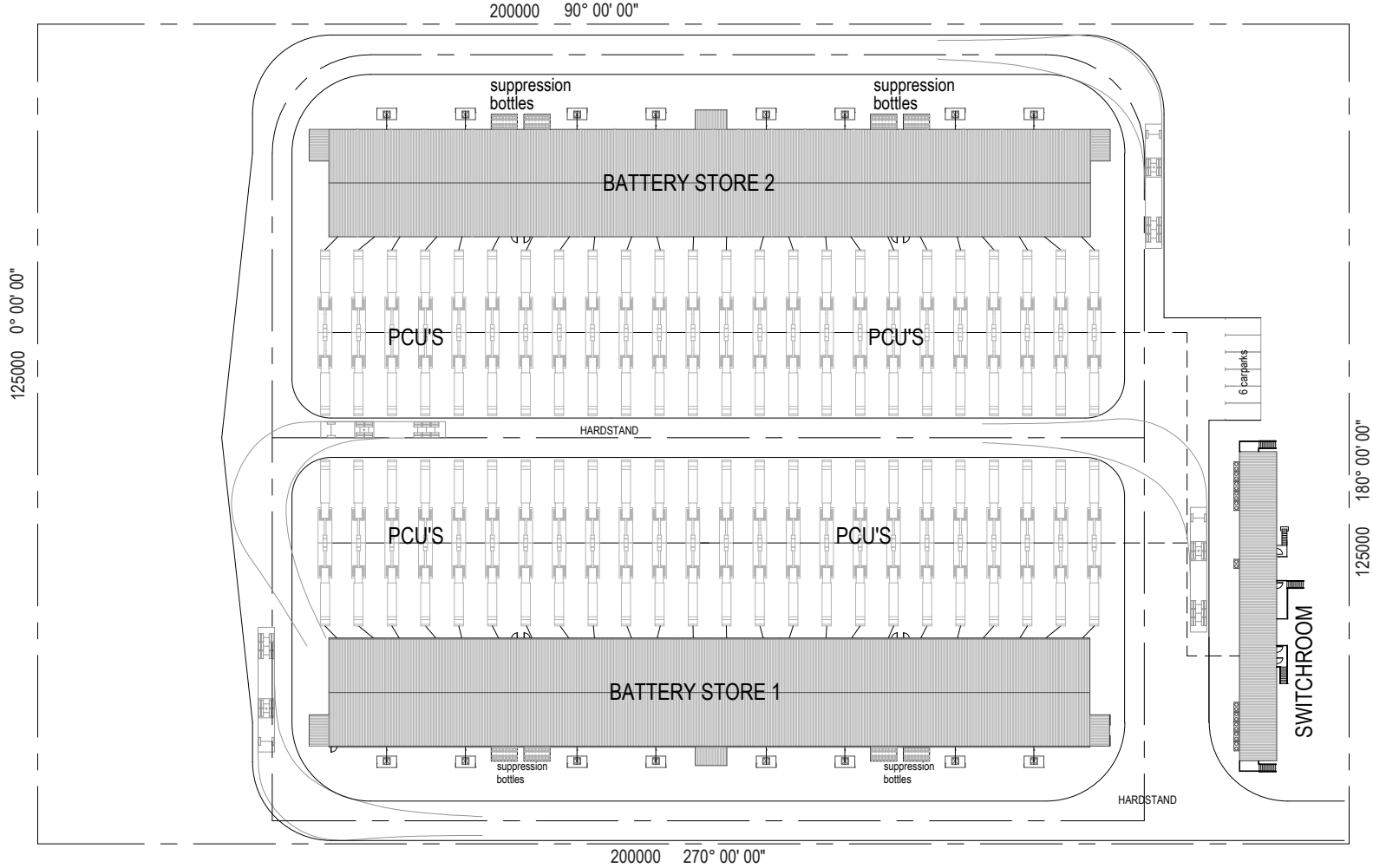
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NOTES:

1. ROLLER DOORS TO BE DESIGNED TO MEET PRESSURE CAPACITY REQUIREMENTS OF THE REGION
2. DISABILITY ACCESS TO COMPLY WITH AS1428.1 INCLUDING A MAXIMUM THRESHOLD OF 5mm AND CARPARK GRADES TO BE A MAXIMUM OF 1 IN 40 (2.5%) FROM DISABILITY CARPARK TO BUILDING.
3. CONCRETE TILT PANELS TO COMPLY WITH BCA CL 1.11.
4. REFER GENERAL NOTES ON 001 FOR FURTHER NOTES AND ABBREVIATIONS
5. REFER TO THE SCHEDULE OF FIXTURES AND FINISHES FOR SPECIFICATIONS

EMERGENCY LIGHTING SCHEDULE				
SYMBOL	C0	C90	HEIGHT	DESCRIPTION
	D50	C50	5000	STANILITE ECBT136M, MAINTAIN 36W SINGLE, BARE BATTERY
	D25	D25	2700	STANILITE ESFLD
	D2.5	E2.5	2400	STANILITE EELED 10W MAINTAINED, SINGLE SIDE

TO COMPLY WITH AS2293.1-2005 AND 8. C.A. PART 4.



1 SITE PLAN

- NOTES:
- THIS PLAN IS A DEVELOPMENT APPROVAL ONLY AND IS NOT TO BE USED FOR CONSTRUCTION PURPOSES.
  - INFRASTRUCTURE TO CONFORM TO AUSTRALIAN STANDARDS, BCANCC AND LOCAL GOVERNMENT REGULATIONS.
  - LAYOUT AND DIMENSIONS ARE INDICATIVE ONLY TO SHOW GENERAL ARRANGEMENT CONCEPTS AND ARE SUBJECT TO FINAL DESIGN.
  - THE SITE BOUNDARIES ARE ARBITRARY AND NEED TO BE INCORPORATED INTO THE OVERALL SITE LAYOUT IN DETAIL DESIGN.
  - EXISTING INFRASTRUCTURE SERVICES HAVE NOT BEEN INCORPORATED INTO THE PLAN. PRIOR TO THE CONCEPT BEING COMPLETED ALL UNDERGROUND SERVICES ARE TO BE SURVEYED OR IDENTIFIED BY OTHER MEANS.
  - A DETAILED SURVEY OR FINISHED SURFACE LEVELS HAS NOT BEEN INCORPORATED INTO THESE DRAWINGS AND THEREFORE MUST BE CONSIDERED DURING DETAILED DESIGN.
  - THE ARRANGEMENT OF THE INTERNAL BUILDING, ASSOCIATED SERVICES AND INVERTORS WILL BE FURTHER DEVELOPED IN DETAIL DESIGN.

- SERVICES:
- WATER SERVICES WILL BE REQUIRED FOR THE AMENITIES IN THE SWITCHROOM.
  - FENCING IS TO BE PROVIDED AROUND THE PERIMETER OF THE BUILDING AREA.
  - HARDSTAND SUITABLE FOR DESIGN VEHICLES WILL BE PROVIDED WITHIN THE BUILDING AREA.
  - APPROPRIATE DRAINAGE WILL BE PROVIDED FOR THE RUNOFF OF WATER IN THIS AREA.
  - SEWERAGE TREATMENT WILL BE PROVIDED AS NECESSARY TO MEET THE LOCAL AUTHORITY REGULATIONS AND ENVIRONMENTAL REQUIREMENTS.



PALLAMANA  
SOLAR FARM

TECHNICAL FIGURE 10A

STORAGE BUILDING  
SITE PLAN

LEGEND:	
BCP	BATTERY COMBINER PANEL
PCU	INVERTER, TRANSFORMER COMBINATION
SITE SCHEDULE	
BUILDING SITE AREA	25000 m²
BUILDING AREA (GROSS)	
Ground Floor	
BATTERY STORE BUILDING 1	1897 m²
BATTERY STORE BUILDING 2	1899 m²
	3796 m²
Switchroom:	
SWITCHROOM	268 m²
	268 m²
Grand total	4064 m²
CARPARKING SCHEDULE	
Total Carparks	6

INFRA DWG	N/A	APPD DATE	14-08-2018
LAYOUT DWG	N/A	T-LAYOUT NO.	N/A

DRAWING NUMBER	03791D3403-01
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SCALE - N.T.S.	@A3
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COORDS	N/A
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PLANNING PERMIT APPLICATION

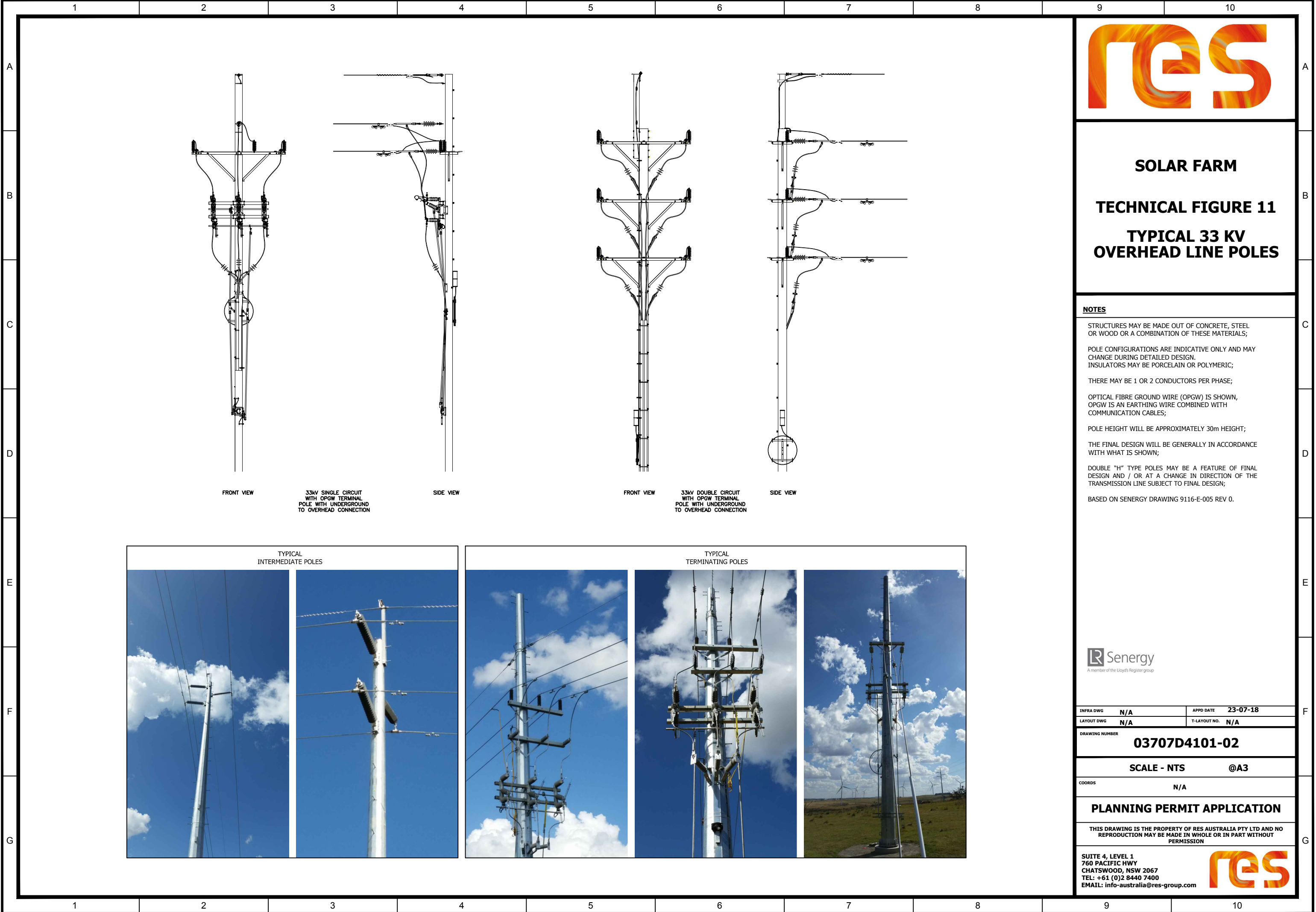
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**SOLAR FARM**

