Tailem Bend Solar Project Stage 2

Equis Energy (Australia)

Section 49 Development Application

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TB2-008

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Contents

Acronyms and Abbreviations

AADT	Average Annual Daily Traffic
AC	Alternating current
ARENA	Australian Renewable Energy Agency
BDBSA	Biological Database of South Australia
CEMP	Construction Environmental Management Plan
DCP	Department of the Premier and Cabinet
DC	Direct current
DEWNR	Department of Environment, Water and Natural Resources
DPA	Development Plan Amendment
DPTI	Department of Transport and Infrastructure
DSD-AAR	Department of State Development – Aboriginal Affairs and Reconciliation
EPA	Environmental Protection Authority
Equis	Equis Energy (Australia)
FTE	Full time equivalent
GW	Gigawatt
GWh	Gigawatt-hour
kV	kilovolt
ZTVI	Zone of Theoretical Visual Influence
LCVIA	Landscape Character and Visual Impact Assessment
MW	Megawatt
MWAC	Megawatts Alternating Current
OEMP	Operational Environmental Management Plan
PV	Photovoltaic
Q3	Third quarter
RET	Renewable Energy Target
SA	South Australia
TBSP	Tailem Bend Solar Project Stage 1
TB2SP	Tailem Bend Solar Project Stage 2
TEC	Threatened Ecological Communities

Executive Summary

Equis Energy (Australia) ('Equis', the applicant) is proposing the development of Stage 2 of the Tailem Bend Solar Project (TB2SP), which will have a generation capacity of up to 90MW_{AC} and is designed to be 'battery ready'. The proposed development represents a construction cost of $105 - 125 million and will adjoin Stage 1 of the Tailem Bend Solar Project (TBSP), to the north of Substation Road. Stage 1 of TBSP was approved on 4 May 2017, Development Number 571/V001/17.

Equis is Asia Pacific's largest independent renewable energy developer and investor. Equis builds, owns, and operates renewable energy generation assets and associated infrastructure.

The subject site is formally described as Allotment 100 and 101 Substation Road, Certificates of Title Volume 5864 Folio 516 & 517, in the area named Tailem Bend. Equis will lease the land for the TB2SP under a long-term lease arrangement from the land owner (for a minimum of 30-years, plus a 20-year extension). Stages 1 and 2 of the TBSP will operate in parallel to efficiently meet South Australia's electricity demand.

The proposed development incorporates the following key elements:

- Solar modules with Single-axis tracker mounting systems;
- Module footings;
- Inverter stations;
- Associated underground cables connecting groups of solar panels to inverter stations and inverter stations to the 33kV switchgear in the TBSP facility substation on the southern side of Substation Road (noting the facility substation is part of a separate Development Approval 571/V004/16);
- Administration/controls and laydown compound area including:
    - Future battery storage;
    - Combined control room and administration building with amenities;
    - Operation & maintenance workshop building;
    - Car parking sufficient for employees and contractors during operation of the TB2SP;
- Drainage works, including stormwater management systems;
- Security fencing and CCTV installation;
- Low-level night time lighting;
- Lightning protection;
- Crossovers from Substation Road and internal access roads; and
- Demolition of uninhabitable dwelling and any ancillary structures located on the subject site.

This development application is submitted pursuant to Section 49 of the *Development Act 1993* with the endorsement of the Department of the Premier and Cabinet. The Section 49 process is appropriate for electricity infrastructure such as the proposed solar plant, as generation is provided for public usage and represents a service historically provided by the State.

A number of additional approvals under other legislation will be required prior to the construction and operation of the solar project, including approval for the clearance of native vegetation, Transmission Connection Agreement to connect the power station to the adjacent substation, and an Electricity Generation Licence for connection to the National Electricity Market.

The footprint of the proposed solar project will occupy the majority of the subject site area to optimise energy generation. The subject site is currently used for agricultural purposes. High voltage transmission lines are present within registered easements.

The solar energy generated from the TB2SP will be exported to the transmission network. The TB2SP will connect to the TBSP facility substation (separate Development Approval 571/V004/16) on the southern side of Substation Road. The TBSP facility substation was designed to accommodate the anticipated capacity of the TB2SP. The network connection will be made to the ElectraNet substation via the TBSP facility substation.

A key factor in favour of the proposed development is that as a renewable energy source it will have zero carbon emissions during operation. This project will contribute to reducing South Australia's greenhouse gas emissions as it will provide alternative power generation to more carbon-intensive generators. The growth of renewable energy, and reductions in emissions intensity, are underpinned by the targets established in South Australia's Strategic Plan (e.g. Targets 59, 64 and 66) and Low Carbon Emissions Investment Plan for South Australia.

Construction of the TB2SP will directly support strategic national, state and local government priorities relating to the development of renewable energy facilities and the transition to a low carbon economy.

Key Environmental Considerations

Visual Amenity

A Landscape Character and Visual Impact Assessment was completed for the TB2SP, which assessed the likely effect of the TB2SP on landscape character and visual amenity. Management strategies (where required) were identified to reduce the overall visual impact associated with the TB2SP.

The LCVIA completed for the TB2SP determined that although the TB2SP will alter landscape and visual qualities of the locality and wider contextual landscape, it was considered that visual mitigation (vegetative screening) for two sensitive receptor locations (if considered required by these two landholders) can adequately manage visual impacts. Discussions with the landowners has revealed that screening is not considered to be required at this time. Intervening topography and existing vegetation largely screen views of the subject site from key receptors and highly exposed locations (i.e. areas that are highly frequented). However, there is the elevated location on the Dukes Highway which will provide views of the TB2SP. At this location, the TB2SP is predicted to provide a moderately beneficial impact when viewed in conjunction with the TBSP, and slightly beneficial when assessed as a singular development.

For viewers more than three kilometres away from the subject site, the reduction in apparent size of the development as a result of distance will mean that it is likely to be insignificant in height and concealed within the view. In particular, the sense of place and place attachment values of Tailem Bend and Murray River will not be detrimentally affected by the project.

Traffic

A preliminary Traffic Management Plan has been prepared for the TB2SP. The preliminary Traffic Management Plan addresses construction vehicle access arrangements and identifies traffic management measures proposed to address traffic safety and access issues inherent with using oversized vehicles and general construction traffic.

Two access routes are proposed for construction traffic accessing the subject site; one from the Mallee Highway and one from the Dukes Highway. These access routes will direct traffic to access points on Substation Road to access the subject site. Based on the estimated level of construction traffic, heavy vehicle movements on the Dukes and Mallee Highways are not expected to greatly alter traffic movement on the existing roads. Pavement wear and road condition on Lime Kiln Road and Substation Road during construction will be managed through

maintenance intervention to be agreed between Equis, DPTI and Council. No upgrades or alterations to the existing road network are proposed as part of this Development Application.

Anticipated traffic volumes will be highest during the construction phase of the project. Operational vehicle movements are expected to be minimal, and not have any significant impact on the local road network. Staff attendance on site will be approximately 1-3 personnel employed on a full time, on site basis. Additional staff are expected to be employed on part-time and contract basis, for specialist electrical skills, module cleaning and other maintenance requirements associated with the TB2SP. Operational vehicle movements are therefore not expected to significantly impact on other road users and the local road network.

Vegetation

An assessment of ecological values at the subject site was undertaken to determine the presence of species of conservation significance (i.e. species protected under Commonwealth or State legislation). The subject site consists of cleared land that has been used for cropping and pasture with scattered patches of remnant native vegetation comprising approximately 22 hectares and approximately 53 scattered remnant individual trees.

In general, disturbance levels within the remnant vegetation of the subject site have been high. Past vegetation clearance has reduced vegetation communities to small patches surrounded by land that has been cropped and grazed continuously for many decades. Infestations of African Boxthorn (Declared under the *Natural Resources Management Act* and a Weed of National Significance) are common throughout the remnant vegetation patches and often present under scattered paddock trees and scattered small infestations of Bridal Creeper (Declared) were also recorded.

No State or Commonwealth threatened flora species, fauna species or plant communities were recorded during the survey and it is considered that they are unlikely to be present given the highly modified and degraded condition of the vegetation communities present within the subject site.

Clearance of native vegetation will be required to undertake the development associated with the TB2SP; however, the design of the TB2SP has limited the total area to be cleared whilst maximising the potential of the project. Clearance of approximately 46 scattered remnant native trees and approximately 1.3 ha of native vegetation (predominantly comprising numerous small patches of trees separated by cropping land, with an understorey that is dominated by exotic species and biomass).

An application to the Native Vegetation Council for approval to clear this vegetation will be submitted prior to the commencement of construction. Clearance will be offset in accordance with *Native Vegetation Act 1991* requirements.

Cultural Heritage

A desktop heritage assessment and Aboriginal heritage work area clearance survey of the subject site was completed to determine the presence of non-Aboriginal and Aboriginal archaeological material within the boundary of the subject site.

The review of the DSD-AAR Central Archive indicated there is potentially a reported site of Aboriginal heritage significance within the subject site. The DSD-AAR map provides the approximate locations of sites and does not reflect an accurate location of the site; as this will vary from site to site, depending on the site information contained in the Central Archive.

The Ngarrindjeri Heritage Committee completed a Work Area Clearance Survey of the site on 31 August 2017. This survey did not report on the existence or otherwise of the DSD-AAR reported site, therefore the actual location and existence of the 6727-3923 site remains unknown. However, the Ngarrindjeri Heritage Committee has issued a work area clearance for construction of solar infrastructure on the subject site (Ngarrindjeri Heritage Committee 2017).

The closest State heritage place (the former Lime Kilns) is located approximately 700 metres to the south of the subject site boundary and will not be impacted by the proposed solar project. The TB2SP will not impact upon any State or local heritage listed properties.

1. Introduction

Equis Energy (Australia) ('Equis', the applicant) is proposing the development of Stage 2 of the Tailem Bend Solar Project (TB2SP), which will have a generation capacity of up to 90MW_{AC} and is designed to be 'battery ready'. The proposed development represents a construction cost of $105 - 125 million and will adjoin Stage 1 of the Tailem Bend Solar Project (TBSP), to the north of Substation Road. Stage 1 of TBSP was approved on 4 May 2017, Development Number 571/V001/17.

This development application has been prepared by Jacobs on behalf of Equis for the development authorisation of the Tailem Bend Solar Project Stage 2, which is situated on private property identified as Allotment 100 and 101 Substation Road, Tailem Bend (the subject site). The location of the subject site, in relation to Adelaide and Tailem Bend, is shown in Figure 1-1

The subject site is located within the area of the Coorong District Council and is situated within the Urban Employment Zone of the Coorong District Council Development Plan (the Development Plan) (refer Figure 1-2).

Equis will lease the land for the TB2SP under a long-term lease arrangement from the land owner (for a minimum of 30-years, plus a 20-year extension). Stages 1 and 2 of the TBSP will operate in parallel to efficiently meet South Australia's electricity demand. The TB2SP has been endorsed by the Department of the Premier and Cabinet (DPC) on 7 November 2017 as public infrastructure, and this development application is submitted pursuant to *Section 49* of the *Development Act 1993* (refer to Appendix A).

To support the preparation of this development application, consultation has been undertaken with relevant project stakeholders including the Coorong District Council and the Development Assessment Commission. A letter of support from the Coorong District Council is provided in Appendix B.

This report has been prepared to support the development application for the proposed TB2SP at the subject site, and includes:

- An overview of the applicant's background and record as a developer of renewable energy projects (Section 2);
- A summary of the statutory requirements applicable to this development application and the alignment of the TB2SP with State and National strategic objectives (Section 3);
- A description of the subject site and project locality (Section 4);
- A detailed description of the proposed development (Section 5);
- A summary of the environmental impact assessment studies and the anticipated environmental impacts of the project (Section 6);
- An assessment of the proposed development against the relevant principles of the Coorong District Council Development Plan (Section 7);
- The proposed environmental management framework for the construction, operation and repowering/decommissioning of the TB2SP (Section 8);
- Endorsement of the TB2SP as 'public infrastructure' by the Department of State Development for assessment under Section 49 of the *Development Act 1993* (Appendix A);
- A letter from Coorong District Council in support of the proposed TB2SP (Appendix B);
- Certificates of Title for the subject site (Appendix C);
- An indicative site plan, locality plan, elevations and other relevant design information (Appendix D and Appendix E);

- Detailed technical investigations which have informed the preparation of this development application; including a Landscape Character and Visual Impact Assessment (Appendix F), a Preliminary Traffic Management Plan (Appendix G) and a Vegetation Assessment (Appendix H); and
- Relevant Coorong District Council Development Plan Policy (Appendix I).

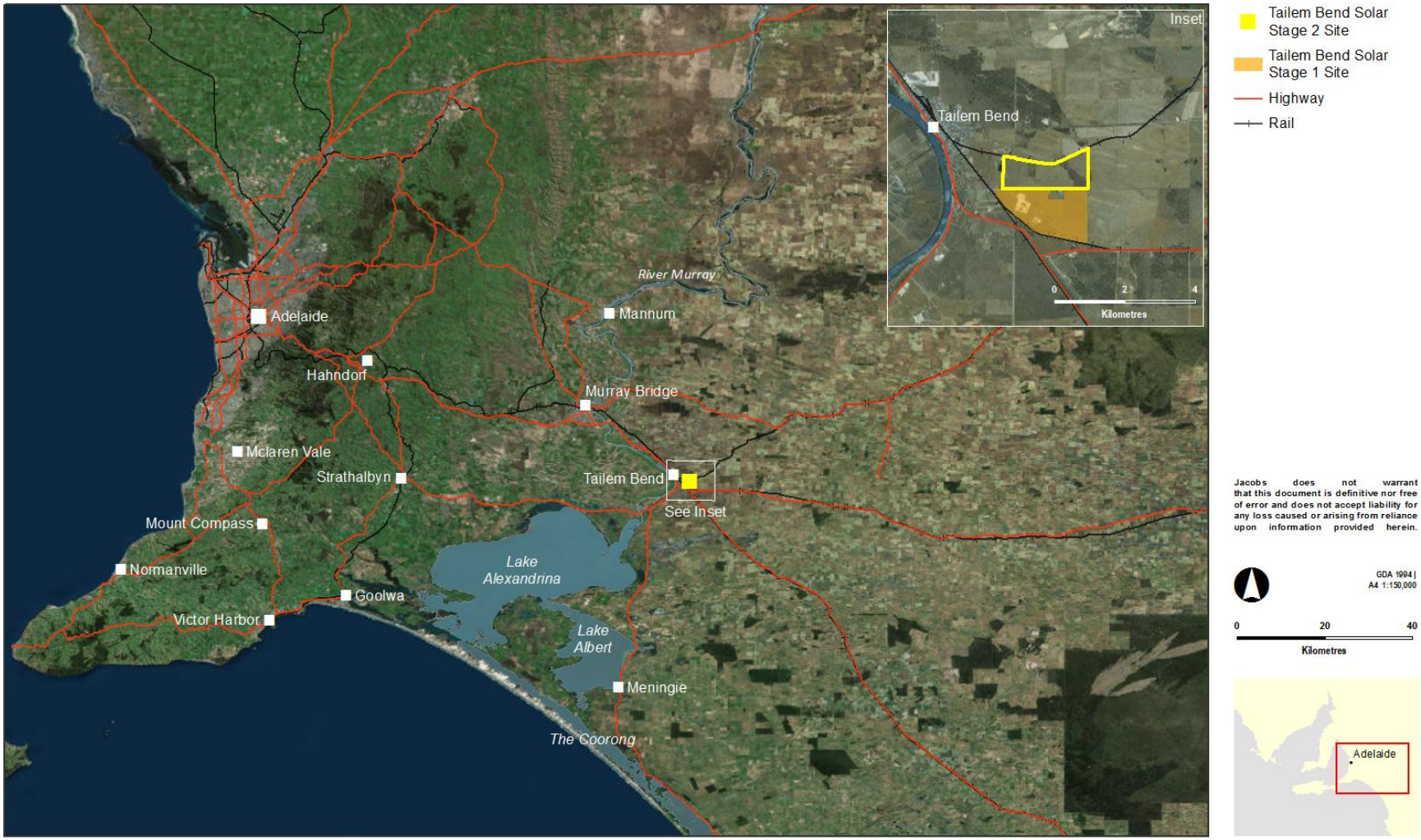

Figure 1-1 : Location of the Subject Site

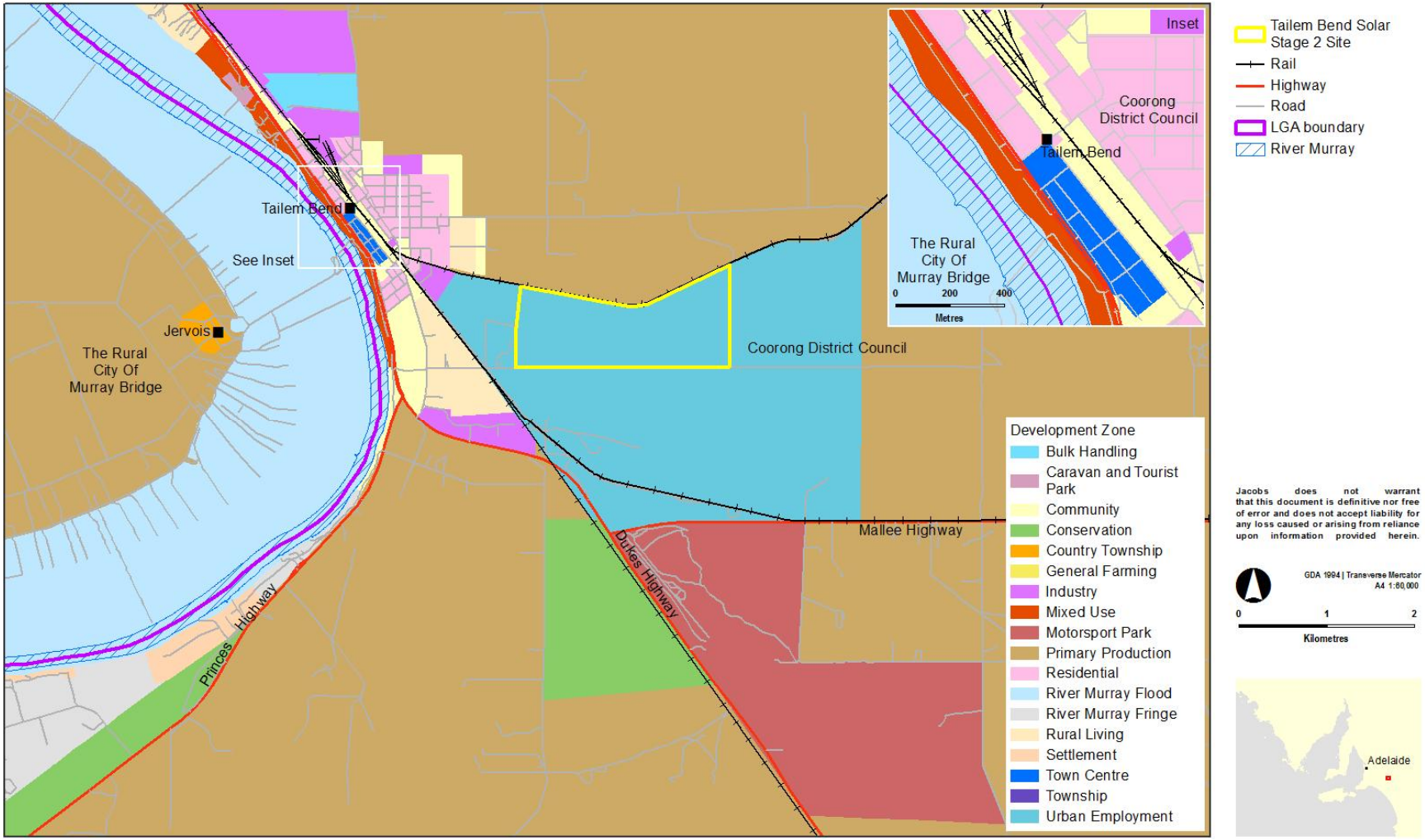

Figure 1-2 : Development Plan Zoning, Coorong District Council

2. The Applicant – Equis Energy (Australia)

Equis is Asia Pacific's largest independent renewable energy developer and investor. Equis builds, owns, and operates renewable energy generation assets and associated infrastructure. Equis currently owns over 1.2GW of operating renewable energy assets across Asia with a further 500MW of assets presently under construction (see Figure 2-1). Equis has a pipeline of over 1.4GW of solar projects expected to be constructed in the next two years.

Equis is a market leader with a diversity of projects across the major renewable energy sectors of solar, wind and hydro generation and across the various established Asian markets. Equis combines local development and construction teams with regional expertise and procurement power.

Equis operates from 15 offices, employing 272 professionals including 100 engineers and 35 local development professionals. In each country Equis employs local land, development, grid assessment, construction management and operations as well as monitoring experts. This positions Equis as Asia-Pacific's only renewable energy independent power producer with dedicated local management teams and leading market positions in each investable Asian market; namely Australia, India, Indonesia, Japan, Philippines, Taiwan and Thailand. Equis Energy (Australia) draws on this experience and is integrated into this regional Equis development platform.

Equis Energy (Australia) was formed in January 2016 by assembling leading Australian experts in development, construction and operations of renewable and conventional energy assets in the Australian market. The Australian team is actively developing a pipeline of over 2800MW of renewable energy assets in Australia and to date has successfully secured Development Approvals for solar projects totalling 1,277MW in South Australia and Queensland.

