



Visual Impact Verification Report

NYNGAN SOLAR PLANT



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1 INTRODUCTION

1.1 BACKGROUND

AGL Energy Limited (AGL) has completed construction of a solar photovoltaic (PV) power station with a nominal capacity of up to 102 megawatts (MW) at Nyngan in Central West New South Wales (NSW). The solar plant is located approximately 10 kilometres west of the Nyngan township.

The Nyngan Solar Plant development encompasses the construction, operation and decommissioning of a solar power station over approximately 250 hectares of privately owned property, and a transmission line easement approximately 3 kilometres long by 40 metres wide to connect the solar plant to the existing Nyngan – Cobar 132 kV transmission line.

Fresh Landscape Design completed a Visual Impact Assessment (VIA) for the Nyngan Solar Plant as part of the Nyngan Solar Plant Environmental Impact Statement (EIS) in 2012. The VIA report (Fresh Landscape Design 2012) described the results of the fieldwork, the existing landscape character in the vicinity of the site, documented the assessment of visual impact of the proposal and made recommendations for mitigation measures.

Development consent for the project was granted by the NSW Minister for Planning and Infrastructure under Part 4 of the *Environmental Planning and Assessment Act 1979* on 15 July 2013. The development consent specifies the conditions of project approval with which AGL and its contractors must comply. The following two conditions are relevant to this report:

B18. *Within six months of the commissioning of the development, the Applicant shall prepare and submit a Visual Impact Verification Report for the Director-General's approval. Unless otherwise agreed to by the Director-General, the Visual Impact Verification Report shall confirm the visual impacts at each of the receptors and roadways identified in the Environmental Impact Statement, or subsequently identified in the final design work, as having the potential to be 'highly impacted', considering the final model and layout of generating components on site as well as site specific mitigating factors at the receptors and roadways (such as receptor orientation and intervening screening factors). The Visual Impact Verification Report shall identify all reasonable and feasible screening and landscape planting options available at each receptor and roadways at which potential impacts have been verified to be 'high' including demonstration that these measures have been determined in consultation with affected receptors and relevant road authorities.*

B19. *Within 18 months of the approval of the Visual Impact Verification Report by the Director-General (or as otherwise agreed to by the Director-General), the Applicant shall ensure that the measures identified in the Report are implemented at affected receptors and roadways as identified in the Report in consultation with the relevant residents/landowners and road authorities.*

1.2 PURPOSE OF THIS REPORT

This report is a Visual Impact Verification Report, completed in accordance with development consent condition B18. The purpose of the report is to confirm the visual impacts of the constructed Nyngan Solar Plant, as set out in Condition B18. The report identifies all reasonable and feasible screening and landscape planting options available at each identified receptor and roadway that have the potential to be highly impacted, with reference to the measures identified in the EIS.

2 METHODS

The 2012 VIA (Fresh Landscape Design 2012) was reviewed in relation to identified receptors. The original VIA identified 17 viewpoints, see map at Appendix A, taken from the 2012 VIA. Table 2-1 below summarises the visual impact outcomes from the 2012 VIA. None were considered to be highly affected.

Table 2-1 Summary of significance of visual impacts

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

Although the proposal was not predicted to be visible at the majority of the viewpoints, each viewpoint was visited between 8 - 9 September 2015 by environmental consultants Jenny Walsh and Carolyn Woods to confirm the visual impacts of the solar plant at each of the receptors and roadways identified in the 2012 VIA. There were no additional receptors or roadways identified during the final design of the solar plant.

Photographs were taken at each viewpoint and an assessment made against the predictions. Photographs are provided in Section 3 of this report.

Condition B18 requires that, for receptors where potential impacts have been verified to be high, all reasonable and feasible screening and landscape planting options available at each receptor and roadways are identified. No receptors were considered to be highly affected in the 2012 VIA, therefore screening and landscape planting options were not required to be considered.

3 VISUAL IMPACT VERIFICATION

The Nyngan Solar Plant comprises solar arrays covering approximately 250 hectares and comprising 1.36 million panels which are oriented in a northerly direction. The project also includes substation infrastructure, roads and small buildings and a 3km long 132 kV transmission line which extends to the south of the site. The most visible elements from identified viewpoints are the plant and the transmission line.