**TECHNICAL FIGURE 11**

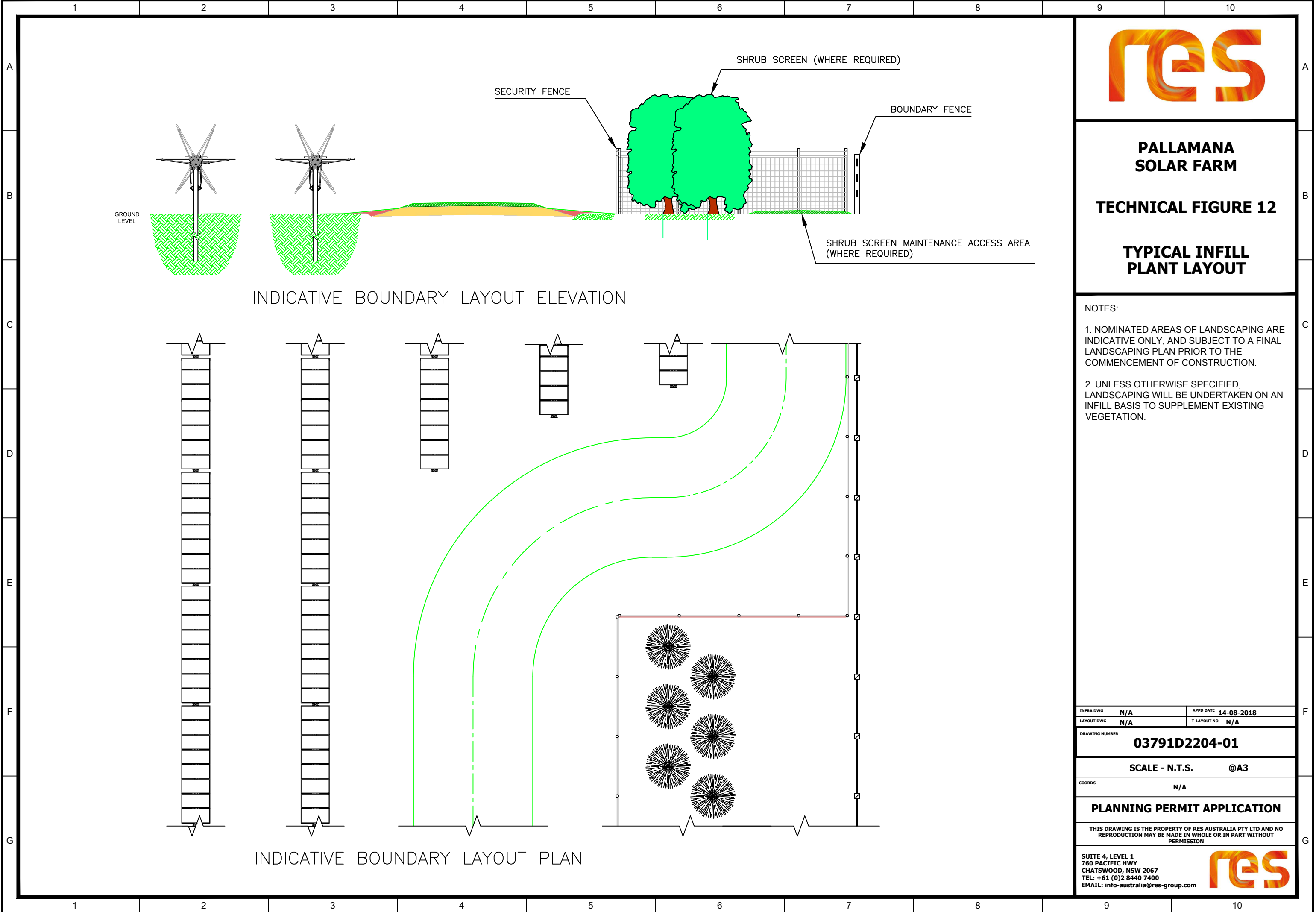
**TYPICAL 33 KV OVERHEAD LINE POLES**

- NOTES**
- STRUCTURES MAY BE MADE OUT OF CONCRETE, STEEL OR WOOD OR A COMBINATION OF THESE MATERIALS;
  - POLE CONFIGURATIONS ARE INDICATIVE ONLY AND MAY CHANGE DURING DETAILED DESIGN. INSULATORS MAY BE PORCELAIN OR POLYMERIC;
  - THERE MAY BE 1 OR 2 CONDUCTORS PER PHASE;
  - OPTICAL FIBRE GROUND WIRE (OPGW) IS SHOWN, OPGW IS AN EARTHING WIRE COMBINED WITH COMMUNICATION CABLES;
  - POLE HEIGHT WILL BE APPROXIMATELY 30m HEIGHT;
  - THE FINAL DESIGN WILL BE GENERALLY IN ACCORDANCE WITH WHAT IS SHOWN;
  - DOUBLE "H" TYPE POLES MAY BE A FEATURE OF FINAL DESIGN AND / OR AT A CHANGE IN DIRECTION OF THE TRANSMISSION LINE SUBJECT TO FINAL DESIGN;
  - BASED ON SENERGY DRAWING 9116-E-005 REV 0.



INFRA DWG	N/A	APPD DATE	23-07-18
LAYOUT DWG	N/A	T-LAYOUT NO.	N/A
DRAWING NUMBER			
03707D4101-02			
SCALE - NTS		@A3	
COORDS			
N/A			
PLANNING PERMIT APPLICATION			
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**PALLAMANA  
SOLAR FARM**

**TECHNICAL FIGURE 12**

**TYPICAL INFILL  
PLANT LAYOUT**

- NOTES:
- 1. NOMINATED AREAS OF LANDSCAPING ARE INDICATIVE ONLY, AND SUBJECT TO A FINAL LANDSCAPING PLAN PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
  - 2. UNLESS OTHERWISE SPECIFIED, LANDSCAPING WILL BE UNDERTAKEN ON AN INFILL BASIS TO SUPPLEMENT EXISTING VEGETATION.

INFRA DWG	N/A	APPD DATE	14-08-2018
LAYOUT DWG	N/A	T-LAYOUT NO.	N/A
DRAWING NUMBER			
03791D2204-01			
SCALE - N.T.S.		@A3	
COORDS			
N/A			
PLANNING PERMIT APPLICATION			
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# ATTACHMENT E

## DATA SHEETS





Preliminary Technical  
Information Sheet



# KuMax

## HIGH EFFICIENCY POLY<sup>GEN 3</sup> MODULE

### CS3U-330 | 335 | 340 | 345P

#### (1000 V / 1500 V)

With Canadian Solar's industry leading high efficiency poly cell technology and the innovative LIC (Low Internal Current) module technology, we are now able to offer our global customers high power poly modules up to 345 W.

The KuMax poly modules with a dimension of 2000 × 992 mm, close to our 72 cell MaxPower modules, have the following unique features:

- **Higher** power classes for equivalent module sizes
- **High** module efficiency up to 17.39 %
- **LOW** hot spot temperature risk
- **LOW** temperature coefficient (Pmax): -0.39 % / °C
- **LOW** NMOT (Nominal Module Operating Temperature):  $43 \pm 2$  °C



More power output thanks to  
low NMOT:  $43 \pm 2$  °C



Low power loss in cell  
connection



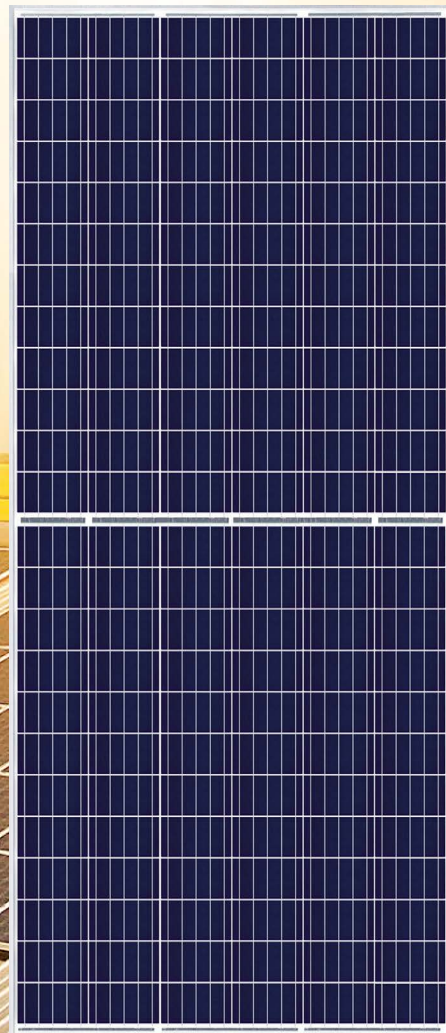
Safer: lower hot spot  
temperature



Heavy snow load up to 5400 Pa,  
wind load up to 2400 Pa



Low BoS cost with  
1500 V<sub>DC</sub> system voltage



linear power output warranty



product warranty on materials  
and workmanship

#### PRODUCT CERTIFICATES\*

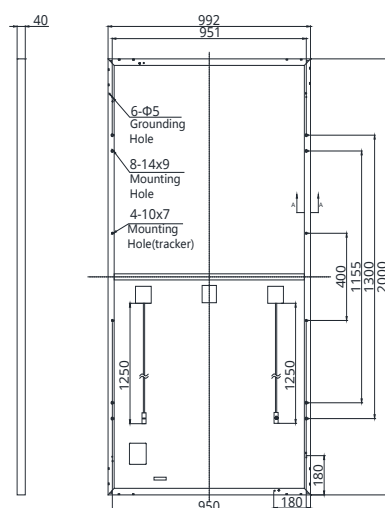
IEC 61215 / IEC 61730: 2005 & 2016: VDE / CE  
UL 1703: CSA



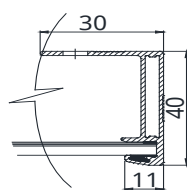
\* Please contact your local Canadian Solar sales representative for the specific product certificates applicable in your market.

