NORTHERN MIDLANDS SOLAR FARM

Noise Impact Assessment

Prepared for:

Connorville Estates c/- Robert Luxmoore Pty Ltd
11A Newton Street,
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BASIS OF REPORT

This report has been prepared by SLR Consulting Australia Pty Ltd (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Connorville Estates c/- Robert Luxmoore Pty Ltd (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

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DOCUMENT CONTROL

Reference	Date	Prepared	Checked	Authorised
640.30536.00000-R01-v1.2	February 2023	Benjamin French	Gustaf Reutersward	Gustaf Reutersward
640.30536.00000-R01-v1.1	February 2023	Benjamin French	Gustaf Reutersward	Gustaf Reutersward
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640.30536.00000-R01-v0.1	December 2022	Benjamin French	Gustaf Reutersward	Gustaf Reutersward

EXECUTIVE SUMMARY

This technical report is an attachment to the Northern Midlands Solar Farm Development Application submission on behalf of Connorville Estates.

SLR Consulting Pty Ltd (SLR) was engaged by Robert Luxmoore Pty Ltd on behalf of Connorville Estates to conduct a noise assessment of a proposed 288 MW DC / 370 MWp AC solar farm located at 394 Connorville Rd to support a Development Application submission to the Northern Midlands Council under the *Land Use Planning & Approvals Act 1993*.

The project is located on rural farmland approximately 16 km south-southeast of Cressy, Tasmania.

Evaluation of noise impacts on sensitive receptors has been undertaken in accordance with the *Environmental Management and Pollution Control Act 1994*, *Environmental Management and Pollution Control (Noise) Regulations 2016* and the *Environment Protection Policy (Noise) 2009.*

Unattended noise monitoring was conducted between 19 September and 26 September 2022 at two locations representative of the existing ambient environment. These measurements were used to determine appropriate noise goals in general accordance with the *Noise Measurement Procedures Manual*, borrowing elements from the NSW *Noise Policy for Industry, 2017*.

The key project impacts in relation to noise is as follows:

- **Noise from construction activities:** All construction works will be completed under a Construction Environmental Management Plan (CEMP). Due to the distances between the proposed site and the closest receptors construction noise impacts are relatively minimal. However, scheduling construction activities in accordance with the Prohibited Hours as defined in the Regulations[1], community engagement and best practice noise management controls, regular maintenance, broadband reversing beepers etc. will further minimise residual risk of harm to nearby receptors.
- **Noise from operational activities:** The closest receptor is located approximately 1,250 m north of Solar West. Night-time compliance is achieved at this receptor with the current modelling with no additional mitigation. Some receptors close to the existing transmission line corridor may experience some corona ('buzzing') noise during periods of heavy rain or high humidity, the installation of any additional transmission lines to cater for this project is not expected to increase corona noise at these receptors significantly.

It is recommended to update the noise model during detailed design to ensure compliance is maintained. Confirmation of compliance will be verified by post commissioning noise measurements.

[1] Refer to Item 2 of Schedule 1 in the *Environmental Management and Pollution Control (Noise) Regulations 2016*. Reproduced in **Table 3** in this report.

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APPENDICES

1 Introduction

Connorville Estates is proposing to develop a 288 MW DC / 370 MWp AC solar farm and 345.9 MW / 691.7 MWh battery energy storage system (BESS), located at 394 Connorville Rd, Cressy, Tasmania.

SLR Consulting Pty Ltd (SLR) has been engaged by Robert Luxmoore on behalf of Connerville Estates to conduct a noise assessment to support the development application of the proposed Northern Midlands Solar Farm under the *Land Use Planning & Approvals Act 1993*.

2 Project Area

The proposed site is located on rural farmland approximately 16 km SSE of the township of Cressy. The farm is divided into two areas with the infrastructure area consisting of a Battery Energy Storage System (BESS), (capacity TBD) and a substation and solar farm in Solar West and a smaller solar farm located approximately 2.5 km south east of Solar West as shown in **Table 1**.

The infrastructure study area is sited so that the substation can utilise an existing transmission easement to feed power to the Palmerston substation located 13 km to the west.

54 noise sensitive receptors were identified within a 5 km radius of the site boundary and 500 m from the transmission line easement. See **Figure 1** for receptor locations and **Table 1** for their GDA 2020 Zone 55 coordinates.

Figure 1 Project area and close sensitive receptors

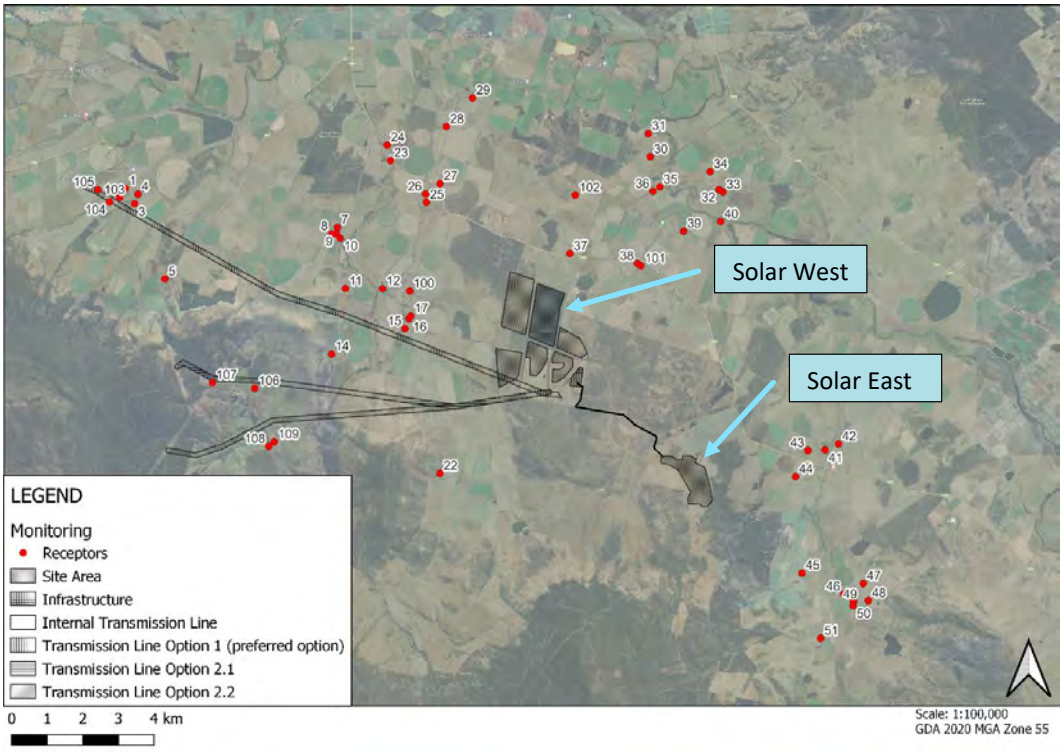


Table 1 Noise sensitive receptors

ID	Easting	Northing	ID	Easting	Northing
1	500488	5373658	35	515507	5373700
3	500747	5373230	36	515315	5373573
4	500840	5373494	37	512979	5371829
5	501597	5371117	38	514879	5371546
7	506446	5372560	39	516177	5372455
8	506281	5372383	40	517216	5372728
9	506415	5372395	41	520149	5366315
10	506521	5372263	42	520528	5366480
11	506673	5370846	43	519671	5366299
12	507714	5370843	44	519320	5365565
14	506281	5369006	45	519502	5362857
15	508345	5369720	46	520675	5362264
16	508459	5369996	47	521225	5362563
17	508506	5370075	48	521365	5362082
22	509327	5365652	49	520951	5362049
23	507940	5374442	50	520939	5361939
24	507846	5374874	51	520025	5361024
25	508947	5373270	100	508481	5370778
26	508924	5373496	101	514978	5371483
27	509328	5373789	102	513133	5373471
28	509507	5375396	103	500325	5373403
29	510243	5376197	104	500041	5373280
30	515238	5374548	105	499713	5373622
31	515183	5375198	106	504125	5368044
32	517171	5373624	107	502935	5368207
33	517279	5373556	108	504516	5366417
34	516922	5374130	109	504671	5366540

3 Project Criteria

In Tasmania, the *Environmental Management and Pollution Control Act 1994* (Act), *Environmental Management and Pollution Control (Noise) Regulations 2016* (Regulations) and the *Environment Protection Policy (Noise) 2009* (EPP Noise) regulates noise from industry. The objectives of the EPP Noise are to implement the Act and to protect the acoustic environment that are conductive to:

- The wellbeing of the community including its social and economic amenity, or
- The wellbeing of an individual, including the individual's
    - Health and
    - Opportunity to work and study and to have sleep, relaxation and conversation without unreasonable interference from noise.

The EPP Noise provides acoustic environment indicator levels, adopted from the World Health Organisation publication *Guidelines for Community Noise, 1999*. A selection of project relevant indicator levels is shown in **Table 2**. Note that these environment indicator levels are indicative, and not mandatory noise levels.

Table 2 Acoustic environment indicator levels

Specific Criteria	Critical Health Effect(s)	L_{eq} [dBA]	Time base [hours]	L_{max} fast [dBA]
Outdoor Living Area	Serious annoyance, daytime and evening	55	16	-
	Moderate annoyance, daytime and evening	50	16	-
Dwelling, Indoors	Speech intelligibility & moderate annoyance, daytime and evening	35	16	-
Inside bedrooms	Sleep disturbance, night time	30	8	45
Outside bedrooms	Sleep disturbance, window open (outdoor values)	45	8	60
Industrial, commercial, shopping and traffic area, indoors and outdoors	Hearing impairment	70	24	110

The Northern Midlands Council has published general guidelines on noise but does not have specific noise criteria for industry.

Although the acoustic indicator levels in **Table 2** are not mandatory noise limits, they can be used to form a basis for design targets.

It is noted that the background determination methodology in the Tasmanian Environment Division's document *Noise Measurement Procedures Manual* is very similar to the Rating Background Level prescribed in the NSW's *Noise Policy for Industry, 2017 (NPfI)* [2]. It is proposed to adopt the NSW procedure for defining noise targets as it is more conservative than the WHO Acoustic Environment Indicator levels.

[2] The main difference between procedures is the NSW procedure uses a 15 min assessment period, the Tasmanian procedures uses 10 minute periods. For the purposes for assessment, the Tasmanian Background Noise Level procedure detailed Part B Section 14 of the *Noise Measurement Procedures Manual* and the NSW *Noise Policy for Industry* RBL procedure are interchangeable. The 10 minute period was used for this assessment.

According to the NSW NPfI, project noise targets are the minimum of:

- Recommended Amenity Noise Levels:
  - 50/45/40 dBA for day/evening/night respectively, and
- Project Intrusiveness Noise Levels:
  - Which is the maximum of:
    - Rating Background Level + 5 dB, or
    - 40/35/35 dBA for day/evening/night respectively (rural residential settings)

For example, when background levels are low, i.e. RBL + 5 < 35 dBA, the night time noise targets are set to 35 dBA according to the minimum Project Intrusiveness Noise Levels. When background levels are high (RBL + 5 > 40 dBA), the noise targets are limited to 40 dBA according to the Amenity Noise Level.

For sleep disturbance assessments, the NSW Noise Policy for Industry recommends noise targets of:

- L_{AFmax} = 52 dBA or
- L_{AFmax} = RBL + 15 dBA, whichever is greater.

3.1 Construction Noise

The aforementioned Act, Regulations and EPP Policy also control construction noise. Part 2, Section 6 of the Regulations specifies:

1) A person must not operate equipment, or a machine specified in Schedule 1 on -

a. Any residential premises; or

b. Any site where construction, or demolition, that is not the construction or demolition of a public street, is taking place –

If the noise emitted by the equipment, or machine, when so operated is, or likely to be, audible in a habitable room in any residential premises, other than the residential premises referred to in paragraph a. whether or not the doors and windows of that habitable room are opened or closed.

Table 3 presents the prohibited hours of use for mobile machinery, forklift trucks and portable equipment, operation of such equipment is prohibited within these periods if it is likely to be audible in a habitable room. Operation of construction equipment outside of the prohibited hours of use is unlimited, provided the EPP Noise is upheld, i.e. best practice environmental management to reduce noise emissions to the greatest extent that is reasonably practical, dominant or intrusive noise characteristics of an activity should be reduced to the greatest extent that is reasonably practical etc.

Table 3 Schedule 1 – Prohibited hours of use: Mobile machinery, forklift truck or portable equipment

Day of Operation	Prohibited hours of use
Monday to Friday	Before 7 am and after 6 pm
Saturday	Before 8 am and after 6 pm
Sunday or public holiday	Before 10 am and after 6 pm

4 Existing Noise Environment

Unattended noise monitoring was conducted at the two closest identified dwellings, located approximately 4 km from the proposed solar farm, as shown in **Figure 2**. Monitoring was conducted from Monday 19 September until Monday 26 September 2022. The monitoring equipment was located outdoors and in acoustic free field conditions. Photos of the installed equipment are shown **Appendix A**. Details of the equipment are provided in **Table 4**.

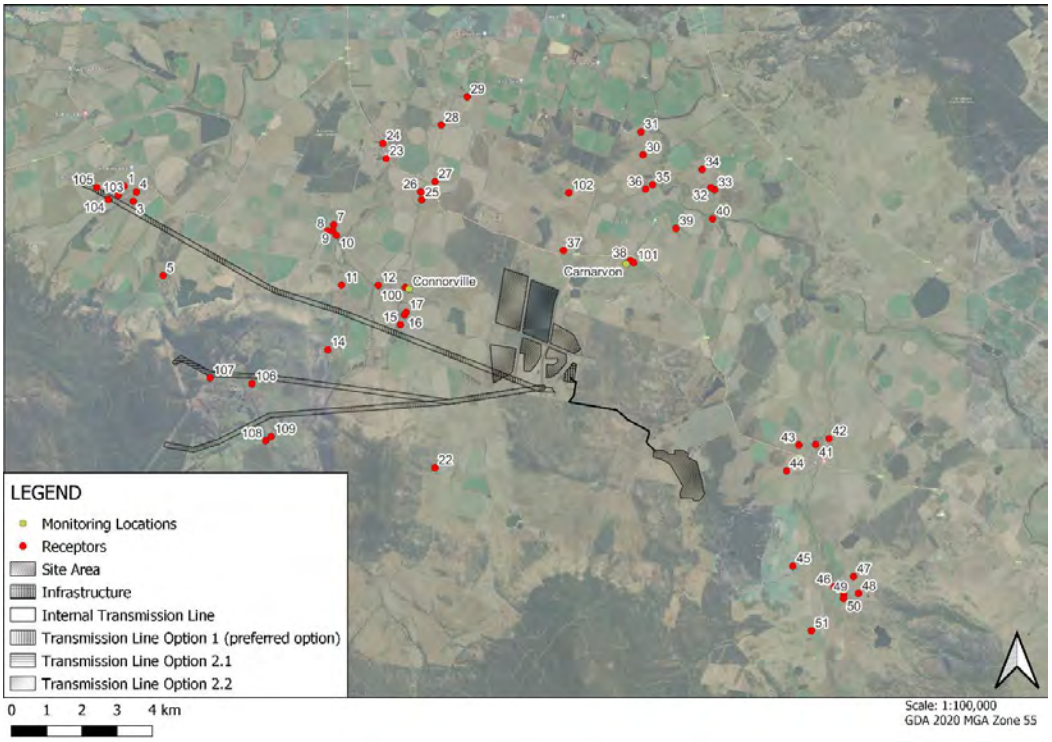
Table 4 Measurement equipment details

Location	Measurement Equipment	Calibration status
Connorville	Ngara noise monitor Serial No 8780DB	Current (calibration due 14 May 2023)
Carnarvon	Ngara noise monitor Serial No 8781BE	Current (calibration due 1 April 2023)

Noise monitoring was conducted in accordance with AS 1055:2018 *Acoustics- Description and measurement of environmental noise*. Background levels were determined in general accordance with the *Noise Measurement Procedures Manual, Second Edition July 2008*.

Weather data was obtained from the nearest Bureau of Meteorology weather station at Cressy, approximately 15 km NNW of the monitoring locations. Data potentially affected by rain or wind has been excluded from the analysis.

Figure 2 Monitoring locations



4.1 Results

Table 5 and **Table 6** presents the measured representative daily background levels for day, evening and night periods at Connorville and Carnarvon respectively. Day periods are defined in the Tasmanian Environment Division of the Department of Environment, Parks, Heritage and the Arts *Noise Measurement Procedures Manual, 2nd Edition July 2008.* The background noise levels are taken as the median of all 10 percentile $L_{90,\ 10\ min}$ values calculated over the monitoring period. The background noise levels for both locations are summarised in **Table 7.** Detailed graphs showing hourly L_{10}, L_{90} and L_{eq} levels with observations from the Cressy weather station are presented in **Appendix A**.

Table 5 Connorville background noise results

Date	10th percentile of $L_{90,\ 10\ min}$ dBA		
	Day (7am to 6 pm)	Evening (6 pm to 10 pm)	Night (10 pm to 7 am)
Mon 19 Sep	26	27	23
Tue20 Sep	25	27	25
Wed 21 Sep	25	31	28
Thurs 22 Sep	26	29	29
Fri 23 Sep	24	*	30
Sat 24 Sep	35	32	24
Sun 25 Sep	23	31	25
Mon 26 Sep	25	-	-
Median	**25**	**30**	**25**

* The entire evening period of Friday 23 Sep was excluded due to wind.

Table 6 Carnarvon background noise results

Date	10th percentile of $L_{90,\ 10\ min}$ dBA		
	Day (7am to 6 pm)	Evening (6 pm to 10 pm)	Night (10 pm to 7 am)
Mon 19 Sep	30	25	24
Tue20 Sep	31	26	24
Wed 21 Sep	32	29	26
Thurs 22 Sep	32	30	28
Fri 23 Sep	32	*	31
Sat 24 Sep	36	27	24
Sun 25 Sep	29	25	23
Mon 26 Sep	29	-	-
Median	**31**	**27**	**24**

* The entire evening period of Friday 23 Sep was excluded due to wind.

Table 7 Summary of background noise levels, L_{90} dBA

Location	Day	Evening	Night
Connorville	**25**	**30**	**25**
Carnarvon	**31**	**27**	**24**

4.2 Discussion

SLR Consulting completed unattended background noise monitoring for the proposed Northern Midlands Solar Farm project from 19 September to 26 September 2022.

The Environment Division adopts the World Health Organisation acoustic environment indicator levels in the EPP Noise as an indicator of environments conductive to health and wellbeing. The indicator levels are 50 dBA (L_{eq}) for day and 45 dBA (L_{eq}) for night, with an additional 60 dBA (L_{max}) criterion for sleep disturbance. These levels are significantly higher than the measured backgrounds; adopting these as targets would allow the project to drastically alter the existing ambient environment.

Therefore, it is proposed to apply the NSW Noise Policy for Industry minimum assumed rating background noise level (RBL). The minimum rating background level noise levels is applied when the measured backgrounds are very low, this is common for rural situations, as is the case here.

Project intrusiveness noise levels are defined as RBL + 5 dB. Similar to the WHO environment indicator levels, these are not directly used as regulatory limits but are used to assess potential noise impacts.

The NSW minimum Project Intrusiveness Noise Level are shown in **Table 8** along with the minimum measured background levels + 5 dB, the minimum intrusiveness levels, recommended amenity noise levels and the derived project noise targets.

Table 8 Project noise targets

Time of Day	Measured Background Level + 5 dB, dBA	Minimum Intrusiveness Noise Levels, dBA	Recommended Amenity Noise Levels (rural residential), dBA	Project Noise Targets, $L_{Aeq,\ 10\ min}$ dBA
Day	30	40	50	**40**
Evening	32	35	45	**35**
Night	29	35	40	**35**

In order to protect existing ambient environment, it is proposed to adopt the more stringent noise targets of **40/35/35 dBA ($L_{eq,\ 10\ min}$) for day/evening/night** respectively.

For sleep disturbance, it is also proposed to adopt the more stringent NSW Noise Policy for Industry noise target of **52 dBA (L_{AFmax})**.

5 Acoustic Investigation

This acoustic investigation assesses construction and operational noise impacts to the closest receptors. The following six construction scenarios were modelled:

- BESS Earthworks & Hardstand – involving bulk earthworks and hardstand construction of the BESS infrastructure and substation site
- BESS Infrastructure installation – construction of the BESS facility substation and auxiliary buildings
- Solar farm construction - construction of the solar arrays
- Transmission line construction – construction of transmission towers and lines, three options were assessed:
    - Option 1 (preferred option)
    - Option 2.1
    - Option 2.2

One operational scenario was modelled. All inverters in the solar array and BESS are assumed to be operating at 100% capacity and for the entire duration of the assessment period. Noise levels are also assessed against the night time noise criterion. This is considered the most conservative noise scenario.

5.1 Noise Modelling

A 3D noise model was constructed within the modelling software SoundPLAN 8.2 to predict noise levels at the nearby sensitive receivers.

Noise modelling was conducted using the ISO 9613-2[3] algorithms incorporated in the noise modelling software. The ISO 9613-2 algorithm predicts the A-weighted sound pressure levels under meteorological conditions favourable to propagation from sources of known sound power levels. This enhanced propagation is equivalent to downwind propagation or a moderate ground-based temperature inversion. The model also includes attenuation due to air absorption, ground attenuation and shielding.

5.2 General Modelling Assumptions

The following general assumptions are made based on best-practice modelling method to suit the project:

- The reflection-order of other buildings was set to three (3), indicating that the noise model allowed for three (3) reflections off façades.
- Source heights were set according to the source item.
- Receivers were set 1.5 m above ground level.
- All equipment is assumed to be in operation for the entire 1 hour assessment period.
- Ground topography within 5 km of the proposed site was sourced from publicly available 1 m elevation data published by the Tasmanian Government.

[3] ISO 9613-2:1996 *Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation*

- Ground absorption is modelled by a single number parameter between 0 (hard – reflective) and 1 (soft – absorptive). The infrastructure was modelled as hard ground, all other ground surfaces were modelled with a ground absorption parameter of 0.6, suitable for rural farmland.

5.3 Construction Noise Assessment

Construction activities are proposed to be undertaken during daytime hours only. Stages of the construction includes:

1. Earthworks, including compaction and drainage and construction of hardstand pads for the solar farm infrastructure.
2. Infrastructure deliveries and installation, installation of transformers and construction of onsite buildings.
3. Construction of solar panel array.
4. Construction of a 220 kV double circuit overhead transmission line between the solar farm and the Palmerston TasNetworks Sub Station located at 4554 Poatina Road, Cressy. Three transmission line options were assessed, Option 1 follows the existing transmission line easement. A parallel transmission line will be constructed adjacent to the existing 110 kV line. Options 2.1 and 2.2 involve linking up with an existing easement approximately 9 km west of the project site (as shown in **Figure 2**).

5.3.1 Sound Power Levels

Sound power levels of typical mobile plant and equipment, taken from SLR's noise database of field measurements and BS 5228-1:2009[4] are summarised in **Table 9**. For a worst-case assessment it is assumed that all equipment is operating continuously over the assessment period, due to sequencing of equipment usage that often occurs on site, this is expected to represent a conservative approach.

The loudest construction activity is anticipated to be the piling of the steel columns that support the solar panel arrays, which is completed by a specialist piece of equipment. These units are typically track mounted and diesel powered with the high-speed piling achieved hydraulically. The full sequence for completing a pile, (which includes: traversing to next pile position, lifting and loading the pile into position, hammering in the pile, releasing the hammered pile), would typically take approximately 2 minutes of which half of that interval includes the hammering phase.

It is anticipated to have six solar farm pile driver operating with the solar farm area at one time, the Solar Array installation scenario was modelled as an area source with all sound power located at one point. The levels calculated at each receptor with this method represents the worst case exposure to piling noise.

The transmission line construction is assumed to be of a steel post/truss construction. The dominant noise sources will be concentrated around the construction of the post footing, i.e. excavation, hammering and piling.

[4] *Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 1: Noise*

The contour maps presented in **Section 6** show the resulting noise levels if construction of each footing was carried out in sequence. Noise emissions from one footing is not combined with emissions from the next. Similarly to the solar farm construction scenario, this analysis shows the worst case situation. Impacts to any one receptor during the construction activity will be relatively short term as the work front progresses to other footings.

The earthworks + hardstands and infrastructure delivery and instalment scenarios were modelled as area sources covering the infrastructure study area. The overall sound power level is distributed over this area.

Table 9 Construction equipment sound power levels

Scenario	Equipment	Quantity	SWL, per item, $L_{Aeq, 15\ min}$	Overall, $L_{Aeq, 15\ min}$
Solar Array Install	Solar Farm Pile Driver	6	117[1]	125
Earthworks + Hardstand	Excavator	2	104	123
	Dozer	1	108	
	Grader	1	104	
	Dump Truck	2	102	
	Vibratory Roller	1	105	
	Concrete Truck	4	104	
	Concrete Pump	4	102	
	Concrete Poker	4	97	
	Rock Breaker	1	121	
	Chain Trencher	1	102	
	Rock Saw	1	113	
	Water Truck	1	111	
	Diesel Generator	4	94	
	Diesel Pump	2	97	
Infrastructure Delivery and Construction	Trucks	2	102	115
	Powered Hand Tools	4	102	
	Forklift or Telehandler	1	102	
	20 t Franna crane	1	98	
	Diesel Generator	4	94	
	Diesel Pumps=	2	97	
	Elevated Working Platform (EWP)	3	95[2]	
Transmission Line Construction	Trucks	1	102	122
	Powered Hand Tools	2	102	
	Crane	1	98	
	Rotary Piling Rig	1	112	
	Concrete Truck	2	104	
	Concrete Pump	2	102	
	Rock Hammer	1	121	

Scenario	Equipment	Quantity	SWL, per item, $L_{Aeq,\ 15\ min}$	Overall, $L_{Aeq,\ 15\ min}$
	EWP	3	95[2]	

1 A 5 dB penalty has been applied to the solar farm pile driver due to impulsive noise characteristics
2 A 5 dB penalty has been applied to the EWP due to tonality noise characteristics

5.4 Operational Noise Assessment

5.4.1 Sound Power Levels

Sound power levels of noise producing equipment shown in **Table 10** are typical of currently available equipment. All items are assumed to be in operation for the entire 1 hour assessment period, thus 15-minute and 1-hour noise data are identical. The medium voltage power station inverters are also assumed to operate at 100% capacity (i.e. maximum fan speed) 24 hours each day.

Since only overall sound pressure levels were provided for some equipment, the spectrum for the transformers were adopted from refence data by Bies and Hanson (11.16). These spectra are shown in **Table 11**.

Table 10 Equipment sound power levels

Qty	Item	Sound Pressure Level (SPL), $L_{eq\ 15\ min}$, dBA	Overall Sound Power Level (SWL), $L_{eq\ 15\ min}$, dBA
71	Inverter	62 dBA at 10 m	90 per unit
96	Battery enclosures	63 dBA at 1 m per unit	71 dBA per unit
2	HV Transformer	N/A	92 dBA per unit
4	Auxiliary transformers	56 dBA at 1 m	65 dBA per unit

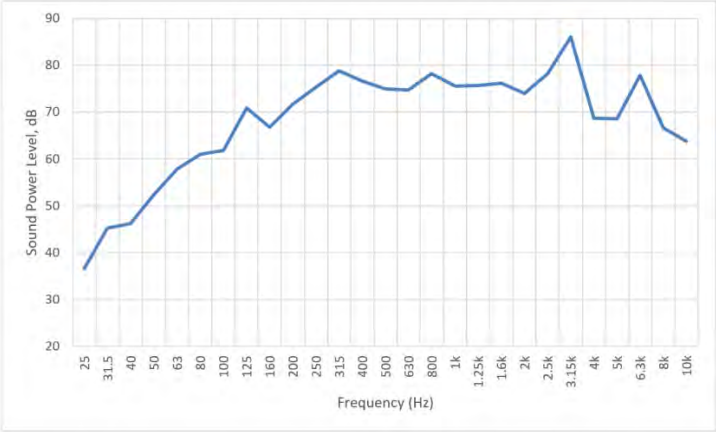
Table 11 Nominative noise spectra

Item	Octave Band Centre Frequency, Hz -linear weighting, dBZ								dBA
	63	125	250	500	1k	2k	4k	8k	
Inverter	63	73	81	80	81	81	86	78	**90**
BESS battery enclosure chiller & Combiner cabinet chiller	68	69	69	68	66	62	58	52	**71**
HV Transformer	94	96	92	92	86	81	76	69	**92**
Aux. Transformer	67	69	65	65	59	54	49	42	**65**

The 1/3 octave sound power spectrum for a typical inverter used in the assessment is shown in **Figure 3**. Note the tones at 125, 3.15k and 6.3k Hz. The inverters were modelled with the 1/3 octave data but are summarised in **Table 11** as octaves for convenience.

The inverter units were modelled as point sources within the solar farm areas according to the Entura PV Concept Layout. The BESS and substation equipment were summed and modelled as an area source encompassing the infrastructure study area.

Figure 3 Nominative inverter sound power level spectrum



6 Assessment Results

6.1 Construction Noise Results

Table 12 presents the construction noise results for the assessed scenarios. It is important to note the transient nature of construction noise, particularly over large areas with a moving work front, such as the solar array and transmission line construction. Receptors with predicted elevated noise levels will be impacted for a relatively short period of time i.e. less than a week, as the work front moves away from the receptor.

Noise contour plots for these scenarios are shown in **Figure 4** to **Figure 9**.

