



APPLICATION ON NOTIFICATION – CROWN DEVELOPMENT

Applicant:	Terregra Renewables Pty Ltd
Development Number:	415/V012/18
Nature of Development:	Construction of a 4.9MW solar farm and associated infrastructure
Type of development:	Crown – Public Infrastructure
Zone / Policy Area:	Primary Production / North Central Area Policy Area 5
Subject Land:	Allotment 10, DP 88321 (CT 6092/92)
Contact Officer:	Sharon Wyatt
Phone Number:	08 7109 7132
Start Date:	16 August 2018
Close Date:	14 September 2018
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 local Council office (if identified on the public notice).	

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

Fax Number: (08) 8303 0753

SECTION 49 & 49A – CROWN DEVELOPMENT DEVELOPMENT APPLICATION FORM

PLEASE USE BLOCK LETTERS

FOR OFFICE USE

COUNCIL: Murray Bridge

DEVELOPMENT No: _____

APPLICANT: Terregra Renewables

PREVIOUS DEVELOPMENT No: _____

ADDRESS: 33 Warwick St
Walkerville SA 5081

DATE RECEIVED: / /

CROWN AGENCY: 2 Dept Trade, Tourism & Investment

CONTACT PERSON FOR FURTHER INFORMATION

Name: Grazio Maiorano (URPS)

Telephone: 83337999 [work] 0400205885 [Ah]

Fax: _____ [work] _____ [Ah]

Email: grazio@urps.com.au

<input type="checkbox"/> Complying <input type="checkbox"/> Merit <input type="checkbox"/> Public Notification <input type="checkbox"/> Referrals	Decision: _____ Type: _____ Finalised: / /
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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.

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

EXISTING USE: Primary Production

DESCRIPTION OF PROPOSED DEVELOPMENT: Renewable Energy Facility (Solar Farm)

LOCATION OF PROPOSED DEVELOPMENT: _____

House No: _____ Lot No: 10 Street: Mannum Road Town/Suburb: Murray Bridge North

Section No [full/part] _____ Hundred: Mobilong Volume: 6092 Folio: 92

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

LAND DIVISION: N/A

Site Area [m²] _____ Reserve Area [m²] _____ No of existing allotments _____

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

DEVELOPMENT COST [do not include any fit-out costs]: \$ 8.45m

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

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

SIGNATURE: frank Pearson

Dated: 20 / 7 / 2018



URPS

Terregra Renewables

18ADL-0158

20 July 2018



RENEWABLE ENERGY FACILITY – SOLAR FARM

Application for Public Infrastructure Development under
Section 49 of the Development Act 1993

2441 Mannum Road, Murray Bridge North



Renewable Energy Facility

20 July 2018

Lead consultant URPS

Prepared for Terregra Renewables

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URPS Ref R001_v3_180511_Section 49 Application 20_7_18

Document history and status

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V1	24.05.2018	GB	GM	Initial Draft
V2	30.05.2018	GM	GB	Updates
V3	20.07.2018	GM	GM	Updates

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1.0 Application Overview

Renewable Energy Facility – Solar Farm	
Applicant	Terregra Renewables sponsored by the Department for Trade, Tourism and Investment.
Property Location	2441 Mannum Road, Murray Bridge North
Description of Land	Certificate of Title Volume 6092 Folio 92
Ownership	WC Harries and EA Harries as Joint Tenants
Site Area	21.5 hectares
Council	Rural City of Murray Bridge
Development Plan	Murray Bridge Council (consolidated 23 January 2018)
Zone	Primary Production
Policy Area	North Central Policy Area 5
Current Land Use	Rural Residential
Description of Development	Installation of 4.9 megawatt solar farm
Assessment Pathway	Section 49 (Public Infrastructure) of the <i>Development Act 1993</i>
Cost of Development	\$8.45 Million
Public Notification	15 business days, as per Section 49 (7d) of the <i>Development Act 1993</i>
Relevant Authority	The Minister for Planning
Referrals	Rural City of Murray Bridge
Related Applications	N/A
Plans and Details	Plans and Details prepared by Balance Utility Solutions. Department for Trade, Tourism and Investment Sponsorship Letter
Contact Person	Grazio Maiorano, URPS, 8333 7999 / Geoff Butler, URPS, 8333 7999

2.0 Background

2.1 Project Background

URPS has been engaged by Terregra Renewables to provide planning advice for the development of a solar renewable energy facility at Murray Bridge North. The development involves the installation of a 4.9 megawatt (MW) solar array of ground mounted solar panels, an associated control room building, two inverters (containing inverters/transformers and switchgear), internal underground cabling, an underground high voltage cable connection to the South Australian Power Network (SAPN) grid, security fencing and vehicle access gate, landscaping, an access point to Mannum Road and internal service roadways. Further details of the proposal are described later in this report.

This development is to be assessed pursuant to Section 49 of the *Development Act 1993* as 'Public Infrastructure'. See **Appendix A** for the letter of sponsorship of the development from the Department for Trade, Tourism and Investment.

2.2 Terregra Renewables

PT. Terregra Asia Energy was created to be the leader in providing clean, renewable power for Indonesia as it grows to become one of the world's leading economies.

Its history goes back over 20 years to the establishment of PT. Mitra Megatama Perkasa (MMP) in 1995. MMP was a mechanical and electrical contractor focusing on the power generation sector, primarily working for PLN, Indonesia's national electricity company. In 2010, MMP made its first investment in power generation, a mini-hydro plant located in Sumatera. MMP became PT. Terregra Asia Energy in 2016 as it shifted its focus to hydro and solar power generation.

Now PT. Terregra Asia Energy is a truly global company and began developing utility scale solar projects in South Australia towards the end of 2017. After establishing a local subsidiary, Terregra Renewables Pty Ltd, put considerable effort towards identifying viable project sites that would support the grid and positively contribute to the nearby region. Terregra Renewables now has a number of potential sites within South Australia with the intention being to develop, own and operate these facilities. Terregra Renewables will be involved with these facilities over several decades and therefore seeks a long-term relationship within the State.

The management team at Terregra Renewables brings years of directly relevant renewable energy experience having developed, built and operated similar facilities across the world. Led by Mr Lasman Citra who developed and grew PT. Terregra Asia Energy, the Australian entity is also supported by Mr Paul Turney, who has 30 years of energy experience over 4 continents, and Mr Graham Pearson who is permanently based in Adelaide and Melbourne.

Subject to obtaining appropriate sites and approvals, Terregra Renewables is planning to roll-out another 10 to 40 megawatts of projects in South Australia.

Additional information about the company can be found on <http://www.terregra.com>.



2.3 Public Infrastructure and State Agency Support

‘Public Infrastructure’ is defined by Section 49 (1) of the Act, as:

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; ... (underlining added)**

Section 49 (2) (c) goes on to state:

Subject to this section, if –

- (c) **a person proposes to undertake development initiated or supported by a State agency for the purposes of the provision of public infrastructure and specifically endorsed by the State agency for the purposes of this section, the State agency must lodge an application for approval containing prescribed particulars with the State Planning Commission. (underlining added)**

The development is considered to be a type of ‘Public Infrastructure’ as per the Act, and has support from the Department for Trade, Tourism and Investment (see **Appendix A**). Therefore, the development is lodged with the State Planning Commission for assessment.

3.0 Subject Land and Locality

3.1 Subject Land

The site of the proposed development (the subject land) is to be located on portion of Allotment 10 in Deposited Plan 88321 at 2441 Mannum Road, Murray Bridge North. A copy of the Certificate of Title for Allotment 10 is contained in **Appendix B**.

