



**ASSESSMENT REPORT:
Nyngan Solar Plant
Nyngan (SSD-5355)**



Director General's
Environmental Assessment Report
Section 79C of the
Environmental Planning and Assessment Act 1979

July 2013

Abbreviations

Applicant	AGL Energy Limited, or any other person or persons who rely on this consent to carry out the development that is subject to this consent
CIV	Capital Investment Value
Consent	This development consent
Department	Department of Planning & Infrastructure
DGRs	Director General's environmental assessment requirements
Director General	Director General of the Department
EIS	Environmental Impact Statement titled Nyngan Solar Plant, dated March 2013
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
EP&A Regulation	Environmental Planning and Assessment Regulation 2000
EPI	Environmental Planning Instrument
Minister	Minister for Planning & Infrastructure
NOW	NSW Office of Water
OEH	Office of Environment and Heritage
PAC	Planning Assessment Commission
RMS	Roads and Maritime Services
RtS	Response to Submissions
SRD SEPP	State Environmental Planning Policy (State and Regional Development) 2011
SSD	State Significant Development

Cover Photograph: Photograph of a solar plant under construction (AGL Ltd March 2013)

© Crown copyright 2013
Published July 2013
NSW Department of Planning & Infrastructure
www.planning.nsw.gov.au

Disclaimer:

While every reasonable effort has been made to ensure that this document is correct at the time of publication, the State of New South Wales, its agents and employees, disclaim any and all liability to any person in respect of anything or the consequences of anything done or omitted to be done in reliance upon the whole or any part of this document.

Executive Summary

AGL Energy limited (the Applicant) proposes to construct and operate a solar plant and associated electrical infrastructure with a maximum generating capacity of up to 106 MW. The solar plant is to be known as the Nyngan Solar Plant. The site is located 10km west of Nyngan in the Bogan Shire Local Government Area.

The Capital Investment Value (CIV) of the development is \$300,000,000, and the proposal will create approximately 300 full-time equivalent (FTE) construction jobs and 2-3 FTE operations and maintenance staff.

Pursuant to Clause 20 of Schedule 1 of *State Environmental Planning Policy (State and Regional Development) 2011*, the proposal is State Significant Development as it is development for the purpose of a facility for the generation of electricity that has a capital investment value of more than \$30 million. Therefore the Minister for Planning and Infrastructure is the consent authority.

The proposal was developed in response to the Federal Government's Solar Flagships Program, which is part of the Australian Government's \$4.5 billion Clean Energy Initiative (CEI), announced in the May 2009 Budget. The CEI complements the Carbon Pollution Reduction Scheme and the Renewable Energy Target (RET) of 20% of electricity from renewable sources by 2020 by supporting the research, development and demonstration of low-emission energy technologies.

The Solar Flagships Program aims to accelerate the commercialisation of solar power in Australia, with the commitment of \$1.5 billion to support the construction of up to four large-scale solar power plants in Australia, using solar thermal and photovoltaic (PV) technologies.

In June 2012, the Australian Government selected AGL as the successful applicant in the solar PV category of the Solar Flagships Program independent reassessment process. AGL was selected to deliver two large-scale solar plants projects at Nyngan and Broken Hill (approved on 27 March 2013 by the Planning Assessment Commission), with nominal capacities of up to 106 MW and 53 MW, respectively.

The Applicant has identified that the development would generate approximately 231 GWh of renewable energy each year (at maximum capacity) over the operating life of the plant which would produce enough electricity on an annual basis to power approximately 33,000 average NSW homes.

The Environmental Impact Statement (EIS) for the development was placed on exhibition for a period of 33 days from 14 March 2013 until 15 April 2013. The Department received 6 submissions from public authorities and 1 submission from the general public. No submission objected to the development, however the public submission raised concerns with respect to the marketability of the adjoining land, quiet enjoyment of the neighbouring land and impact on a potential home location, value and safety.

The Department has assessed the Applicant's EIS, Submissions Report and submissions on the development and considers that there are a number of constraints to the development that will need to be carefully managed. These include construction noise, construction traffic, and biodiversity. Consequently, the Department has recommended conditions of consent to ensure that impacts are effectively managed and mitigated.

The Department considers that the development is in the public interest as it would positively contribute towards achieving the RET, is consistent with the NSW State Plan and Federal

Government targets for reducing greenhouse gas emissions, would help meet the predicted growing demand for electricity, and is consistent with Section 79C and the objects of the Environmental Planning and Assessment Act, 1979 (including ecologically sustainable development).

The Department is also satisfied that the development can achieve acceptable amenity, health and environmental standards through the recommended conditions of consent and the Applicant's mitigation measures, and can proceed in a sustainable manner with overall benefits to the State.

The Department therefore recommends that the development be approved, subject to conditions.

TABLE OF CONTENTS

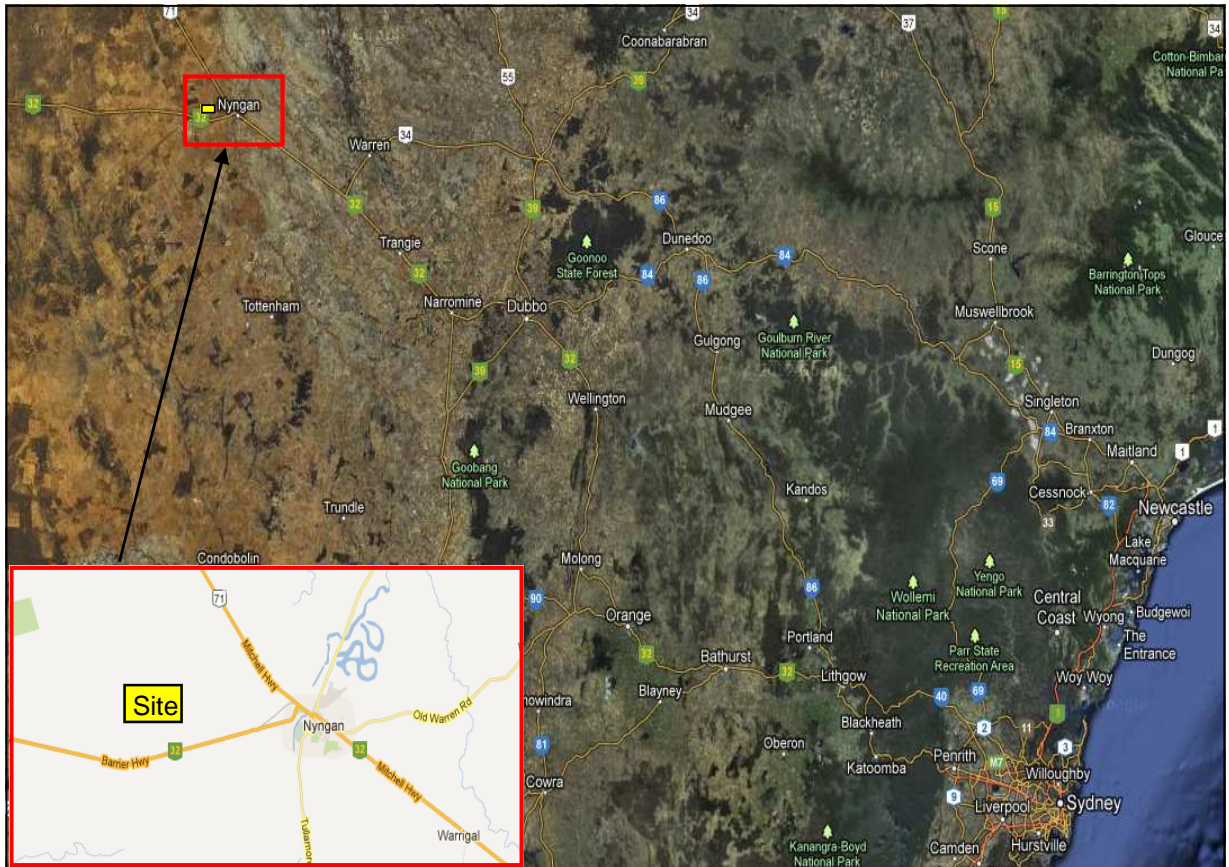
TABLE OF CONTENTS	III
1. BACKGROUND	1
1.1 LOCATION	1
2. PROPOSED DEVELOPMENT	2
2.1 DEVELOPMENT DESCRIPTION	2
3. STATUTORY CONTEXT	7
3.1 STATE SIGNIFICANT DEVELOPMENT	7
3.2 PERMISSIBILITY.....	7
3.3 CONSIDERATIONS UNDER SECTION 79C OF THE EP&A ACT	7
3.4 ENVIRONMENTAL PLANNING INSTRUMENTS.....	7
3.5 OBJECTS OF THE EP&A ACT	7
3.6 ECOLOGICALLY SUSTAINABLE DEVELOPMENT	8
3.7 PLANNING ASSESSMENT COMMISSION	9
4. CONSULTATION AND SUBMISSIONS	10
4.1 EXHIBITION AND NOTIFICATION	10
4.2 PUBLIC AUTHORITIES.....	10
4.3 COMMUNITIES	11
4.4 RESPONSE TO SUBMISSIONS	11
5. ASSESSMENT	12
5.1 BIODIVERSITY.....	12
5.2 NOISE	16
5.3 VISUAL IMPACT.....	19
5.4 OTHER ISSUES.....	21
6. RECOMMENDATION	29
APPENDIX A ENVIRONMENTAL IMPACT STATEMENT	30
APPENDIX B SUBMISSIONS	31
APPENDIX C APPLICANT’S RESPONSE TO SUBMISSIONS	32
APPENDIX D CONSIDERATION UNDER SECTION 79C	33
APPENDIX E CONSIDERATION OF ENVIRONMENTAL PLANNING INSTRUMENTS	35
APPENDIX F RECOMMENDED CONDITIONS OF CONSENT	36
APPENDIX G POLITICAL DONATIONS STATEMENT	37

1. BACKGROUND

1.1 Location

The proposed Nyngan Solar Plant is to be located 10km west of Nyngan within the Cobar Peneplain Bioregion in the Bogan Shire Local Government Area. The development location is shown in **Figure 1**.

Figure 1 – Site Location



The land surrounding the site is predominately rural in nature, containing a number of farm and rural residential properties, as well as agricultural structures, local roads and access tracks.

The site is rural land comprised of grazing and cropping uses, and is largely cleared with some small remnant patches of degraded native vegetation and scattered trees.

2. PROPOSED DEVELOPMENT

2.1 Development Description

AGL Energy limited (the Applicant) proposes to construct and operate a solar plant and associated electrical infrastructure with a maximum generating capacity of up to 106 MW and is to be known as the Nyngan Solar Plant. The layout of the proposed development is shown in **Figure 2**. The key components are listed in **Table 1**.

