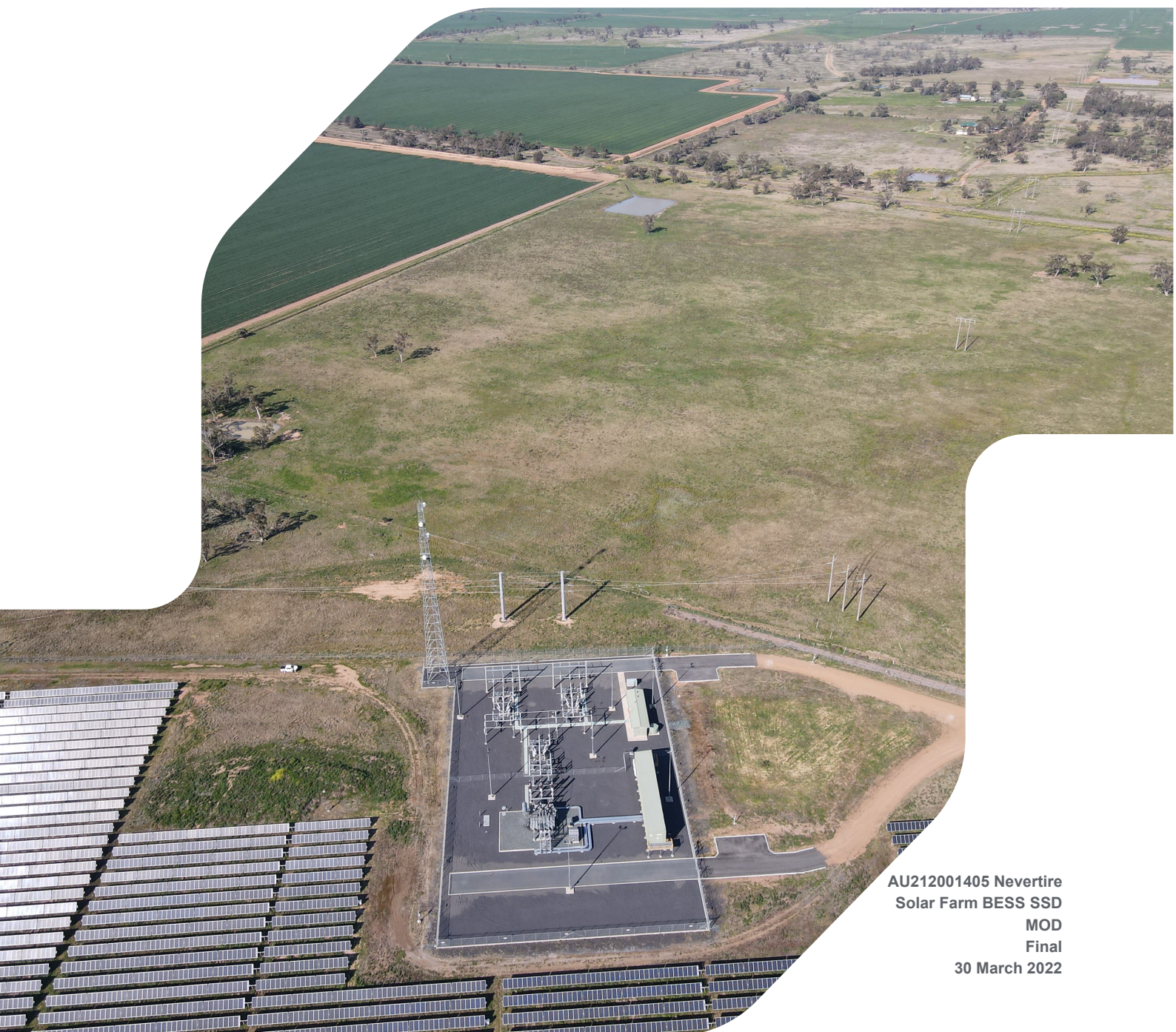


NEVERTIRE SOLAR FARM MODIFICATION 4 SUBMISSIONS REPORT

SSD 8072



AU212001405 Nevertire
Solar Farm BESS SSD
MOD
Final
30 March 2022

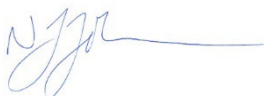
REPORT

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30 March 2022

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Prepared by:

RPS

Michelle Moodley
Senior Consultant - Environment

Level 13, 255 Pitt Street
Sydney NSW 2000

T +61 2 8099 3200
E michelle.moodley@rpsgroup.com.au

Prepared for:

Elliott Green Power

Tom Kibble
Head of Legal

Angel Place, Level 9, 123 Pitt Street
Sydney NSW 2000

T +61 (0) 434 992 714
E tom.kibble@elliottgreenpower.com

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EXECUTIVE SUMMARY

Elliott Green Power the current owner of the Nevertire Solar Farm propose to modify the development (SSD8072) through addition of a Battery Energy Storage System support and integrate with the Nevertire Solar Farm. To support Elliott Green Power's application to seek a modification, a Modification Report was submitted to the Department of Environment and Planning. The Modification Report was placed on public exhibition from 16 February 2022 to 1 March 2022. During this period submissions were sought from community members, government agencies, and other organisations.

This Submissions Report has been prepared to consider and respond to the issues raised during public exhibition of the Modification Report, consistent with the *SSD Guidelines – Preparing a Submissions Report* (NSW Department of Planning, Industry and Environment (DPIE), November 2021).

Submissions were received from 13 government agencies and organisations. No submissions were provided by community members and no form letters or petitions were received.

Submissions have been analysed, responded to and where necessary, recommendations have been included in the updated mitigation measures for the modified development.

A request for information from the Department of Planning, Industry and Environment – Energy Assessments prompted further analysis of visual impacts to residential receivers. As a result, the Visual Impact Assessment that was undertaken by RPS in November 2021 has been amended. The findings have indicated that overall visual impacts to residential receivers would be nil to moderately low.

In addition, further information has been provided to verify the separation distances between battery sub-units are sufficient to ensure a fire does not propagate between the individual sub-units. As a result, a memorandum to supplement the Preliminary Hazard Analysis that was undertaken by SLR in October 2021 has been prepared. The findings have indicated that based on minimum clearance distances from fire modelling using the UL 9540A ANSI/CAN/UL *Standard for Test Method for Evaluating Thermal Runaway Fire Propagation in Battery Energy Storage System* (UL9540A), two proposed 70 m by 20 m BESS battery pack enclosures for the BESS facility would be able to accommodate 40 BESS battery packs. Furthermore, the memorandum has demonstrated that the fire risks from the BESS can comply with the Hazardous Industry Advisory Paper No. 4, Risk Criteria for Land Use Safety Planning (Department of Planning, 2011).

Through responding to submissions and the preparation of the Submissions Report, the justification of the modified development remains consistent with the Nevertire Solar Farm Modification 4 Report, SSD 8072 (RPS, December 2021).

1 INTRODUCTION

1.1 Background

The Nevertire Solar Farm (the 'Approved development' (NSF)) is located approximately one kilometre (km) west of the Nevertire township and 90km west of Dubbo, within the Warren Shire Council local government area (LGA). Development consent for the NSF was originally issued by the NSW Department of Planning and Environment on 5 July 2017 (State Significant Development (SSD) 8072) and allows for the construction, upgrading and decommissioning of the NSF.

Since development consent for the NSF was granted, the development has been modified on three occasions. Final commissioning of the NSF was completed on 20 February 2020 and unconstrained operation at 100 per cent export was approved.

Elliott Green Power (EGP), the current owner of the NSF, proposes a further modification to the project for the addition of a Battery Energy Storage System (BESS) facility to be located on about 2.5 hectares of a parcel of land immediately adjacent the NSF (identified as Lot 38, DP755292) (the BESS facility site).

An overview of the proposed modification is as follows:

- The construction, operation and decommissioning of a BESS facility to support and integrate with the NSF. It is expected that the BESS facility would consist of up to 40 shipping container style battery energy storage packs using a lithium technology or similar. It would include battery storage containers, converters, RMU, step-up transformers, HV underground feeders, connection to the NSF 22kV switchboard and associated roads, tracks, fences and control building.
- Subdivision of Lot 38, DP755292 into two allotments, one to be solely dedicated to the siting of the BESS facility. The other allotment would be retained for its existing land use.
- Inclusion of the parcel of land that contains the BESS facility into the Approved development footprint for the NSF.

A Modification Report to support EGP's application to seek a modification to SSD8072 under Section 4.55(2) of the *Environmental Planning and Assessment Act 1979* (EP&A Act) was submitted to the Department of Environment and Planning (DPE).

The Modification Report was placed on public exhibition from 16 February 2022 to 1 March 2022. During this period submissions were sought from community members, government agencies, and other organisations.

1.2 Purpose of this Submissions Report

This report has been prepared to consider and respond to the issues raised during public exhibition of the Modification Report. This report also describes any changes to the proposed modification, including a revised consolidated list of the mitigation measures for the modified development.

The Submissions Report has been prepared consistent with the *SSD Guidelines – Preparing a Submissions Report* (NSW Department of Planning, Industry and Environment (DPIE), November 2021).

2 ANALYSIS OF SUBMISSIONS

2.1 Overview of submissions

An overview of the submissions made during the exhibition period has been provided in Table 2-1. Copies of the full submissions can be viewed or downloaded from the [NSW Major Projects Website](#).

No submissions were provided by community members.

No form letters or petitions were received.

The following government agencies and other organisations provided submissions and/or requested additional information:

- Warren Shire Council
- Transport for NSW
- Essential Energy
- Transgrid
- Heritage Council of NSW
- Department of Planning and Environment – Biodiversity, Conservation and Science Directorate
- Department of Planning and Environment – Crown Lands
- Department of Primary Industries Agriculture
- Fire and Rescue NSW
- Department of Regional NSW – Mining, Exploration and Geoscience – Geological Survey of NSW
- Department of Planning and Environment – Water and the Natural Resources Access Regulator
- Department of Planning, Industry and Environment – Energy Assessments
- NSW Rural Fire Services

Table 2-1: Overview of submissions received

Position	Number of submissions from government agencies and other organisations	Number of submissions from community members	Total number of submissions
Support	0	0	0
Comment	13	0	13
Object	0	0	0
Total			13

2.2 Response methodology

As only a small number of submissions were provided, the submissions have been responded to on a stakeholder basis, consistent with the *SSD Guidelines – Preparing a Submissions Report* (NSW DPIE, November 2021).

3 ACTIONS TAKEN SINCE EXHIBITION

3.1 Overview of actions taken

The following actions have been taken since exhibition and following receipt of the submissions:

- Analysis of submissions, as described in Section 2
- Consultation (through phone-calls and email, dated 2 March 2022) with DPE to clarify the request for additional information
- Further assessments:
 - A memorandum (memo) to the Preliminary Hazard Analysis (PHA) (SLR, October 2021), has been prepared in March 2022. The PHA Memorandum has been provided in Appendix C.1. A summary of the report is provided below in Section 3.2.
 - The Visual Impact Assessment (VIA) (RPS, November 2021) has been amended in March 2022. The amended VIA has been provided in Appendix C.2. A summary of the key findings of the report have been provided below in Section 3.3.
- Preparation of updated mitigation measures for the modified development (Appendix B)

3.2 Preliminary Hazard Analysis Memo

3.2.1 Assessment approach

A PHA Memo has been prepared by SLR in March 2022 (Appendix C.1) to provide further information for DPE to verify the separation distances between battery sub-units would be sufficient to ensure a fire does not propagate between the individual sub-units including:

- verification that the BESS would be accommodated within the area designated for the BESS, accounting for separation between BESS sub-units to prevent fire propagation; and
- demonstrating that the fire risks from the BESS can comply with the NSW Department of Planning's, Hazardous Industry Advisory Paper No. 4, Risk Criteria for Land Use Safety Planning (HIPAP 4).

3.2.2 Assessment

The PHA Memo indicated that in managing BESS fire-related risks the key to separation is to provide sufficient space between rows of adjacent BESS units and between BESS units and the BESS enclosure perimeter.

- Generally, BESS battery packs have a minimum clearance distance to the nearest boundary of their enclosure of between 5 m to 6 m. This is based on the radiant heat flux from a theoretical BESS battery pack fire that might be experienced by site personnel.
- Rows of adjacent BESS battery pack units will also be separated by a minimum clearance which will vary in terms of the front and end walls and side walls. This is based on the radiant heat flux from a theoretical BESS battery pack fire that an adjacent BESS unit might experience in relation to its structural integrity.

Minimum clearance distances from fire modelling

The acceptance criteria used for fire modelling are given in terms of radiant heat flux limits are related to personnel exposure and BESS unit structural integrity.

Personnel Exposure

HIPAP 4 states that a radiation intensity of 4.7 kW/m² is considered high enough to trigger the possibility of injury for people who are unable to be evacuated or seek shelter. HIPAP 4 also suggests that a level of heat radiation of 4.7 kW/m² would cause injury after 30 seconds' exposure. On this basis, HIPAP 4 recommends a risk injury criterion of 50 in a million per year at a heat flux of 4.7 kW/m².

BESS Unit Structural Integrity

HIPAP 4 states that a radiation intensity of 12.6 kW/m² can result in (i) a significant chance of fatality for extended exposure and a high chance of injury, (ii) the temperature of wood rising to a point where it can be ignited by a naked flame after long exposure, and (iii) thin steel, with insulation on the side away from the fire, reaching a thermal stress level high enough to cause structural failure.

There are two approaches available for determining the minimum clearance distances for BESS units based on achieving the two nominated radiant heat flux limits of 4.7 kW/m² (personnel safety) and 12.6 kW/m² (structural integrity): quantitative fire modelling or certified testing using the UL9540A Test Method.

Quantitative fire modelling

In the absence of actual fire test data, since the choice of BESS unit is not known at this stage, a literature review of credible fire scenarios for comparable containerised BESS systems has been undertaken to investigate clearance distances using the quantitative fire modelling approach. The following approximate clearance distances have been indicated in the literature:

- 6 m = minimum distance from either the front, end or side walls of any BESS battery pack to the associated enclosure fence perimeter (based on the 4.7 kW/m² criterion).
- 2 m to 3 m = minimum distance between adjacent BESS battery pack side walls (based on the 12.6 kW/m² criterion).
- 3 m to 4 m = minimum distance between adjacent BESS battery pack front and end walls (based on the 12.6 kW/m² criterion).

On the basis of the above and the current design (refer to Figure 3-1), the two proposed 70 m by 20 m BESS battery pack enclosures for the BESS facility may not be sufficient to accommodate the proposed 40 BESS battery packs with an approximate size of 7.5 m by 2 m.

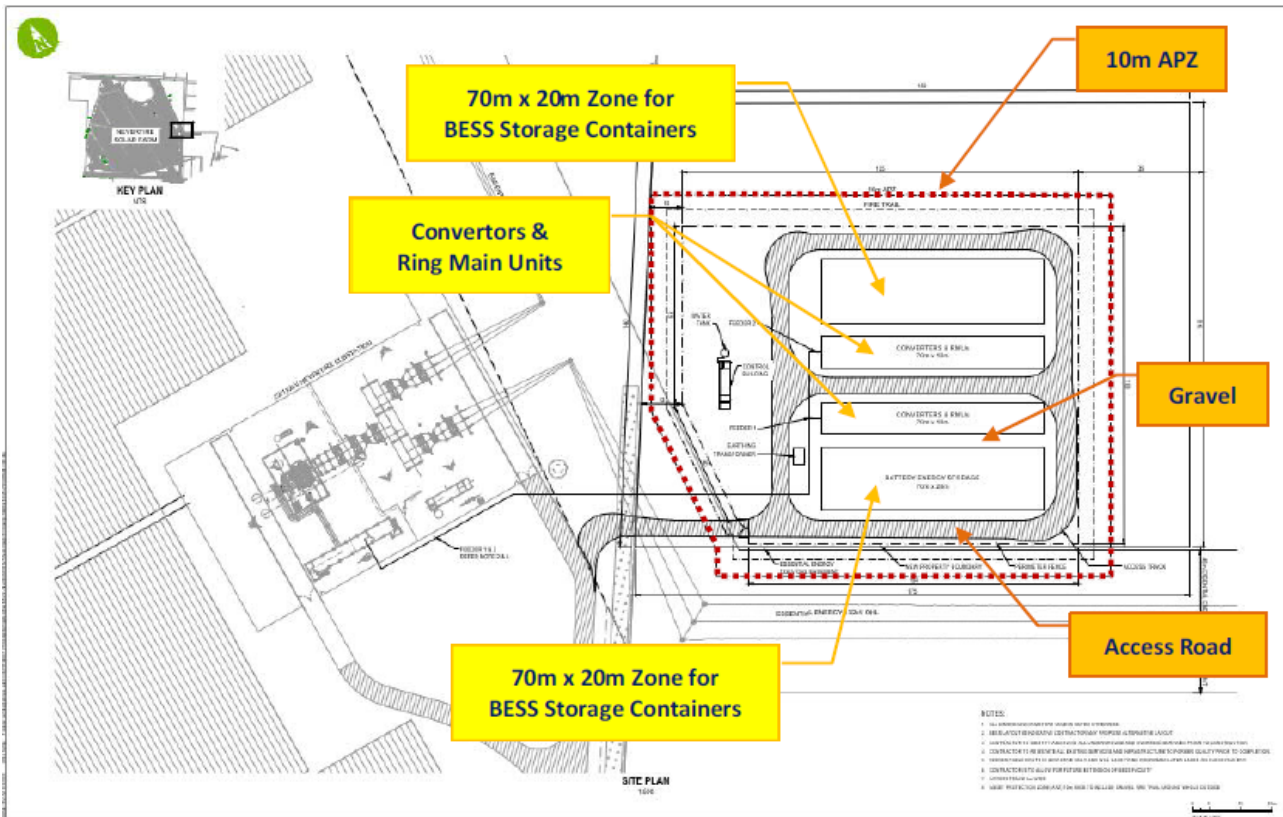


Figure 3-1 BESS facility layout (SLR, 2022)

Certified Tests – UL9540A

The standard certification test for establishing the minimum fire related clearances for commercially available BESS containerised units is UL 9540A ANSI/CAN/UL *Standard for Test Method for Evaluating Thermal Runaway Fire Propagation in Battery Energy Storage System* (UL9540A).

A number of the potential BESS container manufacturers being considered for the proposed BESS facility (including the Tesla Megapack) have carried out their fire testing under UL9540A. The Tesla Megapack UL9540A test results indicate that a separation distance between the sides and backs of Tesla Megapacks of 155 mm was sufficient in terms of preventing a fire from spreading from one unit to another. In reviewing actual installations involving Tesla Megapacks namely the Gambit Energy Storage Park installation in Angleton Texas it has been found that, a single row of 10 Tesla Megapack pairs of containers required a total length of approximately 56 m. This implies that the two 70 m by 20 m BESS battery pack enclosures (refer to Figure 3-1) designated for the proposed BESS facility would be sufficient to accommodate a total of 40 Tesla Megapacks, configured in pairs.

Achieving the risk level recommended in HIPAP 4

As noted previously, the HIPAP 4 risk criteria heat flux levels are associated with an occurrence of 50 in a million per year. This is achieved via a combination of the following:

- The “credible” fire scenarios discussed above (and associated safe separation distances) were developed using the maximum expected temperature inputs as suggested by AS 1530.4-2014 *Methods for Fire Tests on Building Materials, Components and Structures. Part 4 Fire-Resistance Tests for Elements of Construction*. Thus, the modelled fires used the upper bound of any plausible fire event.
- The layers of protection provided by global BESS manufacturers (e.g., Tesla, Wartsila, etc) that have been developed over recent years, have successively reduced the incidence of (i) an electrolyte-instigated fire, and (ii) a battery cell thermal runaway fire.

The combination of sufficient separation distance and BESS unit safety systems are able to achieve the HIPAP 4 requirements for fire risk.

On the basis of the above, the PHA Memo has concluded that the proposed BESS facility would satisfy the issues raised regarding adequate BESS unit separation and the fire safety requirements of Hazardous Industry Planning Advisory Paper (HIPAP) No.4.

3.2.3 Mitigation measures

In addition to the mitigation measures related to Hazards in the Modification Report it has been recommended that the PHA Memo be updated once the specific choice of BESS container and battery pack is made to confirm the conclusions of the memo. This recommendation has been included in the updated mitigation measures (Appendix B).

3.3 Amended VIA

3.3.1 Assessment approach

The Visual Impact Assessment has been amended in March 2022 (Appendix C.2) to include analysis of visual impacts to the residential receiver located on Lot 4 DP755292, confirm which of the selected viewpoints are representative of views from residential receivers and provide distances to these receivers.

3.3.2 Assessment

Visual impacts to residential receiver Lot 47 DP75529

Viewpoint 25 (the view from Lot 47 DP75529) has been assessed as part of the Amended VIA (refer Figure 3-2).



Figure 3-2 View from Lot 47 DP 755292 (EGP, 2022)

REPORT

The Amended VIA has indicated that visual impacts to the residential receiver on Lot 47 DP75529 has been identified as:

- Moderately sensitive due to its rural setting, vegetative screening and capacity for change without impacting its valued attributes.
- Having low magnitude of change as the proposed BESS is blocked from the onsite shed and vegetation and cumulative impacts have been identified to be negligible.
- Moderate to low overall.

Views from residential receivers

The Amended VIA confirms which of the selected viewpoints are representative of views from residential receivers and provides distances to these receivers as summarised in Table 3-1 below:

Table 3-1 Summary of visual impacts and distances to residential receivers

Viewpoint	Representative of a residential receiver (Yes/No)	Distance to the proposed BESS facility	Overall potential impact
1	No	5.6 km	Nil visual impact
2	No	6.8 km	Nil visual impact
3	No	3.1 km	Nil visual impact
4	No	2.3 km	Nil visual impact
5	No	4.8 km	Nil visual impact
6	No	0.9 km	Low visual impact
7	Yes	1.1 km	Nil visual impact
8	Yes	1.5 km	Nil visual impact
9	Yes	1.3 km	Nil visual impact
10	No	2.5 km	Nil visual impact
11	No	4.3 km	Nil visual impact
12	No	2.2 km	Low visual impact
13	Yes	1.3 km	Nil visual impact
14	No	2.9 km	Nil visual impact
15	No	7.2 km	Nil visual impact
16	Yes	1.0 km	Nil visual impact
17	No	2.2 km	Nil visual impact
18	No	1.1 km	Low visual impact
19	No	0.8 km	Low visual impact
20	Yes	1.2 km	Nil visual impact
21	No	0.9 km	Negligible visual impact
22	No	5.8 km	Nil visual impact
23	No	5.1 km	Nil visual impact
24	Yes	4.1 km	Nil visual impact
25	Yes	1.0 km	Moderate low visual impact

3.3.3 Mitigation measures

The mitigation measures related to visual impacts in the Modification Report as provided in Appendix B are sufficient.

4 RESPONSE TO SUBMISSIONS

Government agency submissions are addressed in the order received. For each submission, verbatim text from the original submission has been provided in the left hand column and a response is provided in the right hand column.

4.1 Warren Shire Council

Submission	Response
Site familiarisation with the Rural Fire Services should be completed to ensure that during a fire event, the RFS are prepared and informed of the site, infrastructure and the surrounding environment. Contact details for adjoining neighbours should be recorded onsite and made available to RFS in the event of a fire, to enable access and fire fighting measures. Site inspection for the maintenance of the IPZ on a regular basis to ensure that vegetation growth is maintained/removed/controlled, be completed and recorded as part of the BMP.	EGP acknowledges the recommendation from Council. The recommendation has been included in the updated mitigation measures for the modified development (refer Appendix B).

4.2 Transport for NSW (TfNSW)

Submission	Response
<p>TfNSW understands development consent for the Nevertire Solar Farm was granted in 2017 under SSD-8072 and the solar farm has been operational since February 2020. TfNSW notes the proposed modification will involve:</p> <ul style="list-style-type: none">• The construction of a battery energy storage system (BESS) which will be fully integrated with the solar farm.• Subdivision of the subject lot (Lot 38 DP755292) into two lots, one to be used for the BESS and the second to be retained for its existing use (grazing).• It is anticipated that the BESS will comprise of 40 shipping container style battery packs, converters, ring main unit, transformers, HV underground feeders, connection to the Nevertire Solar Farm 22Kv switchboard, a control building and associated internal roads and fences.• Access to the site is proposed via the existing access to the solar farm from the Mitchell Highway which was upgraded to a CHR/AUL to satisfy the conditions of consent for the solar farm.• The largest vehicle that will be required during construction of the BESS is a 20m long articulated vehicle. Swept path analysis for a 26m B-double was provided with the initial application for the solar farm.• Construction is to take 12 months and involve a maximum of 50 employees. Peak period of construction works to reach 50 light vehicle and 30 heavy vehicle movements per day.	EGP acknowledges the comments from TfNSW and can be a condition of the consent.