Equis has a strong track record in construction management and project delivery and has successfully commissioned approximately 547MW of utility scale solar generation capacity across Japan, the Philippines, India and Thailand. Specifically, Equis has:

- Completed 34 assets and has 11 assets under construction;
- Successfully commissioned 100% of its solar projects before the required or scheduled commercial operation dates in its respective power purchase agreements;
- Consistently delivered strong cost management across geographies with most projects delivered within or under budget; and
- A track record of completing 100% of assets which have commenced construction.

Equis' first project in Australia is the TBSP (Stage 1), a 108 MW_{AC} solar photovoltaic (PV) facility located in South Australia adjoining the subject site. The project will be one of the first utility scale solar projects in Australia that will be developed without the need for Australian Renewable Energy Agency (ARENA) funding. Equis has obtained approval from the Government of South Australia for public infrastructure pursuant to Section 49 of the *Development Act 1993.* Construction of the TBSP will commence in the first quarter of 2018.

Within Queensland, Equis' has received approval for two projects: the 120MW_{AC} Collinsville North Solar Project, which is currently under late-stage project development; and the Wandoan South Solar Project, located within the Western Downs Regional Council area. The Wandoan South Solar Project has a total project capacity of between 650MW_{AC} (via single-axis tracking) to one GW (via fixed tilt racks) and includes battery storage capacity of up to 150MW_{AC} and two hours of storage, per stage.

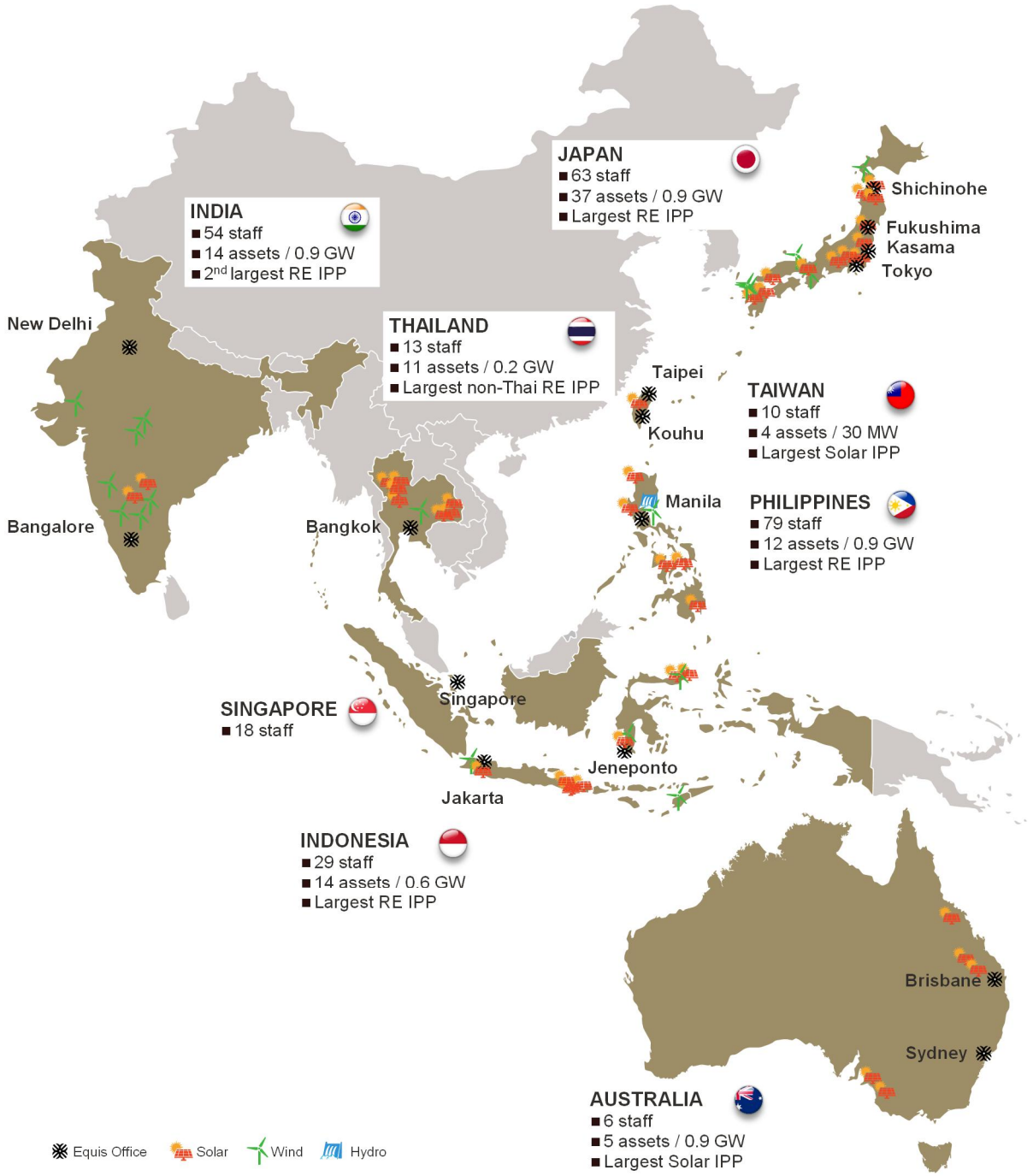

Figure 2-1 : Equis project locations

Equis has in-house expertise in the design, procurement, construction management and operation of renewable generation facilities. Additionally, Equis is a large customer to the major engineering, procurement and construction contractors and renewable energy technology equipment providers.

Equis is not a passive investor. Equis builds businesses and projects, and requires members of the investment team to take active roles in corporate governance, whilst participating in each stage of the development and construction process. This provides Equis with the necessary strengths to establish an average of one renewable energy asset every five weeks since October 2013.

3. Statutory Requirements

This section identifies the key approval requirements for construction and operation of the TB2SP. It also considers the strategic alignment of the TB2SP with relevant National and State policy objectives.

3.1 Approval Process

This development application is submitted pursuant to Section 49 of the *Development Act 1993* with the endorsement of DPC (refer to Appendix A for DPC endorsement letter).

Under Section 49, public infrastructure incorporates '… infrastructure, equipment, structures, works and other facilities used in or connection with the supply of… electricity…'.

The *Development Act 1993* defines infrastructure for the purposes of electricity generation as 'electricity infrastructure, in accordance with the definition provided in Section 4 of the *Electricity Act 1996*'. The establishment of the TB2SP at the subject site represents the development of **Electricity Infrastructure**:

> ***Electricity Act 1996, Section 4, Electricity Infrastructure*** means—
>
> *a) electricity generating plant; and*
>
> *b) powerlines; and*
>
> *c) substations for converting, transforming or controlling electricity; and*
>
> *d) equipment for metering, monitoring or controlling electricity; and*
>
> *e) any wires, equipment or other things (including tunnels and cavities) used for, or in connection with, the generation, transmission, distribution or supply of electricity; and*
>
> *f) anything declared by regulation to form part of electricity infrastructure,*
>
> *but does not include anything declared by regulation not to form part of electricity infrastructure.*

The Section 49 process is considered to be the appropriate approval process for the development as the TB2SP is an 'electricity generating plant' and incorporates 'substations for converting, transforming or controlling electricity'.

The electricity generated from TB2SP will be provided for public usage and represents a service historically provided by the State. The Minister (or delegate) is the relevant authority for applications submitted pursuant to Section 49. The Development Assessment Commission supports this process through assessment of the application and the preparation of a report to the Minister. The Minister (or delegate) may, after receiving a report from the Development Assessment Commission, approve or refuse the development.

3.1.1 Public Notification

The proposed development has an estimated cost of construction of $105 to $125 million. Accordingly, public notification for a period of 15 business days is required pursuant to subsection 49(7(d)) of the *Development Act 1993* as the cost of the proposed development is greater than $4 million.

3.1.2 Statutory Referrals

In accordance with Section 49 of the *Development Act 1993*, and Schedule 8 of the *Development Regulations 2008*, the following statutory referrals will be required:

- **Commissioner of Highways** – the TB2SP will temporarily change the nature of movement at two access points from arterial roads during the construction period to facilitate the delivery of project components; and
- **Coorong District Council** – the TB2SP is proposed within the Coorong District Council and a referral is required.

The statutory referrals will be facilitated by the Development Assessment Commission following lodgement of this development application.

3.2 Additional Approvals

A range of additional approvals will be required prior to the construction and operation of the TB2SP, including:

- Approval for the clearance of native vegetation required to construct the solar plant, in accordance with Section 27 of the *Native Vegetation Act 1991.* The native vegetation clearance application will be submitted separately to the Native Vegetation Council prior to the commencement of construction;
- Network connection agreement to connect the TB2SP to the adjacent substation in accordance with the National Electricity Rules; and
- Electricity Generation Licence for connection to the National Electricity Market in accordance with the requirements of the *Electricity Act 1996*.

Other approvals (e.g. heavy vehicle permits) may be required subject to the construction methodology of the construction contractor and will be obtained by the appointed contractor prior to the commencement of construction.

3.3 Strategic Alignment

The TB2SP will provide various economic and energy security benefits to South Australia, which in turn support the attainment of a range of identified state and national strategic priorities. The TB2SP will:

- Support regional energy supplies;
- Provide a stimulus to the local economy; and
- Contribute to the overall reduction of South Australia's greenhouse gas emissions through the growth of renewable energy sources.

3.3.1 Alignment with National Policy Objectives

The TB2SP will complement and increase the generation of renewable energy within South Australia and the broader National Electricity Market. Australia's Renewable Energy Target (RET) emphasises the need to reduce greenhouse gases, specifically in the electricity generation sector through the encouragement of additional sustainable and renewable sources. The RET targets both large-scale and small scale renewable generation. The RET envisages that by 2020, 20 percent of Australia's electricity supply will be derived by renewable sources. The proposed TB2SP supports the achievement of the RET through generation of additional renewable energy. The alignment of the TB2SP with the various components of the RET are identified in Table 3-1.

Table 3-1 : TB2SP Alignment with the Renewable Energy Target

Objective/Target	Project Alignment
20 per cent of Australia's electricity supply will be derived from renewable energy sources by 2020. Minimum of 33,000 Gigawatt-hour (GWh) of Australia's electricity comes from renewable sources by 2020.	Establishment of up to 90MW$_{AC}$ of renewable energy generation within the South Australian market (200 GWh). New renewable energy generation taking advantage of South Australia's solar resources.

Objective/Target	Project Alignment
15,200 new jobs between now and 2030.	Job creation and opportunities for local contractors / suppliers during construction phase and ongoing maintenance. The construction workforce is estimated to have a peak of 100 - 150 people over the 9-month construction period. During operations, 1 - 3 full-time staff are expected to be employed at the site in addition to a few part-time and contract staff for specialist electrical skills, module cleaning and other maintenance requirements.
$40.4 billion in new investment, $10 billion in large-scale, $30.4 billion in small-scale.	Investment of $105 to $125 million in regional South Australia. Opportunities for local contractors / suppliers during construction phase and ongoing maintenance.
Enough electricity to power the equivalent of at least 5 million average homes per year.	Additional local (South Australian) generation. Reduced reliance on interstate supply via the interconnector. Generation of enough electricity to power the equivalent of 36,000 average South Australian homes per year.

3.3.2 Alignment with State Policy Objectives

The TB2SP will provide several economic and energy security benefits to South Australia which in turn support the attainment of a range of State strategic priorities. The State strategic priorities are identified within the following documents:

- SA Strategic Plan (Government of South Australia, 2011) – the overarching strategic plan, providing a blueprint for the development of the State;
- SA's Ten Economic Priorities (Government of South Australia 2016) – the top economic focus areas identified as growth areas within the State;
- Strategic Infrastructure Plan for South Australia (Government of South Australia, 2005) – the overarching State framework for the planning and delivery of infrastructure; and
- SA Low Carbon Investment Plan (Government of South Australia, 2014) – the key strategies identified by the State to support current and future low carbon investments.

The alignment with each of these plans is summarised in Table 3-2.

Table 3-2 : TB2SP State Policy Alignment

Objective/ Target	Project Alignment
State Strategic Plan	
Target 38: Business investment Exceed Australia's ratio of business investment as a percentage of the economy by 2014 and maintain thereafter.	Investment of $105 to $125 million in regional SA. Opportunities for local contractors / suppliers during construction phase and ongoing maintenance.
Target 47: Jobs Increase employment by 2% each year from 2010 to 2016.	Job creation and opportunities for local contractors / suppliers during construction phase and ongoing maintenance. The construction workforce is estimated to have a peak of 100 - 150 people over the 9-month construction period. During operations, 1 - 3 full-time staff are expected to be employed at site in addition to a few part-time and contract staff for specialist electrical skills, module cleaning and other maintenance requirements.
Target 49: Unemployment Maintain equal or lower than the Australian average through to	Job creation and opportunities for local contractors / suppliers during construction phase and ongoing maintenance.

Objective/ Target	Project Alignment
2020.	The construction workforce is estimated to have a peak of 100 - 150 people over the 9-month construction period. During operations, 1 - 3 full-time staff are expected to be employed at site in addition to a few part-time and contract staff for specialist electrical skills, module cleaning and other maintenance requirements.
Target 59: Greenhouse gas emissions reduction Achieve the Kyoto target by limiting the states greenhouse gas emissions to 108% of 1990 levels during 2008-2012, as a first step towards reducing emissions by 60% (to40% of 1990 levels) by 2050.	Additional local (South Australian) generation. Reduced reliance on interstate supply via the interconnector. Establishment of up to 90MW_{AC} of renewable energy generation within the South Australian market (200 GWh).
Target 64: Renewable energy Support the development of renewable energy so that it comprises 33% of the state's electricity production by 2020.	Additional local (South Australian) generation. Reduced reliance on interstate supply via the interconnector. Establishment of up to 90MW_{AC} of renewable energy generation within the South Australian market (200 GWh).
Target 66: Emissions intensity Limit the carbon intensity of total South Australian electricity generation to 0.5 tonnes of CO2/MWh by 2020.	Establishment of up to an additional 90MW_{AC} of renewable energy generation within the South Australian market (200 GWh).
SA's Ten Economic Priorities	
Unlocking our resources: Unlocking the full potential of South Australia's resources, energy and renewable assets.	New renewable energy generation taking advantage of South Australia's solar resources.
Low Carbon Investment Plan for SA	
Strategy 1: Clear Policy and Efficient Regulatory Environment Target of $10 billion in low carbon investment and 50 per cent of electricity production by renewable energy by 2025 To support the uptake of solar energy.	Investment of $105 to $125 million in low carbon electricity generation in regional South Australia. Establishment of a large scale solar project in regional South Australia.

4. Subject Site and Project Locality

The subject site is located approximately 1.5 km south-east of Tailem Bend and 90 km south-east of Adelaide (Plate 4-1 and Figure 1-1) and adjoins the TBSP to the north via Substation Road. The subject site is presented in Plate 4-2 and Plate 4-3, with the key details of the subject site provided in Table 4-1.

Table 4-1 : Details of the Subject Site

Feature	Description
Formal description:	Allotment 100 and 101 Substation Road, Tailem Bend (Plate 4-2 and Plate 4-3).
Ownership details:	The subject site is located on privately owned land defined by two Certificates of Title: • Certificate of Title Volume 5864 Folio 516 – Allotment 100 Deposited Plan 58321 in the Hundred of Seymour; and • Certificate of Title Volume 5864 Folio 517 – Allotment 101 Deposited Plan 58321 in the Hundred of Seymour. Equis will lease the land for the TB2SP under a long-term lease arrangement (30-years and 20-year extension option). A copy of the Certificates of Title for the subject site is presented in Appendix C.
Site area:	The subject site is irregular in shape and approximately 207.3 ha.
Existing land uses and infrastructure on the subject site:	The subject site has been historically used for agricultural purposes for grazing and rural activities. Existing high voltage transmission lines are present within registered easements in the eastern portion of the site connecting to the ElectraNet substation (refer to Figure 4-1). These are located to the north of the substation with one running parallel to the site, another large easement within the south-eastern corner of the lot which runs diagonally across the site. In total, there are four registered easements, which have been avoided by the layout of the TB2SP: • D – Minister for Infrastructure – T 3326110; • B – ETSA Corporation – T 3504219; and • A & C – Transmission Lessor Corporation (Subject to Lease 9061500) and ElectraNet Pty Ltd – T 2435051 & T 6624676. An uninhabitable dwelling is present within the subject site, located in the central portion of the site (refer to Figure 4-1 and Plate 4-2).
Surrounding land uses:	The site is bound by: • Tailem Bend – Loxton Railway (disused) to the north; • Substation Road to the south; • Private properties and Lime Kiln Road to the west; and • Private properties to the east. The subject site has a frontage to Substation Road of approximately 2.8 kilometres and adjoins the railway (Tailem Bend – Loxton) to the north for approximately 2.9 kilometres. The surrounding land use is predominately agricultural, with scattered rural dwellings evident within the sites vicinity. There is also a Motorsport Park under development approximately 1.7 km to the south of the subject site. Existing SA Power Networks and ElectraNet substations are located adjacent to the southern boundary of the subject site. The TB2SP network connection would be made to the ElectraNet substation. A local radio tower is present within one kilometre of the subject site.
Local road network:	The Mallee Highway runs east-west, approximately 1.8 kilometres south of the subject site. The Dukes Highway runs from the north-west to the south-east, with the closest point approximately one kilometre south of the subject site. Immediately to the west of the site are Lime Kiln, Adelaide and Magpie Roads which offer connection to local and distributer connection roads. The connections to the road network from the subject site are shown in Figure 4-3.
Potential sensitive receivers:	The closest sensitive receiver is a dwelling to the south-west of the project footprint, approximately 100 metres from the subject site. The next closest is a dwelling is approximately 140 metres from the subject site located to the east of the south-eastern corner.

Feature	Description
	There are approximately a further five dwellings within one kilometre of the subject site. Surrounding residential dwellings which are potential sensitive receivers are presented in Figure 4-4. Consultation with the Coorong District Council has indicated that a new land division has been approved on Ross Road (to the north west of the subject site) for Rural Living purposes, with a dwelling approved on one of the allotments (as at 12 December 2017, R Lucas 2017, personal communication).
Vegetation:	The subject site is predominantly cleared due to historical clearing on the land, which has been utilised for cropping and pasture. Scattered patches of degraded remnant native vegetation comprising approximately 22 hectares (ha) and approximately 53 scattered remnant individual trees are present within the subject site. The development footprint for the TB2SP maximises retention of the patches of remnant vegetation. No flora or fauna species or Threatened Ecological Community listed under the *Environment Protection and Biodiversity Conservation Act 1999* are likely to be present or significantly impacted by the proposed solar project. A referral under the provisions of the Act is not required.