Figure 2 – Site layout

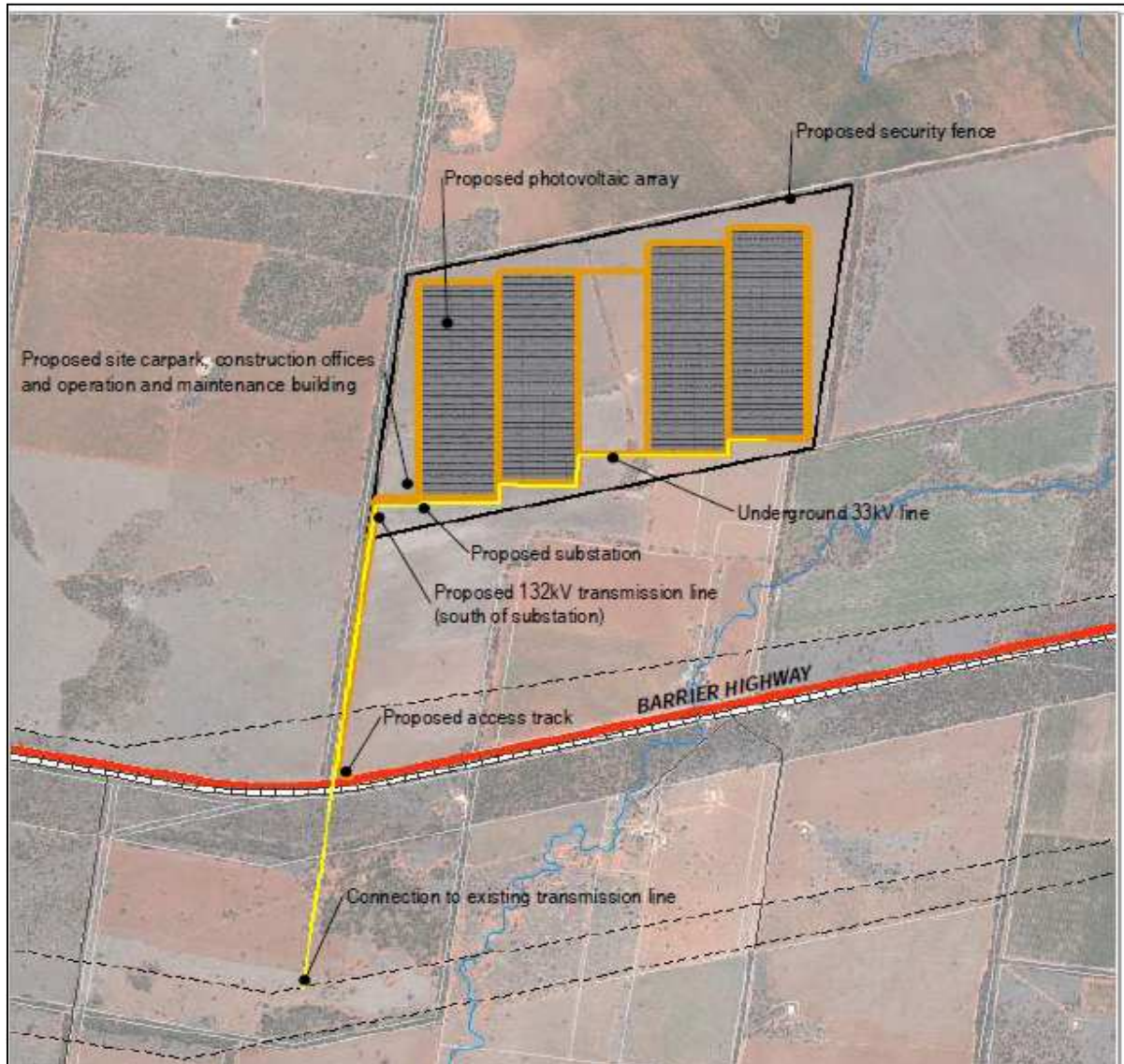


Table 1: Key Components of Development

Aspect	Description
Development Summary	<p>The construction and operation of a 106 MW photovoltaic array with underground electrical connections and overhead transmission line to connect with the existing Nyngan-Cobar 132kV transmission line.</p> <p>Annual production output of 231 gigawatt hours (GWh) is predicted to supply the equivalent of 33,000 average NSW homes.</p> <p>The proposal also includes substation augmentation, road upgrades and internal access tracks, fencing and landscaping, operations and maintenance building and temporary construction infrastructure.</p> <p>The photovoltaic array will cover approximately 300 ha of a 460 ha site, and about 14 ha will be required for the transmission line.</p>
Photovoltaic modules	Consists of approximately 1.35 million photovoltaic (PV) modules arranged in a fixed tilt from horizontal of 25 degrees at a zero degree north azimuth. The modules measure 1200mm x 600mm x 6.8mm.
Electrical connections	<p>Underground electrical cabling connecting the PV modules to the central inverters and transformers.</p> <p>A new overhead transmission line over a length of 3km connecting the substation (consisting of a busbar, circuit breakers, current transformers, and transformers) located near the south-western corner of the site into the Nyngan-Cobar 132kV transmission line.</p>
Access tracks and parking	A 6m wide 2.6km long main gravel access road located within the transmission line easement would service both construction and operational traffic to the site. Internal 6m solar plant access tracks would be required to access all inverter/kiosk locations, construction site office, laydown area, the operations and maintenance building and the perimeter of the solar plant. A car park consisting of approximately 110 spaces located in the south western corner of the site.
Fencing and landscaping around the site	A type 2-Y-B/B-T security fence, 2.37m-2.97m high inclusive of double gates at the access points would protect the perimeter of the solar plant site.
Operations and maintenance building and amenities	A permanent operations and maintenance building constructed of prefabricated steel ATCO or similar on concrete foundations. A septic system would also be installed.
Decommissioning	The solar plant is expected to be operational for 30 years after which all above ground infrastructure would be removed.
Construction	Approximately 18 months.
Jobs	2-3 operations and maintenance staff and 300 FTE construction jobs.
CIV	\$300,000,000

2.2 Development Need and Justification

The Applicant has provided the following justification for the development:

- Utilises renewable energy sources and thereby avoids approximately 203,000 tonnes of CO₂ equivalent per annum by replacing fossil fuel based energy;
- Annual production output of 231 gigawatt hours (GWh) is predicted to supply the equivalent of 33,000 average NSW homes;
- Assists in meeting NSW and Australian Government targets for renewable energy generation and reduction in greenhouse gas emission;
- Generate approximately 300 local jobs during construction and encourages regional development; and
- It will help develop the solar power industry and supply chain in Australia.

Renewable Energy

The National Strategy for Ecologically Sustainable Development 1992 encouraged federal, state/territory and local governments to pursue ecologically sustainable development (ESD), with climate change being identified as a threat to a sustainable future. With energy production being the primary source of Australia's emissions, governments are recognising the need to reduce Green House Gas (GHG) emissions. The development of low or zero GHG emission energy technologies such as the solar plant is essential to achieving significant reductions in emissions.

In this respect, the Applicant states the Nyngan Solar Plant would avoid approximately 203,000 tonnes of CO₂ equivalent per annum by replacing fossil fuel based energy. The lower emission intensity of the proposed development is therefore compliant with *The National Greenhouse Strategy* which aims to lower the emissions intensity associated with electricity production.

The Department considers that the proposed solar plant would make a contribution towards offsetting the emissions of Carbon Dioxide (CO₂) and other gases, particulate emissions and other pollutants that would otherwise be produced if the equivalent power supply was provided by fossil-fuel combustion. The development would also result in the avoidance of the consumption of water that would otherwise have been used in coal or other fossil fuel fired power stations.

The Australian Government's Mandatory Renewable Energy Target (MRET) scheme was also established in 2001 to expand the renewable energy market and increase the amount being utilised in Australia's electricity supply. The Renewable Energy Target (RET) scheme is an expansion of the MRET and has been established to encourage additional generation of electricity from renewable energy sources. In February 2011, the Enhanced Renewable Energy Target (ERET) was also introduced which consisted of the Small-scale Renewable Energy Target (SRET) and the Large-scale Renewable Energy Target (LRET). This was done to provide greater certainty for households, large-scale renewable energy developments and installers of small-scale renewable energy systems like solar panels and solar water heaters.

The Applicant has identified that the development would generate approximately 231 GWh of renewable energy each year over the operating life of the plant. This equates to approximately 1.3% of the LRET for the first year of targeted operation (2015) and 0.6% of the total LRET target for 2020. The solar plant would generate enough renewable energy to power up to the equivalent of 33,000 homes average use.

The Department supports the development of solar plants as a form of renewable energy, subject to the suitability of the location of these plants. This is consistent with the Commonwealth and State policies of promoting the production and uptake of renewable energies as a means of addressing climate change. The solar plant would contribute to

Australia's Renewable Energy Target (RET) of sourcing 20% of electricity from renewable sources by 2020.

The development is therefore consistent with the NSW Government's *NSW 2021* plan and draft *Renewable Energy Action Plan*, which each seek a target of achieving 20% renewable energy consumption by 2020. *NSW 2021* also sets out goals and strategies for rebuilding and developing NSW and delivering sustainable growth. The proposed development contributes to the achievement of these goals.

Generating Capacity

The Australian Energy Market Operator (AEMO) Electricity Statement of Opportunities 2012 (9 August 2012) states that NSW's average annual growth rate of energy consumption and maximum demand (based on medium economic growth forecasts) over the next 10 years is 1.2%. The projected summer 10% Probability of exceedence (POE) for maximum demand for 2012-2013 is 14,065MW, a reduction of 2,056 MW (13%) from 2011, and is projected to grow at an average annual rate of 1.2%, or approximately 175MW.

AEMO predicts that low reserve conditions (LRC) may occur in NSW by 2021-22. The LRC point is the time at which the network reliability standard may not be met, and at which point loadshedding may be required and brown-outs may occur in some areas. Continued demand growth beyond the LRC without provision of additional generating capacity increases the need for loadshedding and exacerbates issues with the quality and reliability of supply (i.e. Increases in brown-out extent, severity and duration).

The Department notes that the timing of a generation capacity shortfall in New South Wales has shifted by 3 years since the 2011 projections. This in itself is sufficient to suggest that a level of caution should be applied to predictions made about events five to ten years into the future. Further, the changing regulatory, policy and market setting for electricity generation in New South Wales and more broadly across the National Electricity Market is another factor that has the potential to affect future predictions. However, the Department considers it prudent to take a strategic approach to the issue of timing of additional generating capacity by accepting that such additional capacity may be required at any point in the period 2014-2022, and that additional generating capacity should be available for implementation within that period, if required, rather than conclusively determining a date for implementation at this time. To do otherwise is to fail to recognise that estimates such as the LRC point are not fixed and determinative, but rather reflect the uncertainties inherent in the assumptions around matters such as future market conditions, domestic and global economics, demand management and energy efficiency uptake.

The Department considers that in conjunction with relevant demand management and efficiency measures, a diverse mix of local generating solutions would provide a risk-averse method of achieving a secure and reliable electricity supply base for the State, which is resilient to changing market factors including a more constrained carbon market and water restrictions associated with any future drought. Local generation in regional areas would promote greater transmission efficiencies (and associated greenhouse gas benefits from reduced transmission losses) by reducing the need for electricity to be delivered from further afield.

Although it is acknowledged that solar plants could not solely meet the future energy demands on either the Federal or State level, they are likely to play an increasing role in energy production and the development of solar energy will encourage and assist future industry development, and provide greater community access to renewable energy.

Solar Flagships Program

The Solar Flagships Program is part of the Australian Government's \$4.5 billion Clean Energy Initiative (CEI), announced in the May 2009 Budget. The purpose of the CEI is to

support the demonstration, development and research of low-emission energy technologies. As part of the CEI, the Australian Government committed funding of \$1.5 billion to the Solar Flagships Program. This funding was to be used to support the construction and demonstration of large-scale solar power stations in Australia. The Solar Flagships Program was administered by the Department of Resources, Energy and Tourism (DRET).