Table 12 Construction noise results

Scenario	Number of receptors				
	Less than 40 dBA	40 to 50 dBA	50 to 60 dBA	60 to 70 dBA	above 70 dBA
Earthworks & Hardstand	54	-	-	-	-
Infrastructure	54	-	-	-	-
Solar Array Construction	51	3	-	-	-
Transmission Line Option 1	40	4	5	4	1
Transmission Line Option 2.1	51	1	1	1	-
Transmission Line Option 2.2	51	2	1	-	-

Figure 4 Construction results – Earthworks and Hardstand

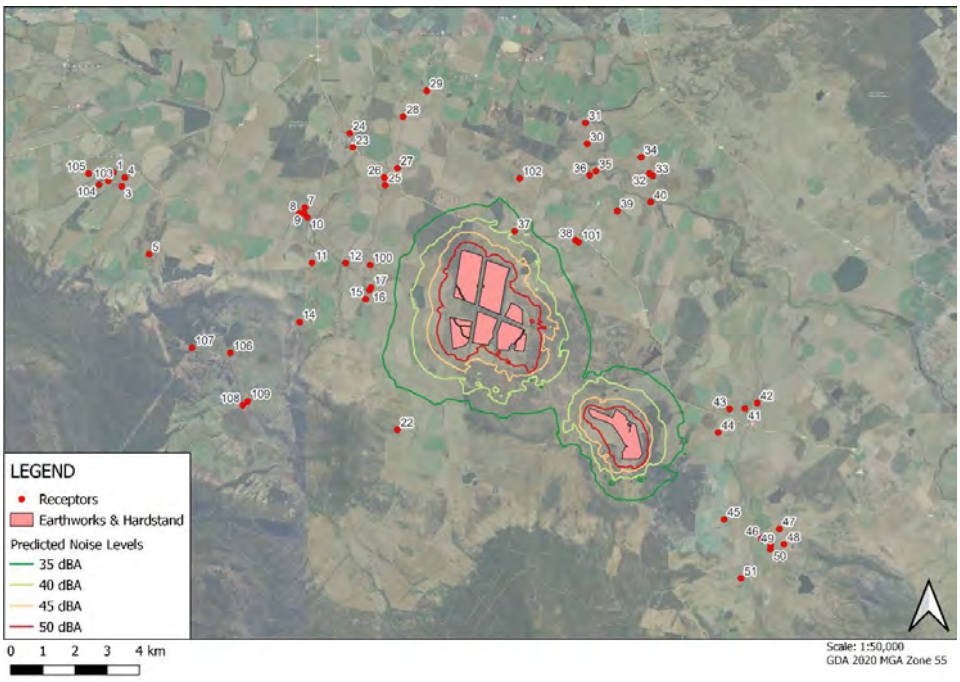


Figure 5 Construction results - Infrastructure

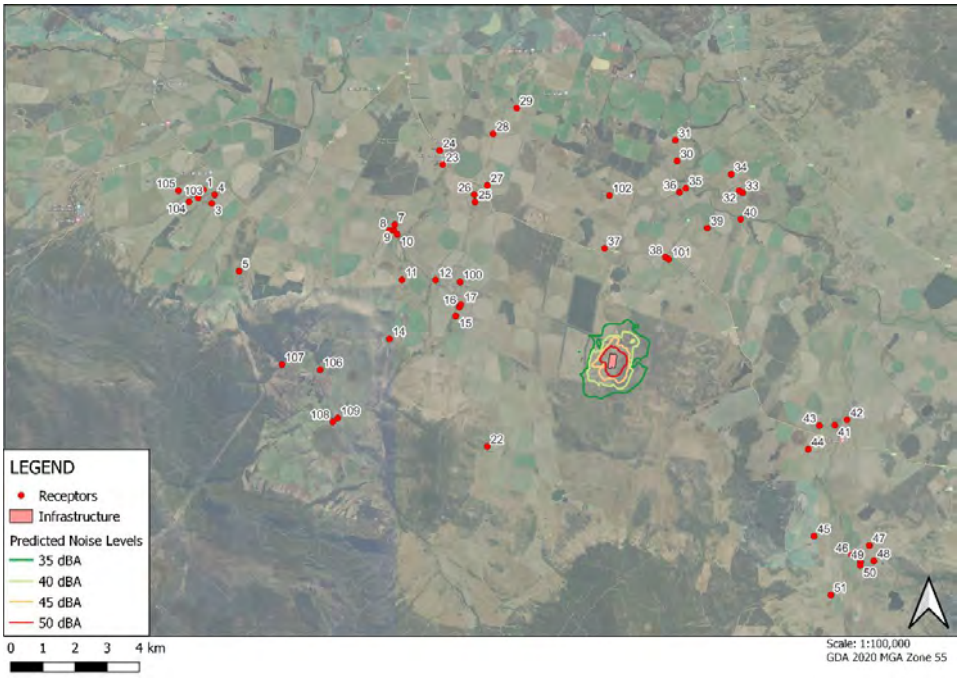


Figure 6 Construction results – Solar Array

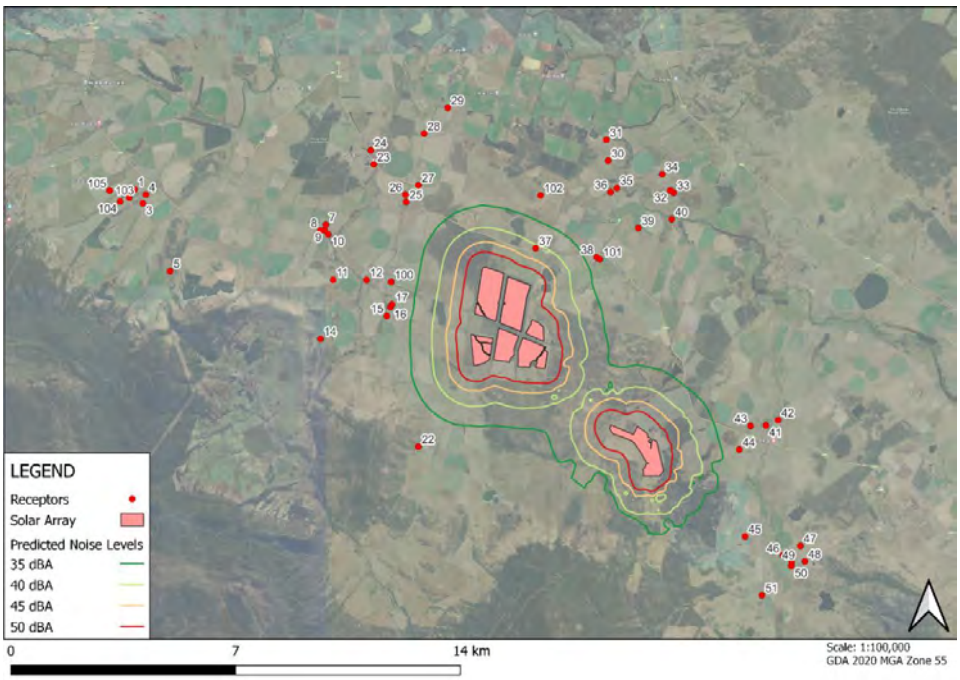


Figure 7 Construction results – Transmission Line Option 1

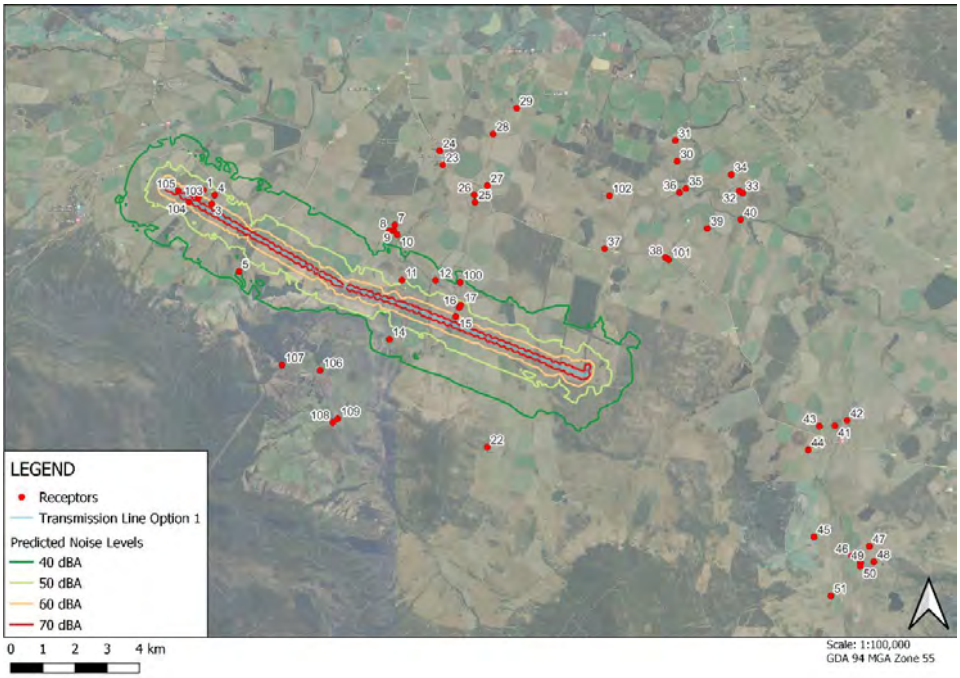


Figure 8 Construction results – Transmission Line Option 2.1

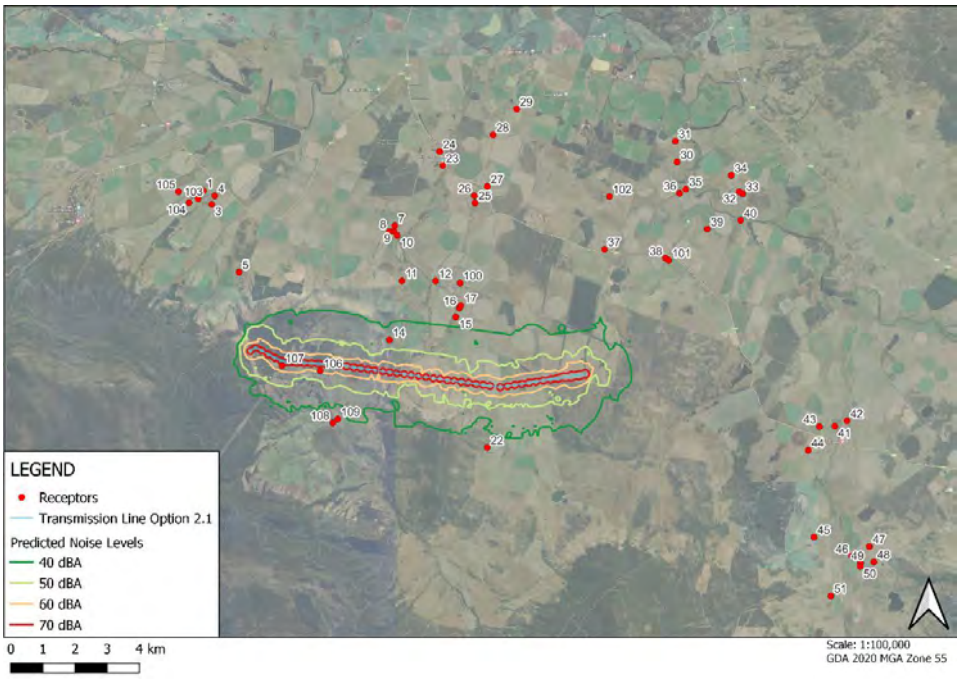
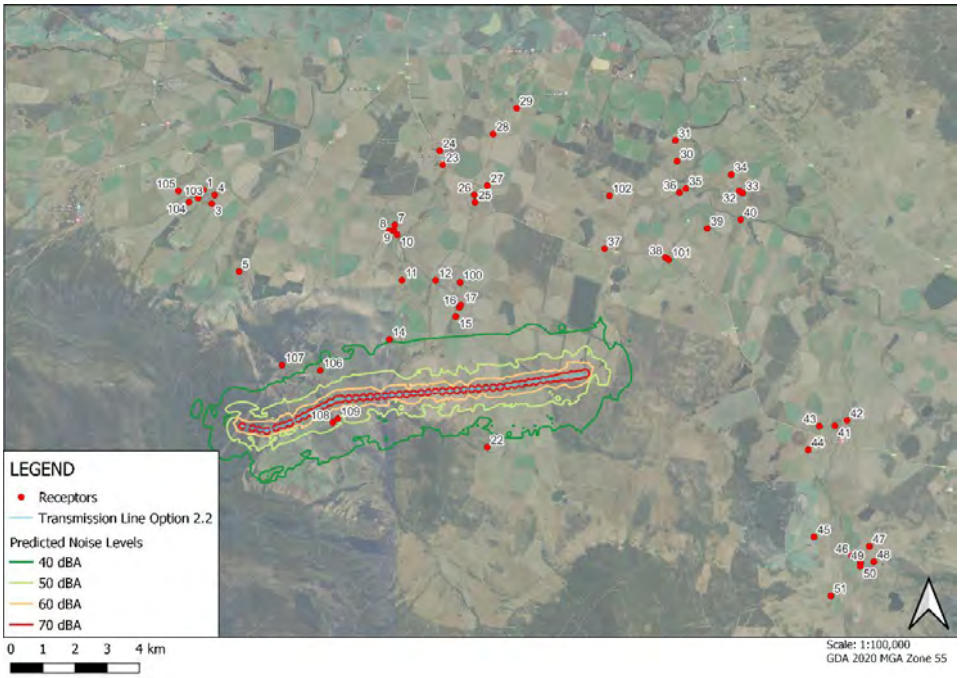


Figure 9 Construction results – Transmission Line Option 2.2



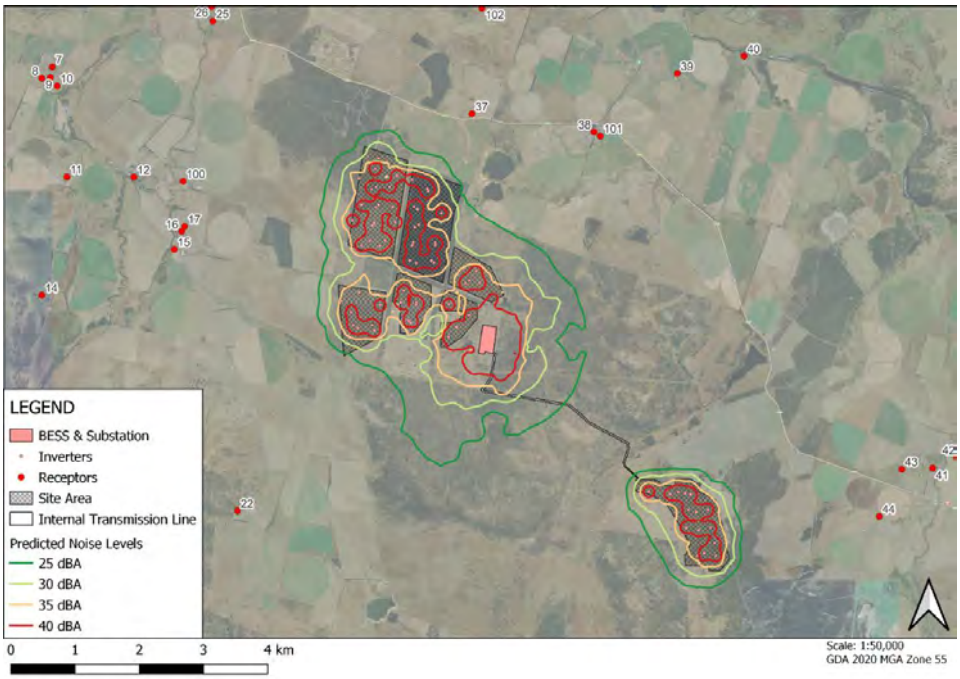
6.2 Operational Noise Results

Table 13 shows the predicted noise levels at the identified sensitive receptors compared with the night time noise goal of 35 dBA. Compliance can be achieved at all receptors without additional noise mitigation. **Figure 10** shows the predicted operational noise contours.

Table 13 Operational noise results

Scenario	Number of receptors					Noise Goal, dBA
	Less than 35 dBA	35 to 40 dBA	40 to 45 dBA	45 to 50 dBA	Above 50 dBA	
Operational noise	54	-	-	-	-	35

Figure 10 Operational noise



6.2.1 Transmission Lines – Corona Noise

Corona noise is caused by the partial breakdown of the insulation properties of air surrounding the conducting wires. It generally only occurs in humid conditions, as provided by fog or rain. A minimum line potential of 70 kV or higher is required to generate corona noise depending on the electrical design. Corona noise does not occur on domestic distribution lines.

Corona noise has two major components, a low frequency tone associated with the frequency of the AC supply (100 Hz for 50 Hz source) and broadband noise. The tonal component of the noise is related to the point along the electric waveform at which the air begins to conduct. This varies with each cycle and consequently the frequency of the emitted tone is subject to great fluctuations. Corona noise can be characterised as broadband 'crackling' or 'buzzing' and is generally only a feature during foggy or raining conditions.

SLR has previously measured corona noise at a site near Officer in outer Melbourne, Victoria. It was possible to measure corona noise at close distances, at high frequencies only, as other noise sources, namely traffic and birds, caused some interference at times. A 500 kV line was measured during damp foggy conditions.

At a distance of 30m along the ground from the line a L_{eq} noise level of approximately 44 dBA was measured. At a distance of 100m the corona noise was calculated to be approximately 39 dBA.

Based on these measurements it is noted that corona noise from the existing transmission line may be audible at the receptors in the vicinity of Palmerston Sub Station (receptors 3, 103, 104 and 105), as shown in **Figure 11**. The impact of running additional 220 kV lines (Option 1) will not significantly increase existing corona noise emissions.

Figure 11 Transmission line corona noise

The closest receptors to Option 2.1 are receptors 106 and 107, corona noise from the proposed transmission lines can potentially exceed 35 dB at those receptors under the correct conditions. Corona noise is not expected to be audible at any receptors in Option 2.2 is selected.

7 Discussion

7.1 Construction Noise

Construction of the solar farm is predicted to not adversely impact amenity of nearby sensitive receptors due to its remoteness. Piling of the solar array steel columns may be audible from the closest receptors i.e. Receptor 37 to the north, for a short period as the closest row of piles are driven.

Construction of the transmission lines will be audible from several receptors regardless of the option chosen. Option 2.2 is the least impactful as the closest no closer than 500 m to a sensitive receptor. Option 1 will impact the receptors near Palmerston substation, however the work is temporary and should be conducted outside of the prohibited hours as defined in the Act.

The Australian Standard AS2436-2010 *Guide to Noise Control on Construction, Maintenance and Demolition Sites* sets out numerous practical recommendations to assist in taking all reasonable and practicable measures to prevent or minimise noise impacts.

All construction works will be completed under a Construction Environmental Management Plan (CEMP).

Noise control strategies to be considered are listed below:

- Ensure construction works to occur outside of the prohibited hours as defined in the Act (see **Table 3** for a summary of the prohibited hours)
- Notification of receptors of the proposed works schedule and potential noise impacts and relevant contacts for queries or complaints.
- Incorporate clear signage at the site including relevant contact numbers for community enquiries.
- The lowest noise emitting plant and equipment that can economically and efficiently undertake the work should be selected where possible.
- Maintain regular maintenance of equipment to keep it in good working order and operating at the lowest feasible noise level.
- Use less intrusive broadband reversing beepers on mobile plant where possible.
- Equipment operators are to be made aware of noise impacts and techniques to minimise emissions through training/instruction, examples include:
    - Avoid dropping materials from height into bins, trucks and receptacles.
    - Operate mobile plant and power tools in a quiet, efficient manner where possible.
    - Switch plant off when not in use
- Machines/tools found to produce excessing noise compared with industry best practice should be removed from service until repairs or modification can be made, or the machine/tool is replaced.
- Where possible avoid tonal reversing/movement alarms on machinery and replace with broadband (non-tonal) alarms or ambient noise-sensing alarms.
- Use dampened bits on impulsive tools (e.g. ratchet drivers) to avoid ‘ringing’ noise.

7.2 Operational Noise

Predicted operational noise levels at all sensitive receptors are less than the night time noise goal of 35 dBA, thus compliance with the *Environment Protection Policy (Noise) 2009* can be achieved.

The operational noise assessment presented in this report is to be considered a conservative approach, i.e., inverters and battery cooling systems and HV transformers operating at 100% capacity all the time combined with atmospheric conditions favourable to noise propagation.

All plant will be reviewed during detailed design to ensure that compliance with the noise goals can be maintained through the selection of equipment and site layout.

The potential of additional transmission lines along the existing transmission easement will likely not drastically alter the existing environment.

8 Conclusions

This Noise Impact Assessment was prepared to support a Development Application of the Northern Midlands Solar Farm project at 394 Connorville Rd. This report presents background noise measurement results, noise goals, assessment methodology, results and management strategies to minimise noise impacts to sensitive receptors as far as reasonably practicable.

Construction noise impacts are considered relatively minor due to distances to sensitive receptors. Impacts are further minimised by scheduling works to day periods and a combination of training/equipment maintenance and community engagement. Noise control strategies given in **Section 7.1** should be implemented in the Construction Environmental Management Plan (CEMP).

Compliance with the relevant noise legislation is achieved at all sensitive receptors with additional mitigation. All plant will be reviewed during the detailed design stage to ensure that compliance with the noise goals is maintained as the acoustic performance of plant and site layout is refined, followed by post commissioning noise measurements to confirm compliance.

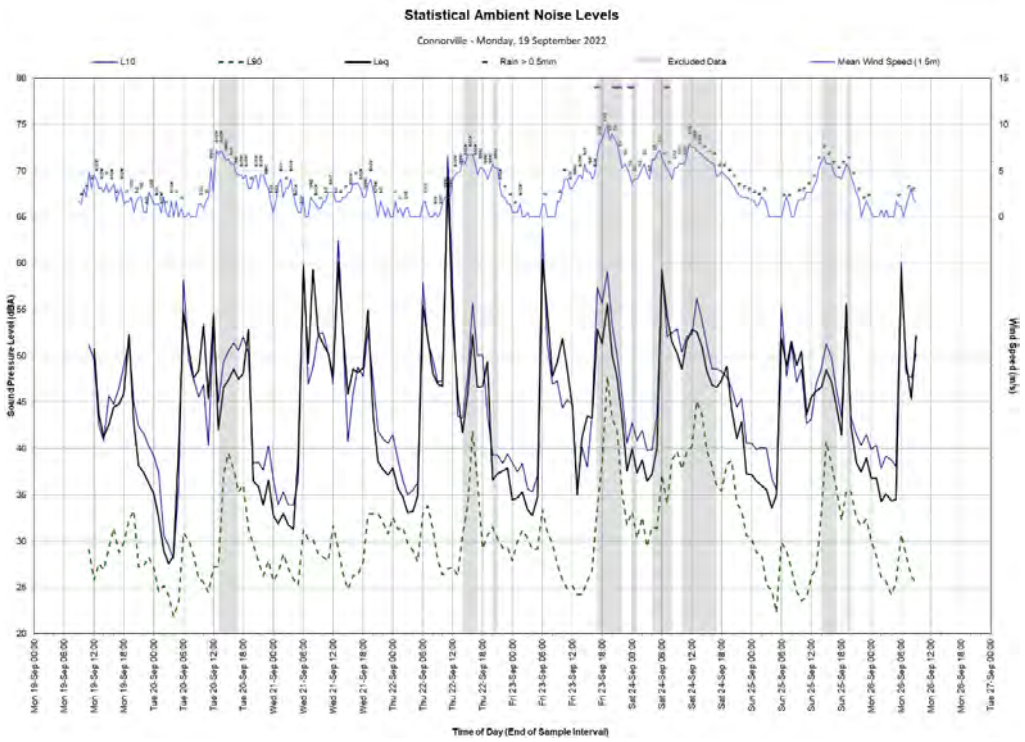
Appendix A:

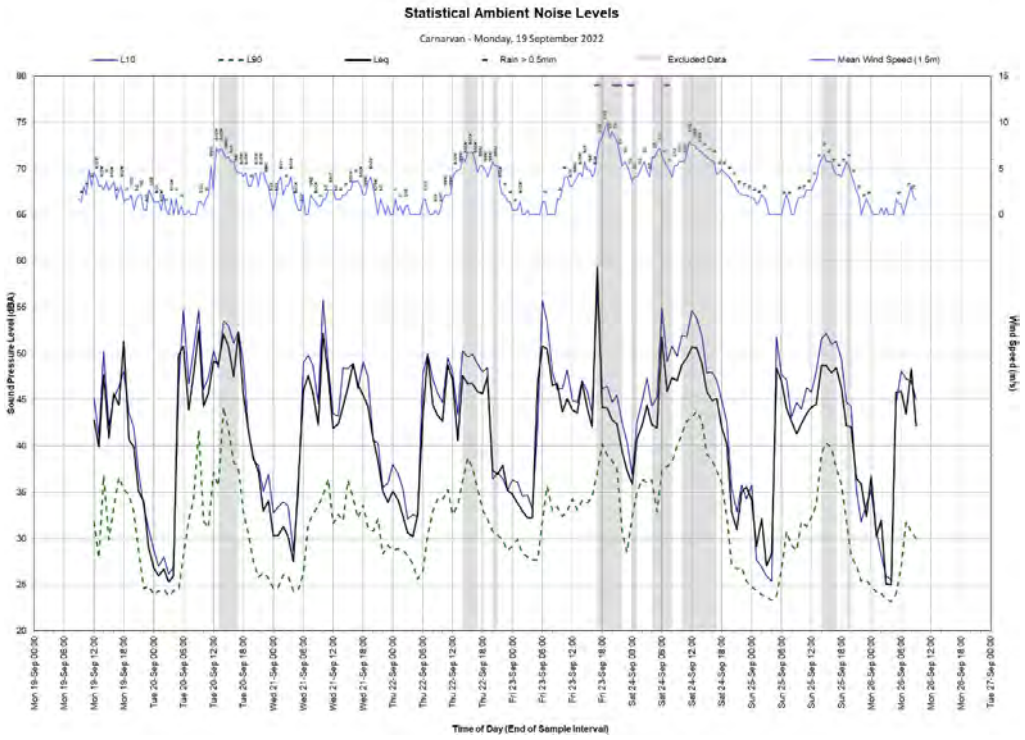
Monitoring Results

Figure 12 Connerville noise monitor

Figure 13 Carnarvon noise monitor

The following figures present detailed noise summaries showing hourly L_{Aeq}, L_{A90} and L_{A10} levels and with weather. Excluded data is highlighted with grey boxes.





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T: +65 6822 2203

www.slrconsulting.com

cogency

25 May 2023

Paul Godier
Senior Planner
Northern Midlands Council
13 Smith Street, Longford 7301
Tasmania

Our Project Ref: 2210

Dear Paul,

DEVELOPMENT APPLICATION - NORTHERN MIDLANDS SOLAR FARM

On behalf of our client, Connorville Estates Pty Ltd c/o Robert Luxmoore Project Management Pty Ltd, we are pleased to submit this Discretionary Development Application (DA) for the Northern Midlands Solar Farm proposal. The DA package outlines the anticipated use and development of land for an approximately 288 MW large-scale solar energy installation and associated infrastructure, on private land known as Connorville Station in Cressy, Tasmania.

The Northern Midlands Solar Farm represents the next generation of renewable energy development in Tasmania, and the proponent supports the vision for Tasmania's Renewable Energy future and the 2040 Renewable Energy Target of 200% renewable generation. Developing solar power generation in the Northern Midlands region is an important step to increasing reliable and affordable power, and to ensuring growth in Tasmania's economy through investment and job creation. The proponent's commitment to the development of this long-term solar energy asset would result in positive outcomes for the local community and wider Tasmania.

The proposed solar farm and associated infrastructure are defined as 'Utilities' under the Norther Midlands Planning Scheme and require a planning permit. The following DA triggers apply to the proposal, with reliance upon some Performance Criteria among the Use and Development Standards:

- Clause 21.2 Use Table: Discretionary Use Class (Agriculture Zone)
- Clause 26.2 Use Table: Permitted Use Class (Utilities Zone – Palmerston Substation)
- Clause C2.0 Parking and sustainable transport
- Clause C3.0 Road and railway assets
- Clause C4.0 Electricity transmission infrastructure protection
- Clause C6.0 Local heritage place
- Clause 7.0 Natural assets (Waterway and coastal protection area only)
- Clause C12.0 Flood-prone areas
- Clause C13.0 Bushfire-prone areas

To support Council's assessment of the DA, please find enclosed with this application the following documents:

- Application form, signed
- Planning Report, Cogency Australia
- Details of Certificates of Title (Appendix A)
- Site Layout, Cogency Australia (Appendix B)
- Design Plans, Entura, FTC and DNV (Appendix C)
- Bushfire Impact Statement, Groundproof Mapping (Appendix D)
- Landscape and Visual Impact Assessment, Moir Landscape Architecture (Appendix E)
- Socio-Economic Assessment, Urban Enterprise (Appendix F)

- Community & Stakeholder Engagement Summary Report, Cogency Australia (Appendix G)
- Traffic Impact Assessment, Pitt&Sherry (Appendix H)
- Agricultural Assessment, Ag-Challenge (Appendix I)
- Aboriginal Cultural Heritage Assessment, CHMA (Appendix J)
- Historic Heritage Assessment, CHMA (Appendix K)
- Flora and Fauna Assessment, Nature Advisory (Appendix L)
- Flooding Impact Assessment, Pitt&Sherry (Appendix M)
- Acid Sulfate Soil Investigation, Pitt&Sherry (Appendix N)
- Noise Impact Assessment, SLR Consulting (Appendix O)

The proposal has been rigorously assessed and the potential impacts evaluated. Based on the technical impact assessments, the proposal is not expected to generate any unreasonable or significant environmental or community impacts. Conversely, the proposal supports significant economic development for the region and contributes to Tasmania's legislated renewable energy generation target. This site is ideally suited to a solar farm and associated infrastructure development, as it is well-concealed from public view, benefits from existing infrastructure in the region, and is a significant distance from sensitive receptors. Native vegetation removal has primarily been avoided and impacts to natural values minimised where possible. The sites of Aboriginal cultural heritage significance will not be disturbed, and agricultural activities ('Agrisolar' sheep grazing) will continue in conjunction with the operation of the solar farm. The proposed 220 kV transmission connection to Palmerston Substation, running alongside the existing 110 kV line, is compatible with the existing energy production infrastructure present within the landscape.

For the reasons outlined above and in the enclosed Planning Report, it is considered that the proposal warrants planning approval. Furthermore, please note that all landowners have been notified of this proposal and DA.

Please refer to the Planning Report and accompanying technical assessments for further information. Should you have any questions, please do not hesitate to contact me on 0400 797 106 or at rebecca@cogencyaustralia.com.au.

Thank you for your consideration of this matter and we look forward to receiving a response.

Yours Sincerely,

Rebecca Wardle

Rebecca Wardle
Director and Co-Founder
Cogency Australia

NORTHERN
MIDLANDS
COUNCIL

13 Smith Street / PO Box 156
Longford Tas 7301

PLANNING APPLICATION

Phone: 6397 7303
E-mail: planning@nmc.tas.gov.au

PLANNING APPLICATION

Proposal

Description of proposal: The Proposal is for a large-scale solar energy installation and associated infrastructure, defined as 'Utilities' in the Northern Midlands Planning Scheme. The associated infrastructure includes a new 220 kV transmission line, an internal 33 kV line, a battery energy storage system (BESS), inverters, access roads, among others.

Please refer to the enclosed Planning Report for a full description of the Proposal, the definitions, and the permit triggers against the Northern Midlands Planning Scheme.

……

……

……

(attach additional sheets if necessary)

If applying for a subdivision which creates a new road, please supply three proposed names for the road, in order of preference:

1…… 2…… 3……..

***Site address**: 'Connorville Station', 394 Connorville Road, Cressy, 7302 Tasmania*……

……..

CT no: See attached list of Certificates of Title……

Estimated cost of project *Greater than $10 million*……*

**Estimation of capital costs covering all components are difficult to estimate for a proposal of this scale*

(include cost of landscaping, car parks etc for commercial/ industrial uses)

Are there any existing buildings on this property? ***Yes*** */ No*

If yes – main building is used as …The Connorville Station buildings are located outside of the proposed Development Area……..