Plate 4-1 Tailem Bend: closest town to subject site

Plate 4-2 View of the subject site from Substation Road, showing the uninhabitable dwelling located in the central portion of the site

Plate 4-3 View of subject site from Substation Road, showing high voltage transmission lines and patches of vegetation

Plate 4-4 Substation Road, located adjacent to subject site

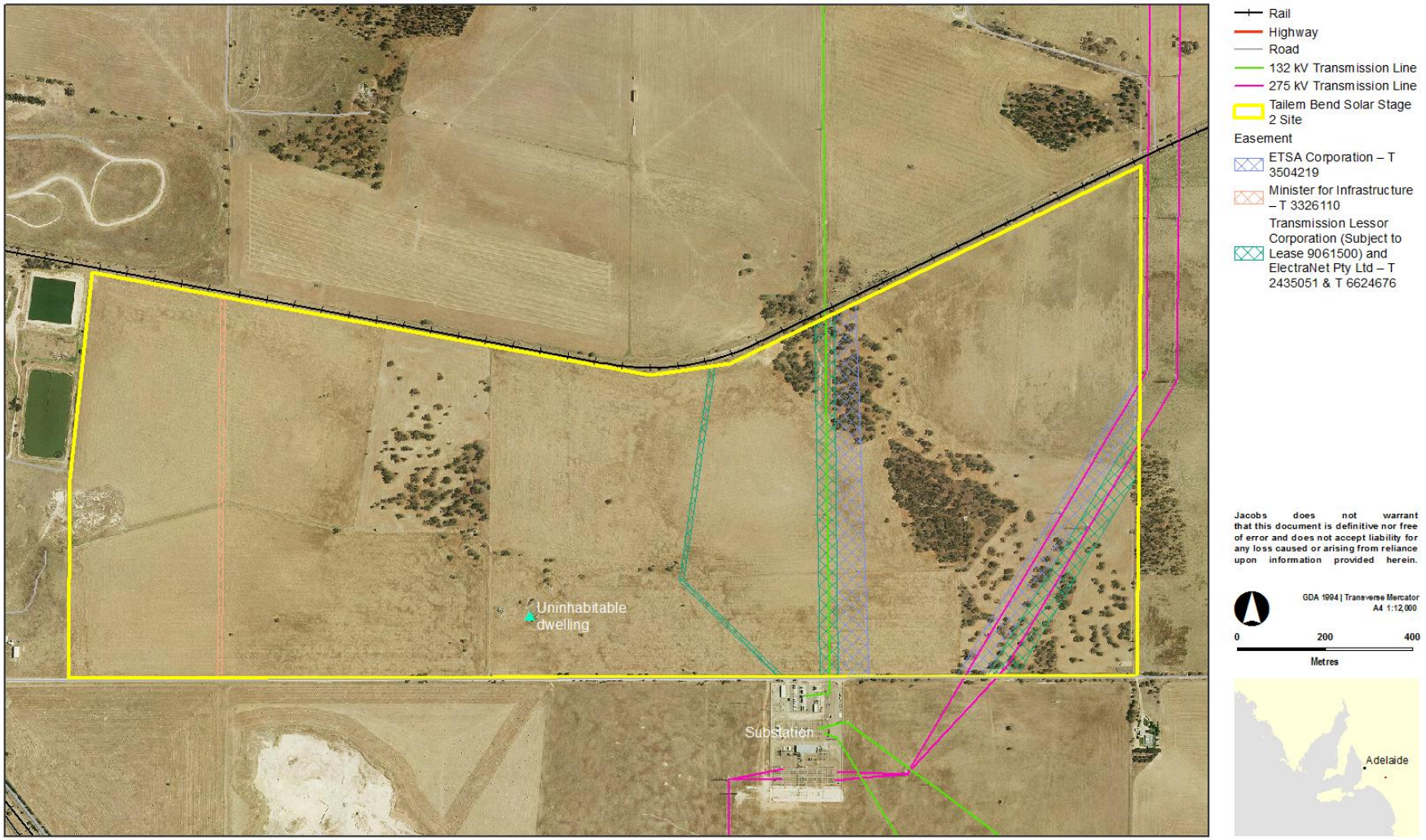

Figure 4-1 : Existing Land Use and Infrastructure

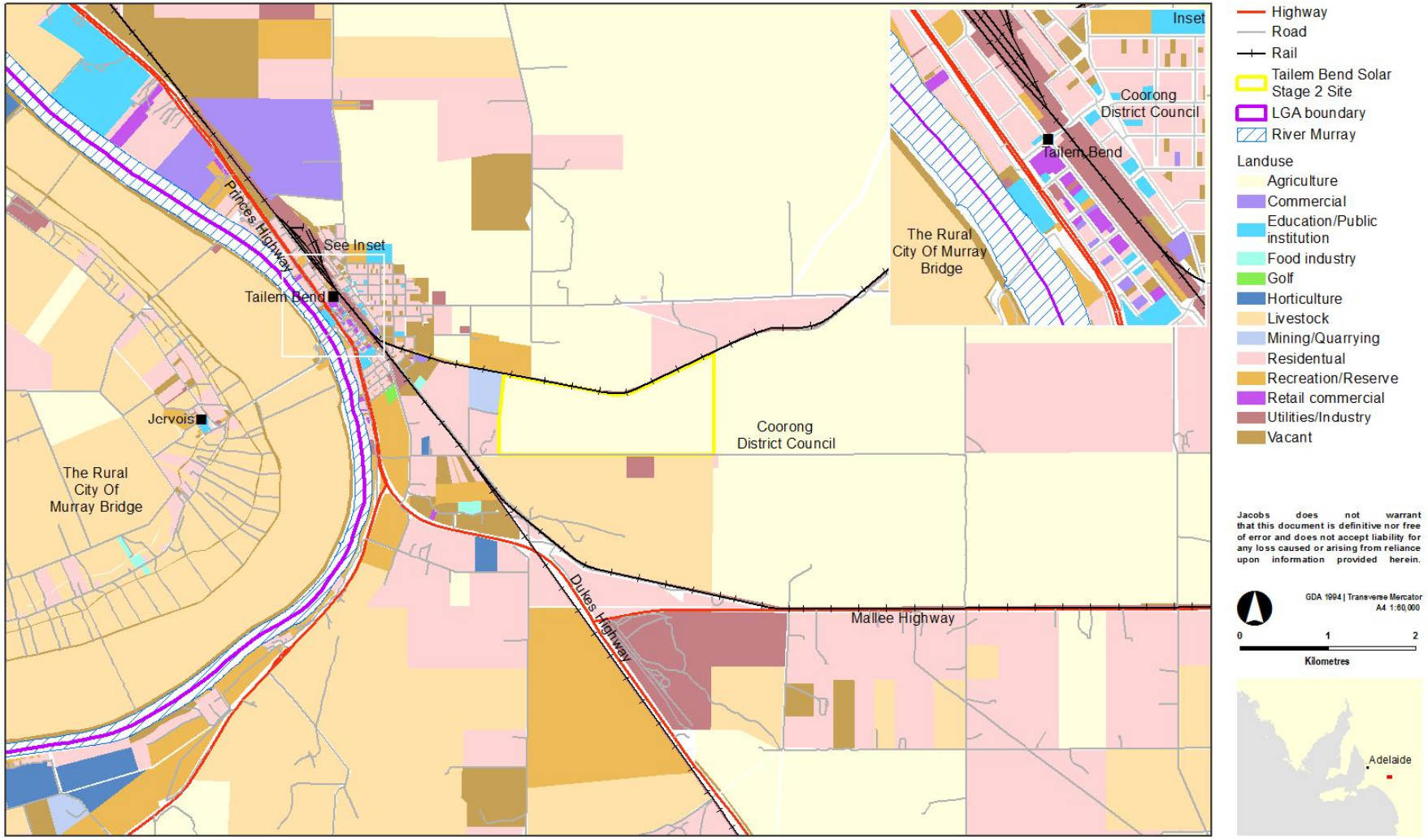

Figure 4-2 : Surrounding Land Use

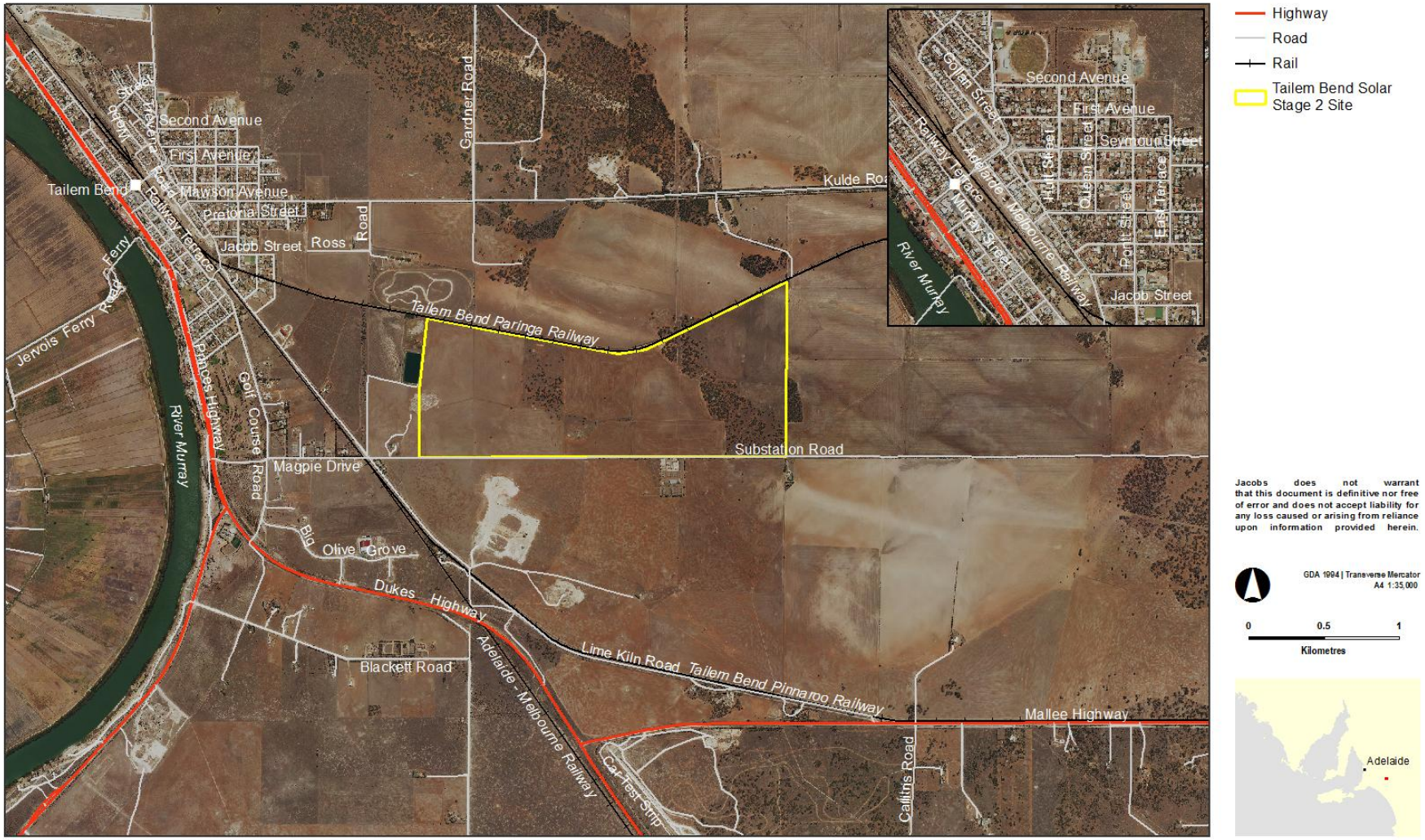

Figure 4-3 : Local Road Network

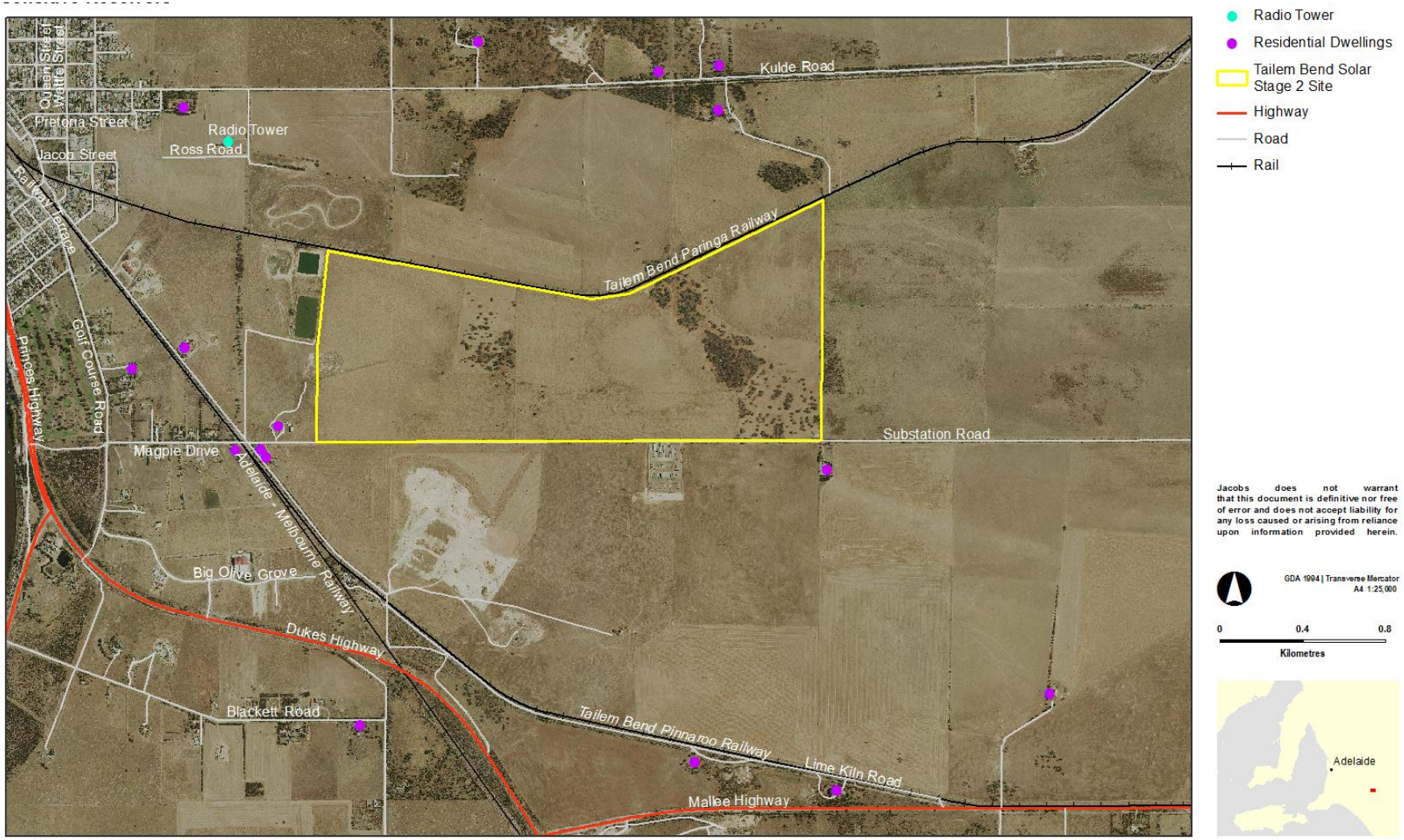

Figure 4-4 : Potential Sensitive Receivers

5. Description of the Development

The proposed TB2SP involves establishing a solar photovoltaic power station with a generation capacity of up to 90MW$_{AC}$ and associated ancillary infrastructure. The proposed development is designed to accommodate battery installation that has capacity to store up to 100MW and three hours of storage capability. The TB2SP will service electricity demand in South Australia and will contribute to reducing greenhouse gas emissions within Australia.

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

Groups of solar panels are connected to each inverter and the inverters are linked together to collect the total energy being produced. Step-up transformers, that increase the voltage to 33kV, are housed in the inverter containers. Underground cables are run from each inverter station to the 33kV switchgear inside the control room at the TBSP facility substation (separate Development Approval 571/V004/16) on the southern side of Substation Road where the voltage is again stepped up via one or more transformers to match the voltage of the transmission network.

The solar panels will be mounted on single-axis tracking racks to collect and convert solar energy into electricity. The panels will be installed in parallel rows, with approximately 4.5 metres spacing between each row. A detailed overview of solar technology and a description of the single axis-tracking panels is provided in Section 5.1.2.

Ancillary infrastructure is included as part of the proposed TB2SP to support the functions of the solar technology. Ancillary infrastructure elements are described in Section 5.1.1 and described further in Sections 5.1.3 to 5.1.12. The TB2SP will include an administration/controls compound area of approximately half a hectare located near the southern boundary of the subject site. The compound will be set back 10 metres from the frontage of Substation Road, in accordance with the setback guidelines under the Coorong District Council Development Plan, near the primary operational access point for the site and will include battery storage, administration, workshop and associated buildings. An indicative layout of the administration/controls and laydown/compound areas is illustrated in Figure 5-1.

The indicative project layout (Appendix D) depicts the TB2SP covering the majority of the subject site; avoiding approximately 20.7 ha of remnant native vegetation which is to be maintained and protected. The final layout of the project is anticipated to utilise approximately 186.3 ha of the 207 ha subject site, for a total generation capacity of up to 90MW$_{AC}$. As detailed in Section 5.1.12 the final project layout depends on a number of factors and will be determined during detailed design.

5.1 Proposed Layout and Key Components

The TB2SP incorporates the solar plant and supporting ancillary infrastructure. Each major component of the proposed development is identified and discussed in further detail below.

5.1.1 Summary components

The proposed development incorporates the following elements (refer to Appendix D for layouts and elevations):

- Solar modules with Single-axis tracker mounting systems;
- Module footings;

- Inverter stations;
- Associated underground cables connecting groups of solar panels to inverter stations and inverter stations to the 33kV switchgear in the TBSP facility substation on the south side of Substation Road (noting the facility substation is part of a separate Development Approval 571/V004/16);
- Administration/controls and laydown compound area including:
  - Future battery storage;
  - Combined control room and administration building with amenities;
  - Operation & maintenance workshop building;
  - Car parking sufficient for employees and contractors during operation of the TB2SP;
- Drainage works, including stormwater management systems;
- Security fencing and CCTV installation;
- Low-level night time lighting;
- Lightning protection;
- Crossovers from Substation Road and internal access roads; and
- Demolition of an uninhabitable dwelling and any ancillary structures located on the subject site.

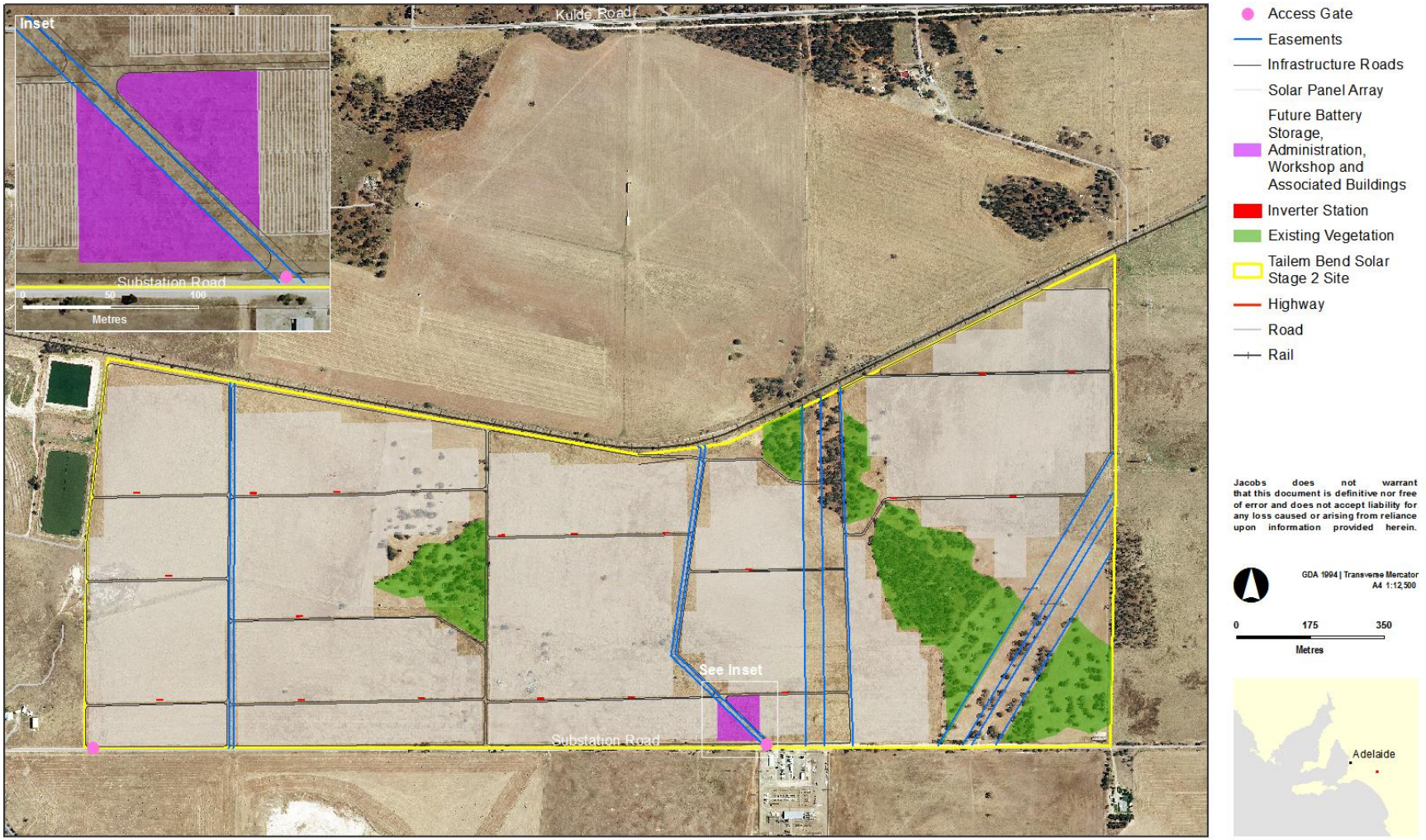

Figure 5-1 : Indicative Layout of the Administration/Controls and Laydown Compound Area

5.1.2 Solar Technology

The proposed solar technology has been designed and sited to minimise impacts from glare or glint, while maximising generation capability.

Solar panels (modules) are designed to absorb sunlight, not reflect and are coated with a layer of anti-reflective material that allows the sunlight to pass through but minimises reflection. The operation of solar technology produces minimal glare, as reflected light is contradictory to efficient generation of electricity. Data sheets for indicative modules are provided in Appendix E.

Design measures to minimise glare/glint impacts from the solar technology include:

- Coating the solar panels with a layer of anti-reflective material which allows for sunlight to pass through to the silicon; and
- Minimising the thickness of the aluminium frame on the solar panels.

The indicative solar panel design and layout plans are attached in Appendix D and are discussed in further detail below.

5.1.2.1 Single-axis Tracking Solar Panels

The solar panels will be mounted on single-axis tracker structures. The single-axis tracking mounting system allows the panels to track the sun from east to west across the sky over the day. These systems are higher in cost (for both purchase and maintenance) due to the number of moving components, however they allow the capture of more of the sun's energy and hence produce more generation than fixed-tilt mounting systems.

The typical height of the bottom of the solar modules will be 0.5 to 0.8 metres above ground level. The maximum height of modules is expected to be 3 metres above ground level. The panels will be installed in parallel rows, with approximately 4.5 metre spacing between each row.

Indicative design schematics are shown in Figure 5-2 and Figure 5-3, with preliminary designs anticipating an above ground height of 2.42 metres. The final height of the technology will be determined and confirmed during the detailed design phase.

Data sheets for indicative single-axis trackers are provided in Appendix E.

