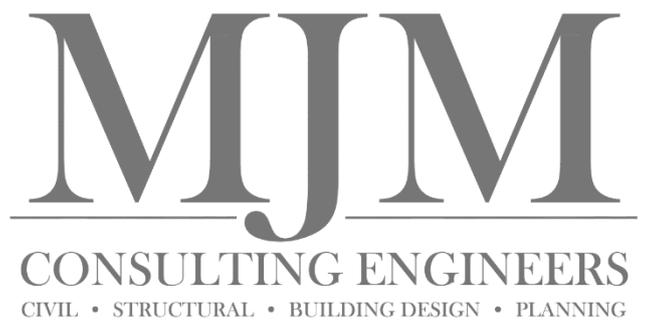


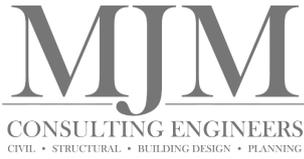
Proposed micro solar farm

1083 Buckingbong Road, Gillenbah, NSW

Statement of Environmental Effects

Prepared for Narrandera Solar Project Pty Ltd





Project

Proposed micro solar farm

1083 Buckingbong Road, Gillenbah, NSW

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1 EXECUTIVE SUMMARY

The proposal is for development of a micro solar farm at 1083 Buckingbong Road, Gillenbah, a site which is zoned a combination of RU1 Primary Production and RU4 Primary Production Small Lots and is currently utilised for agricultural purposes. Construction of the solar farm would be undertaken over a 6-month period with the site to operate over a 31-year lease period from the beginning of construction.

The development would be located on a lot zoned RU1 Primary Production and although Electricity generating works are prohibited in the RU1 Primary Production zone under the Narrandera Local Environmental Plan 2013, the project is permitted with consent under the State Environmental Planning Policy (Infrastructure) 2007 (ISEPP).

The development and its potential impacts are described in detail throughout this report and it is considered that it is permissible due to consistency with the applicable legislation, plans and policies. As demonstrated throughout this report the proposal would not have any significant adverse environmental consequences during either construction or operation which could not be managed on the site. Further to this, the site is ideally located due to the rural location and the proximity to existing Essential Energy infrastructure required for connection to the electrical network which is a requisite for the project to succeed.

It is considered that the development can be approved subject to a merits assessment.

2 INTRODUCTION

2.1 OVERVIEW

This Statement of Environmental Effects (SEE) has been prepared on behalf of Narrandera Solar Project Pty Ltd (the applicant) to form part of a Development Application for a micro solar farm to be developed at 1083 Buckingbong Road, Gillenbah, New South Wales (NSW). An aerial image of the site and surrounds is provided in the below figure.

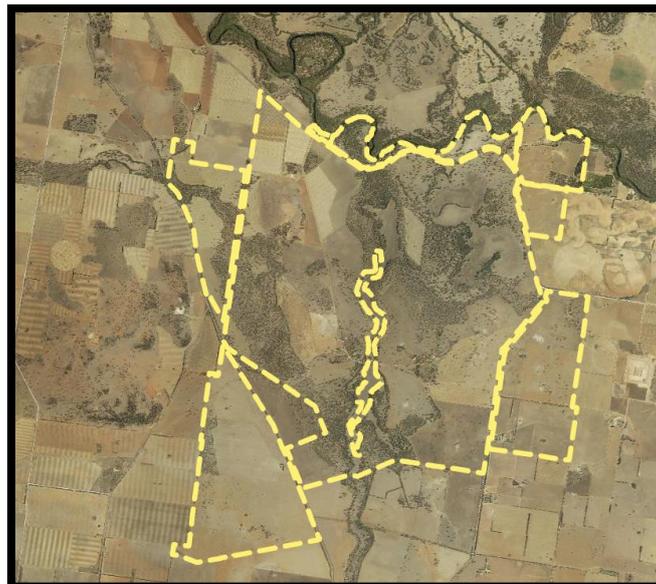


Figure 1 Aerial image of development site and surrounds (Source: NSW Planning Portal)

The micro solar farm model involves the construction of smaller solar farms that integrate into the existing Essential Energy electrical network. As such, the subject site has been chosen due to its abuttal to existing Essential Energy 11KV transmission lines. Due to the existing substation and power lines, the site is immediately proximate to assets that service local population centres and commercial operators which ensures electricity is most efficiently transferred from the source facility.

The site is currently utilised for agricultural purposes and contains dwellings and associated farm structures on lots to the north and north west which include structures of local heritage significance being the Buckingbong Homestead and outbuildings, and Buckingbong Woolshed. The development would be located on a previously cultivated lot within the north eastern portion of the substantial property as identified in the below figure.

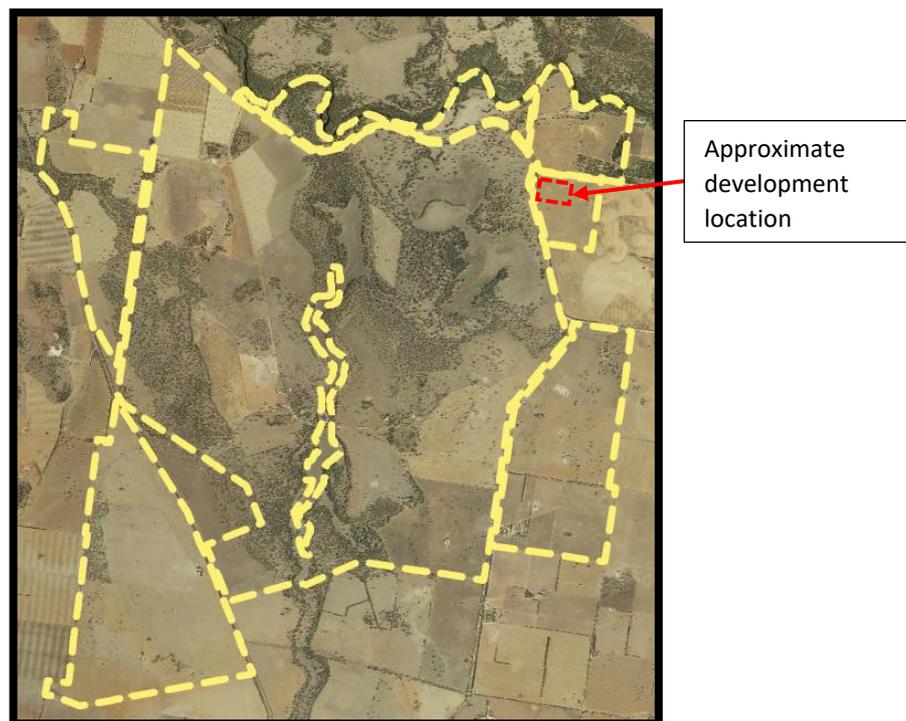


Figure 2 Approximate development proposal area (Source: NSW Planning Portal)

The proposal would include the installation of approximately 16,128 450W solar panels which would be mounted on single-axis tracking systems. The solar panels would be supported by ancillary services including a power station consisting of an inverter, transformers and switch gear; a HV switchboard consisting of HV switch gear; battery storage; electrical poles; hardstand vehicle areas and site fencing and landscaping.

The solar farm would have a 31 year lifespan from the beginning of construction with the project to be decommissioned and the site rehabilitated at the conclusion of its use which would allow the development footprint area to be re-utilised for agricultural undertakings as appropriate.

2.2 DEVELOPER OVERVIEW

Narrandera Solar Project Pty Ltd (the applicant) is a subsidiary of ACEnergy Pty Ltd (ACEnergy). ACEnergy is a company that specialises in renewable energy development who have extensive experience with post renewable projects across most of Australia. In addition to the micro solar farm network, ACEnergy has been involved in other renewable projects which have included solar and wind power stations. They hold a portfolio of utility-scale solar farm projects across regional Australia including Stanhope, Echuca, Girgarre and Numurkah as well as a number of upcoming projects within New South Wales.

2.3 SCOPE OF STATEMENT OF ENVIRONMENTAL EFFECTS

This Statement of Environmental Effects accompanies a development application for the proposed development. It has been prepared on behalf of the client and includes the matters referred to in Section 4.15 of the *Environmental Planning and Assessment Act 1979* (the Act) and the matters required to be considered by the consent authority.

The purpose of this SEE is to:

- Describe the land to which the DA relates to and the character of the surrounding area;
- Describe the proposed development;
- Define the statutory planning framework within which the DA is to be assessed and determined; and
- Assess the proposal against the relevant heads of consideration as defined by Section 4.15 of the *Environmental Planning & Assessment Act 1979*.

3 SITE DESCRIPTION

3.1 DEVELOPMENT SITE

The development site is known as 1083 Buckingbong Road, Gillenbah. It is located approximately 18 km south east of the Narrandera township as shown in the below figure.

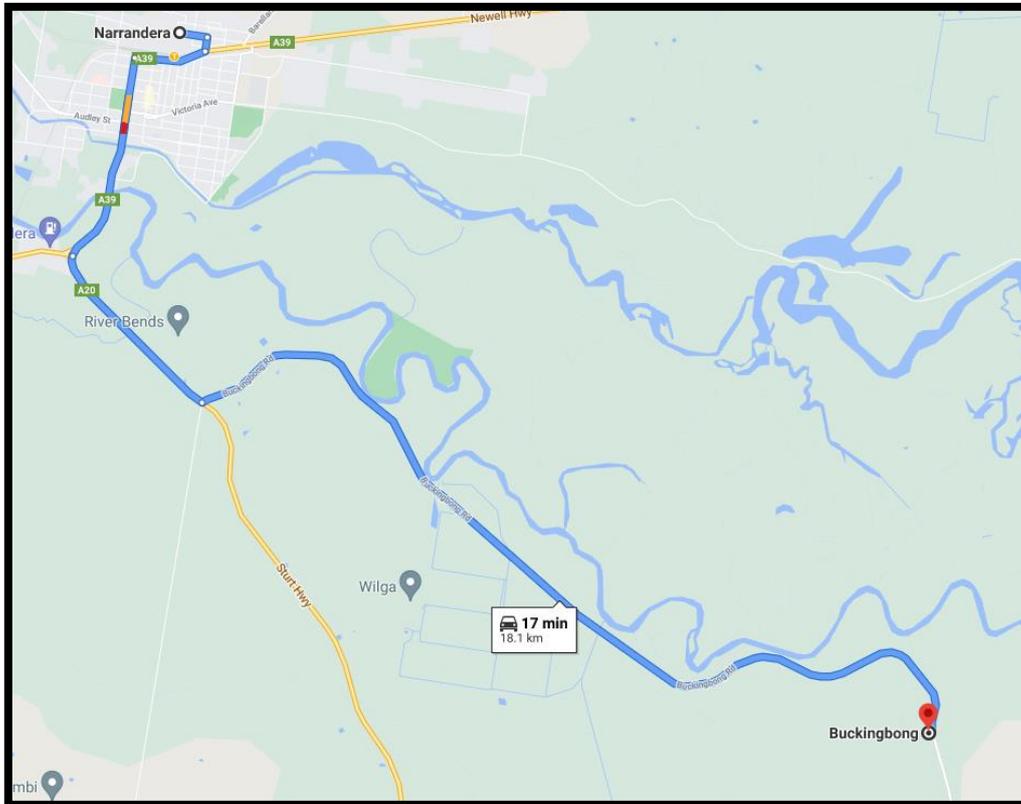


Figure 3 Location of development site from Narrandera township (Source: Google Maps)

It is located on both the eastern and western sides of the Sturt Highway, the northern and southern sides of Buckingbong Road and the southern side of the Murrumbidgee River as shown in the locality plan on the following page.

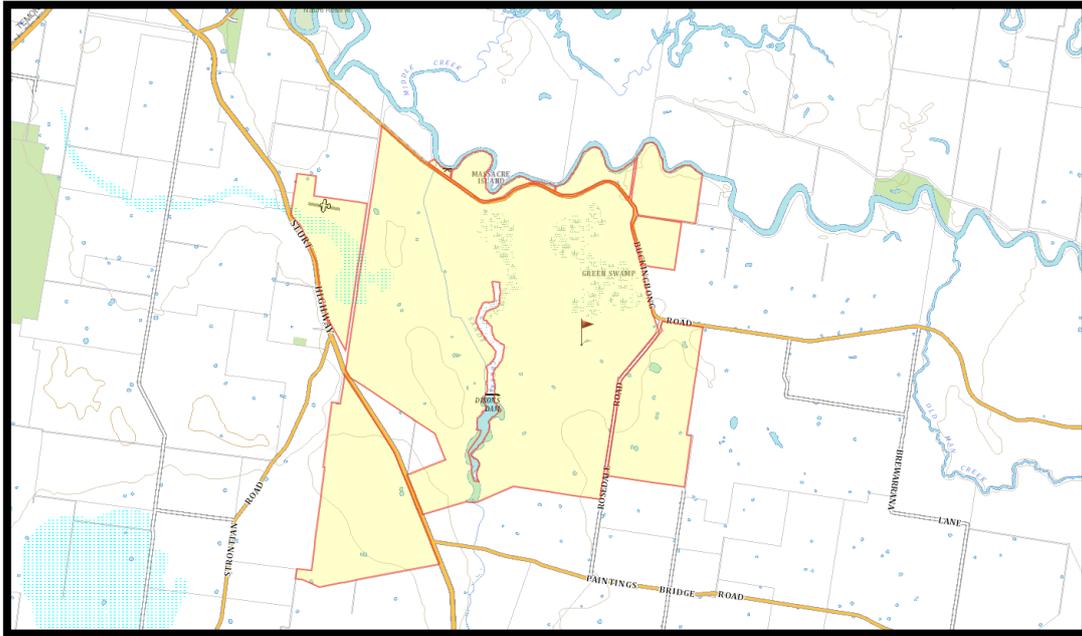


Figure 4 Locality Plan (Source: SixMaps)

The property consists of a number of lots as identified in the below figure.

1/-/DP1251925	1/-/DP134399	1/-/DP134947
1/-/DP134974	1/-/DP721977	1/-/DP754540
10/-/DP134399	10/-/DP134947	11/-/DP134399
11/-/DP134947	113/-/DP754552	114/-/DP754552
115/-/DP754552	116/-/DP754552	117/-/DP754552
118/-/DP754552	119/-/DP754552	12/-/DP134399
12/-/DP134947	120/-/DP754552	129/-/DP754552
13/-/DP134399	13/-/DP754540	130/-/DP754552
14/-/DP134399	15/-/DP134399	16/-/DP134399
17/-/DP754552	18/-/DP754552	19/-/DP754552
2/-/DP1251925	2/-/DP134399	2/-/DP134947
2/-/DP134974	2/-/DP209777	20/-/DP754552
21/-/DP754552	22/-/DP754540	22/-/DP754552
23/-/DP754552	24/-/DP754552	3/-/DP1251925
3/-/DP134399	3/-/DP134947	3/-/DP134974
35/-/DP754540	37/-/DP754552	4/-/DP134399
4/-/DP134947	4/-/DP754552	40/-/DP754552
44/-/DP754540	5/-/DP12202	5/-/DP134399
5/-/DP134947	5/-/DP754552	58/-/DP754540
6/-/DP134399	6/-/DP134947	6/-/DP754552
61/-/DP754552	62/-/DP754552	63/-/DP754552
64/-/DP754552	65/-/DP754552	68/-/DP754552
69/-/DP754552	7/-/DP134399	7/-/DP134947
7/-/DP754552	70/-/DP754552	7005/-/DP102418
71/-/DP754552	72/-/DP754552	7
75/-/DP754552	76/-/DP754552	74/-/DP754552
8/-/DP134399	8/-/DP134947	79/-/DP754540
85/-/DP754552	9/-/DP134399	81/-/DP754552
91/-/DP754552	92/-/DP754552	9/-/DP134947
94/-/DP754552	95/-/DP754552	93/-/DP754552
		B/-/DP101391

Figure 5 Lot & DP property details (Source: NSW Planning Portal)

The site is irregular in shape and approximately 4,980Ha in size. It has frontage to the Sturt Highway of approximately 3km to the west of Lot 37 DP 754552 and 4.3km to the east of Lot 2 DP 209777. It also has frontage of approximately 8.4km to Buckingbong Road to the north and north east of Lot 4 DP 754552 and the north of Lot 3 DP134974 of approximately 830m. Lot 120 DP 754552 also

has an eastern frontage to Rosedale Road of approximately 4km.

The site is zoned a combination of RU1 Primary Production and RU4 Primary Production Small Lots, consistent with all adjoining land as shown in the below figure.