If variation to Planning Scheme provisions requested, justification to be provided:

…N/A……..

……..

……..

……..

……..

(attach additional sheets if necessary)

Is any signage required? …N/A……..

(if yes, provide details)

PLANNING APPLICATION

Applicant / owner details

Applicant: Rebecca Wardle, Director, Cogency Australia Pty Ltd……

Signature of Applicant: ….. Rebecca Wardle ……**Date:** 25 May 2023……..

Applicant's Details:

Postal address: 61 Bangalore Street, Kensington VIC 3031……

……

Phone: 0400 797 106…… Mobile: 0400 797 106……..

E-mail: rebecca@cogencyaustralia.com.au……

☑ I agree to receive communication regarding this application via email (please tick)

Name of Owner/s of subject site: Connorville Estates Pty Ltd……..
(as per certificate of title)

*(If the subject site is Crown land, owned by the Council or administered by the Council or the Crown, the application must be signed by **either** the responsible Minister of the Crown (or the Minister's delegate) **or** by the General Manager of the Council, **and** must be accompanied by written permission of that Minister or general manger to the making of the application.)*
*If the proposal involves works to an existing access or a new access the application must be signed by **either** the responsible Minister of the Crown (or the Minister's delegate) **or** by the General Manager of the Council **and** must be accompanied by the written permission of that Minister or general manager to the making of the application.*

Owner's postal address: 394 Connorville Road, Cressy, 7302 Tasmania ……

Owner's email address: roderic@connorville.com.au……

As the owner of the land, I consent to the application being submitted,

Signed: ……**Date**: ……

OR

As the applicant, I declare that I have notified the owner of the application

Signed: … Rebecca Wardle ……**Date**: 25 May 2023…….

Right of Way:
If the subject site is accessed via a right of way, the owner of the ROW must also be notified of the application.

Name of Owner/s of ROW: ……

ROW Owner's Postal Address: ……
As the applicant, I have notified the owner of the ROW of the application

Signed: ……**Date**: ……
(attach extra page if required)

Office use only:

Paid $…… Date: …… Receipt No: …… (Code 01)

Ref: **P1**……**/** …… Discretionary / Permitted / No Permit Required

Attachments:

☑ **Site plan** *(A4 or A3) showing:*
- new buildings, works and alterations
- north point, relative site and floor levels
- lot boundaries, contours, road frontages, rights of way, easements and any services over the land
- location of any existing buildings or structures on the land or adjoining lots
- existing natural features such as trees, watercourses etc
- items to be demolished, areas to be cut and filled
- vehicle access points to roads and provisions for car parking & manoeuvring
- provision of open space, including gradients, dimensions, access and adjoining open spaces
- provisions for drainage
- a completed environmental supplement for commercial or industrial developments

☑ **Adequate information to fully explain proposal, its intent, compatibility with environs & justification for any variation of Scheme provisions**

☑ **Locality plan showing:**
- nearby streets
- nearby buildings & features

☑ **Landscape plans & elevations** *(A4 or A3) showing:*
- existing vegetation
- proposed plantings
- trees to be removed or land clearing and measures to prevent site soil erosion / pollution

☑ **Proposal plans/drawings** *(A4 or A3) showing:*
- floor plan (inc area in m^2)
- building elevations (inc heights of building)
- external materials and proposed colour scheme
- type and colour and construction materials on all external surfaces
- details of external lighting including the location, direction and strengths of external lights and proposed baffle devices
- details of signage required

☑ **Consent of the property owner;**

☑ **Copy of title plan & easements** (available from Service Tas)

☑ **Other reports** (eg engineering)

☑ **Fees**

Application fees are based on estimates provided by the applicant when the planning application is made – an adjustment may be levied when a project cost is provided at building application stage.

Applications may be emailed to Planning@nmc.tas.gov.au, and application fees may be paid over the phone to Council's receptionist.

PRIVACY STATEMENT

The Northern Midlands Council abides by the *Personal Information Protection Act 2004* and views the protection of your privacy as an integral part of its commitment towards complete accountability and integrity in all its activities and programs.

Collection of Personal Information: The personal information being collected from you for the purposes of the *Personal Information Protection Act, 2004* and will be used solely by Council in accordance with its Privacy Policy. Council is collecting this information from you in order to process your application.

Disclosure of Personal Information: Council will take all necessary measures to prevent unauthorised access to or disclosure of your personal information. External organisations to whom this personal information will be disclosed as required under the *Building Act 2016*. This information will not be disclosed to any other external agencies unless required or authorised by law.

Correction of Personal Information: If you wish to alter any personal information you have supplied to Council please telephone the Northern Midlands Council on (03) 6397 7303. Please contact the Council's Privacy Officer on (03) 6397 7303 if you have any other enquires concerning Council's privacy procedures.

NORTHERN
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(attach additional sheets if necessary)

If applying for a subdivision which creates a new road, please supply three proposed names for the road, in order of preference:

1…… 2…… 3……..

***Site address**: 'Connorville Station', 394 Connorville Road, Cressy, 7302 Tasmania*……

(includes Council road reserves - Macquarie Rd, Billopp Rd)……..

CT no: See attached list of Certificates of Title……

Estimated cost of project *Greater than $10 million*……*

**Estimation of capital costs covering all components are difficult to estimate for a proposal of this scale*

(include cost of landscaping, car parks etc for commercial/ industrial uses)

Are there any existing buildings on this property? ***Yes*** */ No*

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(attach additional sheets if necessary)

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(if yes, provide details)

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Signature of Applicant: ……**Date:** 25 May 2023……..

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Postal address: 61 Bangalore Street, Kensington VIC 3031……

Phone: 0400 797 106…… Mobile: 0400 797 106……..

E-mail: rebecca@cogencyaustralia.com.au……

☑ I agree to receive communication regarding this application via email (please tick)

Name of Owner/s of subject site: Northern Midlands Council (road reserves), & Connorville Estates Pty Ltd.

*(If the subject site is Crown land, owned by the Council or administered by the Council or the Crown, the application must be signed by **either** the responsible Minister of the Crown (or the Minister's delegate) **or** by the General Manager of the Council, **and** must be accompanied by written permission of that Minister or general manger to the making of the application.)*
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Owner's postal address: 394 Connorville Road, Cressy, 7302 Tasmania ……

Owner's email address: roderic@connorville.com.au……..

As the owner of the land, I consent to the application being submitted,

As Crown Delegate,
Department of State Growth **Signed**: ……**Date**: ……

OR

As the applicant, I declare that I have notified the owner of the application

Signed: ……**Date**: ……

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Attachment to Development Application Form – Site Title Details

Connorville Station (Energy installation & Transmission)

Detail			
Location	394 Connorville Road, Cressy, 7302 Tasmania		
Certificates of title	*Title ID*	*Council Property ID:*	*Easements / Restrictions?*
	132 520 /1	675 14 89	Yes – listed in folio text
	145 787 /1	268 01 18	Yes – listed in folio text
	145 788 /1	268 01 34	Yes – listed in folio text
	97 / 24 DO	*General Law* 675 14 70	No
	133 307 /1	675 14 70 (Transmission line only)	Yes – listed in folio text

Access Tracks

Address	Council Property ID	Title Detail	Easements / Restrictions?
Lot 1 Macquarie Road, Campbell Town TAS 7210	2680126	145786/3	Yes – listed in folio text and schedule enclosed
'Tier View' – 3504 Macquarie Rd Cressy TAS 7302	6751534	101914/1	Yes – listed in folio text, plus Part 5 Agreements enclosed
Macquarie Road, Cressy TAS 7302	6751518	31760/1	No
'Pisa' - 3979 Macquarie Road, Cressy TAS 7302	6751462	165632/1	Yes – listed in folio text

220 kV Transmission Line (Linear route) and Palmerston Substation

Address	Council Property ID	Title Detail	Easements / Restrictions?
543 Lake River Road, Cressy TAS 7302	1499659	137968/1	Yes – listed in folio text
'Park nook' 543 Lake River Road, Cressy TAS 7302	6752932	138284/1	Yes – listed in folio text
Near 543 Lake River Road (LGA Subdivision Road)	0	110322/2	Yes – listed in folio text
543 Lake River RD Cressy TAS 7302	1499659	110322/1	Yes (schedule enclosed)
Lake River RD Cressy TAS 7302	1694745	103677/2	Yes – listed in folio text
'Rock Thorpe' – 318 Lake River Road, Cressy TAS	6752924	204030/1	Yes – listed in folio text
4792 Poatina Road, Cressy TAS 7302	3300690	126579/3	Yes – listed in folio text
5000 Poatina RD Cressy TAS 7302	3300682	125220/1	Yes (listed in folio text)
'Woodside' 4740 Poatina Road, Cressy TAS 7302	6753425	126579/2	Yes – listed in folio text
'Palmerston Transend SUB STN' - 4554 Poatina Rd Cressy TAS 7302	6753097	142369/1	Yes – listed in folio text
'Palmerston Transend SUB STN' - 4554 Poatina Rd Cressy TAS 7302	6753097	142369/3	Yes – listed in folio text

Road Reserves (access points construction)

Road	Owner/Manager
Macquarie Road	Northern Midlands Council
Lake River Road	Northern Midlands Council
Billopp Road	Northern Midlands Council
Poatina Road	**Department of State Growth**

Department of State Growth

Salamanca Building Parliament Square
4 Salamanca Place, Hobart TAS
GPO Box 536, Hobart TAS 7001 Australia
Email permits@stategrowth.tas.gov.au Web www.stategrowth.tas.gov.au
Ref: SRA-23-594

Tasmanian Government

Billy Greenham
On behalf of Connorville Estates Pty Ltd
By email: billy@cogencyaustralia.com.au

Dear Billy

Crown Landowner Consent Granted – 394 Connorville Road (Poatina Main Road), Cressy

I refer to your recent request for Crown landowner consent relating to the development application at 394 Connorville Road (Poatina Main Road), Cressy for construction of transmission line.

I, Vincent Tang, Director Asset Management, the Department of State Growth, having been duly delegated by the Minister under section 52 (1F) of the *Land Use Planning and Approvals Act 1993* (the Act), and in accordance with the provisions of section 52 (1B) (b) of the Act, hereby give my consent to the making of the application, insofar as it affects the State road network and any Crown land under the jurisdiction of this Department.

The consent given by this letter is for the making of the application only insofar as that it impacts Department of State Growth administered Crown land and is with reference to your application dated 29 August 2023, and the approved documents, as accessible via the link below:

https://files.stategrowth.tas.gov.au/index.php/s/49bND63mIHjYjRx

A copy of the Instrument of Delegation from the Minister authorising the delegate to sign under section 52 of the Act can also be accessed via the above link.

Please access and download these documents for your records as soon as possible as this link will expire six months from the date of this letter.

In giving consent to lodge the subject development application, the Department notes the following applicable advice:

> The Department notes that the applicant is not clear on the potential needs for Oversize / Overmass (OSOM) transport of project items, however in section 9.4 it is recognised that transport approvals will need to be obtained separately if this activity is required.
>
> If OSOM activity is likely to be involved, the Department encourages the applicant to make contact at an early stage so that this detail can be assessed.
>
> Early involvement is extremely important in the event of road infrastructure upgrades being required to cater for the activity, so that the necessary time for planning, obtaining funding and completing the road infrastructure upgrade does not impact project development timeframes.
>
> Contact details: hvaccess@stategrowth.tas.gov.au Phone: 03 6166 3258

The Department reserves the right to make a representation to the relevant Council in relation to any aspect of the proposed development relating to its road network and/or property.

Yours sincerely

Fiona McLeod
DIRECTOR ASSET MANAGEMENT

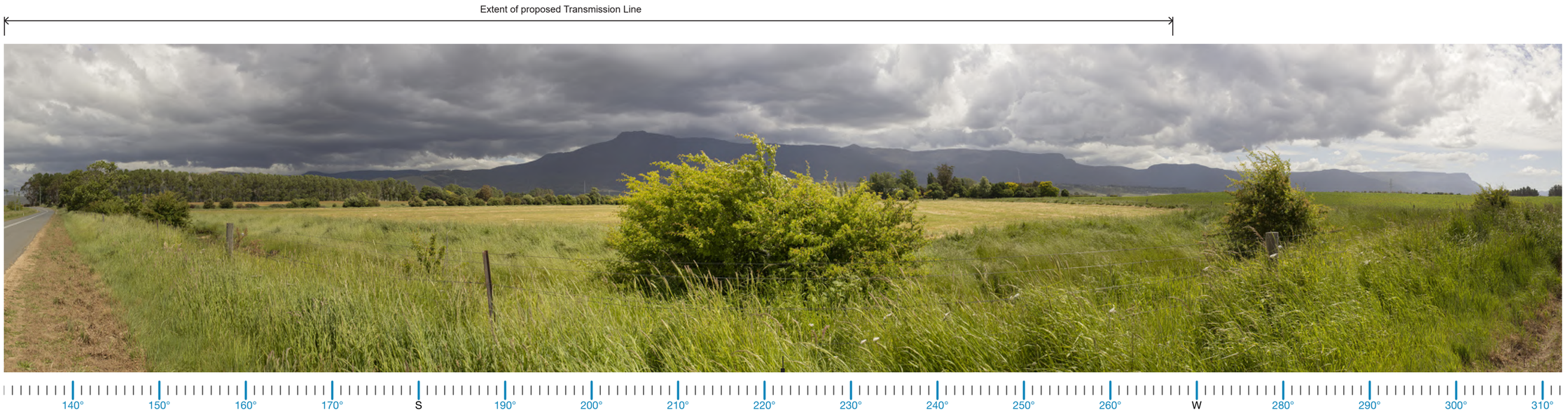
Delegate of
Minister for Infrastructure and Transport
Michael Ferguson MP

11 October 2023

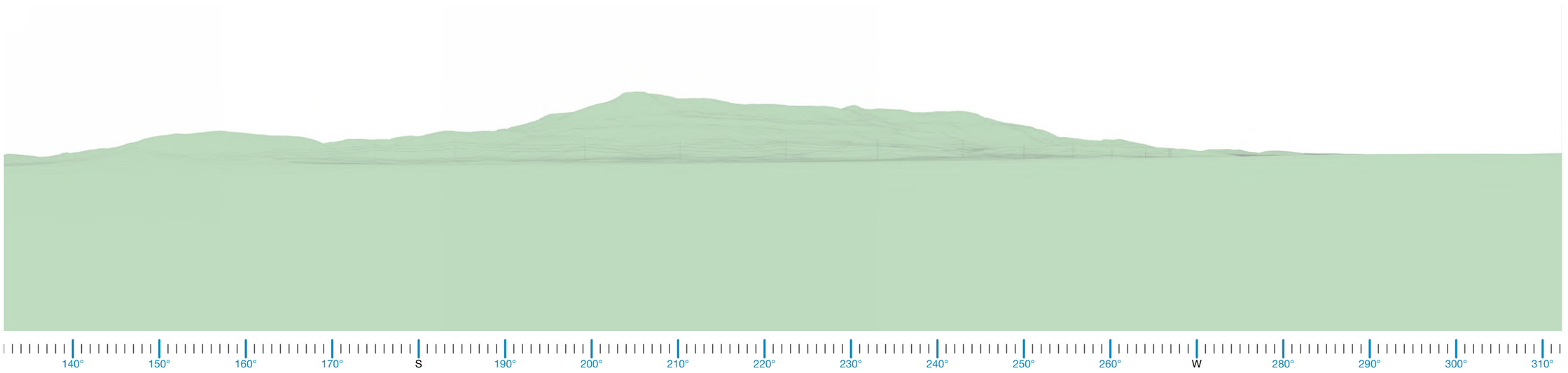
cc: General Manager, Northern Midlands Council

Photomontage 06 Poatina Road, Cressy

Existing view - 180° Baseline panorama



Proposed view - 180° Photomontage



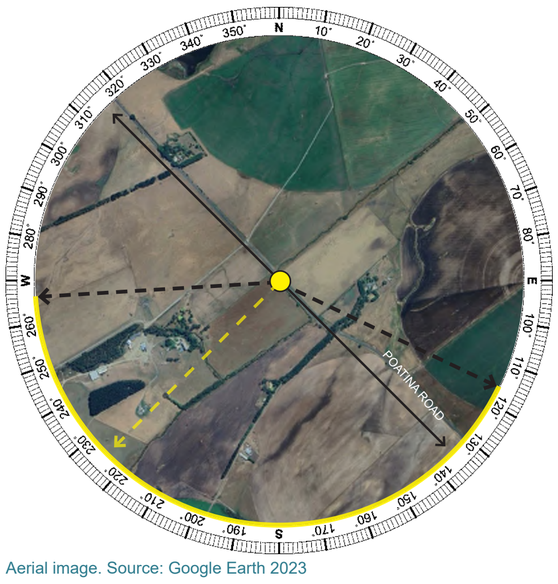
Proposed view - 180° Wireframe

LEGEND

Viewing direction and centre of panorama

Extent of panorama

Extent of visible transmission line
(based on topography alone)



Aerial image. Source: Google Earth 2023

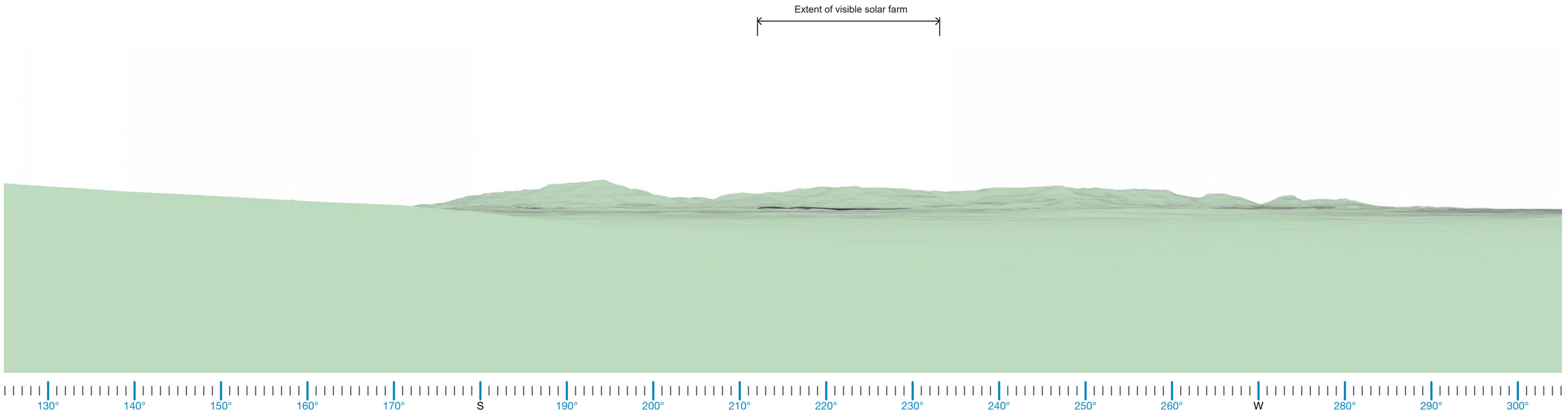
Photomontage 04 NVMP31

Location:
Poatina Road, Cressy
Photograph Date and Time:
7th December 2022 02:45pm
Coordinates:
41°47'11.49"S 147°00'37.96"E
Distance to Nearest Solar Panel:
0.88 km (Transmission)
Viewing Direction:
Southwest
Elevation:
166m

Photomontage 01 Mount Joy Road, Cressy

Existing view - 180° Baseline panorama

Proposed view - 180° Photomontage



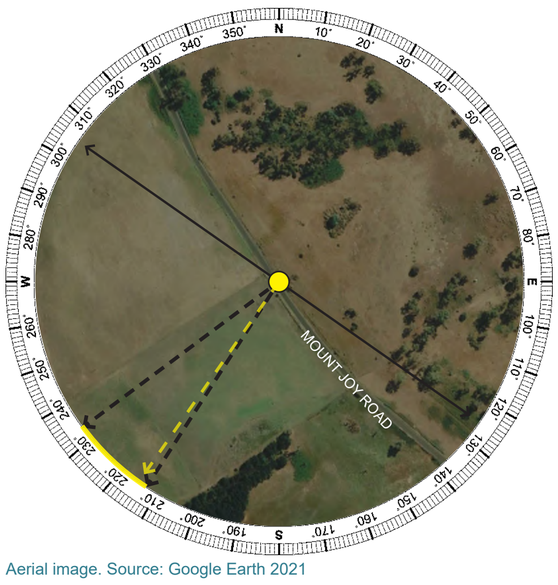
Proposed view - 180° Wireframe

LEGEND

Viewing direction and centre of panorama

Extent of panorama

Extent of solar farm
(based on topography alone)



Aerial image. Source: Google Earth 2021

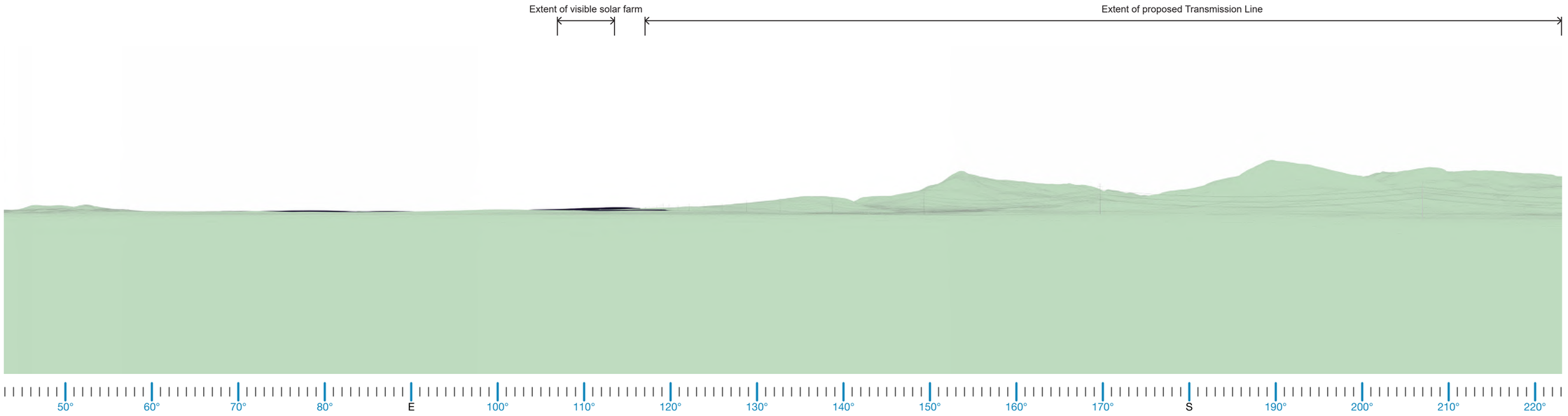
Photomontage 01 NVMP01

Location:
Mount Joy Road, Cressy
Photograph Date and Time:
6th December 2022 04:36pm
Coordinates:
41° 46'01.05"S 147°12'46.87"E
Distance to Nearest Solar Panel:
7.28 km
Viewing Direction:
Southwest
Elevation:
185m

Photomontage 02 Connorville Road, Cressy

Existing view - 180° Baseline panorama

Proposed view - 180° Photomontage



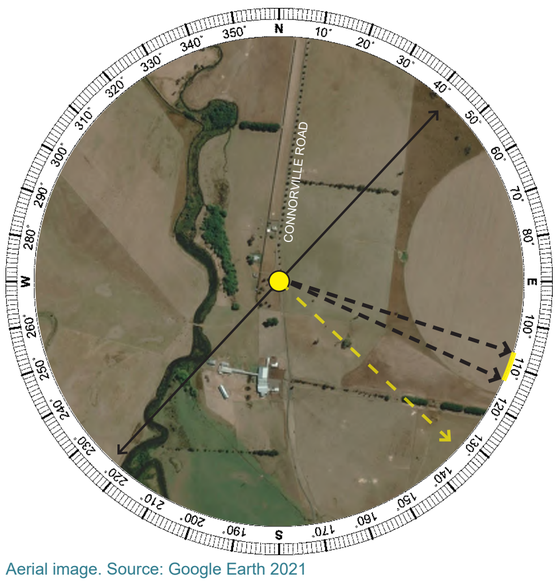
Proposed view - 180° Wireframe

LEGEND

Viewing direction and centre of panorama

Extent of panorama

Extent of solar farm
(based on topography alone)



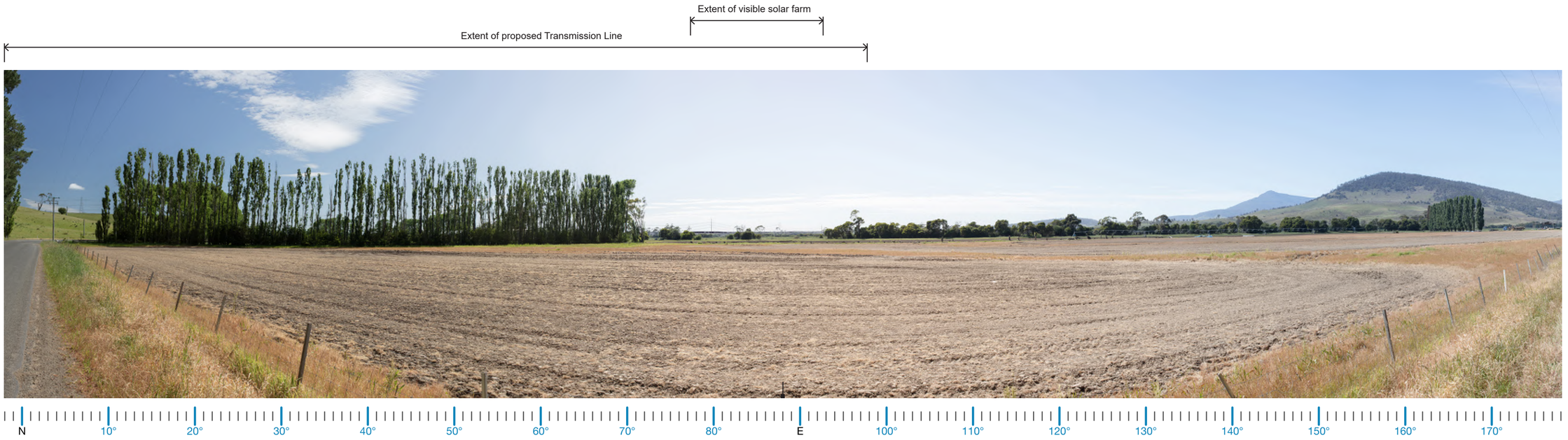
Aerial image. Source: Google Earth 2021

Photomontage 02 NVMP21

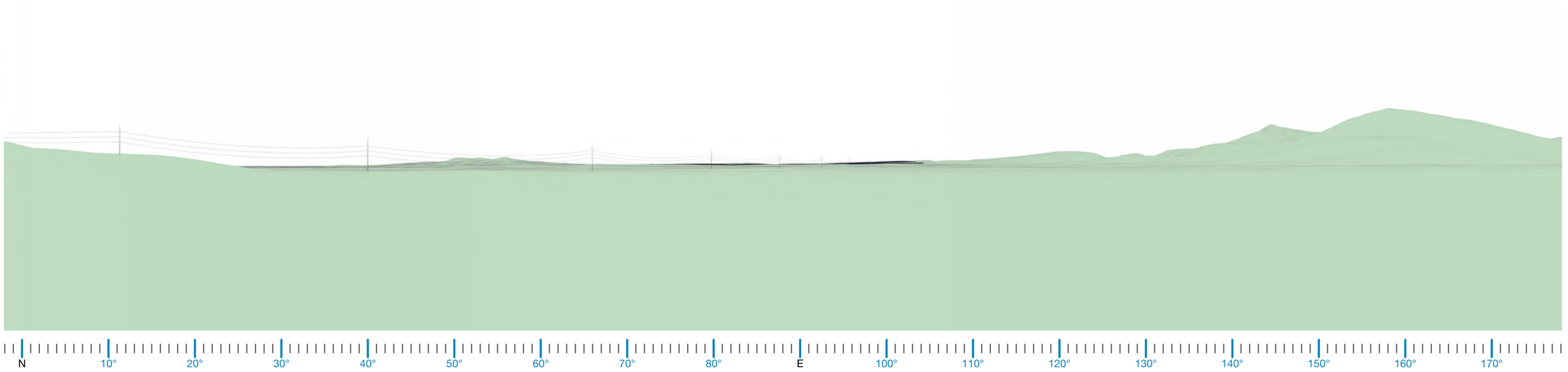
Location:
Connorville Road, Cressy
Photograph Date and Time:
7th December 2022 11:30am
Coordinates:
41° 49'19.68"S 147°6'8.81"E
Distance to Nearest Solar Panel:
2.50 km (Solar Farm) - 0.50 km (Transmission)
Viewing Direction:
Southeast
Elevation:
172m

Photomontage 03 Lake River Road, Cressy

Existing view - 180° Baseline panorama



Proposed view - 180° Photomontage



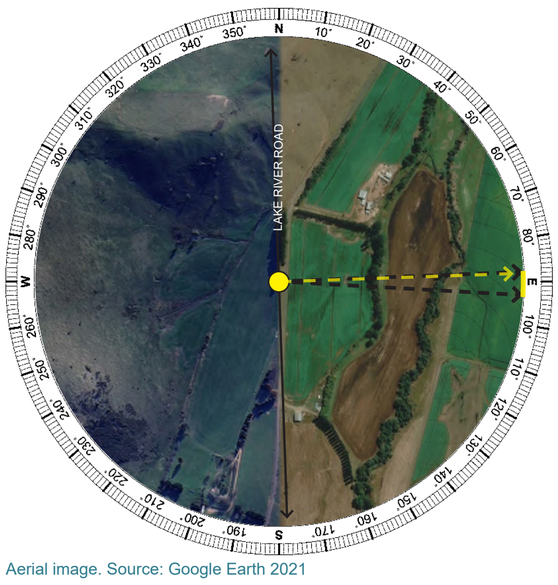
Proposed view - 180° Wireframe

LEGEND

Viewing direction and centre of panorama

Extent of panorama

Extent of solar farm
(based on topography alone)