Submission	Response
<ul style="list-style-type: none"> Operational traffic is expected to be minimal and only required for maintenance of the battery packs and associated equipment. <p>The proposed modification complies with TfNSW conditions 1-7, schedule 3 of the existing development consent</p>	
<p>Having regard for the above, TfNSW does not object to the modification subject to the following conditions being included in the conditions of the modified development consent:</p> <ul style="list-style-type: none"> The proposed modification is to comply with the existing conditions of development consent imposed by TfNSW. The existing Traffic Management Plan (TMP) and Driver Code of Conduct is required to be reviewed and updated in response to the changes proposed as a part of the modification and prior to the commencement of construction works in consultation with TfNSW and is required to include the proposed construction traffic routes discussed in Section 5.2 of the Traffic Impact Assessment dated 27 October 2021. The reviewed and updated TMP is to be provided to contractors and employees as a part of the site induction and a copy is to be made available to TfNSW with each major update. Prior to the issuing of the Occupation Certificate, the developer must formally execute a right of way arrangement by way of a Section 88B Instrument under the <i>Conveyancing Act, 1919</i> to legally benefit Lot 38 DP755292 and burden Lot 2 DP1258306. 	<p>EGP acknowledges the inclusion of the conditions in the conditions of the modified development consent. The requirements have been included in the updated mitigation measures for the modified development (refer Appendix B).</p>

4.3 Essential Energy

Submission	Response
<p>Nevertire SF has provided a brief on this project and is currently entering into a CSA (Customer Service Agreement) which will kick off Nevertire to work through the required studies/update's to be assessed with EE/AEMO.</p>	<p>EGP acknowledges the comments from Essential Energy. No further action is required.</p>

4.4 TransGrid

Submission	Response
<p>This is not a TransGrid project project-they are connecting to Essential Energy infrastructure between Dubbo/Nyngan.</p> <ol style="list-style-type: none"> TransGrid doesn't have any infrastructure on this land. 	<p>EGP acknowledges the comments from TransGrid and notes the project does not affect their infrastructure.</p>

4.5 Heritage Council of NSW

Submission	Response
The subject site is not listed on the State Heritage Register (SHR), nor is it in the immediate vicinity of any SHR items. Further, the site does not contain any known historical archaeological relics. Therefore, no further heritage comments are required. The Department does not need to refer subsequent stages of this proposal to the Heritage Council of NSW.	EGP acknowledges the comments from Heritage Council of NSW and that no further comment require further input is required.

4.6 Department of Planning and Environment (DPE) – Biodiversity, Conservation and Science Directorate (BCS)

Submission	Response
<p>BCS endorses the land category assessment in the biodiversity impact analysis report, and considers that:</p> <ul style="list-style-type: none">• The biodiversity impact analysis contains adequate information to support the conclusion that the proposed development area is Category 1 – exempt land under the <i>Local Land Services Act 2013</i>• As the land is Category 1 – exempt land, a biodiversity development assessment report is not required <p>Further, the tests of significance of impact to threatened species has been carried out appropriately in the context of the proposal.</p> <p>Based on the information provided BCS concurs that the proposed project modification will not impact on biodiversity values.</p>	EGP acknowledges the comments from BCS.

4.7 DPE – Crown Lands

Submission	Response
As no Crown land, roads or waterways are in the vicinity of the proposal/are affected by the proposal, Crown Lands has no comments at this time.	EGP acknowledges the comments from DPE - Crown Lands

4.8 Department of Primary Industries (DPI) Agriculture

Submission	Response
<p>The NSW Department of Primary Industries (DPI) Agriculture is committed to the protection and growth of agricultural industries, and the land and resources upon which these industries depend. In this case we acknowledge the proposed development being the creation of a 2.5ha lot and Battery Energy Storage System on Lot 38 DP775292 is deemed permissible by 34(2A) of the SEPP Infrastructure 2007 due to location adjacent to the Nevertire Solar Farm on Lots 1 and 2 DP1258306.</p>	<p>EGP acknowledges the comments from DPI Agriculture</p>
<p>The proposed subdivision of the vacant Lot 38 (approximately 24ha) will create a residue lot of 21.5ha within the RU1 Primary Production zone, which has a 1000ha minimum lot size under the Warren LEP 2012. Lot 38 has Land and Soil Capability Class 3 land, being used for irrigated cropping as part of a larger holding.</p>	
<p>In terms of agricultural capability, it will be necessary to ensure weed management is carried out to prevent impacts on adjoining agricultural land, and post-development, it is important that the new parcel can be rehabilitated to enable cropping at the end of the BESS life.</p>	<p>On the BESS facility site, all propagules of exotic flora within the impact area and adjoining 10m area would be removed to prevent the spread or growth of exotic flora. This requirement was included in the updated mitigation measures for the modified development (refer Appendix B).</p> <p>At the end of the BESS life, the BESS facility site would be rehabilitated to restore land capability to pre-existing land capability as stated in the updated mitigation measures for the modified development (refer Appendix B).</p>

4.9 Fire and Rescue NSW (FRNSW)

Submission	Response
<p>Due to the unique challenges of combating a BESS fire in a remote location FRNSW make the following recommendations:</p> <ul style="list-style-type: none">• To ensure that the fire prevention, detection, protection, and firefighting measures are appropriate to the specific fire hazards and adequate to meet the extent of potential fires, a comprehensive Fire Safety Study (FSS) is recommended to be undertaken.• That the FSS is developed in accordance with the requirements of Hazardous Industry Planning Advisory Paper No.2 (HIPAP No.2).• That the FSS is required to be developed to the satisfaction of the operational requirements of FRNSW. FRNSW recommend that the development of a FSS be a condition of consent.• That the development of the FSS considers the operational capability of local fire agencies and the need for the facility to achieve an adequate level of on-site fire and life safety independence.	<p>EGP acknowledges the recommendation to develop a FSS in accordance with HIPAP No.2. The recommendation has been included in the updated mitigation measures for the modified development (refer Appendix B).</p>
<p>FRNSW note that the facility is to be unmanned and there would be no permanent dedicated operational personnel. To ensure first responders have ready access to information which enables effective hazard control measures to be quickly implemented FRNSW make the following recommendations:</p> <ul style="list-style-type: none">• That an Emergency Response Plan (ERP) be developed to specifically address foreseeable on-site and off-site fire events and other emergency incidents, (e.g., fires involving solar panel arrays or the BESS, bushfires in the immediate vicinity or potential hazmat incidents).• That the ERP detail the appropriate risk control measures that would need to be implemented in order to safely mitigate potential risks to the health and safety of firefighters and other first responders (including electrical hazards). Such measures would include the level of personal protective clothing required to be worn, the minimum level of respiratory protection required, decontamination procedures, minimum evacuation zone distances and a safe method of shutting down and isolating the photovoltaic system or BESS (either in its entirety or partially, as determined by risk assessment).• Other risk control measures that may need to be implemented in a fire emergency due to any unique hazards specific to the site should also be included in the ERP.• That two copies of the ERP are stored in a prominent 'Emergency Information Cabinet' which is located in a position directly adjacent to the site's main entry point/s.	<p>EGP acknowledges the recommendation to develop an ERP for the BESS facility site. The recommendations have been included in the updated mitigation measures for the modified development (refer Appendix B).</p>
<ul style="list-style-type: none">• That an Emergency Services Information Package is to be developed as detailed in FRNSW guideline - Emergency Services Information Package and Tactical Fire Plans for use by responding firefighters. It is to be stored along with the ERP in an 'Emergency Information Cabinet' which is located in a position directly adjacent to the site's main entry point/s.	<p>EGP acknowledges the recommendation to develop an Emergency Services Information Package for the BESS facility site. The requirement has been included in the updated mitigation measures for the modified development (refer Appendix B).</p>

4.10 Department of Regional NSW – Mining, Exploration and Geoscience (MEG) – Geological Survey of NSW (GSNSW)

Submission	Response
MEG-GSNSW have reviewed the Nevertire Solar Farm Modification 4 Report (dated 21 December 2021) and have no resource sterilisation issues or concerns to raise.	EGP acknowledges the comments from MEG-GSNSW

4.11 DPE – Water and the Natural Resources Access Regulator (NRAR)

Submission	Response
<p>The following post approval recommendation is provided by NRAR.</p> <ul style="list-style-type: none">The proponent should update the Soil and Water Management Plan to ensure adequate measures are in place to address erosion and sedimentation due to construction of the project. This needs to be in accordance with the guideline, Managing Urban Stormwater: Soils and Construction (Landcom 2004).	EGP acknowledges the recommendation from NRAR to update the Soil and Water Management Plan. The recommendations have been included in the updated mitigation measures for the modified development (refer Appendix B).

4.12 Department of Planning, Industry and Environment (DPIE) – Energy Assessments

Submission	Response
<p>Provide further information in the Preliminary Hazard Analysis for the Department to verify the separation distances between battery sub-units (containers, enclosures etc) are sufficient to ensure a fire does not propagate between the individual sub-units including:</p> <ul style="list-style-type: none">• verification that the Battery Energy Storage System (BESS) would be accommodated within the area designated for the BESS, accounting for separation between BESS sub-units to prevent fire propagation; and• demonstrating that the fire risks from the BESS can comply with the Department’s Hazardous Industry Advisory Paper No. 4, ‘Risk Criteria for Land Use Safety Planning’;	<p>A PHA Memo has been prepared by SLR in March 2022 to provide further information. The PHA Memo has been provided in Appendix C.1. A summary of the report has been provided below in Section 3.2.</p> <p>The memo had two outcomes from investigating the minimum clearance distances for BESS units:</p> <ol style="list-style-type: none">2. Following a literature search of credible fire scenario modelling relevant to BESS units, it has been tentatively concluded that:<ul style="list-style-type: none">– The two proposed 70 m by 20 m BESS battery pack enclosures for the facility (refer to Figure 3-1) may not be sufficient to accommodate the planned 40 BESS battery packs of an approximate size of 7.5 m by 2 m.However, it has been noted that the design of the BESS facility would be subject to original equipment manufacturers (OEM) final design. In addition, a number of the potential BESS container manufacturers are being considered for the proposed BESS facility, including the Tesla Megapack which has plan dimensions of 7.14 m by 1.6 m – slightly smaller than the dimensions adopted in the current design.3. Following a web-based search of certified fire tests to UL9540A, it has been concluded that:<ul style="list-style-type: none">– The two proposed 70 m by 20 m BESS battery pack enclosures for the facility (refer Figure 3-1) would be able to accommodate 40 BESS battery packs employing Tesla Megapacks. <p>Therefore, the PHA Memo has verified that the BESS would be accommodated within the area designated for the BESS, accounting for separation between BESS sub-units to prevent fire propagation</p> <p>The PHA Memo has indicated that HIPAP 4 states that a radiation intensity of 4.7 kW/m² is considered high enough to trigger the possibility of injury for people who are unable to be evacuated or seek shelter. HIPAP 4 also suggests that a level of heat radiation of 4.7 kW/m² would cause injury after 30 seconds’ exposure. On this basis, HIPAP 4 recommends a risk injury criterion of 50 in a million per year at a heat flux of 4.7 kW/m². which is achieved via a combination of sufficient separation distance and BESS unit safety systems – both of which would be included as part of the proposed BESS facility. As such the PHA Memo has indicated that the proposed BESS facility would satisfy the fire safety requirements of HIPAP 4.</p>

Submission	Response
Update the Visual Impact Assessment to include analysis of visual impacts to residential receiver R21, confirm which of the selected viewpoints are representative of views from residential receivers and provide distances to these receivers;	<p>An Amended VIA has been prepared by RPS in March 2022 to provide further information. The amended VIA has been provided in Appendix C.2. A summary of the key findings of the report have been provided below in Section 3.3.</p> <p>An analysis of visual impacts to the residential receiver located on Lot 47 DP75529 identified that the overall visual impact would be moderate to low.</p> <p>The Amended VIA has indicated which of the selected viewpoints are representative of views from residential receivers and it has provided distances to the receivers. This information has been summarised in Table 3-1.</p>
Confirm the height of the BESS containers noting the EIS refers to 2.6 m and 2.9 m.	Height of the BESS containers is 2.6 m.

4.13 NSW Rural Fire Service (NSW RFS)

Submission	Response
<p>The New South Wales Rural Fire Service (NSW RFS) has reviewed the EIS and provides the following comments;</p> <ul style="list-style-type: none"> The recommendations of the Bush Fire Assessment Report (page 3-4), prepared by Bush fire and Environmental Management Consultancy (BEMC) Pty Ltd, dated 20 October 2021 shall be included in the modified development consent. 	EGP acknowledges the comment from NSW RFS to include the recommendations from the Bushfire Assessment Report (BEMC, October 2021). The recommendations of the have been included in the updated mitigation measures for the modified development (refer Appendix B).

5 UPDATED PROJECT JUSTIFICATION

Through providing additional information to verify the separation distances between battery sub-units and further analysing the visual impacts of the BESS to residential receivers the justification of the modified development as it was presented in the Nevertire Solar Farm Modification 4 Report, SSD 8072 (RPS, December 2021) remains current and is considered adequate. As such an updated justification for the modified development has not been included in this Submissions report.

Appendix A

Submissions register

Group	Name	Section where issues raised are addressed in the Submissions Report
Councils	Warren Shire Council	4.1
Public authorities	TfNSW	4.2
	Essential Energy	4.3
	TransGrid	4.4
	Heritage Council of NSW	4.5
	DPE - BCS	4.6
	DPE - Crown Lands	4.7
	DPI Agriculture	0
	FRNSW	0
	MEG-GSNSW	4.10
	DPE - NRAR	4.11
	DPIE – Energy Assessments	3.1, 3.2, 3.3, 4.12
	NSW RFS	0

Appendix B

Updated mitigation measures

The table below provides a consolidated list of the mitigation measures for the Modified development. The list includes mitigation measures for the approved development that would be relevant to the Modified development (and revised where required to align with BESS facility as shown in **bold**), as well as new measures that have been identified during the environmental impact assessment (shown in **bold**) and responding to submissions for the proposed BESS facility (shown in blue).

Construction (C), Operation, (O), Decommissioning (D)

Safeguards and Mitigation Measures	Design	C	O	D
General				
• Consultation with local community, to minimise impact of construction of adjacent agricultural activities and access.		C		
• Consultation would be undertaken with Essential Energy regarding connection to the substation and design of electricity transmission infrastructure.		C		
• Development of a complaints procedure to promptly identify and respond to issues generating complaints.		C	O	D
Biodiversity				
• Stockpiling materials and equipment and parking vehicles would be avoided within the dripline (extent of foliage cover) of any native tree.		C		D
• Prior to the commencement of work, a physical vegetation clearing boundary at the approved clearing limit is to be clearly demarcated and implemented. The delineation of such a boundary may include the use of temporary fencing, flagging tape, parawebbing or similar.				
• Where possible, use non barbed-wire on exterior fencing to minimise bird collision risks.			O	
• Where possible, landscape plantings would be comprised of local indigenous species with the objective of increasing the diversity of the existing vegetation. Planting locations would be designed to improve the connectivity between patches in the landscape where consistent with landscaping outcomes.			O	
– On the BESS facility site native vegetation commensurate to the surrounding remnant PCT should be planted. This should be done to compensate for woody vegetation cleared between November and December 2015				
• If night work is unavoidable, ensure any floodlights are directed away from vegetation.		C		D
• Weed and hygiene protocols would be prepared and implemented.		C		D
– On the BESS facility site remove all propagules of exotic flora from within the impact area and adjoining patch (within 10m) to prevent the spread or growth of exotic flora				
• During operation direct lights away from vegetation.			O	

Safeguards and Mitigation Measures	Design	C	O	D
<ul style="list-style-type: none"> Weed and planting protocols would be prepared and implemented 			O	
<ul style="list-style-type: none"> Where possible, it is recommended that areas of inundation mapped within the BESS facility site be avoided by micro-siting the BESS facility to align with areas of drier vegetation. 	Design			
Aboriginal heritage		C		
<ul style="list-style-type: none"> All relevant staff and contractors should be made aware of their statutory obligations for heritage under the <i>National Parks and Wildlife Act 1974</i> and the <i>Heritage Act 1977</i>. If suspected Aboriginal objects are identified the following procedures must be followed: <ol style="list-style-type: none"> Immediately cease all activity at the location. Ensure no further harm occurs, secure the area, consult with the onsite RAP. Notify the Environment Protection Authority's Enviro Line on 131 555, Warren LALC on 0268 474 599 and an archaeologist (RPS +61 2 8099 3200). No further action to be undertaken until Heritage NSW provides written consent. 		C		D
<ul style="list-style-type: none"> Protocols must be provided that ensure the risk of encountering burials is appropriately managed. If burials are identified, work must immediately cease, the site must be secured, NSW Police must be contacted and HNSW must be notified. All human remains in, on or under the land must not be harmed. If suspected human remains are located during any stage of the proposed works: <ol style="list-style-type: none"> Immediately cease all activity at the site. Ensure no further harm occurs, secure the area to avoid further harm to the remains. Notify the NSW Police 000. Notify the Environment Protection Authority's Enviro Line on 131 555, Warren LALC on 0268 474 599 and an archaeologist (RPS +61 2 8099 3200). 		C		D
<ul style="list-style-type: none"> Further archaeological assessment would be required if the proposal activity extends beyond the area of the current investigation. This would include consultation with the registered Aboriginal party and may include further field survey. 		C	O	D
Noise				
Implement noise control measures such as those suggested in Australian Standard 2436-2010 " <i>Guide to Noise Control on Construction, Demolition and Maintenance Sites</i> ", to reduce predicted construction noise levels.		C		
<ul style="list-style-type: none"> Highly noise intensive works should only be undertaken during the following standard construction hours, unless otherwise assessed and justified: <ul style="list-style-type: none"> 7 am to 6 pm Mondays to Fridays, inclusive; and 8 am to 1 pm Saturdays; and at no time on Sundays or public holidays Provide appropriate respite periods as per the Roads and Maritime Construction Noise and Vibration Guideline (August 2016) when noise intensive works are undertaken or during periods of high noise impacts Carry out community consultation to determine the need and frequency of respite periods, if necessary 		C		D

Safeguards and Mitigation Measures

Design

C

O

D

- Avoid loading and unloading of materials / deliveries outside of daytime hours
- Site entry and exit points should be located as far as possible from sensitive receivers
- Compounds and work areas should be one-way to minimise the need for vehicles to reverse
- Work compounds, parking areas, equipment and stockpiles should be positioned away from noise- sensitive locations and/or in shielded locations
- Trucks should not idle near to residential receivers
- Stationary sources of noise, such as generators, should be located away from sensitive receivers
- Training should be provided to project personnel, including relevant sub-contractors, on noise and vibration requirements and the location of sensitive receivers during inductions and toolbox talks
- Delivery vehicles should be fitted with straps rather than chains for unloading, wherever possible
- Truck drivers should avoid compression braking as far as practicable
- Use the minimum sized equipment necessary to complete the work and where possible, use alternative, low-impact construction techniques
- Power tools should use mains power where possible rather than generators
- Shut down machinery, including generators, when not in operation
- Avoid dropping materials from a height and dampen or line metal trays, as necessary
- Ensure equipment is operated in the correct manner
- All equipment should be appropriately maintained and fitted with noise control devices, where practicable, including acoustic lining of engine bays and air intake / discharge silencers, etc.
- Provide appropriate notice to the affected sensitive receivers prior to starting works and before any noisy periods of works
- Provide signage with a 24 hour contact number
- Where there are complaints regarding noise, review and implement additional control measures, where feasible and reasonable
- Conduct noise and/or vibration monitoring in response to any formal complaints received
- Conduct vibration monitoring whenever vibration intensive works are undertaken within the minimum working distances of sensitive receivers or structures.

-
- During detailed design / equipment procurement, ensure that the BESS facility noise emission sources achieve quantities and sound power levels equal to or lower than presented in this report. If overall BESS facility noise emissions are expected to be higher, additional assessment should be considered Design

-
- Where new and improved BESS facility technology becomes available within the life of the project, replacement of BESS facility equipment should aim to achieve sound power levels equal to or lower than presented in this report. If overall BESS facility noise emissions are expected to be higher, additional assessment should be considered O
 - All formal / reoccurring operational noise complaints should be investigated and where necessary, operator attended noise compliance measurements should be undertaken to measure and compare the site noise level contributions to the predicted values and the PNTLs presented in this report
-

Safeguards and Mitigation Measures	Design	C	O	D
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- All site noise levels should be measured to exclude any influential source not associated with the project
- If the measured site noise levels are below the predicted values and comply with the PNTLs presented in the Noise Impact Assessment, no further mitigation or management measures are required
- If the measured site noise levels are above the predicted noise levels or PNTLs presented in the Noise Impact Assessment, further mitigation and/or management measures should be considered

Visual

- | | | | | |
|--|--------|---|---|---|
| <ul style="list-style-type: none"> • The materials and colour of onsite infrastructure would, where practical, be non-reflective and in keeping with the materials and colouring of existing infrastructure or of a colour that would blend with the landscape. • Review and limit the impacts of the construction laydown areas on the site • Review lighting design to mitigate its impact on adjacent residential areas. • Lighting would be designed to align with principles identified within the Dark Sky Planning Guidelines (2016) and would include using shielded fittings | Design | | | |
| <ul style="list-style-type: none"> • Avoid unnecessary loss or damage to other vegetation adjacent to the BESS facility site by protecting vegetation not proposed for removal prior to construction • Minimise light spill from the BESS facility site by directing construction lighting into the construction areas and ensuring the site is not over-lit. This includes the sensitive placement and specification of lighting to minimise any potential increase in light pollution • Temporary hoardings, barriers, traffic management and signage would be removed immediately when no longer required • The site is to be kept tidy and well maintained, including removal of all rubbish at regular intervals. | | C | | D |
| <ul style="list-style-type: none"> • Minimise light spill from the BESS facility site by directing operational lighting into the site and ensuring the site is not over-lit. This includes the sensitive placement and specification of lighting to mitigate increase in light pollution • Undertake regular maintenance work to the area around the BESS facility to maintain a clean and safe working environment • Damage to fencing, Graffiti and other visual nuisance should be removed during operation to maintain the visual appearance of the BESS facility • Review any future changes to the facility in relation to their impacts on visual amenity • Adhere to requirements of the Dark Sky Planning Guidelines (2016) and implement the following practices: <ul style="list-style-type: none"> – Eliminate upward spill light – Direct light downwards, not upwards – Avoid ‘over’ lighting – Switch lights off when not required – Use energy efficient bulbs – Use asymmetric beams, where floodlights are used – Confirm lights are not purposefully directed towards reflective surfaces – Use warm white colours. | | | O | |

Safeguards and Mitigation Measures	Design	C	O	D
Soils and water quality				
<ul style="list-style-type: none"> The soil and water management plan, and erosion and sediment control plans, would be updated for the proposed BESS facility, implemented and monitored during the proposal, in accordance with Landcom (2004), to minimise soil (and water) impacts. These plans would include provisions to: <ul style="list-style-type: none"> Carry out soil testing prior to any impacts, to inform any soil treatments (such as application of gypsum in compacted areas and top soil management) and provide baseline information for the decommissioning rehabilitation. Install, monitor and maintain erosion controls. Ensure that machinery leaves the site in a clean condition to avoid tracking of sediment onto public roads which may cause risks to other road users through reduced road stability. Manage topsoil: In all excavation activities, separate subsoils and topsoils and ensure that they are replaced in their natural configuration to assist revegetation. Stockpile topsoil appropriately so as to minimise weed infestation, maintain soil organic matter, maintain soil structure and microbial activity. Minimise the area of disturbance from excavation and compaction; rationalise vehicle movements and restrict the location of activities that compact and erode the soils as much as practical. Any compaction caused during construction would be treated such that revegetation would not be impaired. Ensure any discharge of water from the site is managed to ensure ANZECC (2000) water quality criteria are met. Manage works in consideration of heavy rainfall events; if a heavy rainfall event is predicted, the site should be stabilised, and work ceased until the wet period had passed. 		C		D
<ul style="list-style-type: none"> A spill response plan would be developed as part of the overall risk management plan to prevent contaminants affecting adjacent surrounding environments. The plan would: <ul style="list-style-type: none"> Manage the storage of any potential contaminants onsite. Mitigate the effects of soil contamination by fuels or other chemicals (including emergency response and EPA notification procedures and remediation. Ensure that machinery arrives on site in a clean, washed condition, free of fluid leaks. 		C	O	D
<ul style="list-style-type: none"> A protocol would be developed in relation to discovering buried contaminants within the proposal site (e.g. pesticide containers). It would include stop work, remediation and disposal requirements. 		C		D
<ul style="list-style-type: none"> Design would take into account: <ul style="list-style-type: none"> Stage construction where necessary to avoid working in areas that are inundated with water. Where possible installation of electrical equipment elevated above ground level at the BESS facility site 	Design			
<ul style="list-style-type: none"> All staff would be appropriately trained through toolbox talks for the minimisation and management of accidental spills. 		C	O	D
<ul style="list-style-type: none"> All fuels, chemicals, and liquids would be stored at least 50 m away from any waterways or drainage lines and would be stored in an impervious bunded area. 		C	O	D
<ul style="list-style-type: none"> Adequate incident management procedures would be incorporated into the Construction Environmental Management Plan, including requirement to notify EPA for incidents that cause material harm to the environment (refer s147-153 <i>Protection of the Environment Operations Act</i>). 		C	O	D