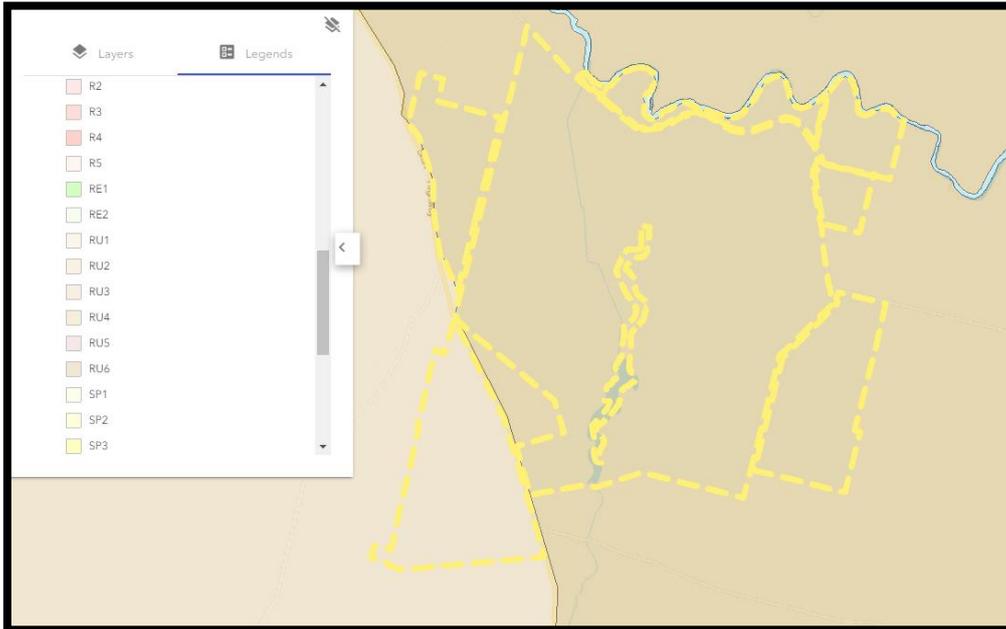


Figure 6 Narrandera Local Environmental Plan 2013 Zoning Plan of subject site and surrounds (Source: NSW Planning Portal)

The topography of the property varies over its expansive area however there are no sizeable changes in topography which would inhibit the proposed development as shown in the below figure.

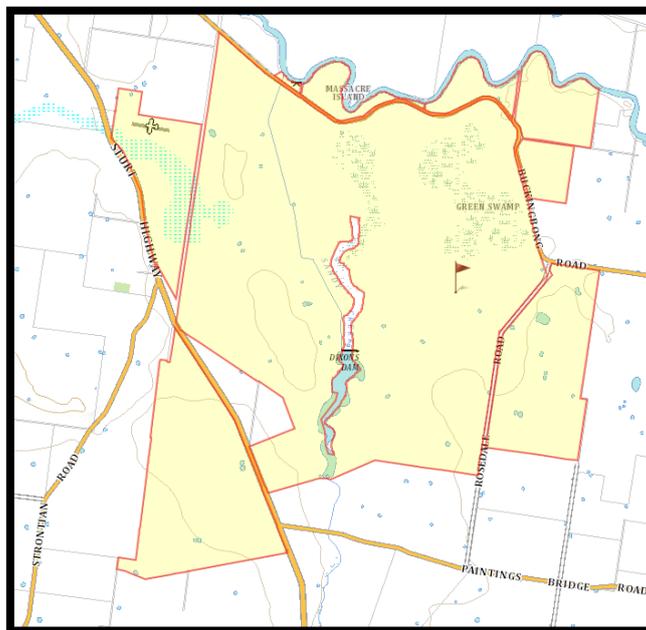


Figure 7 Site topography (Source: SixMaps)

The site is currently utilised for agricultural purposes in the form of grazing and arable cultivation. Due to the past agricultural use the proposal area has been cleared and had only recently been prepared again for a new crop prior to negotiations between the landowner and developer for the

project. A portion of the site towards the north and north eastern extent is identified as being bushfire prone land as shown in the below figure.

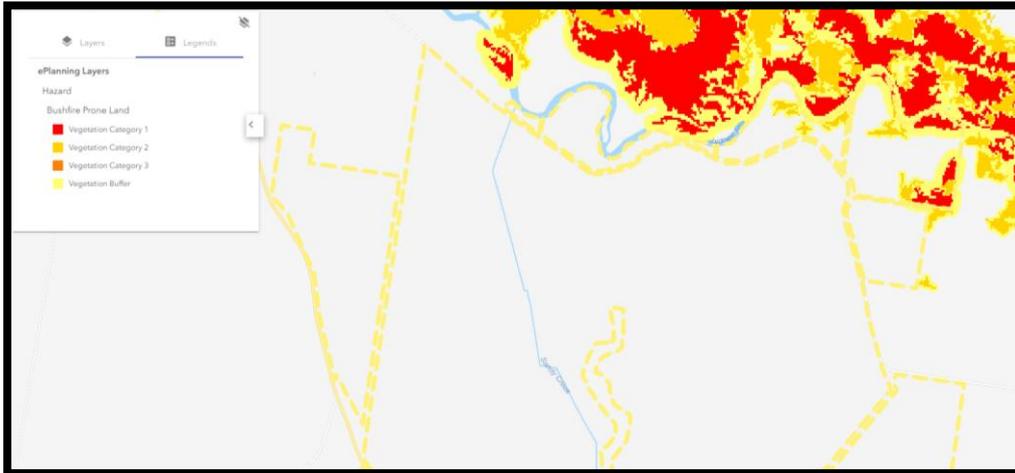


Figure 8 Bushfire prone land map of development site (Source: NSW Planning Portal)

Although the mapped bushfire prone vegetation is located around the boundary of the site and not within the vicinity of the proposal area, it is noted that the vegetation within 140 metres of the proposal area would be classified as ‘grassland’ as discussed in the accompanying Bushfire Assessment and Bushfire Emergency Management and Operations Plan.

Parts of the site are identified as being flood prone in Council’s Floodplain Risk Management Study and Plan and as such a Flood, Drainage and Groundwater Assessment accompanies this report as a separate cover attachment and is discussed in further detail in further sections of this document.

3.2 SUBJECT LOT

The proposed development would be located on Lot 22 DP 754540 (subject lot), with overhead power poles and powerlines also traversing Lot 1 DP754540 to the north as shown in the below figures and accompanying development plans.

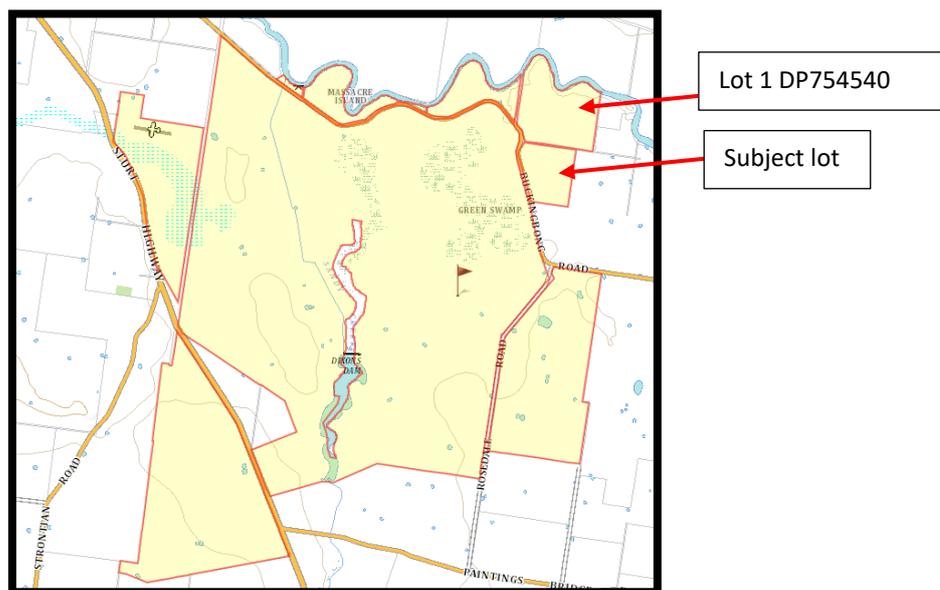


Figure 9 Subject lot (Source: SixMaps)

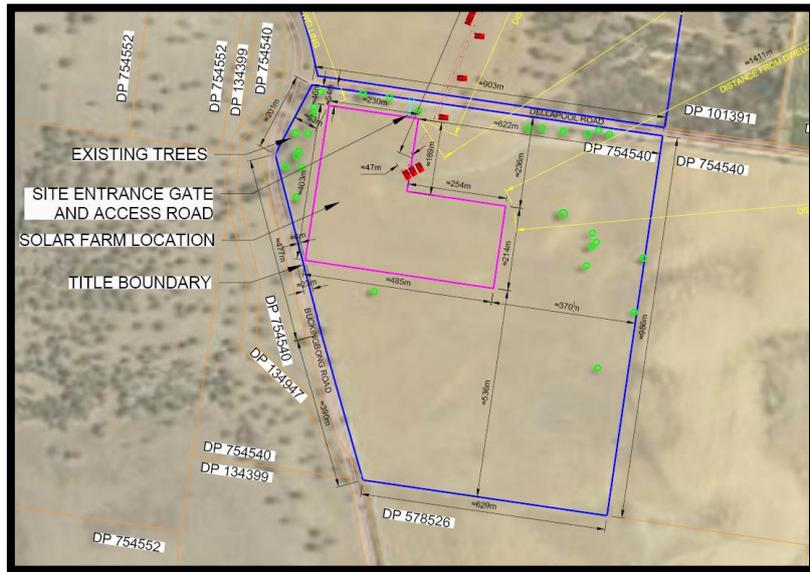


Figure 10 Extract from Location Diagram (Source: ACnergy)

The subject lot does not contain any structures. The nearest dwellings are located on the property on separate lots to the north and north west being 952 metres and 818 metres respectively from the proposal area. There are also three additional dwellings located on neighbouring properties located to the north east as shown in the below figure.

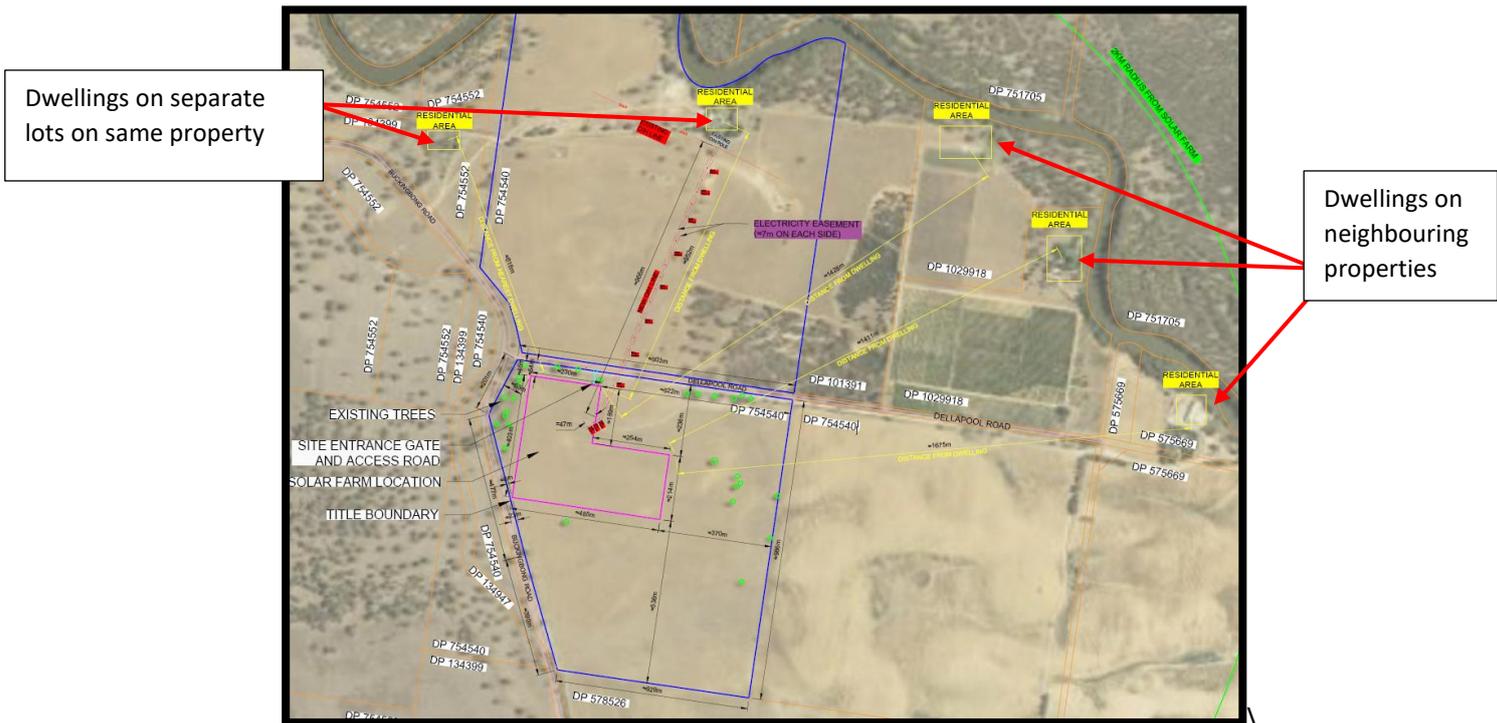


Figure 11 Surrounding dwelling locations (Source: SixMaps)

As shown in the annotated extract from the site survey (on the following page) the subject lot is undulating with the lowest area being located to the north east of the development footprint.

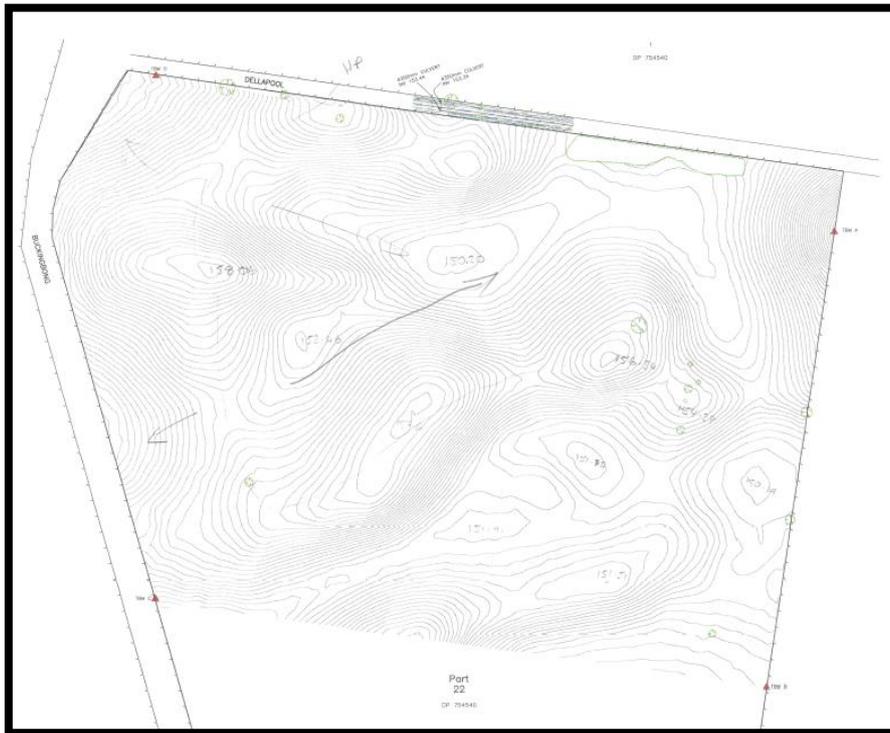


Figure 12 Annotated site survey extract (Source: PHL Surveyors)

No trees would be required to be removed to facilitate the proposal.

It is noted that there are two areas identified as bushfire prone land within the subject lot being along the north eastern property boundary and the south eastern property boundary as shown in the below figure.

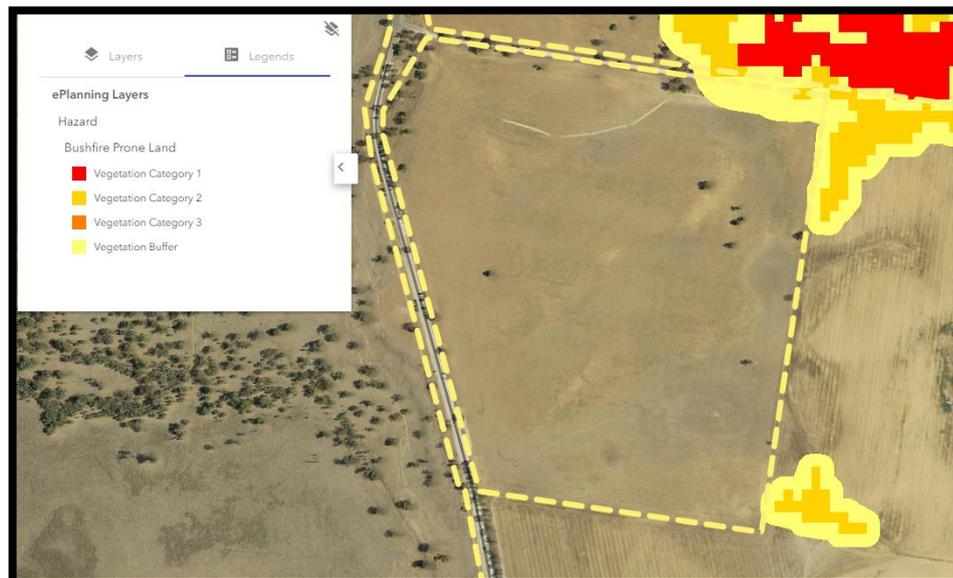


Figure 13 Bushfire prone land mapping of subject lot (Source: NSW Planning Portal)

Although the mapped vegetation is located over 200 metres from the proposal area it is noted that the vegetation within 140m of the proposal area is identified as 'grassland' and as such this hazard is considered in the accompanying Bushfire Assessment and Bushfire Emergency Management and Operations Plan.