Aerial image. Source: Google Earth 2021

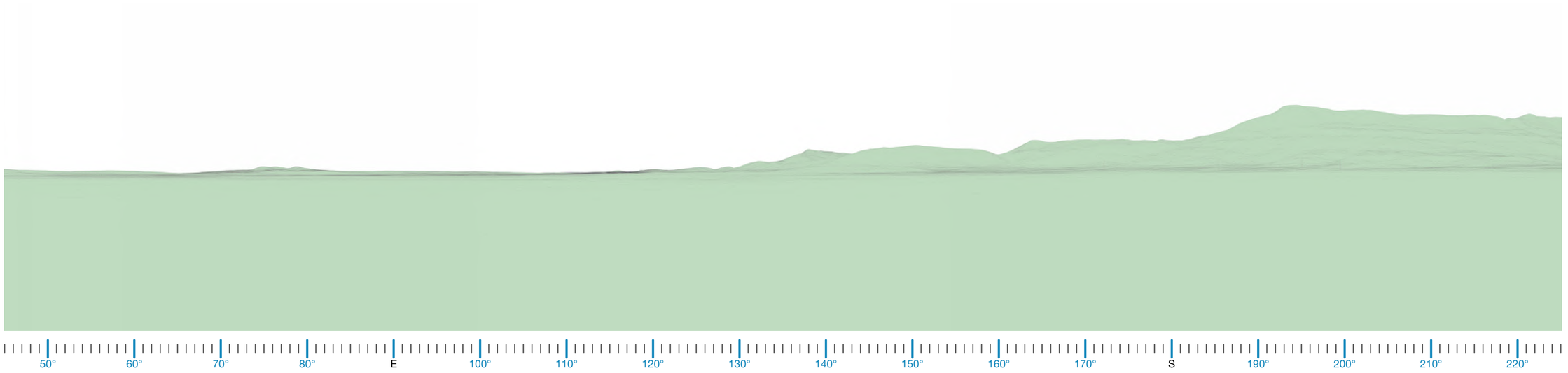
Photomontage 03 NVMP15

Location:
Lake River Road, Cressy
Photograph Date and Time:
7th December 2022 10:00am
Coordinates:
41°49’32.46”S 147°4’40.32”E
Distance to Nearest Solar Panel:
4.50 km (Solar Farm) - 0.45 km (Transmission)
Viewing Direction:
East
Elevation:
176m

Photomontage 04 Poatina Road, Cressy

Existing view - 180° Baseline panorama

Proposed view - 180° Photomontage



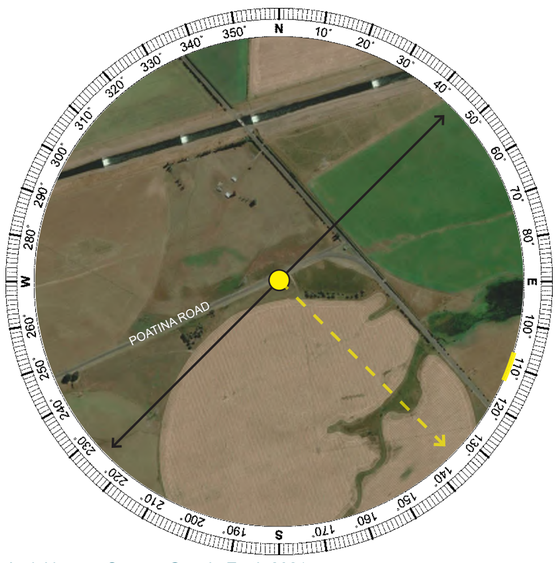
Proposed view - 180° Wireframe

LEGEND

Viewing direction and centre of panorama

Extent of panorama

Extent of solar farm
(based on topography alone)



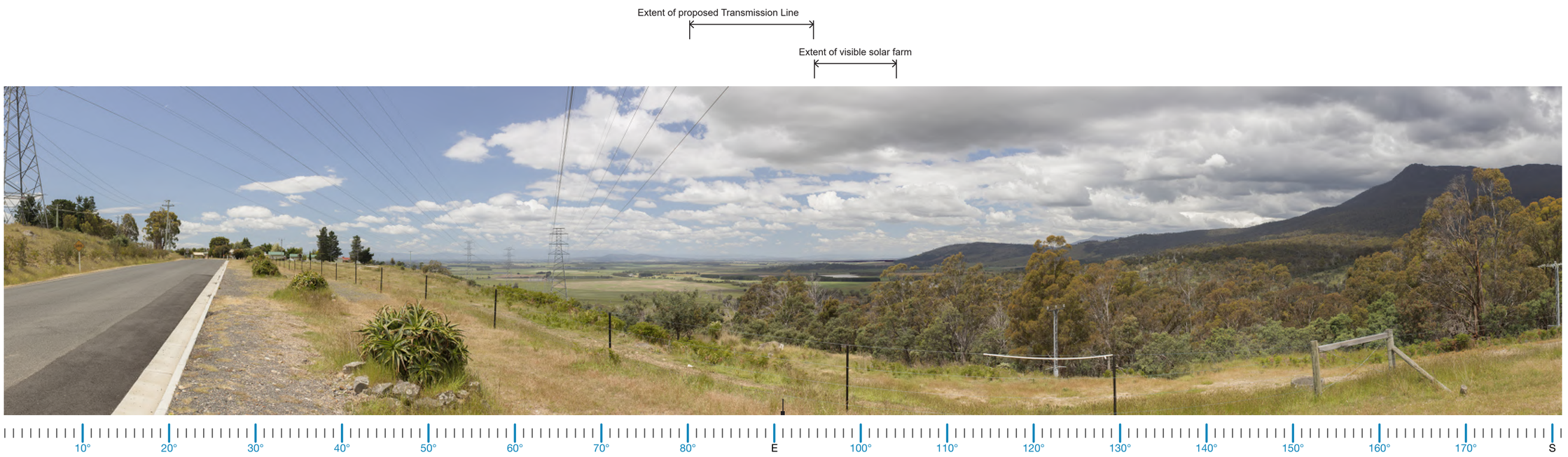
Aerial image. Source: Google Earth 2021

Photomontage 04 NVMP31

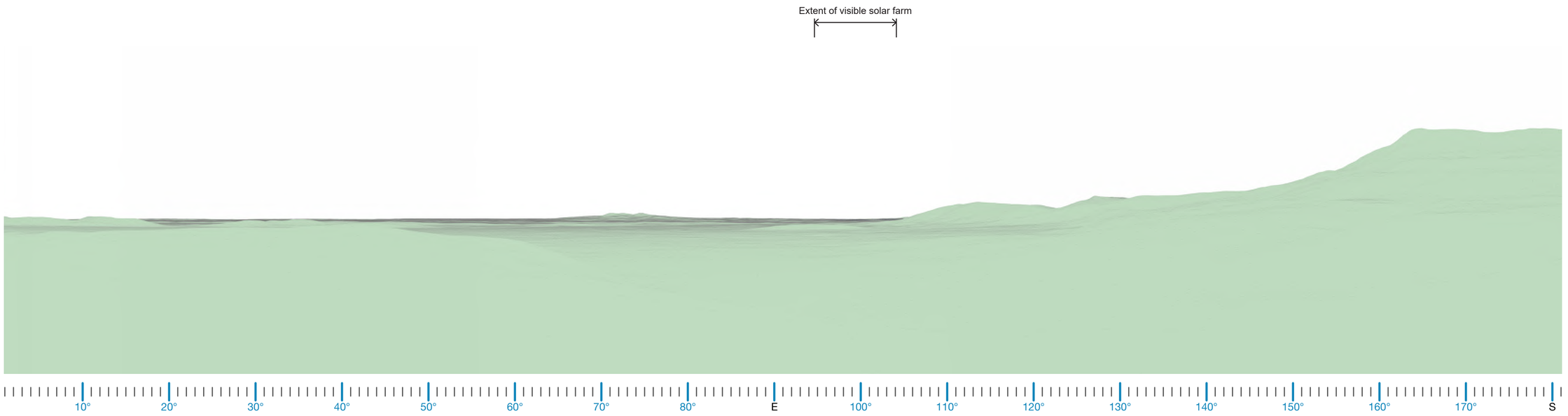
Location:
Poatina Road, Cressy
Photograph Date and Time:
7th December 2022 02:39pm
Coordinates:
41° 46'38.92"S 146°59'48.40"E
Distance to Nearest Solar Panel:
1.15 km (Transmission)
Viewing Direction:
Southeast
Elevation:
171m

Photomontage 05 Gordon Road, Poatina

Existing view - 180° Baseline panorama



Proposed view - 180° Photomontage



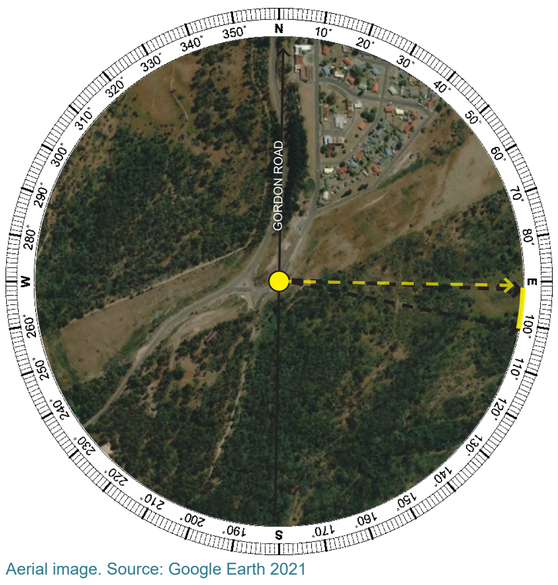
Proposed view - 180° Wireframe

LEGEND

Viewing direction and centre of panorama

Extent of panorama

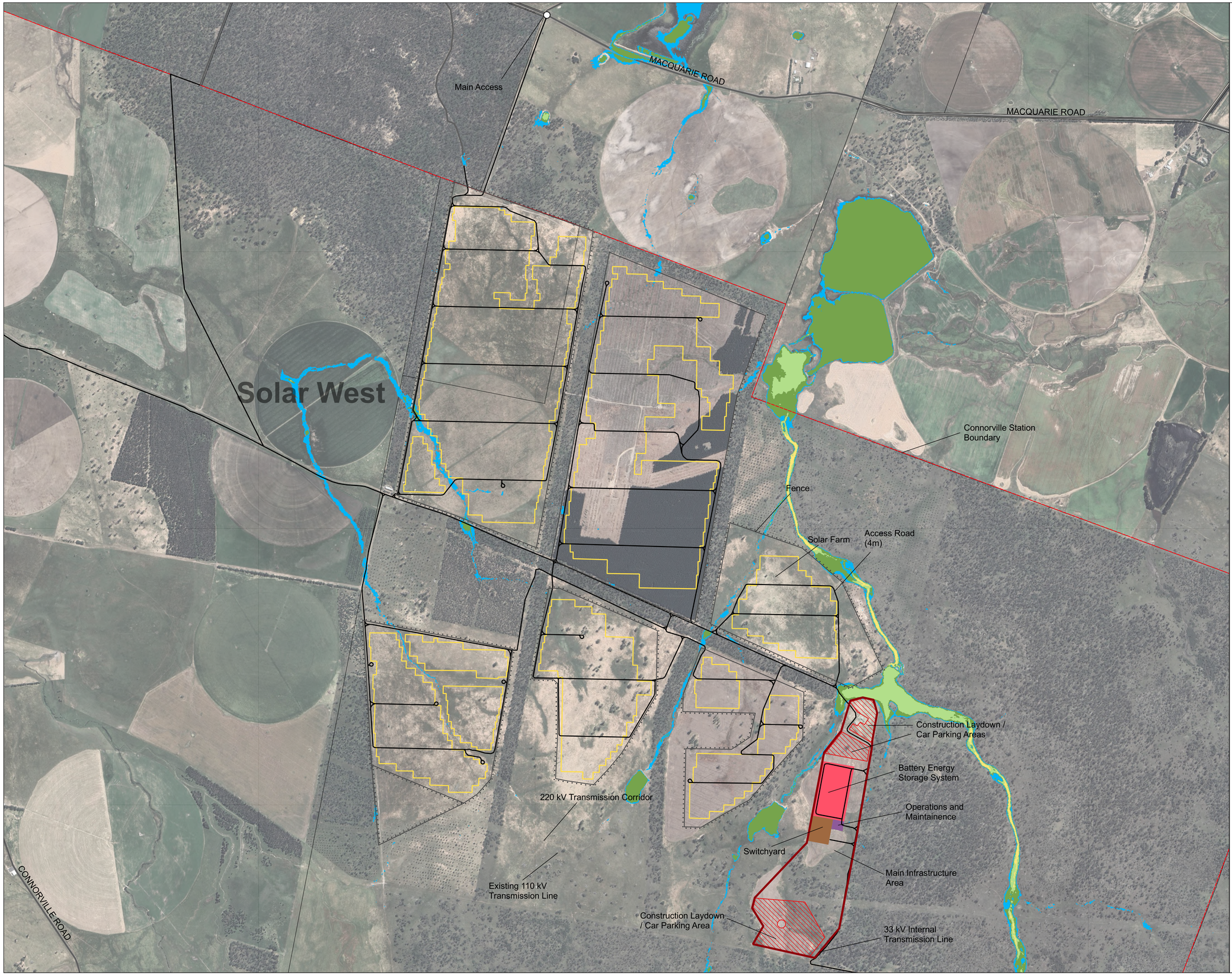
Extent of solar farm
(based on topography alone)



Aerial image. Source: Google Earth 2021

Photomontage 05 NVMP28

Location:
Gordon Road, Poatina
Photograph Date and Time:
7th December 2022 02:08pm
Coordinates:
41°47'57.69"S 146°57'30.10"E
Distance to Nearest Solar Panel:
2.91 km (Transmission)
Viewing Direction:
East
Elevation:
312m



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ROBERT LUXMOORE
Project Management

Masterplan Page 4 West Area (Hydrology Overlay)

2210 - Northern Midlands Solar Farm

Existing Features
- Parcels
- Existing Road
- 110 kV Transmission Line

Cultural Heritage Sites
- Artefact Scatter
- Isolated Artefact

Proposed Development
- Connorville Station
- Access Road
- Solar Farm
- Main Infrastructure Area
- Battery Energy Storage System
- Operations and Maintainence
- Switchyard
- Construction Laydown / Car Parking Area
- 220 kV Transmission Corridor
- 33 kV Internal Tranmission Line
- Fence
- Main Access Point
- Secondary/Emergency Access Point

Solar West 1% AEP Peak Hazard
- H2
- H3
- H4
- H5
- H6

Version: 1.0

Date: 14/09/2023

0 100 200 m

1:8,000 at A1

Main Access

110 kV Transmission Line

MACQUARIE ROAD

Connorville Station Boundary

Solar East

33 kV Internal Transmission Line

Switchyard

Fence

Construction Laydown / Car Parking Areas

Access Road (4m)

Solar Farm

cogency

ROBERT LUXMOORE Project Management

Masterplan Page 5 East Area (Hydrology Overlay)

2210 - Northern Midlands Solar Farm

Existing Features
- Parcels
- Existing Road
- 110 kV Transmission Line

Proposed Development
- Connorville Station
- Access Road
- Solar Farm
- Swtichyard
- 33 kV Internal Tranmission Line
- Construction Laydown / Car Parking Area
- Fence
- Main Access Point
- Secondary/Emergency Access Point

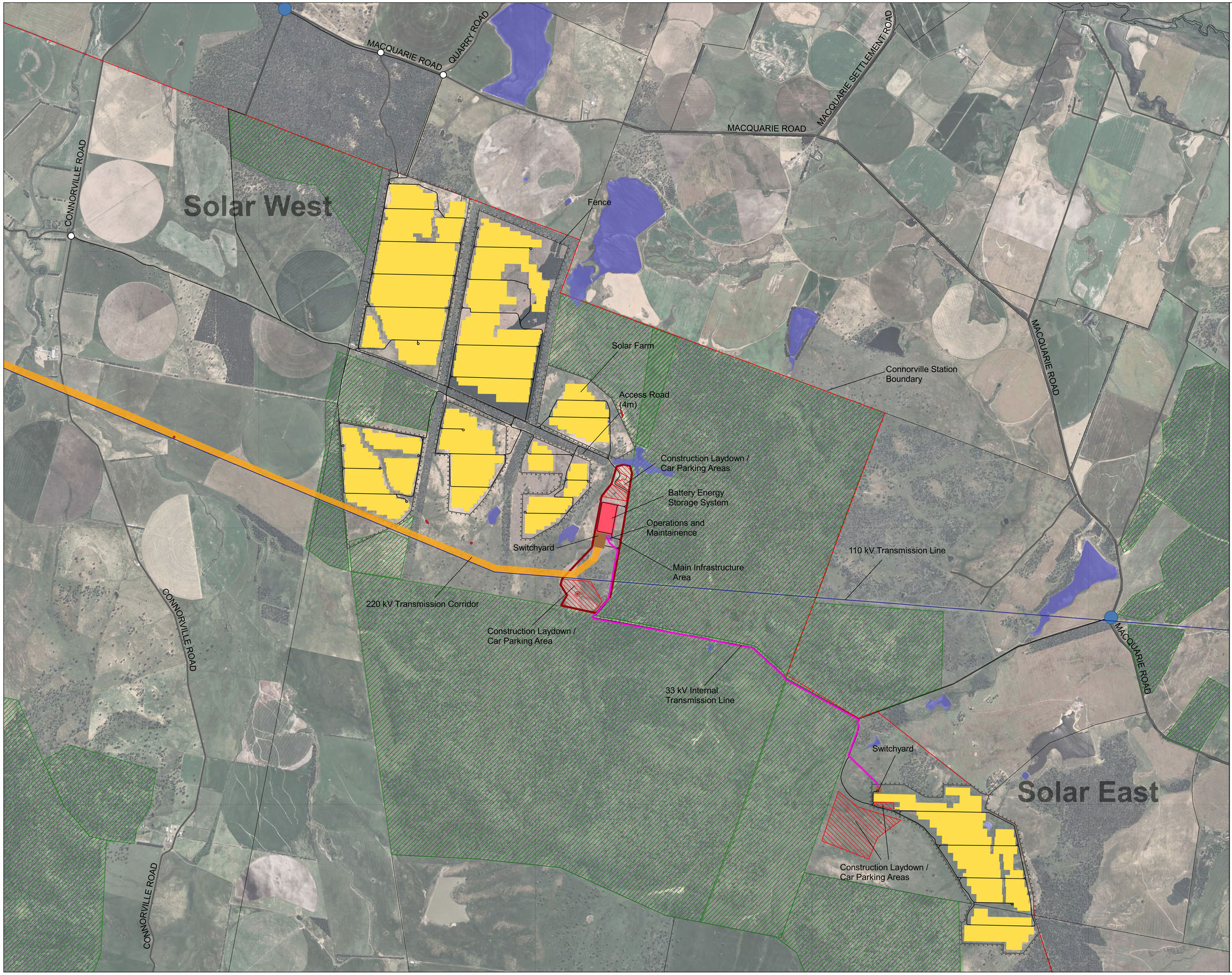
Solar East 1% AEP Peak Hazard
- H2
- H3
- H4
- H5
- H6

Version: 1.0

Date: 14/09/2023

0 50 100 150 m

1:5,000 at A1



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ROBERT LUXMOORE
Project Management

Masterplan Page 1
Overall Area

2210 - Northern Midlands Solar Farm

Existing Features
- Parcels
- Existing Road
- Conservation Covenant and Greening Australia Reserve
- Dam
- Watercourse
- 110 kV Transmission Line

Cultural Heritage Sites
- Artefact Scatter
- Isolated Artefact

Proposed Development
- Connorville Station
- Access Road
- Solar Farm
- Main Infrastructure Area
- Battery Energy Storage System
- Operations and Maintainence
- Swtichyard
- Construction Laydown / Car Parking Area
- 220 kV Transmission Corridor
- 33 kV Internal Tranmission Line
- Fence
- Main Access Point
- Secondary/Emergency Access Point

Version: 6

Date: 09/08/2023

0 250 500 m

1:14,000 at A1

SAUDRIDGE ROAD
POATINA ROAD
POATINA ROAD
BILLOP ROAD
MACQUARIE ROAD
DELMONT ROAD
MACQUARIE ROAD
QUARRY ROAD
MACQUARIE SETTLEMENT ROAD
MACQUARIE ROAD
LAKE RIVER ROAD
CONNORVILLE ROAD
CASEYS ROAD
GLEN ROAD
CONNORVILLE ROAD
LAKE RIVER ROAD

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ROBERT LUXMOORE
Project Management

Masterplan Page 2
Transmission Line

2210 - Northern Midlands Solar Farm

Existing Features
- Parcels
- Existing Road
- Conservation Covenant and Greening Australia Reserve
- Dam
- Watercourse
- Transmission Line

Cultural Heritage Sites
- Artefact Scatter
- Isolated Artefact

Proposed Development
- Connorville Station
- Access Road
- Solar Farm
- Main Infrastructure Area
- Battery Energy Storage System
- Operations and Maintainence
- Swtichyard
- Construction Laydown / Car Parking Area
- 220 kV Transmission Corridor
- 33 kV Internal Tranmission Line
- Fence
- Main Access Point
- Secondary/Emergency Access Point

Version: 6

Date: 09/08/2023

0 250 500 m

1:25,000 at A1

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ROBERT LUXMOORE
Project Management

Masterplan Page 3
Transmission Line - Palmerston Substation

2210 - Northern Midlands Solar Farm

Existing Features
- Parcels
- Existing Road
- Dams
- Watercourse
- Palmerston Substation
- Transmission Line

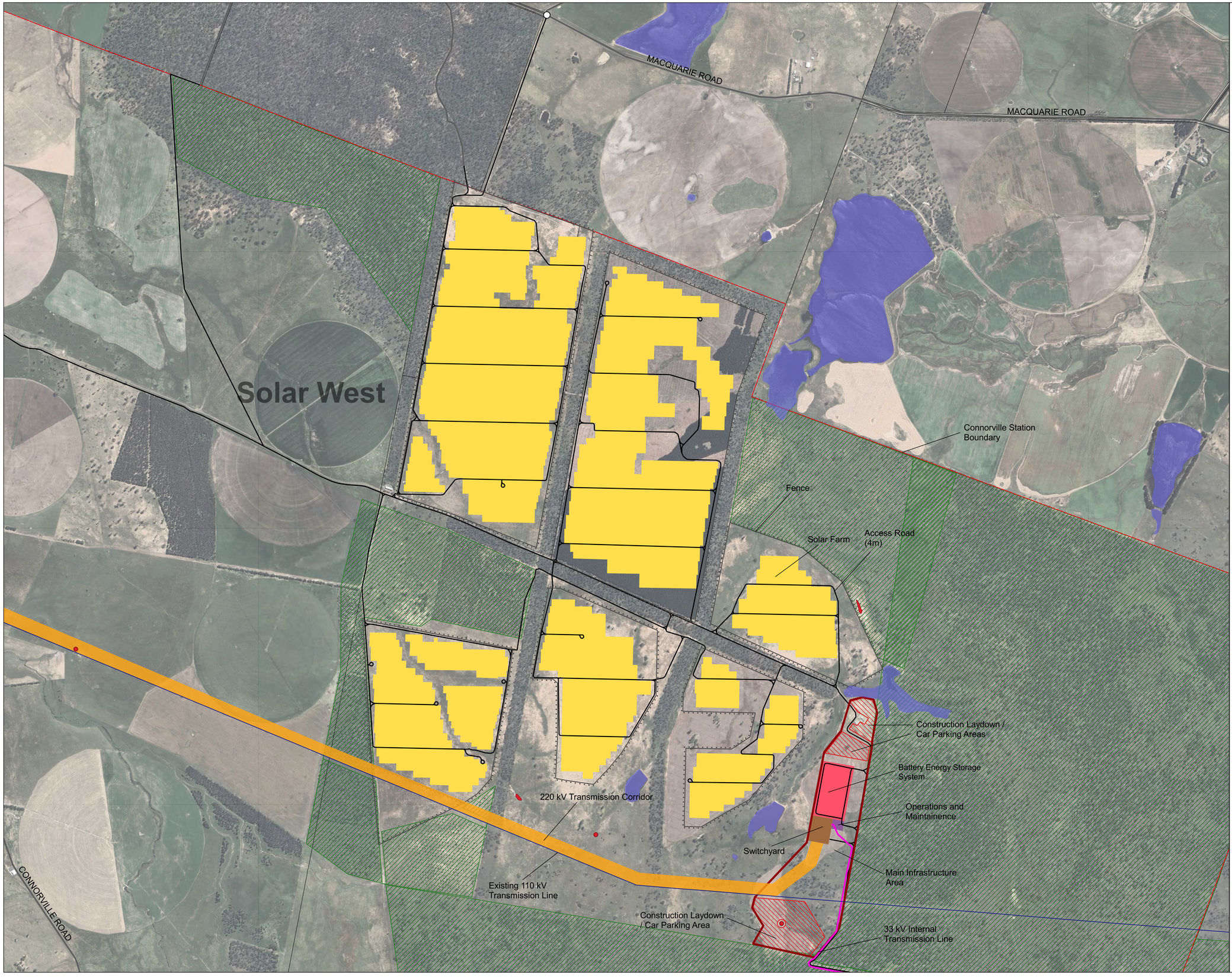
Proposed Development
- 220 kV Transmission Corridor

Version: 6

Date: 09/08/2023

0 50 100 m

1:5,000 at A1



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ROBERT LUXMOORE
Project Management

Masterplan Page 4
West Area
2210 - Northern Midlands Solar Farm

Existing Features
- Parcels
- Existing Road
- Conservation Covenant and Greening Australia Reserves
- Dam
- Watercourse
- 110 kV Transmission Line

Cultural Heritage Sites
- Artefact Scatter
- Isolated Artefact

Proposed Development
- Connorville Station
- Access Road
- Solar Farm
- Main Infrastructure Area
- Battery Energy Storage System
- Operations and Maintainence
- Switchyard
- Construction Laydown / Car Parking Area
- 220 kV Transmission Corridor
- 33 kV Internal Tranmission Line
- Fence
- Main Access Point
- Secondary/Emergency Access Point

Version: 6

Date: 09/08/2023

0 100 200 m

1:8,000 at A1

Main Access

110 kV Transmission Line

MACQUARIE ROAD

Connorville Station Boundary

33 kV Internal Transmission Line

Solar East

Switchyard

Fence

Construction Laydown / Car Parking Areas

Access Road (4m)

Solar Farm

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ROBERT LUXMOORE Project Management

Masterplan Page 5
East Area

2210 - Northern Midlands Solar Farm

Existing Features

- Parcels
- Existing Road
- Conservation Covenant and Greening Australia Reserves
- Dam
- Watercourse
- 110 kV Transmission Line

Proposed Development

- Connorville Station
- Access Road
- Solar Farm
- Swtichyard
- 33 kV Internal Tranmission Line
- Construction Laydown / Car Parking Area
- Fence
- Main Access Point
- Secondary/Emergency Access Point

Version: 6

Date: 09/08/2023

0 50 100 150 m

1:5,000 at A1

Northern Midlands Solar Farm: Planning Application Report

Connorville Estates Pty Ltd C/- Robert Luxmoore Pty Ltd

13 September 2023

I. Document Details

Northern Midlands Solar Farm

Project No:	2210
Report Name:	Northern Midlands Solar Farm: Planning Application Report
Revision:	1
Date:	13 September 2023
Client:	Connorville Estates Pty Ltd C/- Robert Luxmoore Pty Ltd

Cogency Australia Pty Ltd
cogencyaustralia.com.au
office@cogencyaustralia.com.au

Document history

Revision	Date	Description	Author	Approved
1	22-05-2023	Draft Planning Application Report	BG	RW
2	10-09-2023	Planning Application Report (updated to address RFI)	BG	RW

II. Executive Summary

Connorville Estates Pty Ltd (the Proponent) have engaged Robert Luxmoore Pty Ltd (Robert Luxmoore), a project management firm that specialises in large-scale renewable energy assets connected to the Australian National Electricity Market (NEM), and Cogency Australia Pty Ltd (Cogency), a planning and engagement firm, to prepare the enclosed Development Application package to be lodged with the Northern Midlands Council (the Planning Authority) for permit approval.

This planning report supports a Discretionary Development Application for use and development of land for Utilities (a large-scale solar farm and associated infrastructure, including battery storage and electricity transmission infrastructure), known as the Northern Midlands Solar Farm (and hereby referred to in this report as the 'Proposal') at 'Connorville Station', Cressy. The purpose of this Development Application package is to provide the Planning Authority and referral authorities with comprehensive detail of the Proposal. This includes detail on the Proponent and project team, built features, potential impacts, and compliance with relevant Acts, regulations, plans, land use controls and guidelines, contained primarily within the Tasmanian Planning Scheme – Northern Midlands (the Planning Scheme).

The Development Application use class is defined as 'Utilities' within the Planning Scheme. The Proposal is to be located primarily within the 17,600 ha Connorville Station property, which is private freehold land owned by the Proponent. The Proposal includes associated internal infrastructure such as a large-scale battery energy storage system (BESS), 33 kV transmission line along an existing access track, inverters, transformers and ancillary infrastructure, access tracks (on neighbouring land), fencing, landscaping, as well as an external 220 kV overhead transmission line ('Electricity transmission infrastructure'), approximately 15km in length, to connect to the grid at Palmerston Substation. To reach Palmerston Substation, the external transmission connection crosses five separate landowner properties, and follows the existing 110 kV overhead transmission line. Multiple access points will be required for construction to Macquarie Road, Lake River Road, Billopp Road, and Poatina Road.

The Proposal is located within the Agriculture Zone under Clause 21.0 to the Planning Scheme and its permit approval does not require a rezoning. The following Development Application triggers apply to the Proposal, with reliance upon some Performance Criteria among the Use and Development Standards:

- Clause 21.2 Use Table: Discretionary Use Class (Agriculture Zone), relies upon some Performance Criteria
- Clause 26.2 Use Table: Permitted Use Class (Utilities Zone – Palmerston Substation), relies upon some Performance Criteria
- Clause C2.0 Parking and sustainable transport, relies upon some Performance Criteria
- Clause C4.0 Electricity transmission infrastructure protection, relies upon some Performance Criteria
- Clause 7.0 Natural assets (Waterway and coastal protection area only), relies upon some Performance Criteria
- Clause C12.0 Flood-prone areas, relies upon some Performance Criteria
- Clause C13.0 Bushfire-prone areas, relies upon some Performance Criteria

Based on technical impact assessments, the Proposal is not expected to generate any unreasonable or significant environmental or community impacts. The Proposal supports significant economic development for the region and contributes to Tasmania's legislated renewable energy generation target. This site is ideally suited to a solar farm and associated infrastructure development, as it is well-concealed from public view, benefits from existing infrastructure in the region, and is a significant distance from sensitive receptors. Native vegetation removal has primarily been avoided and impacts to natural values minimised, no known sites of cultural significance are disturbed, and agricultural activities ('Agrisolar' sheep grazing) will continue. The proposed 220 kV transmission connection to Palmerston Substation, running alongside the existing 110 kV line, is compatible with the existing energy production infrastructure present within the landscape.

