

Scoping Report

BERYL SOLAR FARM



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ACRONYMS AND ABBREVIATIONS

ABS	Australian Bureau of Statistics
AHIMS	Aboriginal heritage information management system
CEMP	Construction environmental management plan
Cwth	Commonwealth
DP&E	Department of Planning and Environment
EEC	Endangered ecological community – as defined under relevant law applying to the proposal
EIS	Environmental Impact Statement
EPBC Act	<i>Environmental Protection and Biodiversity Conservation Act 1999</i> (Cwth)
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i> (NSW)
ha	hectares
Heritage Act	<i>Heritage Act 1977</i> (NSW)
ISEPP	<i>State Environmental Planning Policy (Infrastructure) 2007</i> (NSW)
km	kilometres
LEP	Local Environment Plan
LGA	Local Government Area
m	Metres
MNES	Matters of National environmental significance under the EPBC Act (c.f.)
ME	Mega watts
NPW Act	<i>National Parks And Wildlife Act 1974</i> (NSW)
NSW	New South Wales
NV Act	<i>Native Vegetation Act 2003</i> (NSW)
OEH	(NSW) Office of Environment and Heritage, formerly Department of Environment, Climate Change and Water
RET	Renewable Energy Target
RMS	Roads and Maritime Services
SEARs	Secretary's Environmental Assessment Requirements
SEPP	State Environmental Planning Policy (NSW)
TSC Act	<i>Threatened Species Conservation Act 1995</i> (NSW)

1 INTRODUCTION

First Solar (Australia) Pty Ltd proposes to develop a large scale solar farm at Beryl, NSW. The proposed solar farm would have an upper capacity of 95MW and would supply electricity to the national electricity grid.

1.1 PURPOSE OF THIS DOCUMENT

This Scoping Report provides a description of the proposal including the site and its surroundings, the statutory framework for approval and identification of key potential environmental issues that may be associated with the solar farm proposal. The report has been prepared to support a request to the Department of Planning and Environment (DP&E) for the Secretary's Environmental Assessment Requirements (SEARs) which would guide the preparation of an Environmental Impact Statement (EIS) for the proposal under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

1.2 THE PROPOSAL

1.2.1 Site location

The Beryl Solar Farm proposal site is located approximately 5 kilometres west of Gulgong and 80 kilometres east of Dubbo, within the locality of Beryl and within the Mid Western Local Government Area (LGA). The proposed solar farm would connect to an existing substation immediately adjacent to the site (Figure 1-1).

1.2.2 Site description

The Beryl Solar Farm proposal site would be located on Lot 20 DP 1173059 and Lot 1 DP 1012926, Beryl. The site is approximately 300ha in size. It is agricultural land used for grazing and cropping purposes. A residence is located at the eastern end of the site.

The majority of the site is derived from a community of conservation significance: the Box Gum Woodland Endangered Ecological Community. The community remains present across some of the site in varying levels of condition.

Two ephemeral waterways and eight wetlands/farm dams occur within the proposal site. One waterway, located within the south western area of site, is a tributary of the Cudgegong River. The waterway enters the Cudgegong River approximately 900m south west of the site. The other waterway transverses the eastern area of the site. It is a tributary of the Wialdra Creek, the confluence of which is located approximately 1.2 kilometres north of the site boundary.

Access to the site would be from Beryl Road which bounds part of the site to the north. The Castlereagh Highway, which intersects with Beryl Road 2.5 kilometres from the proposed site entrance, would be the major transport route for haulage and site vehicles during construction and operation of the project.

Three existing electricity transmission lines pass through the proposal site mostly in a north-south direction. The proposal would require an additional transmission line to connect to the adjacent existing substation. The line would be overhead or underground (to be determined) and would be a maximum of 2 kilometres in length.

In the centre of the site, a partly raised embankment (a former railway line) intersects the proposal site in an east-west direction. The railway line infrastructure has been removed.

Site photographs are provided in Appendix A.

1.2.3 Site locality

The proposed solar farm is located within the locality of Beryl, a small rural locality approximately nine kilometres North-West from Gulgong. Adjacent to the site, residences generally occur on large rural properties with grazing and cropping activities.

Gulgong is the closest township to the locality of Beryl, and is five kilometres from the proposed site. The population of Gulgong was 2,383 in the 2011 Census (ABS 2011). The main industries are coal mining at 16.6%; followed by school education at 6.6%, supermarket and grocery stores 4.2% and sheep, beef cattle and grain farming at 3.3% (ABS 2011). The main local industry for employment in Gulgong is the coal mining industry (ABS 2011).

This area of rural NSW is rich in European heritage and was settled in the 1860's during the Australian gold rush (Destination NSW 2016). There are currently 130 buildings, within the town of Gulgong, listed under National Trust classification (Destinations NSW 2016).

Approximately sixty residences are located within two kilometres of the site, one being an involved landholder. A large proportion of these residences would be screened from the proposal site by existing vegetation that is largely associated with Cudgegong River and Wialdra Creek. There are some properties located immediately to the north of the site or on nearby ridgelines and other elevated locations that may have views of the proposed solar farm.

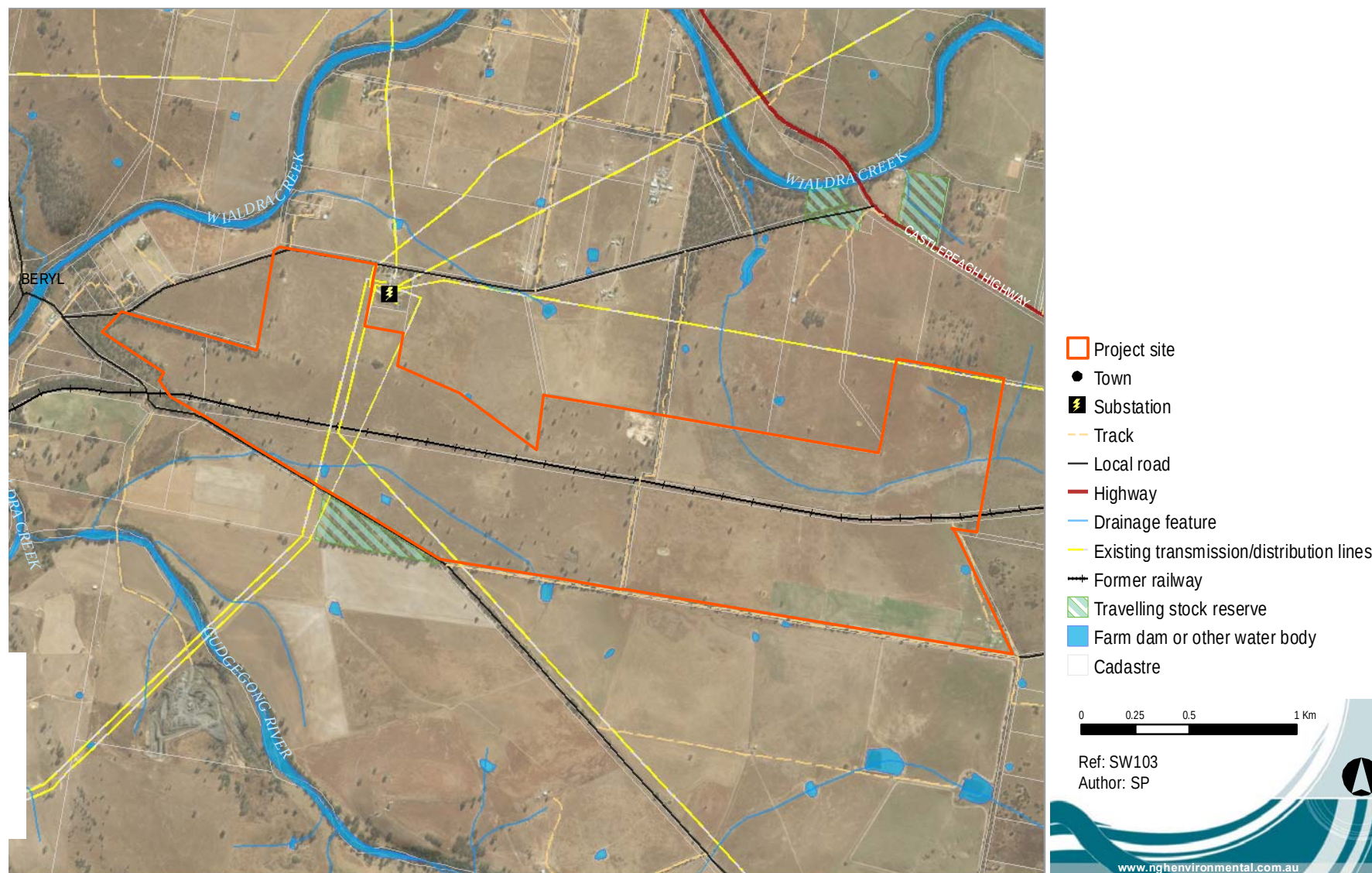


Figure 1-1 Proposal site.