3.3 PRESENT AND PREVIOUS USES OF THE SITE

The site is currently utilised, and has been for a number of decades, for agricultural purposes in the form of grazing and arable cultivation. Overall it contains a number of associated dwellings and other ancillary farm structures. It is noted that no structures are contained on the subject lot with its previous use being limited to agriculture only.

Although the previous and present uses of the site include agricultural activities, these are limited to grazing and arable cultivation. There is no visual evidence on site of contamination and the land is considered to be in a suitable state for solar farm development.

3.1 LOCALITY

Surrounding land is rural in nature being zoned either RU1 Primary Production or RU4 Primary Production Small lots as shown previously in [Figure 6](#) of this report. Six (6) neighbouring dwellings are located within a two kilometre radius of the proposal area, with two of these being located on the same overall property as the solar farm on a different allotment as shown in the below figure.

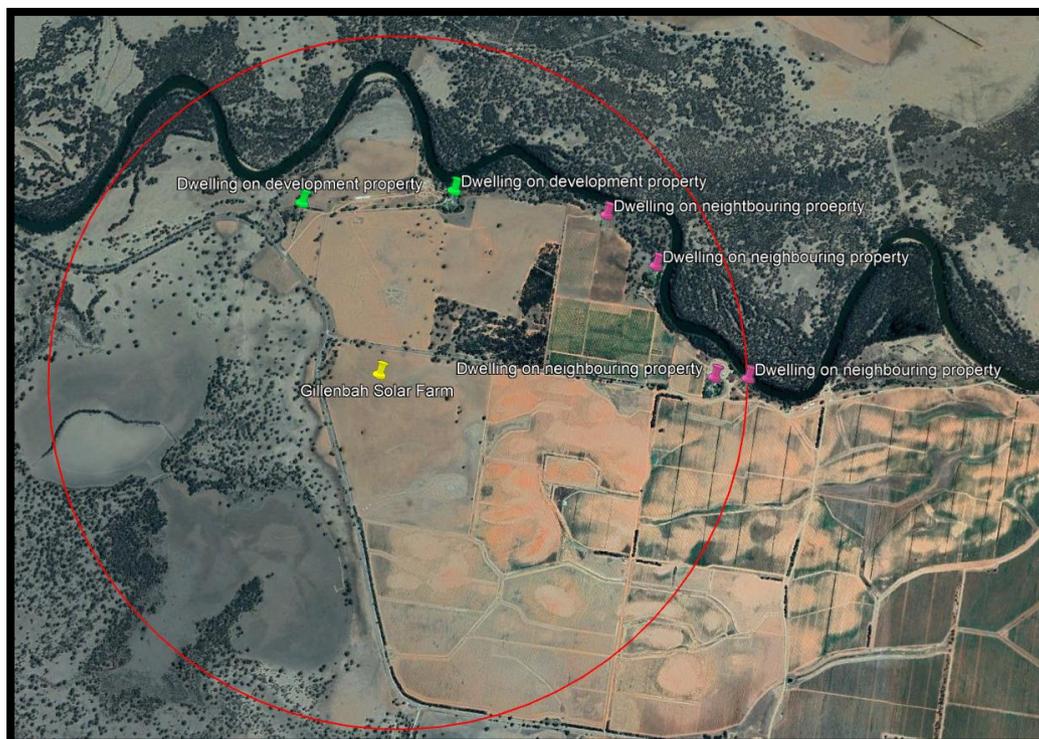


Figure 14 Approximate 2km Radius from development location (Source: Google Earth Pro)

The surrounding land is mostly cleared for agricultural uses with scattered vegetation throughout and the Murrumbidgee River located to the north. Buckingbong Homestead & Outbuildings and Buckingbong Woolshed, both of which are identified as locally significant heritage items, are located on the development property on a separate lot to the north. Wetlands, in the form of Green Swamp, are located west of the proposal area within a separate lot of the overall development property. There are no other significant land uses within the vicinity of the subject lot.

4 PROPOSED DEVELOPMENT

4.1 DEVELOPMENT OBJECTIVE

The objective of the development is to provide renewable energy to regional Australia, where it is most needed, at a scale which is responsive to the surrounding environment including nearby agricultural and other sensitive land uses. The intention is to functionally generate the equivalent output of larger conventional solar farms through a network of smaller facilities that can be rolled out in a site-sensitive manner and deliver renewable energy to different regions of New South Wales. These micro sites can be located on rural land without requiring extensive works to be undertaken on the landform and therefore can avoid the most productive agricultural land.

4.2 DEVELOPMENT DESCRIPTION

The development proposal is for a micro solar farm and associated infrastructure including photovoltaic panels and a power station consisting of inverter, transformer and switchgears. The power station would act as the primary conduit for electricity from the facility prior to it being transferred via overhead powerlines to the nearby Essential Energy transformer.

A 'micro' solar farm differs from a conventional solar farm in that it occupies less land area and has a maximum output of less than 5 megawatts. The project would include the installation of a total of approximately 16,128 PV panels with the entire development having a footprint of approximately 14.7 hectares. It is noted that the entire property has an area of approximately 4,980Ha in size and as such the proposal will still allow agricultural land uses to continue to be undertaken on other areas of the property. The footprint of the solar farm will also be able to be utilised for grazing purposes throughout the life of the development as the compound will be established with ground cover in the form of permanent pasture.

Further to this, the solar farm would have a life span of 31 years from construction, after which it would be decommissioned and all assets removed from the site. The site would then be rehabilitated as required and the development area could easily be returned to agricultural use should this be desired by the landowner.

The solar farm area would be surrounded by a fully secured 1.8-metre-high steel wire fence with a landscaped vegetation buffer located on the interior of the fencing. The landscape buffer would take the form of two rows of plantings, row one being offset approximately 3.5 metres from the site fence, and row two being offset approximately 1.5 metres from the site fence. The buffer would have an expected combined width at maturity of approximately 5 metres. The vegetation would include shrubs with a mature height of approximately 3 metres, and understorey plantings with a mature height of approximately 1.5 metres which would assist in lessening visual impacts of the proposal on nearby residences.

The solar farm would be remotely monitored allowing for constant surveillance without the requirement of onsite staff, however a maximum of two contractors would attend the site a maximum of three times per month for general inspections and maintenance of equipment or landscaping or for security inspection purposes.

4.2.1 EQUIPMENT

4.2.1.1 TRACKERS AND SOLAR PANELS

A total of approximately 16,128 non-reflective solar panels, with approximate dimensions of 2100mm by 1050mm and a depth of 40mm, would be mounted to array tracking systems. A typical array would comprise approximately 80 – 90 individual solar panels.

The tracking system utilises small electric motors to tilt the arrays to ensure maximum solar radiation is received at all times throughout the day. The solar arrays will be mounted with the central axis being approximately 1.4m from ground level. The array and tilted panel would have a maximum height of approximately 2.5m when tilted to its sharpest angle as shown in the below figure.

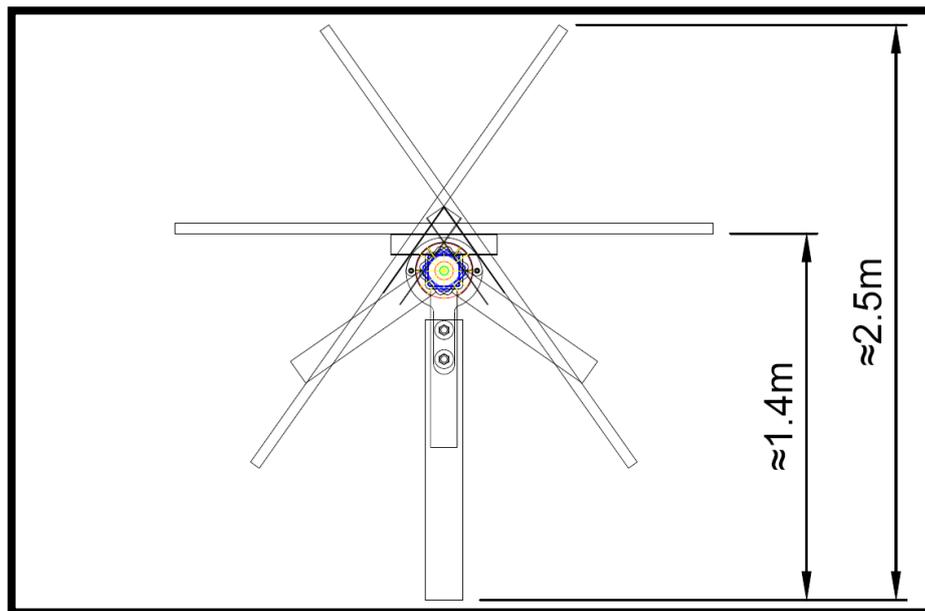


Figure 15 Typical tracker layout (Source: ACEnergy)

A typical solar tracking system including solar panels and arrays is shown in the figure on the following page.



Figure 16 Typical solar tracking system (Source: Google)

4.2.1.2 CENTRAL POWER STATION AND CONNECTIONS

The facility contains a central power station consisting of an inverter, transformer and switchgears similar to that shown in the below figure.

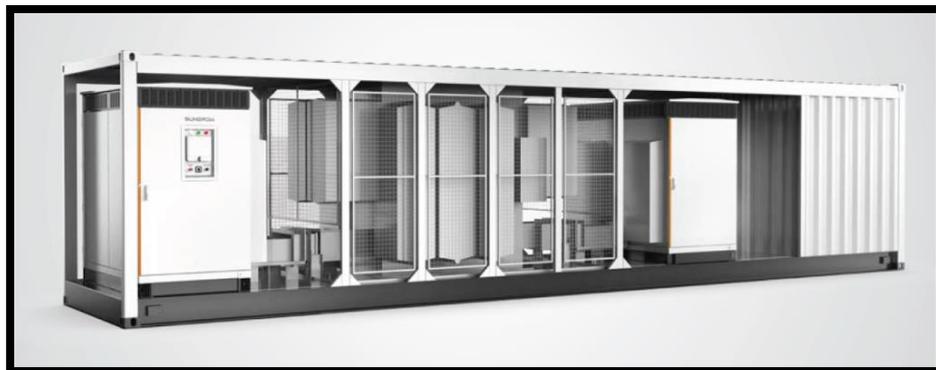


Figure 17 Typical inverter, transformer and switchgears (Source: ACnergy)

The power station will be prefabricated off-site and have dimensions of approximately 13m long, 3m wide and 3m high. It will be located within the compound, as identified in the accompanying ACnergy development plans, and will be utilised as the primary conduit for electricity generated from the solar panels to a HV switch board.

The HV switchboard, which would house the HV switch gear and associated safety features, would receive electricity from the power station via underground cables. The HV switchboard platform would measure approximately 5m wide, 5m long and 4m high. The switchboard would be fixed on the platform beams and the platform would be placed on footings as identified in the accompanying ACnergy plans. The figure on the following page depicts a typical HV switchboard and associated platform.



Figure 18 Typical HV switchboard and platform (Source: ACEnergy)

The HV switchboard would connect via underground cables to one of the two new power poles erected within the compound which would then transfer the electrical load via overhead powerlines to the nearby Essential Energy substation.

As described above, one underground/overhead power pole and an overhead power pole are planned to be installed within the compound, with two (2) additional overhead poles being installed to the north of the compound within the subject lot, and seven (7) additional poles within the lot to the north to support the installation of approximately 960 metres of overhead powerlines which would connect the facility to the existing Essential Energy network infrastructure to the north. Each pole will measure approximately 10 metres in height above ground.

The accompanying development plans prepared by ACEnergy provide additional details of the proposed power station including typical elevations, footings and connection details.

4.2.1.3 ENERGY STORAGE CONTAINERS

Five (5) DC-coupled energy storage containers (ESC) would also be included in the development and would be installed on concrete footings as depicted in the accompanying plans prepared by ACEnergy. They would physically resemble a mounted shipping container measuring approximately 13m long, 3m wide and 3m high and will have a powder-coated grey finish similar to that depicted in the figure on the following page.



Figure 19 Typical DC coupled energy storage container (Source: ACEnergy)

The energy storage containers would allow generated energy to be stored as required and utilised during times of high demand. They can also perform grid management functions such as frequency and voltage control.

4.2.2 FENCING AND LANDSCAPING

Although the subject lot is fenced by typical rural post and wire fencing, the development area would also be enclosed by a 1.8-metre-high chain mesh fence. A landscape buffer would be included inside the site fencing. The buffer would take the form of two rows of plantings, row one being offset approximately 3.5 metres from the site fence, and row two being offset approximately 1.5 metres from the site fence. The buffer would have an expected combined width at maturity of approximately 5 metres. The vegetation would include shrubs with a mature height of approximately 3 metres, and understorey plantings with a mature height of approximately 1.5 metres which would assist in lessening visual impacts of the proposal on nearby residences.

The proposed landscaping is considered appropriate due to the rural location of the development site and the distance to nearby visual receptors which ranges from approximately 818 metres to over 1.5km. Further to this the site is located over 6km east of the Sturt Highway and would therefore have no impact on traffic utilising this roadway.

The landscape buffer will be maintained for the duration of operation of the facility as necessary.

4.2.3 SITE ACCESS

Access to the solar farm would be via a security gate with a width of approximately 8 metres on the northern side of the compound. An all-weather internal access track, with a width of approximately 4 metres, would connect the development area to the proposed new Dellapool Road property access to the north.

A desktop analysis confirms the access is likely to conform to safe sight distance requirements for vehicles leaving the site however this would be able to be confirmed at Construction Certificate application stage through completion of a full site analysis report.

4.2.3.1 LABOUR

Construction is likely to occur over an approximate six (6) month period. Civil earthworks and fencing would begin first, with material delivery, installation, testing, commissioning, and site clean up, landscaping and demobilisation to occur in turn.

During the construction period the amount of workers on the site would depend on the stage of works however a maximum of 50 workers would be on site at any one time. Positions would include Project Manager, Construction Manager, Health and Safety Manager, electrical contractors, plant operators, fencing contractors, heavy vehicle drivers, general labourers and the like.

4.2.4 OPERATION

As described previously in this report, once operational the solar farm would be remotely monitored allowing for constant surveillance without the requirement of ongoing staff. A maximum of two contractors would attend the site a maximum of three times per month for general inspections and maintenance of equipment or landscaping or for security inspection purposes.

It is noted that the majority of technical issues which could arise during operation are able to be solved remotely by engineers who oversee the remote monitoring of the site. Any aspects which require on site attention would be attended by a local contractor who would also undertake the regular maintenance described above.

4.2.5 DECOMMISSIONING

Decommissioning of the facility would occur at the end of the useful life of the infrastructure, anticipated to be approximately 31 years from commencement of construction. At the end of the project lifecycle the facility will be decommissioned in a manner to ensure the land is left in a suitable state for a return to primary production purposes based on the current zoning.

It would be proposed that not later than 12 months prior to the proposed cessation of operation a decommissioning plan be prepared and provided to Council for review and approval. The objective of such a plan would be to restore the land to its pre-existing

state suitable for agricultural use. It would include, but not be limited to, the following details:

- Expected timeline for rehabilitation completion;
- Decommissioning of all solar panels, above and below the ground infrastructure, inverter stations, fencing and any other structures or infrastructure relating to the approved development; and
- Programme of site restoration to return the land back to a suitable state for agricultural production.

4.3 COUNCIL PRE-DA ADVICE

A meeting was held with Council on 5th February 2021 to discuss the proposal. An overview of advice provided by Council and comments in response to this advice is provided in the below table.

Table 1 Pre-DA advice received from Council

COUNCIL ADVICE	COMMENTS
<i>Advice would be sought from Council's Heritage Advisor in relation to whether a Statement of Heritage Impact within the SEE would be sufficient to address the impact of the development on Buckingbong Homestead to the north, or if a visual impact assessment would be required.</i>	Council's Heritage Advisor confirmed in a further email that a Statement of Heritage Impact within the SEE would be sufficient to address the impact of the development on Buckingbong Homestead to the north. This is therefore included further on in this report.
<i>Hydrology, in the form of flood, groundwater and overland flow, would need to be considered</i>	Noted. The development property is identified as flood affected as described previously in this report and as such a Flood, Drainage and Groundwater Assessment was undertaken by Water Technology and accompanies this report as a separate cover attachment. Hydrology is therefore considered further on in this report.
<i>Bushfire to be addressed as required by Planning for Bushfire guide 2019.</i>	Noted. A Bushfire Assessment and Bushfire Emergency Management and Operations Plan accompanies this report as a separate cover attachment.
<i>Proposal area not biodiversity affected however other parts of property are. Address biodiversity including SEPP44, check koala habitat area and undertake a test of significance.</i>	Noted. This is addressed further on in this report.
<i>Council's Manager Roads provided the following advice:</i> <ul style="list-style-type: none"> • <i>Existing access from Sturt Highway to Buckingbong Road is adequate and whilst the development is not integrated development Council will advise TfNSW</i> 	Noted. These aspects are addressed further on in this report.