## ENGINEERING DRAWING (mm)

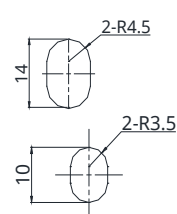
### Rear View



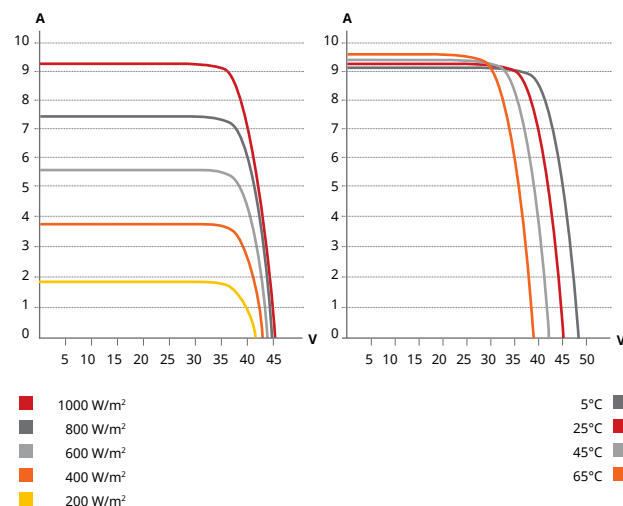
### Frame Cross Section A-A



### Mounting Hole



## CS3U-340P / I-V CURVES



## ELECTRICAL DATA | STC\*

CS3U	330P	335P	340P	345P
Nominal Max. Power (Pmax)	330 W	335 W	340 W	345 W
Opt. Operating Voltage (Vmp)	38.0 V	38.2 V	38.4 V	38.6 V
Opt. Operating Current (Imp)	8.69 A	8.77 A	8.86 A	8.94 A
Open Circuit Voltage (Voc)	45.5 V	45.7 V	45.9 V	46.1 V
Short Circuit Current (Isc)	9.20 A	9.28 A	9.36 A	9.44 A
Module Efficiency	16.63%	16.89%	17.14%	17.39%
Operating Temperature	-40°C ~ +85°C			
Max. System Voltage	1000 V (IEC / UL) or 1500 V (IEC / UL)			
Module Fire Performance	TYPE 1 (UL 1703) or CLASS C (IEC 61730)			
Max. Series Fuse Rating	30 A			
Application Classification	Class A			
Power Tolerance	0 ~ + 5 W			

\* Under Standard Test Conditions (STC) of irradiance of 1000 W/m², spectrum AM 1.5 and cell temperature of 25°C.

## MECHANICAL DATA

Specification	Data
Cell Type	Poly-crystalline, 156.75 × 78.38 mm
Cell Arrangement	144 [2 × (12 × 6) ]
Dimensions	2000 × 992 × 40 mm (78.7 × 39.1 × 1.57 in)
Weight	22.6 kg (49.8 lbs)
Front Cover	3.2 mm tempered glass
Frame	Anodized aluminium alloy, crossbar enhanced
J-Box	IP68, 3 diodes
Cable	4 mm² (IEC), 12 AWG (UL)
Cable Length	1250 mm (49.2 in), 1670 mm (65.7 in) is optional for single tracking system with leap-frog connection
Connector	T4 series
Per Pallet	27 pieces
Per Container (40' HQ)	594 pieces

## ELECTRICAL DATA | NMOT\*

CS3U	330P	335P	340P	345P
Nominal Max. Power (Pmax)	243 W	247 W	250 W	254 W
Opt. Operating Voltage (Vmp)	34.6 V	34.8 V	35.0 V	35.2 V
Opt. Operating Current (Imp)	7.03 A	7.10 A	7.15 A	7.22 A
Open Circuit Voltage (Voc)	42.3 V	42.5 V	42.7 V	42.9 V
Short Circuit Current (Isc)	7.42 A	7.49 A	7.55 A	7.62 A

\* Under Nominal Module Operating Temperature (NMOT), irradiance of 800 W/m², spectrum AM 1.5, ambient temperature 20°C, wind speed 1 m/s.

## TEMPERATURE CHARACTERISTICS

Specification	Data
Temperature Coefficient (Pmax)	-0.39 % / °C
Temperature Coefficient (Voc)	-0.31 % / °C
Temperature Coefficient (Isc)	0.05 % / °C
Nominal Module Operating Temperature	43±2 °C

## PARTNER SECTION



The aforesaid datasheet only provides the general information on Canadian Solar products and, due to the on-going innovation and improvement, please always contact your local Canadian Solar sales representative for the updated information on specifications, key features and certification requirements of Canadian Solar products in your region.

Please be kindly advised that PV modules should be handled and installed by qualified people who have professional skills and please carefully read the safety and installation instructions before using our PV modules.



# MV POWER STATION 4400SC / 5000SC-EV / 5500SC-EV



MVPS 4400SC-10 / MVPS 5000SC-EV-10 / MVPS 5500SC-EV-10



## Robust

- Station and all individual components type-tested
- Optimally suited to extreme ambient conditions
- 5-year factory warranty

## Easy to Use

- Plug and play concept
- Walk-in control rooms
- Completely pre-assembled for easy set-up and commissioning

## Cost-Effective

- Easy planning and installation
- Low transport costs due to 40-foot container

## Flexible

- Global solution for international markets
- For all medium-voltage grids from 20 kV to 35 kV
- Compatible with MVPS 2200SC, MVPS 2500SC-EV, MVPS 2750SC-EV

## MV POWER STATION 4400SC / 5000SC-EV / 5500SC-EV

### Maximum power density

With the double power of the new robust central inverters, the Sunny Central 2200, Sunny Central 2500 EV and Sunny Central 2750 EV, and with perfectly adapted medium-voltage components, the new MV Power Station offers even more power density and is a turnkey solution available worldwide. The solution is the ideal choice for new generation PV power plants operating at 1500V<sub>DC</sub>. Delivered pre-configured in a 40-foot container, the solution is easy to transport and quick to assemble and commission. The MVPS and all components are type-tested, and all come with a 5 year factory warranty. The MV Power Station combines rigorous plant safety with maximum energy yield and minimized deployment and operating risk.



# MV POWER STATION

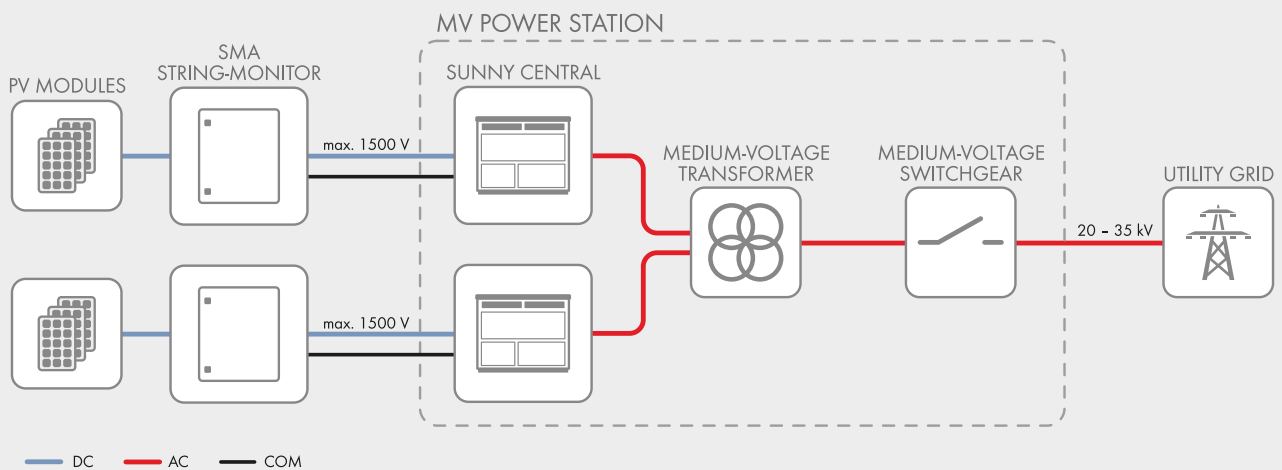
## 4400SC / 5000SC-EV / 5500SC-EV

Technical Data	MV Power Station 4400SC
<b>Input (DC)</b>	
Max. input voltage	1100 V
MPP voltage range (at 25 °C / at 50 °C)	570 V to 950 V / 850 V
Number of independent MPP inputs	2
Max. input current (at 25 °C / at 50 °C)	2 x 3960 A / 2 x 3600 A
Number of DC inputs	2 x 24
Integrated zone monitoring	○
Available DC fuse sizes (per input)	200 A, 250 A, 315 A, 350 A, 400 A, 450 A, 500 A
<b>Output (AC) on the medium-voltage side</b>	
AC power when $\cos \varphi = 1$ (at 25 °C / at 40 °C / at 50 °C / at 55 °C) <sup>1)</sup>	4400 kVA / 4160 kVA / 4000 kVA / 0 kVA
Typical nominal AC voltages	20 kV to 35 kV
AC power frequency	50 Hz / 60 Hz
Transformer vector group Dy11y11 / YNd11d11	● / ○
Transformer cooling methods ONAF <sup>2)</sup> / KNAF <sup>2)</sup>	● / ○
Max. output current at 33 kV	78 A
Transformer no-load losses <sup>3)</sup>	3.1 kW
Transformer short-circuit losses <sup>3)</sup>	37.5 kW
Max. total harmonic distortion	< 3%
Reactive power feed-in	up to 60% of AC power
Power factor at rated power / displacement power factor adjustable	1 / 0.8 overexcited to 0.8 underexcited
<b>Inverter efficiency</b>	
Max. efficiency	98.6%
European efficiency	98.4%
CEC weighted efficiency <sup>4)</sup>	98.0%
<b>Protective devices</b>	
Input-side disconnection point	DC load-break switch
Output-side disconnection point	Medium-voltage vacuum circuit breaker
DC overvoltage protection	Surge arrester type I
DC ground-fault monitoring / remote ground-fault monitoring	○ / ○
DC insulation monitoring	○
Galvanic isolation	●
Arc fault resistance medium-voltage control room (according to IEC 62271-202)	IAC A 20 kA 1 s
<b>General Data</b>	
Dimensions of the 40-foot High Cube ISO container (W / H / D) <sup>5)</sup>	12.192 m / 2.896 m / 2.438 m
Weight	< 26 t
Operating temperature range -25 °C to +55 °C	●
Self-consumption (max. / partial load / average) <sup>1)</sup>	< 16.2 kW / < 3.6 kW / < 4.0 kW
Self-consumption (stand-by) <sup>1)</sup>	< 600 W
Degree of protection according to IEC 60529	Control rooms IP23D, inverter electronics IP65
Degree of protection according to IEC 60721-3-4 (4C1, 4S2 / 4C2, 4S2)	● / ○
Application / use in chemically active environment	In unprotected outdoor environments / ○
Maximum permissible value for relative humidity	15% to 95%
Max. operating altitude above mean sea level 1000 m / 2000 m	● / ○ (earlier temperature-dependent de-rating)
Fresh air consumption of inverter and transformer	20000 m³/h
<b>Features</b>	
DC terminal	Terminal lug
AC connection, MV side	Outer-cone angle plug
Display	○ HMI touch display (10.1")
Communication	Ethernet, Modbus
Station enclosure color	RAL 7004
Transformer for external loads 10 kVA / 20 kVA / 30 kVA / 40 kVA / 50 kVA / 60 kVA	● / ○ / ○ / ○ / ○ / ○
Medium-voltage switchgear, three feeders, transformer feeder with circuit breaker	●
Integrated oil containment	●
Industry standards (for other standards see the inverter datasheet)	IEC 62271-202, IEC 62271-200, IEC 60076, EN 50588-1, CSC certificate
● Standard features   ○ Optional features   – Not available	
Type designation	MVPS 4400SC-10