Safeguards and Mitigation Measures	Design	C	O	D
<ul style="list-style-type: none"> The refuelling of plant and maintenance would be undertaken in impervious bunded areas on hardstand areas only. 		C	O	D
<ul style="list-style-type: none"> Machinery would be checked regularly to ensure there is no oil, fuel or other liquids leaking from the machinery. 		C		D
Traffic/Transport				
<ul style="list-style-type: none"> The existing Traffic Management Plan and Driver Code of Conduct would be reviewed and updated in response to the changes proposed as a part of the modification and prior to the commencement of construction works, in consultation with Warren Council and TfNSW. The plan would include, but not be limited to: <ul style="list-style-type: none"> The proposed construction traffic routes discussed in Section 5.2 of the Traffic Impact Assessment dated 27 October 2021. Assessment of road condition prior to construction on all local roads that would be utilised. A program for monitoring road condition, to repair damage exacerbated by the construction and decommissioning traffic. Designated routes of construction traffic to the site. Carpooling/shuttle bus arrangements to minimise vehicle numbers during construction. Scheduling of deliveries. Community consultation regarding traffic impacts for nearby residents. Consideration of cumulative impacts. Consideration of impacts to the railway. Traffic controls (speed limits, signage, etc.). Procedure to monitor traffic impacts and adapt controls (where required) to reduce the impacts. Providing a contact phone number to enable any issues or concerns to be rapidly identified and addressed through appropriate procedures. The reviewed and updated TMP is to be provided to contractors and employees as a part of the site induction and a copy is to be made available to TfNSW with each major update. Prior to the issuing of the Occupation Certificate, the developer must formally execute a right of way arrangement by way of a Section 8B Instrument under the Conveyancing Act, 1919 to legally benefit Lot 38 DP755292 and burden Lot 2 DP1258306. 		C		D
<ul style="list-style-type: none"> The proponent would repair any damage resulting from proposal traffic (except that resulting from normal wear and tear) as required at the proponent's cost. 		C	O	D
Land use				
<ul style="list-style-type: none"> A Rehabilitation Plan would be prepared to ensure the site is returned to its pre BESS facility land capability. The plan would be developed with reference to base line soil testing and with input from an Agronomist to ensure the site is left stabilised, under a cover crop or other suitable ground cover. The plan would reference: <ul style="list-style-type: none"> <i>Australian Soil and Land Survey Handbook (CSIRO, 2009)</i> <i>Guidelines for Surveying Soil and Land Resources (CSIRO, 2008)</i> The land and soil capability assessment scheme: second approximation (OEH, 2012) Below ground infrastructure that impedes cropping (less than 500mm depth) may be removed, subject to consultation with the land owner. 				D

Safeguards and Mitigation Measures	Design	C	O	D
Waste				
<ul style="list-style-type: none"> A Waste Management Plan (WMP) would be developed in consultation with Warren Shire Council (with regard to disposal options). It would include but not be limited to: <ul style="list-style-type: none"> Identification of opportunities to avoid, reuse and recycle, in accordance with the waste hierarchy. Quantification and classification of all waste streams. Provision for recycling management onsite. Provision of toilet facilities for onsite workers and how sullage would be disposed of (i.e., pump out to local sewage treatment plant). Tracking of all waste leaving the site. Disposal of waste at facilities permitted to accept the waste. Consultation would be undertaken with local waste facility operators to ensure that loads do not exceed capacity. Requirements for hauling waste (such as covered loads). Disposal options for excess waste (Warren Shire has limited options available for the disposal of waste and other viable options would need to be implemented). Wooden crates used on site would need to be thoughtfully disposed of offsite. The crates often cannot be chipped to be used as mulch due to chemical sprays used. Septic system is installed and operated according to the local Warren Shire Regional Council regulations. 		C	O	D
Hazards and risk				
<ul style="list-style-type: none"> All design and engineering would be undertaken by qualified and competent person/s with the support of specialists as required. 		C		
<ul style="list-style-type: none"> Design of electrical infrastructure would minimise EMFs. 		C		
<ul style="list-style-type: none"> Follow industry guidance with respect to minimising exposure to EMF 		C	O	D
<ul style="list-style-type: none"> BESS facility equipment and systems would be designed and tested to comply with international and/ or Australian standards and guidelines 	Design			
<ul style="list-style-type: none"> The PHA Memo would be updated once the specific choice of BESS container and battery pack is made 	Design			
<ul style="list-style-type: none"> Use of fully bunded oil storage for BESS facility transformers in accordance with AS1940 		C	O	
<ul style="list-style-type: none"> Regular tank inspections included in inspection requirements for BESS facility transformers 			O	
<ul style="list-style-type: none"> Develop a Fire management plan for the BESS facility to address: <ul style="list-style-type: none"> Transformer failure and fire Fire starting on site Explosion / Thermal Runaway reaction – powerpacks in containerised modules 		C	O	D
<ul style="list-style-type: none"> Site operating procedures in place to avoid workers coming in contact with electrified systems at the BESS facility site 			O	D
<ul style="list-style-type: none"> BESS facility BMS fault detection and safety shut-off systems provided 		C	O	

Safeguards and Mitigation Measures	Design	C	O	D
• Installation of security fencing around battery facilities and around entire BESS facility site		C		
• Use of internal access roads with appropriate turning circles		C	O	D
• Earthing system installed as per normal electrical facilities		C		
• Installation of CCTV security system to monitor key areas		C	O	
• Completion of a lightning risk assessment in accordance with AS1768		C	O	D
• Include lightning protection measures if deemed necessary		C	O	D
• Develop a Bushfire Management Plan to include but not be limited to:	Design	C	O	D
– Management of activities with a risk of fire ignition.				
– Management of fuel loads onsite.				
– Storage and maintenance of firefighting equipment, including siting and provision of adequate water supplies for bushfire suppression. This includes access to the onsite dam if required for fire emergency situations.				
– The below requirements of Planning for Bush Fire Protection 2019 -				
○ Identifying asset protection zones				
○ Providing adequate egress/access to the site				
○ Emergency evacuation measures				
○ Non-combustible fencing be installed and located 10m from the BESS facility and related infrastructure.				
○ At the commencement of building works and in perpetuity, the 10m APZ around the external boundary fence shall be managed as an Inner Protection Area (IPA) as outlined within Appendix 4 of Planning for Bushfire Protection 2019, and NSW Rural Fire Service ‘Standards for Asset Protection Zones’				
○ The entire area within the fenced BESS facility compound shall be managed as an Inner Protection Area IPA as outlines within Appendix 4 of Planning for Bushfire Protection 2019, and NSW Rural Fire Service ‘Standards for Asset Protection Zones’				
○ Access from Mitchell Highway to the BESS facility compound would be established				
○ Fire trail access around the perimeter fence of the BESS facility compound is provided				
○ A supply pipe from the static water tank associated with the control room shall be established and positioned outside the BESS facility compound to enable responding fire fighters to access this water supply. The location of the supply pipe shall be adequately sign posted for ‘Static Water Supply’ and complying with the static water provisions within Table 7.4a of PBP 2019.				
– Operational procedures relating to mitigation and suppression of bushfire relevant to the solar farm and BESS facility .				
• Site familiarisation with NSW Rural Fire Service would be completed to ensure that during a fire event, NSW Rural Fire Service are prepared and informed of the site, infrastructure and the surrounding environment.				
• Contact details for adjoining neighbours would be recorded onsite and made available to NSW Rural Fire Service in the event of a fire, to enable access and fire fighting measures.				
• Site inspection for the maintenance of the IPA would be undertaken on a regular basis to ensure that vegetation growth is maintained/removed/controlled, be completed and recorded as part of the BMP.				

Safeguards and Mitigation Measures	Design	C	O	D
<ul style="list-style-type: none"> Develop a comprehensive Fire Safety Study in accordance with the requirements of Hazardous Industry Planning Advisory Paper No.2 (HIPAP No.2) to the satisfaction of the operational requirements of FRNSW The FSS would consider the operational capability of local fire agencies and the need for the facility to achieve an adequate level of on-site fire and life safety independence. 	Design		O	
<ul style="list-style-type: none"> Develop an Emergency Response Plan (ERP) that addresses/includes: <ul style="list-style-type: none"> Foreseeable on-site and off-site fire events and other emergency incidents, (e.g. fires involving solar panel arrays or the BESS, bushfires in the immediate vicinity or potential hazmat incidents). The appropriate risk control measures that would need to be implemented in order to safely mitigate potential risks to the health and safety of firefighters and other first responders (including electrical hazards). Such measures would include the level of personal protective clothing required to be worn, the minimum level of respiratory protection required, decontamination procedures, minimum evacuation zone distances and a safe method of shutting down and isolating the photovoltaic system or BESS (either in its entirety or partially, as determined by risk assessment). Other risk control measures that may need to be implemented in a fire emergency due to any unique hazards specific to the site. Two copies of the ERP would be stored in a prominent 'Emergency Information Cabinet' which is located in a position directly adjacent to the site's main entry point/s. 	Design		O	
<ul style="list-style-type: none"> Develop an Emergency Services Information Package as detailed in FRNSW guideline - Emergency Services Information Package and Tactical Fire Plans for use by responding firefighters. It would be stored along with the ERP in an 'Emergency Information Cabinet' which is located in a position directly adjacent to the site's main entry point/s. 	Design		O	
Air quality				
<ul style="list-style-type: none"> Protocols to guide vehicle and construction equipment use, to minimise emissions would be included in construction and operational environmental management plans. This would include but not limited to Australian standards and the POEO Act. 		C	O	D
<ul style="list-style-type: none"> Protocols would be included in construction and decommissioning to minimise and treat dust (water carts or similar in response to visual cues). This may involve installation of barriers such as shade cloth, to protect receivers. 		C		D
Historic heritage				
<ul style="list-style-type: none"> Should an item of historic heritage be identified, NSW Heritage would be contacted prior to further work being carried out in the vicinity. 		C	O	D
Community				
<ul style="list-style-type: none"> The Community Consultation Plan would be implemented to manage impacts to community stakeholders, including but not limited to: <ul style="list-style-type: none"> Protocols to keep the community updated about the progress of the proposal and proposal benefits. Protocols to inform relevant stakeholders of potential impacts (haulage, noise etc.). Protocols to respond to any complaints received. 		C		
<ul style="list-style-type: none"> Liaison with local industry representatives to maximise the use of local contractors, manufacturing facilities, materials. 		C		
<ul style="list-style-type: none"> Liaison with local representatives regarding accommodation options for staff, to minimise adverse impacts on local services. 		C		D

Safeguards and Mitigation Measures	Design	C	O	D
<ul style="list-style-type: none"> Liaison with local tourism industry representatives to manage potential timing conflicts with local events. 		C		D

Appendix C

Supporting information

C.1 PHA Memo

To: Ms Michelle Moodley
From: Dr Peter Georgiou
Date: 23 March 2022
Subject: Nevertire Solar Farm BESS
Response to RFI re Hazards

At: RPS Australia Asia Pacific
At: SLR Consulting Australia Pty Ltd
Ref: 610.30353-M01-v2.0-20220323.docx

CONFIDENTIALITY

This document is confidential and may contain legally privileged information. If you are not a named or authorised recipient you must not read, copy, distribute or act in reliance on it. If you have received this document in error, please telephone our operator immediately and return the document by mail.

Dear Michelle

As you are aware, SLR Consulting Australia Pty Ltd (SLR) prepared the Hazard and Risk Report (in the form of a Preliminary Hazard Analysis) to accompany Modification 4 (SSD-8072-Mod4) related to a proposed new Battery Energy Storage System (BESS) for the approved Nevertire Solar Farm.

Following submission of the modification, DPE (Department of Planning and Environment) have requested further information related to our above-mentioned report, specifically:

- provide further information in the Preliminary Hazard Analysis for the Department to verify the separation distances between battery sub-units (containers, enclosures etc) are sufficient to ensure a fire does not propagate between the individual sub-units including:
 - verification that the Battery Energy Storage System (BESS) would be accommodated within the area designated for the BESS, accounting for separation between BESS sub-units to prevent fire propagation; and
 - demonstrating that the fire risks from the BESS can comply with the Department's Hazardous Industry Advisory Paper No. 4, '*Risk Criteria for Land Use Safety Planning*';

The enclosed responds to the above request for further information. In summary, SLR is confident that proposed BESS will satisfy the issues raised regarding adequate BESS unit separation and the fire safety requirements of Hazardous Industry Planning Advisory Paper (HIPAP) No.4.

Please do not hesitate to contact SLR if further information is required.

Yours sincerely

A handwritten signature in black ink, appearing to read 'Peter Georgiou', written in a cursive style.

DR PETER GEORGIU
Technical Director

Checked/ Authorised by: CS

1 BACKGROUND TO PROPOSED BESS

The approved (SSD-8072) 132 MW Nevertire Solar Farm (NSF) is a solar photovoltaic (PV) plant located approximately 1 km west of Nevertire and 90 km west of Dubbo, within the Warren Shire Council local government area (LGA).

Since development consent for the NSF was granted (July 2017), the development has been modified on three occasions (all approved) to revise the development footprint, facilitate a subdivision and amend the site facilities layout, and use an adjoining property for temporary access and parking during the construction phase.

Approval to export its full capacity into the NSW grid was granted in February 2020.

NSF's owner, Elliott Green Power (EGP), has proposed a further modification to the project for the addition of a Battery Energy Storage System (BESS) facility to support and integrate with the NSF.

- It has been proposed to locate the BESS facility on 2.5 ha of land immediately adjacent to the NSF and the existing overhead transmission line easement.
- The proposed BESS would have a capacity of up to 50 MW / 100 MWh and consist of up to 40 shipping container style battery energy storage packs using a lithium technology or similar.
- The proposal would include battery storage containers, converters, ring main units (RMU), step-up transformers, high voltage (HV) underground feeders, connection to the NSF 22 kV switchboard and associated roads, tracks, fences and a control building.

1.1 Proposal Description

A locality map, including aerial view of the site is provided in Figure 1.

- The nearest sensitive receivers are located approximately 1 km from the proposed BESS site perimeter. They are the residential properties located in the village of Nevertire to the southeast of the proposal. Other rural residential properties are scattered around the site at similar and further distances.
- Nevertire Community Park is located within the village and has been identified as a passive recreation receiver.

A facility layout plan is provided in Figure 2.

- The BESS battery packs will be located within two zones, 70 m by 20 m.
- The BESS battery packs would be separated from the zones dedicated to the Convertors and Ring Main Units as well as the facility's Control Building and other infrastructure.
- The nearest perimeters of the BESS battery pack zones are set back 20 m from the facility's 10 m APZ.

Figure 1 Locality Map

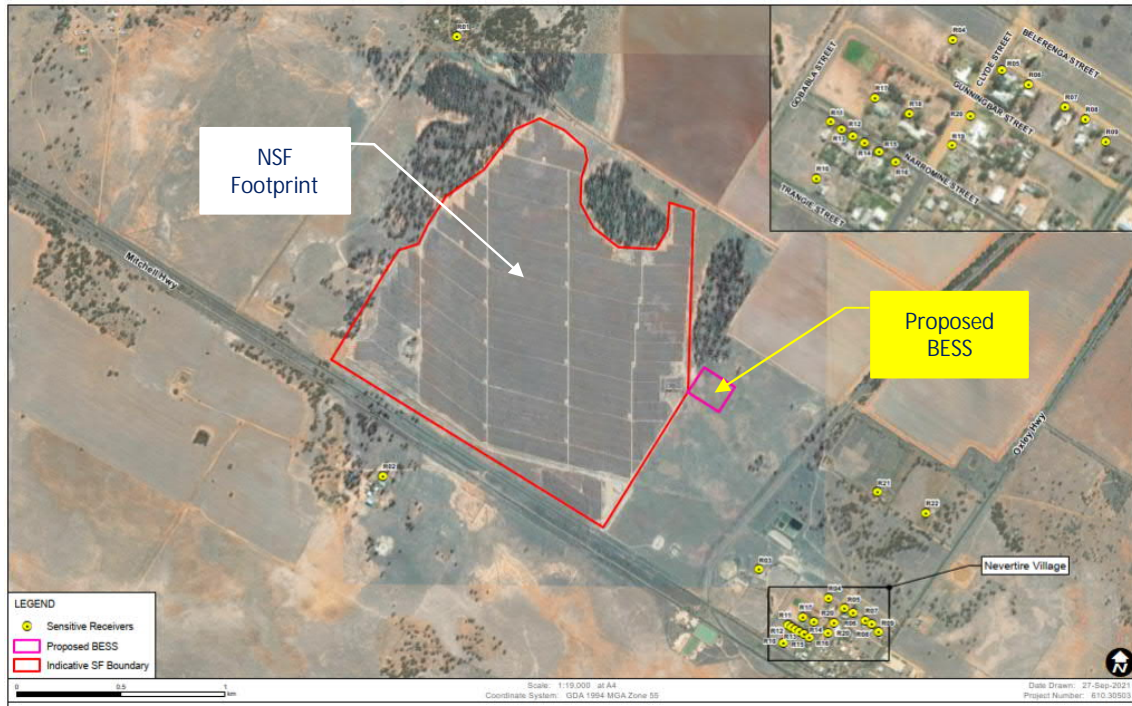
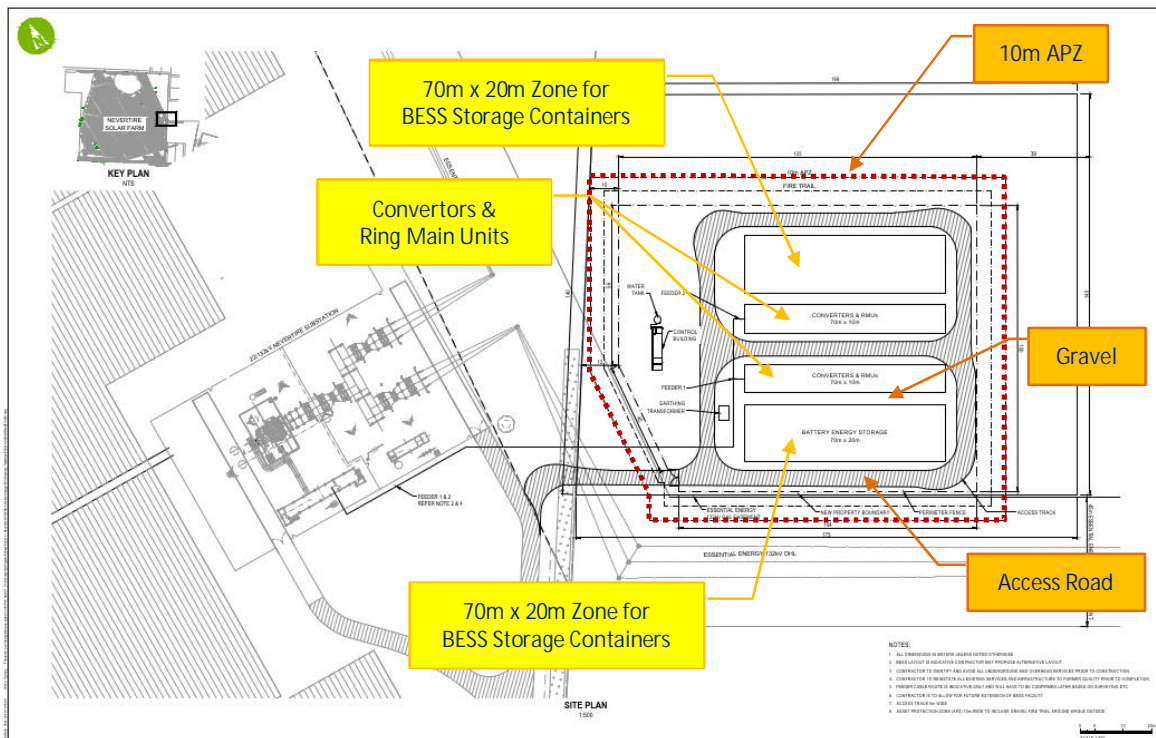


Figure 2 Proposed BESS Layout



2 SUMMARY OF PREVIOUS HAZARD ASSESSMENT

SLR's previous assessment of the proposal was detailed in:

- SLR Report 610.30503-R02-v1.2-20211028.doc, "Nevertire Solar Farm BESS, Preliminary Hazard Assessment", October 2021.

The assessment was prepared in accordance with:

- SEPP'33: Department of Planning NSW, 2011, Applying SEPP 33 - Hazardous and Offensive Development Application Guidelines.
- MLRA: Planning NSW, 2011a Multi-Level Risk Assessment, New South Wales Government
- HIPAP 6: Planning NSW, 2011b Hazard Analysis – Hazardous Industry Planning Advisory Paper No 6, New South Wales Government

The assessment involved the following steps:

- Step 1: Hazard identification;
- Step 2: Hazard analysis (consequence and probability estimations); and
- Step 3: Risk evaluation and assessment against specific criteria.

2.1 Key Outcomes

Preliminary Risk Screening (PRS)

- No dangerous goods are proposed to be used or stored at the facility and therefore the facility is not considered potentially hazardous with regards to dangerous goods in accordance with the thresholds pertaining to SEPP'33.
- The proposed 40 containerised battery energy storage system modules contain battery powerpacks consisting of lithium ion batteries. Lithium ion batteries lie within the Class 9 Miscellaneous Dangerous Substances and articles, which are excluded from the SEPP'33 screening process. However, the hazards associated with these batteries indicate progression to a Preliminary Hazard Analysis.
- No transport of dangerous goods has been proposed for the facility.

On the basis of the above, a more detailed assessment of the hazards associated with the proposed Lithium Ion batteries was undertaken via a Preliminary Hazard Analysis, in accordance with HIPAP 6.

Preliminary Hazard Analysis (PHA)

Following a review of surrounding land use, a series of potentially hazardous events and scenarios were considered to identify if further comprehensive qualitative analysis was required. The listing of all identified hazards has been included in this Memo – refer Attachment A.

Following an initial risk screening, the following potential hazards could not be eliminated through first review and require further examination:

- Hazards associated with lithium ion batteries in the BESS, specifically overheating and fire.
- Hazards associated with oils escaping from transformers.

3 UPDATED HAZARD ASSESSMENT

3.1 Previous BESS-Related Control Measures

In SLR's previous hazard assessment, a series of control measures were developed to maintain and contain BESS-related risks within the site boundary and reduce the risk to areas outside the site boundary.

These control measures have been included in this Memo as Attachment B.

It was concluded that the nominated control measures would be readily implemented as part of plant safety engineering and the comprehensive safeguards that global manufacturers have been developing the past few years.

The guidelines and standards used to develop the control measures are listed in Section 4 – References.

3.2 Updated Control Measures

Following review of SLR's previous hazard assessment, DPE requested further information covering the following:

- provide further information in the Preliminary Hazard Analysis for the Department to verify the separation distances between battery sub-units (containers, enclosures etc) are sufficient to ensure a fire does not propagate between the individual sub-units including:
 - verification that the Battery Energy Storage System (BESS) would be accommodated within the area designated for the BESS, accounting for separation between BESS sub-units to prevent fire propagation; and
 - demonstrating that the fire risks from the BESS can comply with the Department's Hazardous Industry Advisory Paper No. 4, '*Risk Criteria for Land Use Safety Planning*';

3.3 BESS Li-Ion Battery Energy Storage Packs

It was previously noted that the proposed BESS would:

- have a capacity of up to 50 MW / 100 MWh; and
- consist of up to 40 shipping container style battery energy storage packs using a lithium technology or similar.

The specific Li-Ion battery pack option has not yet been selected for the proposed BESS.

The key aspects of BESS-related fire hazard encompass the following two broad areas.

Risks Associated with Non-Battery Fire Events

- Wiring Issues, eg short circuits.
- Electrical Safety System Failures, eg fuses, breakers, insulation, etc.
- Mechanical Interference, eg bugs, rodents, mishandling, etc.

Thermal Runaway

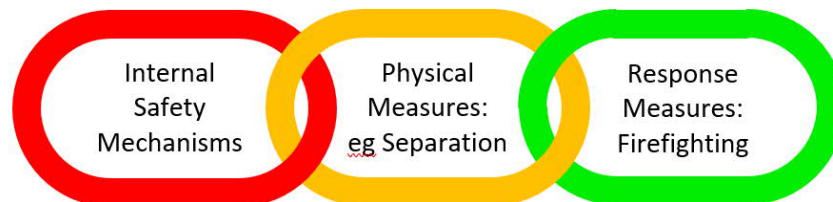
- Causes: manufacturer defect, overcharge, over-discharge, mechanical damage, environmental (too hot, too cold).
- Hazards Produced: heat, flame, off-gassing of mainly H₂ and CO, off-gassing of other toxic gases, deflagration/explosion risk.

Strategy of Protection

The key “links” in managing fire-related risks within a BESS facility are illustrated in the “Fire Response Chain” shown in Figure 3.