<p><i>of the proposal out of courtesy.</i></p> <ul style="list-style-type: none"> • <i>Council agrees that in the past similar smaller solar farm developments that do not access directly from a state road have not required a standalone traffic assessment and as such traffic can be addressed in the SEE.</i> • <i>Traffic aspects to address as a minimum in the SEE to include expected numbers and types of vehicles during construction</i> 	
<p><i>A noise assessment is not required so long as noise is addressed in the SEE.</i></p>	<p>Noted. Noise is addressed further on in this report.</p>
<p><i>If any paddock trees are to be removed, consider if this is covered under the Local Land Services Act or if development approval is required.</i></p>	<p>Noted. No trees are proposed to be removed to facilitate the development.</p>

5 IMPACTS

5.1 CONTEXT AND SETTING

The site is located in an area zoned a combination of RU1 Primary Production and RU4 Primary Production Small Lots as shown previously in [Figure 6](#) on page 6 of this report.

Although topographic mapping confirms the topography of the overall property varies, it does not include extreme slopes. Six (6) residential dwellings are located within 2km of the site, two being located on the overall property and the others on a neighbouring properties to the north east. The development area is separated from the neighbouring dwellings by over 1.4km and therefore it is considered that there is a relative absence of nearby potential visual and acoustic receptors.

The proposal is not considered out of context or incompatible with the setting as agricultural areas have historically been the preferred location for electrical infrastructure, including substations and high voltage overhead transmission lines. Further to this electrical infrastructure, including renewable energy infrastructure and ancillary structures, are common within rural and agricultural areas.

The proposal, being defined as **electricity generating works**, is permissible within the zone according to *Part 3, Division 4 Electricity generating works or solar energy systems* of *State Environmental Planning Policy (Infrastructure) 2007 (ISEPP)*.

The majority of impacts on surrounding land uses would be experienced during the construction period however these impacts would be managed to minimise impacts as outlined in the Construction Management Plan (CMP), a draft of which accompanies this report as a separate cover attachment. The CMP would be amended as necessary and finalised for submission with a future Construction Certificate application for the project should development consent be forthcoming.

Ongoing operation is unlikely to cause detrimental impacts on the surrounding area due to the distance from residential receptors, the inclusion of a landscape buffer within the compound and the natural screening provided by the surrounding topography and land uses. Given the distance between the proposal and the Sturt Highway to the west, being over 6km, impacts on the highway are not anticipated.

All other areas of the expansive property can continue to be utilised for agricultural purposes throughout the life of the development. The footprint of the solar farm will also be able to be utilised for grazing purposes throughout the life of the development as the compound will be established with ground cover in the form of permanent pasture.

Further to this, the solar farm would have a life span of 31 years from construction, after which it would be decommissioned and all assets removed from the site. The site would then be rehabilitated as required and the development area could easily be returned to agricultural use should this be desired by the landowner.

The site is suitably located to obtain the required solar access for the facility to operate as intended without resulting in unreasonable impacts on adjacent properties, while also being located in proximity to Essential Energy infrastructure, a core requirement for the project to succeed.

5.2 VISUAL IMPACTS

Due to the location of the development it is not expected to affect the visual privacy of residential uses within the area. The development does not require any after dark lighting as it will be operated remotely. Security cameras with night vision capabilities will be installed near the access gate however these will not result in detrimental visual impacts.

Due to the rural location and distance to nearby visual receptors, the development is not expected to result in detrimental impacts on the landscape or surroundings. It is noted that a landscape buffer will be provided within the development boundary to assist in reducing visual impacts of the proposal. Further to this, it is noted that the proposal has an expected lifespan of 31 years, after which it will be decommissioned and the landscape will be returned to the current agricultural use.

5.2.1 GLINT AND GLARE

Glint and glare refers to the human experience of reflected light with glint being defined as a momentary flash of bright light, and glare being defined as a continuous source of bright light. Glare assessments for solar farms are generally based on the following factors:

- the tilt, orientation, and optical properties of the PV modules in the solar array;
- sun position over time, taking into account geographic location;
- the location of sensitive receptors (viewers); and
- Screening potential of surrounding topography and vegetation.

PV modules are designed to maximise the absorption of solar energy and therefore minimise the extent of solar energy reflected. PV modules have low levels of reflectivity between 0.03 and 0.20 depending on the specific materials, anti-reflective coatings, and angle of incidence. The higher reflectivity values of 0.20, that is 20% of incident light being reflected, can occur when the angle of incidence is greater than 50 degrees.

A single axis tracking system has a fixed maximum angle of rotation. Once the tracking mechanism reaches this maximum angle the PV modules position relative to the sun becomes fixed and therefore the angle of incidence increases and the potential for glare increases. The tracking system rotates the PV panels across an east to west arc, following the sun's trajectory across the sky. The purpose of the tracking system is to optimize solar energy collection by holding the PV module perpendicular to the sun. The tracking system is capable of a maximum rotation range of 120° (+/- 60°).

The maximum height of the PV modules above natural ground would be approximately 2.5 metres (1.4 metres when the panels are held at 0 degrees (flat) and 2.5 metres at maximum tilt).

The sun changes its east-west orientation throughout the day, and the sun's north-south position in the sky changes throughout the year. The sun reaches its highest position at noon on the Summer Solstice (21 December in the Southern Hemisphere) and its lowest position at sunrise and sunset on the Winter Solstice (21 June in the Southern Hemisphere).

As described throughout this report, there are six (6) residences located within a 2km radius of the development, all of which are located north and north east of the proposal area. As the development lot can be described as undulating there would unlikely be an uninterrupted line of site between the development and the two residences to the north and north west on the overall property. It is noted that the solar farm will include a landscape buffer within its boundary fence comprising two rows of plantings to obtain a matured vegetation combined width of approximately 5 metres and height of approximately 3 metres. Due to the direction of the development from these dwellings combined with the separation distance of over 800 metres and the inclusion of the vegetation buffer, it is considered that the potential for glint and glare impacts on these receptors to be minimal.

The four neighbouring residences located to the north and north east would be buffered from the development by a distance of over 1.4km, remnant vegetation, agricultural land uses (including cultivation of fruit trees) and their own landscaping as shown in the figure on the following page.

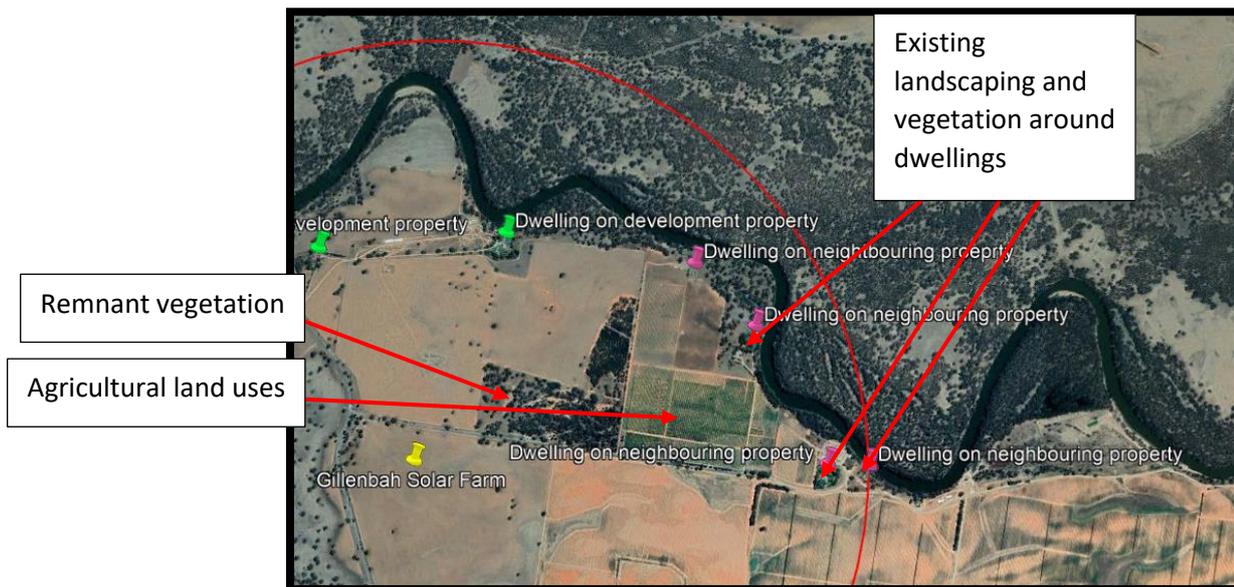


Figure 20 Existing buffers between development location and neighbouring dwellings (Source: Google Earth Pro)

Further to this, the topography combined with the direction of the dwellings from the development and the included vegetation buffer, it is considered that the potential for glint and glare impacts on these receptors to be minimal.

The development lot adjoins Buckingbong Road to the west and Dellapool Road to the north which are not considered to be classified roads. These roads would be utilised by relatively low volumes of traffic which would include movements of surrounding landowners, farm workers and farm traffic including trucks during harvest and movement of farm machinery as required. There is the potential for these roads to also be utilised by recreational users of the Murrumbidgee River to the north. It is considered that due to the relatively low traffic volumes and the inclusion of the landscape buffer there would be minimal opportunities for glint and glare impacts on passing traffic.

5.3 NOISE & VIBRATION

The nearest sensitive receptors include the two (2) dwellings on the overall property which are located over 800 metres north of the proposal area, and the four (4) neighbouring dwellings to the north east which are located over approximately 1.4 km from the proposal area as shown in [Figure 20](#) on page 21 of this report.

Given the two nearest receptors are located on the subject property, it is anticipated that any potential noise and vibration impacts will not be unexpected by the residents given their understanding of, and consent to, the project at hand.

Acoustic impacts are expected during construction of the development in terms of traffic and general onsite construction generated noise. Major civil works, materials delivery and other heavy vehicle movements will only occur between the hours of 7am - 6pm Monday to Friday, and 8am – 1pm Saturday. To maximise productivity less noise intensive activities including electrical work, testing and commissioning may be conducted outside these hours and between 7am – 7pm Monday to Sunday as required.

Given the majority of adjacent land is zoned a combination of RU1 Primary Production and RU4 Primary Production Small Lots, the anticipated noise generation from construction activities is not considered to be above and beyond that which would be expected during intensive agricultural activities such as harvesting. It is noted that construction would be undertaken over a 6 month period however earthworks are anticipated to be undertaken over the first 4 weeks, with delivery of large materials to be undertaken intermittently over the construction period, with a maximum of two heavy vehicles expected to attend the site daily on average.

In relation to vibration impacts, it is noted that there will be vibratory equipment used within the boundaries of the compound including an impact piling rig. The Transport for NSW – Construction Noise Strategy document recommends a separation distance of 15 metres when addressing cosmetic response, and 50 metres when addressing human comfort. It is noted that the sensitive receptors are located well over this distance from the proposal area.

In relation to operational noise, it is anticipated that this would be well below noise generated during construction. The facility will operate 24 hours per day, 7 days per week with operational equipment to include the inverter, AC/DC converter, transformer, battery storage air conditioning unit and the array tracker motors. The potential noise emitted from the equipment has been retrieved from supplier specifications for typical versions of the equipment and is reproduced in the below table.

Table 2 Operational noise sources

EQUIPMENT	NOISE LEVEL	MEASUREMENT DISTANCE
Central Inverter Unit (Sungrow SG2475HV) – per unit	73 - 79 LAeq	1 metre
Inverter Unit Transformer – 5MVA	56 LWA – sound power	N/A
Sungrow SD1250HV DC / DC Converter Unit – per unit	67 - 71 LAeq	1 metre
SMA Battery Storage Container Air Conditioning Unit – per unit	58 LAeq	10 metres
NEXTracker Motor – per unit	< 60 LWA – sound power	N/A

The NSW Environment Protection Authority Noise Policy for Industry (NPfi) provides suitable criterion for addressing operational noise emissions associated with the proposal at sensitive receptors. The Policy was released in 2017 and includes methodologies for assessment and management of typical operational noise emissions from industrial premises within NSW. Within the NPfi, noise emissions are considered in various assessment periods defined as the day, evening, and night to reflect the sensitivity associated within the impacts of noise.

When addressing noise emissions associated with the commercial / industrial uses, the NPfi defines project trigger levels which are used to consider potential impacts at sensitive receptors. The levels are determined based on consideration of what the NPfi refers to as the 'Project Intrusiveness Noise Level', and the 'Project Amenity Noise Levels'.

The intent of the project intrusiveness noise level is to minimise the potential change in acoustic environment at sensitive receptors by ensuring that impacts associated within a new source are controlled to values 5 dB above a minimum threshold noise level. The attributable noise levels are defined as LAeq values assessed over a 15 minute period.

The intent of the project amenity noise level is to limit continuing increases in noise level at sensitive receptors through consideration of independent commercial / industrial operations in accordance with the Intrusiveness Noise Level criteria alone.

In the absence of site measured data, the minimum 'rating background levels' (RBLs) included within the below table have been adopted as the basis of this desktop assessment.

Table 3 Minimum RBLs, project intrusiveness noise levels and project amenity noise levels (Source: NPfl)

DESCRIPTOR	NPFI DEFINED ASSESSMENT PERIOD		
	DAY	EVENING	NIGHT
Minimum RBLs	35 LA90	30 LA90	30 LA90
Project Intrusiveness Noise Levels	40 LA90	35 LA90	35 LA90
Project Amenity Noise Levels (based on the rural area)	50 LAeq	45 LAeq	40 LAeq

In accordance with the methodologies contained within the NPfl, project noise trigger levels are determined based on whichever of the project intrusiveness level and the project amenity level is the lower or more stringent. As such, the project intrusiveness noise levels would apply to this development.

Based on the potential acoustic impacts of the project equipment identified in Table 2, the likely background noise levels generated from the surrounding rural land uses, and the distance of the six (6) sensitive receptors located within a 2km radius of the site, it is unlikely that detrimental acoustic impacts would be experienced during operation of the development.

In relation to operational vibration impacts, it is noted that no vibration intense activities will occur during the operational phase of the development and therefore no adverse vibration impacts are expected on sensitive receptors.

Decommissioning noise is anticipated to mirror that of construction noise and as such is considered to be in line with anticipated agricultural use acoustic impacts within the vicinity.

5.4 AIR AND MICROCLIMATE

The site is located within the Riverina Bioregion which includes southwest NSW, and extends into central-north Victoria (Vic). The bioregion climate is dominated by a persistently dry semi-arid climate characterised by hot summers and cool winters.

The site is located over 6km from the Sturt Highway to the west which is considered to be a sufficient distance for air quality impacts not to be experienced from the highway. Air

quality is however expected to be impacted by existing conditions which include agricultural practices from the subject and surrounding sites.

Available climate data identifies the region receives unpredictable amounts of rainfall with the average ranging from 238 – 617mm per year with drought periods not being unusual. The average monthly maximum temperature ranges from 31.1 - 33.6 degrees, with the minimum ranging from 3.2 – 3.9 degrees.

In previous high-profile solar energy facility developments there has been community concern around the potential heat generated by solar energy facilities leading to a 'micro-climate' in the immediate vicinity. In cases of significantly larger solar facilities of over 100 hectares, the impact of such an effect has been proven to be negligible. In considering the significantly smaller size of this proposal, this is even more so. Additionally, there is very little evidence to support a supposed 'heat island' affect from solar facilities. Any ambient heat from panels would have wholly dissipated by the time it reaches the facility's fence line.

The primary air quality impacts associated with the development are anticipated to be experienced during the construction and decommissioning phases. These impacts would include the potential for dust generation from vehicle movements to, from, and about the site. Potential air quality impacts are considered manageable with the implementation of mitigation measures as outlined in the accompanying draft CMP.

Detrimental air quality impacts are not expected during operation due to the nature of the facility however minor impacts may be experienced via maintenance vehicle movements. Any such impacts are anticipated to be negligible due to limited site attendance.

The impact of the overall development, being solar energy generation, is anticipated to be positive as it would contribute to a reduction in greenhouse gas emissions related to conventional energy generation methods.

Cumulative air quality impacts are expected to be negligible due to the existing use of surrounding land and the relatively limited construction timeframe.

5.5 SOILS AND SURFACE WATER

The potential to impact upon soils and surface water quality on the site is greatest during the construction and decommissioning phases. During these periods the soils will be subject to disturbance associated with site preparation and infrastructure installation/removal. Construction works for the proposed solar farm include removal of minor areas of groundcover and soil during site preparation and minor excavation for footings for the proposed substation, battery energy storage systems, access road, vehicle movement areas, temporary laydown area, parking area and underground cabling.

The upper layer of soil would be subject to temporary disturbance which may lead to erosion and potential sedimentation in runoff during periods of rainfall. Extensive cut and fill is not proposed as part of the development. Minor earthworks will be undertaken to form the vehicle movement and unloading areas as well as to clear area for footings of infrastructure containers. These works would not require cut and fill of any areas over a maximum of 300mm and would not require any retaining walls or similar.

The use of fuels, lubricants and herbicides during construction pose a risk of surface water contamination in the event of a spill. Management of contained sewage disposal facilities also pose a risk to surface water quality should spills occur.

During construction and decommissioning, erosion and sediment control mitigation measures will be implemented as required by applicable policies, guidelines and legislation. Standard mitigation measures around refuelling, maintenance and weed clearing will minimise the risk of spills. Water, which will be sourced externally, will be utilised as required for dust suppression.