- 1) Data based on inverter
- 2) ONAF = Mineral oil with forced air cooling; KNAF = Organic oil with forced air cooling
- 3) Losses in accordance with the Ecodesign regulations, based on grid voltage 33 kV, 50 Hz
- 4) Efficiency measured at inverter with internal power supply
- 5) Transport dimensions

MV Power Station 5000SC-EV	MV Power Station 5500SC-EV
1500 V	1500 V
850 V to 1425 V / 1275 V	875 V to 1425 V / 1275 V
2	2
2 x 3000 A / 2 x 2700 A	2 x 3300 A / 2 x 2970 A
2 x 24	2 x 24
○	○
200 A, 250 A, 315 A, 350 A, 400 A, 450 A, 500 A	200 A, 250 A, 315 A, 350 A, 400 A, 450 A, 500 A
5000 kVA / 4700 kVA / 4500 kVA / 0 kVA	5500 kVA / 5200 kVA / 5000 kVA / 0 kVA
20 kV to 35 kV	20 kV to 35 kV
50 Hz / 60 Hz	50 Hz / 60 Hz
● / ○	● / ○
● / ○	● / ○
88 A	97 A
3.5 kW	3.8 kW
39.2 kW	41.5 kW
< 3%	< 3%
up to 60% of AC power	up to 60% of AC power
1 / 0.8 overexcited to 0.8 underexcited	1 / 0.8 overexcited to 0.8 underexcited
98.6%	98.7%
98.3%	98.6%
98.0%	98.5%
DC load-break switch	DC load-break switch
Medium-voltage vacuum circuit breaker	Medium-voltage vacuum circuit breaker
Surge arrester type I	Surge arrester type I
○ / ○	○ / ○
○	○
●	●
IAC A 20 kA 1 s	IAC A 20 kA 1 s
12.192 m / 2.896 m / 2.438 m	12.192 m / 2.896 m / 2.438 m
< 26 t	< 26 t
●	●
< 16.2 kW / < 3.6 kW / < 4.0 kW	< 16.2 kW / < 3.6 kW / < 4.0 kW
< 740 W	< 740 W
Control rooms IP23D, inverter electronics IP65	Control rooms IP23D, inverter electronics IP65
● / ○	● / ○
In unprotected outdoor environments / ○	In unprotected outdoor environments / ○
15% to 95%	15% to 95%
● / ○ (earlier temperature-dependent de-rating)	● / ○ (earlier temperature-dependent de-rating)
20000 m³/h	20000 m³/h
Terminal lug	Terminal lug
Outer-cone angle plug	Outer-cone angle plug
○ HMI touch display (10.1")	○ HMI touch display (10.1")
Ethernet, Modbus	Ethernet, Modbus
RAL 7004	RAL 7004
● / ○ / ○ / ○ / ○ / ○ / ○	● / ○ / ○ / ○ / ○ / ○ / ○
●	●
●	●
IEC 62271-202, IEC 62271-200, IEC 60076, EN 50588-1, CSC certificate	IEC 62271-202, IEC 62271-200, IEC 60076, EN 50588-1, CSC certificate
MVPS 5000SC-EV-10	MVPS 5500SC-EV-10

## SYSTEM DIAGRAM



## DESIGN NOTES

### Inverter rooms

DC connections are made from below in the inverter's DC connection compartment. An integrated auxiliary transformer and additional space is available for the installation of customer equipment. The air cooling system OptiCool™ ensures smooth operation, even at extreme ambient temperatures.

### Transformer compartment

PV-optimized outdoor transformer to connect two inverters. The side panels are equipped with protective grids. The transformer is connected directly to the inverters by means of a highly efficient three-phase current busbar. This cuts costs, reduces losses and allows a highly compact design with ultimate system safety.

### Medium-voltage control room

Medium-voltage switchgear with three feeders, including two cable feeders with load-break switch and one transformer feeder with circuit breaker. For optimal user protection, the medium-voltage switchgear includes the standard internal arc classification IAC A FL 20 kA 1s according to IEC 62271-200. Numerous options such as additional auxiliary contacts, motor drive or cascade control.

### Low-voltage control room

The station subdistribution board and circuit breakers for control, lighting and outlet is supplied with power via a 10 kVA transformer in the standard version. Transformers with EMC filtering devices in 20 kVA, 30 kVA, 40 kVA, 50 kVA and 60 kVA power classes can be installed to support additional communications and control functions and to operate tracker motors.

In the low-voltage control room, there is sufficient space for additional SCADA equipment as well as the customer's own communication technology or the tried-and-tested SMA Power Plant Controller.

# ENERGY STORAGE

## Energy Storage Overview

RES has taken an early leadership position in the industry. This early mover advantage has resulted in a market leading position in the deployment of grid scale storage.

Maximize Revenues | Optimize Performance | Increase Asset Longevity

### RES' ENERGY STORAGE EXPERTISE

**240 MW/275 MWH**  
GLOBAL CONSTRUCTION PORTFOLIO

**18**   
PROJECTS

**10+**  
STORAGE  
FUNCTIONS

**9**   
ELECTRICITY  
MARKETS  
(system operators)

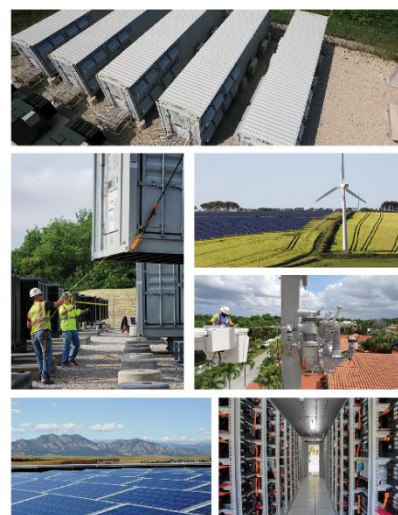
**6**   
BATTERY  
VENDORS


**FIRST**   
NON-RECOURSE  
DEBT FINANCING

DUE DILIGENCE BY  
**4**  UTILITIES

**5**  FINANCIAL  
INVESTORS

**TOP 2** GLOBAL  
PLAYER  
as named by Navigant Research



NAME	FUNCTION	MARKET	MW	MWh	OWNER(S)	OWNER TYPE	RES ROLE		COD
BUO	Freq. Reg.	PJM	4.0	2.6	RES	IPP	Dev, EPC, Own, Asset Manage	Yes	2014 Q1
Amphora	Freq. Reg.	IESO	4.0	2.6	RES	IPP	Dev, EPC, Own, Asset Manage	Yes	2014 Q3
Jake	Freq. Reg.	PJM	19.8	7.9	RES + Prudential	IPP/Investor	EPC, Own, Asset Manage	Yes	2015 Q3
Elwood	Freq. Reg.	PJM	19.8	7.9	RES + Prudential	IPP/Investor	EPC, Own, Asset Manage	Yes	2015 Q4
Willey	Freq. Reg.	PJM	6.0	2.0	Sumitomo Corp.	Investor	Dev, BOP, Asset Manage	Yes	2016 Q1
McHenry	Freq. Reg.	PJM	19.8	7.9	EDF	IPP	EPC	No	2015 Q4
Glacier	Microgrid +	WECC	2.0	4.4	Puget Sound Energy	Utility	EPC	No	2016 Q3
Copley Wood	9 grid/solar apps.	Great Britain	0.3	0.6	WPD	Utility	EPC	Yes	2016 Q3
Clinton	Freq. Reg.	PJM	10.0	4.1	Exelon	IPP	Dev, EPC, Asset Manage	Yes	2016 Q3
2 Demos	Multiple	Germany / Hydro-Québec	1.0	1.0	RWTH / T.C. éolien	Research	EPC	No	2016 Q4
NREL	Multiple	WECC	1.0	1.0	NREL	Research	EPC	Yes	2017 Q2
BQDM	T&D Deferral	NYISO	2.0	12.0	Consolidated Edison	Utility	EPC	Yes	2017 Q3
Broxburn	Freq. Response	Great Britain	20.0	16.0	TRIG	IPP	Dev, EPC, Asset Manage	Yes	2018 Q1
Tynemouth	Freq. Response	Great Britain	25.0	20.0	Enel	IPP	EPC, Asset Manage	Yes	2018 Q1
Port of Tyne	Freq. Response	Great Britain	35.0	23.0	Foresight	IPP	Dev, EPC, Asset Manage	Yes	2018 Q1
TBA	Multiple	CAISO	40.0	40.0	TBA	IPP	EPC, Asset Manage	Yes	2018 Q1
Top Gun	Capacity	CAISO	30.0	120.0	SDG&E	Utility	EPC, Asset Manage	Yes	2019 Q2
<b>18 Projects</b>		<b>TOTAL:</b>	<b>240</b>	<b>275</b>				<b>14</b>	

## Control System - RESolve



RESolve is a proprietary energy management system, specifically developed by RES to integrate all aspects of an energy project. The RESolve system will seamlessly integrate the RES solution with all stakeholders optimising reliability and performance.

RESolve provides seamless integration between energy storage, generation and the wider grid. RES' expertise in grid connected generation ensures RESolve provides an array of grid support and protection management capabilities to keep the energy storage system online safely for longer.

An energy storage system needs to work flawlessly within the owners existing operations. RESolve employs industry standard protocols to provide two-way communications to utility level SCADA systems, and provides performance analysis capabilities via industry standard database links.