1.2.4 Proposal description

The Beryl Solar Farm proposal would comprise of the installation of a solar plant with an upper capacity of 95 MW that would supply electricity to the national electricity grid. First Solar (Australia) Pty Ltd proposes to purchase the land and develop around 220 ha of the 300ha proposal site. An indicative development area is included in Appendix B. A more precise development area would be informed by detailed site investigations and assessment during the planning and design stage.

Boundary realignment

Existing lot boundaries are shown in Figure 1-2.

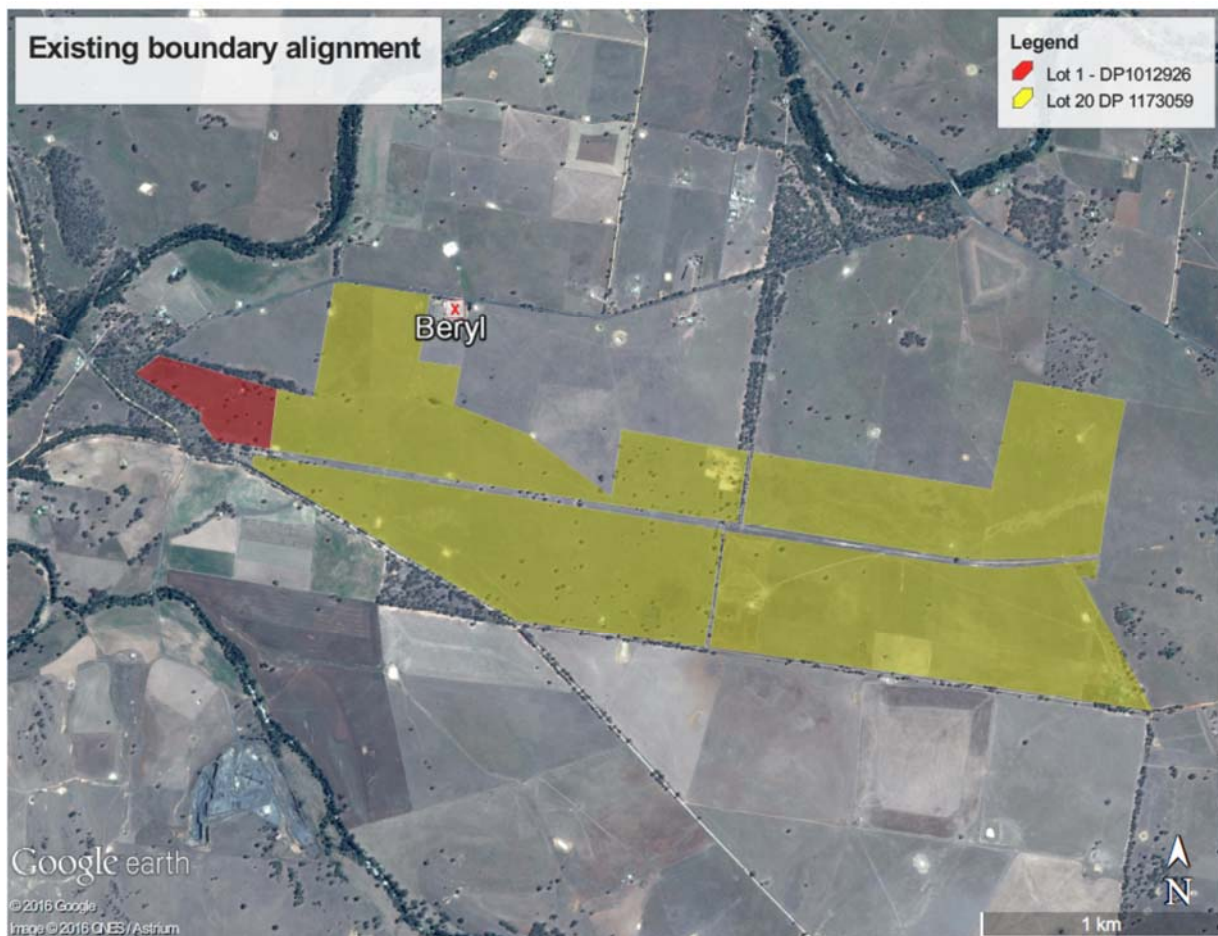


Figure 1-2 Existing lot boundaries

First Solar (Australia) Pty Ltd are proposing to purchase the land proposed for the development. As part of the project, a realignment of these boundaries is proposed as shown in Figure 1-3.

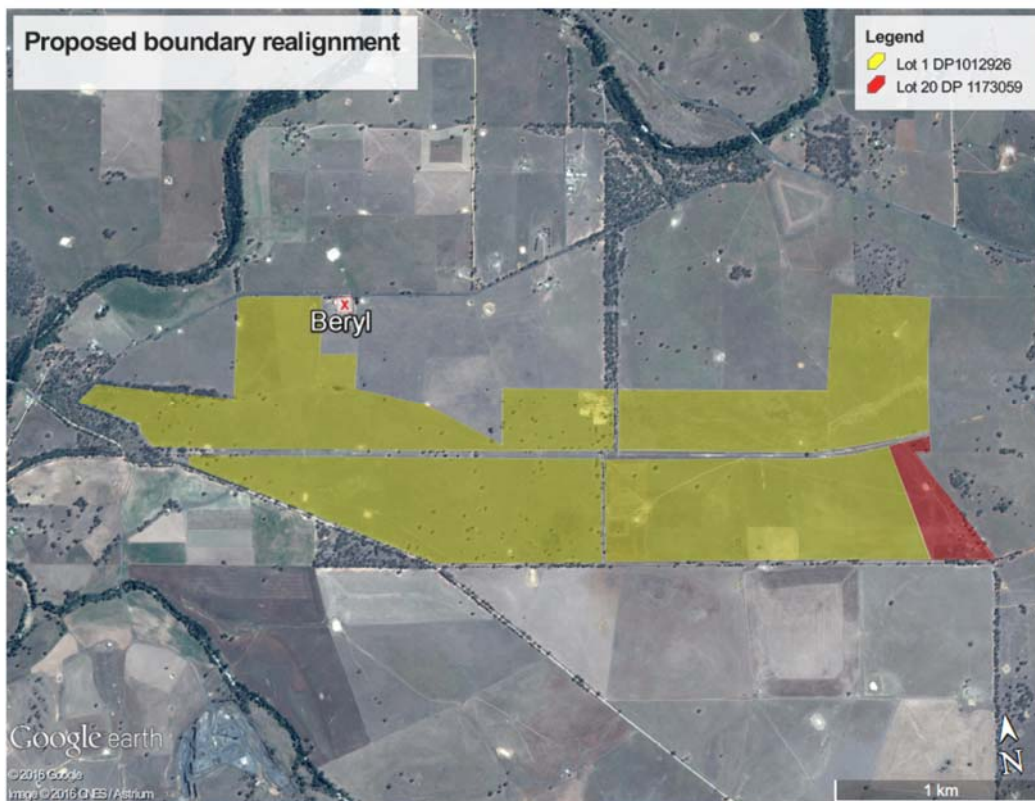


Figure 1-3 Proposed boundary realignment (maps provided by First Solar (Australia) Pty Ltd)

The boundary realignment would result in the following changes to the lot sizes:

1. Lot 20 DP1173059, currently 301.5 hectares, would be reduced to 12 hectares and would contain the existing residence.
2. Lot 1 DP 1012926, currently 10.05 hectares would be increased to 299.55 hectares. This lot would contain the solar farm infrastructure.

Solar farm infrastructure

The solar farm development would include the following elements:

- PV modules mounted on a horizontal tracking structure.
- Site office and maintenance building.
- An access track off Beryl Road
- Overhead cabling for grid connection to the adjacent substation (66kV)
- Underground electrical conduits and cabling to connect the arrays on the array site
- Internal inverter stations to allow conversion of DC module output to AC electricity
- Internal access tracks to allow for site maintenance.
- Perimeter security fencing.
- Native vegetation screening, where required to break up views of infrastructure to specific receivers.

The Beryl Solar Farm is expected to operate for around 30 years. The construction phase of the proposal is expected to take twelve months. After the initial operating period the solar farm would either be

decommissioned, removing all above ground infrastructure and returning the site to its existing land capability, or repowered with new PV equipment.

2 PROPOSAL NEED AND ALTERNATIVES

2.1 PROPOSAL NEED

The proposed Beryl Solar Farm supports Australia in its efforts toward providing 23.5 per cent of its energy from renewable resources by 2020, while further establishing regional NSW as a leader in renewable energy. On an annual basis, the proposed Beryl Solar Farm would provide enough clean, renewable energy for about 28,000 average NSW homes while displacing approximately 183,000 metric tons of carbon dioxide – the equivalent of taking about 49,000 cars off the road.