Image 1, below, shows an aerial view of Allotment 10, the subject land, and its surrounds.



Image 1: Subject Land (Source: LocationSA)

In terms of zoning, the subject land is located within the Primary Production Zone and the North Central Policy Area 5 of the Murray Bridge Council Development Plan (consolidated 23 January 2018) as shown on the map suite MuBr/4. Furthermore, the allotment is identified as being within an area of General Bushfire Risk, as shown on BPA Map MuBr/8.

Allotment 10 has an area of approximately 32.4 hectares. With a proposed area of 21.5 hectares, the subject land will occupy some 66% of the allotment. It will have a frontage of some 549 metres to Mannum Road.



The land is currently used for rural residential purposes and cropping, and features a residential dwelling and associated outbuildings housing a commercial activity.

The natural topography of the allotment slopes generally downwards from north to south on a north-east to south-west axis. There is some existing native vegetation on the allotment, consisting mainly of Mallee Woodland and Melaleuca Shrubland, as evidenced in **Image 2**.



Image 2: Native Vegetation on the allotment (Source: LocationSA)

3.2 Locality

Land uses within the surrounding locality vary between rural residential allotment, large scale agricultural uses and a small scale industrial activity. There are a number of dwellings within the locality, as shown on **Image 3** below.

Mannum Road, which the subject land has primary frontage to, is a Secondary Arterial Road, as indicated on Development Plan Overlay Map MuBr/4 – Transport.

At its nearest point, the subject land is located some 2.2 kilometres north-west from the River Murray and approximately 3.5 kilometres from the Murray Bridge township CBD.

Visually, the locality is defined by open rural land with sections of native vegetation. Built form in the area is largely limited to dwellings, farm buildings and post and wire fencing.

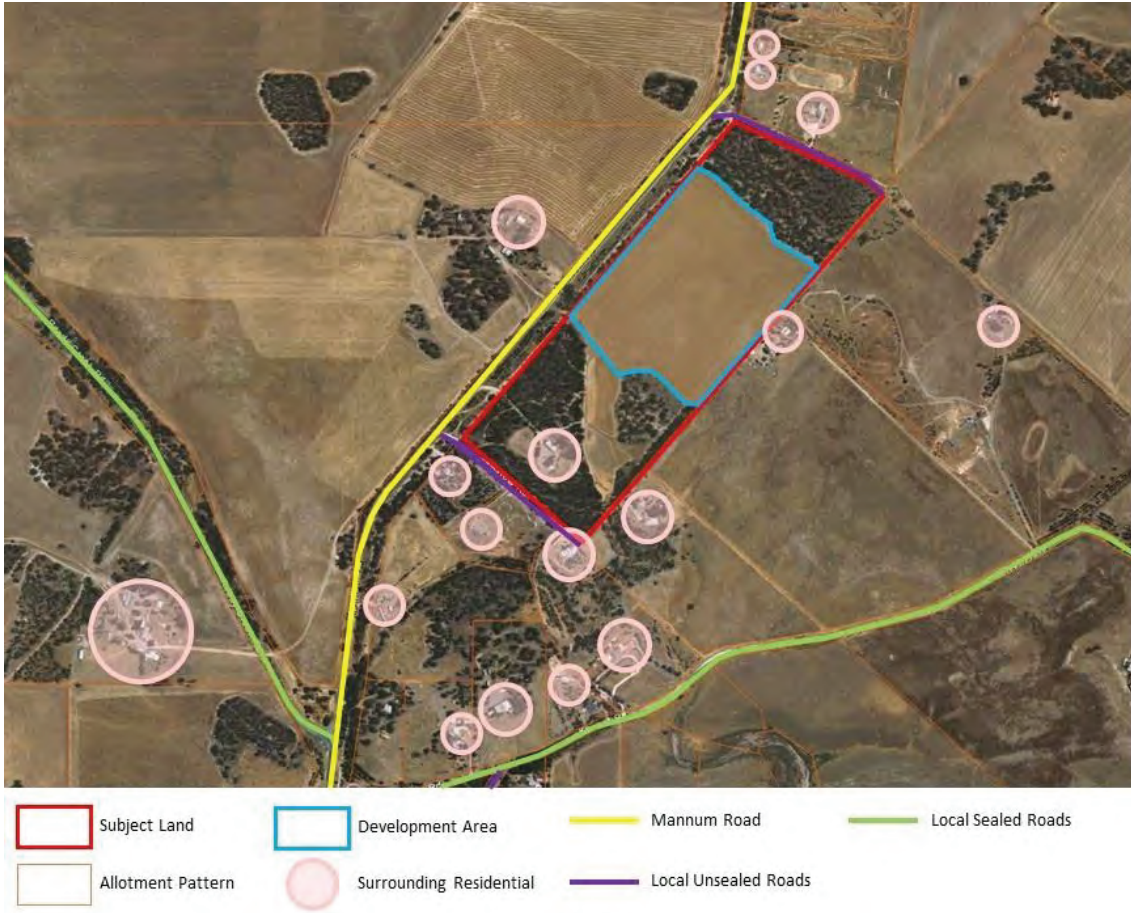


Image 3: Locality Map (Source: LocationSA)



4.0 Proposal

The proposal is detailed in the plans prepared by Balance Utility Solutions. These plans are included in **Appendix C**.

The development comprises the following elements:

- The installation of 17,472 ground mounted solar panels using a tilt system.
- A control building.
- 2 modular inverters containing inverters, transformers and switchgear.
- Underground cabling linking the solar panels to the “power stations” and the control building.
- Underground HV cabling linking the facility to the existing SAPN grid.
- Security fencing and vehicle access gate.
- Landscaping.
- Vehicle access point to Mannum Road.
- Internal service roadways.

The solar panels will cover an area of approximately 8 to 9 hectares, equating to some 40% of the subject land.

The panels will have a fixed degree of tilt, resulting in an overall height of 3145 mm above ground level. Only minimal earthworks will be required for the installation of the supporting frames as they can be directly drilled 1.5 metres into the ground, eliminating the need for cut and fill.

The solar panels are expected to produce 12,168 MWh per annum, which will be exported to the grid.

The control building and inverters are provided in a modular container form that will be mounted on small concrete pads. The following image illustrates the design of the inverters



During plant operation, the photovoltaic panels emit no pollution, produce no greenhouse gases and use no finite fossil-fuel resources.

Employment numbers associated with the facility include up to 40 during the construction phase, with an ongoing need for 2 service staff from time to time. In addition, local professional consultancy services and civil site works teams are being/will be used by Terregra Renewables.



5.0 Procedural Matters

5.1 Section 49 of the *Development Act 1993*

The application will be assessed in accordance with section 49 of the *Development Act 1993*. Pursuant to section 49(2), the proposed development has been supported and sponsored by the Department for Trade, Tourism and Investment for the purpose of the provision of public infrastructure.

5.2 Notification Requirements

In accordance with the notification requirements under Section 49 of the Act it is anticipated that the State Planning Commission will:

- Give notice of the application to the Rural City of Murray Bridge, which has 2 months to respond
- Undertake public consultation for a period of 15 business days as construction works are expected to be in the order of \$8.45 million - exceeding the \$4 million threshold set in Section 49 (7d).

6.0 Planning Assessment

6.1 Strategic Context

While it is acknowledged that strategic directions from the Planning Strategy are not to be used for assessment purposes, it is considered useful to provide a wider context for this proposal.