The layout of the solar plant and transmission line are illustrated in Appendix B.

Table 3-1 verifies the visual impact of the Nyngan Solar Plant on the 17 identified viewpoints.

Table 3-1 Verification of significance of visual impacts


Viewpoint	Visual impact significance (2012)	Comments (2012)	Verification (2015)
V1 Mitchell Highway South (public)	Low	Development barely visible if seen at all	Visited 8 September 2015. Representative views from Mitchell Highway approx. 5km west of Nyngan. Development not visible.
14km from site			

Viewpoint	Visual impact significance (2012)	Comments (2012)	Verification (2015)
V2 Nyngan-Mundaroo Road (public) 10km from site	Low	Development unlikely to be seen	Visited 8 September 2015. Representative views from Nyngan-Mundaroo Road approx. 2.3km north-east of Nyngan. Development not visible.
			


Viewpoint	Visual impact significance (2012)	Comments (2012)	Verification (2015)
V3 Tottenham Road (public)	Low	Development unlikely to be seen	Visited 8 September 2015. View from corner of Tottenham Road and Oatley Street, south western area of Nyngan township. Development not visible.
8km from site			


Viewpoint	Visual impact significance (2012)	Comments (2012)	Verification (2015)
V4 Nyngan Golf Club (public)	Low	Development unlikely to be seen	Visited 8 September 2015. View from levee bank adjacent to Golf Club, south western extent of Nyngan township. Development not visible.
8.5km from site			

Viewpoint	Visual impact significance (2012)	Comments (2012)	Verification (2015)
<p>V5 River Street, Nyngan (public)</p> <p>8.3km from site</p>	<p>Low</p>	<p>Development unlikely to be seen</p>	<p>Visited 8 September 2015. View from east of levee bank, western extent of Nyngan township. Development not visible.</p>
			


Viewpoint	Visual impact significance (2012)	Comments (2012)	Verification (2015)
<p>V6 Peter Sinclair Bridge, Bogan River (public)</p> <p>8.5km from site</p>	<p>Low</p>	<p>Development unlikely to be seen</p>	<p>Visited 8 September 2015. View from middle of bridge western extent of Nyngan township. Development not visible.</p> 

Viewpoint	Visual impact significance (2012)	Comments (2012)	Verification (2015)
<p>V7 Barrier Highway – Riverside Caravan Park (public)</p> <p>7.7km from site</p>	<p>Low</p>	<p>Development unlikely to be seen</p>	<p>Visited 8 September 2015. View from entrance to Caravan Park west of Nyngan township. Development not visible.</p>
			

Viewpoint	Visual impact significance (2012)	Comments (2012)	Verification (2015)
V8 Bogan Road West (public)	Low	Development barely visible if seen at all	Visited 8 September 2015. View from public road to the south west of Nyngan township. Development not visible.
7.2km from site			


Viewpoint	Visual impact significance (2012)	Comments (2012)	Verification (2015)
<p>V9 Tullamore-Nyngan Road Road (public)</p> <p>8.2km from site</p>	<p>Low</p>	<p>Development unlikely to be seen</p>	<p>Visited 8 September 2015. Representative views from Tullamore-Nyngan Road approx. 1.8km south Nyngan. Development not visible.</p>
			

Viewpoint	Visual impact significance (2012)	Comments (2012)	Verification (2015)
<p>V10 Mitchell Highway – Wilgaree (public)</p> <p>5.2km from site</p>	<p>Low</p>	<p>Development barely visible if seen at all</p>	<p>Visited 8 September 2015. View from Mitchell Highway approx. 7km west Nyngan. Development not visible.</p>
			


Viewpoint	Visual impact significance (2012)	Comments (2012)	Verification (2015)
V11 Pangee Road (public)	Low	Development unlikely to be seen	Visited 8 September 2015. View from public road to the south of the development site. Development not visible.
13.8km from site			


Viewpoint	Visual impact significance (2012)	Comments (2012)	Verification (2015)
<p>V12 Miandetta State Forest (public)</p>	<p>Low</p>	<p>Development unlikely to be seen</p>	<p>Visited 8 September 2015. Representative view from Miandetta State Forest near corner of Gilgai Road and Barrier Highway and area adjacent to intersection of roads. Development not visible from these areas.</p>
<p>9.8km from site</p>			