- Link 1: Globally manufactured, commercially available BESS units (battery packs, convertors, etc) come with a range of in-built hazard reduction mechanisms to: firstly, avoid the onset of a fire event; secondly, detect a fire and “announce” it to relevant stakeholders, and thirdly, contain and suppress the fire until external fire-fighting resources can be brought to bear to shut the fire down, if it has not already been contained.
- Link 2: In between the Link 1 automatic fire-management systems and the Link 3 intervention of fire-fighting resources are a series of physical measures, eg separation of BESS units, APZ zones, etc, designed limit the spread of a fire event until fire-fighting resources arrive to shut down the fire, if it has not already been contained.
- Link 3: Appropriate access for fire-fighting vehicles, availability of an adequate water supply for fire-fighting, emergency response planning, etc, form the last link aimed at being able to shut a fire down before it spreads beyond the BESS perimeter and into the surrounding community.

Figure 3 Key Strategic Links in Managing BESS Fire-Related Risks – the Fire Response Chain



While the DPE’s request for further information covers mainly Link 2 (refer Figure 3), this Memo also addresses the other two links as the “Fire Response Chain” depends on the strength of all three links. In particular:

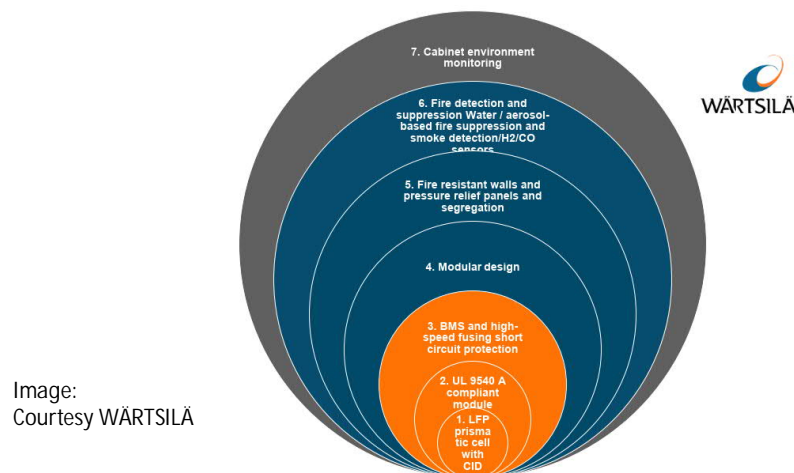
- A strong Link 1 places less onus on Links 2 and 3, and
- Strong Links 1 and 2 place less onus on Link 3.

3.3.1 Link 1

It is worth re-stating that grid-scale BESS units provided currently by global manufacturers (eg Tesla's Megapack) typically contain a hierarchy of fire management controls which create layers of protection as illustrated in Figure 4.

- Electrical Protection is enabled via Current Interrupt Devices (CID) and Rack Level Fuse Protection.
- Mechanical protection is enabled via Pressure Relief Valves.
- LFP chemistry is preferred over NMC because of the higher onset temperature for Thermal Runaway (270°C for LFP versus 210°C for NMC). LFP also has a significantly lower self-heating rate than NMC chemistry batteries.
- BESS units typically come with a BMS (Battery Management System). The BMS monitors a range of variables related to the onset or incidence of a fire event (temperatures, over and under-voltage, over-currents, etc). The BMS will then trigger alarms, instigate internal fire suppression equipment and automatically disconnect each BESS unit in the event of a fire.
- A BMS's fire detection system would normally include: Thermal and Smoke Detectors, Explosive Gas Sensing and H₂ Detection for Thermal Runaway.
- Cabinet walls which are adjacent to other units are fire-rated to EI60, which would provide a 2-hour fire wall between adjacent units.
- The roof panels of BESS packs are typically designed for blast loading to minimise the impact of any potential deflagration/explosion, including roof panel rupture.
- Internal fire suppression systems would normally include a "dry pipe" sprinkler head and, for most modern units, heat-activated aerosols for non-battery fires or once internal temperatures exceed a given temperature limit (usually in the range 140°C to 150°C).

Figure 4 Representative BESS Unit Fire Management Protection System (courtesy: WÄRTSILÄ)



3.3.2 Link 2

The key to Link 2 (refer Figure 3) is to provide sufficient clearance between rows of adjacent BESS units (whether modular/cabinet type or containerised type) and between BESS units and the BESS enclosure perimeter.

- Typically, BESS battery packs have a minimum clearance distance to the nearest boundary of their enclosure of between 5 m to 6 m. This is based on the radiant heat flux from a theoretical BESS battery pack fire that might be experienced by site personnel.
- Rows of adjacent BESS battery pack units will also be separated by a minimum clearance which will vary in terms of the front and end walls and side walls. This is based on the radiant heat flux from a theoretical BESS battery pack fire that an adjacent BESS unit might experience in relation to its structural integrity.

Minimum Clearance Distances from Fire Modelling

The acceptance criteria used for fire modelling are given in terms of radiant heat flux limits and are related to personnel exposure and BESS unit structural integrity.

Personnel Exposure

- This applies to the separation distance of BESS units from the BESS enclosure fence perimeter.
- Following the requirements of HIPAP 4, this Memo has adopted the risk of personal injury as the governing criteria, since this risk level is more stringent than the risk of fatality.
- HIPAP 4 states that a radiation intensity of 4.7 kW/m² is considered high enough to trigger the possibility of injury for people who are unable to be evacuated or seek shelter. HIPAP 4 also suggests that a level of heat radiation of 4.7 kW/m² would cause injury after 30 seconds' exposure. On this basis, HIPAP 4 recommends a risk injury criterion of 50 in a million per year at a heat flux of 4.7 kW/m².
- Further support for this criterion is provided by API 521 6th Edition Table 12, which provides recommended limits regarding thermal radiation for personnel. 4.7 kW/m² is nominated as the limit for sterile radius around a heat source and as a short-term exposure limit (where emergency actions lasting 2-3 minutes can be carried out by personnel with appropriate clothing).

BESS Unit Structural Integrity

- This applies to the separation distance of BESS units from each other.
- HIPAP 4 states that a radiation intensity of 12.6 kW/m² can result in (i) a significant chance of fatality for extended exposure and a high chance of injury, (ii) the temperature of wood rising to a point where it can be ignited by a naked flame after long exposure, and (iii) thin steel, with insulation on the side away from the fire, reaching a thermal stress level high enough to cause structural failure.

Two approaches are available for determining the above minimum clearance distances for BESS units based on achieving the two nominated radiant heat flux limits of 4.7 kW/m² (personnel safety) and 12.6 kW/m² (structural integrity):

- Quantitative fire modelling; or
- Certified results with an appropriate test - the UL9540A Test Method represents industry best practice.

As noted previously, the choice of BESS unit has not yet been made.

Quantitative Fire Modelling

SLR has reviewed the literature of credible fire scenarios for comparable containerised BESS systems. The following approximate clearance distances are indicated in the literature:

- 6 m = minimum distance from either the front, end or side walls of any BESS battery pack to the associated enclosure fence perimeter (based on the 4.7 kW/m² criterion).
- 2 m to 3 m = minimum distance between adjacent BESS battery pack side walls (based on the 12.6 kW/m² criterion).
- 3 m to 4 m = minimum distance between adjacent BESS battery pack front and end walls (based on the 12.6 kW/m² criterion).

On the basis of the above, a possible configuration of BESS battery packs within a long, rectangular site is shown in Figure 5.

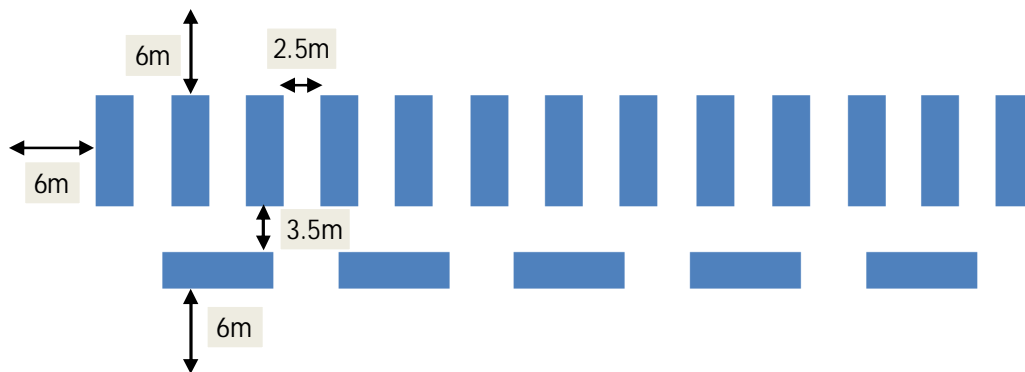
A scenario has been explored under the following assumptions:

- The available space within the site is 70 m x 20 m.
- The BESS battery pack has horizontal dimensions: Length = 7.5 m and Width = 2 m (Note: this is slightly larger than a Tesla Megapack with plan dimensions of 7.14 m by 1.6 m)

For the above scenario:

- 13 BESS battery packs would fit within the rectangular area “side-to-side”.
- 5 BESS battery packs would fit within the rectangular area “end-to-end”.
- A row of side-to-side and end-to-end BESS contains would “almost” fit within the 20 m overall width of the site.

Figure 5 Possible BESS Battery Pack Configuration for a Rectangular Enclosure



On the basis of the above (somewhat conservative) fire scenario analysis, the proposed 70 m by 20 m BESS battery pack enclosures (refer Figure 2) may not be sufficient to accommodate 20 BESS battery packs with an approximate size of 7.5 m by 2 m.

Certified Tests – UL9540A

The standard certification test for establishing (amongst a number of design parameters) the minimum fire-related clearances for commercially available BESS containerised units is UL9540A:

- UL 9540A ANSI/CAN/UL Standard for Test Method for Evaluating Thermal Runaway Fire Propagation in Battery Energy Storage System

A number of the potential BESS container manufacturers being considered for the Proposal (including the Tesla Megapack) have carried out their fire testing under UL9540A.

In fact, UL has established a database of its BESS container fire tests and provides FREE ACCESS to this database:

- Refer ... <https://www.ul.com>

The Tesla Megapack UL9540A test results indicate that:

- A separation distance between the sides and backs of Tesla Megapacks of 155 mm was sufficient in terms of preventing a fire from spreading from one unit to another.

Figure 6 shows some actual installations involving Tesla Megapacks. Of particular interest is the Angleton installation, where the following can be seen:

- The single row of 10 Tesla Megapack PAIRS of containers required a total length of approximately 56 m.

This implies that the two 70 m by 20 m BESS battery pack enclosures (refer Figure 2) designated for the Proposal would be sufficient to accommodate a total of 40 Tesla Megapacks, configured in pairs as shown in Figure 6 (Angleton installation).

Achieving the risk level recommended in HIPAP 4

As noted previously, the HIPAP 4 risk criteria heat flux levels are associated with an occurrence of 50 in a million per year. This is achieved via a combination of the following:

- The “credible” fire scenarios discussed above (and associated safe separation distances) were developed using the maximum expected temperature inputs as suggested by AS 1530.4-2014 Methods for Fire Tests on Building Materials, Components and Structures. Part 4 Fire-Resistance Tests for Elements of Construction. Thus, the modelled fires used the upper bound of any plausible fire event.
- The layers of protection provided by global BESS manufacturers (eg Tesla, Wartsila, etc) that have been developed over recent years, have successively reduced the incidence of (i) an electrolyte-instigated fire, and (ii) a battery cell thermal runaway fire.

The combination of sufficient separation distance and BESS unit safety systems are able to achieve the HIPAP 4 requirements for fire risk.

Figure 6 Example Tesla Megapack Installations

Hornsedale Battery (SA)



Angleton (Texas)



Angleton, Texas

The Gambit Energy Storage Park is an 81-unit, 100 MW system that provides the grid with renewable energy storage and greater outage protection during severe weather.

3.3.3 Link 3

A separate Bushfire Assessment Report has been prepared for the Proposal by BEMC, covering:

- Asset Protection Zones, Landscaping and Construction Standards: including non-combustible fencing to be installed and located 10 m from the BESS and related infrastructure and a 10 m APZ around the external boundary fence, to be managed as an inner protection zone (IPA)
- Access: from Mitchell Highway to the BESS with fire trail access around the BESS compound perimeter fence
- Water Supply: including a supply pipe from the existing static water tank associated with the control room, positioned outside the BESS compound to enable responding fire fighters to access this water supply.
- Bush Fire Emergency Management and Operations Plan (to be developed).

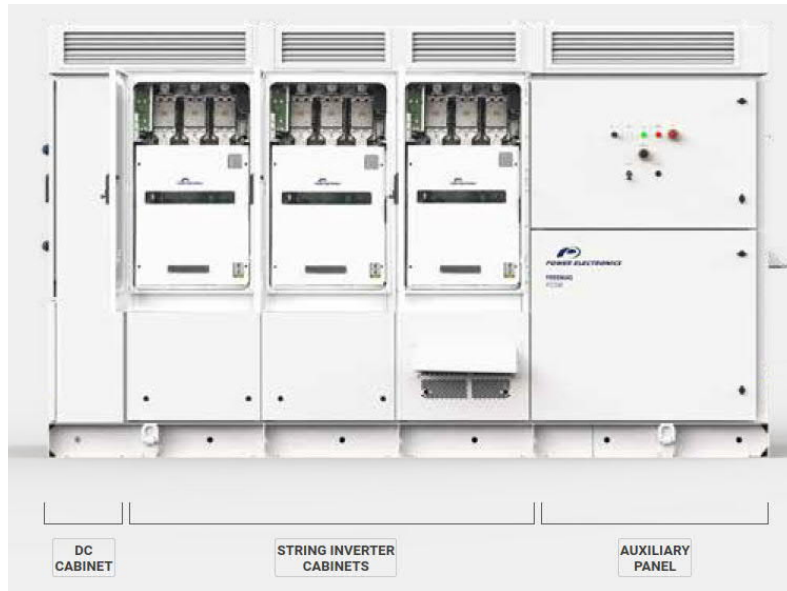
It was concluded that the above measures would enable the Proposal to comply with the performance criteria in Planning for Bushfire Protection (2019).

3.4 BESS Convertors

To date, the only specific item of BESS plant that has been selected is the BESS Power Conversion System, Model/Make: POWER ELECTRONICS Freemaq PCSK.

- The Freemaq PCSK is compatible with all battery technology and manufacturers and, in addition to its AC/DC conversion capabilities, offers grid support functions such as Peak Shaving, Ramp Rate Control, Frequency Regulation, Load Leveling and Voltage Regulation.
- Freemaq PCSK units are designed for concrete pads or piers, open skids and are integrated into full container solutions.
- 3.8 MW Freemaq PCSK units are 12 ft (3.66 m) long - refer Figure 3.
- The chosen Freemaq PCSK units have been in operation (not just for solar facilities) for more than three years and feature a Variable Speed Drive colling system (iCOOL3) that has been certified to IP55 protection for an outdoor convertor. This avoids the need to employ complex liquid cooling systems with the historical risks that such systems have evidenced (albeit infrequently) in the past (complex maintenance, leaks, etc).
- Freemaq PCSK units also feature a unique, autonomous heating system to prevent condensation, key to delivering continuous availability and reducing maintenance.
- Freemaq PCSK units are supported by the Freesun-APP, which provides continuous monitoring of the unit. The units come with built-in wifi, allowing remote connectivity (via the Freesun-APP) to any smart device for detailed updates and information regarding all critical data being recorded within the units - energy registers, production and "events".
- Freemaq PCSDK units all have "Anti-Islanding" that combines passive and active detection methods enable compliance with IEC 62116 and IEEE 1547.
- Finally, the units carry Certification to UL1741, CSA 22.2 No.107.1-16, IEC 62109-1 and IEC 62109-2.

Figure 7 3.8 MW Freemaq PCSK Unit



4 CONCLUSIONS

This Memo has responded to DPIE's request for further information in relation to hazards associated with the proposed BESS facility at the approved Nevertire Solar Farm, in particular:

- The separation distances between adjacent BESS sub-units and between BESS sub-units and their enclosure perimeter;
- Verification that the proposed BESS capacity of the Proposal (50MW/100MWh) can be accommodated within the enclosures provided; and
- HIPAP 4 fire risk issues have been adequately addressed.

Summary of Memo Outcomes 1

Following a literature search of credible fire scenario modelling relevant to BESS units, it was tentatively concluded that:

- In the absence of actual fire test data, the two proposed 70 m by 20 m BESS battery pack enclosures for the facility (refer Figure 2) may not be sufficient to accommodate the planned 40 BESS battery packs of an approximate size of 7.5 m by 2 m, ie slightly larger than a Tesla Megapack.

Summary of Memo Outcomes 2

Following a web-based search of certified fire tests to UL9540A, it was concluded that:

- The two proposed 70 m by 20 m BESS battery pack enclosures for the facility (refer Figure 2) would be able to accommodate 40 BESS battery packs employing Tesla Megapacks.
- The UL9540A test results of other manufacturers' BESS units were not investigated in detail for this Memo. A detailed review of the publicly-available UL9540A test results would identify which other commercially available BESS containerised units (ie other than those incorporating Tesla Megapacks) that would be accommodated within the Proposal's 70 m by 20 m BESS enclosures.

It is recommended that this Memo be updated once the specific choice of BESS container and battery pack is made to confirm the above conclusions.

REFERENCES

AS1768:2020 Lightning Protection

AS 5139 Electrical Installations - Safety of Battery Systems for Use with Power Conversion Equipment

Commonwealth Government, 2020, Australian Code for the Transport of Dangerous Goods by Road and Rail (ADG Number 7.7).

Department of Planning NSW, 2011, Applying SEPP 33 - Hazardous and Offensive Development Application Guidelines.

Ditch, Ben & Zeng, Dong. (2019). Development of Sprinkler Protection Guidance for Lithium Ion Based Energy Storage Systems (FM Global Research Technical Report).

FM Global Property Loss Prevention Data Sheets 5-33, Electrical Energy Storage

IEC 62485-1:2015 Safety requirements for secondary batteries and battery installations - Part 1: General safety information

IEC 62485-2:2010 Safety requirements for secondary batteries and battery installations - Part 2: Stationary Batteries

IEC 62619:2017 Secondary cells and batteries containing alkaline or other non-acid electrolytes - Safety requirements for secondary lithium cells and batteries, for use in industrial applications

IEC 62897 Stationary Energy Storage Systems with Lithium Batteries - Safety Requirements

IEC 62933:2018 Electrical Energy Storage (ESS) Systems;

NFPA 855: 2020 Standard for the Installation of Stationary Energy Storage Systems;

NFPA, 2016 Hazard Assessment of Lithium Ion Battery Energy Storage Systems. Fire Protection Research Foundation and the National Fire Protection Association.

Planning NSW, 2011a Multi-Level Risk Assessment, New South Wales Government

Planning NSW, 2011b Hazard Analysis – Hazardous Industry Planning Advisory Paper No 6, New South Wales Government

UL 1973 Batteries for Use in Light Electrical Rail Applications and Stationary Applications

UL 9540 Standard for Lithium Batteries;

UL 9540 Standard for Energy Storage Systems and Equipment;

UL 9540A ANSI/CAN/UL Standard for Test Method for Evaluating Thermal Runaway Fire Propagation in Battery Energy Storage System

Attachment A

Hazard Identification

Details of the hazardous events, causes, consequences and controls assessed for the proposed BESS modification

Hazardous Incident / Event	Possible Cause	Possible Consequences	Prevention / Protection Safeguards
Bushfire	Bushfire external to site causes fire to spread onto BESS	Damage to the BESS and the solar farm	Implementation of a fire break around the site Implementation of a fire management plan or the like Coordination with local fire authorities
Fire starting on site	Fire starting on site, cause other than starting in containerised module	Damage to the BESS and the solar farm	Implementation of a fire management plan or the like Coordination with local fire authorities
Explosion / Thermal Runaway reaction – powerpacks in containerised modules	Thermal runaway reaction occurs in powerpack from overcharging or fire Faulty powerpacks	Localised damage to containerised modules. Gas / vapour release from containerised modules Fire unlikely to spread between containerised modules (NFPA, 2016)	Equipment and systems will be designed and tested to comply with international and/ or Australian standards and guidelines (see References). Implementation of a fire management plan or the like
Exposure of equipment to high voltage	Short circuit/ or equipment failure	Equipment failure and injury or fatality to personnel	Equipment and systems will be designed and tested to comply with international and/ or Australian standards and guidelines (see References). BESS BMS fault detection and safety shut-off systems provided Emergency Response Plan to cover all site hazards

Hazardous Incident / Event	Possible Cause	Possible Consequences	Prevention / Protection Safeguards
Damage to batteries from vehicle collision	Light vehicle strike to batteries	Damage to battery cells Electrical risks	Use of perimeter fence around battery facility Use of internal access roads with appropriate turning circles Limit of speed limit within fenced facility Earthing system installed as per normal electrical facilities
Transformer Oil Leakage	Corrosion of tank base or leakage of oil tank	Leakage of transformer oil to environment Potential for pool fire in oil	Use of fully bunded oil storage for transformers in accordance with AS1940 Regular tank inspections included in inspection requirements
Security Breach	Security breach into battery storage facility for theft of components	Theft of equipment or risk to personnel	Installation of security fencing around entire facility and also battery facility separately Installation of CCTV security system to monitor key areas Inspections to monitor for security breaches
Damage due to lightning strike	Lightning striking facility and causing damage	Lightning strike causing damage to facility or personnel	Completion of a lightning risk assessment in accordance with AS1768 Include lightning protection measures if deemed necessary
Flooding of facility causing damage	High rainfall and flooding to site	Damage to electrical equipment Restricted access to site	Where possible install electrical equipment elevated above ground level Ensure suitable site access and egress at different locations
Exposure to Electromagnetic Fields (EMF)	Electric fields and magnetic fields from operating electrical equipment and transmission lines	Personnel exposed to elevated EMF levels	Equipment and systems will be designed and tested to comply with international and/ or Australian standards and guidelines (see References). Follow industry guidance with respect to minimising exposure to EMF.