In this regard *The 30-Year Plan For Greater Adelaide (2017 Update)* is the relevant version of the Planning Strategy for the Murray Bridge Council area. The key directions considered to apply to this proposal are listed below:

- Policy 57: Maintain and protect primary production and tourism assets in the Environment and Food Production Areas,
- Policy 71: Encourage the establishment and expansion of medium and large scale renewable energy generation within the region.
- Policy 82: Coordinate and link strategic infrastructure across Greater Adelaide to ensure it meets the needs of a growing population and supports a more productive economy.
- Policy 97: Minimise or offset the loss of biodiversity where this is possible and avoid such impacts where these cannot be mitigated

It is considered the proposed development meets these key directions from the Plan. Discussion in the following sections provides details to support this opinion.

6.2 Zoning

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

The proposed development is best considered defined as a “solar renewable energy facility”, or alternatively could be considered as an “energy generation facility”, “electricity generation facility” or “electricity generating plant”, with these latter terms already used in Development Plans and/or the Act.

As none of these terms are listed as either complying or non-complying forms of development in the Primary Production Zone, the proposal is to be considered as a merit use, subject to assessment against relevant policies.

The following sections list relevant policies and then provide discussion on key aspects.

6.2.1 Zone Policies

Relevant policies from the Primary Production Zone are listed below.

Regard has been given to:

Objective 2: Economically productive, efficient and environmentally sustainable primary production.

Objective 4: Protection of primary production from encroachment by incompatible land uses and protection of scenic qualities of rural landscapes.

Objective 5: Accommodation of wind farms and ancillary development.



Desired Character

This zone covers the majority of the rural area throughout the Rural City of Murray Bridge. The zone will incorporate environmentally sustainable rural activities and maintain a rural character. Development will be undertaken in a manner that minimises adverse impacts on water resources, biodiversity or the visual and scenic quality of the environment, and does not result in air and land pollution, weed infestation, vermin proliferation or the uneconomic provision of infrastructure.

Wind farms and ancillary development such as substations, maintenance sheds, access roads and connecting power-lines (including to the National Electricity Grid) are envisaged within the zone and constitute a component of the zone's desired character.

PDC 1: The following forms of development are envisaged in the zone:

- > bulk handling and storage facility
- > commercial forestry
- > dairy farming
- > farming
- > horticulture
- > intensive animal keeping
- > tourist accommodation (including through the diversification of existing farming activities and conversion of farm buildings)
- > wind farm and ancillary development
- > wind monitoring mast and ancillary development.

PDC 3: Wind farms and ancillary development should be located in areas which provide opportunity for harvesting of wind and efficient generation of electricity and may therefore be sited:

- (a) in visually prominent locations
- (b) closer to roads than envisaged by generic setback policy.

PDC 18: Buildings should be set back a minimum of 50 metres from every public road, other than adjacent to the South Eastern Freeway and the Old Princes Highway where the setback should be a minimum of 100 metres.

Discussion

Allotment 10 is currently primarily used for rural residential purposes. The northern and southern portions of the allotment contain stands of native vegetation, with the land owners' dwelling and shedding located amongst the southern stand of vegetation.

The owners also operate a commercial activity on the land, providing embroidery services for corporate uniforms and other apparel as well as printing services for coffee mugs, mouse pads and the like.

Approximately half of the 32.4 hectare allotment is arable, with the centre portion of the allotment having been cultivated for dryland cropping. Dryland cropping on this small extent of land (some 16 hectares) is not considered a viable activity in its own right and the cessation of the use of this land for low value primary production is considered inconsequential.

While the subject land comprises an overall area of approximately 21.5 hectares, the solar facility itself will only occupy some 8 – 9 hectares and will be located on the already cleared cropping land.

The facility is to be located diagonally on the site, with a north-east to south-west orientation to take best advantage of solar access.

The closest point of the solar panels is to be some 10.7 metres from the boundary of the adjacent Mannum Road reserve. The extensive width of the road reserve in this location means the roadway is located approximately 48 metres from the subject land. Together with the internal setback, this results in the solar facility being located a minimum distance of some 60 metres from the roadway.

Existing roadside vegetation will provide a level of screening to the facility, noting that the height of the solar panels is only 2.104 metres above ground level when they are fully inverted.

On the eastern side of the subject land, the closest point of the solar panels is to be 8.2 metres from the adjacent allotment, with the staggered array of the panels providing further setbacks in some places. A 3 metres wide landscaping strip proposed along portion of this boundary will provide a level of screening.

The three associated buildings, which in any case are to be located centrally to the panel array and the subject land, only have a maximum height of 2.99 metres.

With dimensions of 6.058 metres by 2.438 metres, the modular inverter buildings have a floor area of approximately 14.8 m² each.

While it is noted that a solar renewable energy facility is not specifically listed as an envisaged use in the Zone, review of the envisaged use list indicates a range of activities are appropriate in the Zone, apart from the traditional land uses of farming and horticulture. These additional activities include some non-agricultural activities which have the potential for visual and other impacts (i.e. bulk handling and storage facility, intensive animal keeping, tourist accommodation and wind farms and ancillary development). In this context the establishment of the proposed solar renewable energy facility is not considered inappropriate.

Based on the above discussion, the proposal is considered to align with relevant policies for the Primary Production Zone and is reasonable and supportable.

6.2.2 Policy Area Policies

Relevant policies from the North Central Policy Area 5 are listed below:

Objective 1: An area accommodating a wide range of general farming, intensive animal keeping and other primary production activities on large land holdings in an open rural landscape.

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.

PDC 1: The following forms of development are envisaged in the policy area:

- > farming
- > intensive animal keeping.

Discussion

As discussed in Section 6.2.1 above, the allotment is currently primarily used for rural residential purposes, a commercial activity and dryland cropping. However, with only 16 hectares of the 32.4 hectare allotment arable, the allotment cannot be considered as a relatively large farming property as mentioned in the Desired Character statement.

It is noted that adjoining uses on the eastern side of Mannum Road comprise generally smaller allotments used primarily for rural residential purposes. A number of properties have motor bike “tracks” established on them, while some are used for grazing activities. Larger farming properties are evident to the west of Mannum Road, which are primarily used for general farming, cropping and grazing.



In this context, the establishment of a solar renewable energy facility on the subject land is not expected to adversely impact on the continuation of the farming and other primary production activities being undertaken in the surrounding area.

6.3 Design and Appearance

The relevant policies in this General Section module discuss design of buildings, screening of buildings and setbacks of buildings.

Discussion:

These matters have previously been commented on under Discussion in Section 6.2.1.

6.4 Hazards

The relevant policies in this General Section module are in relation to bushfire risk. In this regard the subject land is within a General Bushfire Risk area as indicated on Bushfire Risk BPA Maps MuBr/1 and 7.

It is to be noted that the proposal does not include any residential, tourist accommodation or other habitable building development.

Regard has been given to:

PDC 10: Buildings and structures should be located away from areas that pose an unacceptable bushfire risk as a result of one or more of the following:

- (a) vegetation cover comprising trees and/or shrubs**
- (b) poor access**
- (c) rugged terrain**
- (d) inability to provide an adequate building protection zone**
- (e) inability to provide an adequate supply of water for firefighting purposes.**

Discussion:

As indicated earlier, all of the proposed facility is to be established on cleared land which has been previously used for cropping. While a 3 metres wide landscaping strip is proposed for screening purposes along portion of the eastern boundary, the selected species will only have a mature height of 2.5 metres, still providing a minimum separation distance of 5 metres to the solar panels.