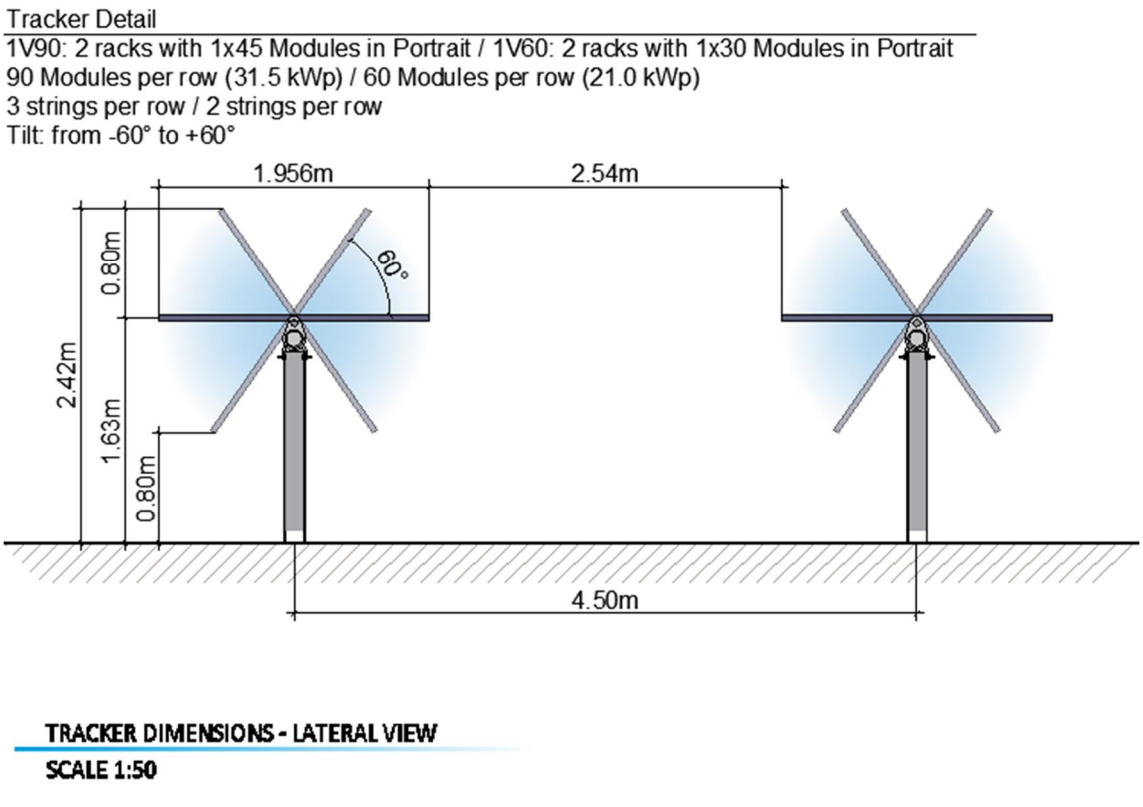

Figure 5-2 : Single-axis Tracking Panel Solar Photovoltaic Modules: Lateral View (preliminary design)

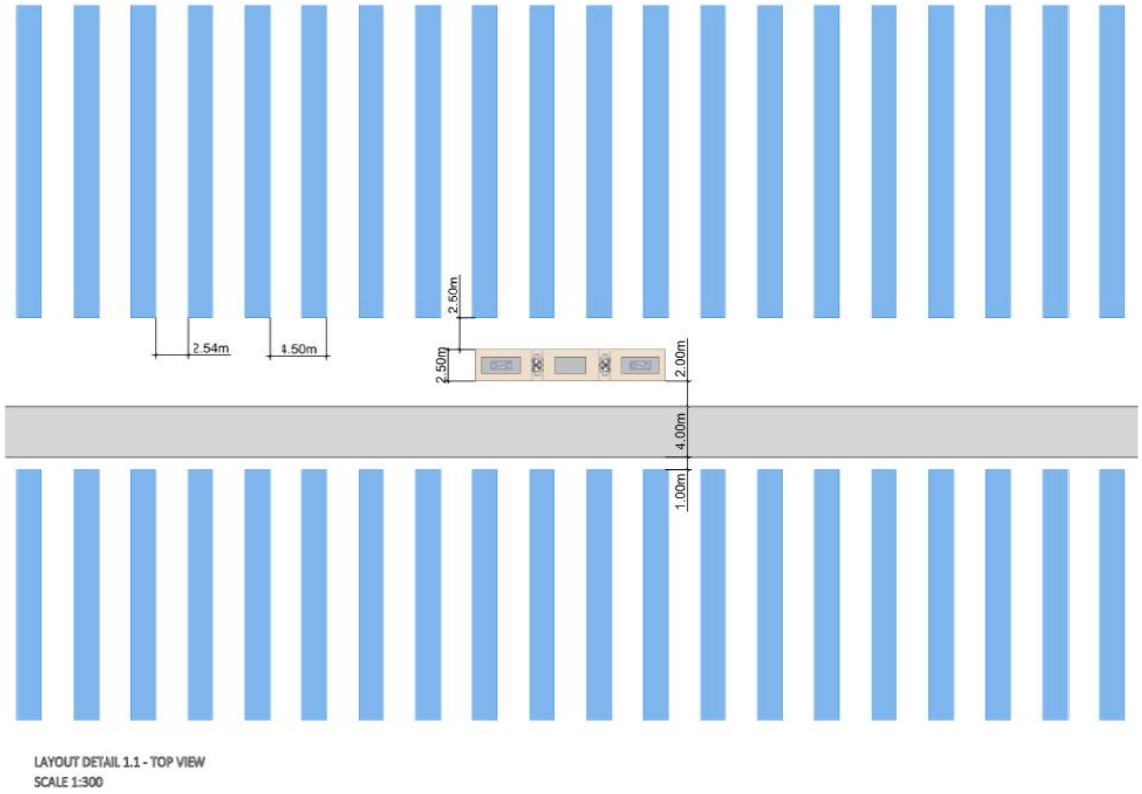

Figure 5-3 : Single-axis Tracking Tilt Module Layout (preliminary design)

5.1.2.2 Module Footings

The footing type to be used for the modules will be either screw piles, driven piles (with or without pre-drilling), concrete footings or a combination of these types (such as driven piles with concrete filling) dependent on the geotechnical conditions across the subject site. Module footing options are shown in Figure 5-4. Final footing selection will be determined during detailed design subject to geotechnical investigations.

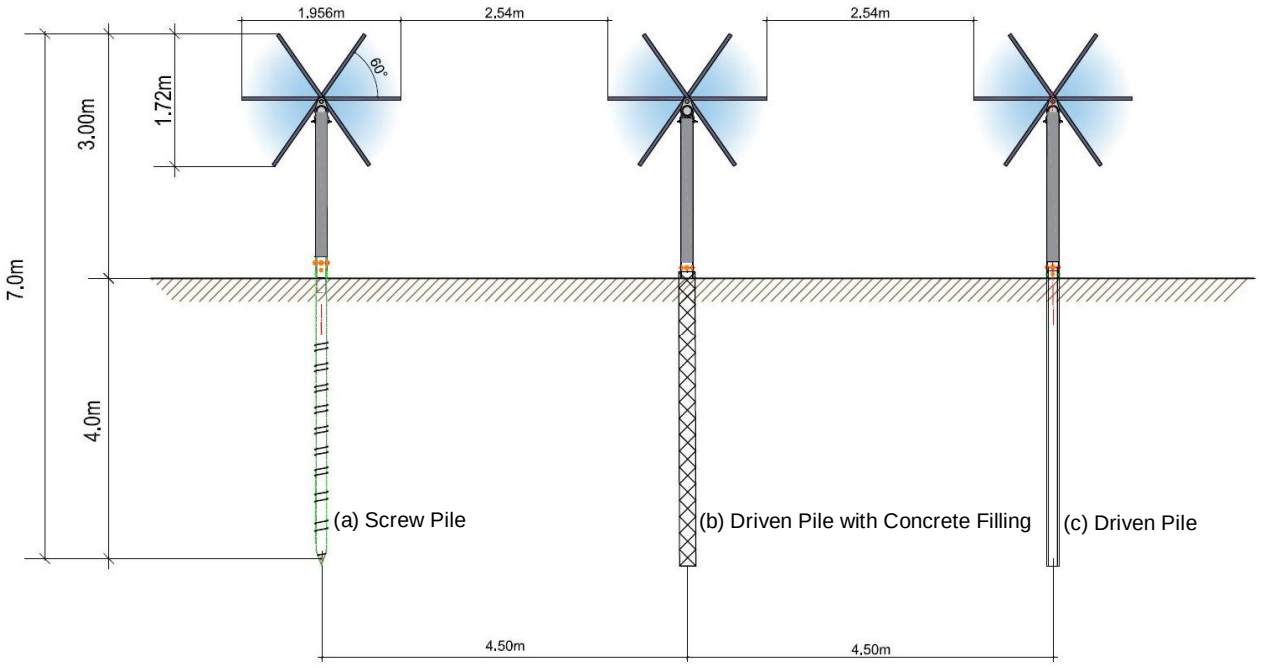

Figure 5-4 : Solar module footing options (to be determined following geotechnical investigations)

5.1.3 Inverter Stations

The solar panels produce energy in the form of direct current (DC), which is converted to alternating current (AC) via solar inverters, to allow the solar generated energy to be fed into the electricity grid. Utility-scale inverters harvest the maximum power from the solar photovoltaic array over a wide range of operating conditions (e.g. solar irradiation, temperature and shading). High quality units require less frequent maintenance and have greater reliability, including some degree of redundancy by compartmentalising key components so that if faults occur they only reduce capacity, thus avoiding the complete system shutting down.

The final type, design and therefore quantity of the inverter stations to be used for the TB2SP are yet to be confirmed. Final selection will be dependent on relative cost, efficiency and reliability of units available on the market at the time of detailed design phase.

However, it is expected that the inverter units will not exceed a height of three metres. The final selection of inverters will identify the units most appropriate for the site to minimise maintenance requirements and have greater reliability, including some degree of redundancy.

The indicative site layout, attached as Appendix D, identifies preliminary location of the inverters throughout the subject site. Data sheets for indicative inverters are provided in Appendix E. A typical 4.4MW inverter station includes the following characteristics; height of 2.5 metres, length of 11.5 metres and width of 1.5 metres as shown in Figure 5-5.

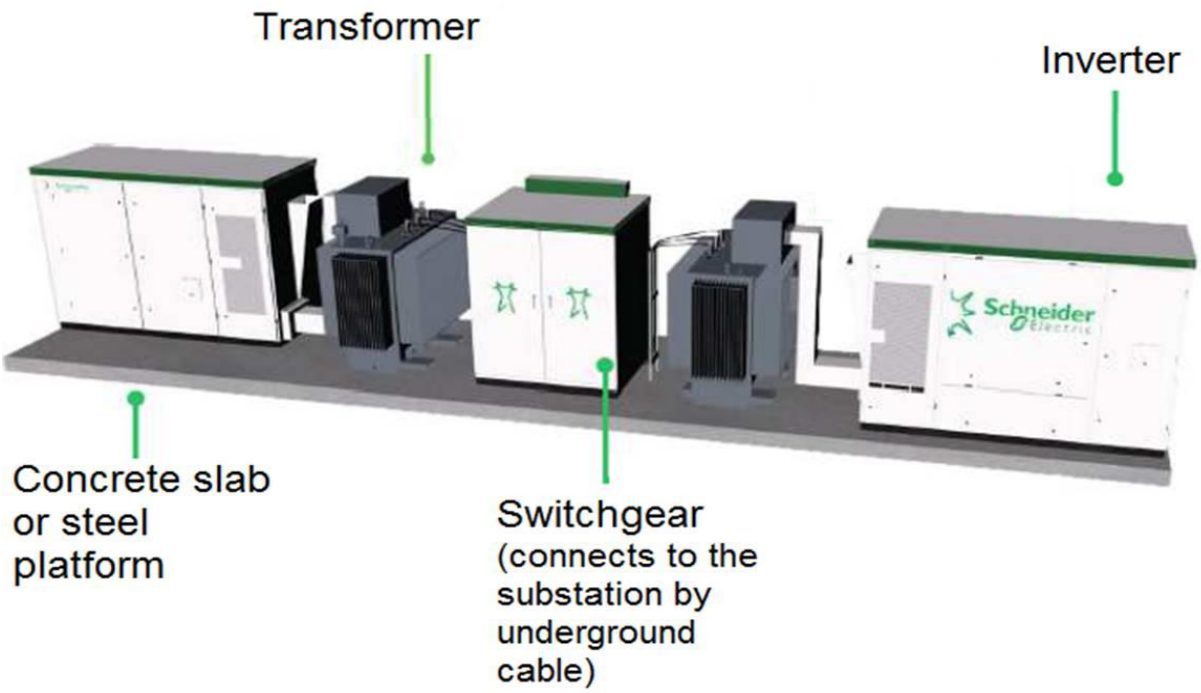

Figure 5-5 : Schematic showing a typical 4.4MW inverter station

5.1.4 Connections

Groups of solar panels are connected to each inverter by underground or above-ground cabling and the inverters are linked together to collect the total energy being produced. Step-up transformers, that increase the voltage to 33kV, are attached to the inverter units.

The solar energy generated from the TB2SP will be exported to the transmission network. Underground cables will run from each inverter station to the 33kV switchgear inside the switch room at the TBSP facility substation (separate Development Approval 571/V004/16) on the southern side of Substation Road, where the voltage is again stepped up via one or more transformers to match the voltage of the transmission network. The TBSP facility substation was designed to accommodate the anticipated capacity of the TB2SP. The two power transformers within the TBSP facility substation will step up the 33kV voltage to 132kV transmission network voltage. A plan showing the proposed cable route to the facility substation is provided in Appendix D.

Existing SA Power Networks and ElectraNet substations are located within a single compound adjacent to the southern boundary of the subject site (opposite the TBSP). The TBSP network connection will be made to the ElectraNet substation via the TBSP facility substation (note the facility substation and connection to the ElectraNet substation are part of Development Approval 571/V004/16). Equis will be the contracting party with ElectraNet for the grid connection such that ElectraNet will have a single point of contact and single metering point for the connection of the solar plant.

The existing substations adjoining the Stage 1 TBSP are shown in Plate 5-1.

Plate 5-1 Existing substation and transmission / distribution lines located on the south side of Substation Road

5.1.5 Administration/Controls and Laydown Compound Area

An indicative layout of the administration/controls and laydown compound area is shown in Figure 5-1. Note the final design for the project is subject to a range of factors as detailed in Section 5.1.12.

The administration and controls functions will be incorporated in a single building which will be set back 10 metres from the Substation Road frontage and sited near the primary site access point to allow for ease of access of the workforce and to maximise the area available for solar panels. Amenities, associated buildings, car parking and battery storage will also be provided in the administration and controls area.

The laydown compound area will be temporary in nature and will occupy approximately half a hectare. It will be located on the Substation Road frontage immediately south of the administration/controls area. During construction, this area will be used as a laydown and storage area and will also house administration workshops and associated buildings during this phase.

Key elements of the administration and laydown compound areas are described in the following sub-sections.

5.1.5.1 Administration and Controls Building

A single building is proposed to provide for administration and controls functions for the TB2SP. The proposed administration and control building will be a single storey structure, with the overall height under six metres. The building will be the administrative and control centre for the TB2SP, and will house permanent staff associated with the facility.

A preliminary layout and elevation drawing of the administration and controls building is provided in Appendix D.

5.1.5.2 Car Parking

Car parking will be located within the vicinity of the administration building and will accommodate staff, visitor and temporary contractor parking. Following sign-in to the site, contractors/tradespeople required to access the solar fields will drive their vehicle directly to the site of work and will not require a formal car parking area.

5.1.5.3 Amenities

The administration and controls area will be connected to the mains water and electricity supply present at Substation Road to provide amenities for the administration and control building. A suitably sized sewage treatment system will be installed to manage wastewater from the amenities.

5.1.5.4 Battery Storage

Battery storage is proposed at the TB2SP for the storage of solar energy to allow the facility to inject power during grid disturbance whenever the grid requires such services and to be used as a generator during times of peak demand. The battery storage area is expected to include a combination of solid structures (to house the batteries) and a range of cables and overhead conductors. The specific height of structures within the battery storage area is yet to be determined, but is expected not to exceed 8.5 metres in height.

Advances in battery storage technology have been continuous and rapid. Commercial scale battery storage is a relatively new technology that is rapidly evolving and decreasing in cost. As such, battery storage at the TB2SP may be installed upfront to provide grid support and/or established at a later date when it is commercially viable to do so. The preferred battery storage option for the project (and more broadly for the electricity network) may be a technology solution that is not immediately available and the battery storage technology to be implemented for the TB2SP is not yet finalised, meaning the total area, location and battery storage capacity for the TB2SP is indicative only, and subject to final selection and detailed design.

The battery storage area will be set back at least 10 metres from the southern boundary of the subject site, located within the administration compound area (refer to Figure 5-1 and Appendix D). Each battery storage module is expected to comprise an enclosed steel structure, similar in resemblance to 40-foot shipping containers (refer to Figure 5-6 and Figure 5-7). A single battery storage container may be approximately 2.44 metres wide, 2.6 metres in height and 12.2 metres in length, although different battery suppliers provide differently sized components. Details will be confirmed during detailed design.

Figure 5-6 : Example of a Tesla Powerpack system installation, a potential battery supplier

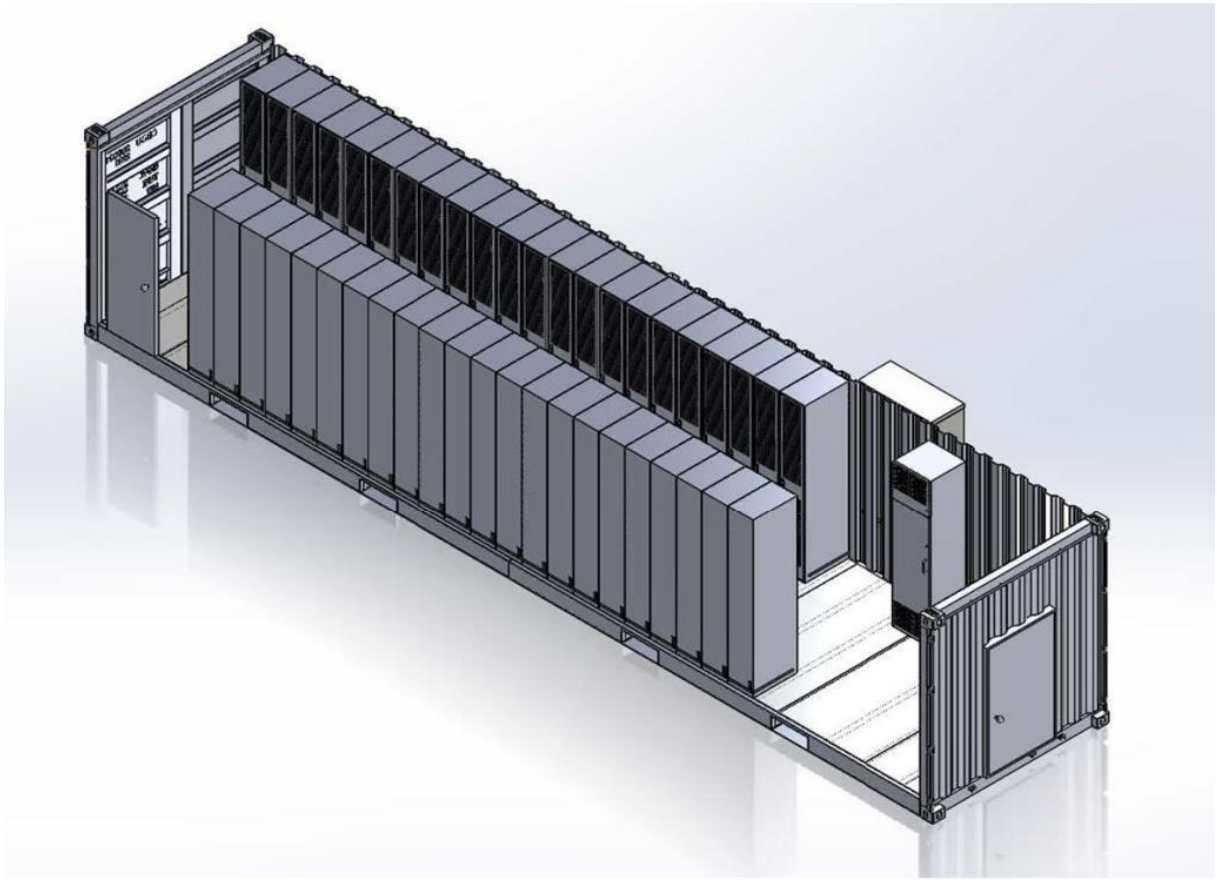

Figure 5-7 : Indicative Battery Storage Area Structure (isometric view)

5.1.6 Fencing and Security

Security fencing will be installed around the perimeter of the solar plant. Signage will be clearly displayed identifying hazards present within the solar plant. Preliminary fencing design is shown in Figure 5-8.

CCTV will also be used to manage security on the subject site. A preliminary design of the structures is provided in Figure 5-9.