The potential for the proposed solar farm to impact upon soils and surface water quality during the operational phase, after the disturbed areas and construction compound have been rehabilitated, is minimal. The site will not be staffed during operation with routine maintenance and monitoring being the extent of regular activities which are unlikely to have any impact to surface water quality. During operation the site will be under permanent pasture which will result in lower level of soil erosion relative to the current land use practice arable cultivation. A rainwater tank with a capacity of 22,500L is proposed to be located on the site as a static water supply to be utilised for bushfire fighting purposes if required.

It is considered that the potential surface water quality impacts do not present any major constraints that cannot be managed. All construction and decommissioning activities for the proposed solar farm will be undertaken in a manner that prevents erosion and sediment impacts at the subject site and those surrounding. Post approval, a Construction Environmental Management Plan (CEMP) will be prepared to identify erosion and sediment control mitigation measures prior to works commencing on the site.

5.6 STORMWATER MANAGEMENT

The accompanying Flood, Drainage and Groundwater Assessment prepared by Water Technology considers stormwater management in relation to the proposal. The assessment notes that the solar panels do not effectively increase the impervious area on the site in the same way road pavement or the roof of a building would. Further to this, the development has been located so as to avoid the deepest ponding areas on the site which are to the north east of the proposal area.

The assessment also notes that the access road, which will be gravel in nature, will result in negligible impacts in regards to runoff volumes and peak flow rates generated on the site however it should be designed to consider typical drainage requirements.

It is noted that due to the topography the site drains in several directions once the low points are filled and that velocities of water moving through the site are generally quite low.

The assessment recommends:

- Ensure that the soil profile has not been overly compacted due to heavy machinery during construction, if it has, mitigate the soil to increase infiltration rates.

- Typical stormwater and environmental management practices should be undertaken during construction to minimise the likelihood of sediment leaving the site.
- Encourage vegetation cover to establish and be maintained. Native grasses would be the preference, but when dealing with cleared farmland, improved pasture is likely to exist in the soils seed bank already.
- Concentrated flows along narrow flow paths should be avoided to minimise erosion potential. There are no major flow paths within the site, therefore there is considered to be a low risk of erosion as a result of concentrated flow paths.
- The gap between each row of solar panels is greater than or equal to the width of the solar panel rows to allow the runoff from the upslope panel a buffer strip to spread across the surface and allow vegetation growth.
- If the slope of the land is greater than 5% provide an energy dissipator or contour that will hold the runoff up and allow it to spread across the downslope evenly. This break in slope should be provided downhill of each dripline from the upslope panel. The site is relatively flat (about 1 ~ 2 %), with several localised areas where ponding may be present so this measure will not be required at this site.
- Existing vegetation, for example grasses and grass cover, provide a filter for sediment control. These should be maintained where possible.

It is concluded that so long as the site layout can meet the above mentioned general stormwater management principles, there is unlikely to be any adverse impact of the development on the hydrology of the catchment.

5.7 GROUNDWATER

It is noted that the subject lot is identified as 'groundwater vulnerable' according to the Narrandera Local Environmental Plan 2013 as shown in the below figure.

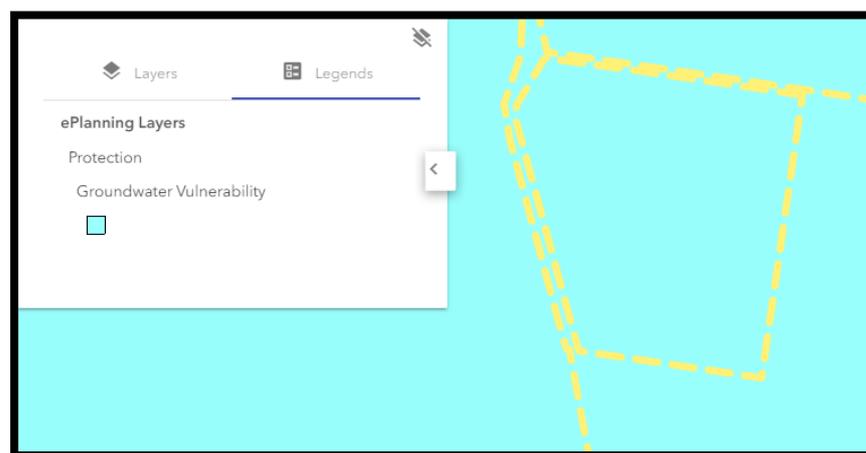


Figure 21 NLEP2013 Groundwater Vulnerability Map (Source: NSW Planning Portal)

No groundwater will be used by the development. Water quality impacts to groundwater during construction, operation and decommissioning are considered unlikely as limited excavation is proposed for the installation of panel tracking systems and ancillary infrastructure. Panels will be installed on driven piles installed not more than 2.5 m below

the ground surface, while minor excavation works would be undertaken for trenching for underground cabling as well as internal access roads and construction of hardstand areas.

Adverse impacts on groundwater dependent ecosystems are not anticipated, nor are cumulative impacts on groundwater including impacts on nearby groundwater extraction for a potable water supply or stock water supply.

Further to this, the accompanying Flood, Drainage and Groundwater Assessment prepared by Water Technology concludes that there is no need for further action in relation to groundwater beyond preparation of an appropriate environmental management plan at Construction Certificate stage of the development.

5.8 LAND AND SOIL CAPABILITY

Land capability is the inherent physical capacity of the land to sustain a range of land uses and management practices in the long term without degradation to soil, land, air and water resources. Failure to manage land in accordance with its capability risks degradation of resources both on- and off-site, leading to a decline in natural ecosystem values, agricultural productivity and infrastructure functionality.

The development site is identified on the Land and Soil Management Capability Mapping for NSW as Class 5 as shown in the below figure.

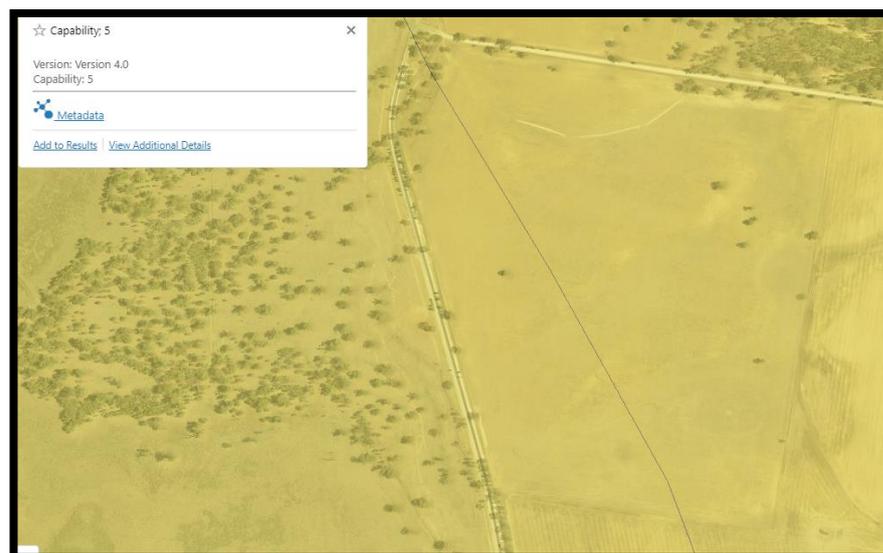


Figure 22 Land capability of development area (Source: NSW SEED Map)

Class 5 lands are described as having severe limitations for high impact land management uses such as cropping and highly specialised land management practices need to be utilised to prevent soil and land degradation. Such lands are generally more suitable for grazing and pasture improvement.

It is noted that groundcover within the development area will be maintained for the life of the solar farm in the form of permanent pasture and as such it is considered that the development will have less impact on the affected land and soil than the agricultural use to date. It will also ensure the land can easily be returned to further agricultural use consistent with the rural zoning in future.

5.9 WEED MANAGEMENT

It is noted that a general definition of a 'weed' is 'a wild plant growing where it is not wanted and in competition with cultivated plants'. For the purposes of this report the term 'weed' refers to noxious weeds as defined under the Noxious Weeds Act 1993 (NWA1993). Noxious weeds generally impact on agriculture, animal or human health or the environment whose control will provide benefit to the community over and above the cost of implementing control programs.

The site has been utilised for agricultural dryland cropping and grazing for an extended period. To enable successful and viable agricultural production it is likely that weed control has been a significant aspect of historical management practices across the site. It is noted that while significant infestations of noxious weeds are unlikely to be prevalent on the site, it is likely that the site contains district weeds typical of agricultural land in the region.

Good weed management is about overall good land management which typically includes strategies which resist further invasion of weeds, reduces the ability of weeds to establish, reduces adverse impacts on the site or to neighbouring properties and strategically addresses a reduction in weed density and distribution where practical.

It is proposed that a detailed Weed Management Plan be prepared and provided to Council as part of a future Construction Certificate application for the project should consent for the development be forthcoming. The objective of such a plan would be to ensure ongoing appropriate weed control and management during the construction and operation of the development to ensure weed control on the site and to minimise the risk of offsite impacts. The plan would include, but not be limited to, the following details:

- Herbicide identification, use and application method;
- Personal, equipment and machinery hygiene practices when entering the site during construction;
- Establishment and management of groundcover for the proposed permanent pasture during operation; and
- Monitoring and maintenance details.

5.10 WASTE AND EFFLUENT DISPOSAL

5.10.1 WASTE

During construction waste is likely to be generated in the form of general waste from materials packaging and general project construction.

All general waste will be collected, sorted and stored appropriately in labelled waste containers. Two waste bins will be located in the management hub area of the site, one of which will house general waste while the other will be for recyclable material only. The bins will be checked and logged daily by assigned personnel and once nearing capacity, these will be collected from the site by a licensed waste contractor and disposed of appropriately.

Mobile wheeled waste bins will also be available on the site to dispose of waste while unpacking materials. Once full, the waste from these bins will be transferred to the bins in

the management hub area. The site will be monitored regularly to ensure all waste is disposed of appropriately and not left about the site.

It is anticipated that little waste will be generated during operation due to the site being unstaffed excepting the periodical attendance of monitoring and maintenance contractors as required. Waste management during operation will however be similar to that during construction, with general and recycling waste bins residing on the site with waste logged once per month and the bins collected by a licensed waste contractor when required.

Waste generated during decommissioning is expected to take similar form to that generated during construction, being general in nature. Waste during the decommissioning phase will be dealt with in the same manner as that generated during the construction phase.

5.10.2 EFFLUENT

During construction effluent will be generated from the portable amenities. Effluent from the site facilities will be pumped to a temporary waste holding tank which will be pumped out and serviced regularly by a suitably qualified and licensed local liquid waste contractor. It is anticipated that emptying and maintenance frequency will be dependent on the stage of construction and the associated number of workers on the site at the time.

Effluent will not be generated during operation as the site will be remotely monitored and will not include sanitary facilities as maintenance contractors will only attend the site a maximum of three (3) times per month.

Effluent generation during decommissioning would be similar to that as described above for the construction period and as such it would be managed in the same manner.

5.11 FLORA AND FAUNA IMPACTS

The site has been historically utilised for agricultural purposes including grazing and arable cultivation, including the development footprint area. The property is identified as 'Terrestrial Biodiversity' as shown in the below figures.



Figure 23 Terrestrial Biodiversity Mapping for entire property (Source: NSW Planning Portal)

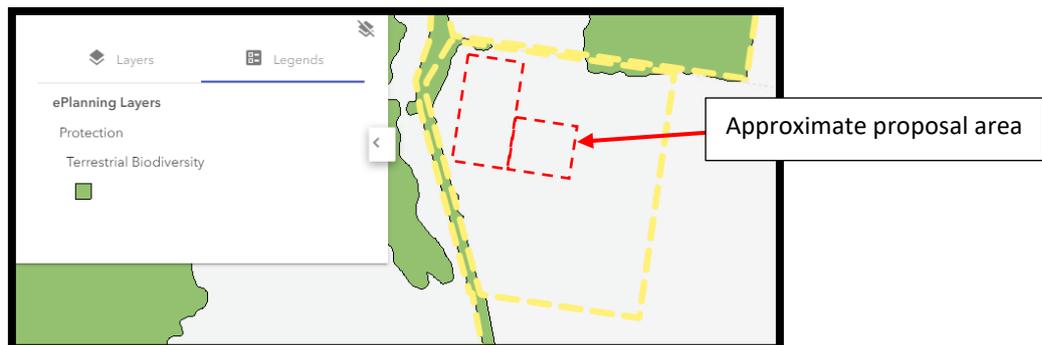


Figure 24 Terrestrial Biodiversity Mapping for subject lot (Source: NSW Planning Portal)

As shown in Figure 24 above the development footprint area is not identified as terrestrial biodiversity and as described previously in this report, does not contain native vegetation.

Parts of the property are identified as containing high biodiversity value vegetation however it is noted that the subject lot is not affected as shown in the figure on the following page.

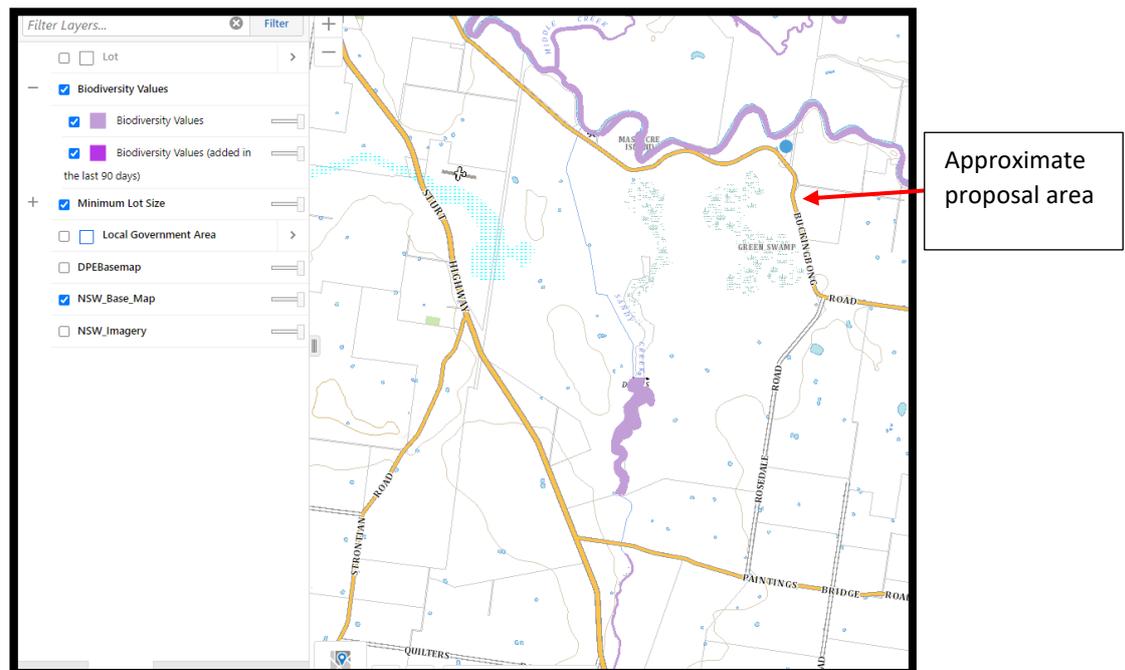


Figure 25 Biodiversity Values Map for entire property (Source: NSW SEED Mapping)

A search of the Biotnet Atlas for threatened and endangered species did not identify any threatened or endangered flora or fauna within the site. It is therefore considered that the development is unlikely to result in detrimental impacts on flora and fauna.

5.12 HERITAGE

5.12.1 ABORIGINAL CULTURAL HERITAGE

A Due Diligence assessment was undertaken in accordance with the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW*. Step 1 of the Due Diligence process relates to whether the activity will disturb the ground surface. Due to the nature of the proposal the site will be disturbed by the footings of the proposed solar panel trackers and the central inverter, battery containers, overhead electrical poles, material laydown area, and vehicle movement areas including the site access track.

Step 2a requires for a search of the AHIMS database to be undertaken and for any other sources of information of which we are aware to be considered. An AHIMS search was undertaken on 21st April 2021 for the subject lot with a buffer of 1,000 metres. The search concluded that no aboriginal sites are recorded in or near the subject lot, nor have any aboriginal places been declared in or near the subject lot. A copy of the AHIMS search results are attached to this report as Appendix A.

Step 2B advises that regardless of the outcome of an AHIMS search, it still needs to be considered whether aboriginal objects are likely to be in the area of the proposed activity when considering specified landscape features. Specified landscape features include rock shelters, sand dunes, waterways, waterholes and wetlands.

Given the absence of significant landscape features on the subject lot, it is unlikely for aboriginal objects to be located in the area, and, further to this, the site would be classified

as 'disturbed land'. The Code of Practice defines disturbed land as "having been the subject of a human activity that has changed the land's surface, being changes that remain clear and observable". Due to the extensive past and present agricultural use of the land, it is our opinion that it is clearly observable that the land would be defined as disturbed land. As such, the Code advises it is reasonable to conclude that there are no known Aboriginal objects or low probability of objects occurring in the area of the proposed development and as such the development can proceed with caution.