Viewpoint	Visual impact significance (2012)	Comments (2012)	Verification (2015)
<p>V13 Redlands house (private)</p> <p>2.7km from site</p>	<p>Low</p>	<p>Development barely visible if seen at all</p>	<p>Visited 9 September 2015. View to the northeast from Redlands house. Trees immediately east of the house screen the view. Development not visible.</p>
			


Viewpoint	Visual impact significance (2012)	Comments (2012)	Verification (2015)
V14 Pic's paddock, Redlands (private)	Low	Top of poles barely visible above distant tree line	Visited 9 September 2015 Representative view to the east from Pic's paddock on Redlands property. About three power poles were visible on the horizon, very small. Not visible in photograph below.
2.6km from site			

Viewpoint	Visual impact significance (2012)	Comments (2012)	Verification (2015)
<p>V15 Barrier Highway line crossing (public)</p> <p>200m to road crossing, 1.8km to substation and solar plant</p>	<p>Low</p>	<p>Poles and wires visible close to crossing point, mitigation suggested</p>	<p>Visited 9 September 2015. Comments at various locations below.</p> <p>View looking west: Powerlines visible to the west and southwest, as per 2012 photomontages. Power poles appear smaller than 2012 montage as proposed poles were 26m tall, installed poles are 20.8m above ground.</p> 

Viewpoint	Visual impact significance (2012)	Comments (2012)	Verification (2015)
		View looking northwest: Powerlines visible to the northwest. No evidence of mitigations.	

Viewpoint	Visual impact significance (2012)	Comments (2012)	Verification (2015)
		View looking north: Substation infrastructure visible to the north. Buildings barely visible.	

Viewpoint	Visual impact significance (2012)	Comments (2012)	Verification (2015)
	View looking southwest: Powerlines visible to the southwest.		

Viewpoint	Visual impact significance (2012)	Comments (2012)	Verification (2015)
V16 Tikkara house (private)	Low	Development unlikely to be visible	Visited 9 September 2015 Tikkara farmhouse remains surrounded by trees and shrubs toward the north (in direction of solar plant) and west (in direction of transmission line) so that views are screened by large blocks of existing vegetation.
1.8km from site	<p>View from Tikkara homestead toward the most open views to the east:</p> 		


Viewpoint	Visual impact significance (2012)	Comments (2012)	Verification (2015)
V17 Barrier Highway – Tikkara (public)	Low	Solar plant barely visible in distance, mitigation suggested	Visited 9 September 2015. Representative ‘worst case scenario’ view to solar plant from Barrier Highway. Solar plant visible in distance to the north and powerlines visible in distance to the northwest (plant area within orange block/ powerlines in yellow block in photo below). No evidence of mitigations.
			

Table 3-2 below provides an overview of implemented mitigation measures.

Table 3-2 Mitigation measures identified and implemented

Viewpoint	Mitigation opportunities (2012 VIA)	Implemented	Comment
1	None	N/A	Verified 8/9/15
2	None	N/A	Verified 8/9/15
3	None	N/A	Verified 8/9/15
4	None	N/A	Verified 8/9/15
5	None	N/A	Verified 8/9/15
6	None	N/A	Verified 8/9/15
7	None	N/A	Verified 8/9/15
8	None	N/A	Verified 8/9/15
9	None	N/A	Verified 8/9/15
10	None	N/A	Verified 8/9/15
11	None	N/A	Verified 8/9/15
12	None	N/A	Verified 8/9/15
13	None	N/A	Verified 9/9/15
14	None	N/A	Verified 9/9/15
15	<p>1. Offset poles as far as possible from both sides of highway to minimise perceived height of nearest poles.</p> <p>2. Use shorter poles for the transmission line (approximately 15m high is desirable) to reduce the contrast in height between the poles and the existing trees (feasibility subject to detail design requirements, reliable visual effect).</p> <p>3. Establish endemic trees and shrubs to fill gaps in roadside vegetation (either along roadsides or inside paddocks) to screen views towards transmission line (feasible but screening effect will take years to develop and plantings may fail).</p>	<p>1. Yes</p> <p>2. Yes</p> <p>3. No</p>	<p>1. It appears poles have been offset from both sides of highway. [client to confirm]</p> <p>2. Shorter poles have been used – 20.8m.</p> <p>3. No planting evident.</p>