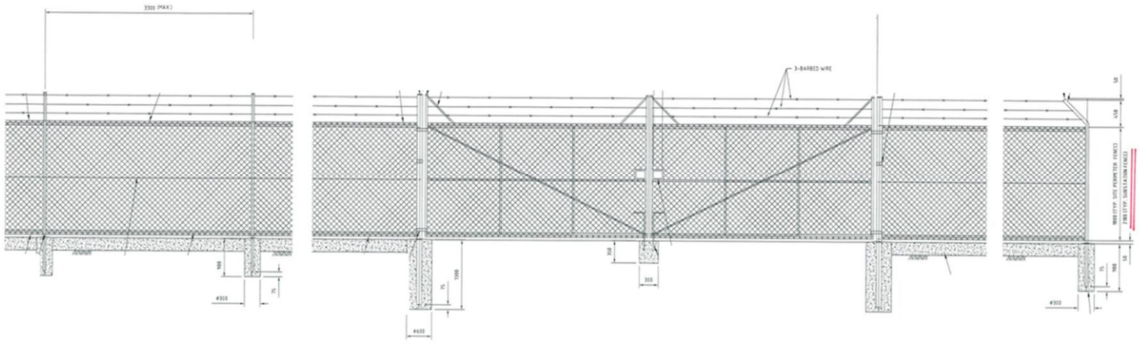

Figure 5-8 : Indicative security fence design

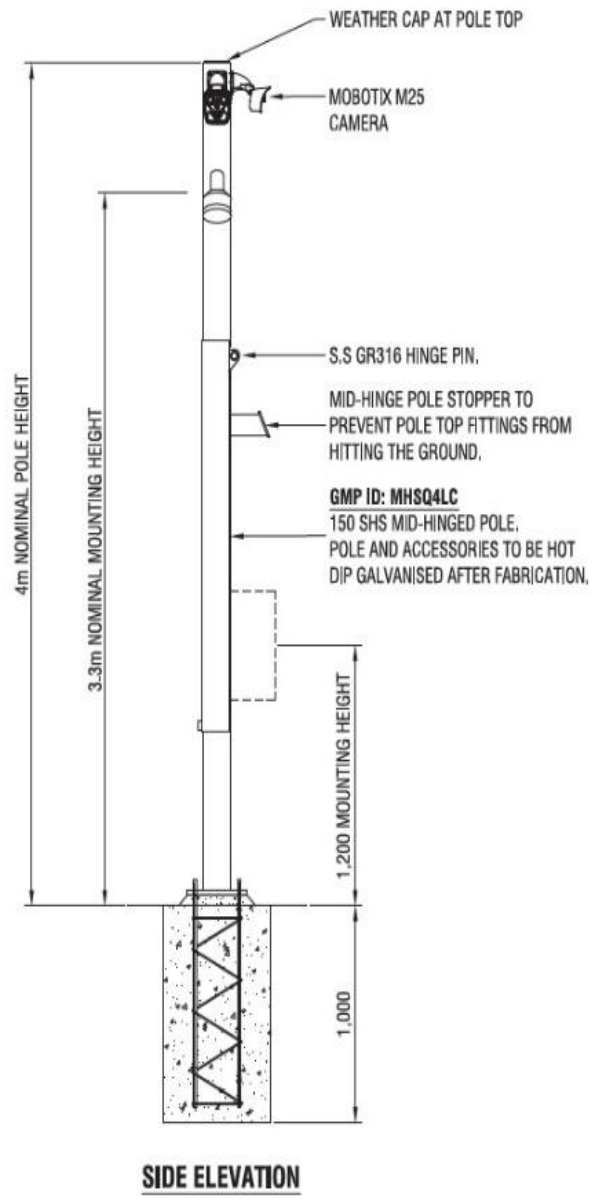

Figure 5-9 : Side Elevation of indicative design of CCTV mounting structure

5.1.7 Lighting

Low-level night time lighting will be installed where necessary for safety and security purposes. The lighting incorporates infra-red technology resulting in minimal light spill beyond the boundaries of the subject site.

5.1.8 Drainage Works, including Stormwater Management

Drainage and stormwater management design will be completed at the detailed design stage. Additional information on proposed stormwater management is provided in Section 5.3.3.

5.1.9 Site Access and Internal Access Roads

Site access is proposed at two locations as follows:

- An entrance is proposed on Substation Road towards the eastern end of the subject site near the proposed administration area; and
- A second access point is proposed at the south-western corner of the subject site. This will serve as an alternative entry/exit point from the site.

The internal access roads will be sufficient to allow for vehicle manoeuvring including large vehicle deliveries. An indicative internal access road layout and design is provided in Appendix D.

5.1.10 Lightning Protection

Lightning protection will be incorporated within the TB2SP. Lightning protection masts are likely to be established for every third or fourth inverter station, with the final number and siting to be determined during detailed design. The lightning protection masts are thin, tubular structures, approximately 8 metres in height with a concrete base and earthing. An indicative lightning protection system is presented in Appendix D.

5.1.11 Landscaping

Targeted landscaping will be established to support erosion control and improve amenity by screening the view of buildings from Substation Road. Buildings and structures within the administration and laydown compound areas will be screened via 10 metres of landscaping along the Substation Road frontage for the full width of the administration and laydown compound area.

5.1.12 Final Project Layout

The indicative project layout (Appendix D) depicts the TB2SP covering the majority of the subject site; avoiding approximately 20.7 ha of remnant native vegetation which is to be maintained and protected. The final layout of the project is anticipated to utilise approximately 186.3 ha of the 207 ha subject site, for a total generation capacity of up to 90MW_{AC} with battery storage of up to 100MW and three hours of storage capacity. The final project layout will be determined following the completion of detailed design, and will be affected by:

- Final selection of panels and other project components: the physical and operational requirements of the various plant required by the TB2SP (e.g. solar panels and inverters) will influence the final layout, spacing between panels and the number of ancillary plant required (inverters, lightning protection etc.);
- Detailed geotechnical investigation: an investigation to determine the geotechnical characteristics of the site will influence the final footing selection and may result in minor alterations to the project layout; and
- Nature of the power purchase agreement: the final power purchase agreement for the electricity generated by the TB2SP will influence the final capacity and the overall final footprint.

As a result of the uncertainty in the project layout, the following information will be submitted to the Minister for Planning prior to the commencement of construction:

- The final design, specification and layout of all solar panels;
- The final design, specification and layout of the inverters, buildings, infrastructure, fencing, earthworks, landscaping, and proposed access points to the local road network;
- The final design, specification and layout of any administration/control building, storage facility, monitoring stations, maintenance, construction and temporary facilities;
- The final alignment and design of any above-ground transmission lines; and
- The final design, specification and layout of the battery storage facility.

5.2 Construction Phase

This section provides an overview of the construction schedule, identifies the anticipated construction workforce and vehicles requirements and summarises the facilities, utilities and waste management practices for TB2SP construction.

5.2.1 Construction Programme

The first quarter of 2019 is the earliest timing for the proposed TB2SP to be operational. Final timeframes are dependent upon market and construction variables. Construction is expected to commence in the second quarter of 2018, with an approximate total construction period of nine to twelve months (i.e. construction complete in the first quarter of 2019). A preliminary schedule is shown in Table 5-1.

The main components of the construction programme include:

- Civil works;
- Establishment of the solar modules and inverters;
- Infrastructure connection; and
- Commissioning of the high voltage electrical connection.

The commissioning process is expected to be complete in the first quarter of 2019. A preliminary construction schedule is shown in Table 5-1. It is expected that construction of TB2SP will commence immediately following the construction of TBSP.

Table 5-1 : Preliminary Construction Works Schedule for TB2SP

Construction Phase	TB2SP Timeframes
Detailed design works	January 2018 – March 2018
Site civil works	April 2018 – July 2018
Delivery of equipment	August 2018 – September 2018
Installation	September 2018 – December 2018
Commissioning & Testing	January 2019 - April 2019

5.2.2 Construction Workforce

Employment generation during the construction period is expected to be approximately 100 - 150 full time equivalent (FTE) jobs at 'peak' times of construction; with an average of 70 personnel on site per month over the total construction period. The 100 - 150 FTE roles are directly generated by the project. Additional support to local employment is also anticipated during the construction period with a preference for local goods and skills provision, and spending in local retail and services by construction employees.

5.2.3 Temporary Construction Facilities

Temporary facilities will be established during construction to provide basic amenities for construction workers and temporary laydown and storage areas for construction materials. The requirements for temporary facilities will be determined by the construction contractor, however, it's anticipated that this will include:

- Site office;
- Temporary toilet facilities;
- Laydown areas; and

- Temporary car parking (informal).

Due to the size of the subject site and available land, all temporary construction facilities will be accommodated within the subject site.

5.2.4 Utilities

The construction contractor will be responsible for providing power and water required to support construction activities. It is anticipated that the first site activity will be the establishment of a permanent auxiliary power supply for construction. Should this not be possible, power will be supplied by portable generators. It is anticipated that construction water requirements will be trucked in.

5.2.5 Vehicle Movements

A summary indicating the estimated number of vehicle movements expected during construction of the TB2SP is provided in Table 5-2. This table includes the total construction impact on Substation Road based on the current proposed construction programs for both TBSP and TB2SP. It is important to note that dependent on the construction methodology of the contractor, traffic volumes may vary from these predicted estimates.

Table 5-2 : Estimated Construction Traffic[1]

		2018								2019			
		May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
TBSP (Substation + Lime Kiln Road)	Trucks	175	240	247	329	346	398	377	37	50			
	Light Vehicles	350	480	480	480	480	480	480	300	200			
TB2SP	Trucks				162	221	230	306	321	370	350	35	46
	Light Vehicles				325	446	446	446	446	446	446	280	186
Total (Substation Road)	Trucks	88	120	124	**327**	**394**	**429**	**495**	**340**	**395**	**350**	**35**	**46**
	Light Vehicles	315	432	432	757	878	878	878	716	626	446	280	186
Daily (Substation Road)	Trucks	4	6	6	16	20	21	25	17	20	18	2	2
	Light Vehicles	16	22	22	38	44	44	44	36	31	22	14	9
	Total	20	28	28	**54**	**64**	**65**	**69**	**53**	**51**	**40**	**16**	**12**

[1]The numbers represent the vehicles travelling to the subject site; therefore the total number of trips generated (in/out of the subject site) will be double what is shown in the table.

Oversized and overmass vehicles will be used to transport the major components of the TB2SP such as the inverters. These major components are most likely to be sourced in Adelaide and are anticipated to access the site from the Mallee Highway or the Dukes Highway. The majority of construction traffic (i.e. light vehicles and trucks) are anticipated to access the site from Murray Bridge or Adelaide via the Princes Highway.

Two access routes are proposed for construction traffic accessing the subject site:

- The Mallee Highway Access (originating from the Dukes Highway) is proposed to be the principal point of access to the subject site. Construction traffic accessing the site from Murray Bridge / Adelaide would access the Mallee Highway from the Dukes Highway, south of Tailem Bend. From the Mallee Highway, traffic will turn left onto Lime Kiln Road. Access to the subject site will be via an access point off Substation Road; and
- The Dukes Highway Access has been identified as an alternative access point for vehicles less than 11 metres in length.

The construction and maintenance of internal access roads will provide for safe and orderly movement of vehicles and minimise scarring to the landscape. Internal roads will be designed to meet construction, operational and safety requirements.

The site access and construction route is shown in Figure 5-10, which identifies the primary access route and the secondary access routes proposed for construction of the TB2SP.

5.2.6 Waste Management

Construction waste management procedures will be implemented via a Construction Environment Management Plan (CEMP). Specific measures to be incorporated will include:

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

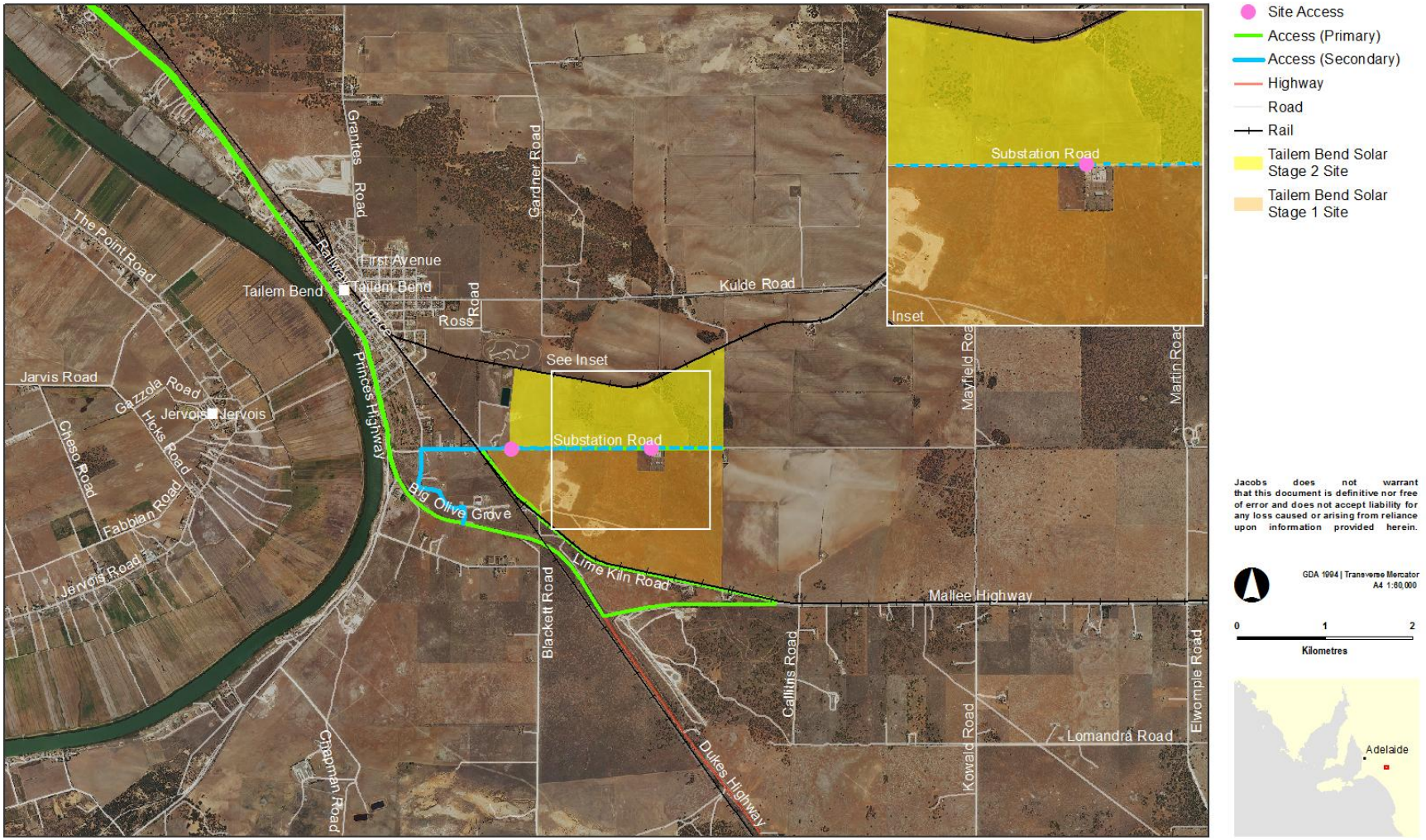

Figure 5-10 : Site Access / Construction Route for TB2SP

5.3 Operational Phase

This section identifies the anticipated operating workforce and summarises the facilities, utilities and stormwater management principles for TB2SP operations.

5.3.1 Operating Workforce

It is expected that 1-3 permanent full time staff will be required to run the facility during operations. The permanent staff will be located in the administration building. The operation workforce requirements will remain consistent for the full-time on site workers throughout the year and the hours of work are not dependent on the amount of energy being generated. Specialist contractors will be on-call to assist with maintenance activities including weed control, internal access road maintenance and module cleaning. It is anticipated the panels will be cleaned on a minimal basis, as required depending on the soiling conditions of the panels and the annual rainfall.

5.3.2 Utilities

The site will be connected to electricity and water at Substation Road. Two water connection options are being investigated:

- Separate line; or
- Shared line with the TBSP.

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

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

5.3.3 Stormwater Management

Runoff from the administration/controls and laydown area (which occupies 0.5 ha or approximately 0.24 percent of the subject site area) may increase compared with current levels as a result of an increase in impervious surfaces, e.g. buildings and car parks.

Runoff from the majority of the site, i.e. solar array, is likely to remain the same as current levels. The areas underneath and surrounding the solar modules will not be impervious but will be retained substantially in the current condition and allow infiltration of rainfall.

Drainage will be designed for all project-disturbed areas to ensure there is no increase in developed flow intensity/frequency beyond the site boundaries. The following key principles will be incorporated into the detailed design of the TB2SP to appropriately manage stormwater runoff:

- Surface water runoff will be discharged to match existing drainage patterns (if any) as much as possible;
- All drainage works will be designed and constructed to prevent scour and erosion. Additional protection measures will be included as required at locations particularly susceptible to scour/erosion (i.e. check dams or rocked lined channels on slopes, rock armour or rock mattresses at stormwater discharge locations); and
- All drainage works will be formed to provide a consistent fall along drainage lines and to avoid flat spots, where water may be subject to collection adjacent to the TB2SP infrastructure.

The stormwater management system will be designed to ensure that there is no increase in velocity profiles or flows entering and discharging the site to cause scouring and erosion. Erosion and sediment control will be undertaken in accordance with the guidelines prescribed by the EPA (2017a).

6. Environmental Assessment

The following sections summarises the outcomes of technical investigations undertaken to determine the feasibility of the TB2SP including existing site conditions and the relevant environmental impacts.

6.1 Visual Amenity

A Landscape Character and Visual Impact Assessment (LCVIA) was undertaken to assess the likely effect of the TB2SP on landscape and visual amenity. The LCVIA considered the sensitivity of the landscape to change, the presence of surrounding dwellings, publicly accessible locations, vantage points and key tourist viewing areas, and identified management strategies to reduce the overall visual impact.

No specific guidelines relating to the assessment of landscape and visual impacts in South Australia are available. As a result, the method for this LCVIA was consistent with the Guidelines for Landscape and Visual Impact Assessment (Landscape Institute & I.E.M.A 2013). The LCVIA has been attached as Appendix F. The LCVIA used desktop study, site visits, photography landscape context analysis and photomontages to:

- Describe the existing environment: topography, vegetation, existing built form and landscape types;
- Undertake a landscape assessment: characterise the existing scenic quality of the project region, including consideration of 'sense of place' and attachment values;
- Identify key receptors: major roads, parks and reserves, townships, tourist sites and residential properties;
- Assess the impact of the development: Changes to landscape and visual amenity were assessed at nominated viewpoints surrounding the TB2SP (refer to Figure 6-1). Visual impact was assessed based on key criteria (distance, sensitivity and exposure), to form a rating of overall visual change. The ratings applied to assess visual change are summarised in Table 6-1; and
- Development management strategies (where required).

Table 6-1 Criteria applied to describe the likely visual impact

Criteria	Description
Substantial adverse impact	Where the scheme would cause a significant deterioration in the existing view.
Moderate adverse impact	Where the scheme would cause a noticeable deterioration in the existing view.
Slight adverse impact	Where the scheme would cause a barely perceptible deterioration in the existing view.
Slight beneficial impact	Where the scheme would cause a barely perceptible improvement in the existing view.
Moderate beneficial impact	Where the scheme would cause a noticeable improvement in the existing view.
Substantial beneficial impact	Where the scheme would cause a significant improvement in the existing view.
No change	No discernible deterioration or improvement in the existing view.

The LCVIA recognised that the dark, reflective nature of the solar array is considered to help minimise visual contrast with the surrounding landscape. A 5 km Zone of Theoretical Visual Influence (ZTVI) was established for the LCVIA.

6.1.1 Existing Environment

The landscape character assessment establishes the baseline upon which effects of the proposed development were assessed. Three distinct landscape character units were identified within the ZTVI as follows:

- Township of Tailem Bend, which comprises the built form of Tailem Bend. The character of the Tailem Bend Township was considered to be of low to moderate scenic quality and had moderate sensitivity to change associated with the relative significance of the place attachment value in the character unit. The Tailem Bend Township is located within the project visibility shadow, and therefore the TB2SP will not be visible from the township;
- Murray River Riparian Corridor located west of the TB2SP. The character of the Murray River Riparian Corridor was considered to be of moderate to high scenic quality and moderate sensitivity to change based on its valued visual and recreational amenity. The Murray River Riparian Corridor is located beyond the project visibility shadow, and therefore the TB2SP will not impact the character or amenity of this unit; and
- Expansive Eastern Plains which incorporates the subject site and immediate surrounds. As a simple landscape offering little visual appeal nor visual amenity, the locality was assessed as having low scenic quality and low sensitivity to change. The project will be visible from locations within the Expansive Eastern Plains.

6.1.2 Sensitive Receptors

The landscape character assessment demonstrated that the TB2SP will not be visible from either the Township of Tailem Bend or Murray River Riparian Corridor. On this basis, further assessment of visual change at these localities was not warranted.

Site visits and evaluation at 18 locations within the Expansive Eastern Plains character unit within the ZTVI identified seven locations considered to be sensitive receptors requiring further visual assessment. Sensitive receptor locations comprised six residential dwellings and one elevated vantage point from the Dukes Highway (see Figure 6-1). During preparation of the LCVIA, Equis has undertaken consultation via meetings with all identified sensitive receptors as summarised in Table 6-2.