5.12.2 EUROPEAN HERITAGE

The site is not located in a heritage conservation area however Lot 1 DP 754540, part of the overall subject property, located to the north of the subject lot contains Buckingbong Homestead and outbuildings and Buckingbong woolshed which are identified as items I032 and I032 of local heritage significance according to Schedule 5 Environmental Heritage of the Narrandera Local Environmental Plan 2013. It is noted that the development is located within proximity to the identified heritage items and would require the erection of overhead powerpoles and powerlines within Lot 1 DP754540 to connect the facility to the nearby Essential Energy Infrastructure, As such a Statement of Heritage Significance is provided in the below section of this report.

5.12.2.1 STATEMENT OF HERITAGE IMPACT

As described in Section 5.12.2 above, the overall subject property contains heritage items identified as *I031 – Buckingbong Homestead and outbuildings* and *I032 – Buckingbong woolshed*. As such a Statement of Heritage Impact is required to determine the impacts the proposal may be on the heritage items, if any.

The NSW State Heritage Register identifies Buckingbong Homestead and its outbuildings as being associated with the Jenkins family since the 1840's. The original house shown on the 1867 survey prepared by surveyor Arthur C Bates still exists at the rear of the later-constructed brick homestead building with corrugated iron roof and wrap-around verandah. There are numerous additions to these buildings, characterised by the peaked iron roofs and brick chimneys in a warren of buildings. To the south of the homestead are the stables, a brick building with delicate vent openings on the side and end walls and a simple gabled roof lantern allowing light to the stalls.

The NSW Stage Heritage Register identifies Buckingbong woolshed as being constructed in c1895, having 35 stalls for shearers which formed part of the central board. The woolshed is constructed with timber framing and corrugated cladding/roofing.

The proposed development would be described as 'new development adjacent to a heritage item' as although the proposal would be located on a separate lot of the same overall property, overhead powerpoles and powerlines associated with the development would be erected within the lot containing the heritage items to provide connection to the existing Essential Energy infrastructure contained therein. The table on the following page assesses the potential impacts of the development on the items.

Table 4 Potential impacts of development on heritage items I031 & I032 Buckingbong Homestead and outbuildings and Buckingbong woolshed

ASPECT	COMMENTS
<p><i>How is the impact of the new development on the heritage significance of the item or area to be minimised?</i></p>	<p>As shown in the accompanying Location Diagram prepared by ACEnergy, the existing Essential Energy overhead line is located south of the heritage items and thus can be utilised by the development without placing assets in closer proximity to the heritage items than existing utility infrastructure.</p> <p>It is also noted that overhead electrical infrastructure is not an uncommon sight in rural areas such as the subject site. Further to this, the presence of existing overhead powerlines illustrate that the proposed assets would not be out of context with the location and therefore are likely to have negligible impact on the heritage significance of the heritage items.</p>
<p><i>Why is the new development required to be adjacent to a heritage item?</i></p>	<p>The proposed development would include overhead powerpoles and powerlines on the same allotment as the heritage items as this lot contains the nearest Essential Energy infrastructure to the development location which would allow connection to the electrical network.</p> <p>It is noted that the infrastructure would be removed in future upon decommissioning of the proposed solar farm and therefore is not a permanent fixture in the location.</p>
<p><i>How does the curtilage allowed around the heritage item contribute to the retention of its heritage significance?</i></p>	<p>The existing Essential Energy overhead power pole is located approximately 100 metres south of the nearest heritage item. As such a curtilage of approximately this distance would be allowed around the heritage items thus contributing to the retention of their heritage significance.</p>
<p><i>How does the new development affect views to, and from, the heritage item? What has been done to minimise negative effects?</i></p>	<p>As previously described, the location of the proposed infrastructure (a minimum of 100 metres south of the heritage item) does not impact on views to and from the heritage items. Negative effects have been minimised through the development only including the minimum required spans of overhead lines to facilitate connection.</p>
<p><i>Is the development sited on any known, or potentially significant archaeological deposits? If so, have alternative sites been considered? Why were they rejected?</i></p>	<p>The development is not sited on any known or potentially significant archaeological deposits.</p>
<p><i>Is the new development sympathetic to the heritage item? In what ways? (e.g. form, siting, proportions, design)?</i></p>	<p>The new development would be sympathetic to the heritage items by maintaining a reasonable distance from the items. Further to this, due to the form of the development the assets do not dominate the significant buildings on the site. It is also noted that</p>

	the overhead electrical infrastructure is not out of context with the surrounding rural area.
<i>Will the additions visually dominate the heritage item? How has this been minimised?</i>	The proposal will not visually dominate the heritage items due to the siting of the development.
<i>Will the public, and users of the item, still be able to view and appreciate its significance?</i>	Due to the location of the proposal, the public and users of the items will still be able to view and appreciate their significance.

5.13 NATURAL HAZARDS

5.13.1 BUSHFIRE

As described previously in this report, portions of the subject lot are identified as bushfire prone land however the development area is not identified as being affected. It is however noted that the vegetation located within 140 metres of the proposal area would be classified as 'grassland' and as such a Bushfire Assessment and Bushfire Emergency Management and Operations Plan has been prepared and accompanies this report as a separate cover attachment.

5.13.2 FLOODING

Parts of the site are identified as being floodprone according to Council's Floodplain Risk Management Study and Plan and as such Water Technology was engaged to prepare a Flood, Drainage and Groundwater Assessment to determine the potential effects, if any, of flooding on the development.

The assessment shows that in a 1% AEP event an area within the footprint of the tracker systems and panels would be affected by ponding to a likely depth of approximately 0.41m. It is noted that the solar panels located on the trackers would have a minimum height above ground level of approximately 0.5m and as such would not be impacted in such an event.

It is also noted that ponding to a likely depth of approximately 0.08m would impact the location of the northernmost battery energy storage container in a 1% AEP event. As such it would be ensured during detailed design that the finished floor level of this container is located approximately above this level to avoid being affected in a 1% AEP event.

In relation to flooding the assessment concludes:

- Any sensitive infrastructure such as inverters and battery storage etc, is recommended to be located above the maximum of the 1% AEP flood level with at least 300 mm freeboard. It is common for this type of infrastructure to be housed within shipping containers or small sheds with relatively small footprints. Given the shallow depths across the site, raising this infrastructure, either through increased footings or raised fill pads is unlikely to result in any adverse flooding impacts offsite.
- Solar panel arrays should be designed so that they can be positioned to have the lowest edge of the solar panel above the 1% AEP flood level. This need not be a permanent setting, but it is suggested that the panels could be operated to tilt so

the lowest edge can lift in times of flood.

- The panel post and footings should be designed to withstand the flood velocities described in this report, which are mostly low in the areas proposed for solar panels.
- The site can be safely accessed from Buckingbong or Dellapool Roads in a 1% AEP flood event. Design considerations should be made for the access track to ensure that overland flow paths identified in this report are catered for.

The assessment recommendations will be considered during detailed design of the project.

5.14 TECHNOLOGICAL HAZARDS

The development would include battery energy storage in the form of five (5) DC-coupled energy storage containers measuring 13 metres long, 3 metres wide and 3 metres high. These would be managed in accordance with *AS/NZS 5139-2017: Electrical installations – Safety of battery systems for use with power conversion equipment* as appropriate.

Electrical equipment of all sizes and voltages produce electric and magnetic fields (EMF). Both fields drop away rapidly with distance from the source, or due to shielding by insulation or earth (in the case of buried installations).

The International Commission on Non-Ionizing Radiation Protection (ICNIRP) has issued Guidelines for Limiting Exposure to Time-Varying Electric and Magnetic Fields. The Australian Radiation Protection and Nuclear Safety Agency (ARPNSA) refer to the ICNIRP guidelines which provide limits for the general public for 50 Hz sources as identified below:

- Electrical Field Strength (E): 5 kilo Volts per metre (kV/m)
- Magnetic Flux Density (B): 200 micro Teslas (μT)

The maximum electric field generated by an 11kV overhead line is depicted in the below figure which shows that the maximum EMF would be emitted between the area directly under the line and 20 metres either side and would measure just over 0.2 kV/m which is well under the ICNIRP EMF guideline limit of 5 kV/m.

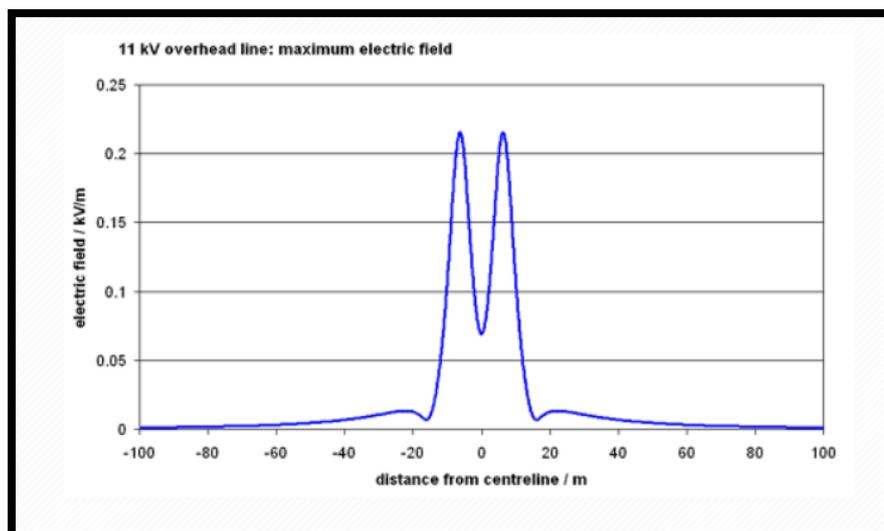


Figure 26 Maximum 11kV overhead line electric field (Source: www.emfs.info/sources/overhead/specific/11-kv)

In relation to magnetic fields produced by 11kV overhead lines, the figure below shows that the maximum EMF would be emitted between the area directly under the line and 20 metres either side and would measure 10 μ T which is well under the ICNIRP EMF guideline limit of 200 μ T.

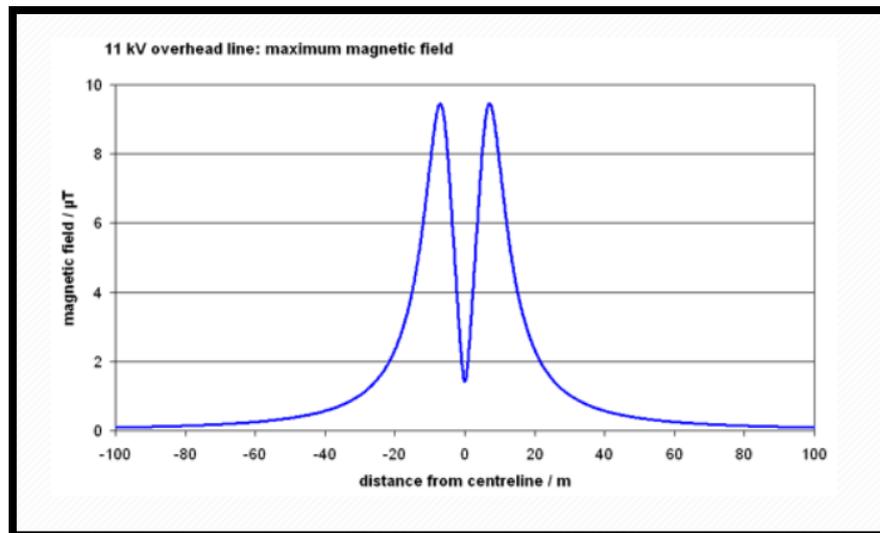


Figure 27 Maximum 11kV overhead line magnetic field (Source: www.emfs.info/sources/overhead/specific/11-kv)

The proposed 11kV overhead lines connecting the facility to the existing Essential Energy infrastructure in the area would be the portion of the development which would emit the most EMF, and as described above, these emissions would be well below the limits specified by the ICNIRP for the general public

5.15 ACCESS, TRANSPORT AND TRAFFIC

5.15.1 ACCESS

The development would be accessed via a short internal access track connecting the compound to a new access at the subject lot's Dellapool Road frontage as shown in the accompanying plans. This site access would be constructed as required to Council standards to support construction traffic in terms of maximum vehicle size and number of expected movements during construction.

5.15.2 TRAFFIC

Traffic will be generated during the 6 month construction period in the form of delivery of materials to site and attendance of construction staff. A maximum of 50 field crew workers would be on site during peak construction, which is proposed to be undertaken between 7am – 6pm Monday – Friday, and 8am – 1pm Saturday. It is expected that arrival and departure of workers to and from the site would be within an hour of the proposed operating hours identified previously.

Minivans will be utilised to transport workers to and from Narrandera and as such the maximum number of vehicle movements expected to and from the site during the peak of construction is 15 vehicles per day.

Material delivery will be undertaken by a number of 5 axle semi-trailers and 3 axle rigid trucks with dimensions as shown in the figure below.



Figure 28 Heavy vehicle lengths (Source: <https://www.rms.nsw.gov.au>)

The majority of material would be transported to the site via rigid trucks, with only the power station requiring transport via a semi-trailer. The majority of deliveries will be undertaken over a three week period averaging two deliveries per day with the first delivery at approximately 8am. A site traffic controller will ensure materials can be offloaded to the designated material loading zone.

Access to and from the site will be via the proposed access from Dellapool Road only as shown in the accompanying plans. Speed signs will be erected on the site fencing to ensure vehicle speeds within the site are limited.

It is noted that vehicles would travel to the site from Narrandera via the Sturt Highway. They would turn off at Buckingbong Road which they would travel for approximately 11km before reaching Dellapool Road and the site access. It is noted that the Sturt Highway is a national highway which facilitates transport of passengers and road freight between Sydney and Adelaide. Due to the capacity of the Sturt Highway, the limited use of large vehicles and the limited construction period, it is considered that the road network will not be detrimentally affected by the additional traffic generated during the peak construction period.

Traffic generation during decommissioning is expected to be similar to that generated during construction and as such it is considered that the impacts on the associated road network would not be detrimental.

Operational traffic would be limited to one to two small vehicles two to three times per month for maintenance activities only.

5.16 SERVICING

As described previously in this report, the proposal area is located within proximity to existing Essential Energy infrastructure in the form of overhead 11kV powerlines which would provide connection of the proposed development to the energy grid.

The local area has the capacity and catchment to provide sufficient workforce numbers to enable the construction of the solar farm with minimal likelihood of attracting large numbers of external workers.

5.17 PUBLIC DOMAIN

There is the potential for short-term impacts on the public domain related to the public road system as a result of construction traffic, as well as the possibility of visual impacts on the environment from the solar farm itself. It is however noted that construction traffic will involve no more than two heavy vehicle movements per day and no more than thirteen light vehicle movements per day. Given the capacity of the Sturt Highway and the ability of the surrounding road network to periodically support additional traffic (such as during harvest season), this is not anticipated to have a negative impact on the public domain noting that the traffic impacts would be short term only.

Given the location of the proposal, there are a limited number of residential receptors and therefore low to negligible visual impacts are expected. The potential impact of the proposal on the public domain is therefore considered to be negligible.

5.18 OTHER LAND RESOURCES

A review of the Minview online database confirms that there are no mineral titles or exploration licenses affecting the subject land. A review of the Biophysical Strategic Agricultural Land (BSAL) map confirms the development site is not BSAL land.

As described previously in Section 5.8 of this report, the subject lot has a land capability of Class 5 which is defined as having severe limitations for high impact land management uses such as cropping and highly specialised land management practices need to be utilised to prevent soil and land degradation. Such lands are generally more suitable for grazing and pasture improvement.

Notwithstanding this, it is noted that the site would be returned to a suitable state for continued agricultural use post decommissioning of the facility, expected to occur approximately 31 years from commencement of construction. It is therefore considered that the proposal would not result in a loss of any significant land resources.

5.19 SAFETY, SECURITY AND CRIME PREVENTION

The safety, security and crime prevention aspects of the proposal have been assessed against the Crime Prevention Through Environmental Design (CPTED) principles as detailed in the below table.

Table 5 CPTED Principles

PRINCIPLE	COMMENTS
<p><i>Principle 1: Natural Surveillance</i></p> <p><i>Providing opportunities for effective surveillance, both natural and technical, can reduce the attractiveness of crime targets. Good surveillance means that people can see what others are doing thereby deterring 'would-be offenders' from committing crime in areas with high levels of surveillance.</i></p>	<p>The development is consistent with this principle as detailed below:</p> <ul style="list-style-type: none"> • The property is located within a rural area with the road frontages of the subject lot likely to provide local access or to support rural undertakings only. It is therefore considered that the opportunity for the facility to be the target of crime to be low. • The facility will be real-time remotely monitored with the site being attended by contractors a few times a month for maintenance and security purposes. • The development would be visible to passing local traffic utilising Buckingbong Road and Dellapool Road and as such would be passively surveyed. • The site entry would be clearly identifiable from the Dellapool Road access. • Due to the type of construction (tracker systems) there would be limited places for offenders to hide on the site. • Night vision capable security cameras will be placed at the compound entrance to assist in surveillance of the facility.
<p><i>Principle 2: Access Control</i></p> <p><i>Physical and symbolic barriers can be used to attract, channel or restrict the movement of people, and in turn, minimise opportunities for crime.</i></p>	<p>The development is consistent with this principle through:</p> <ul style="list-style-type: none"> • Provision of clear signage at the site entry which identifies the site as privately operated. • Provision of a clear entry point from the roadway to the site. • Provision of a clear egress point from the site to the roadway. • Provision of signage to channel users to appropriate areas. • Restriction of access to the site through the provision of one entry point and fencing of the entire development area. • Clear signage to prevent unintended access.
<p><i>Principle 3: Territorial Reinforcement</i></p>	<p>The development is consistent with this principle through provision of a distinct boundary and clear definition of the proposal area in relation to the</p>

<p><i>This principle relies on the users of spaces or areas feeling that they have some ownership of public space and therefore are more likely to gather and enjoy that space. The ownership of space increases the likelihood that people who witness crime in or adjacent to that space will respond by quickly reporting it or by attempting to prevent it.</i></p>	<p>overall property which reduces opportunity for illegitimate use or entry.</p>
<p><i>Principle 4: Space Management</i></p> <p><i>Public space that is attractive and well maintained is inviting to users and becomes a well used space. Linked to the principle of territorial reinforcement, space management ensures that the space is appropriately utilised and well cared for.</i></p>	<p>The development is consistent with this principle through:</p> <ul style="list-style-type: none"> • Ensuring maintenance of the site area and included landscaping to create a 'cared for' image. • Rapid repair of decaying physical elements throughout the lifecycle of the development.