On 10 July 2011 the Australian Government announced the establishment of the Australian Renewable Energy Agency (ARENA) as a part of its Clean Energy Future package. ARENA was to be established as an independent statutory authority tasked with the objectives of improving the competitiveness of renewable energy technologies and increasing the supply of renewable energy in Australia. The Federal Government committed \$3 billion in funding to ARENA.

In June 2012, the Australian Government selected AGL as the successful applicant in the solar PV category of the Solar Flagships Program independent reassessment process. AGL was selected to deliver two large-scale solar plants projects at Nyngan and Broken Hill (approved on 27 March 2013 by the Planning Assessment Commission), NSW, with nominal capacities of up to 106 MW and 53 MW, respectively. The Australian Government committed \$129.7 million to support the development. The NSW Government committed a further \$64.9 million to support the development. The proposed solar plant(s) would also assist the State's goals of attracting solar energy developments to the State and help make NSW home to one of the largest solar thermal or solar photovoltaic power plants in the world.

On the above basis, the Department considers the proposed Nyngan Solar Plant would contribute to addressing the urgent challenges of climate change, reliance on fossil fuels and energy supply. It would also have a role in helping to meet the energy requirements of the State as well as addressing local demand, and would therefore have benefits for the local industry and community.

Additional Benefits

A key goal of *NSW 2021* is to invest in critical infrastructure as a means of achieving economic growth and improving productivity and competitiveness. Ensuring the supply of electricity is essential to the growth of communities and industries across the state both now and in the future.

The Applicant also states that the development will contribute to the development of the solar power industry and supply chain in Australia whilst developing Australian intellectual property and know-how in solar power. The development will also provide a significant economic boost to the local community by providing employment opportunities through the creation of 2-3 operations and maintenance staff and approximately 300 FTE construction jobs.

3. STATUTORY CONTEXT

3.1 State significant development

The proposal is State Significant Development under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) because it is development for the purpose of a facility for the generation of electricity that has a capital investment value of more than \$30 million (clause 20 of Schedule 1 of *State Environmental Planning Policy (State and Regional Development) 2011*). Therefore, the Minister for Planning & Infrastructure is the consent authority.

3.2 Permissibility

The solar plant and transmission line are located on land zoned RU1 – Primary Production, however the transmission line will also cross the Barrier Highway, zoned SP2-Classified Road under the Bogan Local Environmental Plan 2011 (LEP). The Generation of electricity is prohibited in both RU1 and SP2.

Development for the purpose of electricity generating works may be carried out by any person with consent on any land in a prescribed rural, industrial or special use zone under the State Environmental Planning Policy (Infrastructure) 2007. Therefore, as the proposal is for the purpose of generating electricity within a prescribed rural zone and special use zone it is permissible with consent (as the SEPP takes precedence over the LEP).

3.3 Considerations under Section 79C of the EP&A Act

Under Section 79C of the EP&A Act, in determining a development application, a consent authority is required to take a number of matters into consideration in relation to the proposed development. The Department has given due consideration to the matters prescribed by Section 79C.

The Department's detailed consideration of the proposed development against the provisions of Section 79C of the EP&A Act is contained within **Appendix D** of this report.

3.4 Environmental Planning Instruments

Under Section 79C of the EP&A Act, the consent authority, when determining a development application, must take into consideration the provisions of any environmental planning instrument (EPI) and draft EPI (that has been subject to public consultation and notified under the EP&A Act) and development control plan/s (DCPs) that apply to the proposal (however DCPs do not apply to State Significant Development under Clause 11 of State Environmental Planning Policy (State and Regional Development) 2011).

The Department has assessed the proposal against the relevant provisions of applicable EPIs and is satisfied that, subject to the implementation of the recommended conditions of consent, the proposal is generally consistent with the aims, objectives and provisions of these instruments (refer **Appendix E**).

3.5 Objects of the EP&A Act

The Minister should consider the objects of the EP&A Act when making decisions under the Act. The objects most relevant to the Minister's decision on whether or not to approve the development are found in Section 5(a) (i), (ii), (iii), (vi) and (vii). They are to encourage

(i) *the proper management, development and conservation of natural and artificial resources, including agricultural land, natural areas, forests, minerals, water, cities,*

- towns and villages for the purpose of promoting the social and economic welfare of the community and a better environment;*
- (ii) the promotion and co-ordination of the orderly and economic use and development of land;*
 - (iii) the protection, provision and co-ordination of communication and utility services;*
 - (vi) the protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitats, and*
 - (vii) ecologically sustainable development.*

These objects form key areas of assessment within the environmental assessment and are of particular relevance to the eventual determination of the subject development application.

The Department is satisfied that the development involves the proper management and conservation of the environment (such as agricultural land and natural areas) for the purpose of promoting the social and economic welfare of the community, which has been considered in **Section 5.1** (in relation to biodiversity) and in **Sections 5.2, 5.3** and **5.4** (in relation to amenity impacts).

The orderly and economic use and development of land has also been considered in **Sections 5.2, 5.3** and **5.4** of this report in relation to potential impacts of the development on existing receptors, and landuse. The development also seeks to protect future energy supply through the generation of electricity.

Sections 5(a) (iv),(v) and (viii) are not relevant to this proposal as the proposal does not raise significant issues relating to the provision of land for public purposes, community services and facilities or affordable housing. With respect to ecologically sustainable development, the EP&A Act adopts the definition in the *Protection of the Environment Administration Act 1991*, including the precautionary principle which is discussed in **Section 3.6** of this report.

In addition to the above, the agency and community consultation undertaken as part of the assessment process (refer **Section 4** of this report), address objects 5(b) and (c) of the EP&A Act.

3.6 Ecologically Sustainable Development

The EP&A Act adopts the definition of Ecologically Sustainable Development (ESD) found in the *Protection of the Environment Administration Act 1991*. Section 6(2) of that Act states that ESD requires the effective integration of economic and environmental considerations in decision-making processes and that ESD can be achieved through the implementation of:

- (a) the precautionary principle,*
- (b) inter-generational equity,*
- (c) conservation of biological diversity and ecological integrity,*
- (d) improved valuation, pricing and incentive mechanisms.*

The Department has considered the need to encourage the principles of ESD, in addition to the need for the proper management and conservation of natural resources; the orderly development of land considering land use; the need for the development as a whole (which comprises a utility provision); and the protection of the environment including threatened species in **Section 5** of this report.

The Department's assessment of the ecological impacts of the development is based on a conservative and rigorous assessment of the likely extent of ecological impacts and of likely offset requirements to ensure that appropriate and adequate measures are put in place to prevent the threats of serious or irreversible environmental damage consistent with the

precautionary principle and the principle of conservation of biological diversity and ecological integrity.

As a source of renewable energy, the proposal has the potential to address future degradation of the global environment by reducing use of fossil fuels whilst most of the potential impacts from the proposal are likely to be localised and would not diminish the options regarding land and resource uses and nature conservation available to future generations.

The proposal would not require large scale earthworks and impacts to the site would be reversible. The development has significant social and environmental benefits on a local, state and federal level and can be argued to have global environmental benefits on the basis that the development would lower greenhouse gases created in the production of electricity. The development will not significantly affect the conservation values of the locality. The development will see a decrease in costs to the community as a result of a reduction in the externalities involved with burning fossil fuels, such as those resulting from particulate air pollution and greenhouse gas emissions.

On the basis of the assessed impacts on the environment and their ability to be managed, it is considered that the development would be ecologically sustainable within the context of the above principles.

3.7 Planning Assessment Commission

On 14 September 2011, the Minister for Planning and Infrastructure delegated his approval functions under Section 89E of the EP&A Act to the Planning Assessment Commission (PAC) in the cases where applications have been made by private companies (including reportable political donations).

The Applicant is a private company and has provided, with its development application for the subject proposal, a statement indicating it has made a reportable political donation (refer to **Appendix G**). Consequently, pursuant to the Minister's delegation of 14 September 2011, the development application is subject to determination by the PAC.

4. CONSULTATION AND SUBMISSIONS

4.1 Exhibition and Notification

Under Section 89F(1) of the EP&A Act, the Director-General is required to make the development application (DA) and any accompanying information of an SSD proposal publicly available for at least 30 days.

After accepting the Environmental Impact Statement (EIS) for the proposal, the Department placed the DA and EIS on public exhibition for 33 days from 14 March 2013 until 15 April 2013 on the Department's website, and at:

- the Department of Planning & Infrastructure- Information Centre, 23-33 Bridge Street, Sydney Information Centre;
- Bogan Shire Council - 81 Cobar Street Nyngan;
- Bogan Shire Library - 73 Cobar Street Nyngan; and
- Nature Conservation Council of NSW – 2/5 Wilson Street, Newtown.

The Department also advertised the public exhibition in the Nyngan Observer on 13 March 2013, and notified landowners in the vicinity of the site and relevant State and local government authorities.

The Department received 7 submissions on the proposal, 6 from public authorities and 1 from the general public. A summary of the issues raised in submissions is provided below.

4.2 Public Authorities

A total of 6 submissions were received from public authorities, with no specific objections raised to the development (refer **Appendix B** for a copy of the submissions). It was requested that the Department give further consideration to a number of issues. .

The **Department of Trade and Investment – Mineral Resources (DTI)** did not raise any concerns with regards to the development and with regards to mineral resources.

The **Roads and Maritime Services (RMS)** made a number of recommendations in relation to the preparation of a Traffic Management Plan and Haulage Plan, intersection upgrades, required licences and permits, the provision of storing capacity for vehicles, dust management, and disturbance or hazard to the travelling public.

The **Office of Environment and Heritage (OEH)** made recommendations regarding the preparation of a detailed Biodiversity Offset Plan prior to construction. Further, the OEH made comment that no additional on-site dams are to be established, as these can increase the habitat and preferred foraging sites for feral carnivores such as cats and foxes.

The **Catchment Management Authority-Central West (CMA)** request that a rehabilitation plan for the site post-operation be developed.

The **Bogan Shire Council** raised the following concerns and points for consideration:

- Further clarification on construction traffic numbers and control, improvements to the Barrier Hwy intersection and access road and the management of conflict between construction heavy vehicles and school buses was requested;
- Issues were raised in regards to waste management and in particular greater clarity was requested on the amount of waste to be generated and what (if any) Council facilities will be used to dispose of the waste;
- Concerns relating to the socio-economic impacts included the sourcing of the construction workforce, capacity of local short-term accommodation to house workers, impact of additional population on Council infrastructure;

- It was questioned whether the potential supply of water would be from Council;
- Concerns were raised about the impacts on neighbouring farms and homes particularly relating to noise, dust and visual impacts; and
- It was requested that an access or viewing point for tourists on the northern side of the site could be provided.

The **Department of Primary Industries (DPI) – Crown Lands** recommend a condition with respect to the creation of an easement and the payment of compensation for a parcel of crown land prior to operation. The **Department of Primary Industries (DPI) – Office of Water** advised that the Applicant should ensure that the construction and operational water needs of the development are secured prior to construction and that sufficient water should be available in times of low water availability.

4.3 Communities

One submission was received from a member of the public. Whilst the submitter states that the solar plant would be a positive for the Nyngan community, concerns were raised regarding the marketability of the adjoining land, quiet enjoyment of the neighbouring land and impact on a potential home location and value. The submitter also requested an upgrade to the boundary fence due to safety concerns, direct access to the power generated from the development and stated a preference for the continuation of existing farming activities on the site.

An assessment of the key issues raised in submissions has been undertaken in **Section 5** of this report.