The Beryl Solar Farm proposal would provide the following benefits, specific to Australia's commitments:

- Reduction in greenhouse gas emissions required to meet our energy demands
- Assisting the transition towards cleaner electricity generation
- Direct contribution to help in meeting the RET

At a State level, the Beryl Solar Farm proposal is consistent with current goals and targets for renewable energy generation in NSW. These include:

- Goal 22 of the NSW 2021: A plan to Make NSW Number One (NSW Government 2011).
Contribute to the national renewable energy target [i.e. 20% renewable energy supply] by promoting energy security through a more diverse energy mix, reducing coal dependence, increasing energy efficiency and moving to lower emission energy sources
- The three goals of the NSW Renewable Energy Action Plan (NSW Government 2013) which include:
 1. Attract renewable energy investment and projects
 2. Build community support for renewable energy
 3. Attract and grow expertise in renewable energy.

Additionally, the proposal would allow for the provision of:

- Significant economic benefits to the region, through the creation of direct and indirect jobs, supporting small business and by developing skills in a growing industry. First Solar (Australia) Pty Ltd has a proven track record of hiring local, qualified labour for plant construction and long-term positions for the maintenance and monitoring of daily operations.
- Embedded electricity generation, to supply into the Australian grid closer to the consumption centres.

For the life of the project, the proposal would harness a natural resource (solar energy). While the activity would impact on land available for primary production, the land would allow for diversity in land use and being fully reversible and involving limited ground disturbance, it would not remove the potential to use the land for primary production (or some alternative land use) at the end of the solar farm's life (expected to be 30 years). The solar farm would be decommissioned at the end of its operational life, removing all above ground infrastructure and returning the site to its existing land capability.

2.2 ALTERNATIVES CONSIDERED

First solar (Australia) Pty Ltd have reviewed numerous sites within NSW for the solar farm proposal and determined that the Beryl site represented the best opportunity for PV development that could be developed to meet the federal target of 23.5%.

Considerations during initial site investigations included:

- Access to electrical network
- Availability of suitably sized lots
- Existing land use and quality
- Soil structure
- Site vegetation
- Flood risk and location relevant to waterways
- Location of nearby sensitive receivers
- Locality population density

First Solar (Australia) Pty Ltd would finalise the infrastructure layout for the solar farm proposal once environmental constraints have been fully investigated through the EIS process. The proposal design is flexible so that there are a number of alternative arrangements. The final layout would aim to balance solar yield and construction costs factors with the maximum feasible avoidance of environmental constraints. The EIS would include details on the evolution of the final layout, with regard to these factors.

3 CONSULTATION

A Community Consultation Plan (CCP) has been prepared to provide a framework to engage with the community and stakeholders about the proposal and ensure opportunities to provide input into the assessment and development process are understood. Stakeholders were identified as those potentially being impacted by the solar farm proposal or having an interest in the project. The CCP has set out consultation requirements with interested parties including adjacent neighbours, near neighbours, local businesses, any special interest groups and representative bodies such as the Gulgong Chamber of Commerce and the Mid-Western Regional Council. The plan also includes strategies for consultation for the community of Gulgong and the broader community within the Mid-Western Regional Council.

To date, the following activities, consistent with the CCP, have been undertaken:

- Meetings with the Mid-Western Regional Council planning team.
- Door knock to twelve of the nearest neighbours which resulted in discussions with seven landowners. Information regarding potential project and contact details were left at five residences where landowners were not home.
- A planning notification has been mailed to residences within 2 kilometres of the proposal detailing project outline, location, need, project timeline and First Solar (Australia) Pty Ltd contact details.
- A notification for registration of interest for Aboriginal stakeholders was advertised in the Mudgee Guardian on Friday 18th November.
- Establishment of a register to record contact with stakeholders including potentially affected landholders.
- Establishment of a project website and email address - <http://www.firstsolar.com/en/About-Us/Projects/Beryl-Solar-Farm>

As the CCP is implemented in the coming weeks and months, the following activities will be undertaken:

- Face to face meetings with stakeholders and concerned landholders as required.
- An 'open day' to provide detailed information about the proposal to the general public.
- Establishment of a project phone number.

The CCP would aim to ensure that there is effective, ongoing liaison with the community. Measures to reduce adverse impacts and promote positive impacts would be identified in the EIS and appropriate management plans developed for the project. Agency consultation would also be undertaken in accordance with any requirements of the SEARs.

4 PLANNING CONSIDERATION

4.1 NSW LEGISLATION

4.1.1 *Environmental Planning and Assessment Act 1979*

Development in NSW is subject to the requirements of the EP&A Act and its associated regulations. Environmental planning instruments prepared pursuant to the Act set the framework for approvals under the Act. The Beryl Solar Farm proposal would be assessed under Part 4 of the EP&A Act.

4.1.2 *State Environmental Planning Policy (State and Regional Development) 2011*

Clause 20 of Schedule 1 of *State Environmental Planning Policy (State and Regional Development) 2011* states that the following is considered a state significant development:

Development for the purpose of electricity generating works or heat or their co-generation (using any energy source, including gas, coal, biofuel, distillate, waste, hydro, wave, solar or wind power) that:

(a) has a capital investment value of more than \$30 million, or

(b) has a capital investment value of more than \$10 million and is located in an environmentally sensitive area of State significance.'

The Beryl Solar Farm proposal would have a capital investment cost estimated of more than \$30 million. Therefore, the proposal is classified as "State Significant Development" under Part 4 of the EP&A Act.

State Significant Developments are major projects which require approval from the Minister for Planning and Environment. While the Minister for Planning and Environment is the consent authority for State Significant Development, the Minister may delegate the consent authority function to the Planning Assessment Commission (PAC), the Secretary or to any other public authority.

An Environment Impact Statement (EIS) is prepared in accordance with the requirements of the Secretary's Environmental Assessment Requirements (SEARs) of Department of Planning and Environment (DP&E). In determining the SEARs, the Secretary must consult with relevant public authorities and would have regard to the need to assess key issues raised by those public authorities.

4.1.3 *State Environmental Planning Policy (Infrastructure) 2007*

Clause 34(7) of *State Environmental Planning Policy (Infrastructure) 2007* (ISEPP) provides that development for the purpose of a solar energy system may be carried out by any person with consent on any land (except land in a prescribed residential zone). A solar energy system includes a PV electricity generating system. The proposal is therefore permissible with consent within appropriate land zoning.

4.1.4 *Mid Western Regional Council Local Environmental Plan 2012*

The site is located within the Mid Western LGA and is therefore subject to the provisions of the *Mid Western Regional Council Local Environmental Plan 2012*. The solar farm site is located on land zoned RU1 - Primary Production and R5 - Large Lot Residential.

RU1 Primary Production

Electricity generating works are permitted with consent within the RU1 Zone. The LEP states that the consent authority must have regard to the objectives for development in a zone when determining a development application. The objectives of this zone are:

- *To encourage sustainable primary industry production by maintaining and enhancing the natural resource base.*
- *To encourage diversity in primary industry enterprises and systems appropriate for the area.*
- *To minimise the fragmentation and alienation of resource lands.*
- *To minimise conflict between land uses within this zone and land uses within adjoining zones.*
- *To maintain the visual amenity and landscape quality of Mid-Western Regional by preserving the area's open rural landscapes and environmental and cultural heritage values.*
- *To promote the unique rural character of Mid-Western Regional and facilitate a variety of tourist land uses.*

R5 Large Lot Residential

Electricity generating works are prohibited within the R5 Zone. The objectives for development in this zone are:

- *To provide residential housing in a rural setting while preserving, and minimising impacts on, environmentally sensitive locations and scenic quality.*
- *To ensure that large residential lots do not hinder the proper and orderly development of urban areas in the future.*
- *To ensure that development in the area does not unreasonable increase the demand for public services or public facilities.*
- *To minimise conflict between land uses within this zone and land uses within adjoining zones.*

The current site layout includes the construction of four arrays within the R5 Zone. Ongoing consultation between First Solar (Australia) Pty Limited and the Mid-Western Regional Council is continuing with regards to the permissibility of a solar farm in this lot.

Minimum lot sizes

The proposal includes the realignment of lot boundaries as shown in Figure 1-3. Minimum lot sizes as shown on the Lot Size Map of the Mid Western Regional Council LEP are shown in Figure 4-1. A lot size of 12 hectares is below the minimum size lot of 100 hectares. Ongoing consultation between First Solar (Australia) Pty Limited and the Mid-Western Regional Council is continuing with regards to the permissibility of a solar farm on this Lot.