Viewpoint	Mitigation opportunities (2012 VIA)	Implemented	Comment
	<p>4. Minimise clearing for easement on southern side of highway and retain shorter shrubs where possible (feasible but requires co-operation from landowner and authorities).</p> <p>5. Establish strategically located endemic trees and shrubs to screen views from highway to substation and site office.</p> <p>6. Select a dark, neutral colour for the site office walls and roof to assist them to blend with dark colours of nearby tree canopies.</p>	<p>4. Yes</p> <p>5. No</p> <p>6. No.</p>	<p>4. Powerline easement is slightly east of that in 2012 maps – this location required clearing of fewer trees.</p> <p>5. No planting evident.</p> <p>6. Light neutral colours.</p> <p>Verified 9/9/15</p>
16	None	N/A	Verified 9/9/15
17	<p>1. Establish endemic trees and shrubs in gaps in roadside vegetation immediately adjacent to site.</p> <p>2. Establish screening shrubs, growing to at least 2m high, along the southern edges of the solar plant.</p>	<p>1. No</p> <p>2. No</p>	<p>1. Planting not implemented.</p> <p>2. Planting not implemented.</p> <p>Verified 9/9/15</p>

The 2012 VIA noted low visual impact significance for all viewpoints, with mitigation measures suggested for Viewpoints 15 and 17. Table 3-2 lists suggested mitigation opportunities, of which some have been implemented. For Viewpoint 15 the project design changes included the use of shorter power poles to be placed as far from the highway as possible, minimising clearing of the transmission line easement to reduce visual impacts and using a dark, neutral colour for the site office walls and roof. It appears the transmission line poles have been offset from both sides of highway and poles heights have been determined by the road and railing crossings. The site office building walls and roofs are light neutral colours, however these are barely visible from Viewpoint 15.

To mitigate the visual impact of the transmission line, substation and site offices on views from the Barrier Highway, landscape planting options to screen views were suggested in the 2012 VIA. NGH understand that planting is planned to be undertaken over autumn and winter 2016.

The views from the Barrier Highway of the transmission line, substation and site office are seen fleetingly through gaps in roadside vegetation from moving vehicles. This will be minimised through the implementation of the landscape planting proposed, which will require consultation with Roads and Maritime Services.

4 CONCLUSION

AGL has completed construction of the Nyngan Solar Plant. The project's development consent specified the conditions of approval relevant to visual impact: B 18 and B19.

This report has addressed condition B18. The visual impacts at each of the receptors identified in the 2012 VIA were verified. The 2012 VIA did not identify any receptors as being highly impacted, therefore additional screening and landscape planting options are not required by the condition.

REFERENCES

Fresh Landscape Design (2012) *Visual Impact Assessment Nyngan Solar Plant*.

APPENDIX A VIEWPOINTS FROM 2012 VISUAL IMPACT ASSESSMENT REPORT

Map 5 Viewpoints and observation points

NYNGAN SOLAR PLANT Visual Impact Assessment



- ① Viewpoints
- Other observation points
- ≡ Rail
- Highway
- Built up area (Nyngan)
- Road
- - Existing powerline
- Watercourse
- - Proposed underground 33 kV transmission line
- Proposed 132 kV transmission line
- Development site (security fence)
- Proposed infrastructure
- 16km from study area

Notes:
 - Impact areas were derived from 'AGL - Nyngan Solar Power Station.dwg' provided by the client
 - Other base layers from LPI, accessed 2012
 - Aerial base layer from Bing (ESRI Online) accessed 2012