Table 6-2 : Consultation with potentially affected sensitive receptors

Sensitive Receptor	Address	Date	
SR01	Dukes Highway	Discussed with Council & DPTI 4th December 2017	
SR02	60 Magpie Drive	9th November 2017	5th December 2017
SR03	43 Golf Course Road	10th November 2017	5th December 2017
SR04	105 Lime Kiln Road	8th November 2017	5th December 2017
SR05	13 Substation Road	8th November 2017	4th December 2017
SR06	6 Substation Road	9th November 2017	5th December 2017
SR07	278 Substation Road	8th November 2017	5th December 2017
Landowner	39 Golf Course Road		5th December 2017
Landowner	358 Kulde Road	9th November 2017	4th December 2017

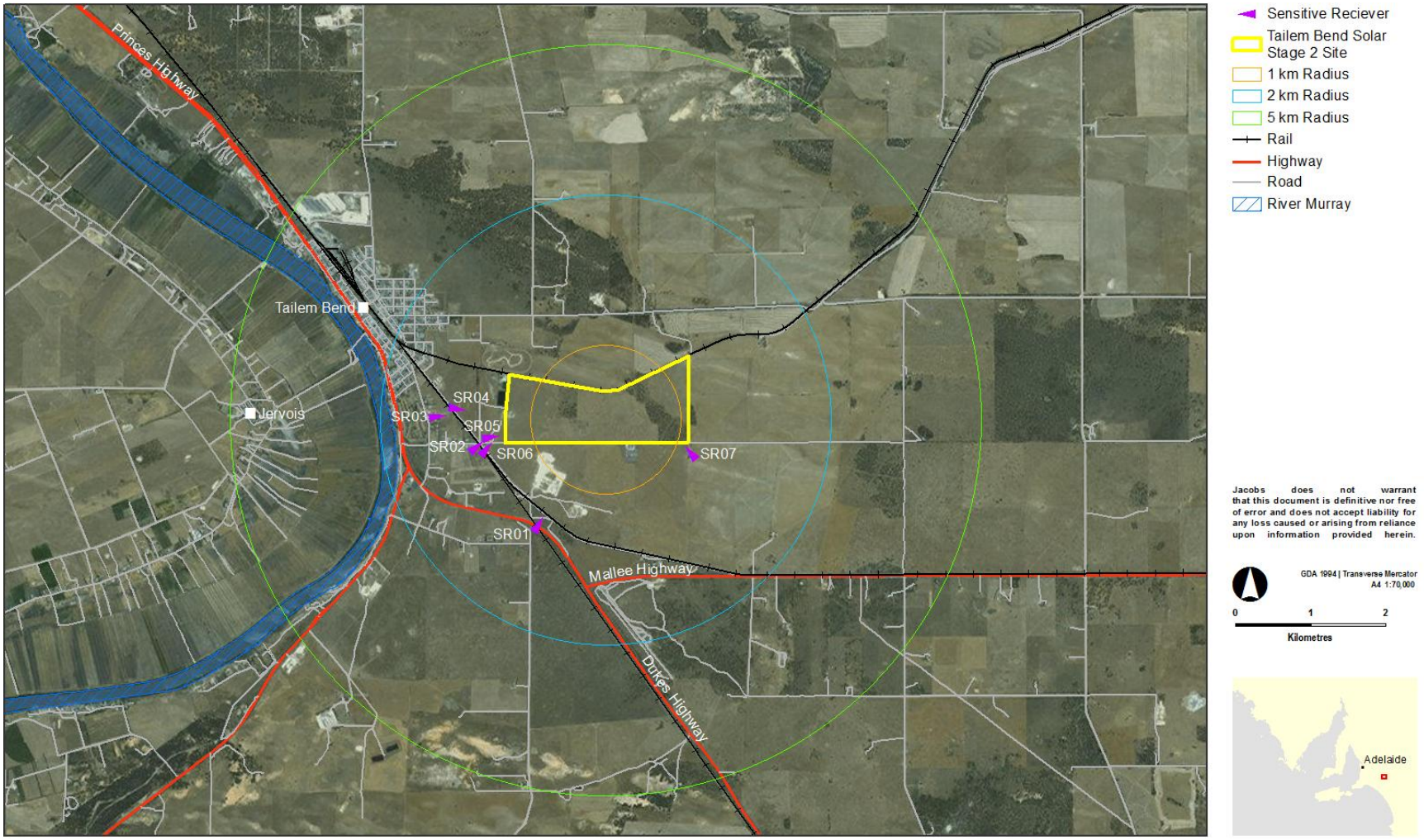

Figure 6-1 : LCVIA Viewpoints

6.1.3 Impact Assessment

During the construction phase, the change to visual amenity within the study area will occur as a result of earthworks, construction of additional infrastructure and an overall increase in the number of people and vehicles. The changing visual environment and activity during construction will be temporary, therefore was not considered in detail in the visual assessment.

The solar farm will be low in profile comprising panels which will not exceed 3-4 metres in height. In theory the solar farm should be visible in the fore and mid-ground from locations to the immediate west and south of the subject site. However, subtle changes in undulation across the landform coupled with existing vegetation scattered across the landscape is likely to screen part or the entire solar farm from many locations within the immediate area.

For viewers more than three kilometres away from the subject site, the reduction in apparent size of the development as a result of distance will mean that it is likely to be insignificant in height and concealed within the view. In particular, the sense of place and place attachment values of Tailem Bend and Murray Bridge will not be detrimentally affected by the project.

Within a locality of low scenic quality, the impact likely to be experienced at sensitive receptors will range between:

- Slight beneficial impact from the elevated sensitive receptor on the Dukes Highway (SR01). When considered in conjunction with the TBSP, the impact improved to moderate beneficial impact;
- No change to slight adverse impact at five residential receptors for TB2SP. When considered in conjunction with TBSP, the impact at two residential receptors remained the same (SR03 and SR07) and the impact at three residential receptors (SR02, SR04 and SR05) increased, with the most notable cumulative effects experienced at SR02 (slight to moderately adverse impact); and
- Moderate adverse impact at one residential receptor (SR06). When considered in conjunction with TBSP, the impact increased to moderate to substantial adverse impact.

Visual mitigation via vegetative screening was recommended for two sensitive receptors (SR02 and SR06), although discussions with landowners at these locations have revealed that the owners do not consider visual mitigation necessary. The recommended mitigations are as follows:

- SR02: The visual impact of PV panels and on-site infrastructure can be mitigated through the introduction of screen planting along the western boundary of TB2SP or on the line of sight within the property boundary. The use of native trees and shrub species with low maintenance requirements would likely ensure that, if desired, a visual buffer could be quickly established; and
- SR06: Boundary screening along and outside the western boundary of TB2SP or on the line of sight within the property boundary will assist in mitigating the visual impact of the PV panels and security fencing. The use of native trees and shrub species with low maintenance requirements is recommended to establish a quick growing impenetrable visual buffer. Planting evergreen native shrubs which attain a height of at least 2 m along the first 40 m of the western boundary of TBSP from Substation Road will achieve the recommended mitigation outcomes for TB2SP (and deliver visual mitigation benefits for the approved TBSP).

Based on these measures, all likely visual impacts on sensitive receptors can be appropriately mitigated if considered required by the landholders.

6.2 Traffic

Construction of the TB2SP will generate increased traffic volumes that have the potential to affect the local road network during the construction period of nine months. Once operational, traffic movements are anticipated to

be negligible, and will not significantly alter traffic volumes from existing conditions. A Preliminary Traffic Management Plan has been prepared to identify traffic management measures and strategies proposed to address traffic safety and access issues inherent with using oversized vehicles and general daily construction and operational traffic. The Preliminary Traffic Management Plan is attached as Appendix G.

The Preliminary Traffic Management Plan was developed via desktop study and site visit to:

- Understand existing traffic conditions;
- Define anticipated construction traffic requirements for the TB2SP;
- Identify construction vehicle access routes;
- Identify general measures to minimise impacts associated with traffic movements during construction; and
- Define maintenance and inspection strategies to minimise impacts to existing road conditions.

6.2.1 Existing Environment

Traffic counts are available for the Department of Planning Transport and Infrastructure (DPTI) roads in the area and are presented in Table 6-3. Mallee Highway, Dukes Highway and Princes Highway are all gazetted heavy vehicle routes (DPTI 2017).

Table 6-3 : DPTI Road Traffic Volumes (DPTI 2017)

Road Section	AADT[1] Estimate	Commercial Vehicles
Dukes Highway (Mallee Highway to Princes Highway)	5000	1500 (30%)
Dukes Highway (McIntosh Way to Mallee Highway	4200	1500 (35.5%)
Princes Highway (Dukes Highway to South Eastern Freeway)	8000	1650 (20.5%)
Princes Highway (Dukes Highway to Langhorne Creek Road	1900	280 (14.5%)
Mallee Highway (Old Dukes Highway to Dukes Highway)	950	230 (24%)

[1]Average Annual Daily Traffic

Data from a Council traffic count undertaken in June 2017 was also available for Substation Road. The volumes from this traffic count are presented in Table 6-4.

Table 6-4 : Council Road Traffic Volumes (MetroCount survey undertaken 16 May to 22 June 2017)

Road Section	Daily Estimate	Peak Hour
Substation Road	24 vehicles	6 vehicles (max PM peak volume)

6.2.2 Sensitive Receptors

For the purposes of construction traffic, the potential sensitive receptors include other road users, and key stakeholders including the Coorong District Council, DPTI and local utility companies.

6.2.3 Impact Assessment

Traffic to the subject site will have its largest volumes during the construction phase. The types of vehicles anticipated to be used during the construction phase include light vehicles, heavy construction vehicles and oversized vehicles. A summary of the estimated number of vehicle movements expected to take place during the construction phase of the TB2SP are presented in Table 5-2.

6.2.3.1 Impacts to traffic from project related construction vehicle movement

While total material volumes will be large, given the scale of the site, it is considered unlikely that daily or peak hourly volumes of generated traffic will exceed any relevant traffic capacity thresholds. Based on the estimated level of construction traffic, heavy vehicles movements on the Dukes and Mallee Highways are not expected to greatly alter traffic movement on these existing roads; however, it is acknowledged that traffic movements on Substation Road will increase by two to six times baseline levels during the construction timeline. A range of management measures are proposed to minimise impacts on other road users and the local road network:

- Regular meeting and engagement with DPTI and Council regarding upcoming construction activities, delivery schedules and any temporary speed restrictions;
- Restricting construction traffic movements during adverse or unsafe weather conditions;
- Driving to the road conditions and adhering to safe operating speeds;
- Providing way-finding signage where necessary to facilitate access along the proposed construction routes (if required); and
- Undertaking dust suppression activities (if required) to minimise dust emissions from construction traffic on unsealed roads.

6.2.3.2 Deterioration of road condition from TB2SP construction traffic

Construction traffic associated with the TB2SP will contribute to additional wear and tear on the access routes (Lime Kiln Road and Substation Road) during the construction timeline. Maintenance and inspection strategies to minimise impacts to existing road conditions will be undertaken.

At the completion of the construction period Equis proposes to reasonably rehabilitate the Coorong Council roads that are used by TB2SP vehicles within the primary access route (i.e. Lime Kiln Road and Substation Road) to a condition no less than prior to the commencement of works. This level is to be agreed between Equis and the Coorong District Council / DPTI prior to the beginning of the construction works.

An audit of road conditions along the nominated access routes will be undertaken prior to the commencement of construction of TB2SP. The condition audit will occur following the completion of any road upgrades (if required). A post construction condition audit will be undertaken to determine any remedial action required to repair access roads degraded as a result of TB2SP related construction traffic.

Road maintenance intervention levels are identified with the Preliminary Traffic Management Plan to rectify any defects to road infrastructure during the construction phase of the TB2SP. The nominated TB2SP road maintenance intervention levels address: signs and delineation; unsealed road pavement; and sealed road pavement. Maintenance requirements and repair timelines to maintain the safety of the access routes for other road users are identified for each intervention level. Any changes of these levels will be agreed upon between Equis, DPTI and the Coorong District Council during regular communications.

6.2.3.3 Impacts to traffic from project-related operational vehicle movements

The anticipated traffic generated during the operation traffic phases of the TB2SP will be limited to light vehicle movements for operations and maintenance staff. The traffic generated during the operation phase is not expected to represent a significant impact to the local road network, nor a significant change to existing road conditions.

6.3 Aviation

There are no concerns in relation to aviation and the proposed development of the T2BSP. The TB2SP has been designed and sited to minimise impact of glare and glint. Additionally, there are no major airports located

within close proximity to the subject site. A minor runway located within close proximity to the TB2SP, at the Tailem Bend Motorsport Park located south of the subject site. A variety of land uses are proposed at the Motorsport Park, including an airstrip. The proposed airstrip is to be located in the northern portion of the Motorsport Park site on an existing drag strip, which will be upgraded to become a runway with a length of approximately two kilometres.

If the proposed airstrip on the Motorsport Park is not developed, the next airstrip closest in proximity is the SA Sky Diving airstrip, located approximately 43 kilometres from the subject site in Wellington.

The design and siting of the TB2SP is not expected to affect either the proposed development of the airstrip on the Motorsport Park or the SA Sky Diving airstrip. There are no large vertical elements that could impede air traffic. As previously outlined, minimal glare is expected from the panels and the TB2SP is not expected to have any impact upon future aviation operations at the Motorsport Park.

6.4 Cultural and Historic Heritage

A desktop heritage assessment and Aboriginal heritage work area clearance survey of the subject site was completed to determine the presence of non-Aboriginal and Aboriginal archaeological material within the boundary of the subject site.

Database searches were undertaken prior to the site survey, including:

- Department of State Development – Aboriginal Affairs and Reconciliation (DSD-AAR) Central Archive;
- South Australian Heritage Register;
- National Trust Register;
- Commonwealth Heritage List;
- National Heritage List;
- World Heritage List; and
- Register of the National Estate (non-statutory archive).

In addition, the following desktop enquiries were also completed:

- Review of topographical maps and aerial imagery covering the subject site;
- Correspondence with Heritage South Australia within the Department of Environment, Water and Natural Resources (DEWNR) regarding available heritage studies for the project area and potential presence of heritage values; and
- Review of a heritage study of the Murray Mallee region in SA, east of the Murray River undertaken by Bruce Harry & Associates (Kloenden and Kloenden 1998).

6.4.1 Existing Environment

The two heritage places were identified within 1 km of the subject site are summarised in Table 6-5.

Table 6-5 : Places of Heritage Significance

Site / Description	Address	Heritage Type	Register ID	Approximate Distance to subject site
Former Lime Kilns (designated place of archaeological significance)	Lime Kiln Road, Tailem Bend, SA	State Heritage Place	13808	700 m south of the Substation Road boundary

Site / Description	Address	Heritage Type	Register ID	Approximate Distance to subject site
Reported Archaeological Site*	N/A	DSD-AAR Central Archive	6727 3923	Unknown - The DSD-AAR map shows an approximately location for the Site indicating it could be within or close to the subject site.

* Note: the location of the reported archaeological site cannot be reproduced, in accordance with the requirements of the Traditional Owners and the Aboriginal Affairs and Reconciliation Division

The review of the DSD-AAR Central Archive indicated there is potentially a reported site of Aboriginal heritage significance within the subject site. The DSD-AAR map provides the approximate locations of sites and does not reflect an accurate location of the site; as this will vary from site to site, depending on the site information contained in the Central Archive.

The Ngarrindjeri Heritage Committee completed a Work Area Clearance Survey of the site on 31 August 2017. This survey did not report on the existence or otherwise of the DSD-AAR reported site, therefore the actual location and existence of the 6727-3923 site remains unknown. However, the Ngarrindjeri Heritage Committee has issued a work area clearance for construction of solar infrastructure on the subject site (Ngarrindjeri Heritage Committee 2017).

The closest State heritage place (the former Lime Kilns) is located approximately 700 metres to the south of the subject site boundary and will not be impacted by the proposed solar project.

6.4.2 Impact Assessment

The TB2SP will not impact upon any State or local heritage listed properties.

The subject site is considered to be of low Aboriginal archaeological sensitivity due to the lack of temporary or permanent water sources. In addition, the site has been subject to moderate to high ground disturbance through pastoral and agricultural uses. Due to the high ground disturbance of the site the risk of finding intact Aboriginal archaeological sites or objects is low. It is unlikely that sub-surface Aboriginal archaeological sites or objects will be found.

If any unexpected objects or skeletal remains that may be of heritage significance are identified during the construction period, stop work procedures will be implemented as follows:

- **Stop works** – stop all works in the vicinity of the object/site and no further disturbance of the object/site will be made;
- **Restrict access** – access to the object/site will be restricted to protect the object/site;
- **Assess object/site** – contact a suitably qualified Aboriginal Monitor or Archaeologist to assess the archaeological material and advise on nature and significance. Contact the local Police if suspected human remains have been discovered; and
- **Manage the area and ongoing access** – determine the appropriate course of action in consultation with the relevant authorities and resume works when it is appropriate to do so.

The stop work procedure will be incorporated into the CEMP and provided to all construction personnel as part of the site induction process.

6.5 Flora and Fauna

An assessment of ecological values at the subject site (Appendix H) was undertaken to determine the presence of species of conservation significance (i.e. species protected under Commonwealth or State Legislation). The following tasks were undertaken for the assessment:

- Review of *Environment Protection Biodiversity and Conservation Act* Protected Matters database and high level assessment of likelihood of occurrence for listed and threatened flora and fauna species;
- Review of Biological Database of South Australia (BDBSA) search extract within five kilometres of the subject site for threatened flora, fauna and ecological community results; and
- Field Survey to map and describe native and exotic vegetation present on or adjacent to the proposed construction footprint.

6.5.1 Existing Environment

The subject site consists of cleared land that has been used for cropping and pasture with scattered patches of remnant native vegetation comprising approximately 22 hectares and approximately 53 scattered remnant individual trees.

Remnant Patches of Native Vegetation

Two blocks of remnant vegetation (Block A and Block B) were classified and mapped in to five areas based on features including size and distribution of patches, overstorey species composition, vegetation condition and overstorey age structure. These five native vegetation areas have been labelled as A1, A2, A3 and B1, B2 based on the naming convention for Bushland Assessments (NVMU 2017). The location of the native vegetation areas is shown in Figure 6-2 and described in Table 6-6. The location of individual scattered native trees and planted vegetation identified by the vegetation assessment is also shown in Figure 6-2.

Table 6-6 : Summary description of remnant native vegetation patches within the subject site

Label	Vegetation Association	Approx. Area (ha)	Summary Description
A1	*Eucalyptus porosa* +/- *E. oleosa* Low open woodland over tussock grassland	5.7	A1 is comprised of small patches of *Eucalyptus porosa* (Mallee Box) tall mallee over a sparse Chenopod shrub understorey. The patches are isolated from each other by areas of cropped land and vary in size ranging from one or two trees to several larger areas including a patch of approximately 1.5 ha adjoining the southern boundary. Mallee Box dominates the overstorey with scattered individual *E. oleosa* (Red Mallee) and *E. phenax ssp phenax* (White Mallee) and is old regrowth with multi-stemmed habit. The patchy open understorey includes *Enchylaena tomentosa* (Ruby Saltbush) and the woody forb *Vittadinia cuneata* (Fuzzy New Holland Daisy). Scattered clumps of *Dianella brevicaulis* (Short-stem Flax-lily) and *Lomandra effusa* (Scented Mat-rush) are present in the larger patches and the herb *Senecio pinnatifolius var pinnatifolius* (Daisy) together with native grass species *Austrostipa spp.* (Speargrass) and *Rytidosperma caespitosum* (Common Wallaby Grass) are common understorey species. All the patches within A1 are accessible to livestock and have been grazed more or less continuously for more than a century.
A2	*Eucalyptus porosa* Mallee over Chenopod low open shrubland and tussock grassland	6.2	A2 comprises a single patch of *Eucalyptus porosa* low mallee located on a low rise. The stunted whipstick characteristic of the mallee overstorey and the lack of species diversity in the understorey reflects the presence of shallow sandy loam soil over sheet limestone. The mid-storey is dominated by *Enchylaena tomentosa* with *Senecio pinnatifolius var pinnatifolius* and *Austrostipa spp.* (Speargrass) common in the understorey. No tree hollows were noted during the field survey.
A3	*Eucalyptus porosa* +/- *E. phenax ssp phenax* Low open woodland	5.6	A3 comprises a single large patch of old growth *Eucalyptus porosa* with scattered individual *E. phenax ssp phenax* and *Melaleuca lanceolata* (Dryland Teatree) (see Plate 6-1). The understorey is dominated by *Enchylaena tomentosa* with scattered patches of

Label	Vegetation Association	Approx. Area (ha)	Summary Description
	over Chenopod low open shrubland and tussock grassland		*Pimelea stricta* (Erect Rice Flower) and *Lepidosperma laterale* and *Lomandra micrantha ssp micrantha* (Small-flowered Mat-rush). Mallee trees are often single trunk trees indicative of old growth and small and medium tree hollows are present in most trees.
B1	*Eucalyptus porosa* / *Callitris gracilis* Low open woodland over Chenopod low open shrubland and tussock grassland.	3.4	Area B1 is located on a low sandy rise in the central portion of the subject site and is comprised of a single larger remnant patch of older growth *Eucalyptus porosa* with *Callitris gracilis* (White Cypress Pine) surrounded by cropping land. The understorey is dominated *by Enchylaena tomentosa* and *Austrostipa spp.* (Speargrass) with the introduced perennial mat plant Galenia (*Galenia sulcata*) and African Boxthorn common. The Mallee trees are comparatively tall (approximately 8 metres) in this area and often single-trunk with small and medium hollows recorded.
B2	Eucalyptus porosa +/- Callitris gracilis Low open woodland over Chenopod low open shrubland and tussock grassland	1.3	Area B2 consists of numerous small patches of open woodland vegetation separated by cropping land. The patches are comprised of older growth *Eucalyptus porosa* with *Callitris gracilis* (White Cypress Pine). The understorey is dominated *by Enchylaena tomentosa* and *Austrostipa spp.* (Speargrass) with the introduced perennial mat plant Galenia (*Galenia sulcata*) and African Boxthorn common.