4.4 Response to Submissions

AGL Energy Limited has provided a response to the issues raised in submissions (refer **Appendix C**). No changes to the infrastructure layout were proposed, however a number of modified or new mitigation measures were introduced.

5. ASSESSMENT

The Department considers the key environmental assessment issues for the development to be:

- Biodiversity;
- Noise and
- Visual Impacts.

5.1 Biodiversity

Flora review

To assess the impacts of the proposal on ecological values of the locality, the Applicant undertook an ecological impact assessment, which included flora and fauna field surveys and habitat assessments. The review was undertaken to identify threatened species, populations and ecological communities that could potentially occur on the site and surrounds based on suitable habitats present.

Native vegetation within the development site consists of a single vegetation community being the Poplar Box-Gum Barked Coolabah–White Cypress Pine shrubby woodland, which is in moderate to poor condition throughout the majority of the development site except within the transmission line easement south of the Barrier Highway, which is considered to be in good condition. This community is not listed as threatened under the *NSW Threatened Species Conservation Act 1995* (TSC Act) or *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Whilst no threatened species were detected during the field surveys, a desktop assessment indicates that two threatened flora species, the Red Darling Pea (*Swainsona plagiotropis*) listed as ‘vulnerable’ under the TSC Act and EPBC Act, and Pine Donkey Orchid (*Diuris tricolor*) listed as ‘vulnerable’ under the TSC Act, have the potential to occur on-site. The timing of the field surveys, however was deemed inadequate to detect these two species, so as a precautionary approach, it was assumed that these two species may occur on the site or in proximity and could be in the good condition. The Applicant has therefore stated that pre-construction surveys will be conducted for these species, to determine if they occur in areas proposed to be impacted. Micrositing of infrastructure can be used to minimise any impacts or if unavoidable, offsets can be appropriately imposed (the OEH did not raise any concerns with this approach). A significant impact on these species was therefore deemed to be unlikely by the Applicant.

No groundwater extraction is proposed, nor would the installation of the solar plant and infrastructure affect the amount of amount of water reaching the ground and its ability to infiltrate and replenish groundwater systems. The development was therefore determined to be unlikely to have an impact on groundwater dependent ecosystems or other natural systems dependent on groundwater resources.

Fauna review

The surveys identified a total of 24 native bird, 2 native mammal, 3 exotic mammal and 12 microbat species within the development area. Fauna survey methods include habitat assessment, microbat surveys, anabat analysis, nocturnal surveys and targeted surveys.

Two threatened bird species were identified which included the Grey-crowned Babbler listed as ‘vulnerable’ under the TSC Act, and Superb Parrot listed as ‘vulnerable’ under the TSC Act and EPBC Act. Three threatened microbat species were identified which included the Yellow-bellied Sheath-tail Bat, Little Pied Bat and Inland Forest Bat, all listed as ‘vulnerable’ under the TSC Act. An unidentified glider (either Squirrel Glider or Sugar Glider) was also recorded during the field surveys, with the Squirrel Glider listed as ‘vulnerable’ under the

TSC Act. Information from previous field surveys also indicate the Pink Cockatoo, listed as 'vulnerable' under the TSC Act, has been recorded nesting in the area.

Assessments of significance conducted by the Applicant concluded that the Grey-crowned Babbler has the potential to be impacted due to the loss of 5.7 hectares of breeding and foraging habitat that is utilised by a group of 6 babblers. A least 3 nests would also be removed by the proposal. This species of bird however was determined to be relatively common in the area (approximately 17 family groups were recorded in the study area and surrounds with a viable population deemed to be 5-20 family groups). Approximately 70 hectares of known habitat for this species of bird also occurs in the immediate vicinity of the site. A significance impact assessment of this species considered that the removal of 1 group and 3 nests would not have an adverse impact on this species at a population level. Precautionary measures however have been recommended to reduce any impacts, such as the removal of certain vegetation to be conducted outside of the breeding season and the undertaking of pre-clearance surveys prior to the felling of trees.

An assessment of significance was not considered necessary for the Superb Parrot as the site is on the edge of this species distribution, and habitat within the site is not identified as breeding habitat. The site is most likely utilised as foraging habitat for the Superb Parrot outside of the breeding season, nevertheless, the majority of preferred foraging habitat is to be retained on-site, with abundant habitat also available elsewhere in the study area. This species was therefore identified as having a low potential to be impacted by the works.

Assessment of significance were also not considered necessary for the microbat species as it was considered only a moderate potential exists for these species to be impacted by the proposal. Whilst the construction of the development would remove up to 10 hollow-bearing trees which provide potential habitat, an abundance of more suitable (better quality) habitat is available adjacent to the site and within the development area.

Whilst the Glider species was not identified, the habitat to the north of the Barrier Highway was not considered suitable for the Squirrel Glider, however habitat south of the Highway may be suitable. The Applicant has taken the precautionary approach to ensure that impacts to Squirrel Gliders are managed, such as committing to undertaking pre-clearance surveys prior to felling hollow bearing trees (of which up to 10 may be removed), salvaging of hollows and re-use of hollows and installation of nest boxes.

Whilst Pink Cockatoos were not identified during the field surveys, this species has previously been recorded nesting in a large stag on the Barrier Highway. The assessment however concluded that the proposal is unlikely to have a significant impact on the Pink Cockatoo, listed as 'vulnerable' under the TSC Act. Only 2 hollow bearing trees to be removed on-site (of the 10 in total) contain medium to large-sized hollows that could provide potential habitat for the cockatoo, and there is an abundance of suitable trees outside of the development area that contain suitable hollows if required.

No migratory species listed under the EPBC Act were recorded, nor are any known to be in the area and so the development was deemed to be unlikely to have a significant impact on any of these species.

Department's Consideration

The Department has considered the Applicant's ecological assessment and is satisfied that the level of information is sufficient to enable the Department to form a view of the existing biodiversity values within the development footprint and likely extent of significance of impacts associated with the construction and operation of the development.

Flora

In total approximately 314 hectares of land is required for the development, being 300 hectares for the footprint of the solar plant and 14 hectares for the transmission line easement. Within the solar plant footprint approximately 5.7 hectares of Poplar Box Woodland vegetation is to be impacted, with the remainder being exotic pasture. The Department notes that the majority of this impact would be from shading of the habitat beneath the modules, and therefore lack of direct sunlight rather than its direct removal. Within the transmission line easement approximately 4.2 hectares of native Poplar Box Woodland vegetation would be modified, with the trees being removed and the shrubs and grasses being retained.

To ensure that measures are taken to protect and minimise the loss of native vegetation during the construction of the development, and that adequate vegetation cover beneath the solar PV arrays would exist, the Applicant's assessment proposes a number of safeguards and mitigation measures. These include ensuring that works would avoid impacts to mature trees that are to be retained, and the preparation of a groundcover management plan that aims to retain vegetation cover beneath the panels to resist erosion and weed infestation.

Nevertheless, given some impacts are unavoidable, the Applicant also proposes an offset strategy that includes a methodology to identify, manage and secure an offset site in perpetuity to offset the impacts of construction of the development.

The Department acknowledges the configuration identified by the Applicant would represent the worst-case level of clearing that would be required for the development. The Applicant also advises that a constraint analysis was utilised early in the planning process to develop a sensitive layout design, avoiding key habitat elements. However to further ensure that impacts to native vegetation are limited, the Department has recommended that the Applicant:

- limit the clearing of native vegetation;
- re-use tree trunks and major branches from cleared trees to enhance habitat; and
- develop and implement a Construction Flora and Fauna Management Plan comprising plans of the location of all native vegetation communities, endangered ecological communities, and potential threatened flora habitat; fencing of sensitive areas and measures for managing any impacts.

The Department believes that if these recommended conditions are adopted, and the measures identified by the Applicant are implemented, impacts to the Poplar Box Woodland vegetation will be minimised to an acceptable level.

The Department also recommended a condition that requires the Applicant to develop and implement a Biodiversity Offset Management Plan in consultation with OEH. This will ensure that any biodiversity values lost as a result of the development will be offset in perpetuity, and also:

- describes the final suite of offset measures to be implemented as well as ongoing management and monitoring strategies; and
- describes the monitoring requirements for compensatory habitat works and other biodiversity offset measures to monitor the effectiveness of the ecological mitigation measures employed.

In addition, the Department has recommended a condition requiring the Applicant to develop a procedure for dealing with unexpected finds of threatened species during construction, including stopping works and notification procedures, and updating of biodiversity offset requirements.

With respect to the Red-darling Pea and Pine Donkey Orchid, the Applicant will be undertaking pre-construction supplementary spring surveys targeting these threatened flora

species. The Department notes that the solar plant array infrastructure has been largely designed to sit outside of the potential area of impact. With respect to the transmission line, a mitigation measure has been included by the Applicant that states the surveys are to be undertaken prior to the finalisation of the transmission line design, with input from an ecologist, and if these species are identified, then micro siting can be undertaken to ensure any significant impacts are avoided. The Department is satisfied with this approach, and also notes that the OEH did not raise any concerns, and therefore considers that such mitigation measures will ensure impacts to these two species will not be significant, however should the impacts be un-avoidable, then all additional impact areas will be added to the total area required to be offset.

The Department considers that with the measures outlined above, any impacts on flora can be adequately mitigated and/or managed, and do not propose a constraint to approval of the development.

Fauna

The Applicant's ecological assessment indicates that up to 10 hollow bearing trees could be impacted by the proposal (6 on the solar plant site and 4 within the transmission line easement), as well as approximately 10 hectares of overstorey vegetation (5.7 hectares of Poplar Box Woodland vegetation within the solar plant and 4.2 hectares within the transmission line easement) that could be used for forage.

The key threatened species within the development area that are dependent on the hollow bearing trees are the Superb Parrot and Micro Bats (and Squirrel Glider and Pink Cockatoo if found to be on-site). All species utilise the foliage for foraging.

The Department acknowledges that the site is at the border of the Superb Parrots distribution and it is therefore unlikely to use the site during the breeding season. The Applicant's ecological assessment also indicates that there is an abundance of hollow bearing trees and open pasture habitats in the surrounding locality that could be used for nesting and forage. Whilst microbats (and Squirrel Glider and Pink Cockatoo if found) would also lose a small amount of potential roosting habitat on-site as a result of the proposal, it was found that an abundance of suitable habitat is also available adjacent to the site for roosting.

Whilst abundant suitable habitat has been found for these species adjacent to the site, the Applicant has also committed to undertaking pre-clearance surveys prior to the removal of any trees that contain hollows, and also the salvage and re-use of hollows and installation of nest boxes to minimise any impacts. The Department believes that if these mitigation measures identified by the Applicant are implemented, the proposal is unlikely to have an unacceptable impact on these species.