Access to the facility will be from the adjacent Mannum Road, a distance of only approximately 48 metres. Internal access will be provided via gravel roads running centrally through the facility and on the southern side.

The natural topography of the allotment slopes generally downwards from north to south on a north-east to south-west axis. While gently undulating, the land is arable and is not viewed as rugged terrain.

The only buildings on site are to be the control room and two associated modular inverters. For operational reasons these buildings are to be located relatively central to the solar panels on the central gravel road.

A water supply for firefighting purposes is not proposed at this time. During detailed design of the facility a safety in design and HAZOP process will be undertaken which will highlight the level of requirement for fire services. The process will identify problems that may represent risks to personnel or equipment. At this stage it is considered likely to be only some smoke detectors in the switch-room and requirements for fire extinguishers with an emergency evacuation point selected.

6.5 Infrastructure

The relevant policies in this General Section module are in relation to minimising the visual and environmental impacts of infrastructure facilities.

Regard has been given to:

Objective 1: Infrastructure provided in an economical and environmentally sensitive manner.

Objective 4: The visual impact of infrastructure facilities minimised.

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.

Discussion:

The visual impacts of the proposal have been discussed earlier in Section 6.2.1.

As the proposed facility is to be established on cleared land previously used for cropping, there will be no loss of native vegetation or increased adverse impact on the environment. While an access road will need to be established to the site from Mannum Road, this is only likely to be a 48 metre length and can be sited to minimise impact on roadside vegetation.

From a more wholistic point of view, the establishment of the solar renewable energy facility will provide overall environmental benefit by emitting no pollution, producing no greenhouse gases, using no finite fossil-fuel resources and producing clean energy for approximately 1735 dwellings.

6.6 Interface between Land Uses

The relevant policies in this General Section module are in relation to minimising adverse impact and conflict between land uses.

Regard has been given to:



Objective 1: Development located and designed to minimise adverse impact and conflict between land uses.

PDC 1: Development should not detrimentally affect the amenity of the locality or cause unreasonable interference through any of the following:

- (a) the emission of effluent, odour, smoke, fumes, dust or other airborne pollutants**
- (b) noise**
- (c) vibration**
- (d) electrical interference**
- (e) light spill**
- (f) glare**
- (g) hours of operation**
- (h) traffic impacts.**

Discussion:

As discussed in Section 6.5 above, the facility will produce no pollutants. In line with normal construction processes, dust suppression measures will be taken if this becomes an issue during the construction phase.

The only noise emitted from an operational solar facility is minimal mechanical noise from the inverters and transformers with cooling fans for temperature regulation. This equipment is to be contained within enclosed buildings in the centre of the development to minimise potential impacts beyond the boundary of the site. Any noise is generated during daylight hours only.

As there is to be no permanent external lighting proposed, no light spill will result from the development.

In relation to glare, photovoltaic panels are designed to reflect as little light as possible (generally around 2% of the light received) to maximise their efficiency, absorb sunlight and convert it to electricity. Minimising the light reflected from solar panels is a goal of panel design, manufacture and installation and it is understood the glare from panels is significantly less than that from bodies of water. The existing vegetation adjacent to the subject land may assist in screening glare, particularly to motorists using Mannum Road.

Traffic impacts from the proposal will be minimal. Apart from the construction period only 2 employees are likely to be onsite from time to time. While an indicative access point has been shown to the site from Mannum Road, its final position will be determined following referral of the proposal to both the Council and the Commissioner of Highways.

In this context, any potential impacts from the proposal are considered to be minimal and can be appropriately managed.

6.7 Landscaping, Fences and Walls

The relevant policies in this General Section module are in relation to landscaping and fencing proposed.

Regard has been given to:

Objective 1: The amenity of land and development enhanced with appropriate planting and other landscaping works, using locally indigenous plant species where possible.

Objective 2: Functional fences and walls that enhance the attractiveness of development.

PDC 1: Development should incorporate open space and landscaping and minimise hard paved surfaces in order to:

- (a) complement built form and reduce the visual impact of larger buildings (eg taller and broader plantings against taller and bulkier building components)**
- (b) enhance the appearance of road frontages**
- (c) screen service yards, loading areas and outdoor storage areas**
- (k) complement existing vegetation, including native vegetation**
- (l) contribute to the viability of ecosystems and species ...**

PDC 3: Landscaping should not:

- (a) unreasonably restrict solar access to adjoining development**
- (d) increase the risk of bushfire.**

PDC 4: Fences and walls, including retaining walls, should:

- (a) not result in damage to neighbouring trees**
- (b) be compatible with the associated development and with existing predominant, attractive fences and walls in the locality**
- (g) in the case of side and rear boundaries, be of sufficient height to maintain privacy and/or security without adversely affecting the visual amenity or access to sunlight of adjoining land**
- (h) be constructed of non-flammable materials.**

PDC 5: Fencing should be open in form to allow cross ventilation and access to sunlight.

Discussion:

Landscaping is proposed along portion of the eastern boundary to provide screening to the proposed development. As indicated on the Landscape Plan in **Appendix C**, this is to be in the form of a 3 metres wide landscaping strip, to be planted with appropriate species nominated in Table MuBr/6 Landscaping Schedule. Selected species will have a height of approximately 2.5 metres at maturity. As will be



appreciated, there is a tension between providing additional landscaping for amenity purposes and the proper functioning of the solar renewable energy facility. The potential for increased bushfire risk to the facility and adjacent development also has to be taken into consideration.

In order to secure the site for safety purposes and to reduce the potential for vandalism, it is to be fenced with chain wire fencing to a height of 1.8 metres and then topped with barbed wire for a further 0.48 metres, resulting in a total height of 2.28 metres. This type of fencing is considered less intrusive than solid fencing and “blends” into the background within a short distance. Landscape screening will reduce the impact of the fence when viewed from the neighbouring development to the east.

6.8 Natural Resources

The relevant policies in this General Section module are in relation to protection of the environment.

Regard has been given to:

Objective 1: Retention, protection and restoration of the natural resources and environment.

Objective 9: Restoration, expansion and linking of existing native vegetation to facilitate habitat corridors for ease of movement of fauna.

Objective 10: Minimal disturbance and modification of the natural landform

PDC 1: Development should be undertaken with minimum impact on the natural environment, including air and water quality, land, soil, biodiversity, and scenically attractive areas.

PDC 31: Development should retain existing areas of native vegetation and where possible contribute to revegetation using locally indigenous plant species.

PDC 42: Development should be designed and sited to prevent erosion.

PDC 43: Development should take place in a manner that will minimise alteration to the existing landform.

PDC 44: Development should minimise the loss of soil from a site through soil erosion or siltation during the construction phase of any development and following the commencement of an activity.

Discussion:

As discussed earlier in Section 6.5, as the proposed facility is to be established on cleared land previously used for cropping there will be no loss of native vegetation or increased adverse impact on the environment from the facility.

While a small length of security fencing is proposed through the Melaleuca Shrubland on the southern boundary of the subject land, it is to be sited on an existing fence line. Construction of the new fence will take into account the need to minimise impacts on the adjacent vegetation. It is noted this vegetation appears to be in a relatively degraded condition, suffering from “edge” effects associated with adjoining cropping cultivation and previous animal husbandry on the land.

As discussed earlier in Section 6.7, landscaping is proposed along portion of the eastern boundary to provide additional screening to the proposed development. Selected species will be from those nominated in Table MuBr/6 Landscaping Schedule.