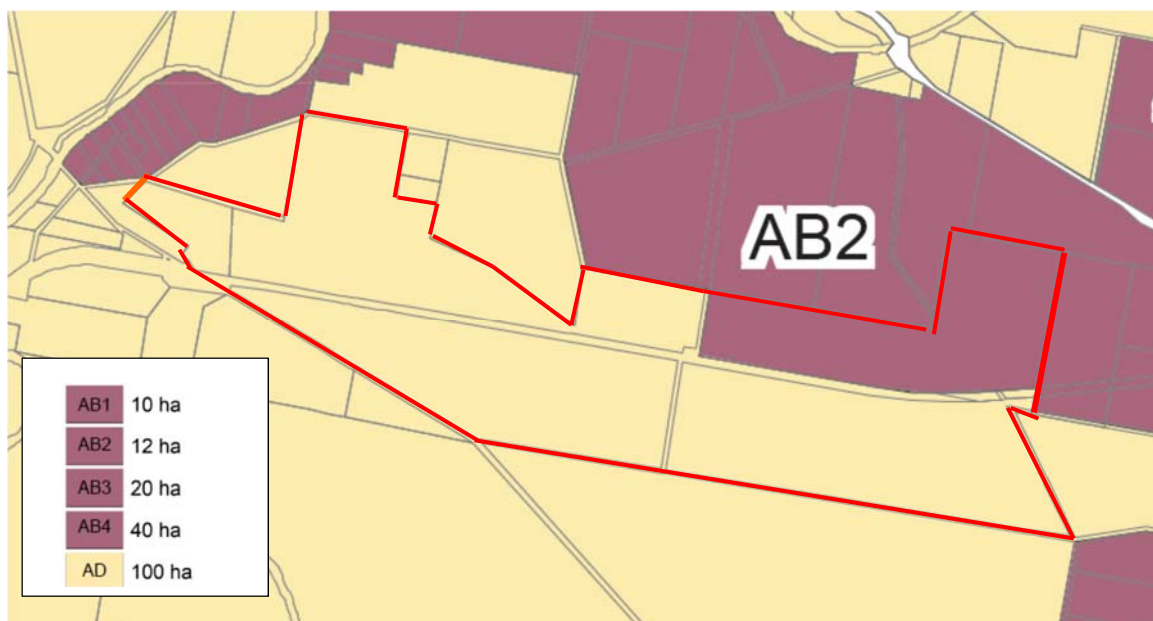


Figure 4-1 Lot size map (crop of Mid-Western LEP – Lot Size Map (Sheet LSZ_005)).

There are several additional Acts and EPI's that are being taken into consideration in relation to this matter:

- Part 2, Division 1, Subdivision 38 of *State Environmental Planning Policy (Exempt and Complying Development Codes)* 2008 which states that boundary realignments can be considered exempt development if the following apply:
 - o that is not carried out in relation to land on which a heritage item or draft heritage item is situated, and
 - o that will not create additional lots or the opportunity for additional dwellings, and
 - o that will not result in any lot that is smaller than the minimum size specified in an environmental planning instrument in relation to the land concerned (unless a lot or lots whose boundaries are being realigned is or are already smaller than the minimum size and that lot or those lots will only increase in size at the completion of the subdivision), and
 - o that will not adversely affect the provision of existing services on a lot, and
 - o that will not result in any increased fire risk to existing buildings, and
 - o if located in Zone RU1, RU2, RU3, RU4, RU6, E1, E2, E3 or E4—that will not result in more than a minor change in the area of any lot, and
 - o if located in any other zone—that will not result in a change in the area of any lot by more than 10%,
- Clause 8(2) and Clause 89E(3) of the *State Environmental Planning Policy (State and Regional Development)* 2011 which state, respectively:
 - o if a single DA comprises development that is only partly State significant development the remainder of the development is also declared to be State significant development
 - o development consent may be granted despite the development being partly prohibited by an environmental planning instrument.
- *State Environmental Planning Policy (Rural Lands)* 2008 and the matters that must be considered in determining development applications for rural subdivisions or rural dwellings.

4.1.5 Roads Act 1993

The *Roads Act 1993* (Roads Act) provides for the classification of roads and for the declaration of the Roads and Maritime Services (RMS) and other public authorities as roads authorities for both classified and unclassified roads. It also regulates the carrying out of various activities in, on and over public roads.

There is potential for the project to require an intersection upgrade at the location of the site access. Approval from the roads authority (RMS and/or Mid Western Regional Council) would be required under section 138 of the Roads Act to erect a structure or carry out a work in, on or over a public road. Mid Western Regional Council and RMS would both be consulted during the design and preparation of the EIS.

4.1.6 Native Vegetation Act 2003

The *Native Vegetation Act 2003* regulates the clearing of native vegetation. Clearing is defined as cutting down, felling, thinning, logging, removing, killing, destroying, poisoning, ringbarking, uprooting or burning native vegetation including native grasses and herbage.

It should be noted that under Section 89J of the EP&A Act, an authorisation referred to in section 12 of the *Native Vegetation Act 2003* to clear native vegetation would not be required for a State Significant Development.

The potential to impact native vegetation is discussed in Section 5.2 of this report.

4.1.7 Threatened Species Conservation Act 1996

The *Threatened Species Conservation Act 1995* (TSC Act) provides for the conservation of threatened species, populations and ecological communities of animals and plants. The TSC Act sets out a number of specific objects relating to the conservation of biological diversity and the promotion of ecologically sustainable development.

It should be noted that under Section 79B(2A) of the EP&A Act, concurrence under Section 79B including concurrence under the TSC Act would not be required for a State Significant Development.

The potential to impact threatened species, populations and ecological communities listed under this Act is discussed in Section 5.2 of this report.

4.1.8 National Parks and Wildlife Act 1974

Under the *National Parks and Wildlife Act 1974*, the Director-General of the National Parks and Wildlife Service is responsible for the care, control and management of all national parks, historic sites, nature reserves, Aboriginal areas and state game reserves. The Director-General is also responsible under this legislation for the protection and care of native fauna and flora, and Aboriginal places and objects throughout NSW.

It should be noted that under Section 89J of the EP&A Act, an Aboriginal Heritage Impact Permit under Section 90 of the *National Parks and Wildlife Act 1974* would not be required for a State Significant Development.

The potential impact to Aboriginal heritage and native fauna and flora are discussed in Section 5.2 of this report.

4.1.9 Heritage Act 1977

This Act aims to conserve heritage values. The Act defines 'environmental heritage' as those places, buildings, works, relics, moveable objects and precincts listed in the Local or State Heritage Significance. A property is a heritage item if it is listed in the heritage schedule of the local Council's Local Environmental Plan or listed on the State Heritage Register, a register of places and items of particular importance to the people of NSW.

It should be noted that under Section 89J of the EP&A Act, an approval under Part 4 or a permit under Section 139 of the *Heritage Act 1977* would not be required for a State Significant Development.

The proposal is unlikely to directly or indirectly on any items of heritage significance (refer to Section 5.3).

4.1.10 Crown Lands Act 1989

The objects of this Act are to ensure that Crown land is managed for the benefit of the people of New South Wales and in particular to provide for:

- (a) *a proper assessment of Crown land,*
- (b) *the management of Crown land having regard to the principles of Crown land management contained in this Act,*
- (c) *the proper development and conservation of Crown land having regard to those principles,*
- (d) *the regulation of the conditions under which Crown land is permitted to be occupied, used, sold, leased, licensed or otherwise dealt with,*
- (e) *the reservation or dedication of Crown land for public purposes and the management and use of the reserved or dedicated land, and*
- (f) *the collection, recording and dissemination of information in relation to Crown land.*

For the purposes of this Act, the principles of Crown land management are:

- (a) that environmental protection principles be observed in relation to the management and administration of Crown land,
- (b) that the natural resources of Crown land (including water, soil, flora, fauna and scenic quality) be conserved wherever possible,
- (c) that public use and enjoyment of appropriate Crown land be encouraged,
- (d) that, where appropriate, multiple use of Crown land be encouraged,
- (e) that, where appropriate, Crown land should be used and managed in such a way that both the land and its resources are sustained in perpetuity, and
- (f) that Crown land be occupied, used, sold, leased, licensed or otherwise dealt with in the best interests of the State consistent with the above principles.

Under Part 3 of the Act, the Minister for Lands must be satisfied that the land has been assessed prior to any allocation action, i.e. reservation, dedication, sale, lease, licence or permit. The purpose of a land assessment is to ensure decisions made in relation to Crown land are in accordance with the principles of Crown land management by (amongst other matters) including an assessment of the capabilities of Crown land and the identification of suitable land uses.

Preliminary data obtained from NSW Land and Property Information does not indicate Crown land to be present within the solar farm site. This would be further investigated in the EIS and the Department of Primary Industries (Lands) would be consulted during the assessment process.

4.2 COMMONWEALTH LEGISLATION

4.2.1 *Environmental Protection and Biodiversity Conservation Act 1999*

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is administered by the Commonwealth Department of the Environment (DoE). Under the EPBC Act, if the Minister determines that an action is a 'controlled action' which would have or is likely to have a significant impact on a Matter of National Environmental Significance (MNES) or Commonwealth land, then the action may not be undertaken without prior approval of the Minister.