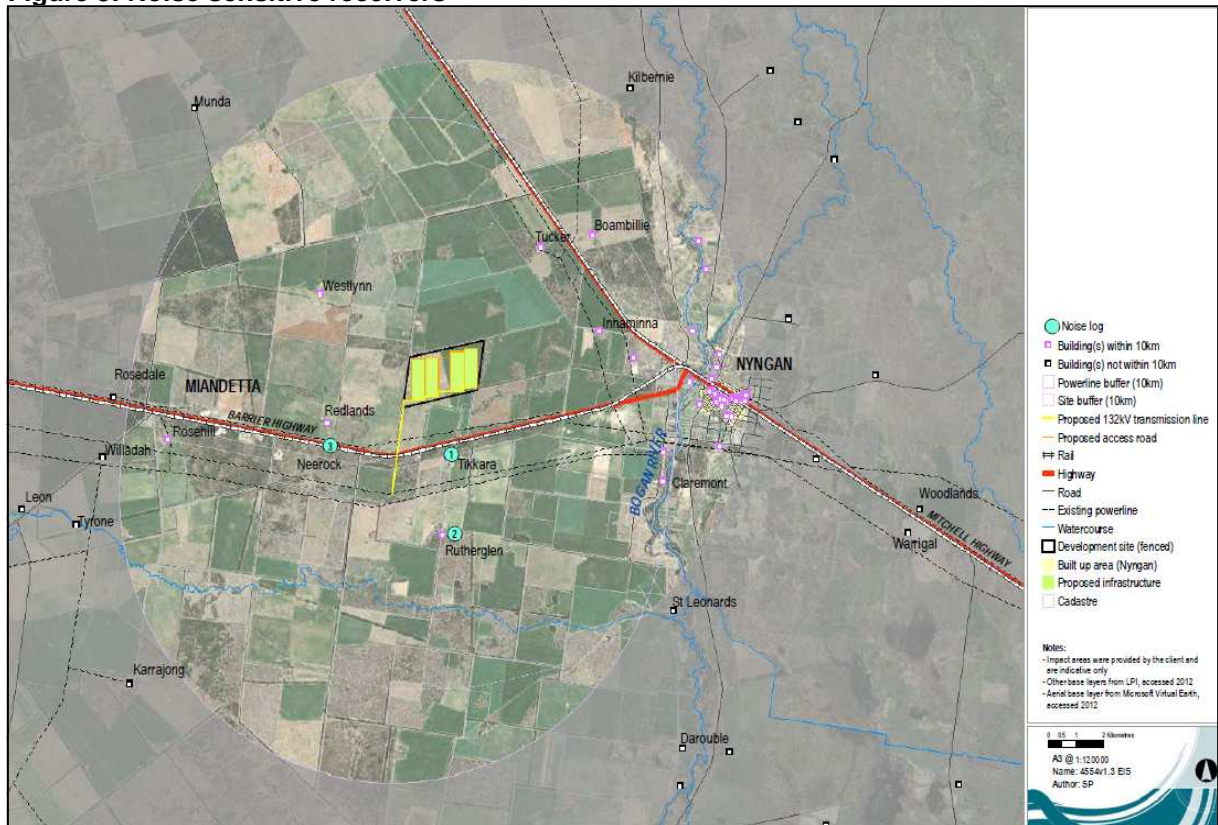
The assessment also identifies one group of Grey-crowned babbblers that would be directly impacted by the proposal as a result of the clearing of 5.7 hectares of breeding habitat, which supports 3 babbler nests. Also a further 16-17 family groups that occupy vegetation remnants in close proximity to the site utilise the site for foraging. The Department notes that there is an abundance of habitat adjacent to the site that would be suitable for the relocation of the displaced group of Babblers. The Department also notes that the OEH did not raise any concerns with the proposed impact on the Babbler. The Department therefore concurs that, with the implementation of the recommended conditions and precautionary measures proposed by the Applicant, such as undertaking the removal of certain vegetation outside of the breeding season of the Babbler, and the undertaking of pre-clearance surveys prior to the felling of trees, the proposed works are unlikely to have a significant impact on this species.

The Department considers therefore that with the measures outlined above, any impacts on fauna can be adequately mitigated and/or managed, and do not propose a constraint to approval of the development.

5.2 Noise

A noise assessment was undertaken by the Applicant's consultant in accordance with the *Department of Environment and Conservation Interim Construction Noise Guidelines; Environmental Criteria for Road Traffic Noise; and Assessing Vibration: a technical guideline* and *NSW Industrial Noise Policy (INP)*. The nearest residential receiver locations are shown in **Figure 3**.

Figure 3: Noise sensitive receivers



Noise Generated During Construction

The construction of the solar plant will occur over a period of 18 months, with the main sources of noise occurring from the use of site machinery and construction vehicle movements. Background noise monitoring was undertaken for the four closest receivers (the background noise levels of the Neerock and Redlands properties were assumed to be the same), and is shown in **Table 2**, together with the applicable noise management levels.

Table 2: background noise monitoring

Sensitive receiver	Rating background level during standard working hours (L _{A90} (15 minutes))	Allowable noise level during standard working hours (RBA + 10 dB)	Highly affected noise level
Residence 1 – located at noise log 1 (involved landholder)	32.4 dBA	42.4 dBA	75 dBA
Residence 2 – located at noise log 2	34.9 dBA	44.9 dBA	75 dBA
Residence 3 – located north of noise log 3	33.7 dBA	43.7 dBA	75 dBA

Residence 1 = Tikkara

Residence 2 = Rutherglen

Residence 3 = Neerock (the background noise levels of the Neerock and Redlands properties were assumed to be the same)

Modelling was undertaken to predict the noise levels associated with the construction of the solar plant, and construction of the transmission line and main access road at the nearest sensitive receivers, based on 10 of the most noisy construction equipment working concurrently. The predicted noise levels indicate that compliance will be achieved at all receivers (with ground and atmospheric absorption effects accounted for). Refer to **Tables 3 and 4**.

Table 3: predicted construction noise levels for the solar plant

Receiver	Distance to Solar Plant (km)	Predicted Noise Level dB(A)	Noise Management Levels dB(A)	Compliance
Tikkara ¹	2	38	42	Yes
Rutherglen	4.55	31	45	Yes
Redlands	2.8	36	44	Yes
Neerock	3.7	33	44	Yes

¹ Tikkara is an involved landowner

Table 4: predicted construction noise levels for transmission line and main access road

Receiver	Distance to transmission line (km)	Predicted Noise Level dB(A)	Noise Management Levels dB(A)	Compliance
Tikkara ¹	1.8	39	42	Yes
Rutherglen	2.3	37	45	Yes
Redlands	2.65	36	44	Yes
Neerock	2.8	36	44	Yes

¹ Tikkara is an involved landowner

Noise mitigation measures have also been proposed by the Applicant to further reduce any potential noise impacts. These include undertaking community consultation to determine the least sensitive time periods for noisy works to occur within, the preparation of a Construction

Noise Management Plan (CNMP) including provisions for noise monitoring, reducing traffic noise (such as minimising the use of engine brakes and engine idling), and the positioning of noisy equipment within the site to provide the greatest acoustic shielding to sensitive receivers.

Noise Generated During Operation

During operation, the sources of noise associated with the proposal are attributed to the electrical substation, maintenance activities and transmission line.

With regards to the substation, the predicted noise level at the closest receiver (Tikkara – approximately 2.4km to the south-east) was determined to be 13dB(A), which is well below the existing background level (refer **Table 2**), and the recommended day-time acceptable amenity noise criteria within the INP of 50dB(A). Noise from the substation was considered by the Applicant to be inaudible.

With regards to the maintenance activities, it is estimated that 2-3 staff will be required to maintain the solar plant during its operation, with the majority of noisy activities occurring in the maintenance building located in the south-western corner of the site. Any noise will be intermittent, and only occur during the day. The Applicant has provided a worst case noise prediction associated with maintenance activities (being the use of a concrete saw) at the closest receiver of 32dB(A), which is 5dB(A) below the intrusive noise criteria of 37dB(A).

With regards to the transmission line, the aeolian noise would occur as wind passes over the transmission line poles and wires, however it is considered to be infrequent, and given the distance to the nearest non involved receiver (2.3km), the Applicant's assessment considers aeolian noise impacts to be negligible. Corona noise (hissing/crackling sound more commonly heard in wet/high humidity conditions) which consists of low frequency and broadband noise, was also considered within the noise assessment with examples provided on the likely noise level impacts at various distances from the transmission line. It was determined that at a distance of 240m, the likely minimum intrusive noise criteria of 35dB(A) would be complied with. Any corona noise impacts were therefore considered by the Applicant to comply with the noise criteria at all receivers.

Department's Consideration

The Department is satisfied that the construction and operational noise impacts of the proposal have been adequately addressed by the Applicant and that the noise levels generated during construction and operation of the development will be within acceptable limits. The noise levels generated by the proposal will therefore not have unreasonable impacts on the amenity of the surrounding receivers nor propose a constraint to approval of the development.

In this respect the Department notes that the predicted noise levels are the 'worst case' analysis, and given the intermittent nature of the works resulting from the different stages of site preparation and transmission line construction, the Department considers that the inclusion of a CNMP will further ensure that the construction noise levels will be managed to an acceptable level.

The Department has therefore recommended a condition requiring a CNMP be prepared and submitted as part of the Construction Environmental Management Plan. This will ensure all feasible and reasonable noise mitigation measures are identified (such as the identification of noise generating construction activities and noise minimisation measures, work practices, resident notification, complaints management and noise monitoring) that will address and manage construction noise and any impacts.

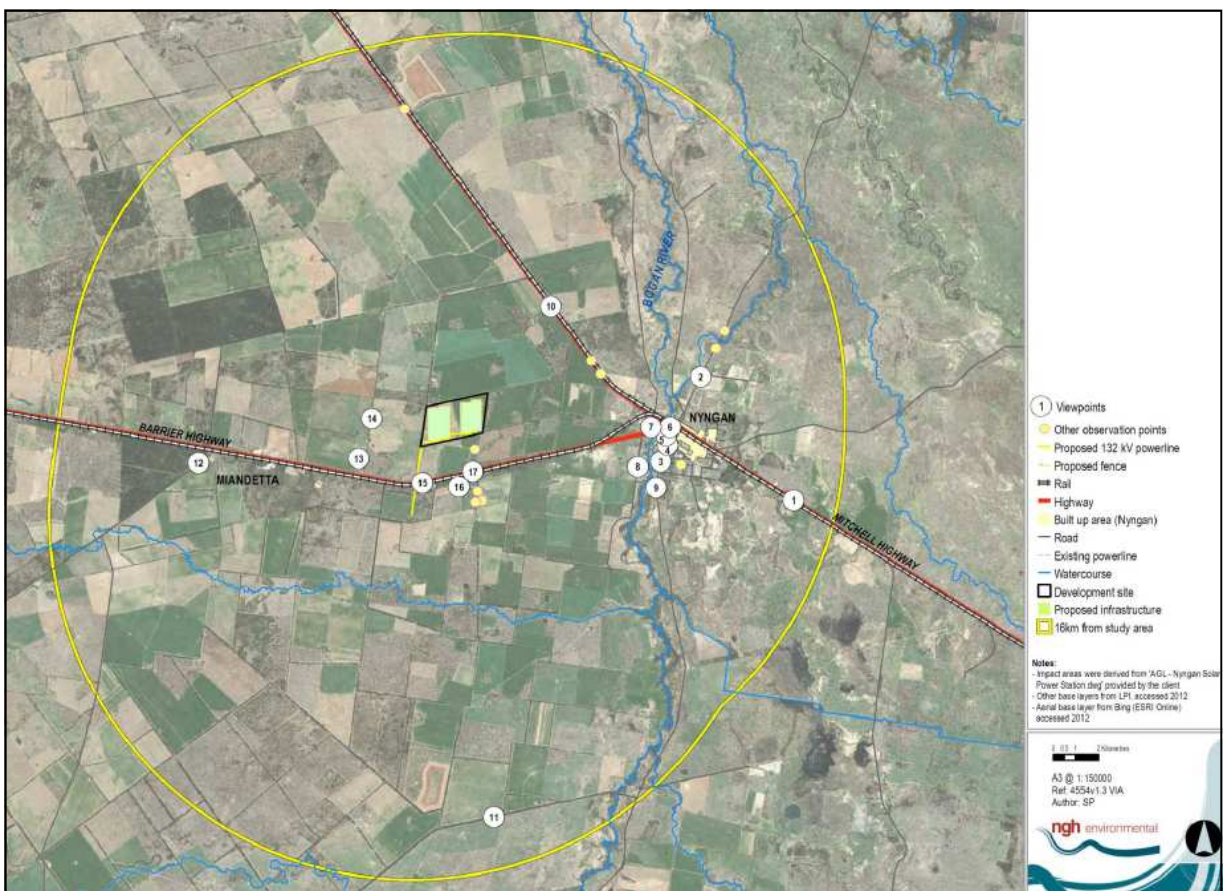
The Applicant has also included mitigation measures regarding the protection of noise amenity and the development of a community consultation program to inform residents and the community.