Attachment A

Control Measures Detailed in SLR Report 610.30503-R02-v1.2-20211028

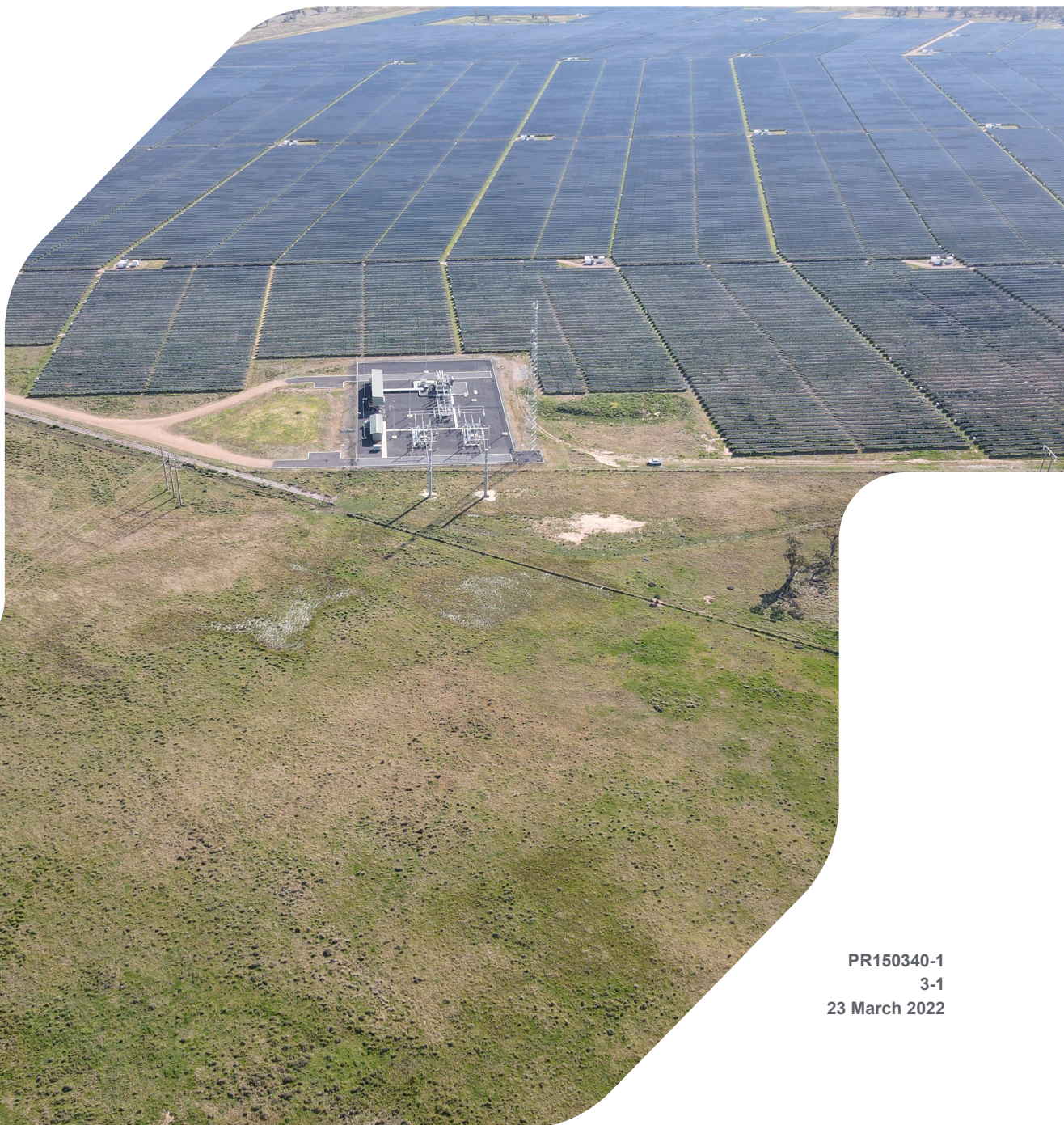
Major Incident	Description	Potential Outcomes	Frequency Estimate	Likely Consequences	Controls	Residual Risk Level
Fire	Fire on site or bushfire impinges on BESS	Localised damage to containerised modules. Unlikely to spread to between containerised modules (NFPA, 2016)	Rare	Damage to individual containerised modules	Equipment to comply with international and Australian standards and guidelines (see References) Fire management plan or the like, be in place	Low
Explosion / Thermal Runaway reaction – powerpacks in containerised modules	Thermal runaway reaction occurs in powerpack from overcharging or fire	Localised damage to containerised modules. Gas / vapour release from containerised modules Unlikely to spread between containerised modules (NFPA, 2016)	Rare	Damage to individual containerised modules	Equipment to comply with international and Australian standards and guidelines (see References) Fire management plan or the like, be in place	Low

Major Incident	Description	Potential Outcomes	Frequency Estimate	Likely Consequences	Controls	Residual Risk Level
Transformer failure and fire	Transformer catastrophically fails	Transformer oil spills and fire	Rare	Leakage of transformer oil to environment Localised fire	Equipment to comply with international and Australian standards and guidelines (see References) Use of fully bunded oil storage for transformers in accordance with AS1940 Regular tank inspections included in inspection requirements Fire management plan or the like, be in place	Low
Electrical Hazards – short circuit /equipment failure	Exposure to high voltages	Electrocution	Rare	Injury / death	Equipment to comply with international and Australian standards and guidelines (see References) Site operating procedures in place to avoid workers coming in contact with electrified systems	Low

C.2 Amended VIA

VISUAL IMPACT ASSESSMENT

Nevertire Solar Farm SSD BESS Modification



PR150340-1
3-1
23 March 2022

REPORT

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1-0	Draft Issue	TFC	5/11/2021
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Approval for issue

Timothy Connor



23 March 2022

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Prepared by:

RPS

Madison Metsala
Business Support Officer

Unit 1
5-7 Barlow Street
South Townsville QLD 4810

T +61 7 4724 4244
E madison.metsala@rpsgroup.com.au

Prepared for:

Elliott Green Power

Level 9 Angel Place
123 Pitt Street
Sydney NSW 2000

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Appendices

Appendix A Design Drawings

TERMS AND ACRONYMS

Table 1: Terms

Term	Description
Amenity	"The pleasantness of a place as conveyed by desirable attributes including views, noise, odour etc." (Australian Institute of Landscape Architects, 2018)
Warren Shire Council	Local Government Area (LGA) for the <i>proposal area</i> .
Character	"A distinct, recognisable and consistent pattern of elements in the landscape that makes one landscape different from another, and often conveys a distinctive 'sense of place'. This term does not imply a level of value or importance." (Australian Institute of Landscape Architects, 2018)
Effect	The landscape or visual outcome of a proposed change. The combined result of sensitivity together with the magnitude of the change. (Australian Institute of Landscape Architects, 2018)
Impact	The categorisation of effects. Legislative context is considered in defining 'impacts' and their significance. (Australian Institute of Landscape Architects, 2018)
Landscape	"Landscape is an all-encompassing term that refers to areas of the earth's surface at various scales. It includes those landscapes that are: urban, peri-urban, rural, and natural; combining bio-physical elements with the cultural overlay of human use and values." (Australian Institute of Landscape Architects, 2018)
Landscape Character	"The combined quality of built, natural and cultural aspects which make up an area and provide its unique sense of place." (Transport for NSW, 2020)
Landscape Character Zone	"An area of landscape with similar properties or strongly defined spatial qualities, distinct from areas immediately adjacent." (Transport for NSW, 2020)
Magnitude of change	The extent of change that will be experienced by receptors. This change may be adverse or beneficial. Factors in this report that are considered in assessing magnitude are: the proportion of the view / landscape affected; extent of the area over which the change occurs; the size and scale of the change; the rate and duration of the change; the level of contrast and compatibility. (Australian Institute of Landscape Architects, 2018)
Proposal	Construction and operation of the new battery facility.
Proposal area	The extent to which the infrastructure upgrade would occur, including ancillary items.
Road reserve	Public roads that are controlled by a local authority/ government or other State authority.
RPS	The author of this Landscape Character and Visual Impact Assessment.
Scenic amenity	"A measure of the relative contribution of each place to the collective appreciation of the landscape." (Australian Institute of Landscape Architects, 2018)
Sensitivity	"Capacity of a landscape or view to accommodate change without losing valued attributes. Includes the value placed on a landscape or view by the community through planning scheme protection, and the type and number of (of) receivers." (Australian Institute of Landscape Architects, 2018)
Values	"Any aspect of landscape or views that people consider to be important. Landscape and visual values may be reflected in local, state or federal planning regulations, other published documents or be established through community consultation and engagement, or as professionally assessed." (Australian Institute of Landscape Architects, 2018)
View	"Any sight, prospect or field of vision as seen from a place, and may be wide or narrow, partial or full, pleasant or unattractive, distinctive or nondescript, and may include background, mid ground and/or foreground elements or features." (Australian Institute of Landscape Architects, 2018)
Viewpoint	"The specific location of a view, typically used for assessment purposes." (Australian Institute of Landscape Architects, 2018)

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Term	Description
Visual amenity	"The attractiveness of a scene or view." (Australian Institute of Landscape Architects, 2018)
Visual catchment	The Australian Institute of Landscape Architects describes visual catchment as "Areas visible from a combination of locations within a defined setting (may be modelled or field-validated)." (Australian Institute of Landscape Architects, 2018)
Visual prominence	Is determined by the size, height and colour of proposed infrastructure elements and the degree to which the landscape within which they sit can assist in reducing their visual prominence (e.g., screening vegetation, landform, etc.).
Visual receptor	Individuals and/or defined groups of people who have the potential to be affected by a <i>proposal</i> . These are sensitive visual receptors such as houses, roads and other infrastructure that is used frequently.

Table 2: Acronyms

Abbreviation	Title
AHD	Australian Height Datum
BESS	Battery Energy Storage System
EP&A Act	<i>NSW Environmental Planning and Assessment Act 1979</i>
LCZ	Landscape Character Zone
LEP	Local Environment Plan
LGA	Local Government Area
PV	Photovoltaic

1 INTRODUCTION

1.1 Purpose

RPS has been commissioned by Elliott Green Power to undertake a Landscape Character and Visual Impact Assessment (LCVIA) for the proposed addition of a battery energy storage system (BESS) to the Nevertire Solar Farm on the Mitchell Highway north-west of the township of Nevertire. The proposed BESS would be located east of the existing solar farm.

This Landscape Character and Visual Amenity Impact Assessment delivers an objective assessment of the probable impacts on the visual environment resulting from the construction and operation of the *proposal*. This report outlines results from site assessment and describes the present landscape character. It documents the assessment of *visual impact* resulting from the *proposal* and provides, if required, recommendations for suitable mitigation measures.

1.2 Study Limitations

This assessment is intended to be an objective report, based on a professional analysis of the provided design. This report seeks to establish the anticipated *visual impacts* of the *proposal* on a range of receivers.

Landscape character and visual impact assessment requires qualitative (subjective) judgements to be made based on our professional background and expertise as Landscape Architects. The assessment process aims to be objective and describe any changes factually. Potential changes because of the *proposal* have been defined, however, the significance of these changes requires qualitative (subjective) judgements to be made. The conclusions of this assessment, therefore combine objective measurement and subjective professional interpretation.

The opinions, conclusions and any recommendations are based on assumptions made by RPS as described in this report.

Due to limited access to the site, as a result of the health orders in place at the time of preparation, this report has been undertaken based on the generated photography and without a site visit by the author.

1.3 Methodology

The methodology for this report is based on the *Guidance Note for Landscape and Visual Assessment* (Australian Institute of Landscape Architects, 2018). As well the methodology in this report is also guided by *Guideline for Landscape character and visual impact Environmental Impact Assessment Practice Note assessment EIA-N04* (Transport for NSW, 2020).

The methodology adopted is process-driven, consistent, and based on professional, value judgement of commonly accepted and adopted criteria in the industry.

The methodology for this visual impact assessment involves the following activities:

- Review of the visual impact assessment undertaken for the Nevertire Solar PV facility prior to its constructions - *Visual Impact assessment - Nevertire Solar Farm* (NGH Environmental, 2017).
- Desktop study using aerial photography to identify the potential visual catchments and possible visual receptors with reference to *Visual Impact assessment - Nevertire Solar Farm* (NGH Environmental, 2017).
- Giving direction(s) to the photographer in relation to the capture of visual data to support this report.
- Reviewing the supplied photography and *Visual Impact assessment - Nevertire Solar Farm* (NGH Environmental, 2017) to describe and evaluate the existing landscape character and visual environment to establish a baseline for the visual assessment.
- Identifying *visual receptors*.
- Undertaking a visual impact assessment using the grading matrix, considering *visual sensitivity* (of the *visual amenity* or *viewpoints*) and the magnitude of the visual change, to arrive at an overall level of *visual impact*.

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In the preparation of undertaking the visual impact assessment, views from habitable room windows and private outdoor areas of residences are treated as sensitive receptors. Views from residual land beyond the primary outdoor area (such as driveways, roadways, easements) are treated as less sensitive receptors.

This assessment adopts the standard methodology of sensitivity relating to proximity - the greater the distance between the visual receptor and the *proposal*, the lesser the *visual sensitivity* of that *visual receptor*.

Key information reviewed as part of this report included:

- Visual Impact assessment - Nevertire Solar Farm (NGH Environmental, 2017).
- Landscape Plan - Nevertire Solar Farm (NGH Environmental, 2018).
- Plans and Elevation issued by the client for the scope of works including:
 - Nevertire Battery Storage – Overall Site Layout Drawing 520214-0000-DRG-EE-0003-C (dated 20211018) by Aurecon.
 - Nevertire Battery Energy Storage System BESS - MV Station Profiles – Generic by Elliott Green Power.
 - Nevertire Battery Energy Storage System BESS - BESS Module Generic – Generic by Elliott Green Power.
 - Nevertire Battery Energy Storage System BESS - BESS Grid Stack – Generic by Elliott Green Power.
- Warren Shire Local Environmental Plan – 2012 (amended 14 July 2021).

2 PROPOSAL OUTLINE

2.1 Site Description

The *proposal* site is located on the Mitchell Highway north-west of the township of Nevertire. The *proposal* site is open, cleared rural land with very little remnant vegetation. The site is located within a very flat landscape at approximately 200m AHD.

Table 3: Proposal area particulars

Aspect	Details
LGA	Warren Shire Council
Coordinates (approx.)	Lat: --31.825 Long: 147.701
Site total area (approx.)	2.5ha
Lot and Plan	Lot 38, DP755292
Land zoning (site)	RU1 – Primary Production
Adjacent land zoning	RU1 – Primary Production SP2 – Special; purpose (Roadway and Railway) RU5 – Rural Village IN1 - General Industries

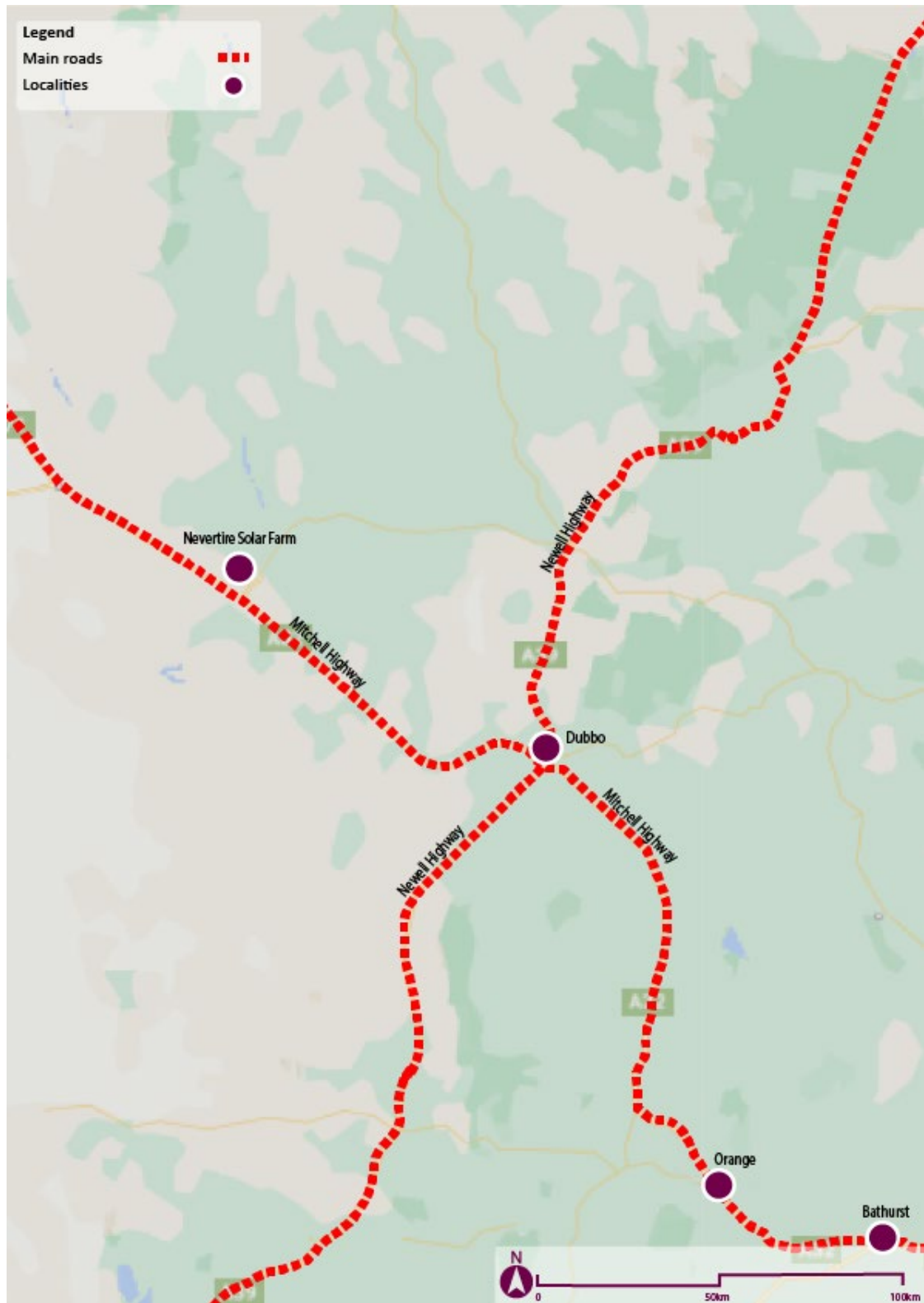


Figure 1: Site Context

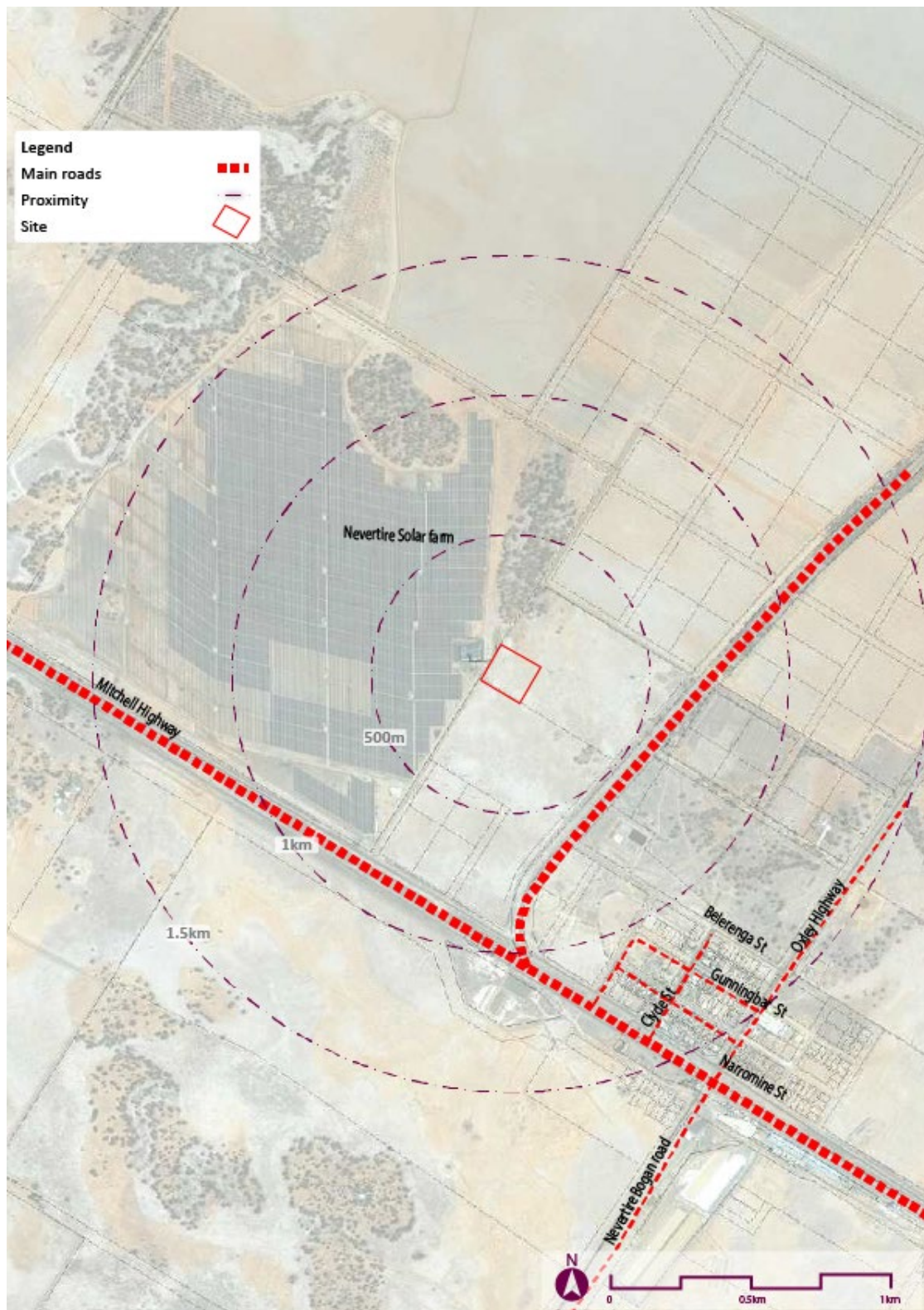


Figure 2: Site Location

2.2 Legislative and Planning Context

The *proposal* is subject to the planning requirements of Warren Shire Council. Relevant planning and legislative documents include:

- *Warren Shire Local Environmental Plan – 2012 (amended 14 July 2021)*

Table 4 outlines objectives for development RU1 – Primary Production and relevant items relating to visual amenity in Warren Shire planning instruments.

Table 4: Local Planning Objectives

Reference	Applicable Principals/Objectives
<p><i>Warren Shire Local Environmental Plan – 2012 (amended 14 July 2021)</i></p>	<p>Objectives of zone (Zone RU1 Primary Production)</p> <ul style="list-style-type: none"> • To encourage sustainable primary industry production by maintaining and enhancing the natural resource base. • To encourage diversity in primary industry enterprises and systems appropriate for the area. • To minimise the fragmentation and alienation of resource lands. • To minimise conflict between land uses within this zone and land uses within adjoining zones. • To protect, enhance and conserve agricultural land in a manner that ensures that the primary role of land is for efficient and effective agricultural pursuits, managed in accordance with sustainable natural resource management principles. • To protect water resources in the public interest. • To protect areas of local, state, national and international significance for nature conservation, including areas with rare plants, wetlands and significant habitat. • To permit rural industries that do not have a significant adverse impact on existing or potential agricultural production on adjoining land. • To conserve and protect the Macquarie Marshes by encouraging and managing appropriate land uses and agricultural activities.

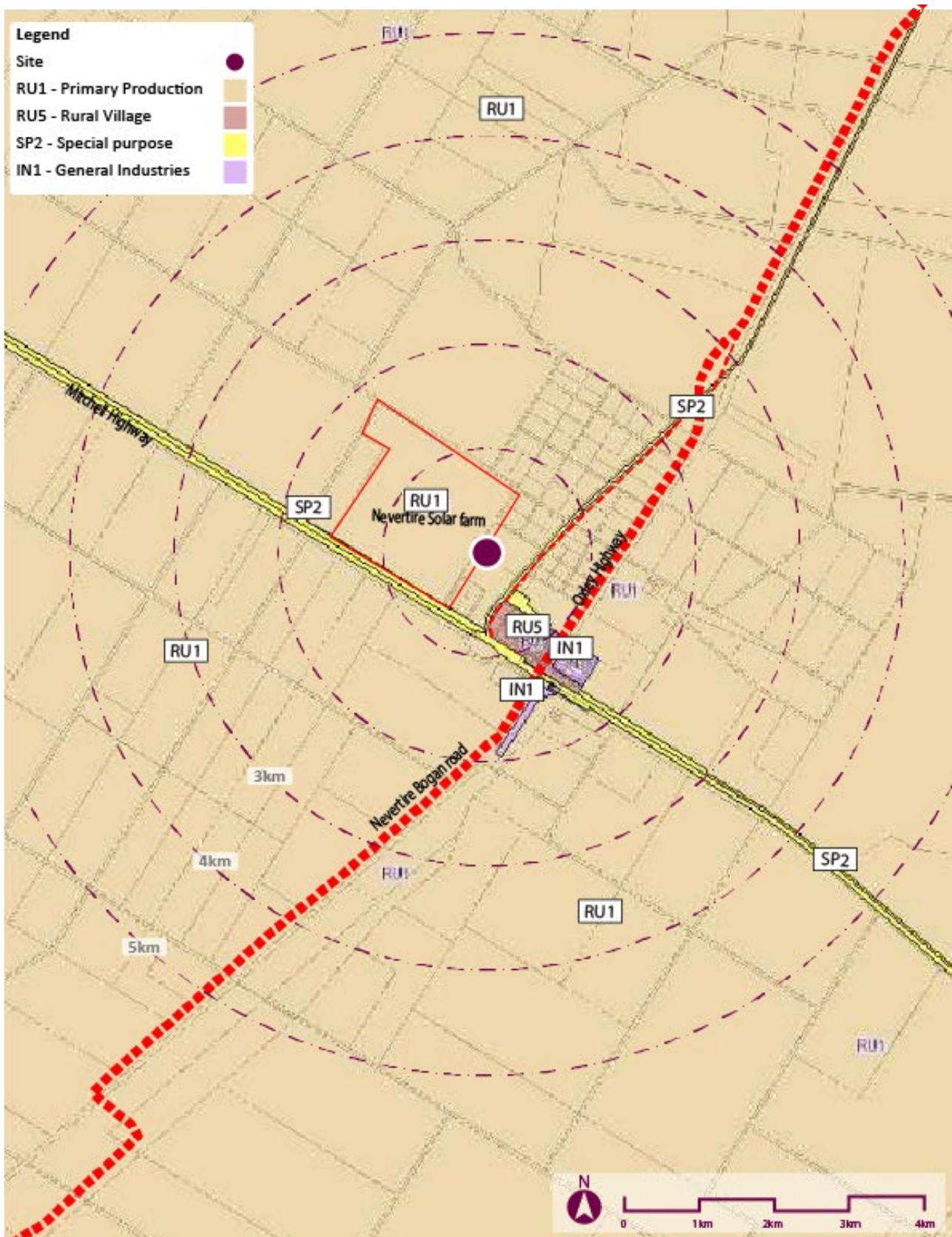


Figure 3: Land Use Zoning (Adjacent to Site)

2.3 Proposal Overview

Generally, the *proposal* includes the following:

- Access road and maintenance track.
- Boundary security fencing.
- Up to 40 shipping container style (12,2m long 2.9m wide 2.6m high) of battery storage (20 containers: 7.2m long, 1.7m wide 2.5m high).
- Converter kiosks and RMU/step-up transformer kiosks (dimensions subject to original equipment manufacturer's final design).
- 22kV underground feeder cables.
- Control building (typically 10m long 5m wide and 3m high; typically, grey/white).
- Connection to existing Nevertire Solar Farm 22kV switchboard.
- Associated drainage, outdoor lighting, and security system.
- Water tank (5m diameter ~30kL).

The key features of the *proposal* are shown in **Figure 4** . Refer **Appendix A** for design drawings.