III. Table of Contents

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List of Tables

IV. Table of Abbreviations

Abbreviation	Meaning	Abbreviation	Meaning
AC	Alternating Current	kV	Kilovolt
AEMO	Australian Energy Market Operator	LPS	Local Provisions Schedules
AHR	Aboriginal Heritage Register	LUPAA	*Land Use Planning and Approvals Act 1993*
ASS	Acid Sulfate Soil	m	Metre
BEMS	Bushfire Emergency Management Strategy	MNES	Matters of National Environmental Significance
BEP	Bushfire Emergency Plan	MW	Mega Watts
BESS	Battery Energy Storage System	MWh	Mega Watts per hour
BIS	Bushfire Impact Statement	NEM	National Energy Market
BMP	Bushfire Mitigation Plan	O&M	Operations & Management
CEMP	Construction Environmental Management Plan	PCU	Power Conditioning Unit
DC	Direct Current	PV	Photovoltaic
DTM	Digital Terrain Model	ReCFIT	Renewables, Climate and Future Industries Tasmania
EMPCA	*Environmental Management and Pollution Control Act 1994*	REZ	Renewable Energy Zone
FTE	Full Time Equivalent	RMPS	Resource Management and Planning System
ha	Hectares	SEIA	socioeconomic impact assessment
HMA	Hazard Management Area	SPP	State Planning Provisions
km	Kilometre	THR	Tasmanian Heritage Register

1. Introduction

Cogency has been engaged by Robert Luxmoore, on behalf of the Proponent, to prepare and lodge a Development Application for a large-scale solar farm and associated infrastructure at Connorville Station, Cressy, Northern Midlands (south of Macquarie Road and east of Connorville Road). The Proposal is known as the Northern Midlands Solar Farm.

Cogency is a boutique planning and engagement firm, focused on renewable energy projects. Cogency has prepared this Planning Report as well as the Community & Stakeholder Engagement Strategy and Summary Report.

The Proponent is a significant family business with a long and renowned history of wool growing in the region. The Proponent is undertaking the initial phases of project design privately (including Development Assessment). This landowner-led model will eventually include a renewable energy developer. The upfront and operational expenses will be recouped over time by profits from the export of generated energy to the grid.

The Development Application is for use and development for Utilities. 'Utilities' is defined as '*The use of land for utilities and infrastructure including:*

- *(b) electricity generation;*
- *(c) transmitting or distributing gas, oil or electricity;*
- *(d) transport networks*.'

The Site comprises 20 lots, detailed in Appendix A. Of these 20 lots:

- 5 lots are within the Connorville Station property (4 for the solar arrays, 1 for the transmission line)
- 4 neighbouring landowner lots are required for access tracks to the solar development areas
- The 220 kV transmission line crosses an additional 8 privately-owned lots as well as Lake River Road (Road Reserve plus 1 subdivided sliver parcel) and connects into Palmerston Substation (2 lots).
- Access points will be to Macquarie Rd, Lake River Rd, Billopp Rd and Poatina Rd, with some works in their respective road reserves for access needs.

The Development comprises Utilities infrastructure as summarised in Chapter 1.1, with a comprehensive description at Chapter 3.

While there are more specific definitions for some components, for example 'Electricity transmission infrastructure', as set out in Clause 6.2, all components are considered associated with/subservient to the primary component – the solar farm ('Utilities') – and therefore grouped under the primary use class.

The Development Area covers a limited area within the Site (approximate Development Area of 543 ha), including adjacent road reserves and the external transmission line. The Development Area can be split into groupings (detailed further in Chapter 1.4.2):

- Solar West (369.2 ha)
- Solar East (63.1 ha)
- 33 kV transmission line (4.0 km), connecting Solar East and Solar West via an existing access track
- 220 kV transmission line (15.4 kilometres)
- Dedicated access tracks (including across neighbouring landholdings)

The proposed solar farm will have a nameplate capacity of approximately 288MW AC / 370MWp DC, with the concept design comprising 677,264 ground-mounted solar panels in sets of arrays. The DC-coupled 345.9 MW / 691.7 MWh BESS will provide supply stability and energy storage capacity, connected by a 15 km long, 220 kV overhead transmission to the Palmerston Substation in Poatina.

The battery storage facility is an essential element of this Proposal as it allows for consistent electricity supply to the National Energy Market (NEM) while the solar panels are not generating electricity.

The proposed new 220 kV transmission line intends to connect the Proposal to the Palmerston Substation, near Poatina. The Proposal benefits from the existing energy transmission infrastructure in the region, and with the construction of the new transmission line will provide grid connection to the Palmerston Substation – part of the NEM.

The planning approval pathway for the Proposal is complicated by a lack of precedent for large-scale solar farms in Tasmania. On the basis of the information available it is considered that, in line with the approvals processes for solar farms in other Australian states and territories, that a regular (i.e., Level 1) Development Application process is appropriate. This is warranted as neither solar farms, BESS facilities nor transmission lines are listed as Level 2 developments under the *Environmental Management and Pollution Control Act 1994* (Tas.) (EMPCA). Moreover, it is also not considered that the Proposal qualifies as a Major Project or Project of State Significance under the *Land Use Planning and Approvals Act 1993* (Tas.) (LUPAA) or the *State Policies and Projects Act 1993* (Tas.). Through correspondence with the EPA between December 2022 and March 2023, the EPA have indicated that the likelihood of the activity causing serious, or material environmental harm is negligible and therefore it is unlikely the proposal would be referred to the Board for environmental assessment.

The land which the Proposal occupies has historically been used for grazing and forestry activities. The more specific locations of solar arrays and other proposed improvements have been chosen due to their lower agricultural productivity, poorer soil quality and low environmental value relative to the remainder of the Connorville Station property. These qualities are evidenced within the suite of specialist reports attached with this report. Responding to the existing environmental conditions of the Site has been a central part of the planning and design process. The main objective of the Proposal's design has been ensuring through construction, operation and decommissioning, that detriments to the existing environmental condition, surrounding agricultural productivity and scenic landscape value are identified and either avoided or reasonably mitigated.

Based on technical impact assessments, the Proposal is not expected to generate any unreasonable or significant environmental or community impacts. The Proposal supports significant economic development for the region and contributes to Tasmania's legislated renewable energy generation target.

The Proposal is primarily located within an Agricultural Zone under Clause 21.0 to the 2022 Tasmanian Planning Scheme - Northern Midlands (the Planning Scheme) and its permit approval does not require a rezoning. This is consistent with most other solar farms in Australia, as agricultural areas tend to present tenurial, sizing and topographical amenability to solar farm developments. The small area of Palmerston Substation is zoned Utilities (with the Proposal a Permitted Use Class). A number of Codes are relevant to the Proposal and set out mandatory and discretionary use and development controls. The purpose and provisions of these Codes have further informed the design and development of the Proposal.

This site is ideally suited to a solar farm and associated infrastructure development, as it is well-concealed from public view, benefits from existing infrastructure in the region, and is a significant distance from sensitive receptors.

1.1 Project Summary

The Northern Midlands Solar Farm will comprise the use and development of a large-scale solar farm (across two areas – Solar East and Solar West), containing 432.3 ha of solar arrays with a nameplate capacity of 288MW AC / 370MWp DC, as well as:

- an internal, 33 kV powerline along an existing access track to connect the two solar farm areas;
- a DC-coupled, approximately 345.9 MW / 691.7 MWh battery energy storage system (BESS);

- other electricity infrastructure including inverters and switchyard;
- other elements required for construction, maintenance and operation, such as an operations and management (O&M) compound, new access tracks and upgrades to existing tracks, laydown areas, security infrastructure, landscaping and worker facilities; and
- an overhead, approximately 15.4 km, 220 kV transmission line connecting the proposed solar farm to the Palmerston Substation northwest of the solar farm.

The total development area of the abovementioned elements is approximately 543 ha.

Within Solar East and Solar West, sheep grazing operations will continue, providing an ongoing 'Agrisolar' use of the land.

There are currently limited views into Connorville Station from surrounding areas, and views of the solar farm from neighbouring properties, roads and public places will be largely or fully obscured due to the site's location and existing vegetation. Where views are possible, site fencing and/or screening vegetation will be provided.

Access points and road upgrades, including the primary and secondary access points for construction and operation vehicles, as well as emergency access points, form part of the Proposal.

Please refer to Figure 1 below for the High-Level Masterplan, Chapter 2 for the location and site map, and Chapter 3 for further details on the Proposal. The exact layout of the solar arrays is subject to further detailed design, as construction drawings are detailed, post development application-approval.

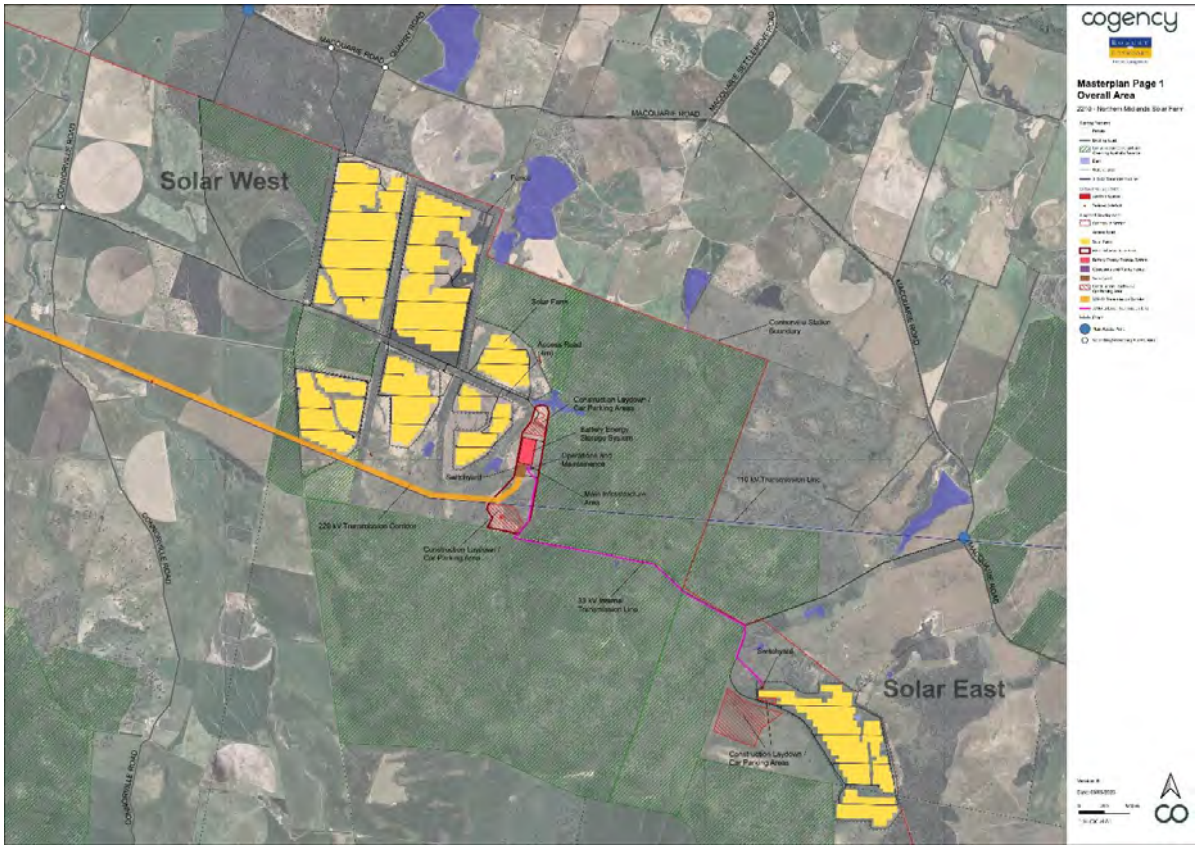


Figure 1 Proposed High Level Masterplan

A consortium of suitably qualified, experienced specialist consultants has been engaged to assess and provide input to the Proposal. The following environmental and technical impact assessments have been prepared to accompany this application and should be read in conjunction with this Planning Report:

- Design Plans (Appendix C), including:
  - Technical Engineering and Transmission Concept Design, Entura
  - Solar Tracker General Arrangement, FTC
  - BESS design, DNV
- Bushfire Impact Statement, Ground Proof Mapping and Fire Hazard and Risk Assessment, NJM Design (Appendix D)
- Landscape and Visual Impact Assessment, Moir Landscape (Appendix E)
- Socio-Economic Assessment, Urban Enterprise (Appendix F)
- Community & Stakeholder Engagement Summary Report, Cogency Australia (Appendix G)
- Traffic Impact Assessment, Pitt & Sherry (Appendix H)
- Agricultural Assessment, Ag-Challenge (Appendix I)
- Cultural Heritage Assessment, Cultural Heritage Management Australia (Appendix J)
- Historic Heritage Assessment, Cultural Heritage Management Australia (Appendix K)
- Flora and Fauna Assessment, Nature Advisory (Appendix L)
- Flooding Impact Assessment, Pitt & Sherry (Appendix M)
- Acid Sulfate Soil Investigation, Pitt & Sherry (Appendix N)
- Noise Impact Assessment, SLR Consulting (Appendix O)

Furthermore, Watts Advisory was engaged to provide advice on grid connection, and Page Seager law firm have provided legal advice throughout the process, including in relation to the adjacent Conservation Covenants. A geotechnical consultant will be engaged to assess the design and layout of the Proposal at the appropriate time.

1.2 The Proponent

Detail	
Proponent	Connorville Estates Pty Ltd
ABN	19 009 476 046
ACN	009 476 046
Registered Address	394 Connorville Road, Cressy, Tasmania 7302

The Proponent, Connorville Estates, is the owner of land known as Connorville Station, one of Tasmania's original and pre-eminent wool properties. Established in 1824, Connorville Station boasts a long association with both the production of merino wool and as a renowned entity in the local area. With the success of their wool production, producing more than 350 bales of fine merino wool and around 130 bales of fine cross-bred wool per year, the Proponent has the necessary private capital to finance initial feasibility and concept design stages.

The Proponent's project manager, Robert Luxmoore, has engaged a group of consultants to support the planning approvals process, including Cogency. Robert Luxmoore, Cogency, and the technical consultants are suitably qualified in their fields and have been selected based on their extensive experience in major renewable energy projects.

It is therefore acknowledged that the Proponent, with the support of the project manager and consultant team, has the financial capacity and experience to successfully undertake the initial project phases, with future partnership(s) with renewable energy developers to deliver the works.

1.3 Proposal Vision

The shared long-term vision for Connorville Station is to continually protect and improve its native vegetation and grasslands as well as to apply principles that ensure the sustainability of the business and the land.

The Proponent supports the vision for Tasmania's Renewable Energy future and the 2040 Renewable Energy Target of 200% renewable generation. It is well understood that developing solar power generation in the Northern Midlands region is an important step to increasing reliable and affordable power, and to ensuring growth in Tasmania's economy through investment and job creation.

The Proponent seeks to develop a portion of their landholding into a long-term solar energy asset which represents the next generation of renewable energy development in Tasmania. Through the combination of solar generation and the BESS, the Proposal will improve the stability and resilience of the electricity grid while increasing Tasmania's renewable energy generation.

Critically for the Proponent, as a well-established wool property, the use of the land for sheep grazing is proposed to continue in conjunction with the operation of the solar farm (known as 'agrisolar' use), preserving the value of the farmland. The Development Area has specifically been chosen as it is lower value agricultural land within Connorville Station.

Table 1 outlines the project timeline, demonstrating the commitment and long-term vision of the Proponent.

Table 1 Project Timeline

Project Timeline	
Project Phase	**Anticipated Delivery**
Planning, design, and early community & stakeholder engagement	Mid 2022 to Early 2023
Development Application lodgement, formal public notice period & continued engagement	Early – mid 2023
Grid studies and connection	Late 2022 to late 2023
Construction Commencement	Mid 2024
Operation	2026

Within the early investigations phase, three potential transmission line routes were considered. Option 1, alongside the existing 110 kV transmission corridor has been selected as the most appropriate. Chapter 3.1.2 provides further detail on the transmission line route. Chapter 3.1.1 outlines the project design iterations.

1.4 Site and Development Area Information

The Proposal covers a significant number of lots, in multiple ownerships, due to its various components. Within the Site lots, the Development Area covers only a small portion of each parcel. This section provides a clear delineation of the Site and Development Area.

As per the Planning Scheme definitions:

- Site means 'the lot or lots on which a use or development is located or proposed to be located'.
- Development Area means 'the area of land occupied by development including its yard, outbuildings, vehicle parking, driveways, storage areas, landscaping and wastewater disposal areas.'

1.4.1 The Site Title Details

Appendix A presents a summary of lot details for the Site. The Site consists of three groups of landholdings:

- In blue: the Connorville Station lots that contain the solar farm and associated infrastructure,
- In purple: the neighbouring landholdings that provide access tracks, and
- In yellow: the group of neighbouring properties through which the proposed 15 km 220 kV transmission line will cross to reach Palmerston Substation.

All of the landowners neighbouring Connorville Station that are within the Site are party to this application. Tables 2, 3 & 4 outline the Site lot details that correspond to each group of parcels. Refer to Appendix A for further details.

Access works are required within the road reserves of Macquarie Rd, Lake River Rd, Billopp Rd and Poatina Rd. Consent to lodge the application has been granted by the General Manager, Northern Midlands Council, and consent sought from Department of State Growth (Crown Consent authority for Poatina Rd).

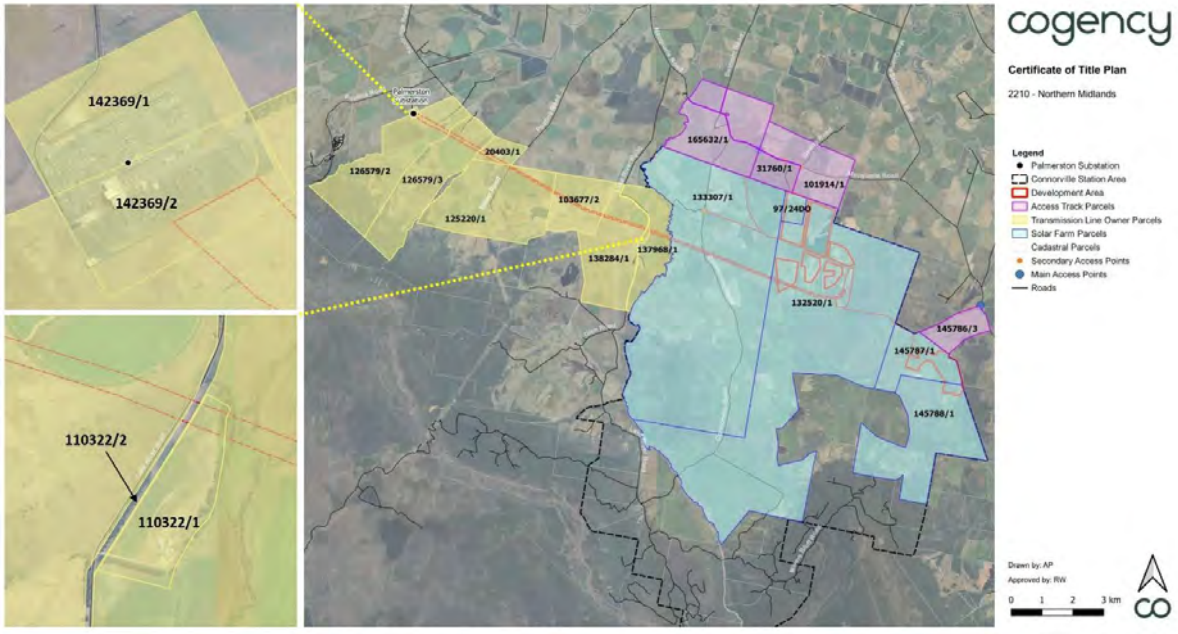


Figure 2 Site lots

As shown above, within Connorville Station (black dashed line) – a 17,600 ha multi-generational agricultural estate, comprising a significant number of parcels – the Site includes a limited number of lots of the broader property (5 lots of Connorville Station). Furthermore, the Development Area (outlined in red) is contained within a small area of the Site's 20 lots.

Outside of Connorville Station, the Site comprises 4 lots for access tracks and 11 lots along the transmission line route (including 2 lots for Palmerston Substation). The proposed transmission line route crosses Lake View Road (road reserve).

Table 2 Site Details – Connorville Station (Energy installation & Transmission)

Detail			
Location	394 Connorville Road, Cressy, 7302 Tasmania		
Certificates of title	*Title ID*	*Council Property ID:*	*Easements / Restrictions?*
	132 520 /1	675 14 89	Yes – listed in folio text
	145 787 /1	268 01 18	Yes – listed in folio text
	145 788 /1	268 01 34	Yes – listed in folio text
	97 / 24 DO	*General Law* 675 14 70	No
	133 307 /1	675 14 70 (Transmission line only)	Yes – listed in folio text

Of the above 5 parcels, 4 are subject to solar area development. The fifth (with the Connorville dwelling) is only subject to the 220 kV transmission line. One parcel (97/24) is a General Law Title.

Table 3 Site Details – Access Tracks

Address	Council Property ID	Title Detail	Easements / Restrictions?
Lot 1 Macquarie Road, Campbell Town TAS 7210	2680126	145786/3	Yes – listed in folio text and schedule enclosed
'Tier View' – 3504 Macquarie Rd Cressy TAS 7302	6751534	101914/1	Yes – listed in folio text, plus Part 5 Agreements enclosed
Macquarie Road, Cressy TAS 7302	6751518	31760/1	No
'Pisa' - 3979 Macquarie Road, Cressy TAS 7302	6751462	165632/1	Yes – listed in folio text

Three neighbouring properties to Connorville Station are required to provide access tracks to Macquarie Road. These will be primary and secondary access points, for construction and emergency management purposes. The tracks currently exist but will require upgrades.

Table 4 Site Details – 220 kV Transmission Line (Linear route) and Palmerston Substation

Address	Council Property ID	Title Detail	Easements / Restrictions?
543 Lake River Road, Cressy TAS 7302	1499659	137968/1	Yes – listed in folio text
'Park nook' 543 Lake River Road, Cressy TAS 7302	6752932	138284/1	Yes – listed in folio text
Near 543 Lake River Road (LGA Subdivision Road)	0	110322/2	Yes – listed in folio text
543 Lake River RD Cressy TAS 7302	1499659	110322/1	Yes (schedule enclosed)
Lake River RD Cressy TAS 7302	1694745	103677/2	Yes – listed in folio text
'Rock Thorpe' – 318 Lake River Road, Cressy TAS	6752924	204030/1	Yes – listed in folio text
4792 Poatina Road, Cressy TAS 7302	3300690	126579/3	Yes – listed in folio text
5000 Poatina RD Cressy TAS 7302	3300682	125220/1	Yes (listed in folio text)
'Woodside' 4740 Poatina Road, Cressy TAS 7302	6753425	126579/2	Yes – listed in folio text
'Palmerston Transend SUB STN' - 4554 Poatina Rd Cressy TAS 7302	6753097	142369/1	Yes – listed in folio text
'Palmerston Transend SUB STN' - 4554 Poatina Rd Cressy TAS 7302	6753097	142369/3	Yes – listed in folio text

While most parcels have some form of easement or restriction, there are no restrictions on Titles for any of the Site lots that prevent or restrict the Proposal. The Proposal avoids contravening areas of Private Timber Reserves and other easements. The full suite of Certificates of Titles, Plans, and relevant separate agreements or easement details are contained in Appendix A.

The road reserves of Macquarie Rd, Lake River Rd, Billopp Rd and Poatina Rd form part of the site, as required for access works.

1.4.2 Development Area

As noted previously, the Development Area for the energy installation components is contained within a small portion of the Connorville Station Site lots.

The Development Area for the 220 kV transmission line is a narrow strip within the impacted lots. The physical impact area is restricted to the poles, typically spaced approximately 200-530 m apart. The existing transmission corridor easement and overlay will need to be expanded at a later time.

Outside of Connorville Station, the 220 kV transmission line crosses an additional 8 privately-owned lots (5 separate owners) as well as Lake River Road (Road Reserve plus 1 subdivided sliver parcel) and connects into Palmerston Substation (2 lots). Landowner agreements are being negotiated separately to the development application. The transmission line crosses Lake River as it goes west to the Palmerston Substation.

Figure 3 shows the Development Area outlines. Within the Development Area there are three distinct areas: the new 220 kV transmission line, Solar East and Solar West. Solar West includes the Main Infrastructure Area.

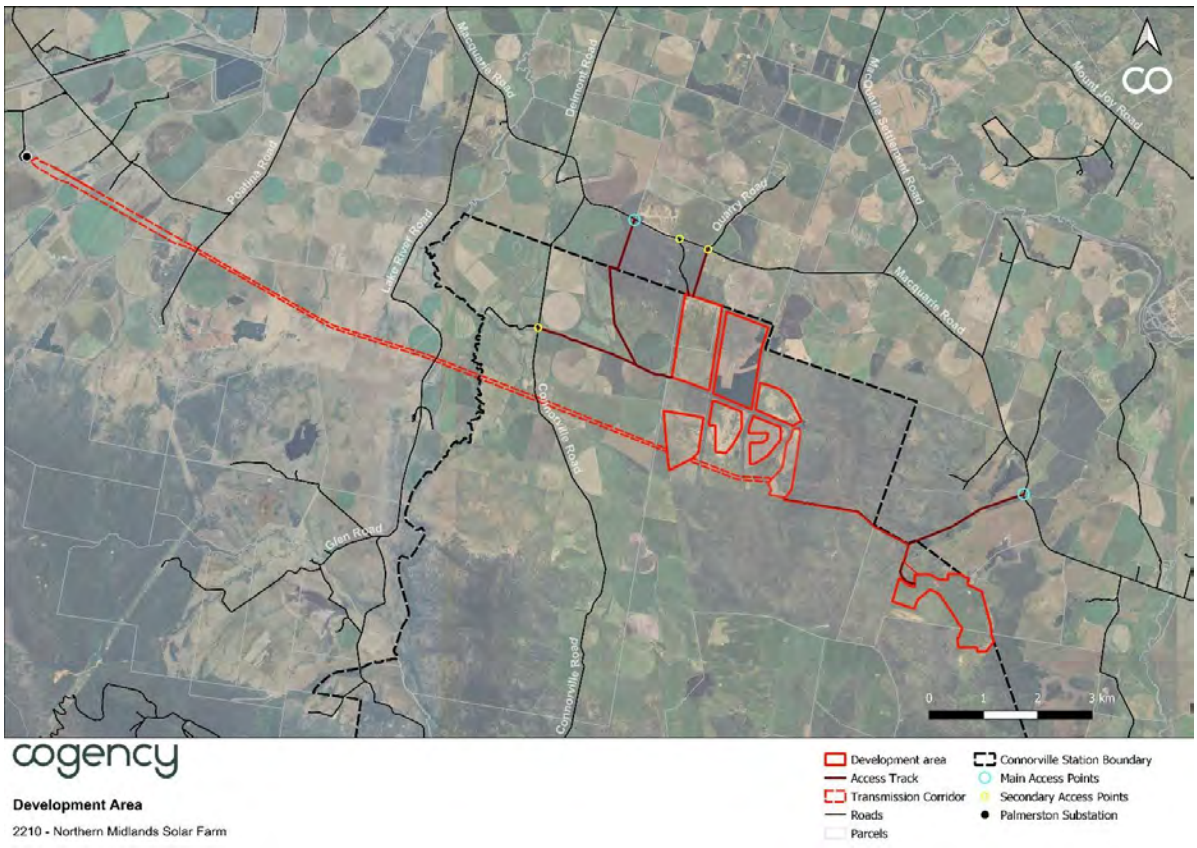


Figure 3 Development Area

2. Site and Context Analysis

2.1 Site Analysis

2.1.1 Connorville Station

Connorville Station is a single property landholding of 17,600 ha, located within the Northern Midlands Council area, approximately 35 km south of Launceston. The property address is 394 Connorville Rd, Cressy, Tasmania. Of the significant number of lots comprising the Connorville Station property, only 5 lots have been selected for the Proposal. The primary access to Connorville Station is Connorville Road (private within Connorville Station, public outside the property), connecting to Macquarie Road.

The Site is currently accessed via Connorville Road and Macquarie Road as well as through various unpaved access tracks.

An existing 110kV overhead transmission line intersects the Site from east to west (Figure 10). Discussions with Watts Advisory and TasNetworks have confirmed that this line would not be capable of supporting a grid connection for a major solar farm.

As identified by Australian Energy Market Operator (AEMO), the site is located within the candidate Central Highlands Renewable Energy Zone (T3), making it a suitable site to develop a solar farm and battery storage. The Site is situated well outside of urban settlement areas, with the nearest being Cressy (15km north-west), Poatina (15km west), Cleveland/Conara (19km east), and Campbell Town (24km south-east).

While Connorville Station is private, freehold land, there are areas subject to Conservation Covenants and Greening Australia Reserves. The Development Area is sited outside of these environmental covenant areas. Figure 10 shows the location of the Conservation Covenants and Greening Australia Reserves on Connorville Station.

The land specifically selected for the development supports agricultural activities, pine plantations, corridors of native vegetation, and some man-made waterbodies. The following subsections provide further site characteristics detail.

The Covenants can restrict certain activities, uses and disturbances within its boundaries. Conservation Covenants are an outcome of a voluntary agreement entered into by landholders with Tasmania's Private Land Conservation Program. They are legally binding and attached to a property's title in perpetuity under the *Nature Conservation Act 2002* (Tas.). A covenant's purpose is to protect the environment by restricting disturbance, clearance, use and development in accordance with a Nature Conservation Plan uniquely prepared for each covenant.

The land specifically selected for the development supports agricultural activities, pine plantations, corridors of native vegetation, and some man-made waterbodies. See chapter 2.7 for further details.