The EPBC Act identifies the following nine MNES:

- World Heritage properties.
- National heritage places.
- Ramsar wetlands of international significance.
- Threatened species and ecological communities.
- Migratory species.
- Commonwealth marine areas.
- The Great Barrier Reef Marine Park.
- Nuclear actions (including uranium mining).
- Water resources (in relation to coal seam gas development and large coal mining development).

Actions that adversely affect these matters may be deemed to be a 'controlled action' under the Act.

A search of the Commonwealth Protected Matters Search Tool (coordinate search, undertaken on 30/11/2016) indicates that there are no World Heritage or National Heritage areas or items within the proposal site. Search results listed four Wetlands of International Importance that are either known to occur or have potential to occur within ten kilometres, however these are not relevant to the site or proposal (closest being 200-300km upstream of the proposal site). Three areas of Commonwealth land were identified, Australian Telecommunications Commission, Commonwealth Trading Bank of Australia and Telstra Corporation Limited. These are not present at the site.

Six threatened ecological communities, 29 threatened species and 8 migratory species were returned from the search. The potential impacts to these threatened entities is discussed in Section 5.2. Further flora and fauna studies would confirm whether impacts to these entities would occur, during the preparation of the EIS.

4.2.2 *Native title Act 1993*

The *Native Title Act 1993* provides a legislative framework for the recognition and protection of common law native title rights. Native title is the recognition by Australian law that Indigenous people had a system of law and ownership of their lands before European settlement. Where that traditional connection to land and waters has been maintained and where government acts have not removed it, the law recognises this as native title.

People who hold native title have a right to consult or continue to practise their law and customs over traditional lands and waters while respecting other Australian laws. This could include visiting to protect important places, making decisions about the future use of the land or waters, hunting, gathering and collecting bush medicines. Further, when a native title claimant application is registered by the National

Native Title Tribunal, the people seeking native title recognition gain a right to consult or negotiate with anyone who wants to undertake a project on the area claimed.

Where native title does exist in relation to the proposal site, First Solar (Australia) Pty Ltd would comply with the provisions of the *Native Title Act 1993*.

5 PRELIMINARY ENVIRONMENTAL ASSESSMENT

5.1 METHODOLOGY

NGH Environmental has undertaken a fatal flaws analysis of the Beryl Solar Farm proposal site. The analysis was undertaken based on desktop review and site surveys, to identify high level constraints and major risks of the project, as well as inform the development of a site layout that reflects the site's constraints.

Low, moderate and high environmental constraints were defined with reference to the 'developability' of the site. Where uncertainty exists, a higher constraint rating was applied. The preliminary constraints map is provided in Appendix C. This will be used to guide further detailed investigations and ultimately the site infrastructure layout.

A summary of the key environmental issues is provided in Section 5.2. The intent of the discussion is to demonstrate an understanding of the issues that require further environmental assessment and proposed investigation strategies for these key issues. The potential impacts of other (less significant) issues are discussed in Section 5.3.

5.2 ASSESSMENT OF KEY ISSUES

5.2.1 *Aboriginal Heritage*

A search of the Aboriginal Heritage Information Management System (AHIMS) on 15th November 2016 identified 16 Aboriginal sites and no Aboriginal places within 1km of the proposal site and 79 Aboriginal sites and no Aboriginal places within 22km of the site.

A preliminary site inspection by an environmental consultant identified the site has having undergone a moderate level of modification based on existing landforms and vegetation including ploughing and development of the raised rail corridor. This is likely to reduce the potential for Aboriginal heritage sites of significance in these areas. Conversely, unmodified areas near waterways and areas located on crests of hills (such as the north-eastern part of the site) are likely to have a higher potential for significance. Wialdra Creek is 190 metres from the north-west boundary of the site. The Cudgegong River is more than 600 metres south of the site. Two waterways lines are mapped within the site but during the site inspection these showed no water and no evidence of incised channels, indicating lesser significance.

Conclusions and need for further assessment

An Aboriginal heritage assessment of the development footprint and stakeholder consultation process would be completed as part of the EIS. The significance of any Aboriginal heritage sites that may be potentially affected by the proposal would be determined in accordance with the Guide to Investigating, assessing and reporting on Aboriginal Cultural Heritage in NSW (OEH 2011).

5.2.2 *Biodiversity*

The potential ecological constraints within the study area have been identified based on the following information sources:

- Existing threatened species listings under the TSC Act and EPBC Act.

- Existing records of threatened species sightings in the study area, as recorded in the Bionet Database (OEH).
- Department of Environment Protected Matters Search Tool (nationally threatened species listed on the EPBC Act).
- Site survey by a qualified botanist and ecologist.

Threatened species and ecological communities

The EPBC Act Protected Matters Search Tool identified six threatened ecological communities, 29 threatened species and 8 migratory species (some of which are included within the threatened bird species) that are either known to occur or have potential to occur in this area. Species include:

- 8 flora species
 - *Euphrasia arguta*
 - *Homoranthus darwinoides*
 - Hoary Sunray (*Leucochrysum albicans* var. *tricolor*)
 - *Philotheca ericifolia*
 - Tarengo Leek Orchid (*Prasophyllum petilum*)
 - A leek orchid (*Prasophyllum* sp. Wybong (C.Phelps ORG 5269))
 - Austral Toadflax (*Thesium australe*)
 - *Tylophora linearis*
- 9 bird species
 - Australasian Bittern (*Botaurus poiciloptilus*)
 - Curlew Sandpiper (*Calidris ferruginea*)
 - Painted Honeyeater (*Grantiella picta*)
 - Swift Parrot (*Lathamus discolor*)
 - Malleefowl (*Leipoa ocellata*)
 - Eastern Curlew, Far Eastern Curlew (*Numenius madagascariensis*)
 - Superb Parrot (*Polytelis swainsonii*)
 - Australian Painted Snipe (*Rostratula australis*)
 - Regent Honeyeater (*Anthochaera phrygia*)
- 1 amphibian species
 - Booroolong Frog (*Litoria booroolongensis*)
- 6 mammal species
 - Large-eared Pied Bat (*Chalinolobus dwyeri*)
 - Spotted-tail Quoll (*Dasyurus maculatus maculatus* (SE mainland population))
 - Corben's Long-eared Bat (*Nyctophilus corbeni*)
 - Greater Glider (*Petauroides volans*)
 - Koala (*Phascolarctos cinereus*, combined population of QLD, NSW and the ACT)
 - Grey-headed Flying-fox (*Pteropus poliocephalus*)
- 3 fish species
 - Flathead Galaxias (*Galaxias rostratus*)
 - Murray Cod (*Maccullochella peelii*)
 - Macquarie Perch (*Macquaria australasica*)
- 2 reptiles
 - Pink-tailed Worm-lizard (*Aprasia parapulchella*)
 - Striped Legless Lizard (*Delma impar*)

A search of the NSW Bionet Atlas of NSW Wildlife was conducted on the 14 November 2016 (coordinate search North: -32.27 West: 149.37 East: 149.59 South: -32.45) to identify species listed under the TSC Act. The search returned 44 records of nine species as listed below:

- Malleefowl (*Leipoa ocellata*)
- Black Falcon (*Falco subniger*)
- Diamond Firetail (*Staganopleura guttata*)
- Koala (*Phascolarctos cinereus*)
- Yellow-bellied Sheath-tail-bat (*Saccolaimus flaviventris*)
- Large-eared Pied Bat (*Chalinolobus dwyeri*)
- Eastern Bentwing-bat (*Miniopterus schreibersii oceanensis*)
- Ausfeld's Wattle (*Acacia ausfeldii*)
- Pine Donkey Orchid (*Diuris tricolor*)

Biodiversity constraints

Field surveys were undertaken in November 2016 by a zoologist and senior botanist over five days and nights. The site survey confirmed that the majority of the site is derived from a community of conservation significance: Box Gum Woodland Endangered Ecological Community which is present in a range of condition levels.

The site has been largely cleared. Occasional mature trees remain scattered across the site. Native vegetation occurs in much of the site with two areas of uncleared remnant native vegetation present in the western part of the site. Two threatened species, *Diuris tricolor* and *Swainsona sericea* were identified within these areas. At the time of the site inspection, several paddocks in the eastern part of the site contained sown pasture. Refer to preliminary constraints map, Appendix C.

Conclusions and need for further assessment

As part of the EIS, the detailed ecological surveys and further investigation and assessment will be undertaken in the format of a Framework for Biodiversity Assessment – Biodiversity Assessment Report, specific to major projects. This will include the calculation of any biodiversity offset required for the project.

5.2.3 Visual amenity

The site is located within a rural residential area with large lot agricultural production. A preliminary inspection has identified that the solar farm could potentially result in visual impacts on several houses to the immediate north of the site and several houses located in elevated areas to the north and south (beyond two kilometres from the site). Further investigation with regards to level of visual impacts would be undertaken as part of the EIS process. Additional consultation with specific affected residences would also be undertaken to gauge degree of impact (subjective for each receiver) and suitable mitigation measures. Onsite vegetation screening to break up views of the site in specific areas will form part of the proposal.