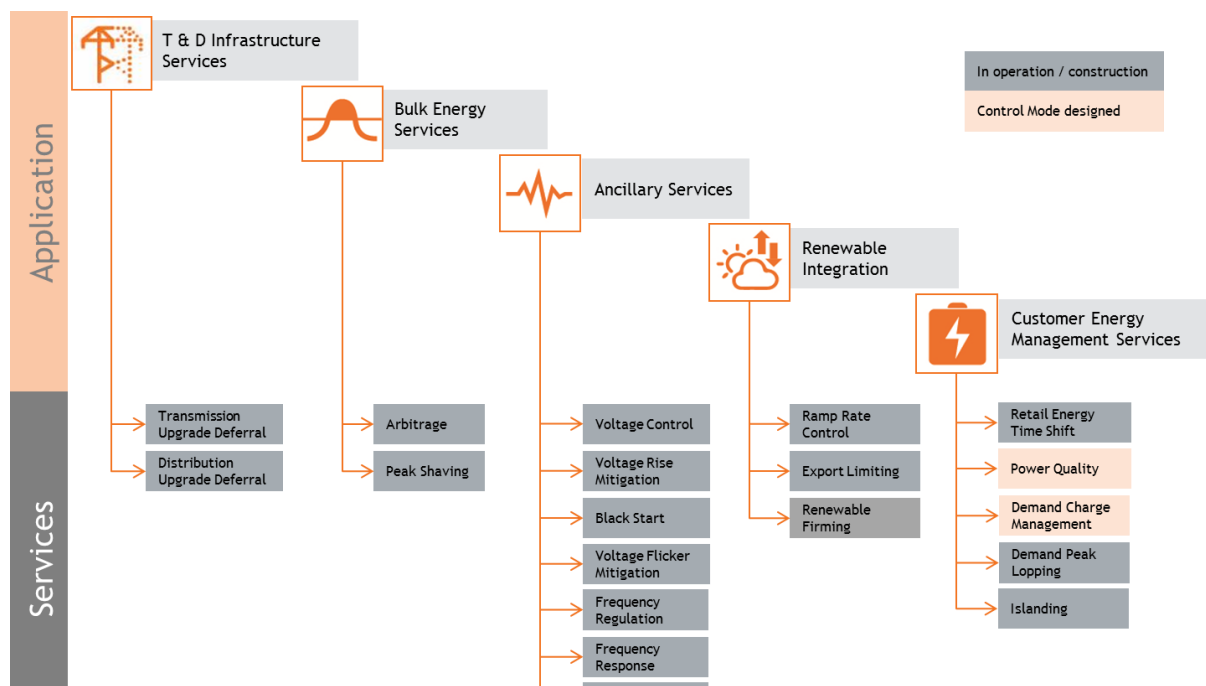
RESolve generates dispatch commands for the ESS using various possible operating modes. It enables remote viewing and operations via a human-machine interface (HMI) or via a utility energy or distribution management system. The RESolve controller is deployed on widely available industrial hardware and meets all applicable information security standards.

Key features of RESolve include:

- > RESolve controls 217MW of energy storage over 14 live and in construction projects, including, hybrid Solar and Energy Storage systems
- > Controls over 2GW of Wind and Solar generation projects
- > Evolved over 25 years from a Wind controller
- > Communicates in all industry standard SCADA protocols
- > Modularity allows for easy expansion redundancy in system design
- > Fundamental control functions are segregated such that failure of one or more functions does not result in failure of other functions
- > Wireless and fiber optic communication allows for redundant communications options with utility operators
- > A detailed HMI for local control in addition to remote-access with a secure, web-based interface allowing remote users to access all normal system control functions, status information, local data historian functions, and configuration options.

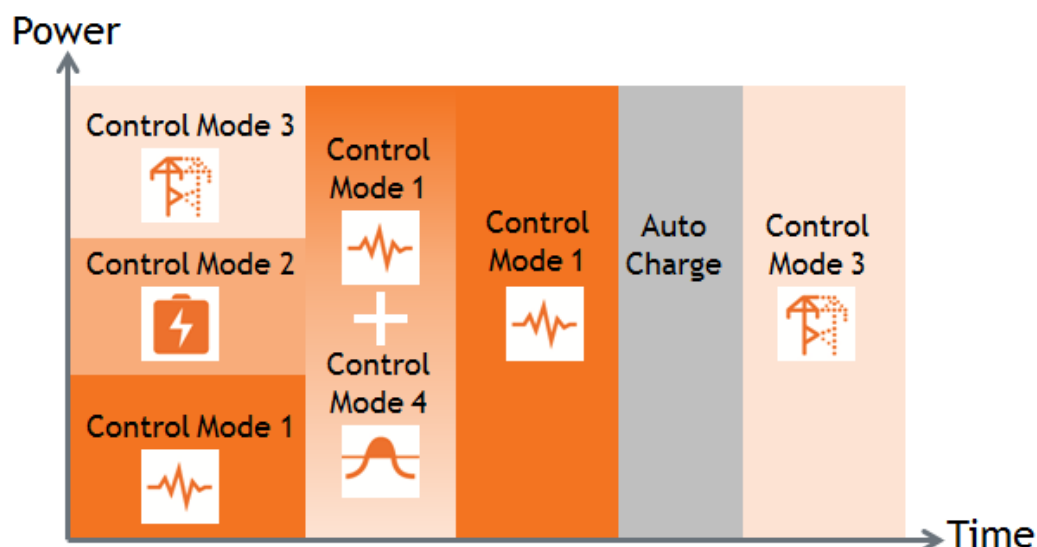
## Battery Dispatch

RESolve, to date, manages approximately twenty distinct control algorithms for energy storage applications and allows a great degree of flexibility in the control logic of the system. It is designed to be modular and easily customisable to allow for control modes to be included in the future.



## RESolve Functions

Examples of the current control algorithms used by RESolve and how RESolve can be configured to perform multiple services at the same time are shown below:



## Degradation

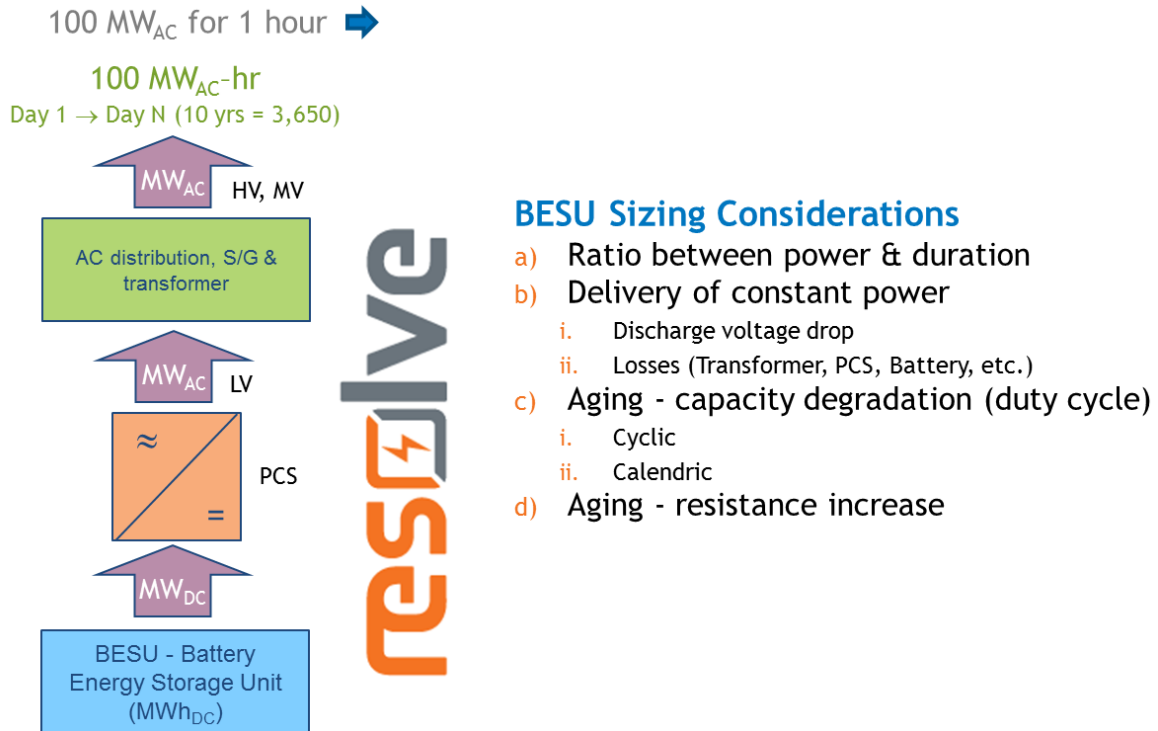
RES' experience in developing and/or operating over 240MW of energy storage projects across the world with a range of battery vendors has given us extensive capability in the optimal sizing and degradation characteristics of energy storage solutions.

By utilising RES' capabilities in data modelling and analytics, RES are able to define duty cycles describing the behaviour of an ESSP and subsequently optimise these alongside in-house degradation models.

The primary factors influencing these characteristics are discharge rate, useable state of charge range (SoCR) of the core battery cells, constant power output, PCS and BOP losses, battery efficiency losses, auxiliary load losses, cyclic aging, calendric aging and core battery cell resistance increases .



A representation of the power flows through an ESSP and the sizing considerations applied is shown below:



An important concept to note is the distinction between the nominal storage capacity within the BESU,  $MWh_{DC}$ , and the required deliverable system capacity  $MWh_{AC}$ . The degree that the BESU  $MWh_{DC}$  is higher than the deliverable system capacity  $MWh_{AC}$  depends on the factors mentioned above as well as any augmentation strategy.