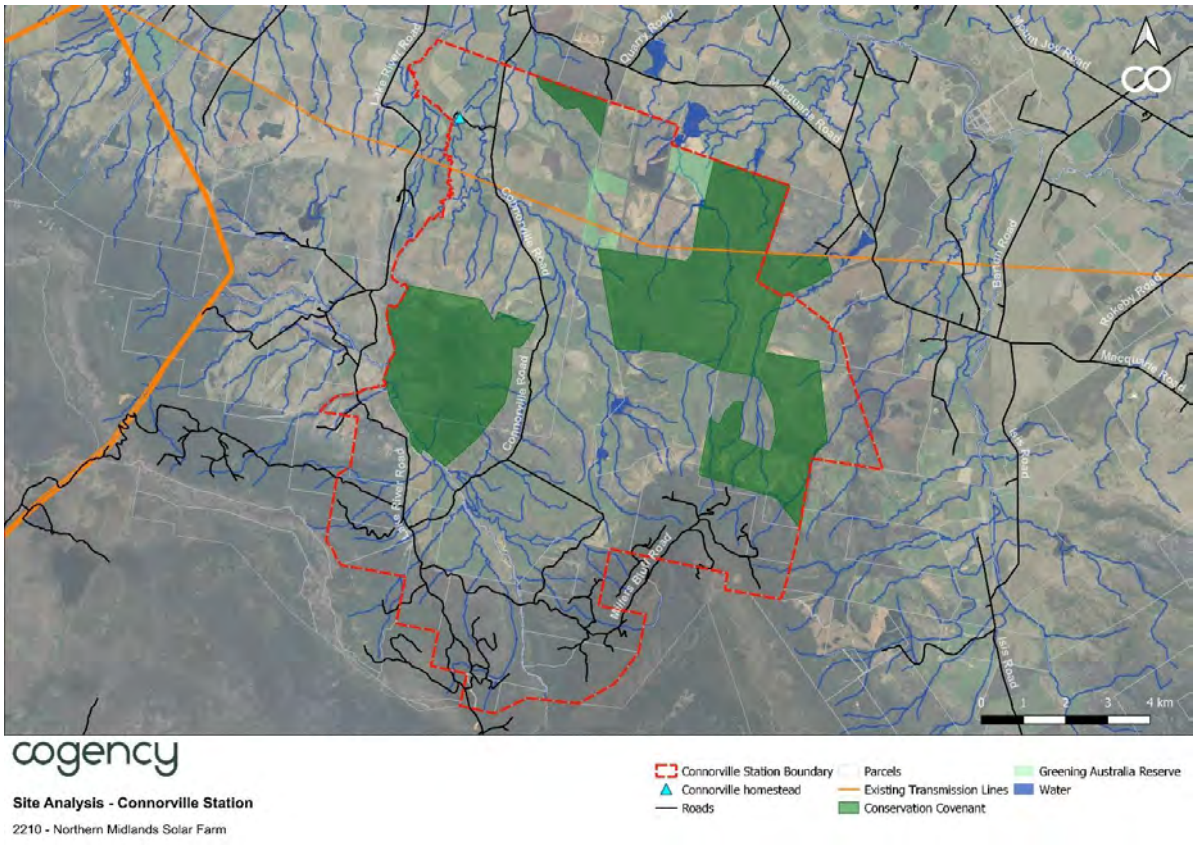


Figure 4 Connorville Station analysis plan

2.1.2 External lots

Outside of Connorville Station, the proposed 220 kV transmission line crosses an additional 8 privately-owned lots as well as Lake River Road (Road Reserve plus 1 subdivided sliver parcel) and connects into Palmerston Substation (2 lots). Figure 5 shows the proposed transmission line route corridor.

The route is characterised by agricultural land use, generally broadacre grazing, and relatively flat terrain. It crosses multiple minor access roads (Connorville Road, Lake River Road & Poatina Road) and Lake River.

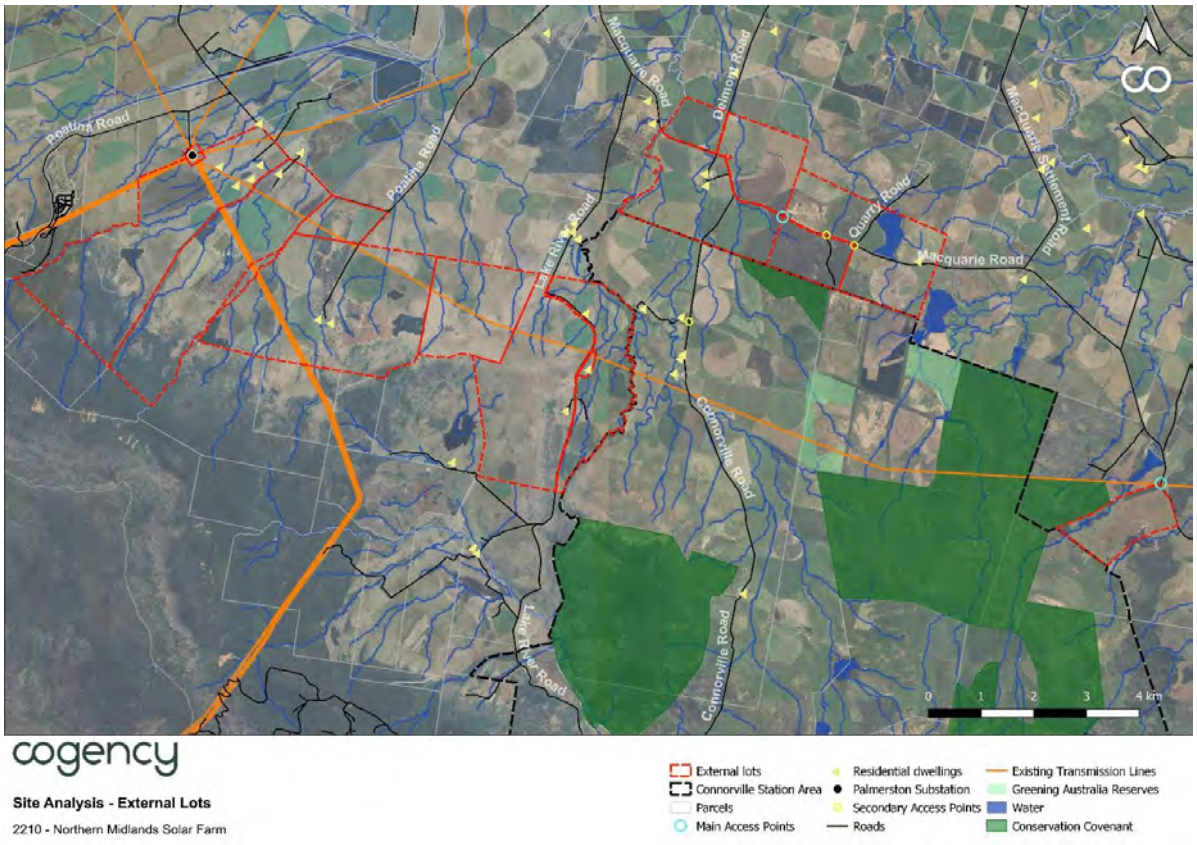
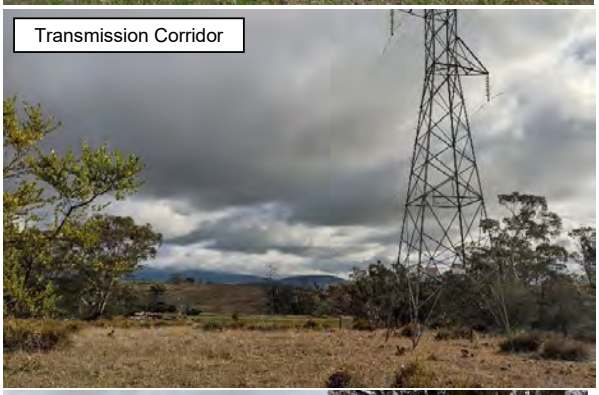


Figure 5 External lots analysis plan

2.2 Site Photos

The following set of photos describe key elements of the Site and Development Area.



2.3 Planning Summary

The Development Application use class is defined as 'Utilities'. The application is for use and development for Utilities: *'The use of land for utilities and infrastructure including:*

(b) electricity generation;
(c) transmitting or distributing gas, oil or electricity;
(d) transport networks.'

The Proposal is located within the Agriculture Zone under Clause 21.0 to the Planning Scheme, with connection into Palmerston Substation entering the Utilities Zone. The Proposal's permit approval does not require any rezoning.

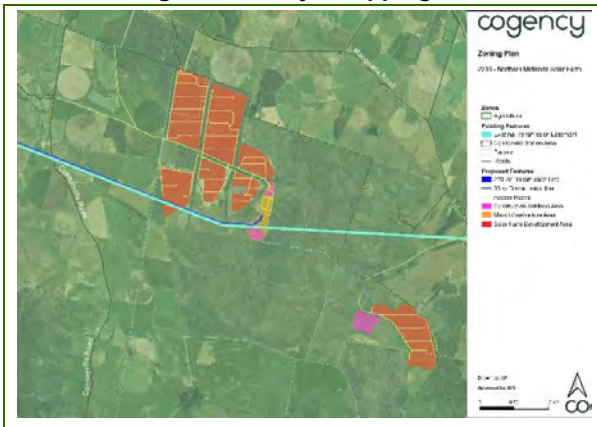
The Development Area is subject to multiple mapped overlays, summarised in Table 5, and shown in thumbnail form in Table 6. Chapters 7.5 and 7.6 provide an assessment against the planning provisions, including larger maps of zoning and overlays.

Table 5 Zoning and Overlays Summary

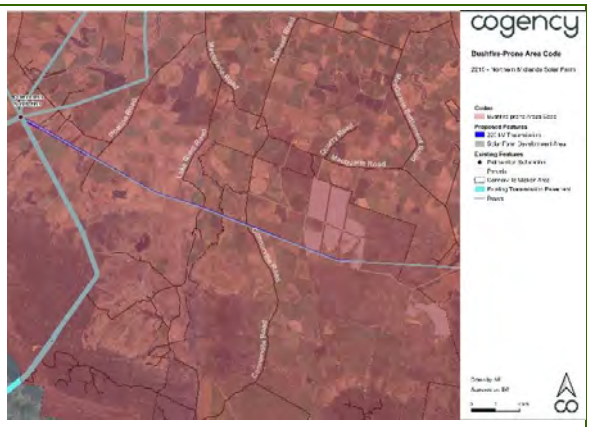
		(Development Area components)					
		Solar West	**Solar East**	**Internal 33kV**	**External 220kV line**		**Access Roads**
		Connorville Station			Connorville Station	External	
	Zoning	Agriculture	Agriculture	Agriculture	Agriculture	Agriculture, Utilities	Agriculture
(Mapped over Development Area)	Electricity transmission infrastructure protection	Yes	No	Yes	Yes	Yes	Yes
	Local heritage place	No	No	No	Yes	No	No
	Waterway and coastal protection area (Natural assets code)	Yes	Yes	Yes	Yes	Yes	Yes
	Flood-prone areas	No	No	No	Yes	Yes	No
	Bushfire-prone areas	Yes	Yes	Yes	Yes	Yes	Yes
	Landslip hazard	Low	No	No	No	Low	No

Of note, Connorville Station is subject to further mapped overlays, and some pockets of other zonings however, these do not apply to the Development Area.

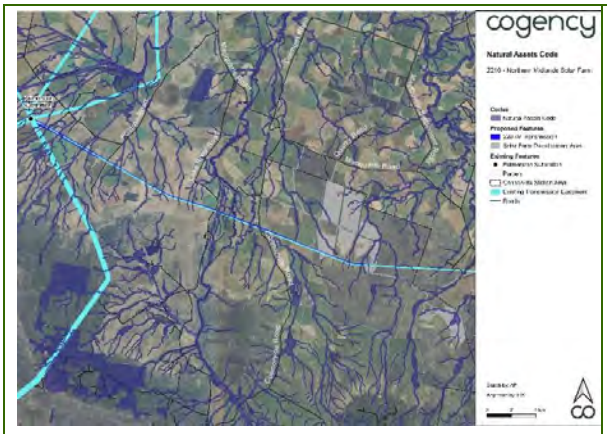
Table 6 Zoning and overlays mapping



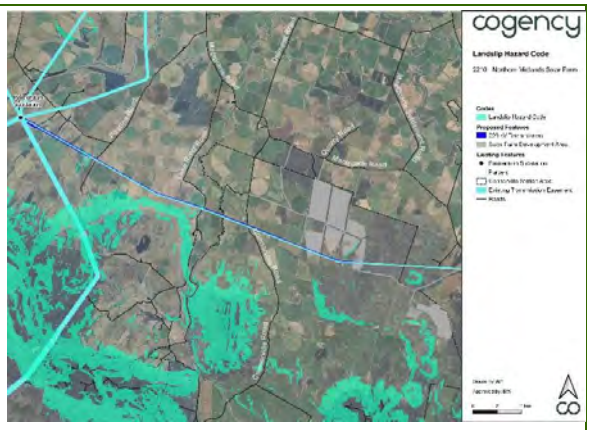
Zoning (Agriculture)



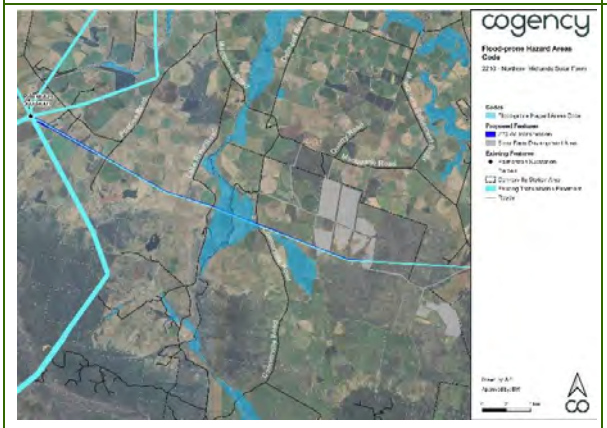
Bushfire-prone areas



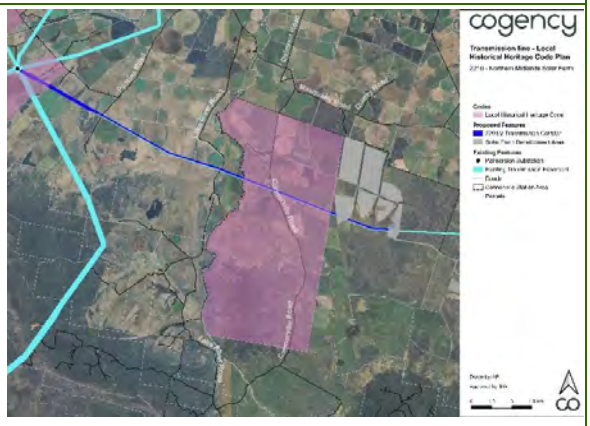
Natural assets code (Waterways)



Landslip hazard areas



Flood-prone areas



Local historical heritage

The following Development Application triggers apply to the Proposal, with reliance upon some Performance Criteria among the Use and Development Standards:

- Clause 21.2 Use Table: Discretionary Use Class (Agriculture Zone), relies upon some Performance Criteria
- Clause 26.2 Use Table: Permitted Use Class (Utilities Zone – Palmerston Substation), relies upon some Performance Criteria
- Clause C2.0 Parking and sustainable transport, relies upon some Performance Criteria
- Clause C4.0 Electricity transmission infrastructure protection, relies upon some Performance Criteria
- Clause 7.0 Natural assets (Waterway and coastal protection area only), relies upon some Performance Criteria
- Clause C12.0 Flood-prone areas, relies upon some Performance Criteria
- Clause C13.0 Bushfire-prone areas, relies upon some Performance Criteria

Chapters 6 and 7 provide further planning policy detail and assessment.

In terms of the development application, the solar farm is the primary element, with battery, transmission lines, access roads and all other infrastructure directly related or subservient to, the primary purpose of renewable energy generation by the solar farm. Under Clause 6.2 all components of the Proposal therefore fall under the Use Class “Utilities”.

2.4 Indigenous History

The Development Area is located along the south-western boundary of the Northern Midlands Nation territory. Historically, the territory of the North Midlands Nation extended NW-SE along the Western Tiers, down through the Deloraine district to the western edge of the Tamar Valley, and further afield along the north coast of Tasmania (See Figure 4 within Appendix J).

The North Midlands nation comprised of at least three clans. Records show that these included the Leterremairrener (Port Dalrymple people) who were located around the east Tamar, the Panninher (Norfolk Plains people) located around the Norfolk Plains, and the Tyerrernotepanner (Stoney Creek or Campbell Town people) who were situated in the vicinity of Campbell Town. The Tyerrernotepanner clan are still present in Tasmania today and are the local Aboriginal community group.

The Tyerrernotepanner are known from ethnographic records to have spent the winter on the eastern coast, with exchange systems with the Oyster Bay Nation. In spring, the Tyerrernotepanner moved back to the plains around Campbell Town that held extensive kangaroo hunting grounds. The Tyerrernotepanner tended to move inland to the Western Tiers during the warmer summer months. The highland country provided the chance to obtain important ochre supplies, as access to the eucalyptus gurii forests, a tree confined to the highlands that produces an intoxicating gum.

Chapter 9.6 summarises the supporting Cultural Heritage Assessment. Of note, the design avoids disturbing artefact sites discovered through that assessment.

2.5 Environmental and Physical Condition

The physical conditions present an ideal site for a solar farm and associated infrastructure. The land has relatively flat topographical conditions. Where undulation occurs it predominantly has a northerly aspect. Existing internal access tracks are used in the design and layout of the Proposal, and the parcels of land that have been selected for the Proposal feature lower agricultural productivity, poorer soil quality and low environmental value relative to the remainder of Connorville Station. The adjacent Conservation Covenant land has been fully avoided in siting the Proposal.

The physical environment varies across the Site, with a mix of agricultural land, pine plantations, corridors of native vegetation and several man-made water bodies. The site has experienced significant land disturbance due to long standing agricultural practices in the area. Grazing paddocks constitute a large portion of the site and are mostly categorised as having a low-quality fauna and flora habitat value.

The low-lying undulating plains of the site are supported by sedimentary and igneous geology. In conjunction, the majority of the solar farm site, as well as the transmission line corridors, support quaternary sedimentary deposits. They consist of Cenozoic sandstones, sand gravels and several other emergent areas of ironstone gravels. No major waterways flow through the core of the site, however, the transmission line route will cross the nearby Lake River (next to the existing transmission line running from the east coast to Palmerston Substation).

Native vegetation has previously been broadly cleared to form paddocks now used for sheep and cattle grazing within the central part of the site, with only scattered trees and small patches of low-quality native vegetation in the form of derived grassland left remaining. Clearing has also occurred in one of the northern parts of the site to support pine silviculture. Some grazing areas support remnant native vegetation in moderate-high condition, with areas along the creek line bisecting the north-eastern part of the site being dominated by native grassland and Eucalyptus amygdalina woodland. Remnant native vegetation predominantly occurs in corridors immediately around the site and in adjoining conservation areas.

The majority of land along all the transmission line route is used for grazing and cropping, supporting only scattered trees and small patches of low-quality native vegetation in the form of derived grassland.

2.5.1 Topography

Across the solar Development Area elevation range varies between 180m and 240m AHD. The identified development sites consist of undulating topography with slopes that range from 0–10°, with some slopes of 15°, mainly surrounding watercourses. These slopes can be considered quite moderate, thus pose minimal risk in heightening fire behaviour.

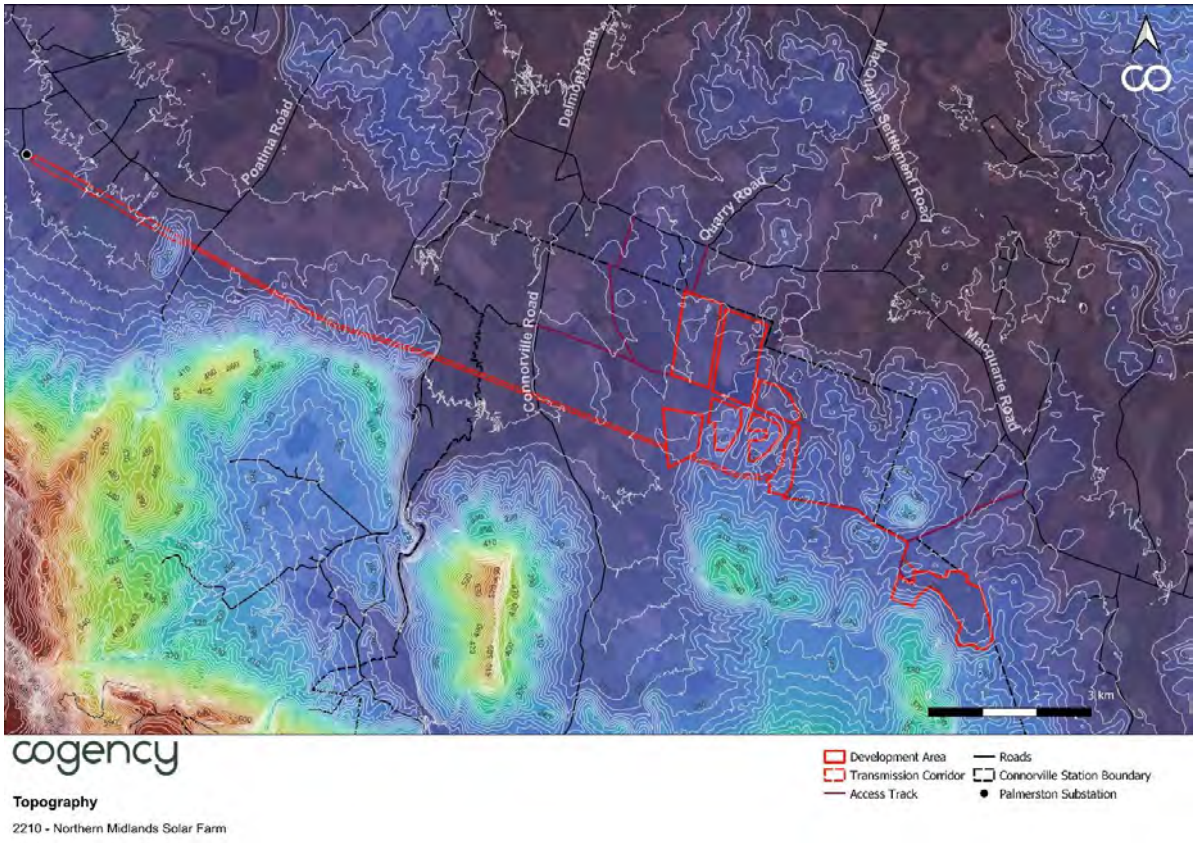


Figure 6 Site topography

There are Scenic Protection Areas at elevations above 300 m AHD within Connorville Station however, the Development Area is wholly outside these areas and therefore they are not relevant considerations.

2.5.1.1 Ecology

As outlined within the Flora & Fauna Assessment (Nature Advisory, Appendix L), the Connorville Station property contains some areas of high-quality biodiversity. However, these areas of high-quality have primarily been avoided in siting of the Development Area.

The ecological study area is situated in the Northern Midlands IBRA Bioregion, in the Brumbys – Lake catchment, and the Northern Midlands local government area.

Within the Development Area, there is minimal native vegetation due to historic clearing and agricultural use. Areas of native vegetation are generally found along the habitat corridors between paddocks, and along the proposed access roads, and considered to be of ‘moderate’ ‘high’, or ‘very high’ quality, and provide ‘moderate’ or ‘high’ fauna habitat. These areas have a higher potential to support listed flora and fauna species compared to the agricultural land.

Solar West and Solar East are connected by an access road cutting through the Conservation Covenant, which supports a large area of treed native vegetation. The areas adjacent to the Site appear to be very similar mosaics of native vegetation and farmland.

The supporting Flora & Fauna Assessment (Appendix L) contains summary maps of vegetation types (TasVEG) across the Development Area, at Figures 2-1 to 2-4 of that report, as well as a flora habitat quality overview at Figure 3 of that report.

2.5.1.2 Watercourses and Waterbodies

As outlined within the Flooding Impact Assessment (Pitt & Sherry, Appendix M), the Connorville Station site contains multiple watercourses and waterbodies (Figure 7).

Within the Solar East and Solar West development areas there are numerous watercourses of varying sizes, including modified drains, minor tributaries, tributaries and streams. There are also waterbodies of varying natural to modified states. These features are primarily within cleared, open grazing paddocks and therefore highly modified. There are five small, man-made dams on-site, and several more on the site boundaries or along the edge of access roads. Permanent or seasonal streams connect some of these dams.

The proposed 220 kV transmission line will cross Lake River (approximately 3 kms west of Connorville Station) and an area subject to flooding. Transmission poles can be micro-sited to avoid and minimise impacts.

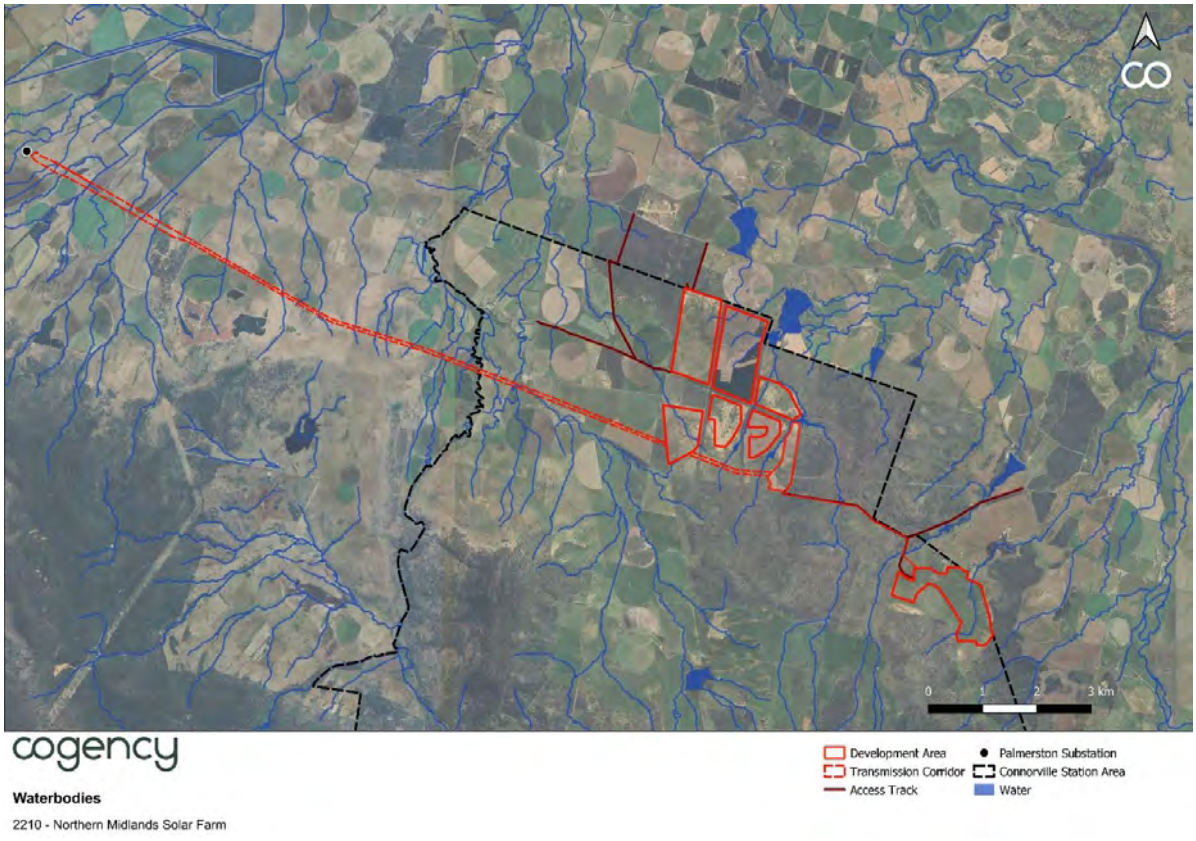


Figure 7 Site waterbodies

Four named watercourses run through the western section of the Site (the neighbouring transmission line properties, not Solar West or Solar East). The largest of these watercourses is Lake River. Woodside Rivulet

and Dairy Creek run in the northeast-to-southwest direction and are semi-permanent tributaries associated with Brumby's Creek. Numerous drainage lines and unnamed watercourses are also present throughout the Site.

2.5.1.3 Soil

No site-specific geotechnical investigation has been completed, as desktop sources available (e.g., LISTMap) and other investigations undertaken (including an acid sulfate investigation and the agricultural impact assessment) suggest that the soil structure is suitable for the proposal. A geotechnical investigation will be undertaken as part of detailed design and any micro-siting issues can be engineered.

Most of the land surrounding the Site is mapped as low probability of Acid Sulfate Soil (ASS) occurrence, with no ASS risk mapping extending within the Site. Further ground truthing is only recommended in limited instances and partly dependent upon detailed design siting. Considering the sandy-clay soil profile at the Solar West site and the slight elevation compared to surrounding landscape, surface water is likely to readily drain to nearby dams and streams, and the soils are unlikely to become waterlogged. There are however a number of waterways traversing this site that are mapped as low risk for ASS further upstream. If these waterways remain undisturbed, further investigation for ASS is not warranted.

The Agricultural Assessment (Appendix I) notes that the Site is located within the undulating plains of the Launceston Tertiary Basin and on the lower foothills of the Great Western Tiers. The Subject Site is partially situated on the lower foothills of the Great Western Tiers, and dolerite surface rock and outcrops can be commonly seen on the land. The Solar East and West are disconnected by a parcel of open woodland under a Conservation Covenant which exhibits rolling to steep hills with surface dolerite present. Solar West consists of flat plains in the northwest paddock, to gently undulating slopes (3-8% gradient) in the rest of the area. Within Solar West, surface rock is uncommon due to removal through farming, but likely to be present within the soil subsurface, especially where the land becomes steeper and more undulating. In Solar East, surface dolerite is more common with larger outcrops present. Further from the rolling foothills, Solar East becomes part of a low gradient drainage basin, where there are some poorly drained areas, particularly along the margins of several small streams and drainage lines that drain towards the northeast. Five soil profiles were assessed to affirm the accuracy of previous soil mapping, and full soil profile descriptions can be found in the Agricultural Assessment's Appendix I.

2.5.2 Improvements

The pastures within Solar West and Solar East in most instances consist of a mix of native grasses, clover, and introduced species, and would generally be regarded as unimproved. In more productive areas including land under centre pivot irrigation in the northwest of Solar West and on the gentle plains, ryegrass, cocksfoot and clover have been sown for grazing purposes. The ~40 ha pivot irrigation area of the Solar West northwest paddock has been sown to ryegrass and clover. Other species recorded within the pastures were capeweed, flatweed, chickweed, some gorse, and spiny rush within low lying areas.

Stock water is available from farm creeks and dams for stock access. There are three large dams on the Solar West site, and two dams located on Solar East. Where dams are not present in a paddock for livestock access, freshwater is pumped from various farm dams and creeks via a stock water reticulation system to stock troughs. Stock water for the reticulation system is sourced from Lake River via two electric 3-phase pumps and reticulated through a mainline. The Proponent holds an irrigation license from Lake River.

Within Solar West and Solar East, farm infrastructure includes all weather access roads and good internal fencing. Along the western boundary of Solar West is an open walled hayshed (~35m x ~6 m), and servicing the northwest paddock is a centre pivot of ~40 ha which may be relocated to another area of Connorville Station.

2.5.3 Existing Access

As outlined within the Traffic Impact Assessment (Pitt & Sherry, Appendix H), Connorville Station's primary access is via Connorville Road – a public road connection from Macquarie Road, that becomes private once inside the Connorville Station property.

Connorville Station has no public road frontages, although there are a number of access tracks, some with formal carriageway easements. Within Connorville Station there are numerous internal tracks used as part of the farming enterprise, mostly sealed. As part of the Proposal, existing and additional tracks are required to be upgraded.

The Proposal will rely upon the following 5 existing access tracks for Solar West and Solar East (see Figure 8), with some requiring upgrading for the purposes of the Proposal:

- Site Access #1 (primary Solar East access): use of an existing carriageway and unsealed private vehicle track from Macquarie Road to Solar East. This access track is on a neighbouring landholding.
- Site Access #2 (secondary Solar West access): upgrade of an existing unsealed private vehicle track from Macquarie Road/Quarry Road intersection to Solar West. This access track is on a neighbouring landholding.
- Site Access #3 (secondary access): upgrade of an existing unsealed private vehicle track from Macquarie Road to Solar West. This access track is on a neighbouring landholding.
- Site Access #4 (primary Solar West access): upgrade of an existing unsealed private vehicle track from Macquarie Road to Solar West. This access track crosses a neighbouring landholding and Connorville lots.
- Connorville Road (secondary access): utilising Connorville Road and internal farm tracks, with upgrades.