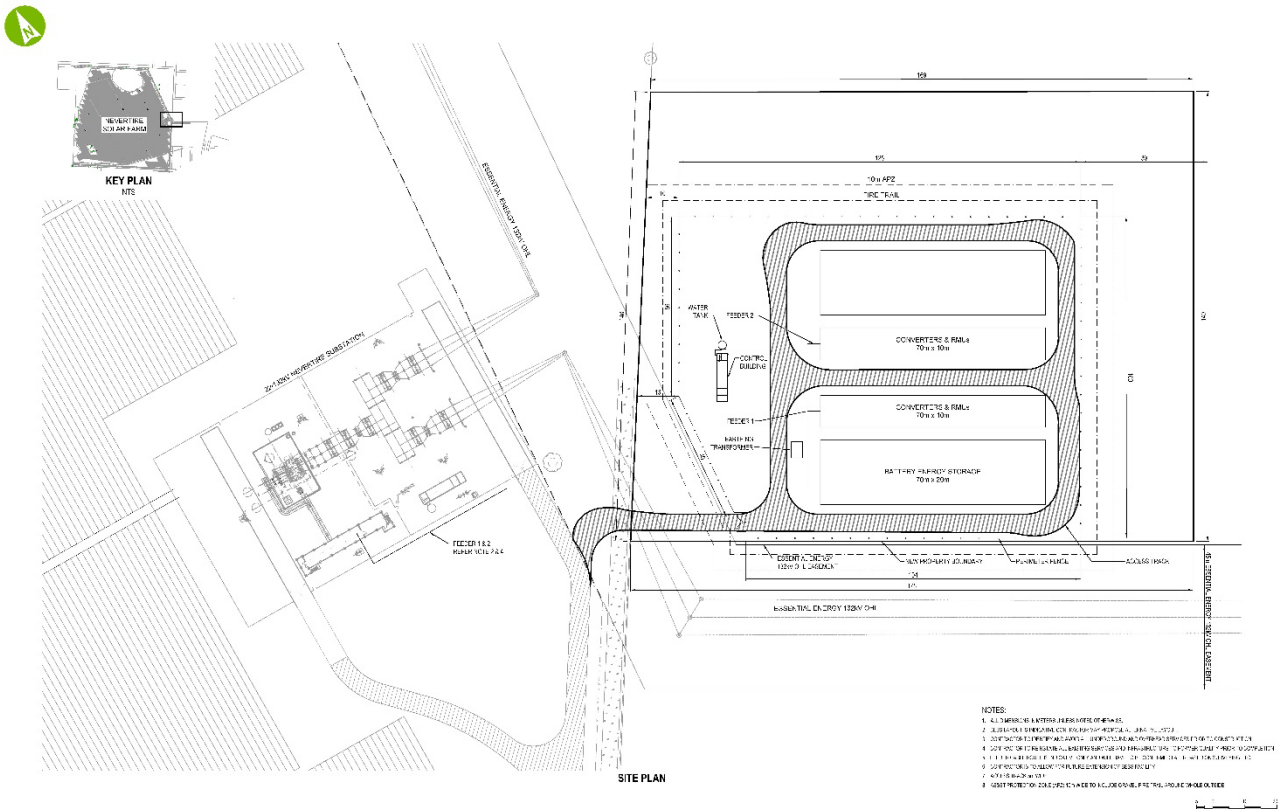


Figure 4: Key Elements of the proposal (Nevertire Battery Storage – Overall Site Layout Drawing 520214-0000-DRG-EE-0003-C (dated 20211018) by Aurecon).

3 LANDSCAPE CHARACTER ASSESSMENT

3.1 Methodology

This chapter outlines the *landscape character* within a localised context to obtain an appreciation of the existing visual environment of the area in which the *proposal* is located, and to subsequently develop a visual baseline. This visual baseline will be used as a measurement to gauge the level of *visual impact* the *proposal* has on its surrounding area.

The methodology used to appraise landscape character in this report is based on an objective assessment of the landscape attributes of a place where:

“Landscape is an all-encompassing term that refers to areas of the earth’s surface at various scales. It includes those landscapes that are: urban, peri-urban, rural, and natural; combining biophysical elements with the cultural overlay of human use and values.” (AILA - Australian Institute of Landscape Architects, 2018)

The *proposal area* is viewed as a whole site within a broader context for the specific purpose of evaluation. The assessment outcomes are used to assist with developing guidelines to manage and plan for the landscape character type and its relationship with the site and *proposal*.

3.2 Defining Landscape Character Zones

For the purposes of this assessment a Landscape Character Zone (LCZ) is defined as “An area of landscape with similar properties or strongly defined spatial qualities, distinct from areas immediately adjacent.” (Transport for NSW, 2020). An appreciation of the visual character of the present landscape assists in the development of a baseline and means for evaluation in visual impact assessment and subsequently how the *proposal* will influence:

- The present visual environment.
- The aesthetic and perceptual aspects of the landscape.
- The unique character of the landscape.

An LCZ, can be defined when there are apparent patterns of elements occurring consistently in a specific type of landscape. The LCZs and prominent landscape features identified and described below collectively define the overall character for the part of the local area.

The Visual Impact Assessment - Nevertire Solar Farm (NGH Environmental, 2017) identified 3 LCZ types in the local area:

- Agricultural.
- Residential.
- Industrial.

The subsequent construction of the solar farm adjacent introduces a fourth type of LCZ.

The Four LCZs identified within the local area of the *proposal* are identified in **Figure 5**. The following sections provide a description of each LCZ to convey the landscape character of the locale.

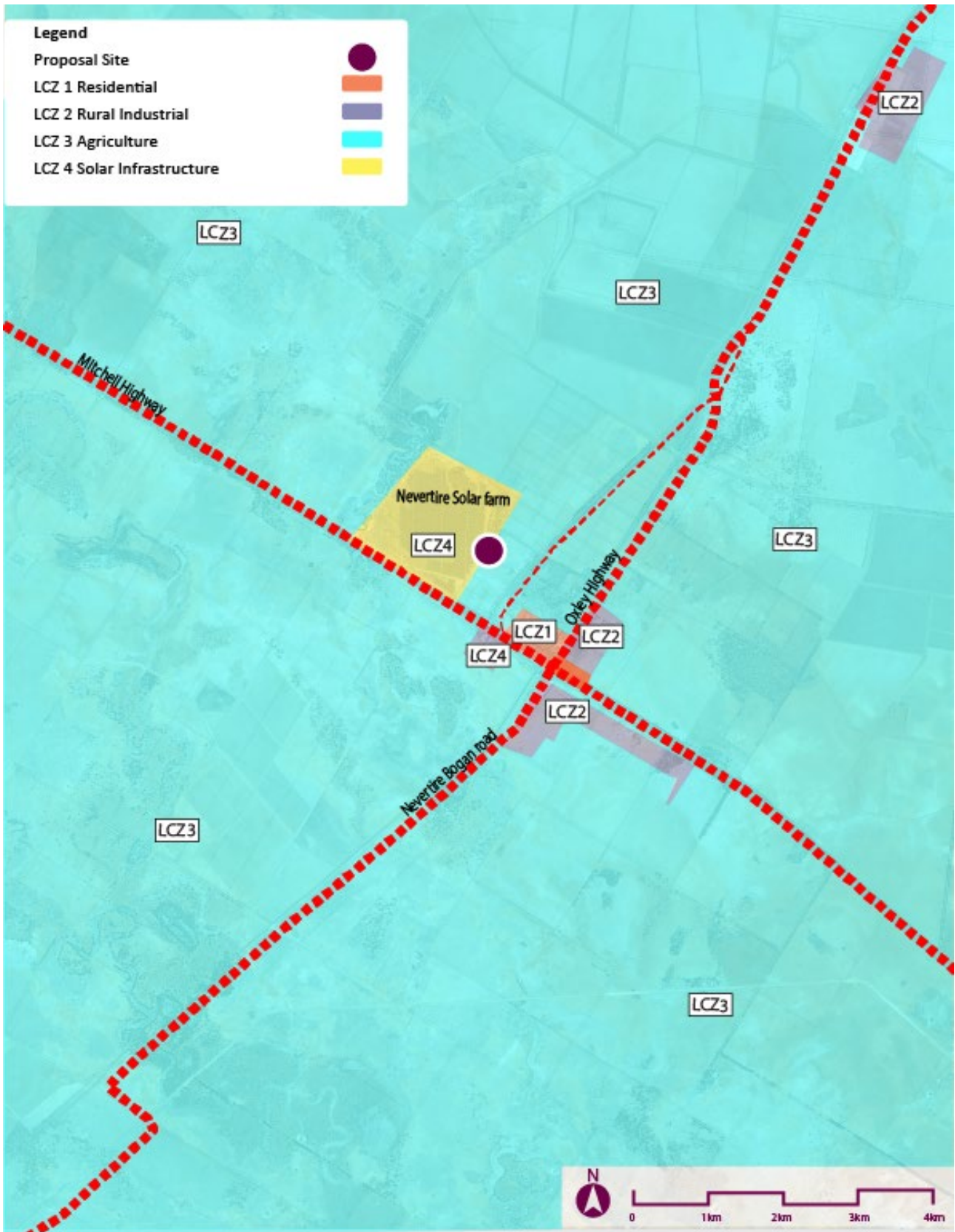


Figure 5: Landscape Character Zones

3.3 Landscape Character Zones

3.3.1 LCZ 1 – Residential

Table 5: LCZ1 - Residential

LCZ1 - Residential	
General description:	Residential areas in the township of Nevertire.
Defining Landscape Characteristics:	<ul style="list-style-type: none"> • Timber and tin style residential buildings. • Some red brick facades and buildings. • Wide sealed and unsealed streets. • Sparsely vegetated with a range of introduced native and exotic tree species. • Ground cover planting to yards and some verges. • Residential yards are fenced with eclectic range of fencing material types. Generally fencing is 1m in height.
General commentary on the capacity of this LCZ to absorb change:	As stated in <i>The Visual Impact Assessment - Nevertire Solar Farm</i> (NGH Environmental, 2017): “Scenic quality is considered moderate. These areas have a variety in colour and form normal in this character type. Elements include the recreational aspects; parks and gardens.”



Figure 6: LCZ 1 – Residential – Typical character image – Photo: Supplied by Client

3.3.2 LCZ 2 – Rural Industrial

Table 6: LCZ2 – Rural Industrial

LCZ2 – Rural Industrial	
General description:	Pockets of rural industrial uses are documented in the landscape. These include silos and other industrial infrastructure to support the agriculture uses in the local district.
Defining Landscape Characteristics:	<ul style="list-style-type: none"> • Large Metal sheds. • A range of galvanised and painted silos. • Sparse hard stand areas for parking large vehicles and dry material storage. • Power infrastructure is evident in and around this LCZ.
General commentary on the capacity of this LCZ to absorb change:	As stated in <i>The Visual Impact Assessment - Nevertire Solar Farm</i> (NGH Environmental, 2017): “Scenic Quality is considered low. Elements are production related. The structures match the land use and have historic references. They have limited screening to break up views.”



Figure 7: Rural Industry – Typical character image – Photo Source: <https://www.deltaagribusiness.com.au/nevertire>

3.3.3 LCZ 3 – Agricultural

Table 7: LCZ 3 – Agricultural

LCZ 3 – Agricultural	
General description:	Raby Estate is located approximately 250m to the south of the <i>proposal</i> . The main house on the property is located 1km south, southwest of the <i>proposal</i> . The Raby Estate property includes parts of LCZ2 – Vegetated Creek.
Defining Landscape Characteristics:	<ul style="list-style-type: none"> • Open views across the expanse of the agricultural use. • Cropping and pasture lands which change colours throughout the seasons. • Low linear forms of fencing, roads, powerlines etc. • Vertical elements stand out in the landscape due to the flat topography and open expansive view. • Rural material types dominate the LCZ.
General commentary on the capacity of this LCZ to absorb change:	As stated in The Visual Impact Assessment - Nevertire Solar Farm (NGH Environmental, 2017): “Scenic Quality is low to moderate. Built elements are production related.” The landscape character type is common in the study area.



Figure 8: Agricultural – Typical character image – Photo: Dylan Del Moro - Alexandria Digital Communication

3.3.4 LCZ 4 – Solar Infrastructure

Table 8: LCZ 4 –Solar Infrastructure

LCZ 4 – Solar Infrastructure	
General description:	Solar infrastructure associated with the Nevertire Solar Farm.
Defining Landscape Characteristics:	<ul style="list-style-type: none">• Photovoltaic solar panels formatted in a linear fashion.• Little natural elements within the LCZ.• Powerlines connecting the PV panels to the nearby substation.
General commentary on the capacity of this LCZ to absorb change:	The LCZ is a landscape which is highly modified from its natural state. This LCZ has the capacity for change and still retain its defining character attributes.



Figure 9: LCZ 4 – Solar Infrastructure – Typical character image. Photo: Supplied by Client

4 VISUAL IMPACT ASSESSMENT

4.1 Methodology

The methodology in this assessment has been adapted from the Guidance Note for Landscape and Visual Assessment (Australian Institute of Landscape Architects, 2018). This methodology has been used as a guide to assess the features and impacts of the *proposal*.

This report considers groups or clusters of *visual receptors* which are used to demonstrate the influence of the *proposal* in a broader context. The two primary measurements used to determine impacts to the landscape character are sensitivity and magnitude of change. These terms are defined as follows:

Sensitivity

For the purpose of this report and the analysis undertaken, sensitivity is defined as “Capacity of a landscape or view to accommodate change without losing valued attributes. Includes the value placed on a landscape or view by the community through planning scheme protection, and the type and number (of) receivers.” (Australian Institute of Landscape Architects, 2018)

The higher the visual quality of the landscape surrounding the viewpoint, the greater the significance of introducing new development and therefore the impact on the existing landscape. For example, the sensitivity of a roadway in an urban environment would be ranked lower than a national parkland. A place with a more consistent character would be more visually sensitive to new development than a place with less consistency. As well, the number and type of receivers is considered. Static Receivers are rated as more sensitive, i.e., residents are more sensitive than travellers or passers-by due to the prolonged nature of their exposure.

Four categories are used in ranking the sensitivity of a viewpoint, ranging from negligible to high.

Magnitude of change

This report and the analysis undertaken utilises the Australian Institute of Landscape Architects definition of magnitude of change. That is “The extent of change that will be experienced by receptors. This change may be adverse or beneficial. Factors that could be considered in assessing magnitude are:

- the proportion of the view / landscape affected;
- extent of the area over which the change occurs;
- the size and scale of the change;
- the rate and duration of the change;
- the level of contrast and compatibility”.

(Australian Institute of Landscape Architects, 2018)

The magnitude is the degree of visual change on the view due to the proposed development. It is the measurement of the overall scale, form and character of a proposed development when compared to the existing condition. (Centre for Urban Design - Roads and Maritime Services, 2018)

The location of the proposed development in relation to the region in question also influences magnitude.

Five categories are used in ranking the magnitude of a proposal, ranging from nil to high.

4.1.1 Assessment of Visual Impacts

Impact on the visual character of the landscape is determined using the matrix shown in **Table 9: Impact Ranking Matrix**. Rankings for sensitivity and magnitude are combined to generate the impact in the body of the table.

Table 9: Impact Ranking Matrix

Sensitivity	Magnitude of change				
	High magnitude of change	Moderate magnitude of change	Low magnitude of change	Negligible magnitude of change	Nil magnitude of change
High sensitivity	High visual impact	High-moderate visual impact	Moderate visual impact	Negligible visual impact	Nil visual impact
Moderate sensitivity	High-moderate visual impact	Moderate visual impact	Moderate-low visual impact	Negligible visual impact	Nil visual impact
Low sensitivity	Moderate visual impact	Moderate-low visual impact	Low visual impact	Negligible visual impact	Nil visual impact
Negligible sensitivity	Negligible visual impact	Negligible visual impact	Negligible visual impact	Negligible visual impact	Nil visual impact

4.2 Viewpoints and Assessment

To assess the *sensitivity* and the *magnitude* of the *proposal* a desktop study was undertaken of potential viewing locations of the *proposal*. Photography was taken by a third party from each of the *viewpoints*. Using the photography, RPS analysed each of the *viewpoints*. **Figure 10** outlines the position of the *viewpoints* analysed for the *proposal* where the impacts on the view are assessed facing towards the *proposal*.

Photomontages were prepared from two locations:

- Viewpoint 6 -Noel Waters Oval and Recreation Ground. See **Figure 17**.
- Viewpoint 19 - View from Mitchell Highway, at Solar Farm Entry. See **Figure 32**

The photomontages were prepared using the following software and tools:

- A 3d model generated in Autodesk Revit 2021 – model based on the dimension provided in the site plan and client provided elevations.
- Materials applied in Lumion 11.5 software using information provided by client.
- Scaling, location, and perspective using existing adjacent communications tower and power infrastructure and Photo Matching tool suite in Lumion 11.5 software.
- Final scaling and location of imagery using existing adjacent communications tower and power infrastructure in Adobe Photoshop 2021 software.
- Masking of foreground/background objects and final image output, from Adobe Photoshop 2021.

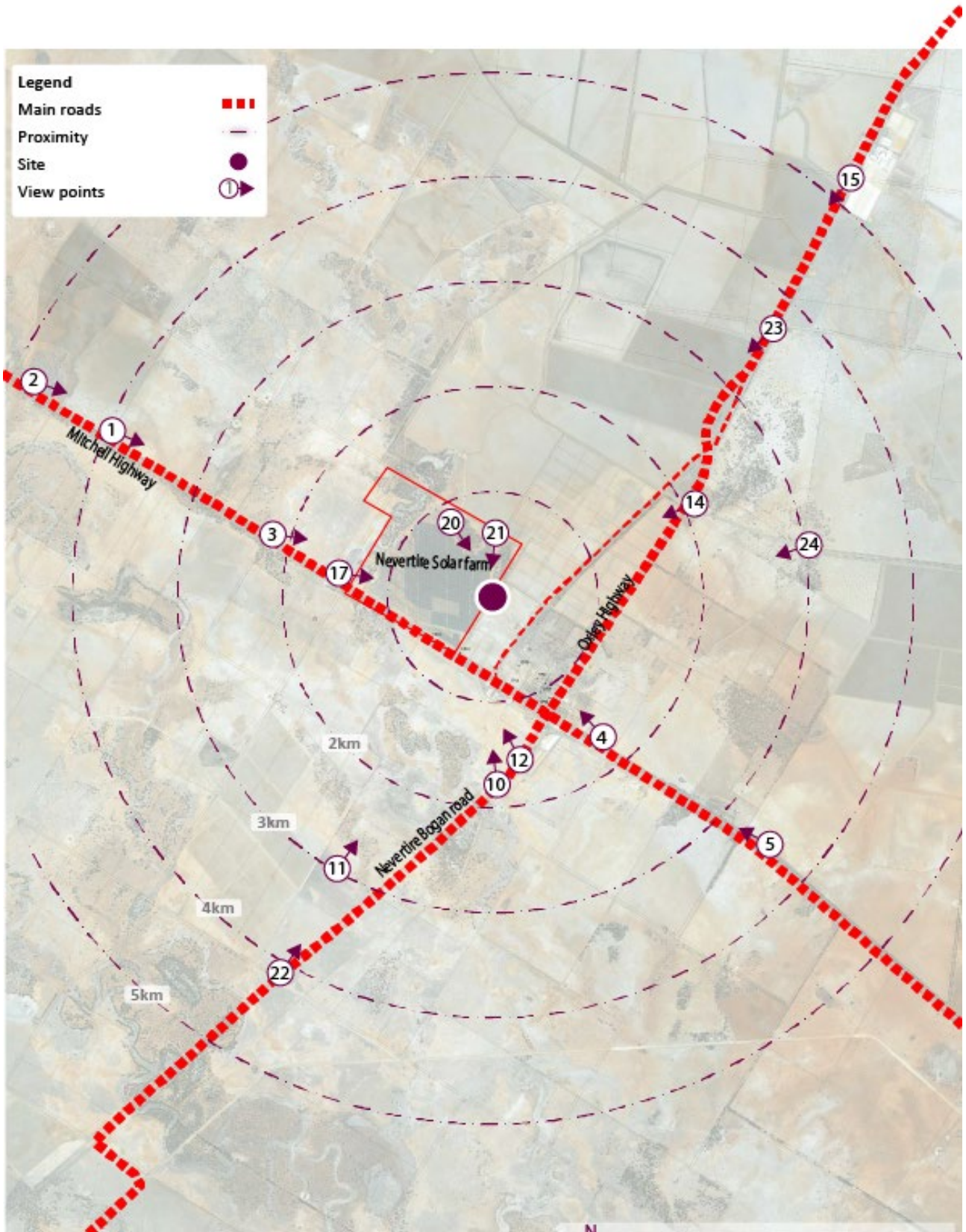


Figure 10: Viewpoint Locations – Context

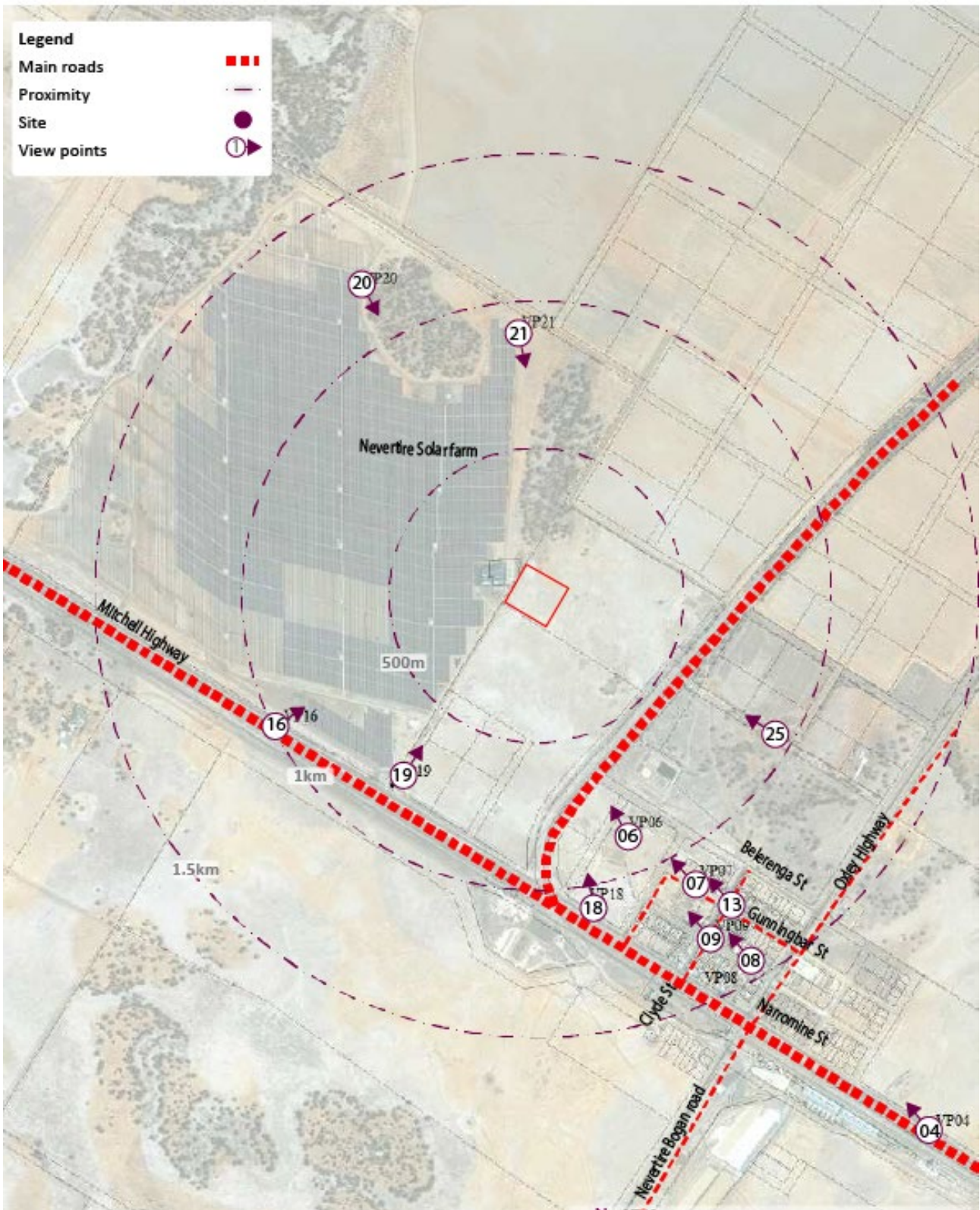


Figure 11: Viewpoint Locations – Near Site

4.2.1 Viewpoint 1: View from Mitchell Highway – Northwest of Proposal

4.2.1.1 Viewpoint Description

Viewpoint description	
Latitude, Longitude:	-31.805787, 147.657165
Distance to the Proposal:	5.6km
Existing viewpoint description:	<ul style="list-style-type: none">• The foreground is dominated grasslands.• Roadside vegetation within view.• Vegetation across the horizon line.• Power infrastructure in the view creating repetitive patterning.
Viewpoint impacts:	<ul style="list-style-type: none">• Nil –vegetation in the landscape blocks views to the <i>proposal</i>.