5.3 Visual Impact

The solar plant will consist of up to 1.35 million photovoltaic (PV) modules, covering an area of approximately 300 hectares. The modules will be mounted on steel post and rail support structures up to 2m in height. Supporting infrastructure includes the installation of, above and underground electrical conduits, construction of a substation, site office and maintenance building; provision of perimeter fencing, unsealed access and up to 3km of transmission line.

The Applicant undertook a visual impact assessment which assessed the impact of the proposal when viewed from a distance of up to 16km. The visual impact assessment consisted of 17 viewpoints (refer **Figure 4**).

Figure 4: Viewpoint locations



The assessment concluded that given the flat terrain, the existence of vegetation that line three sides of the site, and the low profile of the proposed infrastructure, the solar plant would be largely hidden from view from the west, north and east. The solar plant would be visible from the Barrier Highway to the south through gaps in roadside vegetation, however given the distance (approximately 1.5km), this impact was considered to be low (refer **Figure 5**). Mitigation measures such as screen planting could further reduce any impacts if required.

Figure 5: view impact from Barrier highway



Overall, the visual impact from the remainder of the viewpoints was considered to be low by the Applicant (refer **Table 5**).

Table 5: Visual Impact from surrounding viewpoints

Viewpoint	Visual impact significance	Comments
V1 Mitchell Highway South	Low	Development barely visible if seen at all
V2 Nyngan-Mundaroo Road	Low	Development unlikely to be seen
V3 Tottenham Road	Low	Development unlikely to be seen
V4 Nyngan Golf Club	Low	Development unlikely to be seen
V5 River Street, Nyngan	Low	Development unlikely to be seen
V6 Peter Sinclair Bridge, Bogan River	Low	Development unlikely to be seen
V7 Barrier Highway – Riverside Caravan Park	Low	Development unlikely to be seen
V8 Bogan Road West	Low	Development barely visible if seen at all
V9 Tullamore-Nyngan Road	Low	Development unlikely to be seen
V10 Mitchell Highway - Wilgaree	Low	Development barely visible if seen at all
V11 Pangee Road	Low	Development unlikely to be seen
V12 Miandetta	Low	Development unlikely to be seen
V13 Redlands house	Low	Development barely visible if seen at all
V14 Pic’s paddock, Redlands	Low	Top of poles barely visible above distant tree line
V15 Barrier Highway line crossing	Low	Poles and wires visible close to crossing point, mitigation suggested
V16 Tikkara house	Low	Development unlikely to be visible
V17 Barrier Highway - Tikkara	Low	Solar plant barely visible in distance, mitigation suggested

Further, the proposal is not expected to be visible from Nyngan or any fringe urban areas, the Bogan River, local tourist and recreational facilities or the Mitchell Highway.

Sunglint and glare were also considered, with the Applicant stating that the panels are designed to absorb sunlight and convert it into electricity. So minimising the light reflected is a key design goal with reflection expected to be minimal and comparable to glass facades. Views from the Barrier Highway will also be directed at the back of the panels rather than the surface that absorbs the sunlight, which would minimise any glare impacts on passing motorists.

The transmission line will be travelling from the south-western corner of the site, over the Barrier Highway to connect into the existing transmission line to the south. Given the poles will be considerably higher than the existing vegetation, the transmission line will be more visible than the solar plant panels. However, views of the transmission line by passing motorists from the Barrier Highway will only be intermittent, and given the nearest residence is 1.8km away, and blocked by existing vegetation, visual impacts are considered low by the Applicant. The light colour and narrow width of the poles is also expected to help in minimising any visual impacts.

Department's Consideration

Given the low lying nature of the site, the surrounding landscape, and low height of the solar panels, combined with potential mitigation measures such as tree planting, the Department is satisfied that the proposal is unlikely to result in an unacceptable visual impact.

A condition of consent has been recommended by the Department that will require the Applicant to prepare a Landscape Plan to investigate mitigation measures to reduce any visual impacts. The plan will also detail management and monitoring strategies with respect to the ongoing maintenance of landscaped areas as well as including a consultation strategy to seek feedback from affected residents.

The Department also accepts that the purpose of the solar panels is to absorb as much light as possible, and so the development would not result in unacceptable glare impacts to passing motorists or planes.

5.4 Other Issues

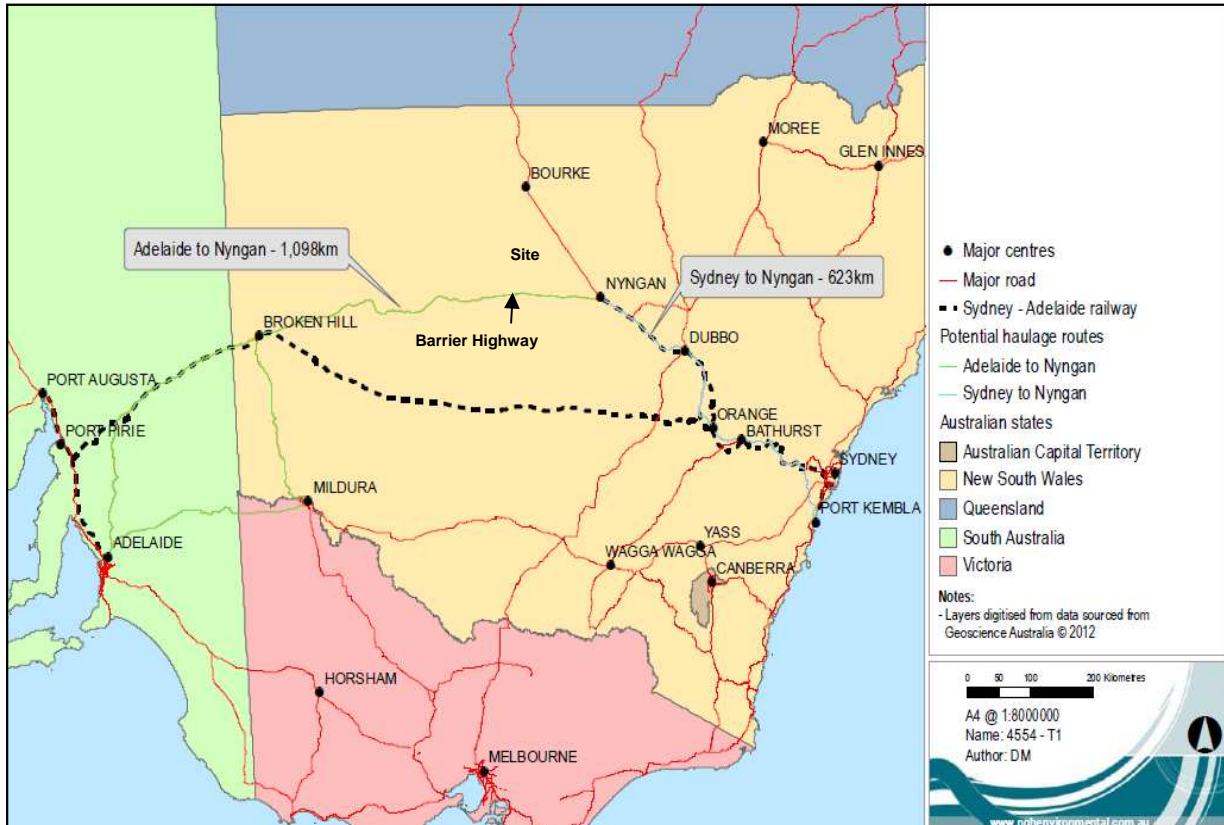
The Applicant has assessed the potential impacts of the development in relation to traffic and transport, aboriginal heritage, land use impacts, bushfire, air quality/dust management, water supply, electric and magnetic fields, potential socio-economic and flooding impacts.

The Department is of the opinion that in most cases the Applicant has undertaken an adequate assessment of the issues. However, conditions are required to ensure that residual impacts are appropriately mitigated and managed. The Department's consideration of these issues is provided below.

Traffic and Transport

Construction of the solar plant would involve the delivery of plant and materials over an 18 month period (approximately). This would involve the use of articulated heavy vehicles to transport 12m shipping containers, and oversize/overmass vehicles to deliver components such as the substation transformer and transmission line poles.

Access to the site is via the Barrier Highway, with the development components either coming from Sydney or Adelaide (refer **Figure 6**). Shuttle buses from Nyngan will transport the majority of the 200-300 construction staff required.

Figure 6 – construction traffic route

Annual average daily traffic levels on the Barrier Highway west of Nyngan are approximately 653 vehicle movements (which is based on actual levels from 2002 however given the region is in population decline the traffic movements are considered to be comparable). The estimated additional average weekday traffic flows resulting from the construction traffic are:

- delivery vehicles – 30 vehicle movements;
- construction staff shuttle buses – 24 vehicle movements; and
- private vehicles – 40-80 vehicle movements.

In addition the Applicant states that construction traffic during the peak hours can be reduced to less than 50 vehicles per hour via staggering start and finish times. The Applicant's assessment concludes that the impact of the additional construction traffic will be negligible due to the existing capacity of the road network.

With respect to the intersection of the Barrier Highway and access road to the site, the Applicant states that the location and form of the access road would be determined in consultation with the RMS, taking into consideration any intersection upgrades inclusive of safe sight distances and adequate turning paths.

The Department acknowledges that an increase in vehicle movements, particularly from heavy vehicles, would have an effect on the safety and operation of the traffic system and condition of the roads if not managed appropriately. To mitigate any potential impacts, the Applicant has committed to undertaking the preparation of a Traffic Management Plan in consultation with the relevant road authority. This includes an assessment of the road condition, intersection upgrades, traffic controls and community consultation. A Haulage Plan is also proposed that will undertake an assessment of the road routes, the scheduling of deliveries and traffic controls such as signage and speed restrictions to minimise safety risks.

To re-enforce this, the Department has recommended a condition requiring the Applicant to undertake a Traffic Management Plan to manage potential traffic conflicts that may be generated during the construction phase. Further, it is recommended a road dilapidation

report be prepared in consultation with the relevant road authority. This will encompass identifying any road upgrades required to accommodate the construction traffic as well as an assessment of the current condition of the roads and mechanisms to restore any damage resulting from construction traffic. The Department has also recommended the Applicant consult with the landowner(s) adjoining the access road regarding any additional fencing required to ensure any livestock is protected from collision risks.

The Department is satisfied that the traffic impacts have been adequately addressed, and the construction and operation of the solar plant is unlikely to have an unacceptable level of impact on the safety and operation of the surrounding traffic network, subject to the Applicant's mitigation measures and conditions recommended by the Department being implemented accordingly.