Access to the proposed 220 kV transmission line will primarily be via Lake River Road and Billopp Road, utilising existing transmission line easements.

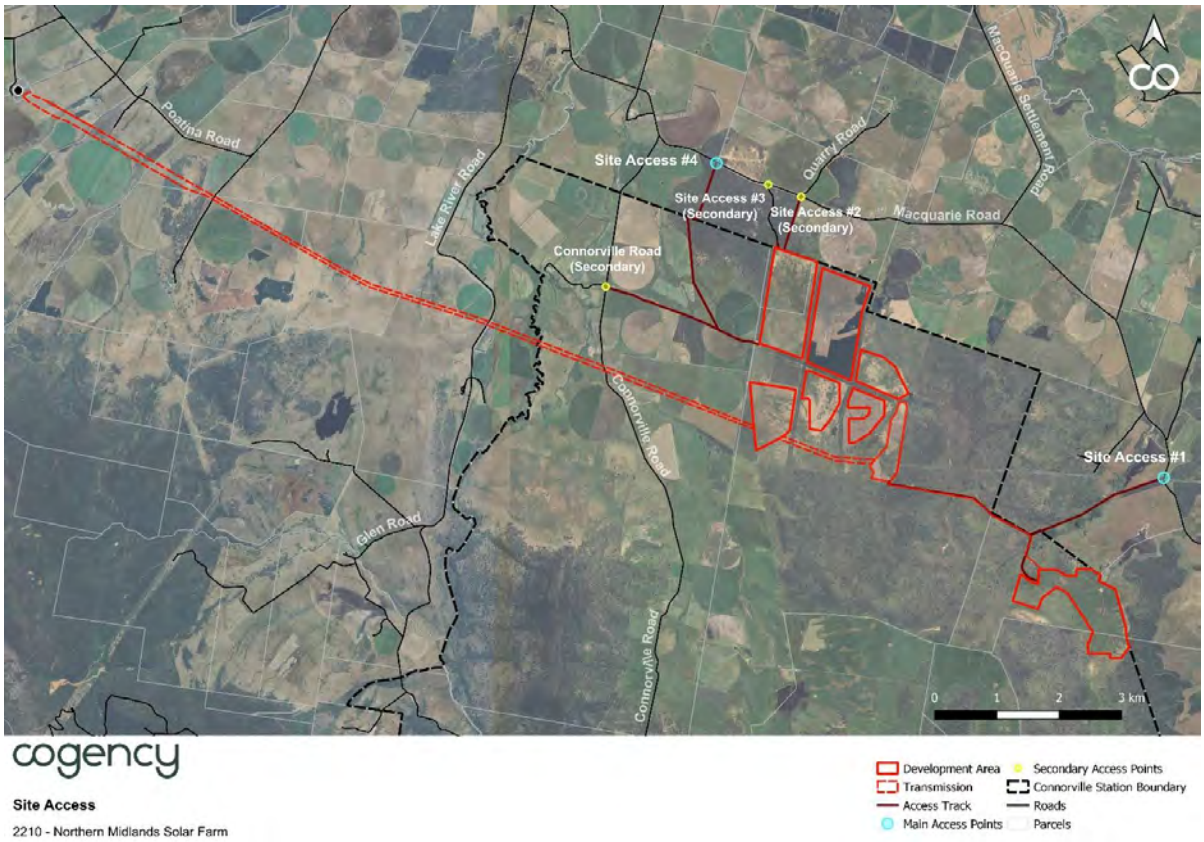


Figure 8 Site access points

2.5.4 Current and Past Land Uses

Connorville Station has been under current family ownership since 1823. Since the arrival of Europeans to the area, the land has primarily been used for agriculture.

The current land use is a combination of grazing with sheep, grazing with cattle, occasional irrigated fodder crop production, and farm forestry. Grazing occurs on both irrigated and dryland pastures.

2.5.5 Existing Transmission Lines and Easements

There is an existing 110 kV transmission line running east-west through the site. This includes a transmission corridor, protected by a planning overlay.

The existing transmission line has insufficient capacity to support connection of the solar farm and BESS, therefore the new 220 kV line is required to connect the electricity generated to the NEM at Palmerston Substation.

2.6 Context analysis

2.6.1 Surrounding Land Uses

The land surrounding the Development Area and Site is highly modified and used intensively for agricultural purposes, predominantly grazing and cropping.

The Development Area is located well outside of urban settlement areas. However, several residential dwellings on large farming properties surround the Development Area. There are 40 dwellings within a defined dwelling survey area, measured within 5km of the solar development areas and within 1km of the proposed transmission route (Figure 9). Importantly, none of the dwellings are located within 1 km of the solar areas. Of the 39 dwellings within the survey area, 13 are located within the Site (6 within Connorville Station).

The nearest dwellings to the solar areas are residential dwellings within the Site (mostly Connorville Station, and another dwelling on the northern access road parcel). The nearest external dwelling to Solar West is approximately 2 kms to the north-east. The nearest dwelling to Solar East is approximately 2.5 kms further east.

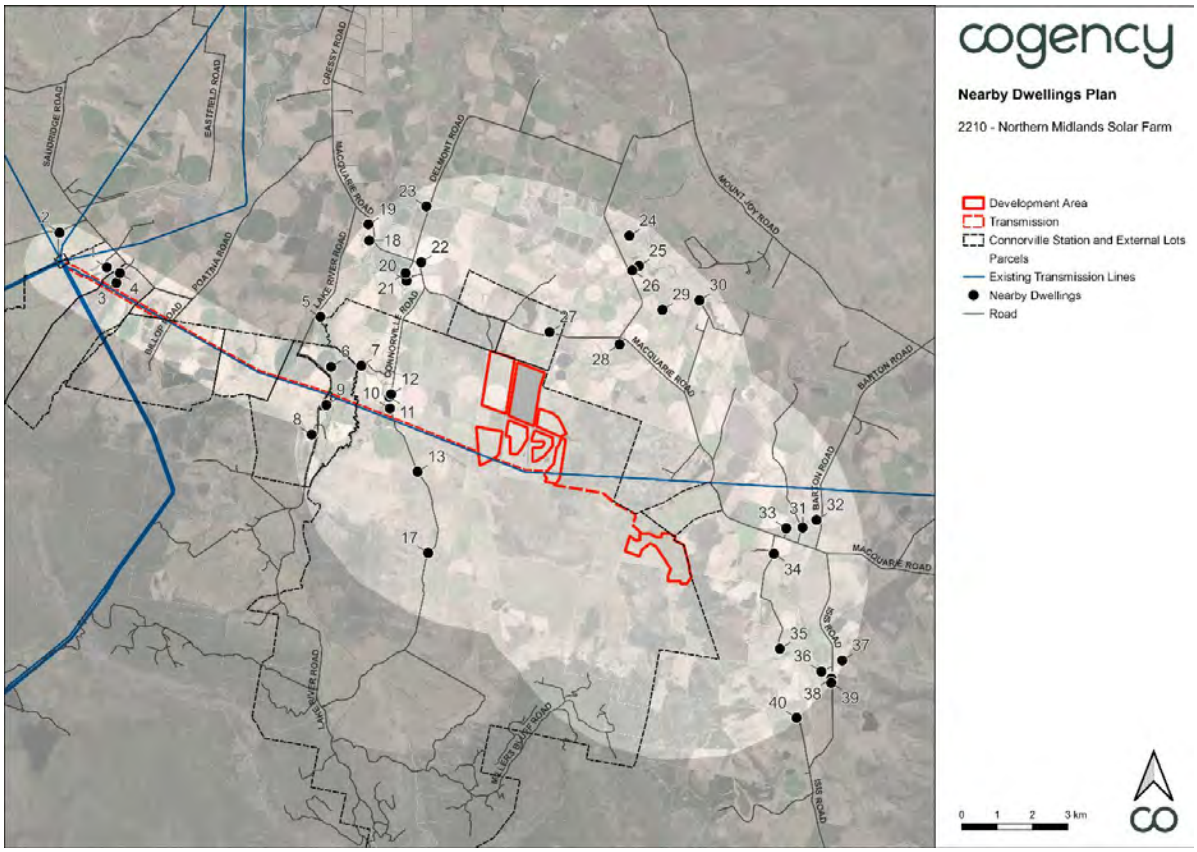


Figure 9 Nearby dwellings

Key Roads in the vicinity of the Development Area are Macquarie Road and Connorville Road – they provide primary access to the proposed solar farm. Macquarie Road is located to the north of and spans the east of the Development Area, it is the primary road in the area. As the proposed transmission line runs west it crosses Connorville Road, Lake River Road and Poatina Road.

To the west of the Development Area are the slopes of O'Connor's Peak. Two defined, perennial rivers, the Isis River and Lake River (crossed by the proposed transmission line), span east and west of the Development Area respectively. Directly to the north and east of the Development Area are smaller creek beds and dams.

The predominant agricultural nature of surrounding uses mean the Site is well suited to the Proposal.

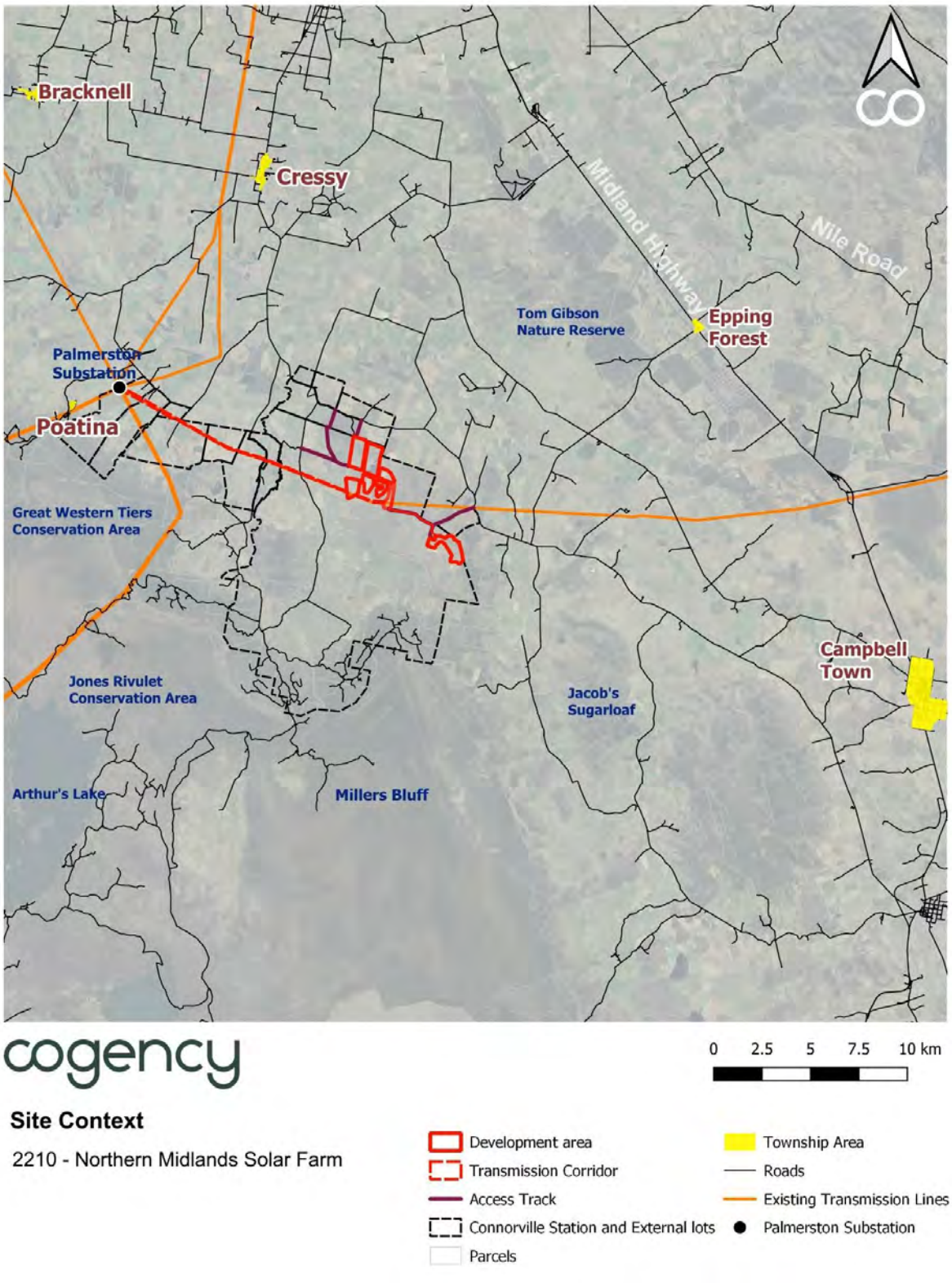


Figure 10 Context Plan

2.6.2 The Northern Midlands

The Proposal is located within the Northern Midlands Council area, which is classified as 'rural, agricultural, and very large' (RAV) in the Australian Classification of Local Governments. The Council occupies a landlocked, northeast portion of Tasmania and supports a population of 13,400. European settlement in the Council Area occurred in the early 1800s. Since then, the main land uses have been wool growing and cropping (particularly cereals, poppies and potatoes).

The region consists of relatively flat, dry and low plains with Tasmania's most fertile soils. The majority of land is therefore put to an agricultural use. Because of its distance from coastlines, Northern Midlands experiences Tasmania's warmest summers and coldest winters, and is the driest area in Tasmania. The region receives between an average of approximately 600 mm rainfall per year.

Northern Midlands' major transport services are the Esk Highway, Midland Highway and Launceston Airport.

2.6.3 Cressy

The Site is located within the locality of Cressy, a large area that includes the township of Cressy. The Site is more than 10 kms south of Cressy township, which is 35 kms south of Launceston. Cressy's population is 1,149[1]. Despite Cressy's location in the Council area's northwest quadrant, Cressy is not a typical northern commuter township and is consistent with the historic country villages of the south. Pastoral land users in Cressy are normally historic and family-based. Cressy is built on the banks of the Macquarie River, the most significant river in the region and the main catchment in the immediate watershed.

[1] Australian Bureau of Statistics, 2021.

3. The Proposal

3.1 Overview and Masterplan

The Northern Midlands Solar Farm will comprise the use and development of a large-scale solar farm (across two areas – Solar East and Solar West), containing 432.3 ha of solar arrays with a nameplate capacity of 288MW AC / 370MWp DC, as well as:

- an internal, 33 kV powerline along an existing access track to connect the two solar farm areas;
- a DC-coupled, approximately 345.9 MW / 691.7 MWh battery energy storage system (BESS);
- other electricity infrastructure including inverters and switchyard;
- other elements required for construction, maintenance and operation, such as an operations and management (O&M) compound, new access tracks and upgrades to existing tracks, laydown areas, security infrastructure, landscaping and worker facilities; and
- an overhead, approximately 15 km, 220 kV transmission line connecting the proposed solar farm to the Palmerston Substation, northwest of the Solar West.

Within the Development Area, sheep grazing operations will continue, providing an ongoing ‘Agrisolar’ use of the land. The Solar West arrays are compartmentalised in six areas to work into the existing paddock and vegetation (windbreak) layout. Solar East comprises a single fenced area.

Figure 11 and Figure 12 show the full site design detail.

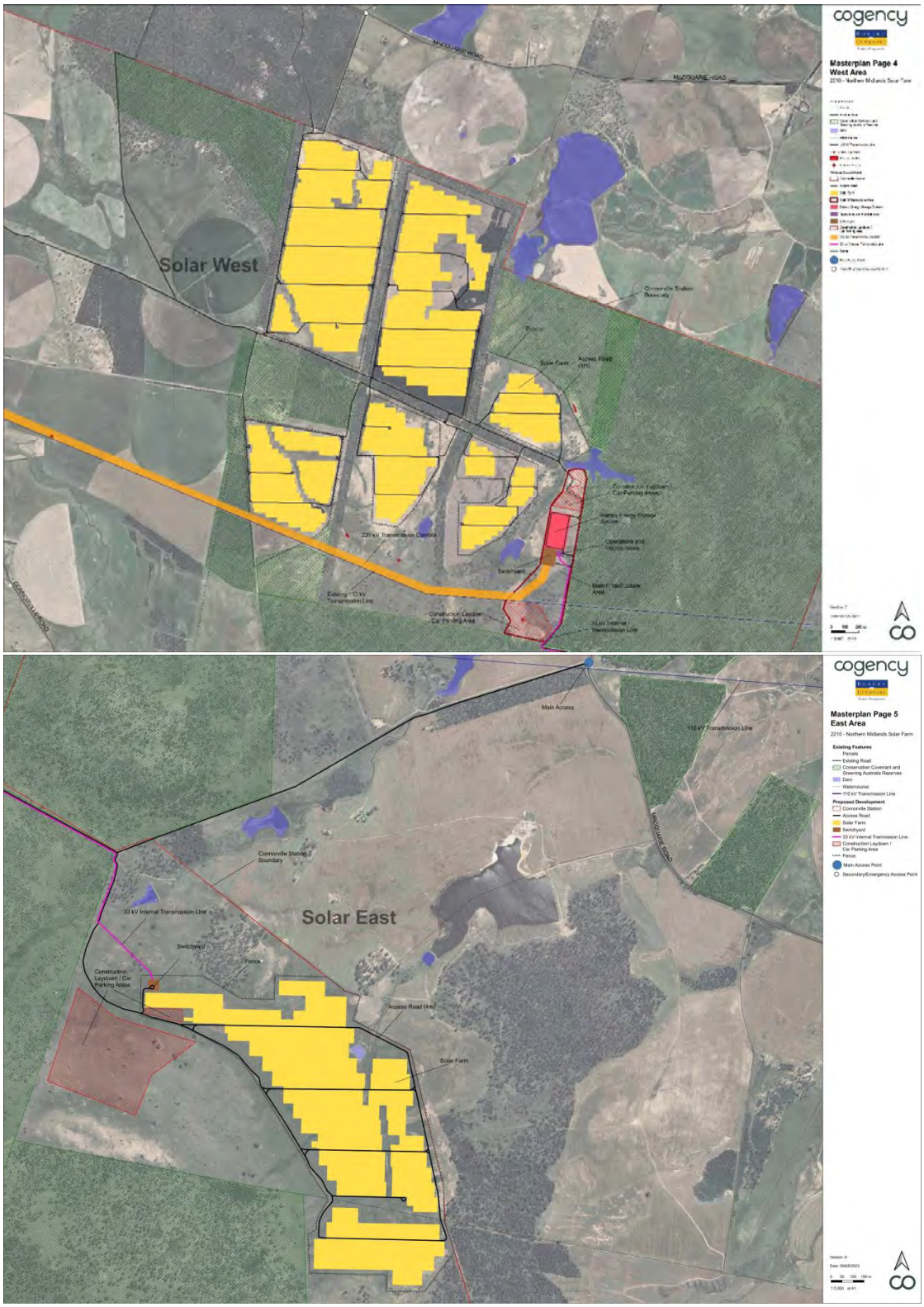


Figure 11 Proposed energy installation design layout

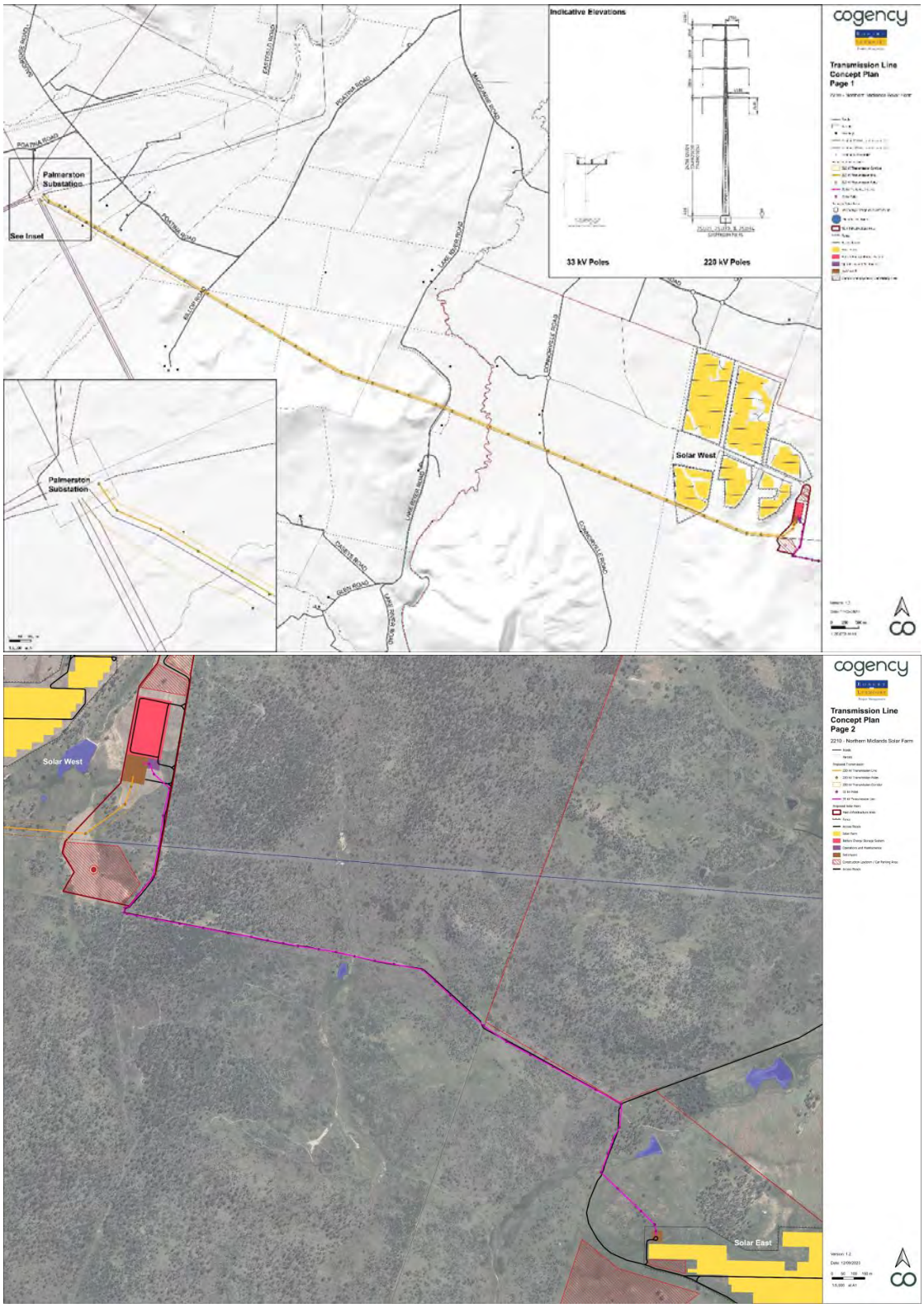


Figure 12 Proposed Transmission lines

3.1.1 Project Iterations

The siting of the Proposal has been specifically designed to avoid sensitivities and constraints as much as possible. For instance, solar areas are within cleared agricultural paddocks and do not remove shelter belts located between paddocks. Similarly, flood modelling, natural contours and cultural heritage investigations have shaped the design iterations.

The key changes made to the siting and layout of the Proposal during the planning and design phase stemmed from the:

- detailed assessment of the three transmission route options studied by the grid specialist and technical consultants (see chapter 3.1.2 below), with Option 1 being selected as the preferred route;
- Aboriginal cultural heritage assessment, which identified key artefact sites that the Development Area has avoided;
- flora and fauna assessment of high-quality native vegetation and habitat to preserve where possible, and Solar West was reduced in size accordingly;
- hydrology assessment of potential flooding hazard, which the key elements of the Proposal have been sited to avoid;
- fire assessment, which prompted adequate setbacks to be provided between the BESS and the property boundary and adjacent dense vegetation; and
- community feedback, especially those regarding views of the Proposal from surrounding properties and public places.

Accordingly, the design iterations have appropriately dealt with various matters to ensure that the siting and layout proposed largely avoids the key constraints and minimises potential environmental and community impacts.

3.1.2 Transmission Line Option Assessment

In order to export the electricity generated by the solar farm to the NEM, a transmission connection is required. Feasibility analysis by Watts Advisory concluded that the existing 110 kV transmission line (Palmerston to Avoca transmission line (TL429)) did not have sufficient capacity to accommodate the Proposal. Therefore, a new transmission line is required. Three potential route options for the proposed overhead 220kV transmission line were considered (shown in Figure 13).

Discussions between the project team and the landowners of the selected route option have taken place. The selection of the preferred route option has taken into consideration the findings of the technical impacts assessments, the issues and opportunities identified with the landowners, and the Clean Energy Council's *Community Engagement Guidelines for Building Powerlines for Renewable Energy Developments*, including exploring opportunities for sharing easements, as recommended in the guideline.

From the multi-criteria analysis, Option 1 (the proposed 220 kV line) demonstrated the least impacts based on studies undertaken to date:

- It provides the strongest and most reliable connection, enabling the solar farm to maximise generation and minimise the risk of curtailment or outages.
- It is associated with the least risk during the connection application process, reducing the risk of cost blowouts or project constraints being identified at a late stage.
- It presents the least technical risk and complexity.
- Easement sharing with the existing 110 kV line is an opportunity.
- Initial budget estimates suggest costs for Options 1 and 2.1 and 2.2 are unlikely to differ significantly.

Furthermore, from a planning perspective, Option 1 avoids the nearby mapped areas of the Scenic Protection Code and has a lower biodiversity impact than Options 2.1 and 2.2. The option analysis was also informed by

feedback from TasNetworks. The proposed alignment, subject to detailed design, is alongside (north) of the existing 110 kV line (see Appendix C for the proposed transmission corridor and concept layout).

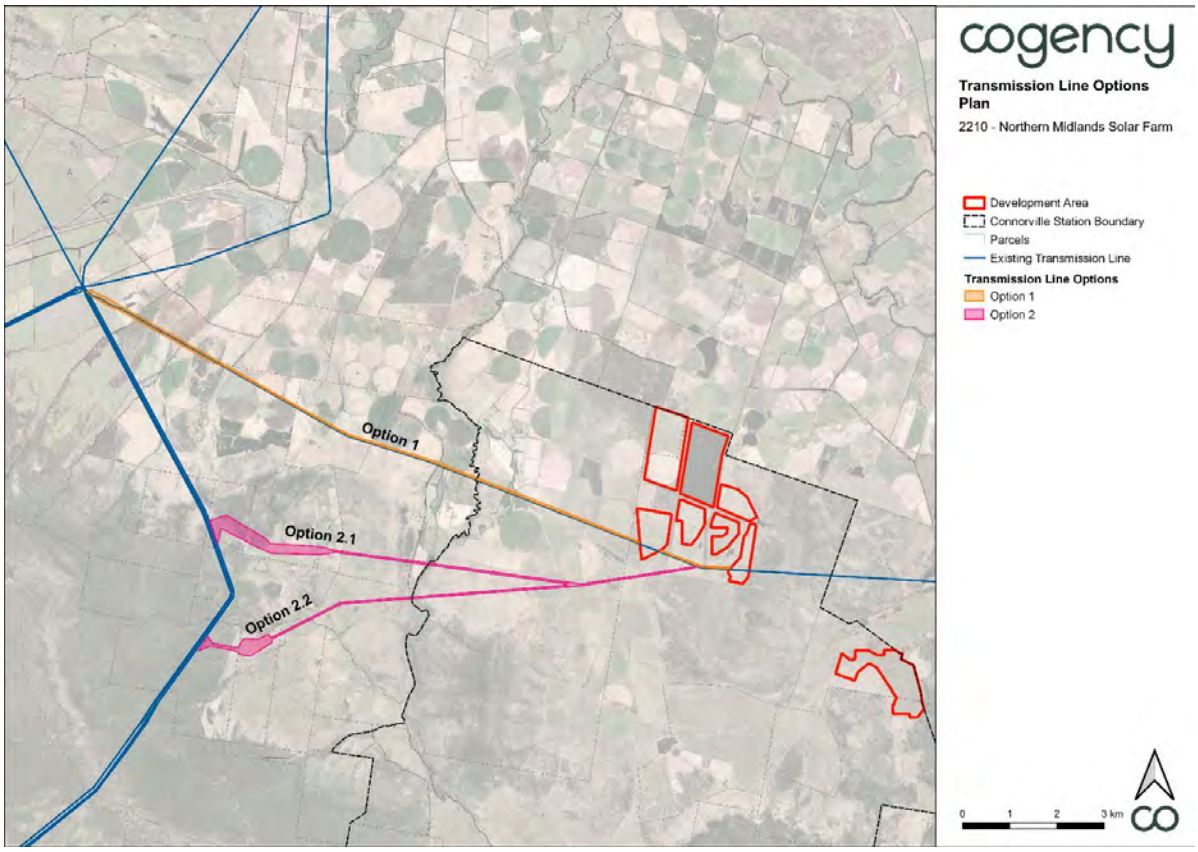


Figure 13 Transmission Line Options Plan

3.2 Solar Panels and Associated Infrastructure

The Proposal comprises:

- Solar components (PV modules, trackers, combiner boxes, inverters)
- Infrastructure (switchyard, BESS, O&M building, internal 33 kV transmission line)
- Construction areas
- Fencing and security
- Access routes
- Landscaping
- External transmission line to Palmerston Substation

Each component is detailed in the following sub-sections.

3.2.1 Solar Panels and Mounting System

The solar farm is expected to have a capacity of 288MW AC / 370MWp DC, covering approximately 432.3 ha (including Solar West and Solar East areas). The concept design is predicated upon panels being single-axis tracking in 2P format, with concept string size of 28 modules (see Figure 14). This equates to 677,264 individual PV modules, with the design subject to detailed design and procurement. Typical dimensions are shown in Figure 15.