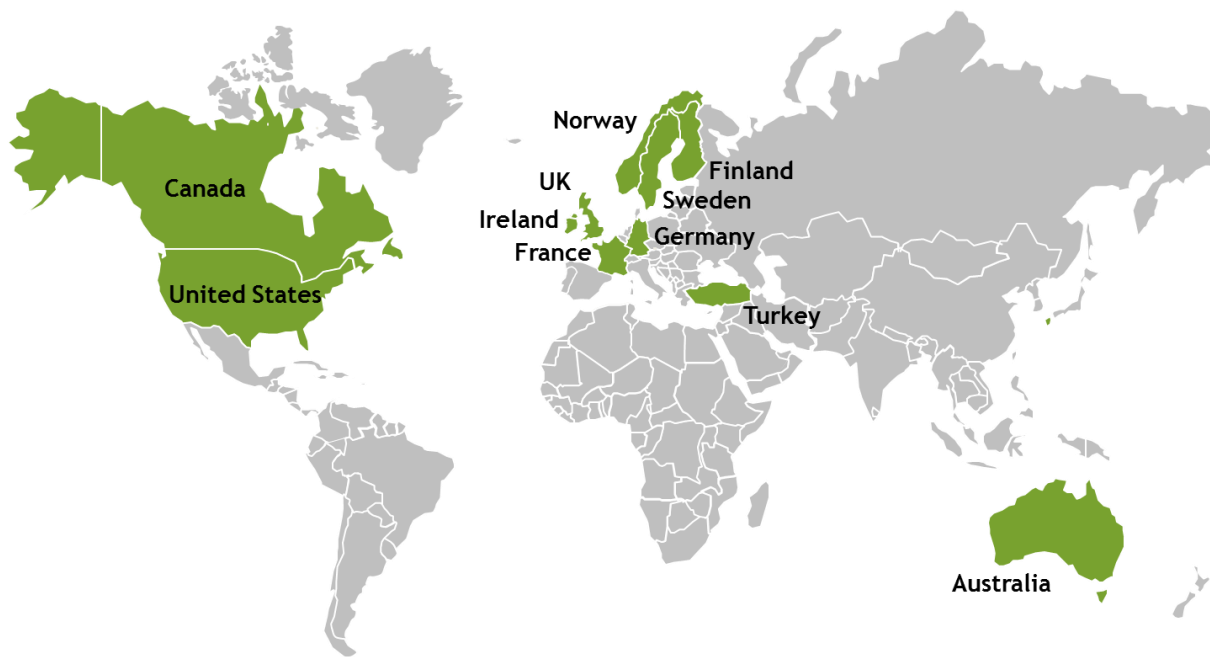
In order to correct for the aging factors causing system degradation, two methods can be employed:

- > Fully overbuild the system with sufficient capacity to compensate for degradation over the required project life or,
- > Only overbuild the system with sufficient capacity to compensate for degradation over some portion of the project life and then augment the system with new BESU capacity that ensures sufficient capacity over the remainder of the project life

RES' in-house degradation models utilise advanced algorithms for predicting capacity degradation based on the described factors and have been developed in collaboration with leading battery vendors to allow us to evaluate the trade-offs in beginning of life (BOL) capacity for fully overbuilt systems that require no augmentation against potential augmentation scenarios.

## Global Procurement

RES has a global supply chain management team for procurement of the key components required for the Project. RES has the ability to leverage a global portfolio as the world's largest privately owned renewable energy and energy storage developer ensuring on time delivery.



RES has developed and built energy storage and generation projects with PCS vendors, including:



RES has developed and built energy storage projects with battery vendors, including:



The final technology selection will be confirmed once the final configuration and technical specification is released.



# **ATTACHMENT F**

**OFFICE OF THE TECHNICAL REGULATOR CERTIFICATE**



Ref: 2017/01873.01 D17076597

15 December 2017

Martin Hemphill  
RES Australia Pty Ltd  
Suite 12 Level 1, 760 Pacific Highway  
Chatswood NSW 2067  
By email: martin.hemphill@res-group.com

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](http://www.sa.gov.au/otr)

Dear Martin,

**RE: CERTIFICATE FOR DEVELOPMENT OF MONARTO SOLAR FARM**

The development of Monarto Solar Farm (Applicant: RES Australia Pty Ltd) 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:

- Your email to the OTR on 15 December 2017, which included the following document attached:
  - 'OTR Certificate Application – Monarto Solar Farm Dec 2017\_FINAL.pdf' dated 15<sup>th</sup> December 2017.
- Your phone discussion with the OTR on 12<sup>th</sup> December 2017 regarding the proposed Monarto Solar Farm.

After assessing the information provided, I advise that approval is granted for the proposed generator, provided that:



- If option A or C as stated in 'OTR Certificate Application – Monarto Solar Farm Dec 2017\_FINAL.pdf' is selected, the full amount of inertia calculated as stated in the OTR's Generator Development Procedure Revision 1.1, is to be provided to the Network at all times whilst the generator is generating;
- If option B or C as stated in 'OTR Certificate Application – Monarto Solar Farm Dec 2017\_FINAL.pdf' is selected, the amount of FFR prescribed in the OTR's Generator Development Procedure Revision 1.1, is to be made available to the Network at all times;

The OTR notes that its requirements may vary from time to time. Should the OTR's requirements become less onerous in the future, this application may abide by these requirements at the time.

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

Yours sincerely

A handwritten signature in blue ink, appearing to read 'Rob Faunt'.

Rob Faunt  
**TECHNICAL REGULATOR**

# **ATTACHMENT G**

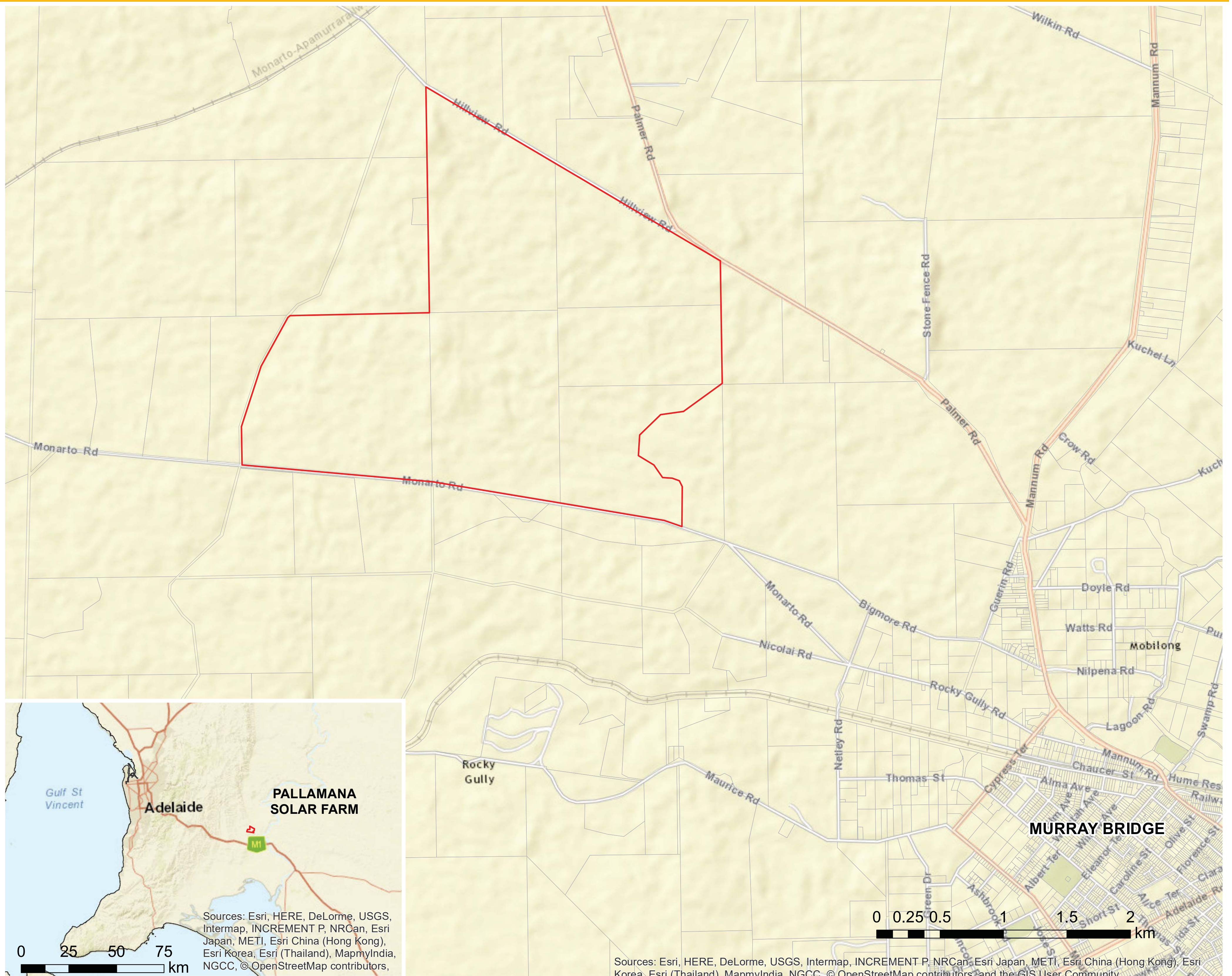
## **COMMUNITY CONSULTATION POSTERS**



# PALLAMANA SOLAR FARM & ENERGY STORAGE PROJECT

## PROJECT OVERVIEW

**RES Australia is proposing a solar farm and energy storage development at Pallamana, located approximately 6km north west of Murray Bridge and 60km south east of Adelaide.**



Pallamana is an ideal site for a solar energy project as it has excellent exposure to Australia's world class solar resources and access to the grid transmission system.

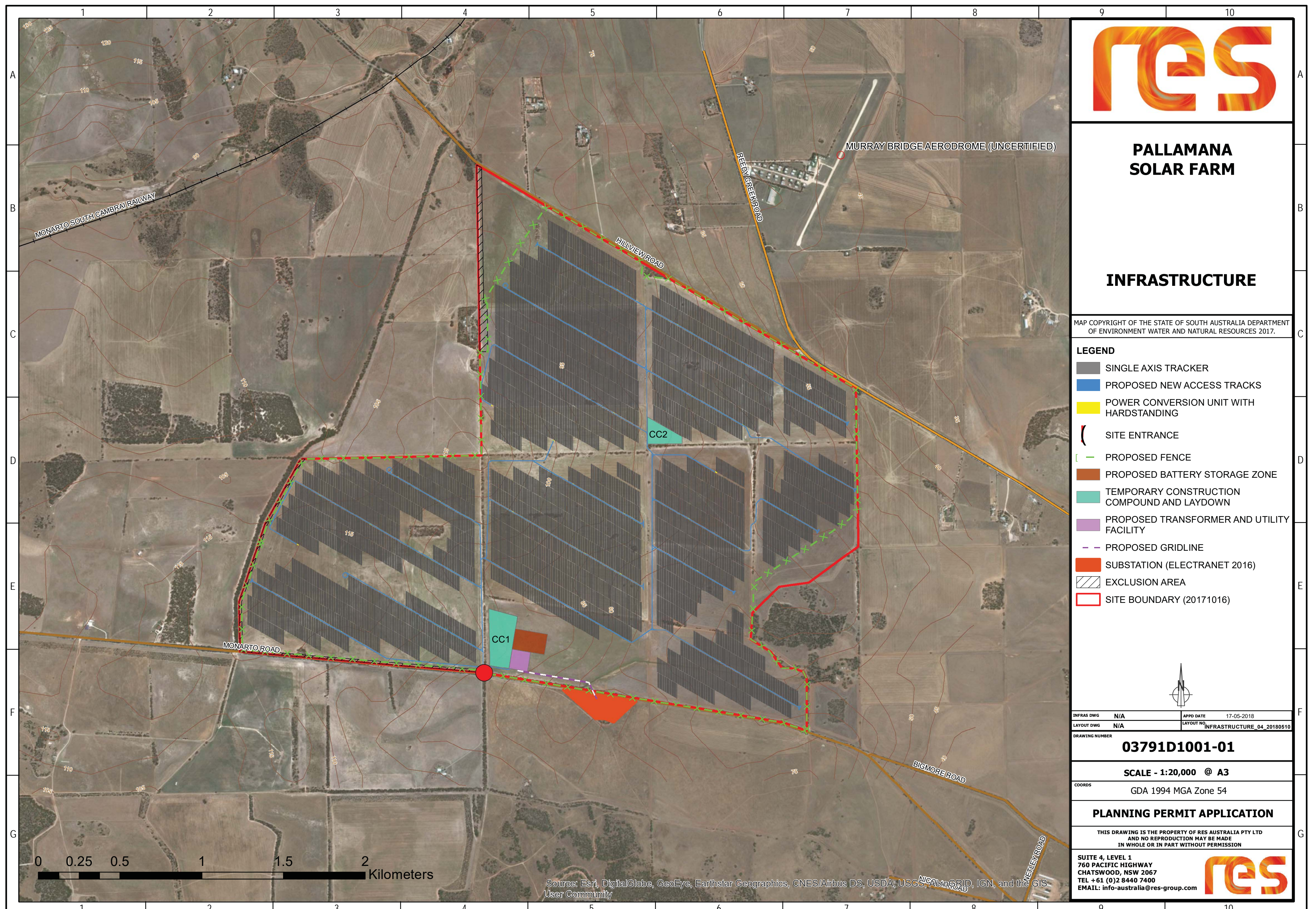
The project aims to supply energy to the National Electricity Market by generating electricity through the use of Solar PV panels. Energy will also be stored and dispatched later through the use of banks of Lithium Ion Batteries.