5.20 SOCIAL AND ECONOMIC IMPACTS

The NSW Government Office on Social Policy defines social impacts as significant events experienced by people as changes in their way of life, their culture, or their community are experienced. The potential social impacts of the development may therefore include impacts on traffic and visual amenity, services, as well as on employment opportunities in the area. Potential traffic and visual impacts have been discussed previously in this report and are considered acceptable.

The proposal would also provide solar energy to the surrounding rural area, with the majority of electricity generated being utilised within the LGA. Potential impacts on employment, through the short-term creation of a number of jobs during the construction period, is also considered positive.

Potential economic impacts are considered positive in the respect of creation of approximately 50 jobs within the locality over approximately 6 months during construction. Further to this, local contractors will be employed for landscape maintenance and security purposes during the long term operation period.

5.21 SITE DESIGN AND INTERNAL DESIGN

The site and internal design have been carefully determined considering the site constraints and opportunities, as well as those of the surrounding area and existing infrastructure. Given the location and distance between residential receptors, the internal and site design are considered appropriate for the proposal.

5.22 CUMULATIVE IMPACTS

Cumulative impacts associated with the development could include individual impacts so close in time that the effects of one are not dissipated before the next or so close in space that the effects overlap. They could also include repetitive, often minor, impacts eroding environmental conditions or different types of disturbances interacting to produce an effect which is greater or different than the sum of the separate effects.

In relation to the proposal, the potential cumulative impacts could include cumulative visual impacts associated with the development of multiple solar developments in the general locality; or cumulative noise, air quality or traffic impacts associated with construction.

It is noted that there are no other solar farm developments located within close proximity of the development site nor are there any other developments which would result in cumulative construction impacts including noise, air quality or traffic. It is therefore considered that cumulative impacts associated with the project would be negligible.

6 PLANNING PROVISIONS

6.1 ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

In NSW the Environmental Planning and Assessment Act 1979 (the Act) institutes a system of environmental planning and assessment in NSW and is administered by the Department of Planning & Environment (DP&E). It is noted that the proposed development is consistent with the objectives of the Act.

Section 1.7 of the Act requires consideration of Part 7 of the Biodiversity Conservation Act 2016 (BC Act). Part 7 of the BC Act relates to Biodiversity assessment and approvals under the Planning Act. Section 7.3 outlines the test for determining whether a proposed development or activity is likely to significantly affect threatened species or ecological communities or their habitats. The development is assessed against the matters outlined in Section 7.3 in the below table.

Table 6 BC Act Section 7.3 Test of Significance

SECTION 7.3 PART	COMMENTS
(a) <i>in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction</i>	A search of Bionet Atlas of NSW did not identify any threatened species within, or adjacent to, the subject lot. Given no tree removal is proposed it would be unlikely to have an adverse effect on threatened species.
(b) <i>in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity—</i> <i>i. is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or</i> <i>ii. is likely to substantially and adversely modify the composition of the ecological community such that</i>	A search of Bionet Atlas of NSW did not identify an endangered ecological community or critically endangered ecological community within, or adjacent to, the subject lot. Given no tree removal is proposed, as well as the absence of any recorded endangered flora or fauna on site, there is not anticipated to be any adverse impacts upon an endangered ecological community or critically endangered ecological community.

<i>its local occurrence is likely to be placed at risk of extinction,</i>	
<i>(c) in relation to the habitat of a threatened species or ecological community—</i> <i>i. the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and</i> <i>ii. whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and</i> <i>iii. the importance of the habitat to be removed, modified, fragmented, or isolated to the long-term survival of the species or ecological community in the locality,</i>	A search of Bionet Atlas of NSW did not identify the habitat of a threatened species or ecological community within, or adjacent to, the subject lot. Given no tree removal is proposed, as well as the absence of any recorded endangered flora or fauna on site, there is not anticipated to be any adverse impacts upon the habitat of a threatened species or ecological community.
<i>(d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),</i>	The published biodiversity values map does not include any declared areas at the subject lot.
<i>(e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.</i>	Given no tree removal is proposed the development is unlikely to be part of a key threatening process or to increase the impact of a key threatening process.

Based on the information in the above table, it is considered that the proposed development is unlikely to significantly affect threatened species or ecological communities or their habitats. A biodiversity assessment report is therefore not required.

As consent is required for the proposed development to be carried out, it is noted that Division 4.3 of the Act applies to the proposal.

Other legislation relevant to the proposal includes:

- State Environmental Planning Policy No. 33 – Hazardous and Offensive Development
- State Environmental Planning Policy (Koala Habitat Protection) 2020;
- State Environmental Planning Policy (Primary Production and Rural Development) 2019
- State Environmental Planning Policy (Infrastructure) 2007;
- State Environmental Planning Policy (State and Regional Development) 2011;
- Narrandera Local Environmental Plan 2013; and
- Narrandera Development Control Plan 2013.

The requirements of these are discussed further on in this report.

6.2 STATE ENVIRONMENTAL PLANNING POLICIES

The below table outlines the SEPPs applicable to this development.

Table 7 Relevant State Environmental Planning Policy Requirements

SEPP	COMMENTS
<i>SEPP33 (Hazardous and Offensive Industry)</i>	<p>The proposed micro solar farm does not pose a significant risk to the locality in relation to human health, life or property, or to the biophysical environment and is therefore not defined as a potentially hazardous industry.</p> <p>The proposal will not emit a polluting discharge which would have a significant adverse impact in the locality or on the existing or likely future development on other land and is therefore not defined as a potentially offensive industry.</p>
<i>SEPP (Koala Habitat Protection) 2020</i>	<p>This policy aims to encourage the proper conservation and management of areas of natural vegetation that provide habitat for koalas to ensure a permanent free-living population over their present range and to reverse the current trend of koala population decline. This policy applies to all land within the Narrandera Local Government Area.</p> <p>Part 2 of the policy requires that the land be assessed to determine if it is potential koala habitat or core koala habitat. It is noted that the property has been historically, and is currently, utilised for agricultural purposes in the form of grazing and arable cultivation. The proposal area is cleared due to the past agricultural use and the proposal does not include the removal of any trees.</p> <p>A search of the Bionet Atlas does not identify koalas in the development area or within the site or surrounds.</p> <p>Given the lack of sightings, the lack of substantial vegetation within the subject lot and the fact that no trees will be removed by the proposal, it is considered that the site is not identified as potential or core koala habitat and therefore the development can proceed without the need for preparation of a Koala Plan of Management.</p>
<i>SEPP55 – Remediation of Land</i>	<p>When assessing an application for development the consent authority must consider whether the land is contaminated, and if so, that it is suitable in its contaminated state (or will be after remediation) for the purposes of the development.</p> <p>As described previously in this report, the subject site is within a rural area and is not identified as contaminated or potentially contaminated land according to available records. It is noted that agriculture is listed as a land use which has the potential to lead to contamination, however the historical agricultural practices have included grazing and arable cultivation. There is no evidence on site of contamination and the land is considered to be in a suitable state for a solar farm development. Further contamination investigation is considered unnecessary for the proposal.</p>
<i>SEPP (Primary Production and Rural Development) 2019</i>	<p>This policy aims, amongst other things, to facilitate the orderly economic use and development of lands for primary production. A review of the provisions of this policy confirms it does not apply to the proposed development and therefore further consideration is not required.</p>
<i>SEPP (Infrastructure) 2007</i>	<p>The aim of this Policy is to facilitate the effective delivery of infrastructure across the State through a number of mechanisms. The proposal would be defined as electricity generating works being a building or place used for the purpose of making or generating electricity or electricity storage.</p>

	<p><i>Part 3, Division 4 Electricity generating works or solar energy systems</i> is relevant to the proposal. Under this division, development for the purpose of electricity generating works may be carried out with consent on the subject lot given its RU4 Primary Production Small Lots zoning.</p> <p>Clause 45 of the ISEPP relates to the determination of a DA which has the potential to affect an electricity transmission line. Before determining a DA, which meets the relevant criteria provided by Clause 45, the consent authority must first notify the relevant electricity supply authority and consider any comments made by this authority within 21 days of the notice.</p> <p>Clause 104 of the ISEPP relates to development that constitutes traffic generating development. Schedule 3 of the ISEPP provides a list of developments that must be referred to the NSW Roads and Maritime Services (RMS). Electricity generating works are not listed as a development in Schedule 3.</p> <p>Section 104 applies where a development has capacity to accommodate 200 or more vehicles. The development would not have capacity to accommodate 200 or more vehicles either during construction or operation and therefore the development does not represent traffic generating development.</p>
<p><i>SEPP (State and Regional Development) 2011</i></p>	<p>This policy aims to identify development that is State significant development; State significant infrastructure; critical State significant infrastructure and regionally significant development.</p> <p>It is noted that the development does not meet the criteria to be classified as State significant development, State significant infrastructure or critical State significant infrastructure due to the capital investment value and the fact the development is being proposed by a private developer.</p> <p>Schedule 7 outlines the development types which are declared to be regionally significant development for the purpose of this Act. The schedule identifies development that has a capital investment value of more than \$5 million for the purposes of electricity generating works as regionally significant development. As such the consent authority for the proposal is the Western Regional Planning Panel.</p>

6.3 STRATEGIC FRAMEWORK

6.3.1 RIVERINA MURRAY REGIONAL PLAN

The Riverina Murray Regional Plan 2036 (RMRP2036) provides a strategic framework for development within the Riverina Murray region. The vision for the RMRP2036 is:

A diversified economy founded on Australia's food bowl, iconic waterways and a network of vibrant connected communities

The vision is supported by the following four regionally focussed goals:

- A growing and diverse economy
- A healthy environment with pristine waterways
- Efficient transport and infrastructure networks
- Strong, connected and healthy communities

These goals are in turn supported by a range of local directions that provide context and detail to the overarching goals. The directions relevant to the proposed development are described in further detail in the below table.

Table 8 Riverina Murray Regional Plan 2036 Directions

DIRECTION	COMMENTS
1: Protect the region's diverse and productive agricultural land	The proposed development will utilise the agricultural land for a set period of time, after which the project will be decommissioned and the land returned to a suitable standard for continued agricultural use as required. The development will therefore be consistent with this direction and relevant associated actions.
11: Promote the diversification of energy supplies through renewable energy generation	The proposal will facilitate renewable energy supply within the region, located so as to take advantage of ready access to the existing electrical network. The development will therefore be consistent with this direction and relevant associated actions.
12: Sustainably manage mineral resources	The development site does not contain any mineral resources and therefore the development will not impact on such. The development will therefore be consistent with this direction and relevant associated actions.
13: Manage and conserve water resources for the environment	The development is located so as to minimise impacts on water catchments including downstream and groundwater sources. It will also have no impact on fish habitat, aquaculture and waterways. The development will therefore be consistent with this direction and relevant associated actions.
15: Protect and manage the region's many environmental assets	The development area is not identified as having high environmental value and will not result in any unavoidable environmental impacts. The development will therefore be consistent with this direction and relevant associated actions.
16: Increase resilience to natural hazards	The development will be located away from areas of high

and climate change	biodiversity value, high bushfire and flood hazards, contaminated land and designated waterways. The development will therefore be consistent with this direction and relevant associated actions.
21: Align and protect utility infrastructure development	The proposal has been located to take advantage of existing infrastructure which minimises costs and maximises benefits. The development will therefore be consistent with this direction and relevant associated actions.

The proposal is therefore considered to be consistent with the RMRP2036.

6.4 NARRANDERA LOCAL ENVIRONMENTAL PLAN 2013

The subject site is zoned RU4 Primary Production Small Lots under the provisions of the Narrandera Local Environmental Plan 2013 (NLEP2013), as detailed previously in Figure 6 on page 6 of this report.

Although electricity generating works are not a listed permitted use within the zone, *Part 3, Division 4 Electricity generating works or solar energy systems* of the ISEPP states development for the purpose of electricity generating works may be carried out with consent on the subject site given its RU4 Primary Production Small Lots zoning. It is noted that ISEPP takes precedence over the NLEP2013 in this instance.

An extract from the Land Use Table for the RU4 Primary Production Small Lots zone is provided below for information.

Zone RU4 Primary Production Small Lots

1 Objectives of zone

- To enable sustainable primary industry and other compatible land uses.
- To encourage and promote diversity and employment opportunities in relation to primary industry enterprises, particularly those that require smaller lots or that are more intensive in nature.
- To minimise conflict between land uses within this zone and land uses within adjoining zones.

2 Permitted without consent

Environmental protection works; Extensive agriculture; Home-based child care; Home occupations; Roads

3 Permitted with consent

Agriculture; Airstrips; Animal boarding or training establishments; Aquaculture; Bed and breakfast accommodation; Boat building and repair facilities; Boat launching ramps; Boat sheds; Building identification signs; Business identification signs; Camping grounds; Cellar door premises; Cemeteries; Charter and tourism boating facilities; Community facilities; Correctional centres; Depots; Dual occupancies (attached); Dwelling houses; Eco-tourist facilities; Environmental facilities; Extractive industries; Farm buildings; Farm stay accommodation; Forestry; Freight transport facilities; Helipads; Home businesses; Home industries; Home occupations (sex services); Industrial training facilities; Information and education facilities; Intensive plant agriculture; Jetties; Landscaping material supplies; Mooring pens; Moorings; Plant nurseries; Recreation areas; Recreation facilities (major); Recreation facilities (outdoor); Research stations; Roadside stalls; Rural industries; Rural workers' dwellings; Sewerage systems; Veterinary hospitals; Waste or resource management facilities; Water recreation structures; Water supply systems; Wharf or boating facilities

4 Prohibited

Waste disposal facilities; Any other development not specified in item 2 or 3

As shown previously in the zoning map extract (Figure 6) the surrounding area is zoned a combination of RU4 Primary Production Small Lots and RU1 Primary Production.

The objectives of the RU4 Primary Production Small Lots zone are outlined in the below table.

Table 9 Objectives of the RU1 Primary Production zone

ZONE OBJECTIVES	COMMENTS
<i>To enable sustainable primary industry and other compatible land use.</i>	This objective is satisfied by the proposal as it includes a compatible land use which will allow the development area to continue to be utilised for grazing activities throughout the life of the development and thereafter.
<i>To encourage and promote diversity and employment opportunities in relation to primary industry enterprises, particularly those that require smaller lots or that are more intensive in nature.</i>	This objective is not relevant to the proposal.
<i>To minimise conflict between land uses within this zone and land uses within adjoining zones.</i>	This objective is satisfied by the proposal as it would not result in a conflict between land uses within the RU4 zone and landuses within the adjoining RU1 zone as described in previous sections of this report.

The below table considers the clauses of the NLEP2013 applicable to the subject development.