Figure 12: Viewpoint 1 – View from Mitchell Highway – Northwest of *proposal* Photo: Dylan Del Moro - Alexandria Digital Communication

4.2.1.2 Assessment of potential visual impacts

For Viewpoint 1 refer to **Table 10** for an assessment of sensitivity, magnitude of change and potential *visual impacts* based on the current *proposal*.

Table 10: Viewpoint 1 - Assessment of potential visual impacts

Sensitivity	Magnitude of change	Overall potential visual impact rating
<p>"Capacity of a landscape or view to accommodate change without losing valued attributes." (Australian Institute of Landscape Architects, 2018)</p>	<p>"The extent of change that will be experienced by receptors. This change may be adverse or beneficial." (Australian Institute of Landscape Architects, 2018)</p>	<p>Rankings for sensitivity and magnitude of change are combined to generate the overall potential visual impact.</p>
Low sensitivity	Nil magnitude of change	Nil visual impact
<ul style="list-style-type: none"> • View is from a main route of travel near the Nevertire township. • The view is considered a rural type setting consistent with the LEP. • Vegetation is noted throughout; upper story vegetation is native – grasslands are introduced species. • There are a range of natural and built elements within the view. • Based on the rural type character, and the disturbed/contrived nature of the view, as compared to its natural state, the view has capacity for change without impacting its valued attributes. 	<ul style="list-style-type: none"> • Nil – the <i>proposal</i> cannot be seen from this viewpoint. • Given the <i>proposal</i> cannot be seen from this viewpoint there are no cumulative impacts associated with the addition of the BESS. 	

4.2.2 Viewpoint 2: View from Mitchell Highway – Northwest of proposal

4.2.2.1 Viewpoint description

Viewpoint description	
Latitude, Longitude:	-31.799856, 147.645689
Distance to Proposal:	6.8km
Existing viewpoint description:	<ul style="list-style-type: none">• The view is dominated grasslands.• Roadside vegetation within view.• Vegetation across the horizon line.• Power infrastructure in the view.
Viewpoint impacts:	<ul style="list-style-type: none">• Nil –vegetation in the landscape blocks views to the <i>proposal</i>.



Figure 13: Viewpoint 2 – View from Mitchell Highway – Northwest of proposal Photo: Dylan Del Moro - Alexandria Digital Communication

4.2.2.2 Assessment of potential visual impacts

For Viewpoint 2 refer to **Table 11** for an assessment of sensitivity, magnitude of change and potential *visual impacts* based on the current *proposal*.

Table 11: Viewpoint 2 - Assessment of potential visual impacts

Sensitivity	Magnitude of change	Overall potential visual impact rating
<p>"Capacity of a landscape or view to accommodate change without losing valued attributes." (Australian Institute of Landscape Architects, 2018)</p>	<p>"The extent of change that will be experienced by receptors. This change may be adverse or beneficial." (Australian Institute of Landscape Architects, 2018)</p>	<p>Rankings for sensitivity and magnitude of change are combined to generate the overall potential visual impact.</p>
Low sensitivity	Nil magnitude of change	Nil visual impact
<ul style="list-style-type: none"> • View is from a main route of travel near the Nevertire township. • the view is considered a rural type setting consistent with the LEP. • vegetation is noted on the right-hand side of the view; the plantings are native. • there are a range of natural and built elements within the view • based on the rural type character, and the disturbed/contrived nature of the view, as compared to its natural state, the view has capacity for change without impacting its valued attributes. 	<ul style="list-style-type: none"> • Nil – the <i>proposal</i> cannot be seen from this viewpoint. • Given the <i>proposal</i> cannot be seen from this viewpoint there are no cumulative impacts associated with the addition of the BESS. 	

4.2.3 Viewpoint 3: View from Mitchell Highway, Northwest of the Site

4.2.3.1 Viewpoint description

Viewpoint description	
Latitude, Longitude:	-31.817816, 147.679964
Distance to Proposal:	3.1km
Existing viewpoint description:	<ul style="list-style-type: none">• The view is dominated by the grassland.• Agricultural infrastructure noted within the foreground.• Roadside vegetation within view.• Power infrastructure is evident in the mid view.• The communications tower (60m tall) from the existing solar PV is evident on the horizon.
Viewpoint impacts:	<ul style="list-style-type: none">• Nil –vegetation in the landscape blocks views to the <i>proposal</i>.



Figure 14: Viewpoint 3 – View from Mitchell Highway, Northwest of the site Photo: Dylan Del Moro - Alexandria Digital Communication

4.2.3.2 Assessment of potential visual impacts

For Viewpoint 3 refer to **Table 12** for an assessment of sensitivity, magnitude of change and potential *visual impacts* based on the current *proposal*.

Table 12: Viewpoint 3 - Assessment of potential visual impacts

Sensitivity	Magnitude of change	Overall potential visual impact rating
<p>"Capacity of a landscape or view to accommodate change without losing valued attributes." (Australian Institute of Landscape Architects, 2018)</p>	<p>"The extent of change that will be experienced by receptors. This change may be adverse or beneficial." (Australian Institute of Landscape Architects, 2018)</p>	<p>Rankings for sensitivity and magnitude of change are combined to generate the overall potential visual impact.</p>
Low sensitivity	Nil magnitude of change	Nil visual impact
<ul style="list-style-type: none"> • View is from a main route of travel near the Nevertire township. • The view is considered a rural type setting consistent with the LEP. • Vegetation is noted in the view; the plantings are native. • There are a range of natural and built elements within the view. • Based on the rural type character, and the disturbed/contrived nature of the view, as compared to its natural state, the view has capacity for change without impacting its valued attributes. 	<ul style="list-style-type: none"> • Nil – the <i>proposal</i> cannot be seen from this viewpoint. • Given the <i>proposal</i> cannot be seen from this viewpoint there are no cumulative impacts associated with the addition of the BESS. 	

4.2.4 Viewpoint 4: View from Mitchell Highway Southeast of the Township of Nevertire

4.2.4.1 Viewpoint description

Viewpoint description	
Latitude, Longitude:	-31.842139, 147.725527
Distance to Proposal:	2.3km
Existing viewpoint description:	<ul style="list-style-type: none">• View across roadside verge agricultural cropping lands to Nevertire township.• Power infrastructure in repetitive pattern heading towards the horizon line.• Buildings, vegetation and power infrastructure across the horizon line.• The communications tower (60m tall) from the existing solar PV is evident on the horizon behind the township.
Viewpoint impacts:	<ul style="list-style-type: none">• Nil –vegetation and building of the Nevertire township blocks views to the <i>proposal</i>.



Figure 15: Viewpoint 4 – View from Mitchell Highway Southeast of the Township of Nevertire Photo: Dylan Del Moro - Alexandria Digital Communication

4.2.4.2 Assessment of potential visual impacts

For Viewpoint 4 refer to **Table 13** for an assessment of sensitivity, magnitude of change and potential *visual impacts* based on the current *proposal*.

Table 13: Viewpoint 4 - Assessment of potential visual impacts

Sensitivity	Magnitude of change	Overall potential visual impact rating
<p>"Capacity of a landscape or view to accommodate change without losing valued attributes." (Australian Institute of Landscape Architects, 2018)</p>	<p>"The extent of change that will be experienced by receptors. This change may be adverse or beneficial." (Australian Institute of Landscape Architects, 2018)</p>	<p>Rankings for sensitivity and magnitude of change are combined to generate the overall potential visual impact.</p>
Moderate sensitivity	Nil magnitude of change	Nil visual impact
<ul style="list-style-type: none"> • View is from a main route of travel near the Nevertire township. • The view is considered a rural agricultural type setting consistent with the LEP. • Little endemic vegetation is noted in the view. • Building typologies are generally rural but not highly evident from this distance. • Based on the rural agricultural type character, and the community's attitudes to this type of environment, the view has moderate capacity for change without impacting its valued attributes. 	<ul style="list-style-type: none"> • Nil – the <i>proposal</i> cannot be seen from this viewpoint. • Given the <i>proposal</i> cannot be seen from this viewpoint there are no cumulative impacts associated with the addition of the BESS. 	

4.2.5 Viewpoint 5: View from Mitchell Highway Southeast of the Township of Nevertire

4.2.5.1 Viewpoint description

Viewpoint description	
Latitude, Longitude:	-31.854711, 147.748697
Distance to Proposal:	4.8km
Existing viewpoint description:	<ul style="list-style-type: none"> • Roadway vegetation dominates the view. • Agricultural lands evident in the background. • Roadway is evident in the view. • Where seen – vegetation is evident on the horizon.
Viewpoint impacts:	<ul style="list-style-type: none"> • Nil –Roadside vegetation blocks views to the <i>proposal</i>.



Figure 16: Viewpoint 5 – View from Mitchell Highway Southeast of the Township of Nevertire Photo: Dylan Del Moro - Alexandria Digital Communication

4.2.5.2 Assessment of potential visual impacts

For Viewpoint 5 refer to **Table 14** for an assessment of sensitivity, magnitude of change and potential *visual impacts* based on the current *proposal*.

Table 14: Viewpoint 5 - Assessment of potential visual impacts

Sensitivity	Magnitude of change	Overall potential visual impact rating
<p>"Capacity of a landscape or view to accommodate change without losing valued attributes." (Australian Institute of Landscape Architects, 2018)</p>	<p>"The extent of change that will be experienced by receptors. This change may be adverse or beneficial." (Australian Institute of Landscape Architects, 2018)</p>	<p>Rankings for sensitivity and magnitude of change are combined to generate the overall potential visual impact.</p>
Moderate sensitivity	Nil magnitude of change	Nil visual impact
<ul style="list-style-type: none"> • View is from a main route of travel near the Nevertire township. • The view is considered a rural agricultural type setting consistent with the LEP. • Some endemic vegetation is noted in the view. • Based on the rural agricultural type character, and the community's attitudes to this type of environment, the view has moderate capacity for change without impacting its valued attributes. 	<ul style="list-style-type: none"> • Nil – the <i>proposal</i> cannot be seen from this viewpoint. • Given the <i>proposal</i> cannot be seen from this viewpoint there are no cumulative impacts associated with the addition of the BESS. 	

4.2.6 Viewpoint 6: View from Noel Waters Oval and Recreation Ground

4.2.6.1 Viewpoint description

Viewpoint description	
Latitude, Longitude:	-31.833137, 147.714542
Distance to Proposal:	0.9km
Existing viewpoint description:	<ul style="list-style-type: none">• Grasslands dominate the foreground of the view.• Power infrastructure throughout the mid view.• Solar panels and vegetation form the horizon line. Solar PV infrastructure is evident on the left of the view.• 60m tall communication tower associated with the existing solar PV farm is in view.
Viewpoint impacts:	<ul style="list-style-type: none">• New security fencing will be evident from this viewpoint.• The BESS and associated infrastructure will be present in this view.



Figure 17: Viewpoint 6 – View from Noel Waters Oval and Recreation Ground Photo: Dylan Del Moro - Alexandria Digital Communication



Figure 18: Viewpoint 6 – Photomontage View from Noel Waters Oval and Recreation Ground Photo: Dylan Del Moro - Alexandria Digital Communication. Photomontage Generation: RPS

4.2.6.2 Assessment of potential visual impacts

For Viewpoint 6 refer to **Table 15** for an assessment of sensitivity, magnitude of change and potential *visual impacts* based on the current *proposal*.

Table 15: Viewpoint 6 - Assessment of potential visual impacts

Sensitivity	Magnitude of change	Overall potential visual impact rating
<p>"Capacity of a landscape or view to accommodate change without losing valued attributes." (Australian Institute of Landscape Architects, 2018)</p>	<p>"The extent of change that will be experienced by receptors. This change may be adverse or beneficial." (Australian Institute of Landscape Architects, 2018)</p>	<p>Rankings for sensitivity and magnitude of change are combined to generate the overall potential visual impact.</p>
Low sensitivity	Low magnitude of change	Low visual impact
<ul style="list-style-type: none"> • The view is considered a rural type setting consistent with the LEP. • The existing solar PV farm and its infrastructure are evident in this view. • Some vegetation is noted in the view; grassland plantings are exotic/introduced species with some remanent vegetation noted. • Based on the existing solar infrastructure and the community's attitudes to this type of environment, the view has capacity for change without impacting its valued attributes. 	<ul style="list-style-type: none"> • The change will be mostly views to the new fencing of the <i>proposal</i> site. • The scale of the change is not significant when compared to that of the adjacent solar PV farm. • There are low levels of cumulative impacts based on the minimal extent of change within this view. • Based on the above, there would be low magnitude of change in this view from this group of receptors. 	

4.2.7 Viewpoint 7: View from Gunningbar Street, Nevertire

4.2.7.1 Viewpoint description

Viewpoint description	
Latitude, Longitude:	-31.834582, 147.717080
Distance to Proposal:	1.1km
Existing viewpoint description:	<ul style="list-style-type: none">• Grasslands dominate the foreground of the view.• Power infrastructure screened by vegetation in the mid view.• Power lines above the horizon line.• 60m tall communication tower associated with the existing solar PV farm is in view.
Viewpoint impacts:	<ul style="list-style-type: none">• Nil –vegetation in the landscape blocks views to the <i>proposal</i>.



Figure 19: Viewpoint 7 – View from Gunningbar Street, Nevertire. Photo: Dylan Del Moro - Alexandria Digital Communication

4.2.7.2 Assessment of potential visual impacts

For Viewpoint 7 refer to **Table 16** for an assessment of sensitivity, magnitude of change and potential *visual impacts* based on the current *proposal*.

Table 16: Viewpoint 7 - Assessment of potential visual impacts

Sensitivity	Magnitude of change	Overall potential visual impact rating
<p>"Capacity of a landscape or view to accommodate change without losing valued attributes." (Australian Institute of Landscape Architects, 2018)</p>	<p>"The extent of change that will be experienced by receptors. This change may be adverse or beneficial." (Australian Institute of Landscape Architects, 2018)</p>	<p>Rankings for sensitivity and magnitude of change are combined to generate the overall potential visual impact.</p>
Moderate sensitivity	Nil magnitude of change	Nil visual impact
<ul style="list-style-type: none"> Views are from residential receptors in a rural setting. The view is considered a rural agricultural type setting consistent with the LEP. Some endemic vegetation is noted in the view. Based on the rural agricultural type character, and the community's attitudes to this type of environment, the view has moderate capacity for change without impacting its valued attributes. 	<ul style="list-style-type: none"> Nil – the <i>proposal</i> cannot be seen from this viewpoint. Given the <i>proposal</i> cannot be seen from this viewpoint there are no cumulative impacts associated with the addition of the BESS. 	

4.2.8 Viewpoint 8: View from 14 Narromine Street, Nevertire

4.2.8.1 Viewpoint description

Viewpoint description	
Latitude, Longitude:	-31.836949, 147.718828
Distance to Proposal:	1.5km
Existing viewpoint description:	<ul style="list-style-type: none">• Roadway with divided median is at the foreground of the view.• An eclectic range of housing and buildings in view.• Building materials vary from building to building; these materials generally demonstrate the rural village nature of Nevertire.• A range of plant species can be seen in view – all plantings are of a contrived nature.• Views to horizon are limited by the buildings and vegetation.
Viewpoint impacts:	<ul style="list-style-type: none">• Nil –vegetation and building of the Nevertire township blocks views to the proposal.



Figure 20: Viewpoint 8– View from 14 Narromine Street, Nevertire. Photo: Dylan Del Moro - Alexandria Digital Communication

4.2.8.2 Assessment of potential visual impacts

For Viewpoint 8 refer to **Table 17** for an assessment of sensitivity, magnitude of change and potential *visual impacts* based on the current *proposal*.

Table 17: Viewpoint 8 - Assessment of potential visual impacts

Sensitivity	Magnitude of change	Overall potential visual impact rating
<p>"Capacity of a landscape or view to accommodate change without losing valued attributes." (Australian Institute of Landscape Architects, 2018)</p>	<p>"The extent of change that will be experienced by receptors. This change may be adverse or beneficial." (Australian Institute of Landscape Architects, 2018)</p>	<p>Rankings for sensitivity and magnitude of change are combined to generate the overall potential visual impact.</p>
Moderate sensitivity	Nil magnitude of change	Nil visual impact
<ul style="list-style-type: none"> The view is considered a rural village setting consistent with the LEP. Little endemic vegetation is noted in the view. Building typologies are generally rural village nature. Based on the rural agricultural type character, and the community's attitudes to this type of environment, the view has moderate capacity for change without impacting its valued attributes. 	<ul style="list-style-type: none"> Nil – the <i>proposal</i> cannot be seen from this viewpoint. Given the <i>proposal</i> cannot be seen from this viewpoint there are no cumulative impacts associated with the addition of the BESS. 	

4.2.9 Viewpoint 9: View from Corner of Narromine and Clyde Streets

4.2.9.1 Viewpoint description

Viewpoint description	
Latitude, Longitude:	-31.836276, 147.717648
Distance to Proposal:	1.3km
Existing viewpoint description:	<ul style="list-style-type: none">• Roadway with divided median in left of the view.• An eclectic range of housing and buildings in view.• Building materials vary from building to building; these materials generally demonstrate the rural village nature of Nevertire.• A range of plant species can be seen in view – all plantings are of a contrived nature.• Views to horizon are limited by the buildings and vegetation.
Viewpoint impacts:	<ul style="list-style-type: none">• Nil –vegetation and building of the Nevertire township blocks views to the proposal.



Figure 21: Viewpoint 9– View from corner of Narromine and Clyde Streets, Nevertire. Photo: Dylan Del Moro - Alexandria Digital Communication

4.2.9.2 Assessment of potential visual impacts

For Viewpoint 9 refer to Table 18 for an assessment of sensitivity, magnitude of change and potential *visual impacts* based on the current *proposal*.

Table 18: Viewpoint 9 - Assessment of potential visual impacts

Sensitivity	Magnitude of change	Overall potential visual impact rating
<p>"Capacity of a landscape or view to accommodate change without losing valued attributes." (Australian Institute of Landscape Architects, 2018)</p>	<p>"The extent of change that will be experienced by receptors. This change may be adverse or beneficial." (Australian Institute of Landscape Architects, 2018)</p>	<p>Rankings for sensitivity and magnitude of change are combined to generate the overall potential visual impact.</p>
Moderate sensitivity	Nil magnitude of change	Nil visual impact
<ul style="list-style-type: none"> • The view is considered a rural village setting consistent with the LEP. • No endemic vegetation is noted in the view. • Building typologies are generally rural village nature. • Based on the rural agricultural type character, and the community's attitudes to this type of environment, the view has moderate capacity for change without impacting its valued attributes. 	<ul style="list-style-type: none"> • Nil – the <i>proposal</i> cannot be seen from this viewpoint. • Given the <i>proposal</i> cannot be seen from this viewpoint there are no cumulative impacts associated with the addition of the BESS. 	

4.2.10 Viewpoint 10: View from Nevertire-Bogan Southwest of the Township of Nevertire

4.2.10.1 Viewpoint description

Viewpoint description	
Latitude, Longitude:	-31.848039, 147.711323
Distance to Proposal:	2.5km
Existing viewpoint description:	<ul style="list-style-type: none"> View across roadside verge agricultural cropping lands towards <i>proposal</i> and Nevertire township. The communications tower (60m tall) from the existing solar PV farm is evident on the horizon.
Viewpoint impacts:	<ul style="list-style-type: none"> Nil – vegetation between the receptor and the <i>proposal</i> block views of the <i>proposal</i>.



Figure 22: Viewpoint 10– View from Nevertire-Bogan Southwest of the Township of Nevertire. Photo: Dylan Del Moro - Alexandria Digital Communication

4.2.10.2 Assessment of potential visual impacts

For Viewpoint 10 refer to Table 19 for an assessment of sensitivity, magnitude of change and potential *visual impacts* based on the current *proposal*.

Table 19: Viewpoint 10 - Assessment of potential visual impacts

Sensitivity	Magnitude of change	Overall potential visual impact rating
<p>"Capacity of a landscape or view to accommodate change without losing valued attributes." (Australian Institute of Landscape Architects, 2018)</p>	<p>"The extent of change that will be experienced by receptors. This change may be adverse or beneficial." (Australian Institute of Landscape Architects, 2018)</p>	<p>Rankings for sensitivity and magnitude of change are combined to generate the overall potential visual impact.</p>
Moderate sensitivity	Nil magnitude of change	Nil visual impact
<ul style="list-style-type: none"> View is from a main route of travel near the Nevertire township. The view is considered a rural agricultural type setting consistent with the LEP. Some endemic vegetation is noted in the view. Based on the rural agricultural type character, and the community's attitudes to this type of environment, the view has moderate capacity for change without impacting its valued attributes. 	<ul style="list-style-type: none"> Nil – the <i>proposal</i> cannot be seen from this viewpoint. Given the <i>proposal</i> cannot be seen from this viewpoint there are no cumulative impacts associated with the addition of the BESS. 	

4.2.11 Viewpoint 11: View from Nevertire-Bogan Southwest of the Township of Nevertire

4.2.11.1 Viewpoint description

Viewpoint description	
Latitude, Longitude:	-31.857775, 147.688681
Distance to Proposal:	4.3km
Existing viewpoint description:	<ul style="list-style-type: none"> • View across roadside verge agricultural cropping lands towards <i>proposal</i> and Nevertire township. • The communications tower (60m tall) from the existing solar PV farm is evident on the horizon. • Vegetation across the horizon line.
Viewpoint impacts:	<ul style="list-style-type: none"> • Nil – vegetation between the receptor and the <i>proposal</i> block views of the <i>proposal</i>.



Figure 23: Viewpoint 11 – View from Nevertire-Bogan Southwest of the Township of Nevertire. Photo: Dylan Del Moro - Alexandria Digital Communication

4.2.11.2 Assessment of potential visual impacts

For Viewpoint 11 refer to Table 20 for an assessment of sensitivity, magnitude of change and potential *visual impacts* based on the current *proposal*.

Table 20: Viewpoint 11 - Assessment of potential visual impacts

Sensitivity	Magnitude of change	Overall potential visual impact rating
<p>"Capacity of a landscape or view to accommodate change without losing valued attributes." (Australian Institute of Landscape Architects, 2018)</p>	<p>"The extent of change that will be experienced by receptors. This change may be adverse or beneficial." (Australian Institute of Landscape Architects, 2018)</p>	<p>Rankings for sensitivity and magnitude of change are combined to generate the overall potential visual impact.</p>
Moderate sensitivity	Nil magnitude of change	Nil visual impact
<ul style="list-style-type: none"> View is from a main route of travel near the Nevertire township. The view is considered a rural agricultural type setting consistent with the LEP. Some endemic vegetation is noted in the view. Based on the rural agricultural type character, and the community's attitudes to this type of environment, the view has moderate capacity for change without impacting its valued attributes. 	<ul style="list-style-type: none"> Nil – the <i>proposal</i> cannot be seen from this viewpoint. Given the <i>proposal</i> cannot be seen from this viewpoint there are no cumulative impacts associated with the addition of the BESS. 	

4.2.12 Viewpoint 12: View from Nevertire-Bogan Southwest of the Township of Nevertire

4.2.12.1 Viewpoint description

Viewpoint description	
Latitude:	33°58'44.99"S
Longitude:	150°46'21.83"E
Distance to Proposal:	2.2km
Existing viewpoint description:	<ul style="list-style-type: none"> • View across roadside verge agricultural cropping lands towards the <i>proposal</i>. • The communications tower (60m tall) from the existing solar PV is evident on the horizon. • Solar PV, fencing and vegetation across the horizon line.
Viewpoint impacts:	<ul style="list-style-type: none"> • New security fencing will be evident from this viewpoint. • The BESS and associated infrastructure will be present in this view.



Figure 24: Viewpoint 12 –View from Nevertire-Bogan Southwest of the Township of Nevertire. Photo: Dylan Del Moro - Alexandria Digital Communication

4.2.12.2 Assessment of potential visual impacts

For Viewpoint 12 refer to Table 21 for an assessment of sensitivity, magnitude of change and potential *visual impacts* based on the current *proposal*.

Table 21: Viewpoint 12 - Assessment of potential visual impacts

Sensitivity	Magnitude of change	Overall potential visual impact rating
<p>"Capacity of a landscape or view to accommodate change without losing valued attributes." (Australian Institute of Landscape Architects, 2018)</p>	<p>"The extent of change that will be experienced by receptors. This change may be adverse or beneficial." (Australian Institute of Landscape Architects, 2018)</p>	<p>Rankings for sensitivity and magnitude of change are combined to generate the overall potential visual impact.</p>
Low sensitivity	Low magnitude of change	Low visual impact
<ul style="list-style-type: none"> The view is considered a rural type setting consistent with the LEP. The existing Solar PV farm and its infrastructure are evident in this view. Some vegetation is noted in the view; grassland plantings are exotic/introduced species with some remanent vegetation noted. Based on the existing solar infrastructure and the community's attitudes to this type of environment, the view has capacity for change without impacting its valued attributes. 	<ul style="list-style-type: none"> The change will be mostly views to the new fencing of the <i>proposal</i> site. The scale of the change is not significant when compared to that of the adjacent solar PV farm. The changes are almost imperceptible at this distance from the <i>proposal</i>. There are very low levels of cumulative impacts based on the minimal extent of change within this view. Based on the above, there would be low magnitude of change in this view from this position. 	