In regard to stormwater management, natural ground conditions and vegetated ground cover will be maintained to ensure any stormwater run-off is absorbed into the soil. In addition, only minimal earthworks will be required for the installation of the supporting posts for the solar panels as they can be directly drilled 1.5 metres into the ground. This will eliminate the need for cut and fill. Together, these measures will minimise the potential for erosion from construction works and the ongoing operation of the solar facility.

6.9 Orderly and Sustainable Development

The relevant policies in this General Section module are in relation to protection of authorised and desired land uses.

Regard has been given to:

Objective 3: Development that does not jeopardise the continuance of adjoining authorised land uses.

Objective 4: Development that does not prejudice the achievement of the provisions of the Development Plan.

PDC 1: Development should not prejudice the development of a zone for its intended purpose.

Discussion:

Apart from potential for some visual impact the proposed development is essentially benign, and will not jeopardise the continuance of adjoining land uses nor future envisaged uses in the Zone.

6.10 Renewable Energy Facilities

The relevant policies in this General Section module are in relation to supporting renewable energy facilities. While the policies give more detailed guidance to wind farm development, some are more generic and recognise the potential for renewable energy facilities in general.

Regard has been given to:

Objective 1: Development of renewable energy facilities that benefit the environment, the community and the state.

Objective 2: The development of renewable energy facilities, such as wind farms and ancillary development, in areas that provide opportunity to harvest natural resources for the efficient generation of electricity.

Objective 3: Location, siting, design and operation of renewable energy facilities to avoid or minimise adverse impacts on the natural environment and other land uses.



PDC 1: Renewable energy facilities, including wind farms and ancillary development, should be:

- (a) located in areas that maximize efficient generation and supply of electricity; and**
- (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.**

Discussion:

The proposed location of the solar renewable energy facility has been carefully chosen to take advantage of an underutilised piece of rural land which has good access to sunlight. Energy produced from the solar panels will be exported to the grid, providing benefit to the community through a renewable energy source.

Additionally, the proposed location largely avoids the potential for adverse impacts on the environment and adjoining land uses.

In this context the proposal is considered to be in accord with the above policies.

6.11 Siting and Visibility

The relevant policies in this General Section module are in relation to minimising the visual impact of the proposal.

Regard has been given to:

PDC 2: Buildings should be sited in unobtrusive locations and, in particular, should:

- (a) be grouped together**
- (b) where possible be located in such a way as to be screened by existing vegetation when viewed from public roads.**

PDC 4: Buildings outside of urban areas and in undulating landscapes should be sited in unobtrusive locations and in particular should be:

- (a) sited below the ridgeline**
- (b) sited within valleys or behind spurs**
- (c) sited in such a way as to not be visible against the skyline when viewed from public roads**
- (d) set well back from public roads, particularly when the allotment is on the high side of the road.**

PDC 5: Buildings and structures should be designed to minimise their visual impact in the landscape, in particular:

- (a) the profile of buildings should be low and the roof lines should complement the natural form of the land ...**

PDC 6: The nature of external surface materials of buildings should not detract from the visual character and amenity of the landscape.

PDC 7: The number of buildings and structures on land outside of urban areas should be limited to that necessary for the efficient management of the land.

PDC 8: Development should be screened through the establishment of landscaping using locally indigenous plant species:

(b) along allotment boundaries to provide permanent screening of buildings and structures when viewed from adjoining properties and public roads

(c) along the verges of new roads and access tracks to provide screening and minimise erosion.

Discussion:

The 3 small buildings associated with the solar energy facility are to be grouped together and located centrally to the site amid the solar panels. They are to be located some 180 metres to 220 metres from Mannum Road, and will have a level of screening provided by the existing roadside vegetation and the surrounding solar panels. Their small size and low profile, together with the undulating nature of the site, will ensure they are not a prominent feature in the landscape.

While the solar panels will also benefit from the screening provided by roadside vegetation and their height of only 3145 mm above ground level, their sheer number (15022) and their coverage of an area of 8 -9 hectares will inevitably result in a level of visibility from a section of Mannum Road.

6.12 Transportation and Access

The relevant policies in this General Section module are in relation to safe and convenient access to the site.

Regard has been given to:

PDC 22: Development should have direct access from an all weather public road.

PDC 23: Development should be provided with safe and convenient access which:

(a) avoids unreasonable interference with the flow of traffic on adjoining roads

(b) accommodates the type and volume of traffic likely to be generated by the development or land use and minimises induced traffic through over-provision

(c) is sited and designed to minimise any adverse impacts on the occupants of and visitors to neighbouring properties.

Discussion:

Access to the site is proposed from the existing access point adjacent Mannum Road, a defined Secondary Arterial Road as illustrated the CGo Plan in **Appendix C**. An access gate of 6 metres width is proposed in this location.



In general, traffic impacts from the proposal will be minimal. Apart from during the construction period, only 2 employees are likely to be onsite from time to time.

7.0 Conclusions

The proposed development comprises a solar renewable energy facility and associated infrastructure that provides the following benefits:

- (a) The site has been carefully chosen as it comprises an underutilised piece of rural land which has convenient access to an adjacent SAPN 33 kV transmission line, providing suitable access to the grid.
- (b) Being located on Mannum Road, a designated Secondary Arterial Road, the site has good accessibility.
- (c) The site is of a suitable size, enabling flexibility to accommodate the desired design of the facility.
- (d) No native vegetation is required to be removed to enable the facility to proceed as the site is already cleared, having previously been used for dryland cropping.
- (e) Negligible impact on biodiversity in the area is anticipated.
- (f) The potential visual impact of the proposal has been minimised by its significant setbacks from Mannum Road (approximately 60 metres) and by being screened by existing vegetation in the road reserve and at the northern and southern ends of the subject land. Additional landscaping is proposed on the eastern side boundary to provide screening of the facility from this direction.
- (g) The solar panels will only have a height of 3145 mm above ground level, with the 3 associated buildings all being less than 3 metres in height.
- (h) The physical characteristics of the land are suitable for such a facility and will not result in the need for cut and fill.
- (i) The establishment of the facility will not impact of the continuation of existing uses or future uses envisaged for the Zone.

In this context, the proposed development is considered to satisfy relevant provisions in the Development Plan and therefore warrants Development Plan Consent.



Appendix A – Letter of Support from Department for Trade, Tourism and Investment



**Government
of South Australia**

Department for Trade,
Tourism and Investment

Ref: IASA2018/03578

Mr Grazio Maiorano
Director
URPS Adelaide
Suite 12 / 154 Fullarton Road
ROSE PARK SA 5067

Dear Mr Maiorano

Crown development and public infrastructure – Terregra Renewables ‘Mobilong Solar Farm’ development, Murray Bridge North

Thank you for your letter dated 26 June 2018 representing Terregra Renewables in relation to its proposed ‘Mobilong Solar Farm’ development to be located near Murray Bridge North, and the subsequent request for the proposal to be considered as a Crown development and public infrastructure under section 49 of the *Development Act 1993*.

I have been advised that the proposed ‘Mobilong Solar Farm’ development will be Terregra Renewables’ first investment into South Australia and will produce approximately 11,404,000 kWh per annum which will be exported to the grid.

The proposal by Terregra Renewables ‘Mobilong Solar Farm’ development has the potential to benefit South Australia and can be considered public infrastructure.