Plate 6-1 : Area A3: Older growth *Eucalyptus porosa* (Mallee Box) with African boxthorn

In general, disturbance levels within the remnant vegetation within the subject site have been high. Past vegetation clearance has reduced vegetation communities to small patches surround by land that has been cropped and grazed continuously for many decades. On-going moderate grazing pressure from livestock and, to a lesser extent in recent years, rabbits, has impacted the understorey where less palatable and more resilient species dominate. Less palatable species typically present in mallee box communities are either absent or confined to scattered individuals growing in a protected location.

Bushland assessments representative of each of the five remnant vegetation areas were completed as part of the assessment of ecological values. Vegetation within Block A was assessed to be in moderate condition and vegetation within Block B was assessed to be in poor condition.

Presence of Weed Species

Infestations of African Boxthorn (Declared under the *Natural Resources Management Act* and a Weed of National Significance) are common throughout the remnant vegetation patches and often present under scattered paddock trees and scattered small infestations of Bridal Creeper (Declared) were also recorded. Weed species recorded across the subject site are summarised in Table 6-7.

Table 6-7 : Summary of weed species recorded at the subject site

Label	Summary
A1	African Boxthorn (*Lycium ferocissimum*) bushes are common in the patches while Bridal Creeper (*Asparagus asparagoides*) was recorded in a small number of locations. Galenia (*Galenia sulcata*), a perennial mat plant is widespread in all patches together with agricultural weeds including Indian Hedge Mustard (*Sisymbrium orientale*) and Horehound (*Marrubium vulgare*).
A2	Scattered infestations of African Boxthorn and Bridal Creeper were recorded in this patch.
A3	Infestations of African Boxthorn were recorded in this patch (see Plate 6-1).
Block B (B1 and B2)	Introduced perennial mat plant Galenia (*Galenia sulcata*) and African Boxthorn common.

Cleared Land and Scattered Trees

Outside of these patches, the subject site is dominated by historically cleared land that has been used for cropping and pasture, with the majority under crop at the time of the field survey. These areas are comprised of exotic grasses (including crop species) and herbs including common agricultural weed species. Approximately 53 native tree are present across the site along fence lines within the cropped paddocks (see Figure 6-2 and Plate 6-2). The dominant species of scattered trees is *Eucalyptus porosa*. There is also a small number of *Callitris gracilis* and other mallee species.

Plate 6-2 : Numerous scattered native trees are found within cropped paddocks

A small number of planted exotic or self-sown non-indigenous natives are present particularly in the vicinity of an uninhabitable dwelling near in the central portion of the survey area. Species include Pepper Tree (*Schinus molle*) and Athel Pine (*Tamarix microphylla*) and *Acacia saligna* (farmyard wattle).

Threatened Species and Threatened Ecological Communities (TEC)

The EPBC search indicated that Iron-grass Natural Temperate Grassland, nationally listed as Critically Endangered under the EPBC Act, may be present on the site. *Lomandra effusa* (Scented mat-rush), one of the key species for this Threatened Ecological Community (TEC) is present in the understorey in several patches of mixed mallee in area A1 (see Plate 6-3).

Assessment of these patches in accordance with conservation advice (TSSC 2008) determined that the patches do not meet the Class A or B TEC criteria, primarily due to the sparse coverage of *Lomandra* clumps and the low species richness of native grasses and broad-leaf herbaceous species. However, they meet the criteria for Class C. The conservation advice stipulates that Class C is not considered part of the EPBC listed TEC, but is *indicative of patches that are degraded and could be rehabilitated to become the listed ecological community* (TSSC 2008).

No State or Commonwealth threatened flora species, fauna species or plant communities were recorded during the survey and it is considered that they are unlikely to be present given the highly modified and degraded condition of the vegetation communities present within the subject site.

Plate 6-3 : Area A1: *Lomandra effusa* (scented mat-rush) is present in the understory of some of the larger patches

6.5.2 Impact Assessment

Potential impacts to flora and fauna values due to the construction and operation of the TB2SP include:

- Loss of threatened flora and fauna species or plant communities;
- Spread of weeds and pest species from the subject site;
- Loss of habitat for fauna species; and
- Clearance of native vegetation.

Loss of Threatened Flora and Fauna Species or Plant Communities

No State or Commonwealth threatened flora species, fauna species or plant communities were recorded during the survey and it is considered that they are unlikely to be present given the highly modified and degraded condition of the vegetation communities present within the subject site.

Spread of Weeds and Pest Species from the Subject Site

The presence of various weed species within the subject site including infestations of African Boxthorn and Bridal Creeper means there is a risk of spreading weeds from the site, particularly during site civil works and clearing activities. Routine weed management procedures will be developed and implemented as part of the CEMP. Significant impacts to biodiversity values from the spread of weeds is considered unlikely and the risk is considered low.

Loss of habitat for fauna species

Older growth mallee found in areas A3, B1 and B2 include trees with small and medium sized tree hollows that provide nesting habitat for a range of bird and bat species. Clearance of the larger areas A3 and B1 has been largely avoided by the proposed layout, however clearance of the majority of area B2 (approximately 1.1 ha) is proposed.

No State or Commonwealth threatened fauna species were recorded during the survey and it is considered that they are unlikely to be present given the highly modified and degraded condition of the vegetation communities present within the subject site. Common fauna species may be impacted by the loss of hollows within the clearance footprint; however, any impacts are expected to be minor given the limited clearance footprint.

The presence of hollows will also need to be considered as part of the native vegetation assessment process, which will be required for the project.

Clearance of native vegetation

Clearance of native vegetation will be required to undertake the development associated with the TB2SP; however, the design of the TB2SP has limited the total area to be cleared whilst maximising the potential of the project (as evidenced by the retention the majority of Block A and area B1, see Figure 6-3). The development will require the following clearances:

- Clearance of approximately 46 scattered remnant native trees located within the fenced paddocks located on the subject site; and
- Clearance of approximately 1.3 ha of vegetation, predominantly from area B2. Area B2 comprises numerous small patches separated by cropping land, with an understorey that is dominated by exotic species and biomass.

An application to the Native Vegetation Council for approval to clear this vegetation will be submitted prior to the commencement of construction. Clearance will be offset in accordance with *Native Vegetation Act 1991* requirements.

6.6 Air Quality

Air quality can be affected by dust caused by soil disturbance (e.g., from earthworks, vehicle traffic and site preparations) and emissions from vehicles and machinery. These impacts can be a nuisance to nearby receivers (residences and farm workers). Given the nature of the TB2SP, air quality impacts are expected to be negligible and no air quality impact assessment has been undertaken.

6.6.1 Construction Air Quality

Construction air quality impacts to sensitive receivers could occur as a result of dust emissions during construction activities or as a result of exhaust emissions from construction equipment. Through the utilisation of standard environmental management controls (e.g. use of water trucks for dust suppression and use of properly maintained equipment), construction air quality impacts at sensitive receivers are expected to be negligible.

6.6.2 Operation Air Quality

The generation of solar energy during the operation of the TB2SP will not generate any emissions or affect air quality. During operation, the project will have a positive impact on emissions to air by reducing Australia's reliance on fossil fuels for electricity generation.

Annual maintenance activities will result in some localised, intermittent vehicle emissions and potentially some generation of dust from vehicles travelling across the internal access tracks, however the impact on local and regional air quality is expected to be negligible.

6.7 Noise

Noise emissions at the TB2SP will primarily be generated during the construction period as a result of earthworks, vehicle traffic, site preparation and emissions from vehicles and machinery. These impacts can be a nuisance to nearby receivers (residences and farm workers).

The project will implement standard environmental management controls, such as: restriction of construction hours to 7 a.m. to 7 p.m. Monday to Saturday in accordance with the requirements of the *Environment Protection (Noise) Policy 2007* (EPA 2017); shutting down equipment when not in use; and utilisation of noise reduction devices. Based on the implementation of these controls, construction noise impacts at sensitive receivers are expected to be negligible.

The TB2SP comprises no significant sources of noise once operational. As such, no noise impacts to sensitive receivers are anticipated during the operation phase of the project.

6.8 Site Contamination

A search of the EPA site contamination index was undertaken on 6 December 2017, which showed that there were no recorded contaminated sites in the vicinity of the subject site. The subject site is understood to have been historically used for grazing and agricultural purposes. Based on the proposed use of the subject site as a solar and battery storage facility, it is considered that historical activities do not pose a significant human or environmental health risk. However, to manage the unlikely event of site contamination being encountered during construction, a procedure for unexpected finds of contamination will be developed and implemented as part of the CEMP for TB2SP.

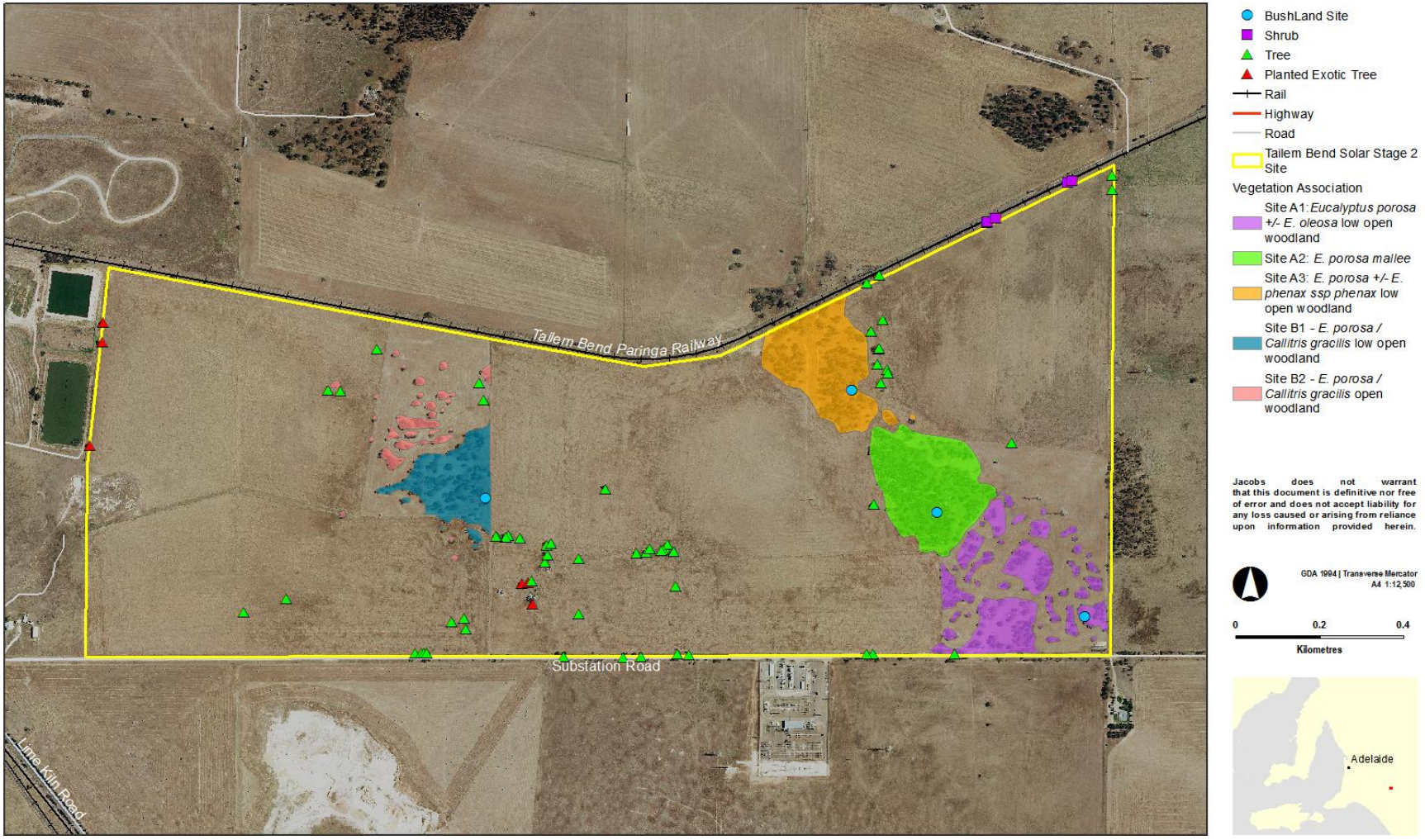

Figure 6-2 : Subject Site Vegetation

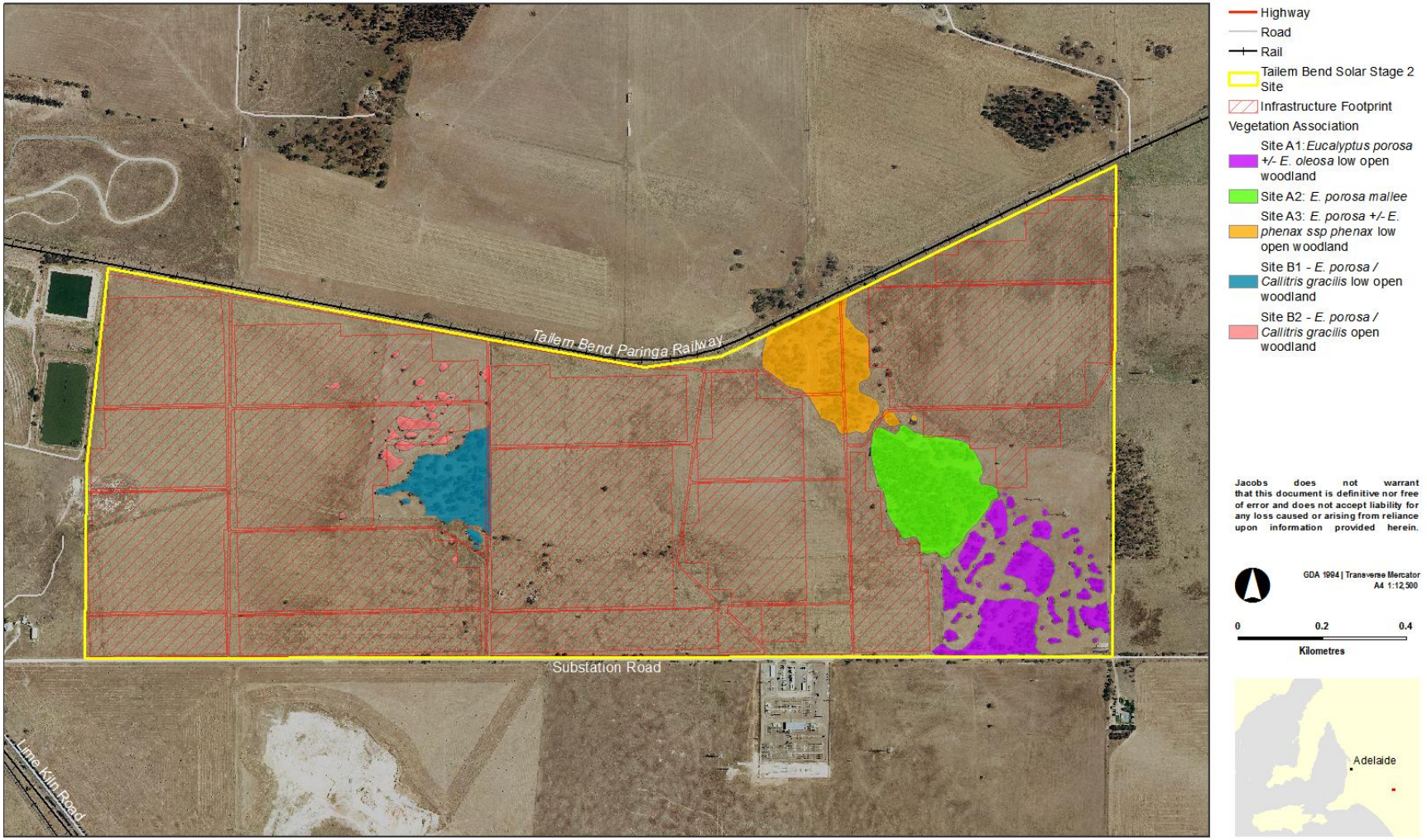

Figure 6-3 : Indicative Native Vegetation Clearance Footprint

7. Development Plan Assessment

The following section identifies the provisions of the Coorong District Council Development Plan relevant to the assessment of the proposed development. The proposed TB2SP is discussed in relation to the Council-wide policy in the Development Plan, including policy relevant to the establishment of renewable energy facilities, as well as an assessment of the consistency of the project within the Urban Employment Zone (Coorong Council Development Plan). A copy of the relevant Development Plan policy is provided in Appendix I.

7.1 Renewable Energy Facilities

Development Plan Section	Objectives	Principles of Development Control
Renewable Energy Facilities	1, 2, 3	1
Energy Efficiency	1, 2	1, 2, 3, 4

Renewable energy facilities, such as the proposed TB2SP, are an envisaged form of development as defined by the Development Plan. The TB2SP is sited to maximise the capacity of the project and to take advantage of the region's natural solar resources for the efficient and the maximum generation of electricity.

The TB2SP has been located in close proximity to an appropriate grid connection to minimise the requirement for additional overhead lines. As outlined in Section 5.1, the TB2SP will use single-axis tracking modules to track the sun from east to west across the sky over the day and maximise the generation capacity of the project. Battery storage is also proposed to be established, further extending the generation capacity of the Project. Space between the solar modules has been allocated to maximise exposure to the sun, without project infrastructure overshadowing the modules.

As previously outlined in Section 3.3, the TB2SP aligns with National and State strategic directions in relation to growth in the renewable energy sector. Locally, the TB2SP will result in a peak of 100-150 FTE jobs during the construction phase and 1-3 permeant FTE jobs located on site during operations.

7.2 Visual

Development Plan Section	Objectives	Principles of Development Control
Design and appearance	1, 2	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 14, 15, 17
Infrastructure	4	8
Interface between land uses	1, 2, 3	1,2, 5
Landscaping, fences and walls	1, 2	1, 2, 3, 4, 5
Siting and visibility	1	1, 2, 3, 4, 5, 6, 7
Renewable Energy Facilities	3	1
Natural Resources	11	1

The subject site is located outside of the Tailem Bend township (approximately 1.5 km), and away from densely populated areas. The Development Plan seeks to maintain the amenity of the locality through the provisions of infrastructure in suitable locations, the minimisation of earthworks and the appropriate siting of structure within the landscape. In this regard:

- The subject site is considered to be an appropriate location given the co-location with existing electricity infrastructure and the short distance required for the grid connection (minimising the need for additional overhead power lines);
- The TB2SP is not proposed in an area of known visual or scenic significance;

- It is expected that minimal earthworks will be required to support the proposed development as the subject site is relatively flat;
- It is acknowledged that the proposed development will be visible within the immediate locality, however given its low profile this impact is anticipated to diminish at greater distances; and
- The TB2SP is located in an area that maximises efficient generation and supply of electricity.

The LCVIA completed for the TB2SP determined that although the TB2SP will alter landscape and visual qualities of the locality and wider contextual landscape, it was considered that visual mitigation (vegetative screening) for two sensitive receptor locations could adequately manage visual impacts. Intervening topography and vegetation largely screen views of the subject site from key receptors and highly exposed locations (i.e. areas that are highly frequented). However, there is one elevated location on the Dukes Highway that will provide views of the TB2SP. At this location, the TB2SP is predicted to provide a moderately beneficial impact when viewed in conjunction with the TBSP, and slightly beneficial when assessed as a singular development.

Within the subject site, targeted landscaping will be established to improve amenity by screening the view of buildings from Substation Road. This screening will comprise 10 metres of landscaping along the Substation Road frontage for the full width of the administration and laydown compound area. Where practicable, buildings and structures will be of muted, earthen tones consistent with dominant colours in the landscape; highly reflective materials will be avoided to avoid glare and reduce the visibility of buildings and structures.

7.3 Traffic and Transport

Development Plan Section	Objectives	Principles of Development Control
Transportation and Access	1, 2, 3, 4, 5	1, 2, 3, 4, 8, 11, 12, 13, 17, 22, 23, 24, 25, 28, 29 31, 32, 33, 34, 36, 37, 38, 39

Two vehicle entries are proposed to access the subject site during the construction period; both from Substation Road. Once operational, the eastern Substation Road access will be the principal access point to the subject site. All vehicles will enter and exit the site in a forward direction, with capacity for a sufficient turning circle provided by the internal roadway and hardstand areas.

The impacts of additional vehicle movements associated with the construction of the TB2SP are anticipated to be minimal as the components are essentially pre-fabricated and only require reassembly on site. The construction program is anticipated to be completed within a nine month period, with heavy vehicle traffic volumes on the Dukes and Mallee Highways not expected to significantly affect traffic movement or safety.

A range of management strategies are identified to further mitigate impacts to road infrastructure and other road users. Specifically, at the completion of the construction period Equis propose to reasonably rehabilitate the Coorong Council roads that are used by TB2SP construction vehicles within the primary access route (i.e. Lime Kiln Road and Substation Road) to a condition no less than prior to the commencement of works, confirmed via a dilapidation report. This level is to be agreed between Equis and the Coorong District Council / DPTI prior to the beginning of the construction works. To support this, a pre-construction audit of road conditions will be undertaken. This will be followed by a post-construction audit, to determine any impacts to road infrastructure attributable to the TB2SP, and undertake any required remedial action to the roads.