It is noted that solar panels are designed to absorb as much sunlight as possible. They therefore reflect a very low percentage of the light they receive and are not considered likely to result in glare or reflections that would affect traffic or nearby receivers.

Conclusions and need for further assessment

A visual impact assessment, including view shed analysis and community consultation input would be prepared as part of the EIS to investigate visual impacts and mitigation options.

5.2.4 Noise

There are two sensitive receivers (non-involved, residential) within 200 metres of the proposal site. Several other properties are located within 500 metres on the northern boundary of the site.

Noise impacts would, for the most part, only occur during construction (generated by construction related vehicles and machinery), with minimal noise likely to be generated during operation. First Solar (Australia) Pty Ltd would adopt mitigation measures during construction, such as standard working hours and regular vehicle and machinery maintenance to reduce the risk of adverse noise impacts.

During the operation of the solar farm, potential noise impacts are associated with the solar tracking system (an optional feature which would operate for around half an hour per day), transformer station and switchgear and any maintenance works undertaken on site. Noise impacts during the operation of the solar farm are expected to be very low.

Conclusions and need for further assessment

A construction noise assessment will be undertaken as part of the EIA to assess potential noise impacts. The assessment will be undertaken in accordance with the Interim Construction Noise Guideline (Department of Environment Climate Change and Water 2009).

5.2.5 Watercourses and hydrology

Two ephemeral waterways and eight wetlands/farm dams occur within the proposal site. One waterway, located within the south western area of site, is a tributary of the Cudgegong River. The waterway enters the Cudgegong River approximately 900m south west of the site. The other waterway traverses the eastern area of the site. It is a tributary of the Wialdra Creek, confluence of which is located approximately 1.2 kilometres north of the site boundary. At the time of the site inspection these waterways were dry. There was no evidence of incised channels and no obvious creek bed.

Section 149 certificates obtained for the proposal site indicate that the land is not within the Flood Risk Precincts identified by the Mudgee Floodplain Management Study. Preparation of the EIS would further investigate the potential for flood to impact the site.

Conclusions and need for further assessment

The EIS would assess the impacts to waterways during construction and operation and include appropriate mitigation measures.

5.3 OTHER ENVIRONMENTAL ISSUES

There are a range of potential environmental issues associated with the Beryl Solar Farm which are not considered to be key issues. These issues are considered secondary issues for investigation, given the characteristics of the proposal and the availability of appropriate safeguards for mitigation. These issues are outlined in Table 5-1.

These issues would be addressed in sufficient detail to assess the level of their impacts (if any). It is anticipated that any impacts identified would be able to be managed through appropriate mitigation measures and management plans.

Table 5-1 Other environmental issues

Issue	Existing environment	Potential impacts	Management and mitigation measures
Soils	Four soil landscapes occur within the proposal site. These include • Nanima (north east area of site) • Craigmore (south east area of site) • Home Rule (Western area of site) • Mebul (small area along south boundary in the western portion of the site). All soil types have a moderate to very high erosion hazard when disturbed. A quarry was previously operational in the central northern part of the site. This area is indicated by a large area of bare soil.	Construction activities would include minor excavations and vegetation removal which have the potential to cause soil erosion and sedimentation and dust issues.	The design would ensure adequate all weather access to the site during construction and operation is provided to avoid erosion/sedimentation impacts and tracking of soil, in particular after rain events. The EIS would provide thorough consideration of soil impacts and proposed mitigation measures during construction and operation.

Issue	Existing environment	Potential impacts	Management and mitigation measures
Historic heritage	A search of the NSW heritage Register on 15th November 2016 for the Mid- Western LGA identified 14 listed items under the NSW Heritage Act and 485 items listed under the Mid- Western LEP and by state agencies. The closest listed heritage items are located within Gulgong, approximately km east of the proposed site. The onsite inspection identified a number of old structures that would potentially have historic significance. These include a dilapidated huts structure and the lane way that runs east west across the site.	The proposal may result in the removal of at least two old structures that are present in the site.	Advice from a heritage specialist would be sought to determine heritage significance of the items identified during the site inspection. Appropriate management measures would be implemented if required.

Issue	Existing environment	Potential impacts	Management and mitigation measures
Access and traffic	Access to the site would be from Beryl Road which bounds part of the site to the north. The access track would be constructed as part of the works. The Castlereagh Highway, which intersects with Beryl Road 2.5 kilometres from the proposed site entrance, would be the major transport route for haulage and site vehicles during construction and operation of the project.	Construction traffic would impact traffic along Beryl Road and Castlereagh Highway. The proposal may require construction of a formal intersection on Beryl Road at the location of the site access. Maintenance access tracks during operation would also be required across the proposal site. One resident is located within 200 meters of the site access. During construction, there may be impacts associated with dust, vibration and noise generation.	Construction traffic impacts would be considered in the EIS and take into consideration existing traffic volumes and any requirements from RMS. Consultation would be undertaken before construction with RMS, the local council and local farmers regarding the works that may affect roads or traffic. The design would also consider any requirements from RMS and other relevant stakeholders on access arrangements to the proposal site. The mitigation measures would require a Traffic Management Plan be prepared.
Contamination	A search of the NSW OEH Contaminated Sites Register on 15 November 2016 identify one site within the Mid-Western LGA. The site is however located within Mudgee, over 27km for the proposed site. The proposed site does not appear on the List of NSW contaminated sites notified to the EPA, as at 15 November 2016. Contamination associated with agricultural activities (e.g., pesticides) may still be present on the site.	There is potential that contaminants may be uncovered during excavation activities at the site.	Risk associated with contamination at the site are considered low and therefore no detailed investigation is likely to be required within the EIS. The mitigation measures would require a CEMP be prepared to manage any contamination identified during site construction.

Issue	Existing environment	Potential impacts	Management and mitigation measures
Land use and resources	The rural land in the study area is used primarily for agriculture including cropping and grazing. There are no current mineral titles across the site (mineral title EL8160 expired 29 August 2016). Beryl Quarry operates 1.2 kilometres south of the site.	Although the proposal has the potential to impact on agricultural use of the site during construction and operation, the relatively small loss of productive land at a regional scale is not considered likely to have a significant impact on the overall agricultural productivity of the region. There would be a loss of access to any resources that may be available at the site for the life of the project.	The solar farm would be decommissioned at the end of its operational life, removing all above ground infrastructure and returning the site to its existing land capability. Overall, the adverse impacts related to alienation of resources are expected to be minimal, and as such, are not considered to be a key environmental issue. This would be discussed in the EIS.
Air Quality	The air quality in Beryl is generally expected to be good and typical of that found in a rural setting in NSW due to low population numbers. Existing sources of air pollution in such a location is expected to comprise vehicle emissions and dust from agricultural practices. During colder months, there may be a minimal increase in air contaminants due to smoke emissions from the operation of solid fuel heating. The Beryl Quarry is the closest facility that is required to report to the National Pollutant Industry.	The construction of the proposal is not anticipated to have a significant impact on air quality, and would mostly be related to dust during dry periods and vegetation removal. Impacts to air quality during operation is likely to be negligible. There is an opportunity to improve air quality in operation by maintaining ground cover beneath the panels compared to existing cropping operations.	The mitigation measures would require a CEMP be prepared to manage air quality impacts during the construction of the project.

Issue	Existing environment	Potential impacts	Management and mitigation measures
Hazard and Risk - EMF	A 66 kv transmission line to connect the site to the substation is proposed.	The transmission line would be constructed between the solar farm and the adjacent substation and would not pass through any nearby properties. The electromagnetic field (EMF) that would be generated by the proposed transmission line is expected to be below the guideline for public exposure and would not be expected to have an adverse impact on human health.	The EMF levels of the proposed transmission line would be assessed as part of the EIS.
Hazard and Risk - Bushfire	The proposal site has been predominantly cleared for agricultural purposes.	The proposal is unlikely to be affected by bushfire, or pose a significant bushfire risk.	The proposed development is unlikely to result in an increased risk of bushfire for the site. This would be assessed in the EIS.
Aviation	Two airstrips are located within 10km of the proposal site.	It is noted that solar panels are designed to absorb as much sunlight as possible. They therefore reflect a very low percentage of the light they receive and are not considered likely to result in glare or reflections that would affect air traffic.	The EIS would provide information about glare impacts related to aviation.

Issue	Existing environment	Potential impacts	Management and mitigation measures
Social and economic impacts	The proposal site is located within the Mid Western Regional Council. The Mid-Western Government area (LGA) had a population of 24,017 in 2014 (ABS 2016). The closest town is Gulgong, located 5 kilometres to the east. 2,383 in the 2011 Census (ABS 2011b). It is an area rich in historic heritage with 130 buildings listed under the National Trust Classification.	The proposal would generate economic benefits during construction and operation, including local employment opportunities.	The EIS would assess potential social and economic impacts of the proposal.
Waste Management	The proposal would generate a number of waste streams and utilise a variety of materials during the construction phase.	During construction, excavated material and green waste would be generated as waste. Packaging from panels and other components would require disposal. Limited operational waste would be associated with this proposal.	A Waste Management Plan (WMP) would be required to be developed and incorporated into the CEMP, prior to construction. This would incorporate the principles to avoid, re-use and recycle to minimise wastes.