In endorsing this proposal under section 49 of the *Development Act 1993* it should be understood:

- it is the responsibility of Terregra Renewables to prepare and submit all documentation as required by section 49 of the *Development Act 1993*
- all costs in the preparation of a development application or other documentation under this or any other legislation, including the lodgement of any such application and any subsequent action required in relation to this is the responsibility of Terregra Renewables

Office of the Chief Executive

Level 9 The Conservatory, 131-139 Grenfell Street, Adelaide SA 5000 | GPO Box 320, Adelaide SA 5001 | DX541
Tel (+61) 08 8303 2432 | Fax (+61) 08 8226 9533

- Terregra Renewables is responsible for obtaining appropriate advice and making independent decisions on requirements in the *Development Act 1993* and the requirements of other legislation in regard to this proposal
- this endorsement does not require agencies to make representations and gives no warranties as to the outcome of any application or the time taken to secure any outcome
- it remains the responsibility of Terregra Renewables to secure all approvals for this proposal, to secure any necessary licences and build and operate all infrastructure
- the proposed and associated infrastructure is to be built to recognised national engineering standards and subject to any necessary building rules consent as per relevant legislation
- the agreement to support this proposal under section 49 of the *Development Act 1993* does not in any way indicate that the South Australian Government or any of its agencies has investigated the feasibility or viability of this proposal; and
- this endorsement for the 'Mobilong Solar Farm' as a Crown development and public infrastructure pursuant to section 49 will expire on 30 June 2019.

If you have any questions regarding this endorsement letter, please contact Mr Robert Demarco, Director, Minerals and Energy via email robert.demarco@sa.gov.au or phone 08 8303 2423.

I wish Terregra Renewables the very best with this proposal and welcome its potential investment into South Australia.

Yours sincerely

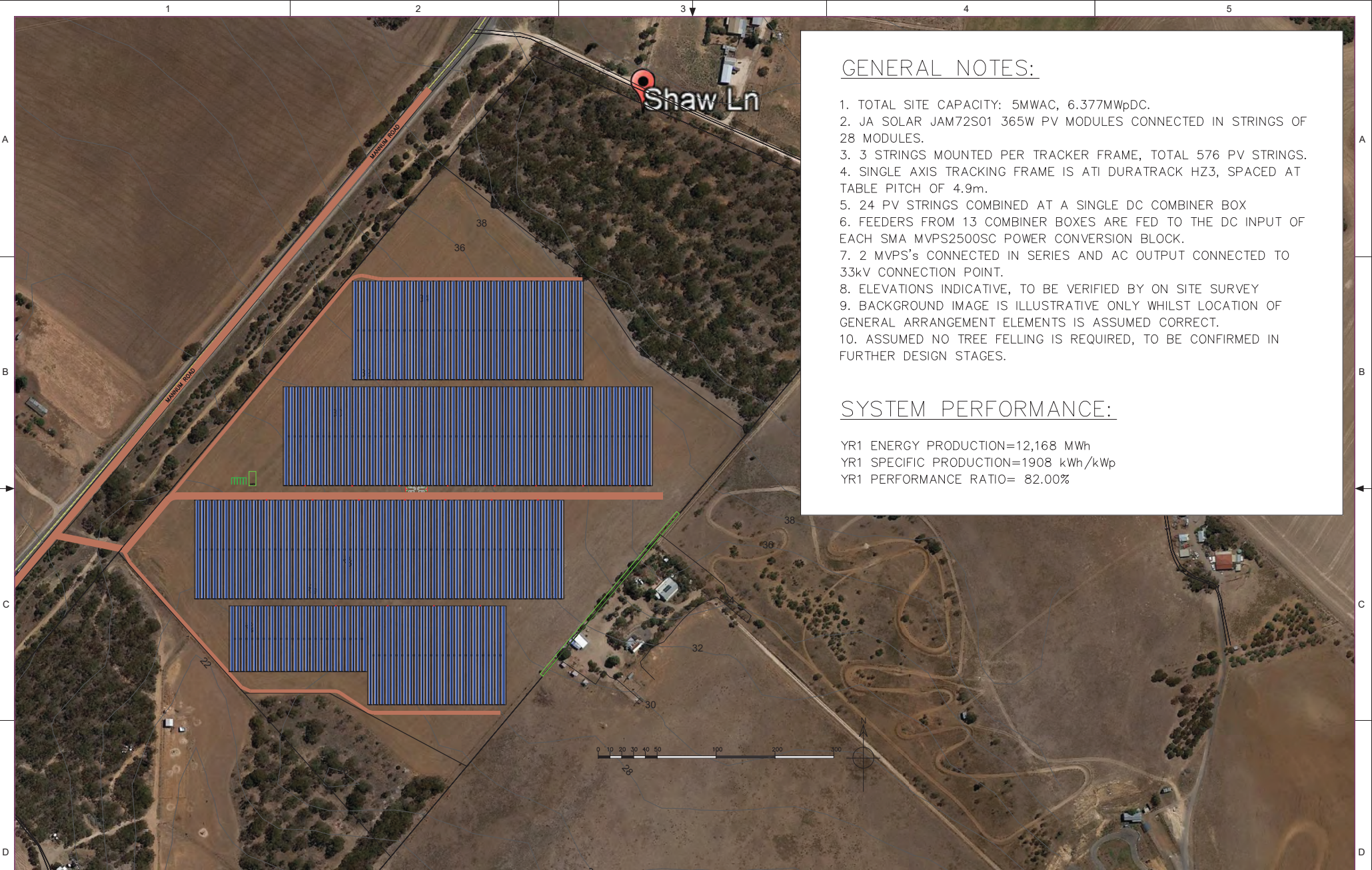


Michael Hnyda
**CHIEF EXECUTIVE, INVESTMENT
DEPARTMENT FOR TRADE, TOURISM AND INVESTMENT**

19 / 07 / 2018



Appendix C – Plans and Details



GENERAL NOTES:

1. TOTAL SITE CAPACITY: 5MWAC, 6.377MWpDC.
2. JA SOLAR JAM72S01 365W PV MODULES CONNECTED IN STRINGS OF 28 MODULES.
3. 3 STRINGS MOUNTED PER TRACKER FRAME, TOTAL 576 PV STRINGS.
4. SINGLE AXIS TRACKING FRAME IS ATI DURATRACK HZ3, SPACED AT TABLE PITCH OF 4.9m.
5. 24 PV STRINGS COMBINED AT A SINGLE DC COMBINER BOX
6. FEEDERS FROM 13 COMBINER BOXES ARE FED TO THE DC INPUT OF EACH SMA MVPS2500SC POWER CONVERSION BLOCK.
7. 2 MVPS's CONNECTED IN SERIES AND AC OUTPUT CONNECTED TO 33kV CONNECTION POINT.
8. ELEVATIONS INDICATIVE, TO BE VERIFIED BY ON SITE SURVEY
9. BACKGROUND IMAGE IS ILLUSTRATIVE ONLY WHILST LOCATION OF GENERAL ARRANGEMENT ELEMENTS IS ASSUMED CORRECT.
10. ASSUMED NO TREE FELLING IS REQUIRED, TO BE CONFIRMED IN FURTHER DESIGN STAGES.