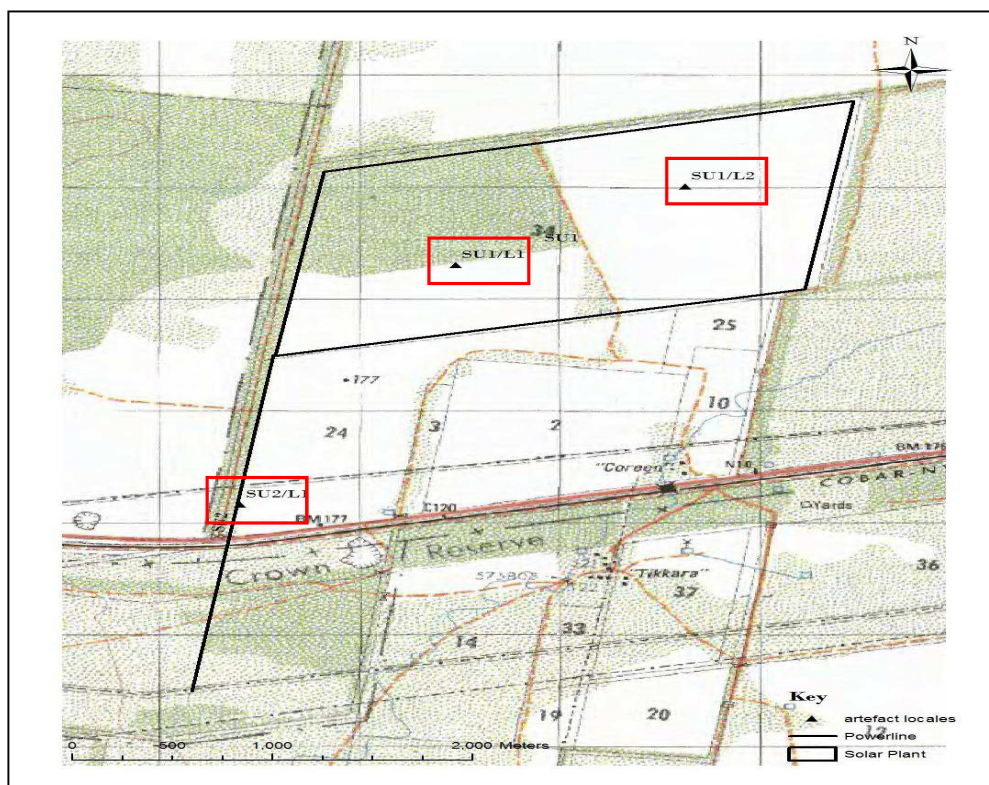
Aboriginal Heritage

An Aboriginal Cultural Heritage Assessment Report was undertaken by the Applicant in accordance with the *Draft Guidelines for Aboriginal Cultural Impact Assessment and Community Consultation* (DEC 2005). Three Aboriginal archaeological sites were located within the development area, comprising single and isolated stone artefacts (refer **Figure 7**).

The isolated finds were considered to have low cultural and archaeological significance in the Applicant's assessment. Undetected or subsurface stone artefacts were also predicted to be present in extremely low density. The Applicant's assessment therefore concludes that the proposed area has low cultural and archaeological potential and significance and so there are no identified indigenous archaeological and heritage constraints relating to the proposal.

The Department is satisfied that the Applicant has adequately identified and assessed the potential impacts of the development components on indigenous heritage in consultation with the registered stakeholder group, including the local Aboriginal groups (both the Nyngan Local Aboriginal Land Council and Boga Aboriginal Corporation participated in the field surveys). Whilst the Applicant concludes that additional avoidance and mitigation strategies are not considered necessary for the development, the Department has recommended a

Figure 7 – Aboriginal archaeological sites



condition requiring the Applicant to prepare an Aboriginal Heritage Plan as part of the CEMP which will further detail the monitoring and management of any Aboriginal heritage impacts as well as procedures to be followed should any previously unidentified objects be discovered during the course of construction.

Land Use Impacts

The proposed site is currently utilised for the purposes of agriculture, mainly sheep grazing. Following construction, the site of the solar plant will no longer be used for grazing, however grazing and cropping would be possible within the transmission line easement. Overall there would be a loss of approximately 0.02% of available agriculture land within the Bogan Shire LGA (out of a total of 1.2 million hectares of land dedicated to agriculture).

The Department acknowledges that there would be a small reduction in land available for agriculture, however considers this reduction to be negligible and therefore unlikely to significantly impact on the agricultural production capacity of the Bogan Shire area.

Risks to surrounding agriculture lands through the spreading of weed species and introduction of pest animals would be managed through the development of a weed management plan. The development and implementation of the ground cover management plan, within the construction environmental management plan, as recommended by the Department would also ensure weed management measures are implemented to control and prevent the spread of noxious weeds.

The solar plant will also be decommissioned after approximately 30 years, which will enable the entire site to be returned to grazing, if required. In this respect the Applicant states all above ground infrastructure will be removed, with the site left in as good or better condition, in terms of vegetation cover after decommissioning.

The Department has also reinforced this through a recommended a condition that requires the site to be returned as far as practicable, to its condition prior to the commencement of construction. This would ensure that land will not be lost to agricultural activities permanently, and should be suitable for agricultural use in the future, if required.

Bushfire

The development involves the construction and operation of an electricity generating facility which includes a series of photovoltaic cells, transformers and transmission line.

Whilst the site does not sit within any bush fire management zones, as depicted in the North West Bush Fire Management Plan, a risk exists that the infrastructure components of the development may exacerbate or cause fire if not managed appropriately.

In this respect, site maintenance activities, welding/soldering activities and the operation of powered motor vehicles or plant fitted with power hydraulics on land containing combustible material, are all activities that can cause or increase the risk of bush fire.

However, given the site is largely cleared of overstorey vegetation, the Applicant states that any risk of bushfire through the above activities would be minimised through the development of a Bush Fire Management Plan. This would include management measures for all activities with a risk of fire ignition, onsite fuel loads, the storage and maintenance of fire fighting equipment and operational and post-fire clean up procedures.

The substation transformer would also contain oil that could cause or exacerbate fire. The Applicant states that the facility however would be bunded with a capacity exceeding the volume of the oil, to contain the oil in the event of a major leak or fire. Asset protection zones would also be maintained around buildings at the site that would minimise the spread of any fire.

Whilst the PV modules contain cadmiums (a toxic chemical), the Applicant has advised that during fire, the glass sheet on either side of the cadmium have been shown to fuse together, resulting in insignificant amounts of cadmium loss. Nevertheless, should there be any fire, post-fire sampling will occur to confirm any emissions.

The Department has also recommended a condition of consent that ensures the development is designed, constructed and operated to minimise and manage fire risks in consultation with the local Rural Fire Service.

The Department is satisfied that the impacts of fire/bushfire have been adequately addressed and subject to the mitigation measures and recommended conditions being implemented, the development will not propose an unacceptable level of risk and impact to bushfire.

Air Quality / Dust Management

The Applicant has indicated that during the construction of the development, dust generation may occur as a result of excavation, earthworks and the movement of traffic along any unsealed roads. The Applicant further states that any impacts to surrounding receivers is considered to be minimal given the distance to the closest non associated receiver is approximately 2.3km.

Nevertheless, the Applicant has proposed to develop protocols to minimise emissions from vehicle and construction equipment and for the suppression of dust such as via the use of water carts. The Department has also recommended a condition that ensures the development is constructed and operated in a manner that minimises dust generation from the site, including wind-blown and traffic generated dust. The solar plant would not emit any emissions during operation.

Water Supply

Water use during construction of the development, mainly for dust suppression, would be up to 150,000 litres/day (0.15ML/day) or approximately 68ML for the total construction period. Options identified for the source of construction water are:

- an existing on-site dam;
- connection to the Cobar Water pipeline; and
- trucking water from the Bogan Shire Council depot.

Water use during operation of the development would largely be for use in the amenities building, and would be approximately 12.8KL/annum. Bottled water is to be supplied for staff drinking purposes (approximately 1.25kL), and the remainder (11.55kL) would be supplied via rainwater tanks or the on-site dam.

In addition, the Cobar Water Board has confirmed that a connection can be made to the Cobar Water pipeline for ongoing supply of water to the site. The Applicant has also consulted with the Bogan Shire Council who indicated that water is available from a standpipe located at the Council depot, of which access can be provided. Council, in its submission, also noted that water could be provided from Bogan Shire council sources at appropriate commercial rates.

Should it be required, the Applicant has included a commitment to consult with the local authorities regarding access to water. The Department has also recommended a condition that information on the source of water for the development is to be further quantified within the Construction Environmental Management Plan.

The Department is satisfied that the adequacy of water supply has been adequately addressed and subject to the Applicant consulting with the relevant authorities, adequate water is available for the construction and operation of the development. The Department is

therefore satisfied that the development will not propose an unacceptable level of impact on the local water supply.

Electric and Magnetic Fields

Electric and Magnetic Fields (EMF) are produced by virtually all electrical equipment and occur wherever electricity is being used. The electric field is proportional to the voltage, whilst the magnetic field is proportional to the current. For the solar plant, the main sources of EMF's would be the 132kV overhead transmission line, underground 33kV cables, substation and the solar PV array.

The Applicant's assessment predicts the following contribution to the magnetic field environment:

- the estimated maximum MF directly under the 132kV line is 40 microteslas (μT) (<40% of the 24hr/day Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) guideline level of 100 μT), with the typical level being up to 2 μT (0.02% of the 24hr/day ARPANSA guideline level) and drops off quickly as you move away, being 0.2 μT at 25m (<0.2% of the of the 24hr/day ARPANSA guideline level);
- the estimated MF directly above the 33kv cable is 1 μT (1% of the of the 24hr/day ARPANSA guideline level) falling away to 0.07 μT at approximately 20m away (0.07% of the 24hr/day ARPANSA guideline level); and
- the substation's estimated MF contribution at the switch yard fence would be 0.8 μT (0.8% of the of the 24hr/day ARPANSA guideline level).

The Applicant's assessment predicts the following contribution to the electric field environment:

- the estimated maximum EF directly under the 132kV line is 4000 volts/metre (v/m) (80% of the of the 24hr/day ARPANSA guideline level of 5,000 v/m), with the typical level being up to 2,000v/m (40% of the of the 24hr/day ARPANSA guideline level) and 200v/m at 25m (4% of the 24hr/day ARPANSA guideline level);
- the Applicant's assessment states that as the underground 33kV cabling is shielded by soil, it would not produce external electric fields; and
- the Applicant's assessment states that is unlikely EF would occur outside the fenced substation.

The Applicant's assessment further states that MF from the solar arrays would be significantly less than other household appliances, and would not be distinguishable from background levels at the site boundary.

The Applicant has further concluded that using the principle of prudence avoidance during the design and siting of the development's infrastructure, any potential exposure to EMFs can be reduced, and therefore adverse health impacts are considered unlikely. In this respect a mitigation measure has been included to locate the substation and transmission lines as far as practical from residences, farm sheds and yards in order to reduce the potential for exposure to EMFs.

Assessments of EMF with respect to the potential of any health effects largely focus on magnetic fields (MFs), as electric fields (EFs) have been known to diminish rapidly with distance from a source in addition to being effectively shielded by common building materials and human skin (the Applicant's assessment also indicates that the measured levels, at source, are well within the relevant health guidelines). MFs however are not readily shielded by common building materials etc. like EFs.