6 CONCLUSION

This report has outlined the proposed Beryl Solar Farm and established the planning context of the project. The proposal would be assessed under Part 4 of the EP&A Act and classed as State Significant Development under *State Environmental Planning Policy (State and Regional Development) 2011*.

Potential environmental impacts associated with the project have been categorised as key issues or other issues. Based on this scoping study, an indicative scope for the EIS has been developed, focusing on the key issues:

- Aboriginal heritage
- Biodiversity
- Visual amenity
- Noise
- Watercourse and hydrology

The other issues can be readily addressed through desktop investigation to inform appropriate mitigation and management measures.

The EIS would be prepared in accordance with the SEARs. Mitigation measures will be developed for inclusion in the EIS and will address the management of key issues and other issues identified in the assessment process.

7 REFERENCES

ABS, 2011, Gulgong 2011 Quickstats, accessed 31 October 2016 from http://www.censusdata.abs.gov.au/census_services/getproduct/census/2011/quickstat/SSC11041.

Destinations NSW, 2016, Gulgong, accessed 31 October 2016 from <http://visitmudgeeregion.com.au/explore-absorb/towns-and-villages/gulgong>.

Department of Environment and Climate Change NSW 2009 Interim Construction Noise Guideline <http://www.epa.nsw.gov.au/resources/noise/09265cng.pdf>

NSW Government 2013 Renewable Energy Action Plan <http://www.resourcesandenergy.nsw.gov.au/energy-consumers/sustainable-energy/renewable-energy-action-plan>

NSW Government 2016 NSW Titles Viewer accessed on line 8 December <http://nswtitles.minerals.nsw.gov.au/nswtitles/>

NSW Government 2011 NSW 2021: A plan to make NSW Number one

NSW Office of Environment and Heritage 2011 Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW. <http://www.environment.nsw.gov.au/resources/cultureheritage/20110263ACHguide.pdf>

APPENDIX A SITE PHOTOGRAPHS

Onsite features



Retired rail way line, now a raised embankment

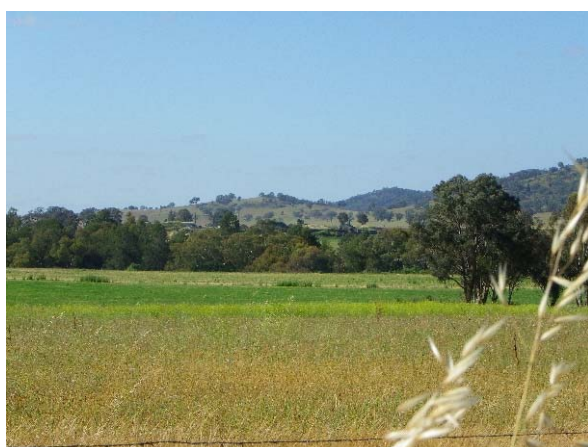


Existing transmission line and farm sheds

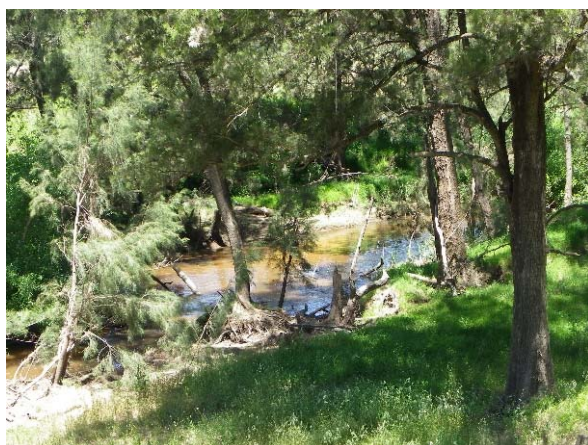


Existing dam and drainage line (no channel)

Nearby areas



Nearby residential and agricultural areas



Wialda Creek



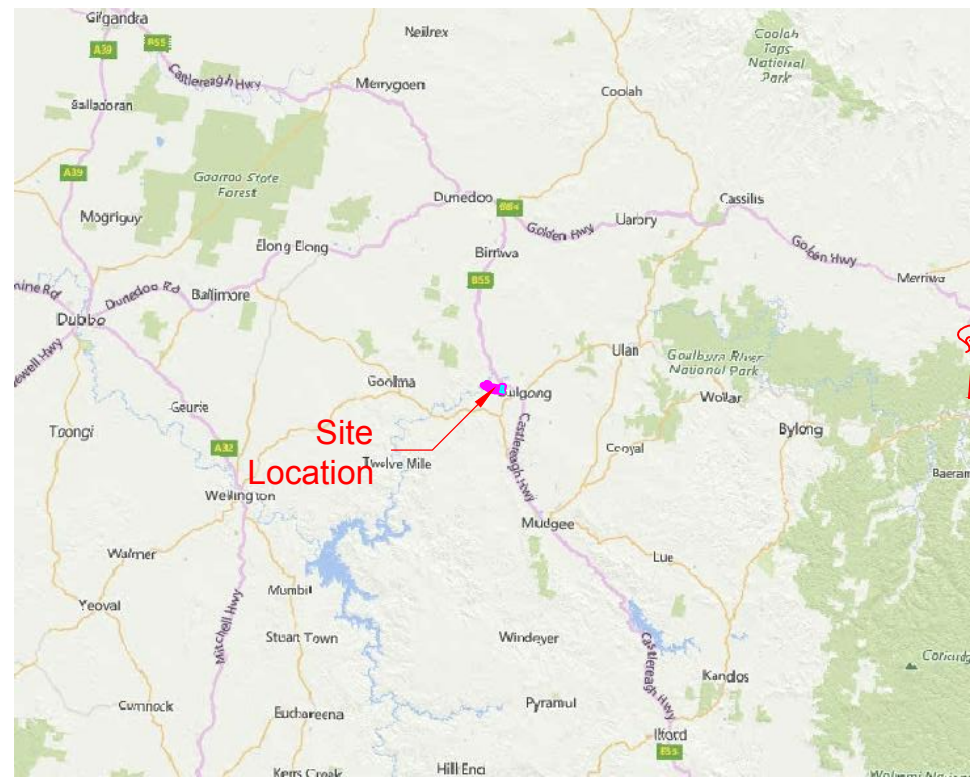
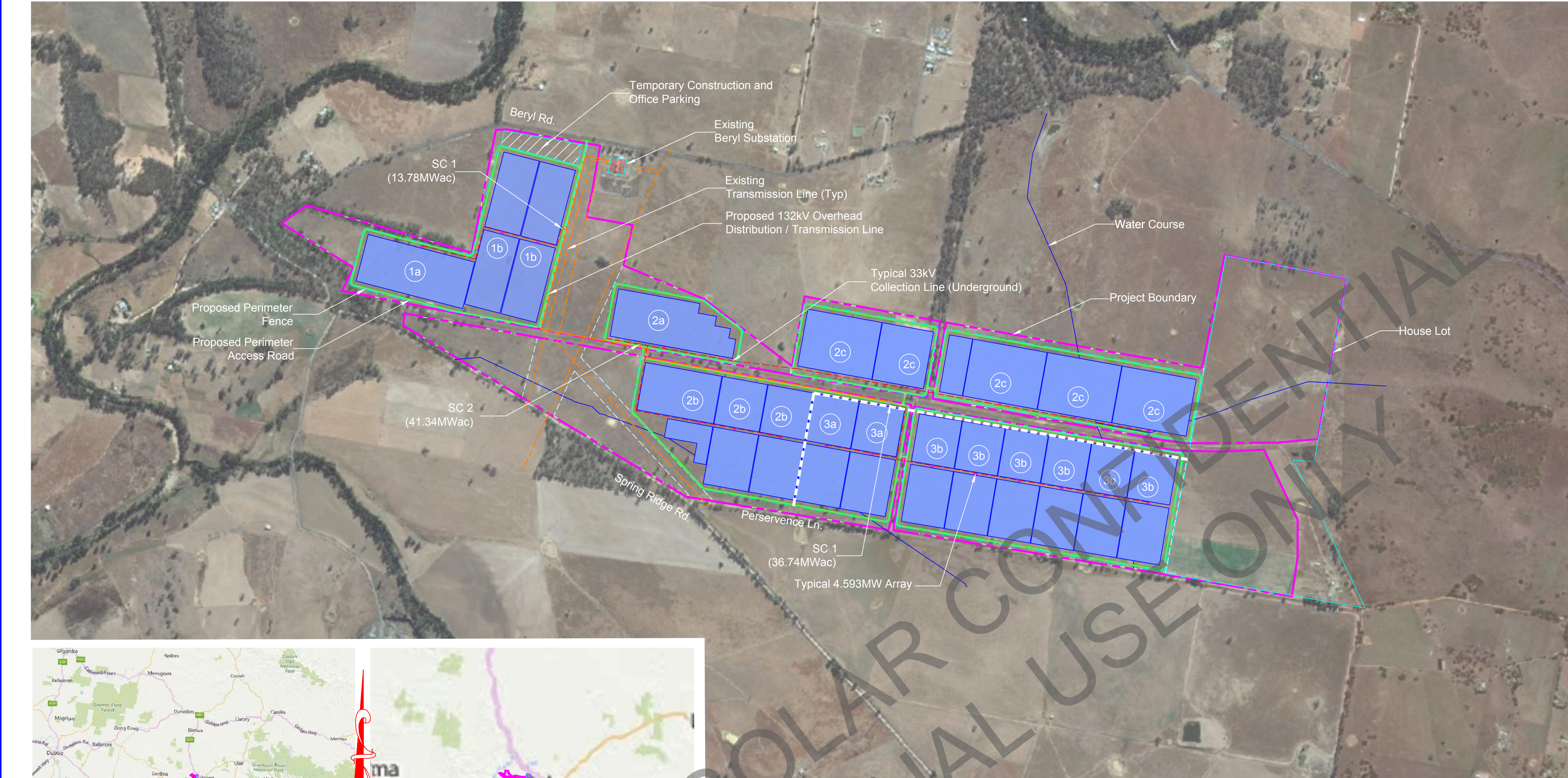
Native remnant vegetation on Annie's Rock Road