# PALLAMANA SOLAR FARM & ENERGY STORAGE PROJECT

## ABOUT THE PROJECT



### KEY FEATURES

- A generating capacity of up to 176 MW or 420,000 Mwh per annum with a site area of approximately 730 hectares.
- Approximately 690,000 solar photovoltaic (PV) panels up to 4 metres in height.
- Generating electricity to be exported to the grid.
- The capacity to generate electricity for approximately 82,000 homes each year.
- Energy storage facility provided by banks of Lithium Ion batteries housed in a purpose-built building.
- Operation and maintenance facilities, a substation, overhead and underground electrical cabling, access tracks are all ancillary elements of the project.

Based on a number of technical, engineering and environmental studies, we have carefully designed this solar farm to consider the following:

**Ecology (Flora & Fauna)**

**Landscape & Visual Impact**

**Aviation**

**Access & Transport**

**Drainage & Stormwater**





# PALLAMANA SOLAR FARM & ENERGY STORAGE PROJECT

## PROJECT BENEFITS

SET TO POWER 82,000 HOMES  
& GENERATE OVER 200 JOBS  
DURING CONSTRUCTION

### ELECTRICITY GENERATION

#### THE PROJECT WILL PROVIDE:

- Enough clean renewable energy to power up to 82,000 South Australian homes annually.
- Additional energy supplies to help meet the growing demands in South Australia.
- Assist with energy security via incorporation of battery energy storage.

#### THE PROJECT WILL CONTRIBUTE TO:

- The South Australian Government objective to achieve \$10 billion in investment in low carbon energy generation by 2025.
- The Federal Government objective to achieve an additional 33GW of electricity from renewable sources by 2020 under the Renewable Energy Target.
- The 2015 Paris Climate Change Conference - COP21 – to achieve a universal agreement on climate with an aim of reducing global warming below 2°C, principally by reducing greenhouse gas emissions.

### COMMUNITY FUND

RES are committed to support our host communities. The project will establish a community fund to benefit the local community.

The fund will:

- Support local projects, community groups and organisations.
- Input will be sought from the community to inform and shape how the fund could be implemented.
- Be managed locally.

### JOBS

With jobs being added to the local economy, businesses will also benefit from the construction.

BUSINESS & LOCAL RETAIL

RESTAURANTS & FOOD SERVICES

HOTELS & ACCOMODATION

HIRE CARS, EQUIPMENT AND MACHINERY

### ENVIRONMENTAL

- Saving of approximately 140,000 tonnes of CO2 emissions per year.
- Enable the land to be rehabilitated to its original condition at the end of the project.
- Additional indigenous planting.



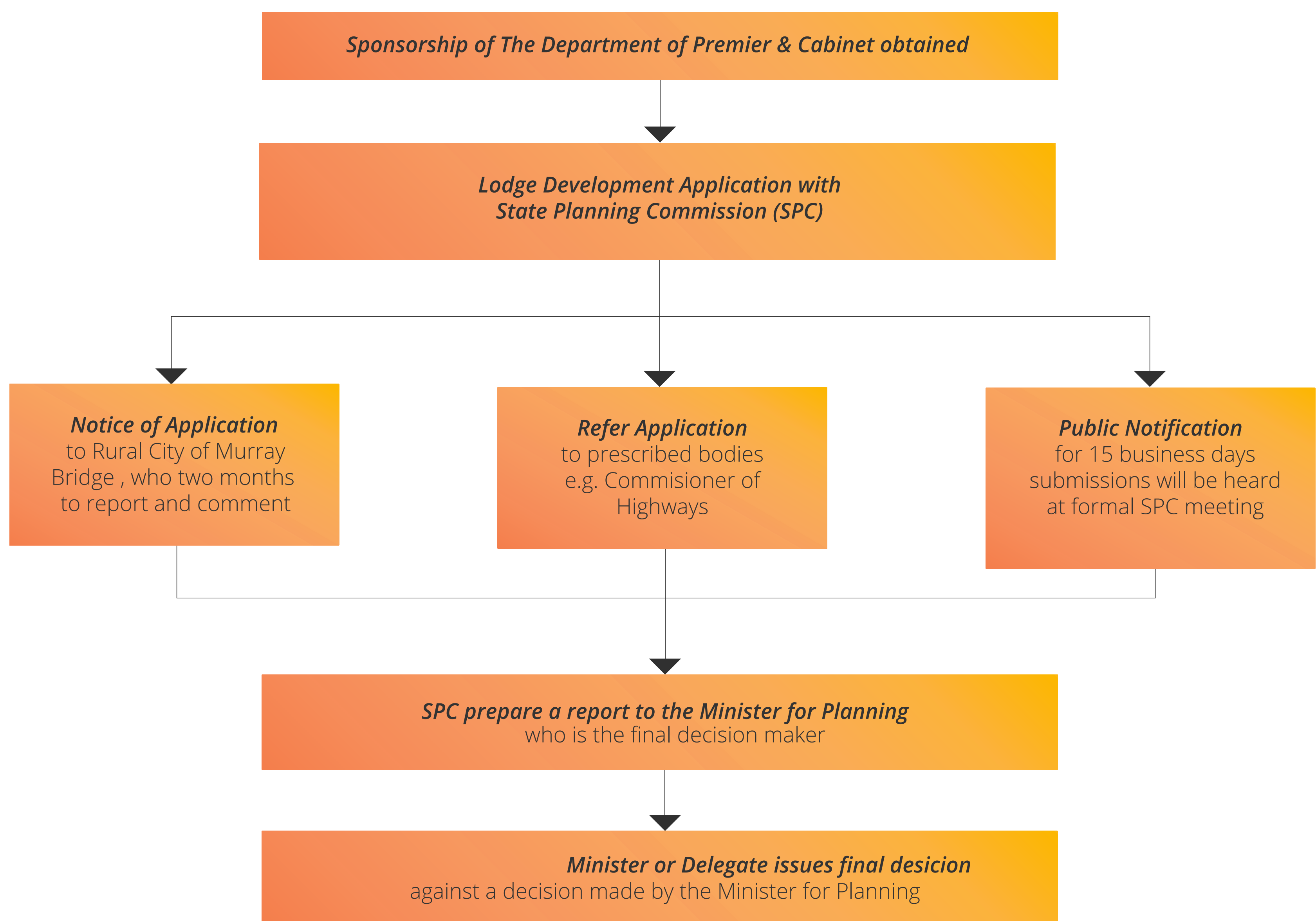
# PALLAMANA SOLAR FARM & ENERGY STORAGE PROJECT

## APPLICATION & APPROVAL PROCESS

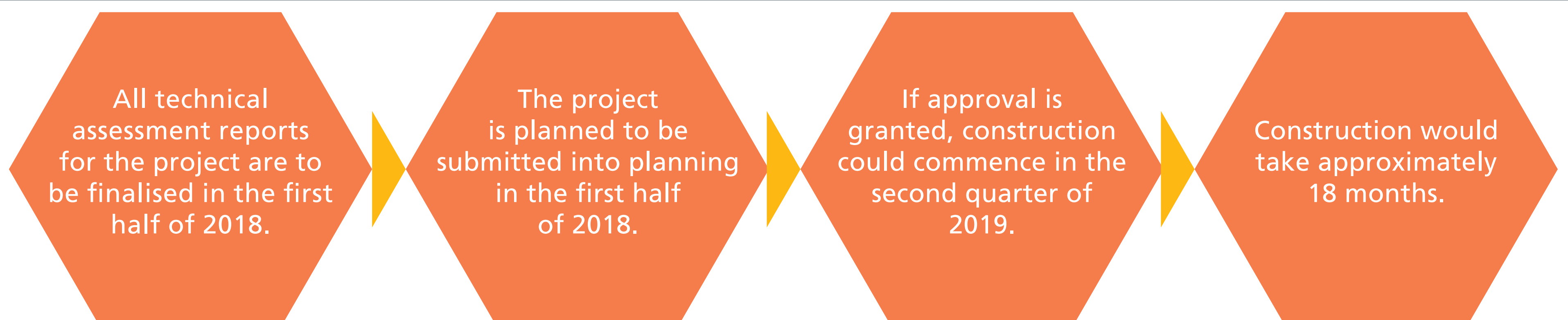
The project will require a development application to be lodged with the State Planning Commission (SPC). It will be assessed as “public infrastructure” pursuant to the Development Act, 1993.

The Crown Sponsorship (Section 49) application process is a assessment pathway established for determining a range of infrastructure that was traditionally provided by the State.

## CROWN DEVELOPMENT - PUBLIC INFRASTRUCTURE SECTION 49 APPLICATION PROCESS



## TIMING





# PALLAMANA SOLAR FARM & ENERGY STORAGE PROJECT

## AVIATION

The project is located immediately south of the Pallamana Aerodrome (Murray Bridge, YMBD).

Given the proximity of the Pallamana Solar Farm to the aerodrome, RES engaged consultants to undertake an Aeronautical Impact Assessment. The assessment included the potential aviation safety implications of the project, including potential glare from the solar (PV) panels.

The technical findings of the Aeronautical Impact Assessment found the project:

- will not penetrate any OLS surfaces;
- will not affect any instrument procedures;
- will not impact on nearby designated air routes;
- will not have an impact on designated airspace; and
- is outside the clearance zones associated with aviation navigation aids and communication facilities.