SYSTEM PERFORMANCE:

YR1 ENERGY PRODUCTION=12,168 MWh
 YR1 SPECIFIC PRODUCTION=1908 kWh/kWp
 YR1 PERFORMANCE RATIO= 82.00%



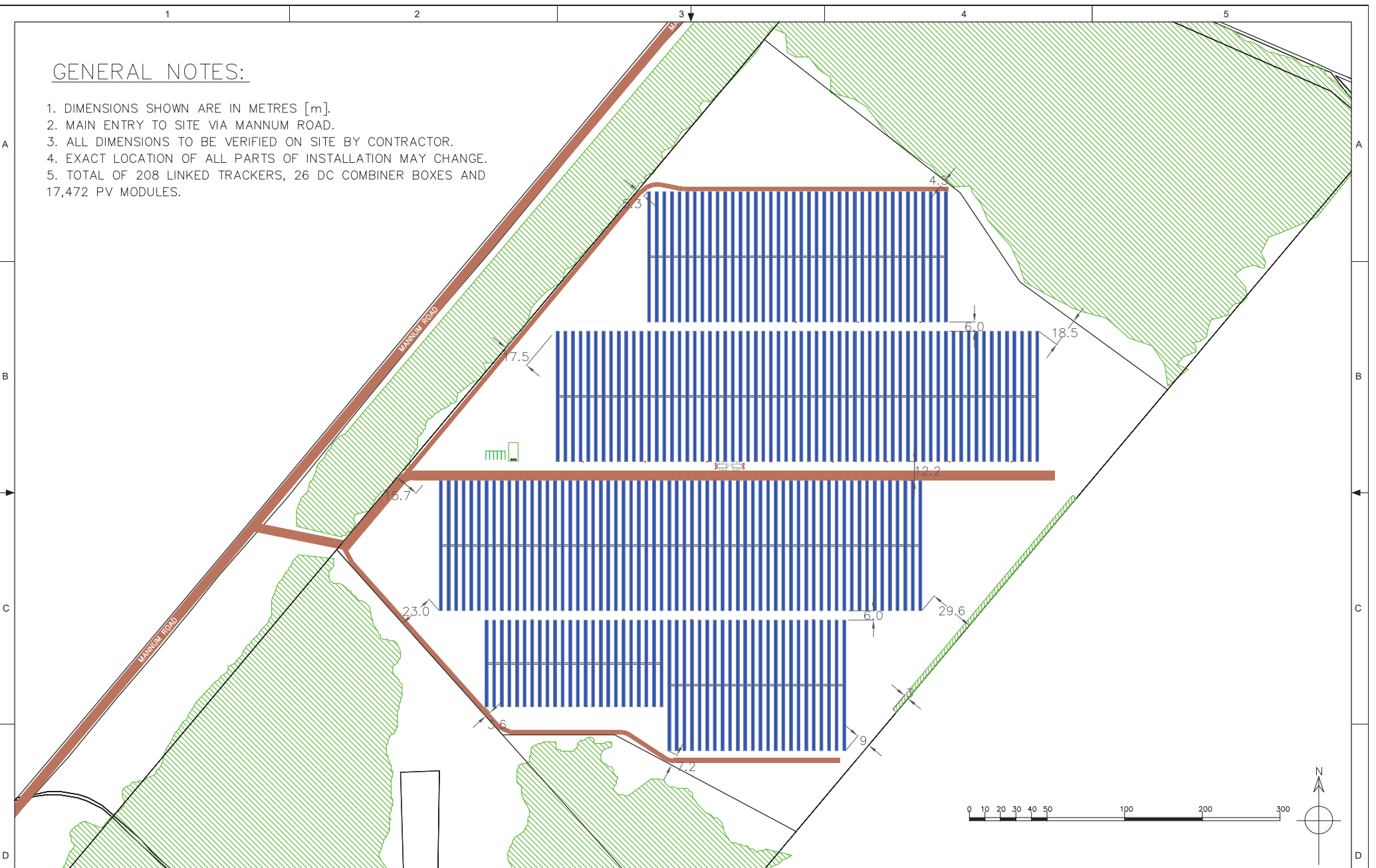
REV.	DATE	DESCRIPTION	DRWN.	CHKD.	APPR.
B	18.07.13	FIRST ISSUE	JM	RD	JD
A	18.07.12	FIRST ISSUE	JM	RD	JD

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TITLE	TERREGRA RENEWABLES MOBILONG 1 SOLAR FARM GENERAL ARRANGEMENT SHEET 1
DWG No.	MOBILONG1-G-GAD-01-1
SCALE	DNS
REVISION	A
PAPER SIZE	A3

GENERAL NOTES:

1. DIMENSIONS SHOWN ARE IN METRES [m].
2. MAIN ENTRY TO SITE VIA MANNUM ROAD.
3. ALL DIMENSIONS TO BE VERIFIED ON SITE BY CONTRACTOR.
4. EXACT LOCATION OF ALL PARTS OF INSTALLATION MAY CHANGE.
5. TOTAL OF 208 LINKED TRACKERS, 26 DC COMBINER BOXES AND 17,472 PV MODULES.



REV.	DATE	DESCRIPTION	DRWN.	CHKD.	APPR.
B	18.07.13	FIRST ISSUE	JM	RD	JD
A	18.07.12	FIRST ISSUE	JM	RD	JD

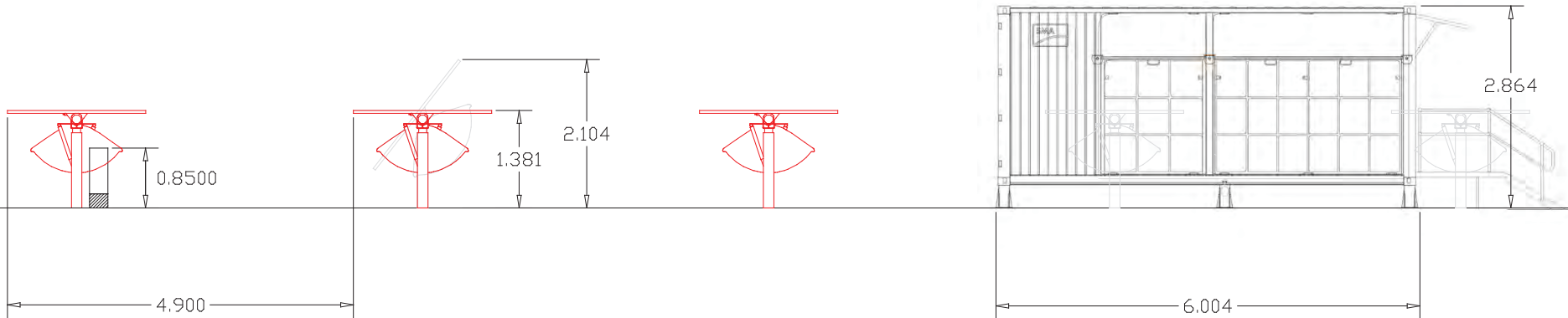
REV.	DATE	DESCRIPTION	DRWN.	CHKD.	APPR.
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TITLE	TERREGRA RENEWABLES MOBILONG 1 SOLAR FARM GENERAL ARRANGEMENT SHEET 3
DWG No.	MOBILONG1-G-GAD-01-3
SCALE	DNS
REVISION	A
PAPER SIZE	A3

GENERAL NOTES:

1. VIEW FROM SOUTH/NORTH POSITION
2. TRACKING FRAME SHOWN IN NOMINAL (FLAT) POSITION.
3. DIMENSIONS SHOWN IN METRES [m]



REFERENCES

REVISIONS

REV.	DATE	DESCRIPTION	DRWN.	CHKD.	APPR.
B	18.07.13	FIRST ISSUE	JM	RD	JD
A	18.07.10	FIRST ISSUE	JM	RD	JD

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TITLE	TERREGRA RENEWABLES MOBILONG 1 SOLAR FARM GENERAL ARRANGEMENT SHEET 5
DWG No.	MOBILONG1-G-GAD-01-5