Table 10 NLEP 2013 clauses applicable to the subject development

PART 2: PERMITTED OR PROHIBITED DEVELOPMENT			
	CLAUSE	COMMENTS	APPLICABLE
2.4	<i>Unzoned Land</i>	Not applicable.	N/A
2.5	<i>Additional permitted uses for particular land</i>	Not applicable.	N/A
2.6	<i>Subdivision – consent requirements</i>	Not applicable.	N/A
2.7	<i>Demolition requires development consent</i>	Not applicable	N/A
2.8	<i>Temporary use of land</i>	Not applicable.	N/A
PART 3: EXEMPT AND COMPLYING DEVELOPMENT			
	CLAUSE	COMMENTS	APPLICABLE
3.1	<i>Exempt development</i>	Not applicable.	N/A
3.2	<i>Complying development</i>	Not applicable.	N/A
3.3	<i>Environmentally sensitive land</i>	Not applicable.	N/A
PART 4: PRINCIPAL DEVELOPMENT STANDARDS			
	CLAUSE	COMMENTS	APPLICABLE
4.1	<i>Minimum subdivision lot size</i>	Not applicable.	N/A
4.1AA	<i>Minimum subdivision lot size for community title schemes</i>	Not applicable.	N/A

4.2	<i>Rural subdivision</i>	Not applicable.	N/A
4.2A	<i>Minimum subdivision lot size for strata plan schemes in certain rural zones</i>	Not applicable.	N/A
4.2B	<i>Rural subdivisions and erection of dwelling houses for intensive plant agriculture</i>	Not applicable.	N/A
4.2C	<i>Erection of dwelling houses on land in certain rural and environmental protection zones</i>	Not applicable.	N/A
4.2D	<i>Erection of rural workers' dwellings</i>	Not applicable.	N/A
4.3	<i>Height of buildings</i>	Not applicable.	N/A
4.4	<i>Floor space ratio</i>	Not applicable.	N/A
4.5	<i>Calculation of floor space ratio and site area</i>	Not applicable.	N/A
4.6	<i>Exceptions to development standards</i>	Not applicable.	N/A
PART 5: MISCELLANEOUS PROVISIONS			
	CLAUSE	COMMENTS	APPLICABLE
5.1	<i>Relevant acquisition authority</i>	Not applicable.	N/A
5.2	<i>Classification and reclassification of public land</i>	Not applicable.	N/A
5.3	<i>Development near zone boundaries</i>	Not applicable.	N/A
5.4	<i>Controls relating to miscellaneous permissible uses</i>	Not applicable.	N/A
5.6	<i>Architectural roof features</i>	Not applicable.	N/A
5.7	<i>Development below mean high water mark</i>	Not applicable.	N/A
5.8	<i>Conversion of fire alarms</i>	Not applicable.	N/A
5.10	<i>Heritage conservation</i>	Not applicable.	N/A
5.11	<i>Bush fire hazard reduction</i>	Not applicable.	N/A
5.12	<i>Infrastructure development and use of existing buildings of the Crown</i>	Not applicable.	N/A
5.13	<i>Eco-tourist facilities</i>	Not applicable.	N/A
5.14	<i>Siding Spring Observatory – maintaining dark sky</i>	Not applicable.	N/A
5.15	<i>Defence communications facility</i>	Not applicable.	N/A
5.16	<i>Subdivision of, or dwellings on, land in certain rural, residential or environmental protection zones</i>	Not applicable.	N/A

5.17	<i>Artificial waterbodies in environmentally sensitive areas in areas of operation of irrigation corporations</i>	Not applicable.	N/A
5.18	<i>Intensive livestock agriculture</i>	Not applicable.	N/A
5.19	<i>Pond-based, tank-based and oyster aquaculture</i>	Not applicable.	N/A
5.20	<i>Standards that cannot be used to refuse consent – playing and performing music</i>	Not applicable.	N/A
PART 6: ADDITIONAL LOCAL PROVISIONS			
6.1	<i>Earthworks</i>	<p>Earthworks are required to be carried out to construct footings for various inclusions in the proposal and for construction of hardstand areas for vehicle movements.</p> <p>The earthworks are not likely to have detrimental impacts on existing drainage patterns and soil stability on the site. The development will not affect the likely future use or redevelopment potential of the land as it will be decommissioned at the end of the expected 31-year lifespan. Any material excavated from the site is not expected to be of poor quality and would be reused onsite for any filling, if required. The development is not likely to detrimentally affect the amenity of adjoining properties.</p> <p>Any required fill material would take the form of material excavated during works or certified clean fill would be imported if required.</p> <p>It is unlikely that any relics would be discovered within the footprint of the development. Should relics be found during construction works, all works on site would cease until appropriate notification, investigation and reporting had been undertaken to the appropriate authority and advice received as to how to proceed.</p> <p>The proposal would not adversely impact on any waterway, drinking water catchment or environmentally sensitive area.</p> <p>Appropriate sediment and erosion controls would be in place during construction works.</p>	✓
6.2	<i>Flood planning</i>	It is noted that parts of the overall property are identified as being located within the 'flood planning area' however the subject lot is not identified. Further to this flooding has	N/A

		been addressed in previous sections of this report.	
6.3	<i>Stormwater management</i>	Not applicable.	N/A
6.4	<i>Terrestrial biodiversity</i>	<p>As noted previously in this report, portions of the site are identified as "Terrestrial Biodiversity" as shown in Figure 23 on page 30 of this report, with the subject lot also being affected as shown in Figure 24.</p> <p>It is however noted that the development footprint area is not identified as "Terrestrial Biodiversity" and does not contain native vegetation.</p> <p>Further to this it is considered that the development would not have any adverse impact on the condition, ecological value and significance of the fauna and flora on the land, or any adverse impact on the importance of the vegetation on the land to the habitat and survival of native fauna.</p> <p>It would not have any potential to fragment, disturb or diminish the biodiversity structure, function and composition of the land nor would it have any adverse impact on the habitat elements providing connectivity on the land.</p> <p>It is noted that the development area has been cleared as part of past agricultural undertakings. The proposal does not require the removal of any native vegetation and as such it is considered that the development has been designed, sited and will be managed to avoid any significant environmental impact.</p>	✓
6.5	<i>Groundwater vulnerability</i>	<p>As shown previously in Figure 21 on page 26 of this report, the subject lot is identified as "groundwater vulnerable" on the NLEP2013 Groundwater Vulnerability Map.</p> <p>Before determining a development application for development on land to which this clause applies, the consent authority must consider the likelihood of groundwater contamination from the development; any adverse impacts the development may have on groundwater dependent ecosystems; the cumulative impact the development may have on groundwater and any appropriate measures proposed to avoid, minimise or mitigate the impacts of the development.</p>	✓

		<p>No groundwater will be used by the development. Water quality impacts to groundwater during construction, operation and decommissioning are considered unlikely as limited excavation is proposed for the installation of panel tracking systems and ancillary infrastructure. Panels will be installed on driven piles installed not more than 2.5 m below the ground surface, while minor excavation works would be undertaken for trenching for underground cabling as well as internal access roads and construction of hardstand areas.</p> <p>Adverse impacts on groundwater dependent ecosystems are not anticipated, nor are cumulative impacts on groundwater including impacts on nearby groundwater extraction for a potable water supply or stock water supply. It is considered that the nature and siting of the development will ensure impacts on groundwater are avoided.</p>	
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6.6	<i>Riparian land and watercourses</i>	<p>It is noted that parts of the property are identified as "Watercourse" on the NLEP2013 Watercourse Map as shown in the below figure.</p>	✓
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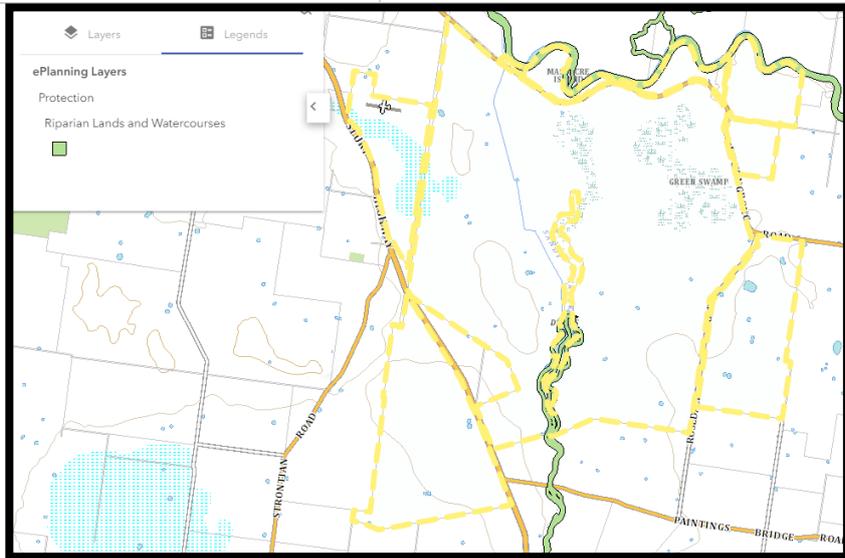


Figure 29 NLEP2013 Groundwater Map for entire site (Source: NLEP2013)

		<p>This clause applies to all land identified as 'watercourse' on the Watercourse map, and all land that is within 40 metres of the top bank of each watercourse on land identified as 'Watercourse' on that map.</p> <p>Although the property is identified as 'watercourse' it is noted that the subject lot</p>	
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		<p>where the development will be situated is not. Further to this, the development would be located approximately 1km from the nearest portion of the overall property identified as 'watercourse' (being the Murrumbidgee River to the north of the proposal area). It is therefore considered that the development would not have any adverse impact on the water quality and flows within the watercourse; aquatic and riparian species, habitats and ecosystems of the watercourse; the stability of the bed and banks of the watercourse; the free passage of fish and other aquatic organisms within or along the watercourse; or any future rehabilitation of the watercourse and riparian areas; nor would it increase water extraction from the watercourse.</p>	
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6.7	Wetlands	<p>It is noted that parts of the property are identified as "Wetland" on the NLEP2013 Wetlands Map as shown in the below figure.</p>	✓
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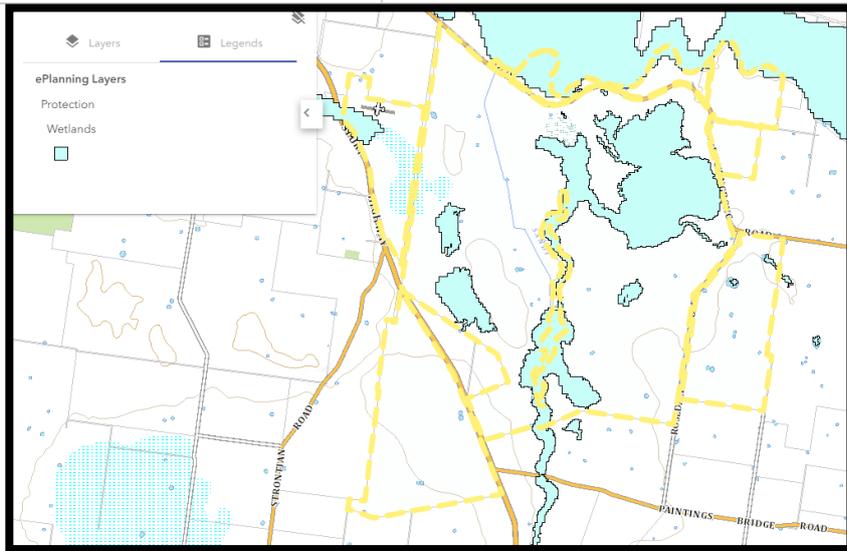


Figure 30 NLEP2013 Wetlands Map for entire site (Source: NLEP2013)

		<p>This clause applies to all land identified as 'wetland' on the Wetlands map.</p> <p>Although the property is identified as 'wetland' it is noted that the subject lot where the development will be situated is not. It is therefore considered that the development would not have any adverse impact on the condition and significance of the existing native fauna and flora on the land; the provision and quality of habitats on the land for indigenous and migratory species; or the</p>	
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		surface and groundwater characteristics of the land, including water quality, natural water flows and salinity.	
6.8	<i>Salinity</i>	Not applicable.	N/A
6.9	<i>Development on river front areas</i>	Not applicable.	N/A
6.10	<i>Development on riverbeds and banks</i>	Not applicable.	N/A
6.11	<i>Airspace operations</i>	Not applicable.	N/A
6.12	<i>Development in areas subject to aircraft noise</i>	Not applicable.	N/A
6.13	<i>Essential services</i>	<p>As described previously in this report, potable water will be made available on the site as required during construction, with ongoing operation only requiring water in the form of a static source for bushfire fighting purposes.</p> <p>An electrical generator will be operated for power supply during construction. Sewage during construction will be pumped from temporary facilities to a holding tank which will be pumped out as necessary on a regular basis and disposed of at a suitably registered facility.</p> <p>Sewage disposal is not required for the projects ongoing operation.</p> <p>Vehicle access will be from the nominated access point on Dellapool Road.</p>	✓

6.1 NARRANDERA DEVELOPMENT CONTROL PLAN 2013

It is noted that the Narrandera Development Control Plan 2013 (NDCP2013) does not include any controls relevant to the proposed development type.

7 CONCLUSION

This SEE report has been prepared to support a development application for a proposed micro solar farm to be located at 1083 Buckingbong Road, Gillenbah. The proposal has been described and discussed in previous sections of this report, and has been considered in respect of the relevant planning provisions applicable to the proposed development. The proposal is considered to be permissible for the following reasons:

- The proposal satisfies the relevant and applicable legislative and State Environmental Planning Policy provisions;
- The proposal is consistent with the aim and directions of the Riverina Murray Regional Plan 2036;

- The proposal is permissible under the provisions of ISEPP;
- The proposal would not have any significant adverse environmental consequences during operation, including adverse air quality or acoustic impacts over and above the existing conditions, as discussed previously in this SEE report; and
- The proposal is not likely to have detrimental effects on the surrounding area.

As demonstrated throughout this report, the development is permissible with consent, subject to a merits assessment.

8 LIST OF APPENDICES

Appendix A: AHIMs Results

9 LIST OF SEPARATE COVER ATTACHMENTS

Development Plan set prepared by ACEnergy

Construction Management Plan draft prepared by ACLE Services

Bushfire Assessment and Bushfire Emergency Management and Operations Plan prepared by MJM Consulting Engineers

Flood, Drainage and Groundwater Assessment prepared by Water Technology

APPENDIX A: AHIMS RESULTS



Office of
Environment
& Heritage

AHIMS Web Services (AWS) Search Result

Purchase Order/Reference : 200576

Client Service ID : 584973

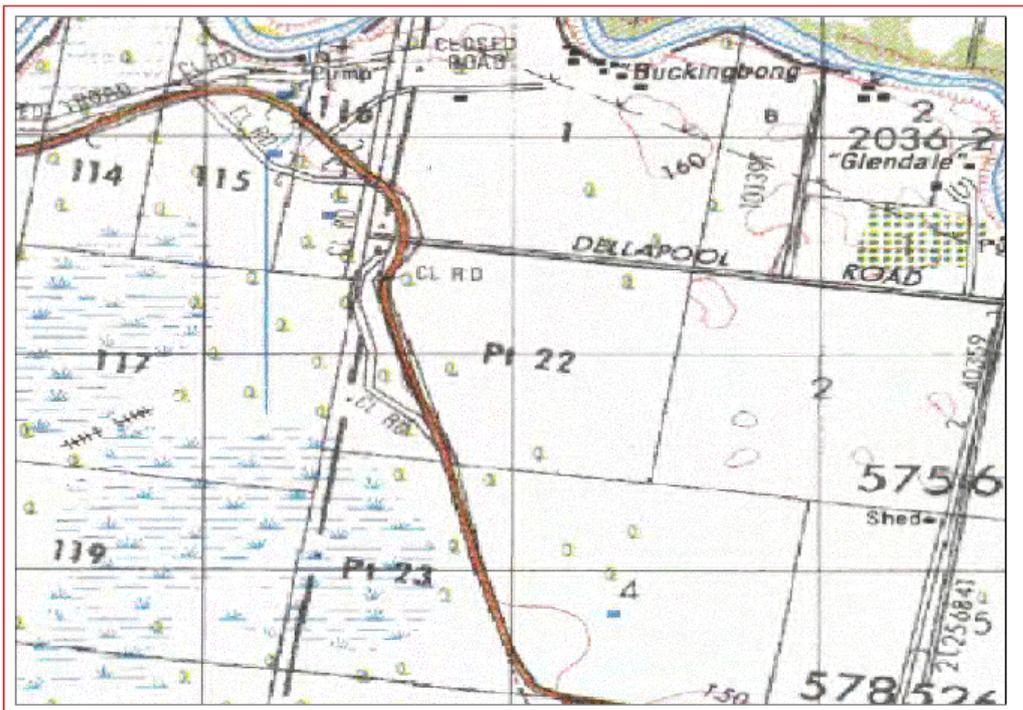
MJM Consulting Engineers
Level 1, 37 Johnston Street
Wagga Wagga New South Wales 2650
Attention: Jenna Amos
Email: jenna.amos@mjm-solutions.com

Date: 21 April 2021

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lot : 22, DP:DP754540 with a Buffer of 1000 meters, conducted by Jenna Amos on 21 April 2021.

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



A search of the Office of the Environment and Heritage AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

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

If your search shows Aboriginal sites or places what should you do?

- You must do an extensive search if AHIMS has shown that there are Aboriginal sites or places recorded in the search area.
- If you are checking AHIMS as a part of your due diligence, refer to the next steps of the Due Diligence Code of practice.
- You can get further information about Aboriginal places by looking at the gazettal notice that declared it. Aboriginal places gazetted after 2001 are available on the [NSW Government Gazette](http://www.nsw.gov.au/gazette) (<http://www.nsw.gov.au/gazette>) website. Gazettal notices published prior to 2001 can be obtained from Office of Environment and Heritage's Aboriginal Heritage Information Unit upon request

Important information about your AHIMS search

- The information derived from the AHIMS search is only to be used for the purpose for which it was requested. It is not be made available to the public.
- AHIMS records information about Aboriginal sites that have been provided to Office of Environment and Heritage and Aboriginal places that have been declared by the Minister;
- Information recorded on AHIMS may vary in its accuracy and may not be up to date. Location details are recorded as grid references and it is important to note that there may be errors or omissions in these recordings,
- Some parts of New South Wales have not been investigated in detail and there may be fewer records of Aboriginal sites in those areas. These areas may contain Aboriginal sites which are not recorded on AHIMS.
- Aboriginal objects are protected under the National Parks and Wildlife Act 1974 even if they are not recorded as a site on AHIMS.
- This search can form part of your due diligence and remains valid for 12 months.