Discussions with the operators of the aerodrome highlighted a concern for aircraft departing in a southerly direction and suffering a loss of power, having no ability to avoid a landing into the solar arrays. In response, and although not a mandatory obligation, RES has modified the proposed solar farm layout to incorporate a forced landing corridor.

The solar glare analysis found that solar farm would be acceptable and further reduced by the use of anti-reflective coatings on the solar (PV) panels.





# PALLAMANA SOLAR FARM & ENERGY STORAGE PROJECT

## VISUAL IMPACT

A landscape character and visual assessment is currently being finalised to identify the potential impact of the Pallamana Solar Farm and Energy Storage project. The assessment evaluates the current landscape character and the degree of visual change that will occur as a result of the project.

The potential visual impact is assessed via a detailed methodology, which includes on-site assessment, defining a zone of theoretical visual influence (ZTVI) and preparation of photo montages. This assessment is undertaken around the project area and notes the topography, land use, existing infrastructure and vegetation coverage to discuss and assess the likely degree of visual change as a result of the project.

### WHAT WILL IT LOOK LIKE?

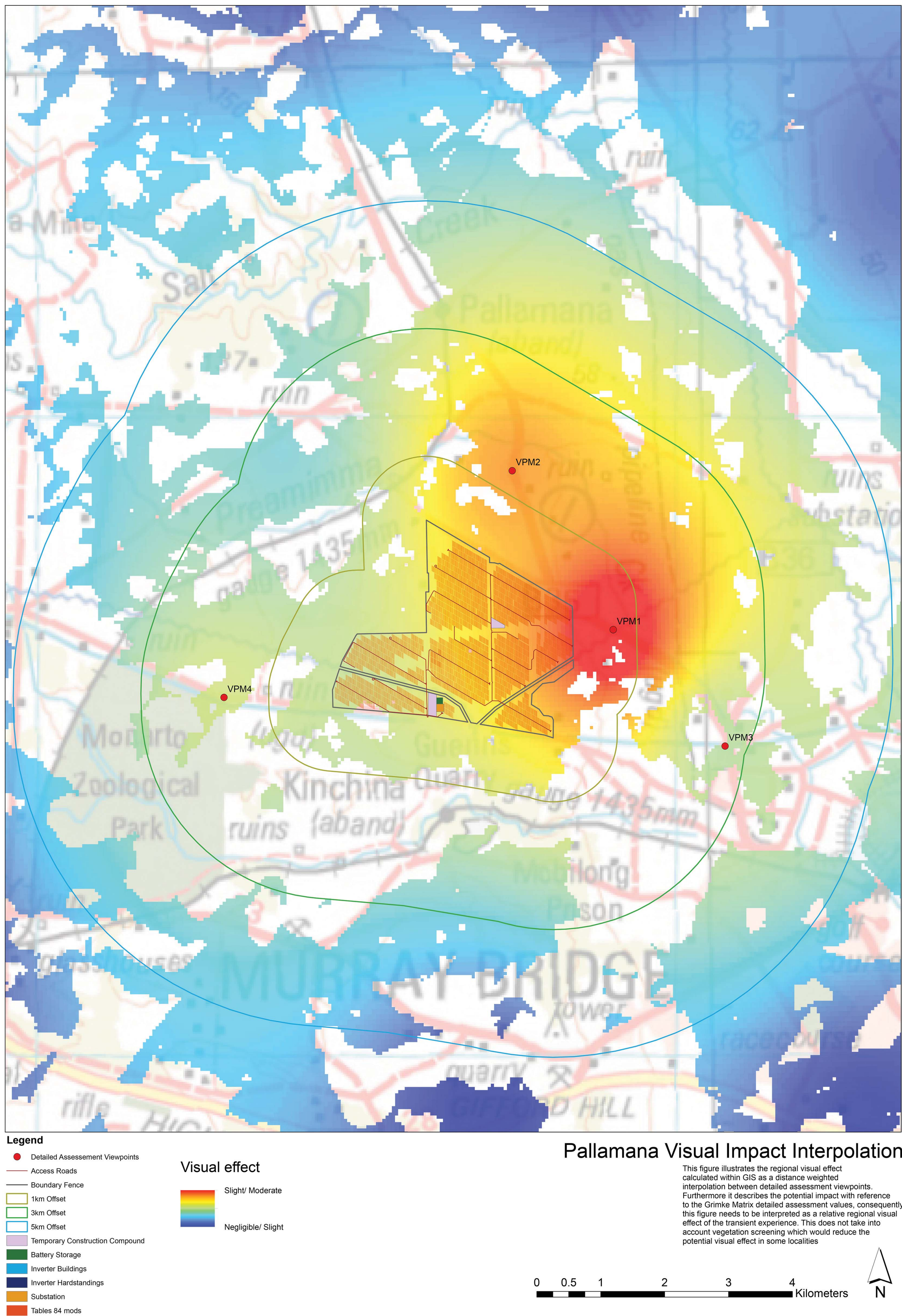
The nature and size of the solar farm mean that some visual impact will be unavoidable. These visual impacts vary from different viewpoints and are often minimised by topography and existing vegetation. RES will provide targeted planting along nominated boundaries of the project area, as well as maximise the retention of existing vegetation on the site.





# PALLAMANA SOLAR FARM & ENERGY STORAGE PROJECT

## VISUAL IMPACT INTERPOLATION





# PALLAMANA SOLAR FARM & ENERGY STORAGE PROJECT

## PHOTO MONTAGE 1

### OVERLAY DEMONSTRATING VISUAL SCREENING



**Viewpoint 1 : Reedy Creek Road near intersection of Hillview Road**



**Viewpoint 2 : Reedy Creek Road**



# PALLAMANA SOLAR FARM & ENERGY STORAGE PROJECT

## ECOLOGY

RES engaged ecology consultants to assess the flora and fauna on the project area. These investigations, findings and recommendations have informed the design, siting and layout of infrastructure for both the solar farm infrastructure area (solar panels, battery storage and associated infrastructure) and the grid connection.



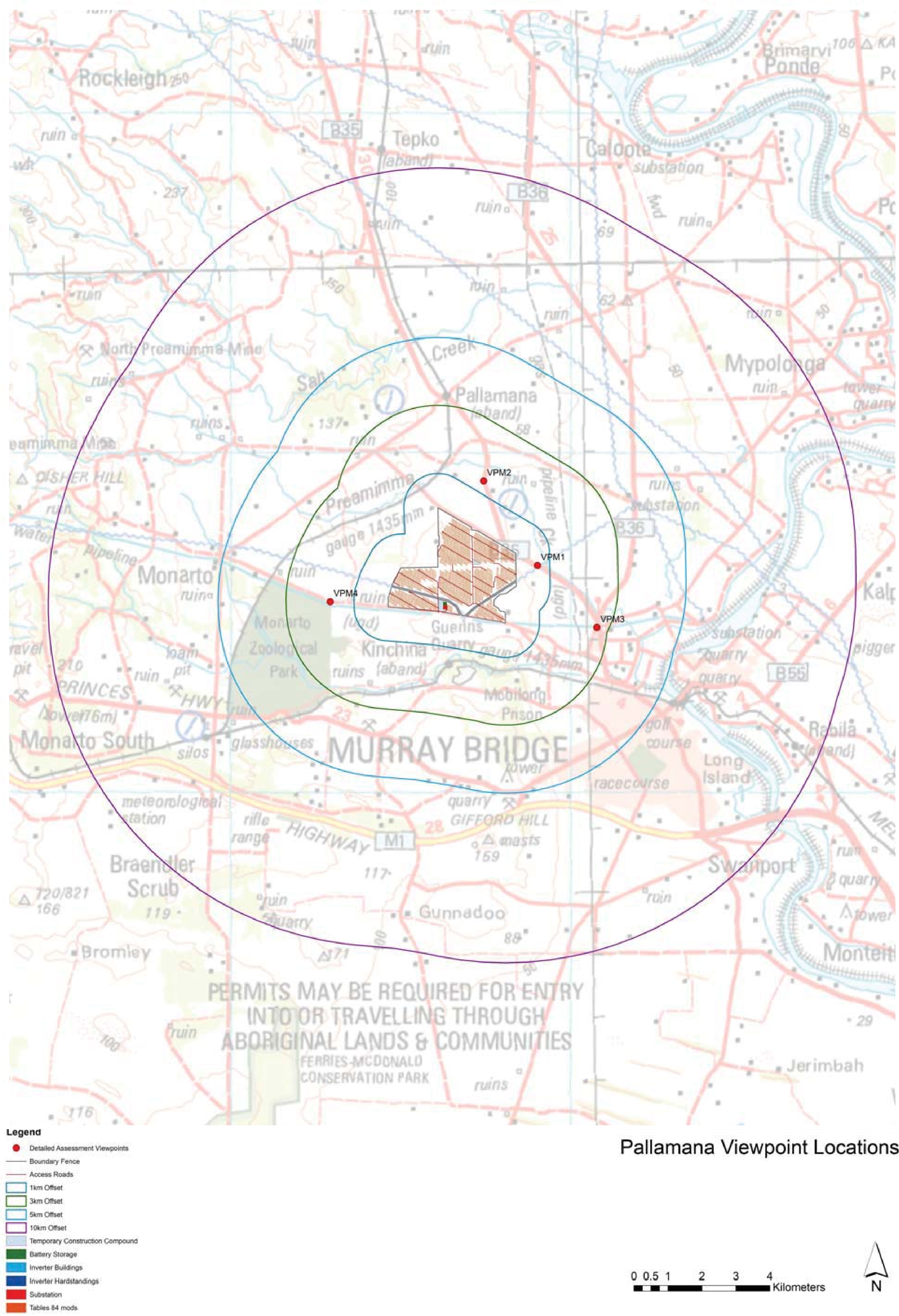
Within the project area the vegetation associations are of a mixed mallee overstorey and amenity plantings and crop/pastoral land. The assessment of the project area identified that the site has very low ecological value but areas of remnant vegetation are important from a landscape context and as connective pathways to areas of large intact vegetation within the locality. The vegetation also provides nesting habitat for species such as parrots in an otherwise highly fragmented habitat. The ecological assessment did not identify any fauna species that are of national or state conservation significance.

The recommendations of the flora and fauna assessment was the retention of as much vegetation as possible and incorporate areas of regeneration. In preparing the proposed layout of the project, areas of vegetation have been excluded from the development and other areas retained. The proposal will also include areas of supplementary planting and management of weeds.



# PALLAMANA SOLAR FARM & ENERGY STORAGE PROJECT

## PHOTO MONTAGE VIEWPOINT LOCATIONS





# PALLAMANA SOLAR FARM & ENERGY STORAGE PROJECT

## PHOTO MONTAGE 2

### OVERLAY DEMONSTRATING VISUAL SCREENING



**Viewpoint 3 : Intersection of Guerin Road and Mannum Road**



**Viewpoint 4 : Monarto Road**