Historic Gulgong (look out, main street)

APPENDIX B INDICATIVE LAYOUT

Y:\FS_Projects\FS Site Development\First Solar AU\Beryl Solar Plant\Active Drawings\Beryl SD-100-T.dwg FS116303 Oct 28, 2016 - 11:10am



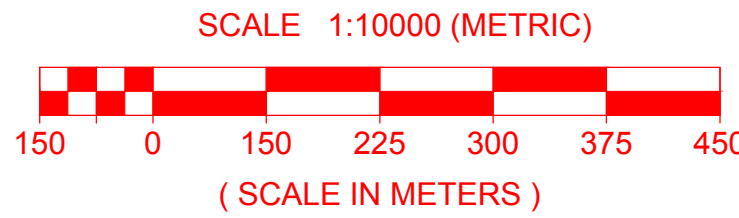
Country Map
Scale NTS



Key Plan
Scale NTS

Site Development Plan

Scale 1:10 000



Legend:

- Project Boundary
- AC Elec. Collection Line (Underground)
- AC Elec. Collection Line (Overhead)
- AC Elec. Distribution / Transmission Line
- Existing Distribution / Transmission Line
- Perimeter Fence
- Proposed Access Road (Dirt)

Beryl Solar Plant

Beryl, New South Wales, Australia

Product Offering

TBD

Project Developer/Owner Operator

First Solar

Project Site Description

302.03 ± Hectare Site
± Hectare Array
Latitude 32°21'26" S
Longitude 149°28'17" E
Elevation 420 m



PROFESSIONAL ENGR.

Beryl Solar Plant
Beryl
New South Wales
Australia, Australia

REV	DATE	REVISION DESCRIPTION	BY	CHK	APP
A	10-28-16	Conceptual Design - Tracker Mounting System	DK	JH	JH

FS JOB #:	0000-0000-00
PROJ. DSGR:	Daiva Kinneman
PROJ. ENGR:	
PROJ. MGR:	
PROJ. DIR:	John Hartelius P.E.
SCALE:	AS NOTED

SHEET TITLE

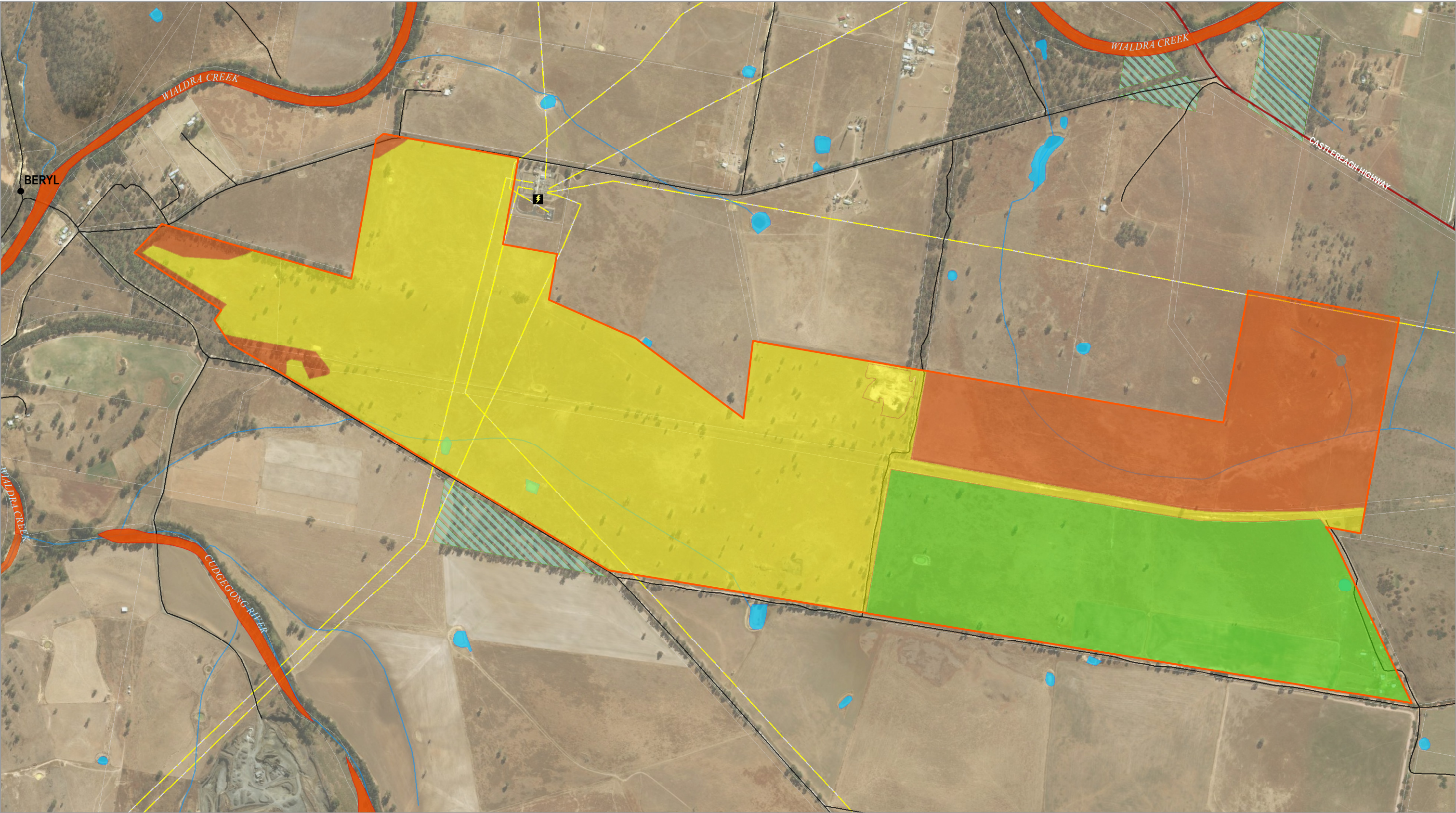
Site Development Plan

SD-100-T
SHEET 1 OF 1

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Site Plan Data Source	
Feature	Description
Boundary	Beryl PV Site KMZ
Coordinate System	Map Grid of Australia Zone 55, using GDA94 datum
Topography	
Hydrology	
Wetlands	
Geotechnical	
Environmental Constraint	
THIS PRINT IS DESIGNED FOR 24" X 36" PLOTTING	
THIS SITE DEVELOPMENT PLAN IS PRELIMINARY AND SUBJECT TO REVISION BASED ON, AMONG OTHER THINGS, CHANGES IN PROJECT SCHEDULE, TECHNOLOGY, AND/OR SITE SPECIFIC CONSTRAINTS.	
THIS PRINT IS NOT TO BE USED FOR CONSTRUCTION UNLESS NOTED AND SIGNED OK FOR CONSTRUCTION ABOVE LAST REVISION.	

APPENDIX C PRELIMINARY CONSTRAINTS MAPPING



CONSTRAINTS

Beryl Solar Farm

- | | | |
|--------------|--|--------------------------|
| Project site | Substation | Travelling stock reserve |
| High | Track (vehicular) | Cadastre |
| Moderate | Local road | |
| Low | Highway | |
| Town | Drainage feature | |
| | Existing transmission/distribution lines | |



0 50 100 200 Metres

A3 @ 1:12091
Ref: SW103
Author: SP

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