7.4 Heritage

Development Plan Section	Objectives	Principles of Development Control
Heritage Places	1, 2, 3	1, 5, 6

A desktop heritage assessment of the subject site was completed to determine the presence of non-Aboriginal heritage values within and in close proximity to the subject site. The closest State heritage place (the former

Lime Kilns) is located approximately 700 metres to the south of the subject site boundary and will not be impacted by the proposed solar project.

The TB2SP will not impact upon any State or Local heritage listed properties.

7.5 Flora and Fauna

Development Plan Section	Objectives	Principles of Development Control
Infrastructure	1	8, 10
Natural Resources	1, 8, 9	1, 2, 31, 32, 33, 34, 35, 36, 37, 38, 44, 45

An assessment of ecological values at the subject site was undertaken to determine the presence of species of conservation significance (i.e. species protected under Commonwealth or State legislation). The subject site has historically been used for agricultural purposes and as such is largely cleared of native vegetation. Scattered patches of remnant native vegetation comprising approximately 22 hectares and approximately 53 scattered remnant individual trees are present within the subject site.

In general, disturbance levels regarding the remnant vegetation within the subject site have been high, resulting in moderate (Block A) to poor (Block B) condition of remnant native vegetation communities.

No State or Commonwealth threatened flora species, fauna species or plant communities were recorded during the survey. Given the highly degraded nature of the subject site, it is not considered likely that any threatened fauna species, plant species or ecological communities are present.

Clearance of native vegetation will be required to undertake the development associated with the TB2SP. The proposed layout of the TB2SP has been designed to avoid clearance of native vegetation where possible, with more than 20 hectares of existing native vegetation proposed to be retained. Development of the project will require approximately 46 scattered native trees to be cleared.

An application to the Native Vegetation Council for approval to clear native vegetation (potentially approximately 1.3 hectares of remnant native vegetation and 46 scattered native trees) will be submitted prior to the commencement of construction. Clearance will be offset in accordance with the *Native Vegetation Act 1991*.

7.6 Air Quality

Development Plan Section	Objectives	Principles of Development Control
Hazards	1, 2	1
Interface between land uses	1, 2, 3	1, 2, 11, 16

The subject site is located within an agricultural area, with good existing air quality. The key sources of air emissions are dust associated with agricultural activities, and vehicle emissions resulting from the proximity of the Dukes Highway, Mallee Highway and agricultural machinery.

The closest sensitive receiver is a dwelling to the south-west of the project footprint, approximately 100 metres from the subject site. The next closest is a dwelling is approximately 140 metres from the subject site located to the east of the south-eastern corner. There are approximately a further five dwellings within one kilometre of the subject site.

As outlined in Section 6.6, the TB2SP is not expected to result in air quality impacts to sensitive receivers in the locality. Standard environmental management strategies will be incorporated into the CEMP to control dust emissions as a result of land disturbance during the construction phase of the project (refer Section 8.1 for further information).

7.7 Noise

Development Plan Section	Objectives	Principles of Development Control
Interface between land uses	1, 2, 3	1, 7, 8

The subject site is located within an agricultural area, with low levels of existing background noise. The key noise source is the traffic from the surrounding road network. There are approximately seven dwellings within one kilometre of the subject site, with the closest located approximately 100 metres from the subject site. Consultation with the Coorong District Council has indicated that a new land division has been approved on Ross Road (to the north west of the subject site) for Rural Living purposes, with a dwelling approved on one of the allotments (as at 12 December 2017, R Lucas 2017, personal communication). The Rural Living Zone is located more than 525 metres from the subject site.

Through the utilisation of standard environmental management controls (e.g. restriction of construction hours, shutting down equipment when not in use and utilisation of noise reduction devices), construction noise impacts at sensitive receivers are expected to be negligible. Once operational, no noise impacts are anticipated as the TB2SP does not incorporate any significant sources of noise.

7.8 Bushfire

Development Plan Section	Objectives	Principles of Development Control
Hazards	1, 2, 5, 6	1, 3, 7, 8, 9,11

With the use of appropriate management strategies, the subject site is not considered to be at a significant risk from bushfire as historical use of the site for agricultural purposes has resulted in the clearance of most significant vegetation. The subject site (and surrounding area) has very low fuel loads as a result of agricultural activity. Critical infrastructure within the TB2SP will be located on large hardstand areas, with a number of access tracks available for vehicle access in the event of a fire.

The main fire risks posed by the TB2SP are:

- Construction activities (e.g. hot work and welding) during the Fire Danger Season (as declared by the Country Fire Service); and
- Fire caused by maintenance activities (hot work, other maintenance work) during the Fire Danger Season (as declared by the Country Fire Service).

Fire management procedures will be developed as part of the CEMP and will, as a minimum, include:

- Emergency response procedures;
- Timing of hot works with regard to fire weather warnings (e.g. avoiding total fire ban or equivalent days);
- Vegetation maintenance on site (i.e. maintaining vegetation clearances from electrical infrastructure, and maintaining fuel loads in accordance with existing levels);
- Induction and training of on-site personnel; and
- Provision of firefighting equipment at the site.

7.9 Site Contamination

Development Plan Section	Objectives	Principles of Development Control
Hazards	1, 2, 8, 9	1, 3, 20

Based on the proposed use of the subject site, it is considered that historical activities at the site do not pose a significant human or environmental health risk. As such, no areas of existing contamination are expected to be encountered during construction or operation of the TB2SP.

7.10 Water and Flooding

Development Plan Section	Objectives	Principles of Development Control
Hazards	1, 2, 4	1, 3, 4, 5, 6
Infrastructure	1	4
Natural Resources	2, 3, 4, 5, 6, 7, 11	1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 14, 16, 17, 19, 21, 22, 29, 34, 44, 45, 47

The subject site is not considered to be at risk of flooding as:

- It is located outside of the River Murray Flood Plain (i.e. the 1956 Flood Boundary as depicted in the Development Plan Map CooD/3 – Development Constraints); and
- There are no watercourses or water bodies located within or adjacent to the site.

Runoff from the administration and laydown compound area (dedicated small area of the subject site) may increase compared with current levels as a result of an increase in impervious surfaces, e.g. buildings and car parks.

Runoff from the majority of the site, i.e. solar array, is likely to remain the same as current levels. The areas underneath and surrounding the solar modules will not be impervious but will be retained substantially in the current condition and allow infiltration of rainfall.

Drainage will be designed for all project-disturbed areas to ensure there is no increase in developed flow intensity/frequency beyond the site boundaries. The following key principles will be incorporated into the detailed design of the project to appropriately manage stormwater runoff:

- Surface water runoff will be discharged to match existing drainage patterns (if any) as much as possible;
- All drainage works will be designed and constructed to prevent scour and erosion. Additional protection measures will be included as required at locations particularly susceptible to scour/erosion (i.e. check dams or rocked lined channels on slopes, rock armour or rock mattresses at stormwater discharge locations); and
- All drainage works will be formed to provide a consistent fall along drainage lines and to avoid flat spots, where water may be subject to collection adjacent to the TB2SP infrastructure.

7.11 Landslip

Development Plan Section	Objectives	Principles of Development Control
Hazards	1, 2	1, 3, 23, 24, 25
Natural Resources	10	1, 46

Detailed geotechnical investigations will be undertaken at the subject site prior to the commencement of construction to determine the foundation requirements for the TB2SP, however given the anticipated and foreseen geotechnical conditions the risk of landslip is considered to be negligible.

7.12 Acid Sulfate Soils

Development Plan Section	Objectives	Principles of Development Control
Hazards	1, 2, 7	1, 3, 18, 19

According to the Australian Soil Resource Information System (ASRIS 2014) the subject site is categorised as an extremely low probability area for acid sulfate soils. As such, acid sulfate soils are not expected to be encountered during the construction and operation of the TB2SP.

7.13 Chemical Storage and Handling

Development Plan Section	Objectives	Principles of Development Control
Hazards	10	21, 22
Natural Resources	1, 11	9, 41

The applicant has identified that no significant quantities of chemicals are proposed to be stored on the subject site during operation. Where required during construction, safe storage and handling of hazardous materials will be controlled through comprehensive and effective site management procedures (refer Section 8.1 for further information).

7.14 Orderly and Economic Development

Development Plan Section	Objectives	Principles of Development Control
Infrastructure	1, 2, 3, 5	1, 2, 11, 12
Interface between land uses	1, 2, 3	2, 5, 16
Orderly and Sustainable Development	1, 2, 3, 4	1, 2, 3, 7
Renewable Energy Facilities	1,2,3	1

The TB2SP is proposed to meet the ongoing electricity demands for South Australia and the broader National Electricity Market. The TB2SP supports renewable energy penetration and peak energy demand in the South Australia region. The siting of the TB2SP has been located so that minimal distance to network connection is required, and where there is capacity within the network to accept additional generation. The TB2SP is considered orderly development in that it provides for the efficient provision of electricity generation.

The TB2SP does not restrict ongoing agricultural activities within the broader locality with the loss of agricultural land limited to the subject site. The proximity of the TB2SP to the grid connection ensures that land is not intersected by overhead lines that may otherwise impact future agricultural practices. The proposed TB2SP would benefit the community, environment and the state through:

- The expansion of a large scale renewable energy facility, capable of providing high predictable levels of electricity to South Australian consumers;
- Approximately 100 - 150 FTE jobs at peak times of construction (with an average of 70 personnel on site per month over the total construction period), and a further 1-3 FTE jobs during the operating phase; and
- Diversification of employment industries within the region, providing additional opportunities to live and work in the area.

7.15 Urban Employment Zone

Development Plan Section	Objectives	Principles of Development Control
Urban Employment Zone	1, 6, 7, 9	1, 4, 5, 6, 9, 10, 11, 15, 17, 19

The desired character of the Urban Employment Zone recognises the proposed TBSP and allows for the expansion of the solar farm along with associated battery storage facilities and energy infrastructure. As such, the TB2SP is development that contributes to the desired character of the zone and is a form of development explicitly contemplated within the zone.

The Urban Employment Zone envisages a mixed use employment zone that accommodates a range of solar generation, related infrastructure and industrial land uses together with other related employment and business activities that generate wealth and employment for the state. The TB2SP will provide a total investment of $105 to $125 million and create opportunities for local contractors / suppliers during construction phase and ongoing maintenance.

The proposed development will not impede the operation of established land uses through encroachment, over development of the sites, noise/emissions or any other harmful or nuisance-creating impact. Once operational there will be no air or noise emissions from the TB2SP. Further, the proposed solar technology has been designed and sited to minimise impacts from glare or glint, while maximising generation capability (refer to Section 5.1.2). This includes the location of associated buildings and structures so as not to interfere with the performance of the panels.

A set back of at least 10 metres from the Substation Road frontage will be maintained for all permanent buildings in accordance with the principles of development control for the Urban Employment Zone. The solar modules and buildings (including battery modules) will be less than 10 metres in height.

Car parking will be located within the vicinity of the administration and controls building and will accommodate staff, visitor and temporary contractor parking

8. Environmental Management

Equis will develop an environmental framework through implementing a Construction Environmental Management Plan (CEMP) and Operational Environmental Management Plan (OEMP), which will be finalised prior to the commencement of construction and operation. The environmental framework establishes objectives and targets to manage the significant environmental aspects of the TB2SP.

The CEMP and OEMP for the proposed TB2SP will address compliance with regulatory requirements, environmental protection policies and relevant guidelines and codes of practice. The specific regulatory requirements for each environmental aspect will be identified in the CEMP and / or OEMP and incorporated, where appropriate, in the performance indicators utilised for monitoring environmental compliance.

8.1 Construction

Equis will implement environmental management strategies during the construction phase of the TB2SP in accordance with the requirements of CEMP. The CEMP will outline environmental management measures to be implemented, timing of their implementation, management and monitoring of the process and procedures.

A detailed CEMP will be developed prior to construction commencing to the satisfaction of the Development Assessment Commission. Development of a detailed CEMP at this stage (as part of the Development Application) is not practical as the detailed management measures will be defined when the construction contractor is engaged for the TB2SP. The detailed CEMP will be based on, and further developed from, the following objectives and management measures.

The key objectives of the CEMP will include:

- To carry out works in accordance with statutory requirements, the conditions of approval for the TB2SP, relevant guidelines and Equis environmental management systems and procedures;
- To minimise impacts to the environment during construction;
- To effectively manage the impact of construction works on neighbouring land uses;
- To provide clear procedures for management of environmental impacts including checking and verification activities and corrective actions;
- To provide an effective framework for ensuring that all contractors engaged in construction comply with the requirements of the CEMP; and
- To clearly identify management responsibilities and reporting requirements to demonstrate compliance with the CEMP.

The CEMP will serve as a working document to be used and updated throughout construction of the TB2SP.

Through the preparation of this Development Application and associated environmental investigations, a range of measures have been identified for incorporation into the CEMP. These measures are summarised in Table 8-1 below.

Table 8-1 : CEMP Management Measures

Aspect	Construction Environmental Management Measure
Noise	• Construction activity resulting in noise will not occur at night- time, on Sundays or public holidays; • Equipment will be shut off or throttled down whenever it is not in actual use; • Noise reduction devices such as mufflers will be fitted on construction equipment; and • Equipment will be serviced regularly and equipment in need of repair will not be used.

Aspect	Construction Environmental Management Measure
Air Quality	• Access roads to be constructed of compacted gravel or similar and kept in good condition; • Use of water trucks or chemical wettings agents where required on unpaved roads or exposed areas; • Vehicle speed limits will be managed to minimise wheel- generated dust; and • Equipment will be serviced regularly and equipment in need of repair will not be used.
Waste Management	• Construction waste will be separated into different streams to facilitate recycling and will be removed from the site by a licensed contractor; • Liquid waste (including hydrocarbons, paints and solvents) will be stored in sealed drums or containers in a bunded area before removal from the site by an EPA licensed contractor for recycling, where possible, or disposal to a licensed facility; • During construction, temporary ablution facilities will be serviced by pump-out tanker trucks, used with off-site disposal by a licensed contractor; and • Manage additional surface water runoff so that no adverse effects from the water are evident.
Cultural Heritage	If any unexpected objects or skeletal remains that may be of heritage significance are identified during the construction period, stop work procedures will be implemented as follows: • Stop works – stop all works in the vicinity of the object/site and no further disturbance of the object/site will be made; • Restrict access – access to the object/site will be restricted to protect the object/site; • Assess object/site – contact a suitably qualified Aboriginal Monitor or Archaeologist to assess the archaeological material and advise on nature and significance. Contact the local Police if suspected human remains have been discovered; and • Manage the area and ongoing access – determine the appropriate course of action in consultation with the relevant authorities and resume works when it is appropriate to do so.
Bushfire	Develop fire management procedures, including: • Emergency response procedures; • Consideration of construction schedule with regard to fire weather warnings (e.g. total fire ban or equivalent days); • Vegetation maintenance on site (i.e. maintaining vegetation clearances from electrical infrastructure; • Induction and training of on-site personnel; and • Provision of firefighting equipment at the subject site.
Flora and Fauna	• An application will be made for the clearance of native vegetation in accordance with the *Native Vegetation Act 1991*; • Only approved areas of native vegetation will be cleared; • Utilise procedures to restrict the spread of weed and pest species from the subject site; and • Minimise vegetation clearance and ensure that the clearance is offset by long-term actions that deliver a significant environmental benefit.
Traffic	• Engagement with DPTI and Council regarding upcoming construction activities, delivery schedules and any temporary speed restrictions, and consultation with potentially affected residents; • Development of a Traffic Management Plan for the construction period; • Restricting construction traffic movements during adverse or unsafe weather conditions; • Driving to the road conditions and adhering to safe operating speeds; and • Providing way-finding signage where necessary to facilitate access along the proposed construction routes (if required).
Visual	• Demobilisation of construction equipment from site as soon as practicable; • Where practicable, buildings and structures will be of muted, earthen tones consistent with dominant colours in the landscape; highly reflective materials will be avoided to avoid glare and reduce the visibility of buildings and structures;

Aspect	Construction Environmental Management Measure
	• Undertake rehabilitation of areas disturbed by the project as soon as practicable; and • Removal of all above ground infrastructure, and rehabilitation of subject site following decommissioning of the Project.

8.2 Operation

The OEMP will be finalised during the construction period prior to the commencement of commissioning activities at the TB2SP.

The key objectives of the Operation Environmental Management Measure entail:

- To carry out works in accordance with statutory requirements;
- To minimise impacts to the environment during operations;
- To effectively manage the impact of operational activities on neighbouring land uses;
- To provide clear procedures for management of environmental impacts including checking and verification activities and corrective actions;
- To provide an effective framework for ensuring that all employees are appropriately inducted on the OEMP requirements and management procedures; and
- To clearly identify management responsibilities and reporting requirements to demonstrate compliance with the OEMP.

The OEMP will serve as a working document to guide and direct operation of the TB2SP. Through the preparation of this Development Application and associated environmental investigations, a range of measures have been identified for incorporation into the OEMP. These measures are summarised in Table 8-2.

Table 8-2 : OEMP Management Measures

Aspect	Operation Environmental Management Measure
Air Quality	• Vehicle speed limits will be managed to minimise wheel- generated dust; and • Operational activities causing dust disturbance to be kept to a minimum.
Cultural Heritage	• Prevent unauthorised disturbance to Aboriginal or Non-Aboriginal heritage.
Bushfire	Develop fire management procedures, including: • Emergency response procedures; • Vegetation maintenance on site (i.e. maintaining vegetation clearances from electrical infrastructure; and • Provision of firefighting equipment at the subject site.
Flora and Fauna	• Manage the quality of land and soils; • Manage surface water so that existing uses, including environmental are protected; • Undertake weed control and fuel management; and • Offset area management.
Traffic	• Driving to the road conditions and adhering to safe operating speeds; and • Undertake dust suppression activities (if required) to minimise dust emissions from construction traffic on unsealed roads.
Site Decommissioning	• Manage the quality of land and soils; • Maintain representation, diversity, viability and ecological function of flora and fauna; and • Rehabilitate the Project site to a standard suitable for future agricultural use.

8.3 Repowering / Decommissioning

Equis will consider two options in regards to the TB2SP once the initial lease contract time is complete relating to repowering or decommissioning of the TB2SP. The expected life span for solar technology of a similar nature to that of the TB2SP is approximately 30 years. The varying options are detailed in the sections below.

8.3.1 Repowering

Repowering of the TB2SP beyond the initial 30-year lease agreement would encompass the continuation of the operations of the TB2SP for the extension option of 20 years. The continuation of operation through the agreed extension would require the continuous repowering of the TB2SP, through upgrading, replacing or repairing various components of the TB2SP. The potential for the TB2SP to operate for the full extension of the 20-year period will be reliant on the market conditions and the condition of the solar technology.

8.3.2 Decommissioning

Should the repowering of the TB2SP not be a viable option, the infrastructure associated with the TB2SP would be decommissioned. If decommissioning of the TB2SP were to occur, all above ground infrastructure associated with the TB2SP would be removed for sale, recycling or disposal. Access tracks and hardstand areas would be remediated in order to prepare a suitable soil profile for subsequent sowing with an appropriate ground cover mix. It is therefore anticipated that following decommissioning of the TB2SP, the subject site would be returned to its existing agricultural land use.

9. Conclusions

It is considered that the proposed TB2SP located at Allotment 100 and 101 Substation Road, Tailem Bend is consistent with the relevant provisions of the Coorong District Council Development Plan and is appropriate for the subject land and the locality.

The subject site was identified as an appropriate location for establishment of the TB2SP to allow for access to a high quality solar resource, co-location with existing electricity infrastructure, minimal distance for a network connection, and capacity within the network to accept additional generation.

The development of electricity infrastructure is essential to meeting the electricity requirements of South Australia, and the socio-economic sustainability of communities. Development of the TB2SP will contribute to reducing greenhouse gas emissions and is aligned with various national and state strategic targets and policies. The proposed development constitutes a renewable energy facility explicitly envisaged by the Urban Employment Zone of the Coorong District Council Development Plan.

It is considered that the TB2SP exhibits sustainable planning merit and accords with the intention for the locality outlined in the Development Plan, specifically:

- It represents establishment of a renewable energy facility, as supported and envisaged by national and State strategic policy as well as the Development Plan;
- The TB2SP is proposed to be sited adjacent to existing electricity infrastructure, minimising connection requirements;
- The location of the subject site provides optimal opportunity for the proposed TB2SP to utilise the region's natural solar resources for the efficient generation of renewable energy;
- Impacts associated with visual amenity are not expected to be significant. Visual mitigation (vegetative screening) for two sensitive receptor locations (if considered required by these two landholders) can adequately manage visual impacts;
- It is considered unlikely that daily or peak hourly volumes of generated traffic will exceed any relevant traffic capacity thresholds. Based on the estimated level of construction traffic, heavy vehicles movements on the Dukes and Mallee Highways are not expected to greatly alter traffic movement on these existing roads; however, it is acknowledged that wear and tear on Lime Kiln Road and Substation Road due to construction traffic associated with the TB2SP traffic movements will need to be managed and mitigated;
- Construction and operation of the TB2SP will not result in significant air or noise emissions hence there will be negligible impact on nearby sensitive receivers;
- The design of the project layout has minimised native vegetation clearance for the development. Approximately 1.3 ha of small patches of trees and approximately 46 scattered trees may require clearance; however at least 20 ha of remnant native vegetation will be retained; and
- No registered places of heritage significance are located on the subject site, nor anticipated to be affected by the TB2SP.

Consequently, the proposed development is not *seriously at variance* with the overall intent of the Coorong District Council Development Plan and merits Development Approval.

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