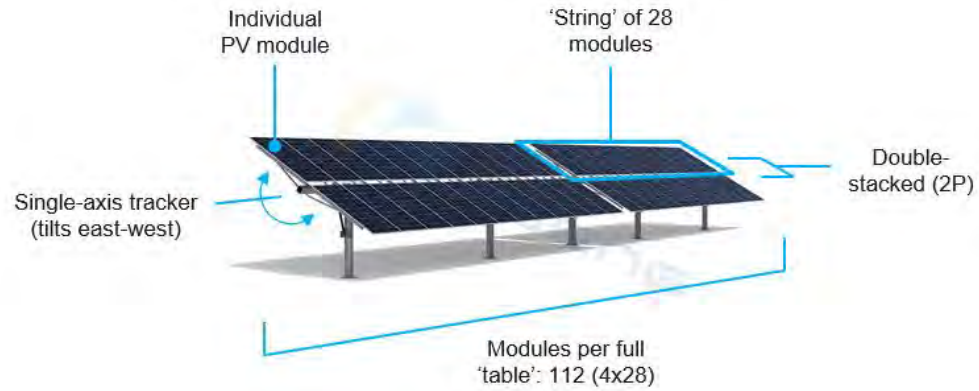


Figure 14 Indicative concept design of solar PV array

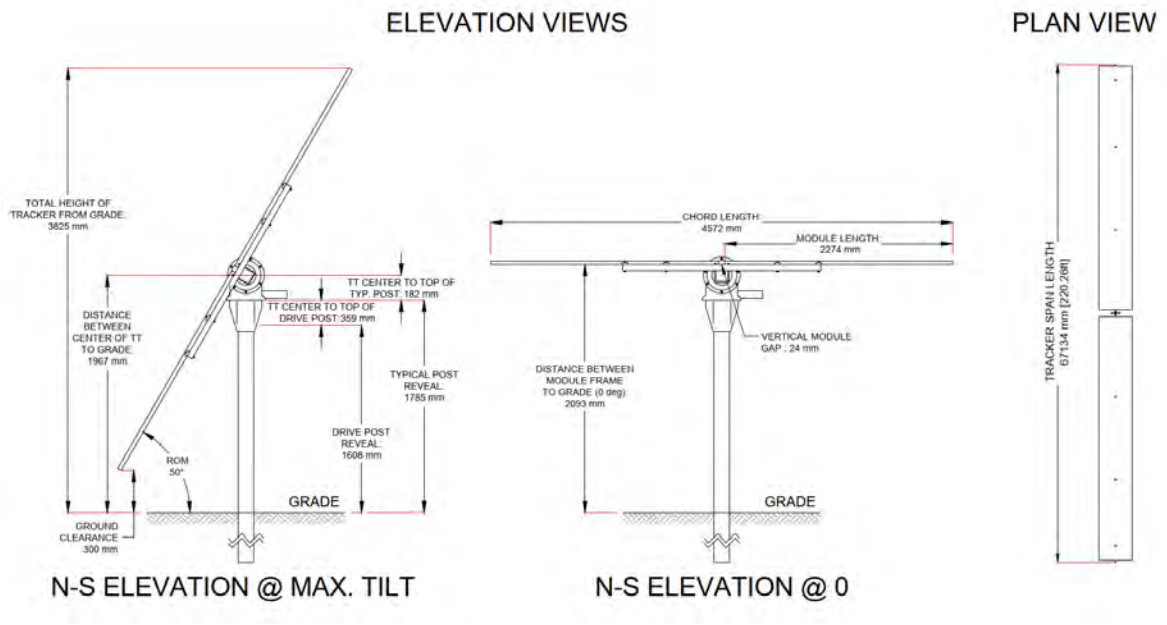


Figure 15 Proposed solar panel tracker details (FTC Solar)

The solar components in detail are:

- PV Modules:
  - Materials: Aluminum frame, Glass, Mono-crystalline cells, Copper insulated cable
  - Average Sizes = 2256mm x 1133mm x 35mm
- Tracker
  - Materials: Galvanised steel, small battery system used to power tracker movement
  - Average Sizes = 67.134m long x 4.572m wide is a single tracker row
  - Covered/uncovered = covered by PV Modules
- Combiner Boxes
  - Materials: Thermoplastic housing, Electrical fuses, Isolation switch
  - Walls – yes, fully enclosed box
  - Average Sizes = 840mm wide x 1058mm high x 360mm deep
  - Covered/uncovered = can be covered by sunshade to keep direct sunlight off combiner box

The installation process involves direct piling and therefore does not require excavation or concrete footings for the solar arrays. Some excavation for in-ground conduits will be required.

3.2.2 Internal Transmission - 33 kV Overhead Transmission Line

In order to connect the Solar West and Solar East areas (essentially to bring electricity from Solar East to Solar West, connecting onto the BESS and export), a 33 kV transmission line is required. The line length is approximately 4.0 km, running overhead, along an existing access track. The route follows a previously cleared track between the vegetated areas of the Conservation Covenant, and minimal clearing would be required to accommodate the transmission line.

The overall pole height is approximately 15 m, as shown in Figure 16.

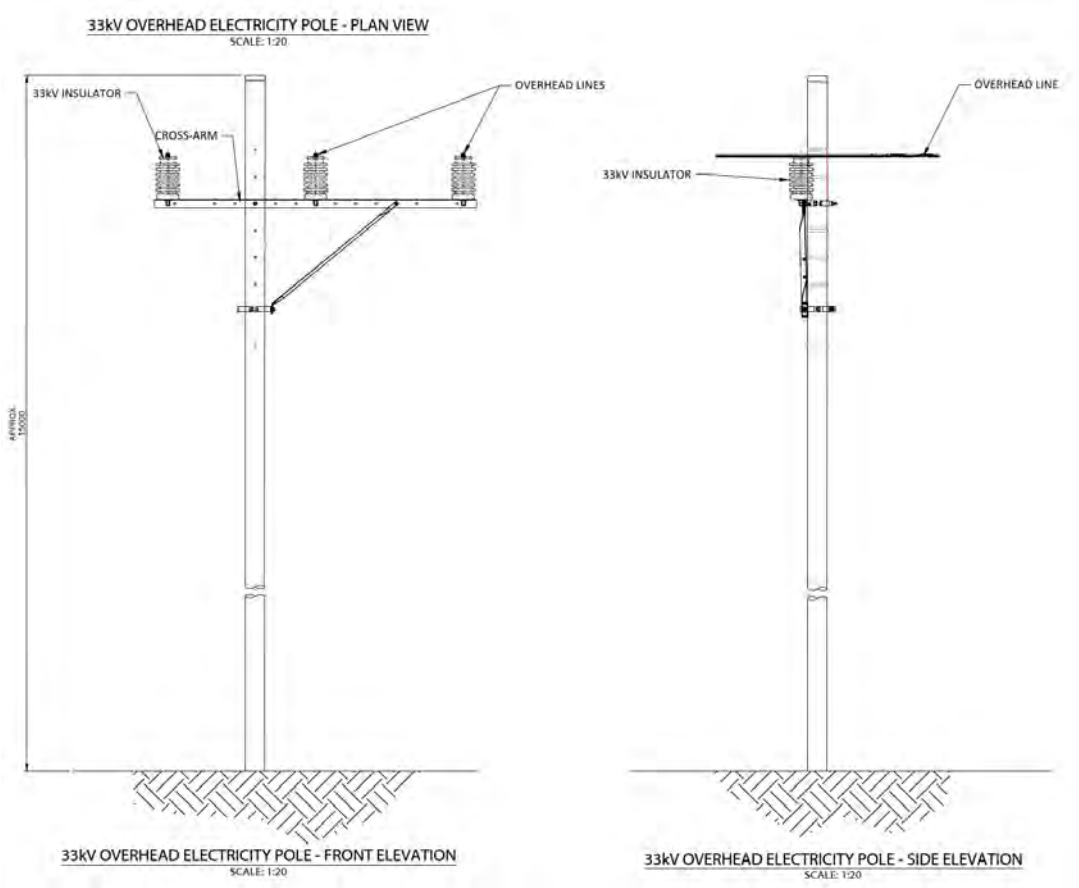


Figure 16 Proposed 33 kV overhead transmission design (DNV)

The transmission line will consist of three wires. Appendix C contains transmission concept design plans.

3.2.3 Battery Energy Storage System (BESS)

The BESS is located within the Infrastructure Area of Solar West, with a footprint of 253 m x 138 m. The BESS combined capacity will be 345.9 MW / 691.7 MWh at the Beginning-of-Life (BOL). Figure 17 and Figure 18 show the BESS typical layout and dimensions. The typical height of each BESS unit is 2.9-3.0 m.

Figure 17 Proposed BESS layout (FNV)

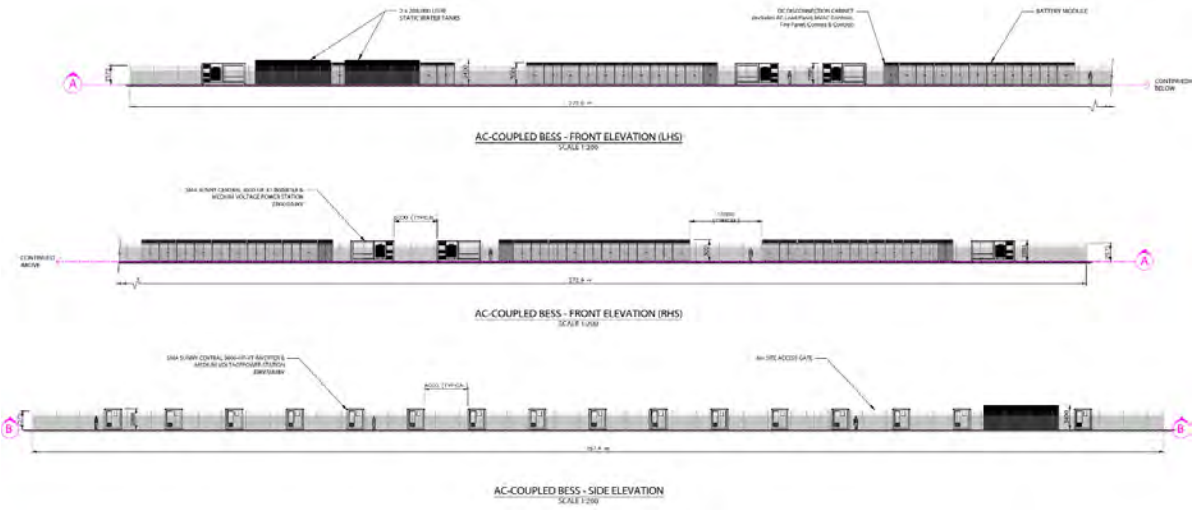


Figure 18 Proposed BESS elevations (FNV)

See Appendix C for full-scale versions of the above plans.

3.2.4 Inverters and Transformers

Spaced throughout the solar array are a series of inverters (also known as PCU). These inverters (see Figure 19) are approximately 6 m long, 2.9 m high and 2.4 m wide.

Figure 19 Typical inverter / PCU

The inverters facilitate the conversion of direct current (DC) from the solar arrays into alternating current (AC).

3.2.5 Switchyard

The switchyard is within the Infrastructure Area, adjacent to the BESS compound (Figure 20). The switchyard is essentially the export point of the generated electricity into the grid (via the 220 kV transmission line). It also comprises the 33 kV transformer as it receives the Solar East connection.

As shown in the layout and elevation, the electrical infrastructure is typically 2.9-5 m high, with the gantry connection to the 220 kV transmission line approximately 11.5 m high. The switchyard is centrally located within the Development Area / Site and adjacent to the existing and proposed transmission lines, in order to minimise any noise or visual/landscape impacts.

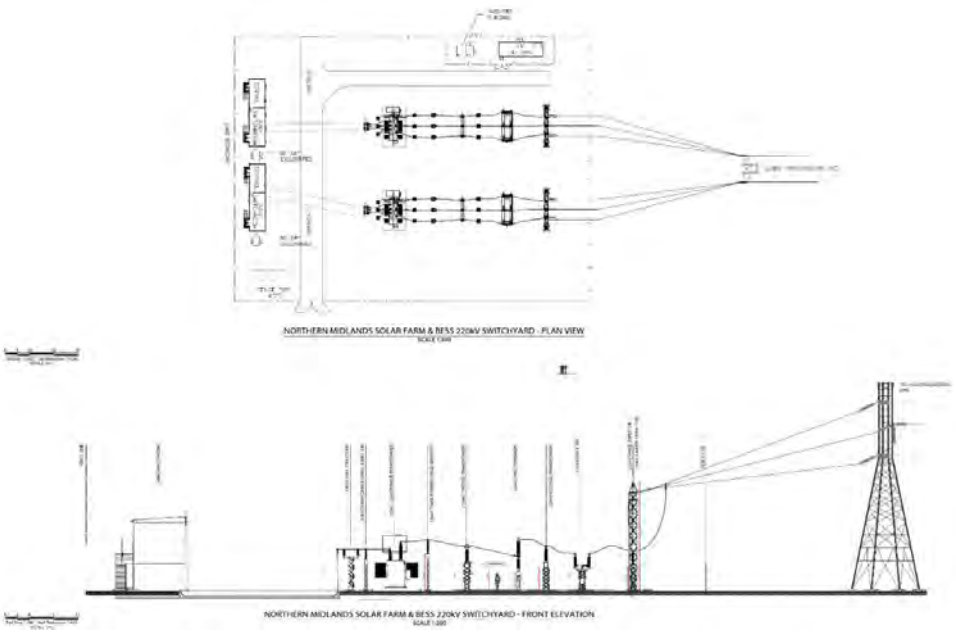


Figure 20 Proposed switchyard design (DNV)

3.2.6 Cabling and trenches

Localised cabling is required within the solar arrays to connect the components. No trenching or cabling is required outside of the solar array and associated infrastructure areas. Detailed design is required for localised cabling.

3.2.7 Site Access and Access Roads

Connorville Station is accessed via Connorville Road (a public, two-way local road), that becomes a private road once inside the property boundary.

There are also several existing farm access gates located along Macquarie Road. These entrances vary from unformed accesses directly onto grassed paddocks, to rough formed gravel tracks. The Traffic Impact Assessment (TIA) (Appendix H) provides further detail on site access.

Three of these existing farm access gates along Macquarie Road are proposed to be developed into main access points (Access #1 and Access #4), with two additional secondary/emergency accesses for NMSF (Access #2 and #3, plus Connorville Road).

The primary access road to Solar West (Access #4) is from Macquarie Road. This is an upgrade of a private unsealed access road on neighbouring private land (Property 'Pisa'). The other primary access road, to Solar East (Access #1), comes directly from Macquarie Road across a neighbouring property (Title 145786/3).

Secondary access points will therefore be Connorville Road and internal farm roads, as well as an existing private unsealed roads (Access #2 and #3).

For construction and maintenance of the proposed 220 kV transmission line, the existing 110 kV transmission line easements will be utilised, accessed via Connorville Road, Lake River Road (primary point) and Billopp Road (a Council managed Local Road extending off Poatina Road). All construction activities will be managed to ensure sufficient distance from live power transmission infrastructure.

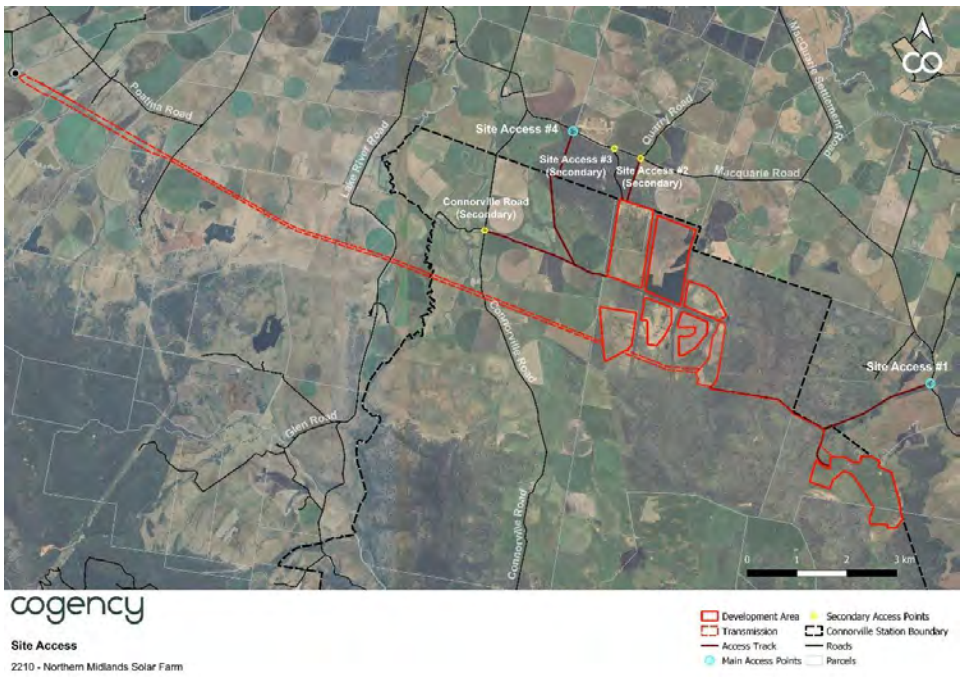


Figure 21 Proposed site access points and roads

3.2.8 Operations and Management Building

An operations and management building is proposed be located within the Main Infrastructure Area. This mainly includes the site office for the construction team and office building for the permanent operations manager. It will be low scale (single storey) in built form.

3.2.9 Fencing, Lighting and Security

The perimeter of the solar array areas will be fenced with an approximately 2.1 m tall security fence (barbed wire on top), to protect from intrusion. Regular spacing of gates will allow multiple controlled access/egress points. Only limited areas (along the eastern boundary of Solar East and the most northern solar array of Solar West) of fencing are along a title / property boundary, with the majority internal to Connorville Station. No fencing is proposed along a public land boundary.

The BESS compound will have an additional security fence, minimum 2.5 m tall (chain wire to a minimum height of 1.8 m plus a three-strand barbed wire top). The design and engineering plans show these in greater detail, which are provided in the appendices.

The security fence is necessary for the integrity of the system. The fence design (height plus use of chain wire) means that animals such as kangaroos and deer cannot be caught within the fencing. The fencing provides additional benefit in the control of sheep grazing.

3.3 Landscaping and Vegetation

3.3.1 Vegetation Removal

The Proposal requires the removal of some native (and non-native) vegetation. The siting and design of the Proposal has avoided the areas of high-quality native vegetation, in accordance with the flora and fauna assessment. Native vegetation removal has mostly been avoided by using existing access tracks through shelterbelts where possible, which will only require minor lopping and tree removal for widening access to the sites. A native vegetation removal plan will be provided as part of a condition on permit and detailed design.

3.3.2 Vegetation Planting and Screening

The topographical context of the Solar West and Solar East areas mean that they are highly obscured from public view. The Landscape and Visual Impact Assessment (LVIA) (Appendix E) includes a Landscape Plan and recommendations. Small areas of landscape plantings are proposed for biodiversity improvement and visual impact amelioration however, minimal vegetation planting is necessary, as the Proposal does not involve significant vegetation removal, nor does it require significant visual screening given it is already obscured from view.

3.4 220kV Overhead Transmission Line

In order to export the renewable energy generation by the Proposal, new transmission line infrastructure is required, and is proposed to connect into the national grid at the Palmerston Substation.

To achieve this, the Proposal includes a 220 kV overhead transmission line along an approximately 15.4 km route, connecting the solar farm and battery facility to the Palmerston Substation. The transmission line will run alongside the existing 110 kV transmission line. The physical impact area is restricted to the poles, spaced approximately 200-530 m apart.

Further detailed design will be required to microsite the poles, in close consultation with TasNetworks. Therefore, this application seeks endorsement of a broader corridor with a permit condition requiring further detailed design plans. The Masterplan (Appendix B) nominates a “corridor” to provide flexibility for detailed design and micro-siting of the poles. This corridor is 60 m wide along the majority of the route as it heads west

from Solar West. The corridor expands to 120 m approximately 3 km east of Palmerston Substation then to approximately 160 m wide for the westernmost 750 metres of the route, to accommodate necessary flexibility. Within Appendix C (Design Plans), are indicative plans of the transmission route, including poles.

The proposed transmission line will:

- Share the existing 110 kV line easement, although requires a minimum separation from the 110 kV line
- Require its own buffer, necessitating an expansion to the easement once completed

Figure 12 shows the proposed transmission corridor as it approaches Palmerston Substation.

Once the full detailed design plans are endorsed and the line constructed, the easements on Titles and the Electricity Infrastructure Protection overlay will need to be expanded to accommodate this new transmission line.

The proposed transmission line utilises a distinct design when compared to the existing transmission towers found in the Northern Midlands Area.

The images in Figure 22 show an example of a 220 kV single-pole transmission and an existing 110 kV lattice tower in the Northern Midlands. The indicative shape of the powerline can be seen in the comparative diagram to the left.

The size of the pole structures used for the transmission line will depend on various factors, including technical requirements of the electricity network. There may also be variations in the height of individual poles based on the requirements of each location. The exact height, spacing and location of poles will be finalised at the detailed design stage.

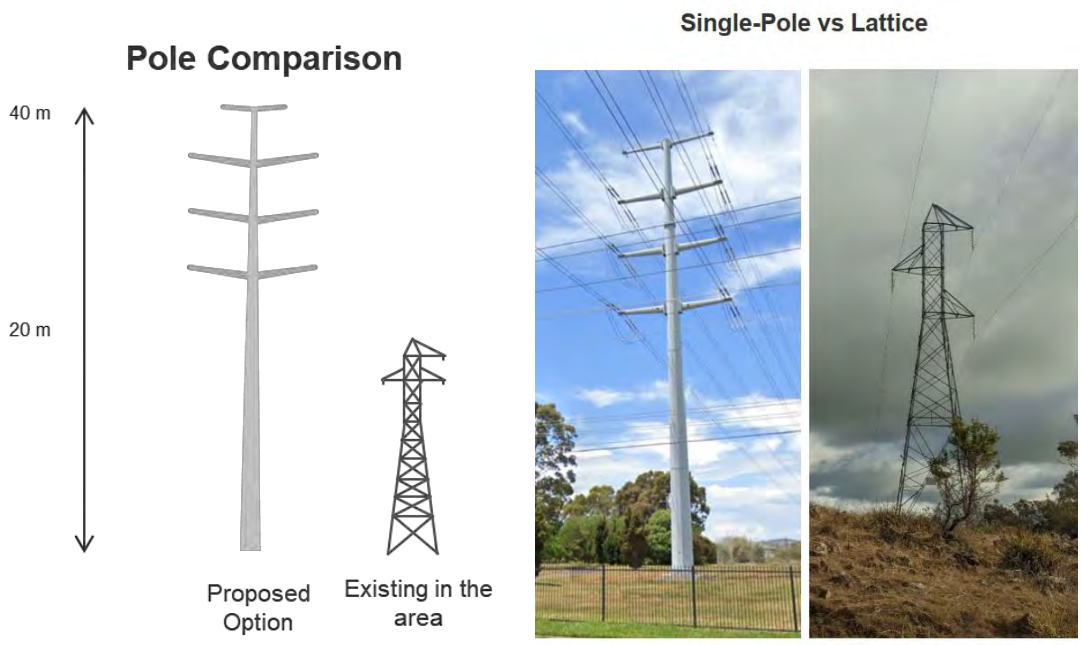


Figure 22 Example of proposed transmission poles

A separate grid connection application will be applied for separately via TasNetworks. The Proponent's consultant team have ongoing discussions with TasNetworks regarding the grid connection.

3.5 Construction, Operation and Lifespan

The construction period is expected to take approximately 1.5 years. Typical solar farm operation periods are 30-40 years. The future leasing and ownership of solar farm's infrastructure is yet to be secured with an appropriate renewable development partner.

3.5.1 Employment opportunities

Chapters 4.3.1, 9.3 and Appendix F (the Socio-Economic Assessment) provide further detail on employment opportunities. The Proposal provides significant job creation, including direct and local jobs. The Socio-Economic Assessment models 370 direct construction jobs, and 11 direct ongoing (FTE) jobs. The local and regional economies can supply a lot of the material components and labour.

3.5.2 Construction

The construction activities will be undertaken in a staged approach due to its scale. The construction period will require haulage of large components and associated access upgrades. A condition on permit, requiring submission of a Traffic Management Plan (TMP), can allow for detailed traffic management approval through the construction phase. The following sub-sections detail the key components of the construction.

3.5.2.1 Temporary Construction Facilities

Both the Solar West and Solar East areas have indicative temporary construction / laydown areas, required for delivery, assembly and of materials and plant to deliver the necessary construction activities. The selected areas are existing cleared grazing land suitable for temporary use without the need to remove any vegetation. Furthermore, their suitability has been assessed in the fire risk reports (Appendix D), which nominate fuel storage (hazardous materials) areas. The temporary areas will include parking, equipment storage, material storage and staff amenities.

3.5.2.2 Construction Impact Mitigation

A Construction Environmental Management Plan (CEMP) will be prepared prior to construction. A CEMP outlines construction mitigation measures to minimise the impacts of construction externalities on the environment and local communities. Issues that should be addressed in a CEMP include: project personnel contact information; public safety and site security; preliminary programme, schedule of works roles & responsibilities; communication and coordination; site set-up; access. The CEMP will also address in detail a range of health, safety, traffic management and amenity issues relating to the construction site and adjoining community.

It will be submitted and approved by the responsible authority prior to construction commencement (it is suggested that a condition of the planning permit requires this).

Due to the distances between the proposed site and the closest receptors construction noise impacts are relatively minimal. However, scheduling construction activities in accordance with the Prohibited Hours as defined in the Regulations, community engagement and best practice noise management controls, regular maintenance, broadband reversing beepers etc. These mitigation measures will further minimise residual risk of harm to nearby receptors.

The surrounding road network is capable of accommodating the required construction traffic and vehicles. Some signage management around Lake River Road is recommended.

3.5.3 Operation

Within the operation phase, there is minimal day-to-day activity relative to construction. It is expected that there will be ~15 ongoing jobs (FTE), related to maintenance, inspections and management.

The Agrisolar component means sheep grazing is the primary method for grass (height) management, although slashing would be used in addition if required, in order to maintain grass height to a suitable fire-risk management standard.

Modern large scale solar farms comprise live performance monitoring components. Detailed design and development will confirm system details.

3.5.4 Decommissioning

Typical lease programs for these types of renewable energy projects have options to extend or decommission after a set period of time (usually 30-40 years). The decommissioning requirements, that typically require the developer to fully return the development to pre-development condition (subject to agreement), will be subject to a condition on the planning permit.

3.6 Agrisolar

'Agrisolar' is the concept of concurrent sheep grazing (or other agricultural activities, such as vegetable growing) and solar electricity generation. Across Australia and internationally, there is growing research on the benefits of Agrisolar. The benefits can be derived from:

- Diversification of income due to the addition of renewable electricity production over grazing land.
- Natural grass management under solar panels (instead of relying upon slashing or spraying).
- Extra shading of sheep and pastures.
- In drier climates, additional moisture through condensation on panels.

Considering the lower agriculture capability of the solar development areas, this diversification and concurrent Agrisolar use can provide strong agricultural benefits for the Proponent.

The Clean Energy Council released their 'Australian Guide to Agrisolar for Large-Scale Solar: For proponents and farmers' March 2021, that contains further information on Agrisolar.

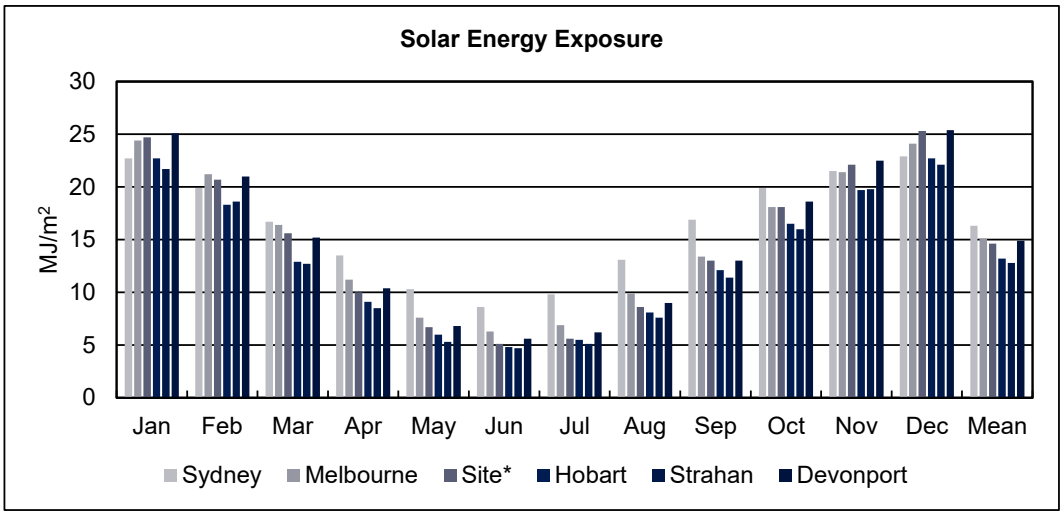
4. Proposal Justification

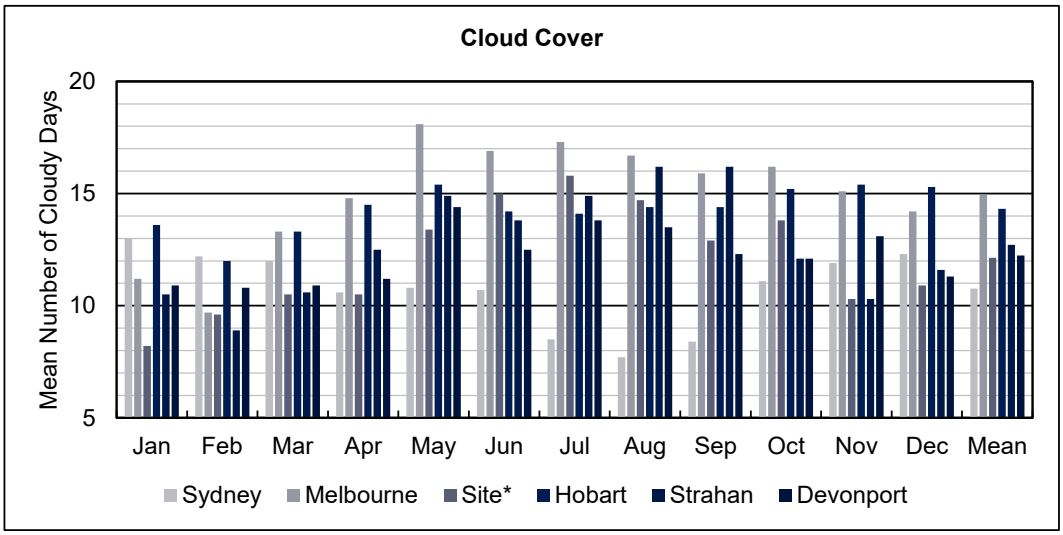
The three primary components to identifying a suitable site are: solar exposure, ability to connect to the grid, and physical site characteristics. The Site is appropriate on all three counts.

4.1 Location Suitability – Solar Exposure

The Site receives mean annual solar gains that are comparable with mainland Australian cities, particularly Melbourne, although this is not consistent throughout the year. There are differences, especially at solstices. What Tasmania loses during winter, it largely regains during summer due to its longer daylight hours. The Site has advantages over other key Tasmanian locations due to geography of the island; being located on the island's eastern half and therefore having less cloud and rainfall.

This is reflected in the Bureau of Meteorology data, which shows that the Site's mean annual solar exposure is higher than most Tasmanian cities and on par with Melbourne's; and the Site's mean annual cloud cover is lower than Melbourne, Strahan and Hobart's, and only trailing Sydney.





Early design investigations in the pre-feasibility stage concluded that the solar exposure at the Site is suitable for a large-scale solar farm.