In Australia there is no established health standard for the assessment of MFs, however in 2006 the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) issued a draft guideline for public comment ("Draft Standard on Exposure Limits for Electrical and

Magnetic Fields”) which proposes a 24 hour exposure limit for MFs to the general public of 1000mG (100 μ T). The ARPANSA draft standard has not to date been finalised.

More recently (in 2010), the International Commission on Non-Ionising Radiation Protection (ICNIRP), an independent international organisation which works in close collaboration with organisations such as the World Health Organisation, published a guideline on EMF – “Guideline for Limiting Exposure to Time-Varying Electric and Magnetic Fields 1Hz-100kHz”. This guideline recommends a MF exposure level for the general public unrelated to exposure time of 2000mG (200 μ T). This level has not been adopted in Australia.

Although any adverse effects of MF are yet to be proven, the Department takes the conservative approach and does not rule them out. For the development, the main source of any MF for the general public would be with the transmission lines, which is related to the current (amps) flowing through the line. The field strengths are also dependent on other factors such as the height of the wires above ground, line design and geometry.

The Department is satisfied that the Applicant has demonstrated the principles of prudent avoidance by locating transmission and power lines as far as practical from residences. The Department is also satisfied that as the levels of MF (even for the worst case scenario being directly under/beside the source of MF) are significantly lower than the ARPANSA levels, and so impact on human health would not occur.

Socio-Economic

In its submission, the Bogan Shire Council raised concerns regarding the socio-economic impacts of the proposal, such as the source of the workforce, where they will be accommodated and impacts on local services.

The Applicant, in its Submission Report, stated that the exact percentage of the construction workforce from the local area is not known, and that initial feedback suggests that a large percentage may need to be sourced from outside Nyngan itself.

In terms of accommodation, it is proposed that a suitable work camp be constructed in Nyngan to house the construction workforce. This would be designed and operated to be largely self-sufficient and would be developed in consultation with, and for the approval of Council.

The Department notes that the necessary infrastructure support for the construction of this development, such as road upgrades will be provided by the Applicant. The Applicant will also be seeking the construction of temporary workers camp post determination of the proposal. In addition it is noted that infrastructure development of this type is unlikely to place any significant ongoing demands on Council services particularly with a maximum workforce of only 2-3 people employed during operation.

The Department also notes that there will be a number of positive socio-economic outcomes. These include an estimated 300 local jobs at the peak of the construction stage and encouragement of regional development, and the Applicant has indicated its intention to maximise the use of local contractors, manufacturing facilities and materials during construction. The Applicant has also indicated it would provide ongoing support for local community activities such as sporting events.

Flooding

A preliminary flood impact assessment was undertaken by the Applicant to determine the impact flooding may have on the proposed solar plant and associated infrastructure. The assessment was based on the 100 year ARI event to assess the flood risk to property from both the mainstream and local catchment runoff, and information from previous flood studies.

It was determined that land within the proposed transmission line route south of the Barrier Highway has experienced impacts from flooding twice in the last 50 years, however this land was not inundated during the more recent 1990 Nyngan floods.

It was determined that land within the proposed transmission line route north of the Barrier Highway and within the solar plant site has not experienced prolonged substantial inundation, however the eastern part of the solar plant site could result in shallow flooding in a 1:100 year ARI flood event, up to a depth of 0.3m. Equipment below 0.3m therefore may be subject to a flood event.

The Applicant advises that the modules would be mounted above the ground (and height of the 1:100 year ARI flood event) on posts that are pile driven to the ground, and a mitigation measure has been included to ensure the substation and office building would be designed to accommodate a 1:100 year flood event and be located out-side of the inundation zone.

The Department has also recommended a condition that as part of the CEMP, measures to monitor and manage flood impacts are to be developed in consultation with NOW, and all ancillary facilities are to be constructed above the 20 ARI flood level unless a contingency plan to manage flooding is prepared and implemented.

The Department is satisfied that the impacts of flood have been adequately addressed and subject to the mitigation measures and recommended conditions being implemented, the development will not be subjected to an unacceptable level of impact due to any flood event

6. RECOMMENDATION

The Department has undertaken a detailed assessment of the proposed Nyngan Solar Plant, having regard to the Applicant's EIS, Submissions Report and mitigation measures. In assessing the development, the Department has also considered the views of local and State authorities and the public as raised in their submissions during exhibition of the EIS.

Based on this assessment, the Department considers the key environmental issues associated with the development to be biodiversity, noise and visual impacts. To minimise potential impacts which may arise with respect to these issues, the Department has recommended stringent conditions of consent which would require that impacts on biodiversity values be offset through the implementation of a Biodiversity Offset Package, limits on construction noise and a visual impact verification report be prepared to confirm the visual impacts at each receptor and the need for any screening and landscaping measures.

Further, the Department has recommended that the construction and operational management plans for the development address the management measures that would be implemented in respect to each of the issues.

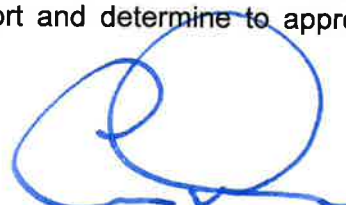
The Applicant has undertaken an adequate assessment of the impacts of the development, and demonstrated that it can be constructed and operated within acceptable environmental limits.

Overall, the Department is satisfied that with the implementation of the Applicant's proposed mitigation measures and the measures outlined in the recommended conditions of consent, the potential impacts would be appropriately mitigated and/or managed to an acceptable level of environmental performance.

The Department considers that the development can achieve acceptable amenity, health and environmental standards, and can proceed in a sustainable manner with overall benefits to the State. The development is therefore justified in terms of helping to meet the energy requirements of the State without the production of additional greenhouse gases and therefore approval of the development is in the public interest.

The Department recommends that the Planning Assessment Commission consider the findings and recommendations of this report and determine to approve the development, subject to the recommended conditions.


Karen Jones 9/7/13
A/Director
Infrastructure Projects

 9.7.13
Chris Wilson
Executive Director
Development Assessment Systems
and Approvals

APPENDIX A ENVIRONMENTAL IMPACT STATEMENT

See the department's website at

http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=5355.

APPENDIX B SUBMISSIONS

See the department's website at

http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=5355.

APPENDIX C APPLICANT'S RESPONSE TO SUBMISSIONS

See the department's website at

http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=5355.

APPENDIX D CONSIDERATION UNDER SECTION 79C

Section 79C of the EP&A Act requires that the consent authority, when determining a development application, must take into consideration the following matters:

<p>(a) the provisions of:</p> <p>(i) any environmental planning instrument, and</p> <p>(ii) any proposed instrument that is or has been the subject of public consultation under this Act and that has been notified to the consent authority (unless the Director-General has notified the consent authority that the making of the proposed instrument has been deferred indefinitely or has not been approved), and</p> <p>(iii) any development control plan, and</p> <p>(iiia) any planning agreement that has been entered into under section 93F, or any draft planning agreement that a developer has offered to enter into under section 93F, and</p> <p>(iv) the regulations (to the extent that they prescribe matters for the purposes of this paragraph), and</p> <p>(v) any coastal zone management plan (within the meaning of the <i>Coastal Protection Act 1979</i>).</p> <p>that apply to the land to which the development application relates.</p>	<p>Detailed consideration of the provisions of all environmental planning instruments (including draft instruments subject of public consultation under this Act) that apply to the proposed development is provided in Appendix E of this report.</p> <p>DCPs do not apply to State Significant Development under Clause 11 of the SRD SEPP.</p> <p>The Applicant has not entered into any planning agreement under section 93F.</p> <p>The Department has undertaken its assessment of the proposed development in accordance all relevant matters as prescribed by the regulations, the findings of which are contained within this report.</p> <p>The site is not located within the coastal zone. Therefore, no coastal zone management plans apply to the proposed development.</p>
<p>(b) the likely impacts of that development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality,</p>	<p>The Department has considered the likely impacts of the development in detail in Section 5 of this report. The Department is satisfied that all environmental impacts can be appropriately managed and mitigated through recommended conditions of consent.</p>
<p>(c) the suitability of the site for the development,</p>	<p>The site has high potential for consistent daily solar energy production with few to no obstructions shading the site and access to existing electrical grid infrastructure.</p> <p>The site is also relatively flat with the closest receiver approximately 2.3km away which reduces construction noise and visual impacts on these receivers.</p>
<p>(d) any submissions made in accordance with this Act or the regulations,</p>	<p>All matters raised in these submissions have been summarised in Section 4.2 of this report and given due consideration as part of the assessment of the proposed development (see Section 5 of this report).</p>

<p>(e) the public interest.</p>	<p>The recommended conditions of consent impose a range of controls, which the Department considers will mitigate any potential environmental impacts of the proposed development.</p> <p>The socio-economic benefits generated from the proposal are considerable, with the provision of approximately 300 full-time equivalent (FTE) construction jobs and 2-3 FTE operations and maintenance staff. The proposal is therefore considered to be in the public interest</p> <p>.</p>
---------------------------------	---

APPENDIX E **CONSIDERATION OF ENVIRONMENTAL PLANNING INSTRUMENTS**

State Environmental Planning Policy (State and Regional Development) 2011

The proposal is State Significant Development under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) because it is development for the purpose of a facility for the generation of electricity that has a capital investment value of more than \$30 million (clause 20 of Schedule 1 of *State Environmental Planning Policy (State and Regional Development) 2011*). Therefore the Minister for Planning & Infrastructure is the consent authority. The SRD SEPP is discussed in **Section 3.2** of this report.

State Environmental Planning Policy (Infrastructure) 2007

The Infrastructure SEPP aims to facilitate the effective delivery of infrastructure across the State by improving regulatory certainty and efficiency, identifying matters to be considered in the assessment of development adjacent to particular types of infrastructure development, and providing for consultation with relevant public authorities about certain development during the assessment process.

Development for the purpose of electricity generating works may be carried out by any person with consent on any land in a prescribed rural, industrial or special use zone under the State Environmental Planning Policy (Infrastructure) 2007. Therefore, as the proposal is for the purpose of generating electricity within a prescribed rural zone and special use zone it is permissible with consent.

State Environmental Planning Policy no.55 – Remediation of Land

SEPP 55 aims to promote the remediation of contaminated land for the purpose of reducing the risk of harm to human health or any other aspect of the environment.

The development is not located on land identified as contaminated land, nor is it adjacent to land identified as contaminated land. Further the EIS identifies that no evidence of contamination was observed during the site visit. Construction activities would also not significantly disturb soil or groundwater at the site.

Bogan Local Environmental Plan 2011

The solar plant and transmission line are located on land zoned RU1 – Primary Production, however the transmission line will also cross the Barrier Highway, zoned SP2-Classified Road under the Bogan Local Environmental Plan 2011 (LEP).

The Generation of electricity is prohibited in both RU1 and SP2, however development for the purpose of electricity generating works may be carried out by any person with consent on any land in a prescribed rural, industrial or special use zone under the State Environmental Planning Policy (Infrastructure) 2007.

Clause 8 of the Infrastructure SEPP states that if there is an inconsistency between the SEPP and any other environmental planning instrument, whether made before or after the commencement of the SEPP, the SEPP prevails to the extent of the inconsistency. As the development is for the purpose of generating electricity within a prescribed rural zone and special use zone, it is permissible with consent.

APPENDIX F RECOMMENDED CONDITIONS OF CONSENT

APPENDIX G POLITICAL DONATIONS STATEMENT