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 Author: SP

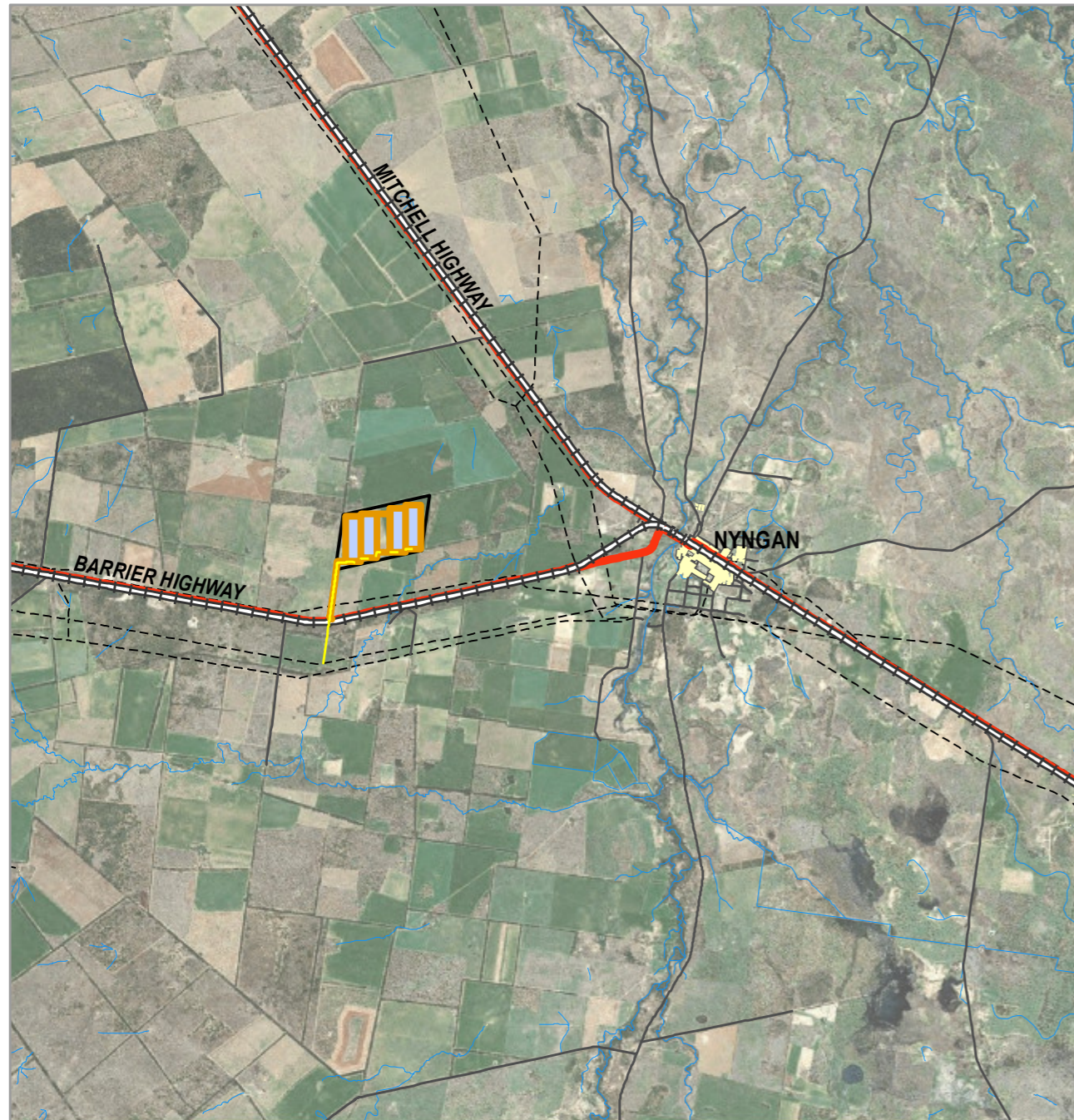
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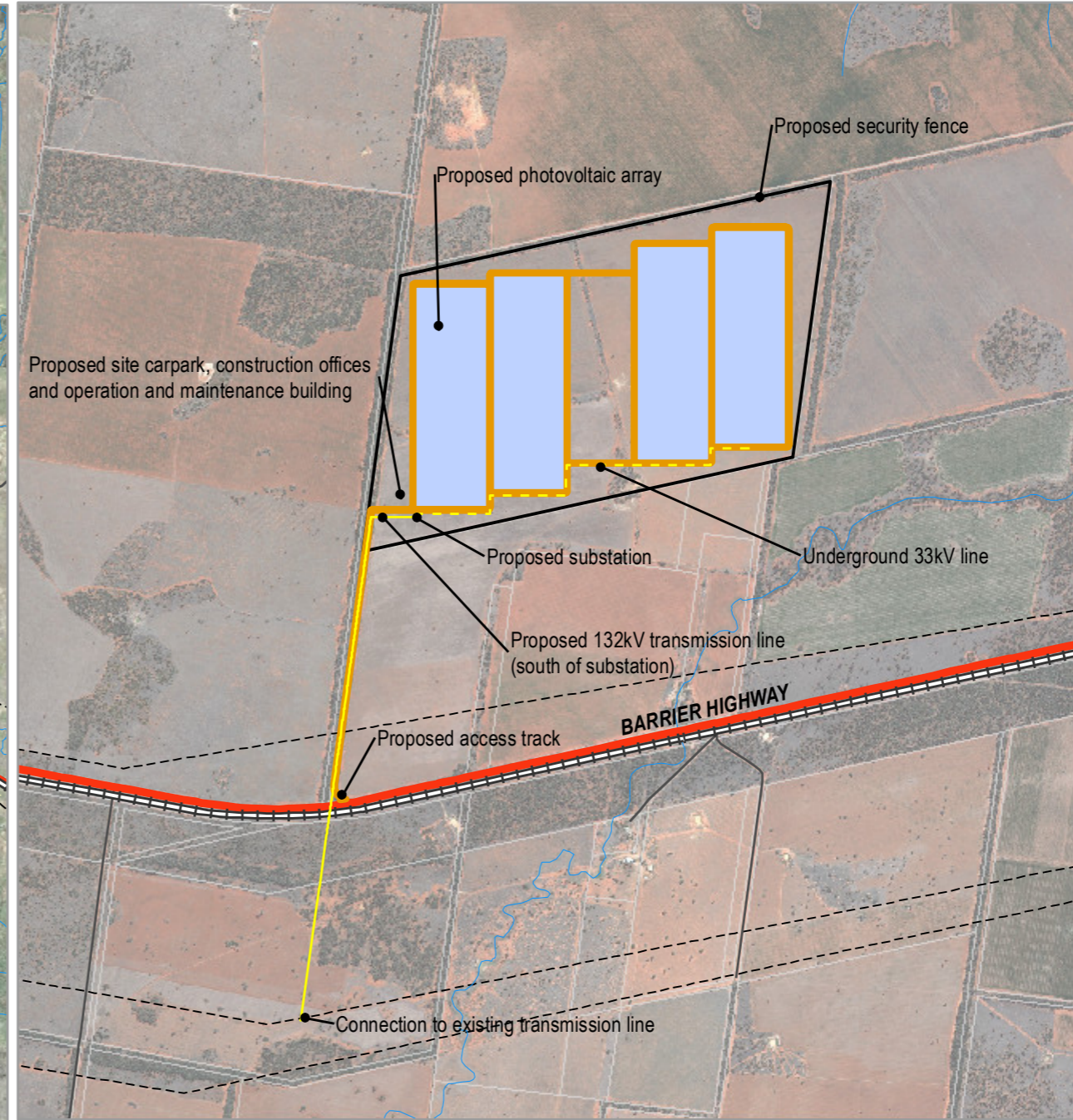
APPENDIX B SOLAR PLANT LAYOUT

Map 1 Location and layout of proposed development

SITE LOCATION RELATIVE TO NYNGAN



SITE LAYOUT



- Proposed underground 33 kV transmission line
- Proposed 132 kV transmission line
- Proposed access road
- Rail
- Highway
- Built up area (Nyngan)
- Road
- Drainage line
- Existing powerline
- Development site (security fence)
- Proposed arrays

Notes:
 - Infrastructure locations are approximate only
 - Other base layers from LPI, accessed 2012
 - Aerial base layer from Bing (ESRI Online) accessed 2012

Notes:
 - Infrastructure locations are approximate only
 - Other base layers from LPI, accessed 2012
 - Aerial base layer from Microsoft Virtual Earth accessed 2012

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 Author: SP