SCALE	DNS
REVISION	A
PAPER SIZE	A3

1

2

3

4

5

MV POWER STATION 2200SC / 2500SC-EV



MVPS 2200SC-10 / MVPS 2500SC-EV-10



Flexible

- Global solution for international markets
- For system voltage of 1,000 V_{DC} or 1,500 V_{DC}
- Various options for monitoring

Robust

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

Easy to Use

- Plug and play concept
- Ideally suited to be exported to overseas markets
- Pre-installed and mechanically protected cabling

Cost Effective

- Easy planning and installation
- High power density per m³ for maximum profitability
- Low transport costs due to 20 foot container

MV POWER STATION 2200SC / 2500SC-EV

Turnkey system solution with the new Sunny Central inverter

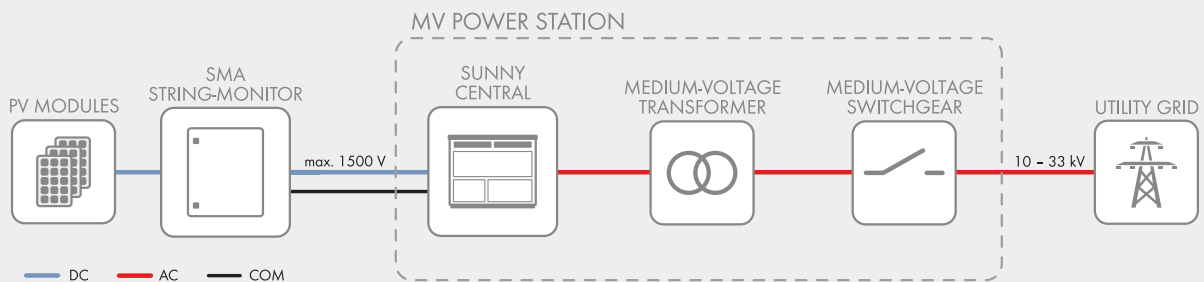
With the compact power of the new, robust Sunny Central inverter and with matching medium-voltage components, the MV Power Station is a turnkey solution that is available worldwide. It represents the ultimate utility scale solution in compactness with 1,000 V_{DC} (2,200 kW) or 1,500 V_{DC} (2,500 kW). Being the ideal choice for large-scale PV power plants, the integrated 20 foot container station is quick to assemble and commission as well as easy and cost-effective to transport. The compact station itself (IEC 62271-202) and all its components are type-tested. The MV Power Station combines rigorous plant safety with maximum energy yield and minimized operating risk. The MV Power Station's components are delivered completely pre-installed and pre-commissioned to speed up station commissioning as much as possible.

MV POWER STATION 2200SC / 2500SC-EV

Technical data	MV Power Station 2200SC	MV Power Station 2500SC-EV
Input (DC)		
Max. DC input voltage	1,100 V	1,500 V
MPP voltage range (at 25 °C / at 50 °C)	570 V to 950 V / 800 V	850 V to 1,425 V / 1,275 V
Max. input current (at 25 °C / at 50 °C)	4,110 A / 3,960 A	3,000 A / 2,700 A
Number of DC inputs	24	24
Available DC fuse sizes (per input)	200 A, 250 A, 315 A, 350 A, 400 A	
Integrated zone monitoring (+/- 0.5 % shunt resistors)	○	○
Output (AC) on the medium-voltage side		
AC-power at $\cos \varphi = 1$ (at 25 °C / at 40 °C / at 50 °C) ¹⁾	2,200 kVA / 2,080 kVA / 2,000 kVA	2,500 kVA / 2,350 kVA / 2,250 kVA
Typical AC voltages	10 kV to 33 kV	10 kV to 33 kV
AC power frequency	50 Hz / 60 Hz	50 Hz / 60 Hz
Transformer vector group Dy11 / YNd11	● / ○	● / ○
Transformer cooling method	ONAN ²⁾	ONAN ²⁾
Max. output current at 20 kV	64 A	73 A
Transformer no-load losses ³⁾	1.595 kW	1.76 kW
Transformer short-circuit losses ³⁾	19.8 kW	22 kW
Max. total harmonic distortion	< 3%	< 3%
Power factor at rated power / displacement power factor adjustable	1 / 0.8 overexcited to 0.8 underexcited	
Feed-in phases / connection phases	3 / 3	3 / 3
Inverter efficiency⁴⁾		
Max. efficiency	98.4%	98.4%
European efficiency	98.3%	98.1%
CEC weighted efficiency	98.0%	98.0%
Protective devices		
Input-side disconnection point		DC load-break switch
Output-side disconnection point		AC circuit breaker
DC overvoltage protection		Type II surge arrester
DC ground-fault monitoring / remote ground-fault monitoring	○ / ○	○ / ○
DC insulation monitoring	○	○
Galvanic isolation	●	●
Arc fault resistance control room (according to IEC 62271-202)	IAC A 20 kA 1 s	IAC A 20 kA 1 s
General data		
Dimensions (W / H / D) ⁵⁾	6.058 m / 2.591 m / 2.438 m	6.058 m / 2.591 m / 2.438 m
Weight	< 16 t	< 16 t
Operating temperature range -25 °C to +40 °C / +50 °C	● / ○	● / ○
Self-consumption (max. / partial load / average) ¹⁾	< 8,100 W / < 1,800 W / < 2,000 W	
Self-consumption (stand-by) ¹⁾	< 300 W	
Internal auxiliary power supply for inverter self-consumption	8.4 kVA transformer	8.4 kVA transformer
Degree of protection according to IEC 60529	Control room IP23D, inverter IP54	
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%	15% to 95%
Max. operating altitude above mean sea level 1,000 m / >1,000 m to 2,000 m	● / ○	● / ○
Fresh air consumption (inverter)	6,500 m ³ /h	6,500 m ³ /h
Features		
DC connection	Ring terminal lug or busbar	Ring terminal lug or busbar
AC connection, MV side	Outer-cone angle plug	Outer-cone angle plug
Display	HMI touch display (10.1")	
Communication protocols / SMA String-Monitor	Ethernet, Ethernet/IP, Modbus	
SC-COM	●	
Station enclosure color	RAL 7004	
Transformer for external loads 10 kVA / 20 kVA / 30 kVA	○	
Medium-voltage switchgear	○	
Oil tray	○	
Standards (more available on request)	IEC 62271-202, IEC 62271-200, IEC 60076	
● Standard features ○ Optional features – Not available		
Type designation	MVPS 2200SC-10	MVPS 2500SC-EV-10

- 1) Data based on inverter
- 2) ONAN = Oil-natural, air-natural cooling
- 3) Losses in accordance with the Ecodesign regulations, based on grid voltage 20 kV
- 4) Efficiency measured at inverter with internal power supply
- 5) Dimensions without feet, service platforms and protection roofs

SYSTEM DIAGRAM



DESIGN NOTES

Inverter compartment

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

Transformer compartment

Outdoor transformer optimized for PV without active fan for reduced maintenance. The side panels are equipped with protective grids. The transformer is connected directly to the inverter by a highly efficient three-phase busbar. This cuts costs, reduces losses and allows a highly compact design.

Control room

The following features are installed:

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 contains the standard internal arc classification IAC AFL 20 kA 1 s according to IEC 62271-200.

Transformers with EMC filters in 10 kVA, 20 kVA and 30 kVA power classes can be installed to support additional communications and control functions and to operate tracker motors.

The station subdistribution board and circuit breakers for control, lightning and socket can optionally be supplied via the 2.5 kVA transformer in the SC or the low-voltage transformer in the control room.



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