4.2.13 Viewpoint 13: View from Corner of Gunningbar and Clyde Streets, Nevertire

4.2.13.1 Viewpoint description

Viewpoint description	
Latitude:	33°58'44.52"S
Longitude:	150°46'27.71"E
Distance to Proposal:	1.3km
Existing viewpoint description:	<ul style="list-style-type: none">• Foreground roadway and rural township buildings.• A fencing and other built structures are evident.• The topography rolls away from view after the midground.• Power infrastructure throughout the view.• Power lines above the horizon line.• Solar PV evident in the left horizon of this view.
Viewpoint impacts:	<ul style="list-style-type: none">• Nil – the topography of the landscape combined with vegetation between the receptor and the <i>proposal</i> block views of the <i>proposal</i>.



Figure 25: Viewpoint 13 – View from Gunningbar and Clyde Streets, Nevertire. Photo: Dylan Del Moro - Alexandria Digital Communication

4.2.13.2 Assessment of potential visual impacts

For Viewpoint 13 refer to Table 22 for an assessment of sensitivity, magnitude of change and potential *visual impacts* based on the current *proposal*.

Table 22: Viewpoint 13 - Assessment of potential visual impacts

Sensitivity	Magnitude of change	Overall potential visual impact rating
<p>"Capacity of a landscape or view to accommodate change without losing valued attributes." (Australian Institute of Landscape Architects, 2018)</p>	<p>"The extent of change that will be experienced by receptors. This change may be adverse or beneficial." (Australian Institute of Landscape Architects, 2018)</p>	<p>Rankings for sensitivity and magnitude of change are combined to generate the overall potential visual impact.</p>
Moderate sensitivity	Nil magnitude of change	Nil visual impact
<ul style="list-style-type: none"> • The view is considered a rural village setting consistent with the LEP. • Little endemic vegetation is noted in the view. • Building typologies are generally rural village nature. • Based on the rural agricultural type character, and the community's attitudes to this type of environment, the view has moderate capacity for change without impacting its valued attributes. 	<ul style="list-style-type: none"> • Nil – the <i>proposal</i> cannot be seen from this viewpoint. • Given the <i>proposal</i> cannot be seen from this viewpoint there are no cumulative impacts associated with the addition of the BESS. 	

4.2.14 Viewpoint 14: View from Oxley Highway, North Northeast of the township of Nevertire

4.2.14.1 Viewpoint description

Viewpoint description	
Latitude, Longitude:	-31.814340, 147.738427
Distance to Proposal:	2.9km
Existing viewpoint description:	<ul style="list-style-type: none"> View across roadside verge agricultural cropping lands towards the <i>proposal</i>. The communications tower (60m tall) from the existing solar PV farm is evident on the horizon. Vegetation across the termination of the view around the existing railway corridor heading north from Nevertire.
Viewpoint impacts:	<ul style="list-style-type: none"> Nil – vegetation between the receptor and the <i>proposal</i> block views of the <i>proposal</i>.



Figure 26: Viewpoint 14 – View from Oxley Highway, North Northeast of the township of Nevertire. Photo: Dylan Del Moro - Alexandria Digital Communication

4.2.14.2 Assessment of potential visual impacts

For Viewpoint 14 refer to Table 23 for an assessment of sensitivity, magnitude of change and potential *visual impacts* based on the current *proposal*.

Table 23: Viewpoint 14 - Assessment of potential visual impacts

Sensitivity	Magnitude of change	Overall potential visual impact rating
<p>"Capacity of a landscape or view to accommodate change without losing valued attributes." (Australian Institute of Landscape Architects, 2018)</p>	<p>"The extent of change that will be experienced by receptors. This change may be adverse or beneficial." (Australian Institute of Landscape Architects, 2018)</p>	<p>Rankings for sensitivity and magnitude of change are combined to generate the overall potential visual impact.</p>
Moderate sensitivity	Nil magnitude of change	Nil visual impact
<ul style="list-style-type: none"> View is from a main route of travel near the Nevertire township. The view is considered a rural agricultural type setting consistent with the LEP. Some endemic vegetation is noted in the view. Based on the rural agricultural type character, and the community's attitudes to this type of environment, the view has moderate capacity for change without impacting its valued attributes. 	<ul style="list-style-type: none"> Nil – the <i>proposal</i> cannot be seen from this viewpoint. Given the <i>proposal</i> cannot be seen from this viewpoint there are no cumulative impacts associated with the addition of the BESS. 	

4.2.15 Viewpoint 15: View from Oxley Highway, North Northeast of the township of Nevertire

4.2.15.1 Viewpoint description

Viewpoint description	
Latitude, Longitude:	-31.775974, 147.760354
Distance to Proposal:	7.2km
Existing viewpoint description:	<ul style="list-style-type: none">• View along roadside verge and agricultural cropping lands towards the <i>proposal</i>.• Powerline and roadway evident in view,
Viewpoint impacts:	<ul style="list-style-type: none">• Nil – vegetation between the receptor and the <i>proposal</i> block views of the <i>proposal</i>.



Figure 27: Viewpoint 15 – View from Oxley Highway, North Northeast of the township of Nevertire. Photo: Dylan Del Moro - Alexandria Digital Communication

4.2.15.2 Assessment of potential visual impacts

For Viewpoint 15 refer to Table 24 for an assessment of sensitivity, magnitude of change and potential *visual impacts* based on the current *proposal*.

Table 24: Viewpoint 15 - Assessment of potential visual impacts

Sensitivity	Magnitude of change	Overall potential visual impact rating
<p>"Capacity of a landscape or view to accommodate change without losing valued attributes." (Australian Institute of Landscape Architects, 2018)</p>	<p>"The extent of change that will be experienced by receptors. This change may be adverse or beneficial." (Australian Institute of Landscape Architects, 2018)</p>	<p>Rankings for sensitivity and magnitude of change are combined to generate the overall potential visual impact.</p>
Moderate sensitivity	Nil magnitude of change	Nil visual impact
<ul style="list-style-type: none"> View is from a main route of travel near the Nevertire township. The view is considered a rural agricultural type setting consistent with the LEP. Some endemic vegetation is noted in the view. Based on the rural agricultural type character, and the community's attitudes to this type of environment, the view has moderate capacity for change without impacting its valued attributes. 	<ul style="list-style-type: none"> Nil – the <i>proposal</i> cannot be seen from this viewpoint. Given the <i>proposal</i> cannot be seen from this viewpoint there are no cumulative impacts associated with the addition of the BESS. 	

4.2.16 Viewpoint 16: View from Mitchell Highway, 300m west of the Solar Farm Entry

4.2.16.1 Viewpoint description

Viewpoint description	
Latitude. Longitude:	-31.829841, 147.702243
Distance to Proposal:	1km
Existing viewpoint description:	<ul style="list-style-type: none">• The foreground is dominated grasslands.• Roadway within view• Vegetation across the horizon line.• Solar farm and infrastructure present within view.• Power infrastructure in the view throughout the view.
Viewpoint impacts:	<ul style="list-style-type: none">• Nil –vegetation and solar farm blocks views to the <i>proposal</i>.



Figure 28: Viewpoint 16 – View from Mitchell Highway, 300m west of the Solar Farm Entry. Photo: Dylan Del Moro - Alexandria Digital Communication

4.2.16.2 Assessment of potential visual impacts

For Viewpoint 16 refer to Table 25 for an assessment of sensitivity, magnitude of change and potential *visual impacts* based on the current *proposal*.

Table 25: Viewpoint 16 - Assessment of potential visual impacts

Sensitivity	Magnitude of change	Overall potential visual impact rating
<p>"Capacity of a landscape or view to accommodate change without losing valued attributes." (Australian Institute of Landscape Architects, 2018)</p>	<p>"The extent of change that will be experienced by receptors. This change may be adverse or beneficial." (Australian Institute of Landscape Architects, 2018)</p>	<p>Rankings for sensitivity and magnitude of change are combined to generate the overall potential visual impact.</p>
Low sensitivity	Nil magnitude of change	Nil visual impact
<ul style="list-style-type: none"> • The view is considered a rural type setting consistent with the LEP. • Some buildings and low visual quality structures are present in the view. • There are a range of natural and built elements within the view. • Those natural elements in the view are contrived. • Based on the rural type character, and the disturbed/contrived nature of the view, as compared to its natural state, the view has capacity for change without impacting its valued attributes. 	<ul style="list-style-type: none"> • Nil – the <i>proposal</i> cannot be seen from this viewpoint. • Given the <i>proposal</i> cannot be seen from this viewpoint there are no cumulative impacts associated with the addition of the BESS. 	

4.2.17 Viewpoint 17: View from Mitchell Highway, west of the Nevertire Solar Farm

4.2.17.1 Viewpoint description

Viewpoint description	
Latitude, Longitude:	-31.822600, 147.688420
Distance to Proposal:	2.2km
Existing viewpoint description:	<ul style="list-style-type: none">• The view is dominated by the roadway and grasslands.• Roadside vegetation within view.• Vegetation across the horizon line.• Power infrastructure in the view.
Viewpoint impacts:	<ul style="list-style-type: none">• Nil –vegetation in the landscape and the solar PV panels block views to the <i>proposal</i>.



Figure 29: Viewpoint 17 – View from Mitchell Highway, west of the Nevertire Solar Farm. Photo: Dylan Del Moro - Alexandria Digital Communication

4.2.17.2 Assessment of potential visual impacts

For Viewpoint 17 refer to Table 26 for an assessment of sensitivity, magnitude of change and potential *visual impacts* based on the current *proposal*.

Table 26: Viewpoint 17 - Assessment of potential visual impacts

Sensitivity	Magnitude of change	Overall potential visual impact rating
<p>"Capacity of a landscape or view to accommodate change without losing valued attributes." (Australian Institute of Landscape Architects, 2018)</p>	<p>"The extent of change that will be experienced by receptors. This change may be adverse or beneficial." (Australian Institute of Landscape Architects, 2018)</p>	<p>Rankings for sensitivity and magnitude of change are combined to generate the overall potential visual impact.</p>
Low sensitivity	Nil magnitude of change	Nil visual impact
<ul style="list-style-type: none"> • The view is considered a rural type setting consistent with the LEP. • Some buildings and low visual quality structures are present in the view. • There are a range of natural and built elements within the view. • those natural elements in the view are contrived. • Based on the rural type character, and the disturbed/contrived nature of the view, as compared to its natural state, the view has capacity for change without impacting its valued attributes. 	<ul style="list-style-type: none"> • Nil – the <i>proposal</i> cannot be seen from this viewpoint. • Given the <i>proposal</i> cannot be seen from this viewpoint there are no cumulative impacts associated with the addition of the BESS. 	

4.2.18 Viewpoint 18: View from Mitchell Highway – South of the Proposal

4.2.18.1 Viewpoint description

Viewpoint description	
Latitude, Longitude:	-31.835310, 147.713147
Distance to Proposal:	1.1km
Existing viewpoint description:	<ul style="list-style-type: none"> • Sparsely vegetated grassland dominates this view. • Fencing and recreational infrastructure present in the view. • Power infrastructure evident in the view. • The communications tower (60m tall) from the existing solar PV facility is evident on the horizon • Solar PV panels and vegetation are noted on the horizon line.
Viewpoint impacts:	<ul style="list-style-type: none"> • The existing fencing within the landscape will block the lower parts of the <i>proposal</i>. • The new fencing would be evident in the far view. • The buildings, BESS and associated infrastructure would be evident in the far view.



Figure 30: Viewpoint 18– View from Mitchell Highway, south of the proposal. Photo: Dylan Del Moro - Alexandria Digital Communication

4.2.18.2 Assessment of potential visual impacts

For Viewpoint 18 refer to Table 27 for an assessment of sensitivity, magnitude of change and potential *visual impacts* based on the current *proposal*.

Table 27: Viewpoint 18 - Assessment of potential visual impacts

Sensitivity	Magnitude of change	Overall potential visual impact rating
<p>"Capacity of a landscape or view to accommodate change without losing valued attributes." (Australian Institute of Landscape Architects, 2018)</p>	<p>"The extent of change that will be experienced by receptors. This change may be adverse or beneficial." (Australian Institute of Landscape Architects, 2018)</p>	<p>Rankings for sensitivity and magnitude of change are combined to generate the overall potential visual impact.</p>
Low sensitivity	Low magnitude of change	Low visual impact
<ul style="list-style-type: none"> • The view is considered a rural type setting consistent with the LEP. • The existing solar PV farm and its infrastructure are evident in this view. • Some vegetation is noted in the view; grassland plantings are exotic/introduced species with some remanent vegetation noted. • Based on the existing solar infrastructure and the community's attitudes to this type of environment, the view has capacity for change without impacting its valued attributes. 	<ul style="list-style-type: none"> • The change will be mostly views to the new fencing of the <i>proposal</i> site. • The scale of the change is not significant when compared to that of the adjacent solar PV farm. • There are very low levels of cumulative impacts based on the minimal extent of change within this view. • Based on the above, there would be low magnitude of change in this view from this group of receptors. 	

4.2.19 Viewpoint 19: View from Mitchell Highway, at Solar Farm Entry

4.2.19.1 Viewpoint description

Viewpoint description	
Latitude, Longitude:	-31.831550, 147.706307
Distance to Proposal:	0.8km
Existing viewpoint description:	<ul style="list-style-type: none">• Sparsely vegetated grassland dominates this view.• Fencing and buildings from solar PV farm present in the view.• Power infrastructure evident in the view.• The communications tower (60m tall) from the existing solar PV facility is evident on the horizon• Vegetation is noted on the horizon line.
Viewpoint impacts:	<ul style="list-style-type: none">• The new fencing would be evident in the far view.• The buildings, BESS and associated infrastructure would be evident in the far view.



Figure 31: Viewpoint 19 – View from Mitchell Highway, at solar farm entry. Photo: Dylan Del Moro - Alexandria Digital Communication



Figure 32: Viewpoint 19 – Photomontage View from Mitchell Highway, at solar farm entry. Photo: Dylan Del Moro - Alexandria Digital Communication. Photomontage Generation: RPS

4.2.19.2 Assessment of potential visual impacts

For Viewpoint 19 refer to Table 28 for an assessment of sensitivity, magnitude of change and potential *visual impacts* based on the current *proposal*.

Table 28: Viewpoint 19 - Assessment of potential visual impacts

Sensitivity	Magnitude of change	Overall potential visual impact rating
"Capacity of a landscape or view to accommodate change without losing valued attributes." (Australian Institute of Landscape Architects, 2018)	"The extent of change that will be experienced by receptors. This change may be adverse or beneficial." (Australian Institute of Landscape Architects, 2018)	Rankings for sensitivity and magnitude of change are combined to generate the overall potential visual impact.
Low sensitivity	Low magnitude of change	Low visual impact
<ul style="list-style-type: none"> The existing solar PV farm and its infrastructure are evident in this view. Some vegetation is noted in the view; grassland plantings are exotic/introduced species with some remanent vegetation noted. Based on the existing solar infrastructure and the community's attitudes to this type of environment, the view has capacity for change without impacting its valued attributes. 	<ul style="list-style-type: none"> The change will be mostly views to the new fencing of the <i>proposal</i> site. The scale of the change is not significant when compared to that of the adjacent solar PV farm. There are very low levels of cumulative impacts based on the minimal extent of change within this view. Based on the above, there would be low magnitude of change in this view from this group of receptors. 	

4.2.20 Viewpoint 20: View from north of the Solar Farm lot, on alignment from potential receptors north-west of the Proposal.

4.2.20.1 Viewpoint description

Viewpoint description	
Latitude, Longitude:	-31.816569, 147.705094
Distance to Proposal:	1.2km
Existing viewpoint description:	<ul style="list-style-type: none"> • Fencing is at the foreground of the view. • Trees in the midground prevent most views beyond. • The communications tower (60m tall) from the existing solar PV facility is evident on the horizon .
Viewpoint impacts:	<ul style="list-style-type: none"> • Nil –vegetation in the landscape and the solar PV panels block views to the <i>proposal</i> from the receptors northwest of the <i>proposal</i>.



Figure 33: Viewpoint 20– View from north of the Solar Farm lot, on alignment from potential receptors north-west of the proposal. Photo: Dylan Del Moro - Alexandria Digital Communication

4.2.20.2 Assessment of potential visual impacts

For Viewpoint 20 refer to Table 29 for an assessment of sensitivity, magnitude of change and potential *visual impacts* based on the current *proposal*.

Table 29: Viewpoint 20 - Assessment of potential visual impacts

Sensitivity	Magnitude of change	Overall potential visual impact rating
<p>"Capacity of a landscape or view to accommodate change without losing valued attributes." (Australian Institute of Landscape Architects, 2018)</p>	<p>"The extent of change that will be experienced by receptors. This change may be adverse or beneficial." (Australian Institute of Landscape Architects, 2018)</p>	<p>Rankings for sensitivity and magnitude of change are combined to generate the overall potential visual impact.</p>
Moderate sensitivity	Nil magnitude of change	Nil visual impact
<ul style="list-style-type: none"> Views are from residential receptors in a rural setting. The view is considered a rural agricultural type setting consistent with the LEP. Endemic vegetation is noted in the view. Based on the rural agricultural type character, and the community's attitudes to this type of environment, the view has moderate capacity for change without impacting its valued attributes. 	<ul style="list-style-type: none"> Nil –vegetation in the landscape and the solar PV panels block views to the <i>proposal</i> from the receptors northwest of the <i>proposal</i>. Given the <i>proposal</i> cannot be seen from this viewpoint there are no cumulative impacts associated with the addition of the BESS. 	

4.2.21 Viewpoint 21: View from north of the Proposal

4.2.21.1 Viewpoint description

Viewpoint description	
Latitude, Longitude:	-31.817885, 147.710747
Distance to Proposal:	0.9km
Existing viewpoint description:	<p>The basis of this description will be from beyond the fencing of the solar farm as viewed by the adjacent receptor.</p> <ul style="list-style-type: none"> • Fencing divides the photo (and in the case of the receptor be looking through 2 sets of fencing toward the <i>proposal</i>). • Solar PV panels would be evident on the right of the view. • The maintenance track would be evident in the view behind a fence. • Vegetation screens the horizon in the right of the view. • The communications tower (60m tall) from the existing solar PV facility is evident on the horizon. • Power infrastructure is evident in the view.
Viewpoint impacts:	<ul style="list-style-type: none"> • Negligible – vegetation in the landscape and dual layers of fencing will heavily screen views to the <i>proposal</i>.



Figure 34: Viewpoint 21 – View from north of the proposal. Photo: Dylan Del Moro - Alexandria Digital Communication

4.2.21.2 Assessment of potential visual impacts

For Viewpoint 21 refer to Table 30 for an assessment of sensitivity, magnitude of change and potential *visual impacts* based on the current *proposal*.

Table 30: Viewpoint 21 - Assessment of potential visual impacts

Sensitivity	Magnitude of change	Overall potential visual impact rating
<p>"Capacity of a landscape or view to accommodate change without losing valued attributes." (Australian Institute of Landscape Architects, 2018)</p>	<p>"The extent of change that will be experienced by receptors. This change may be adverse or beneficial." (Australian Institute of Landscape Architects, 2018)</p>	<p>Rankings for sensitivity and magnitude of change are combined to generate the overall potential visual impact.</p>
Low sensitivity	Negligible magnitude of change	Negligible visual impact
<ul style="list-style-type: none"> • The view is considered a rural type setting consistent with the LEP. • The existing solar PV farm and its infrastructure are evident in this view. • Some vegetation is noted in the view; grassland plantings are exotic/introduced species with some remanent vegetation noted. • Based on the existing solar infrastructure and the community's attitudes to this type of environment, the view has capacity for change without impacting its valued attributes. 	<ul style="list-style-type: none"> • Negligible - vegetation in the landscape and dual layers of fencing will heavily screen views to the <i>proposal</i>. • There are very low levels of cumulative impacts based on the minimal extent of change within this view due to the heavy vegetative screening. 	

4.2.22 Viewpoint 22: View from Nevertire-Bogan Southwest of the Township of Nevertire

4.2.22.1 Viewpoint description

Viewpoint description	
Latitude, Longitude:	-31.870572, 147.680525
Distance to Proposal:	5.8km
Existing viewpoint description:	<ul style="list-style-type: none">• View across roadside verge agricultural cropping lands towards <i>proposal</i> and Nevertire township.• The communications tower (60m tall) from the existing solar PV farm is evident on the horizon.
Viewpoint impacts:	<ul style="list-style-type: none">• Nil – vegetation in the landscape blocks views to the <i>proposal</i>.



Figure 35: Viewpoint 21 – View from north of the proposal. Photo: Dylan Del Moro - Alexandria Digital Communication

4.2.22.2 Assessment of potential visual impacts

For Viewpoint 22 refer to Table 31 for an assessment of sensitivity, magnitude of change and potential *visual impacts* based on the current *proposal*.

Table 31: Viewpoint 22 - Assessment of potential visual impacts

Sensitivity	Magnitude of change	Overall potential visual impact rating
<p>"Capacity of a landscape or view to accommodate change without losing valued attributes." (Australian Institute of Landscape Architects, 2018)</p>	<p>"The extent of change that will be experienced by receptors. This change may be adverse or beneficial." (Australian Institute of Landscape Architects, 2018)</p>	<p>Rankings for sensitivity and magnitude of change are combined to generate the overall potential visual impact.</p>
Moderate sensitivity	Nil magnitude of change	Nil visual impact
<ul style="list-style-type: none"> • The view is considered a rural type setting consistent with the LEP. • Some buildings and structures are present in the view. • Some vegetation is a dominant part of the view; the plantings are exotic/introduced species. • There are a range of natural and built elements within the view. • Those natural elements in the view are contrived. • Based on the rural type character, and the disturbed/contrived nature of the view, as compared to its natural state, the view has some capacity for change without impacting its valued attributes. 	<ul style="list-style-type: none"> • Nil – the <i>proposal</i> cannot be seen from this viewpoint. • Given the <i>proposal</i> cannot be seen from this viewpoint there are no cumulative impacts associated with the addition of the BESS. 	

4.2.23 Viewpoint 23: View from Oxley Highway, North Northeast of the township of Nevertire

4.2.23.1 Viewpoint description

Viewpoint description	
Latitude, Longitude:	-31.793212, 147.749901
Distance to Proposal:	5.1km
Existing viewpoint description:	<ul style="list-style-type: none"> • View along roadside verge and agricultural cropping lands towards the <i>proposal</i>. • Powerline and roadway evident in view,
Viewpoint impacts:	<ul style="list-style-type: none"> • Nil – vegetation between the receptor and the <i>proposal</i> block views of the <i>proposal</i>.



Figure 36: Viewpoint 23 – View from Oxley Highway, North Northeast of the township of Nevertire. Photo: Dylan Del Moro - Alexandria Digital Communication

4.2.23.2 Assessment of potential visual impacts

For Viewpoint 23 refer to Table 32 for an assessment of sensitivity, magnitude of change and potential *visual impacts* based on the current *proposal*.

Table 32: Viewpoint 23 - Assessment of potential visual impacts

Sensitivity	Magnitude of change	Overall potential visual impact rating
<p>"Capacity of a landscape or view to accommodate change without losing valued attributes." (Australian Institute of Landscape Architects, 2018)</p>	<p>"The extent of change that will be experienced by receptors. This change may be adverse or beneficial." (Australian Institute of Landscape Architects, 2018)</p>	<p>Rankings for sensitivity and magnitude of change are combined to generate the overall potential visual impact.</p>
Moderate sensitivity	Nil magnitude of change	Nil visual impact
<ul style="list-style-type: none"> • View is from a main route of travel near the Nevertire township. • The view is considered a rural agricultural type setting consistent with the LEP. • Some endemic vegetation is noted in the view. • Based on the rural agricultural type character, and the community's attitudes to this type of environment, the view has moderate capacity for change without impacting its valued attributes. 	<ul style="list-style-type: none"> • Nil – the <i>proposal</i> cannot be seen from this viewpoint. • Given the <i>proposal</i> cannot be seen from this viewpoint there are no cumulative impacts associated with the addition of the BESS. 	

4.2.24 Viewpoint 24: View from Lot 30 DP755292 (east of the proposal)

4.2.24.1 Viewpoint description

Viewpoint description	
Latitude, Longitude:	-31.818898, 147.753713
Distance to Proposal:	4.1km
Existing viewpoint description:	<ul style="list-style-type: none">• Foreground is driveway.• Garden before a turf area ahead of the fence line.• Shrubs and vegetation along fence line with <i>proposal</i>.• Large native and introduced trees on receptor site will be present in the view.• Existing building on the <i>proposal</i> site would be present in the view. <p>Note: views from habitable spaces on this property are partially screened by vegetation between the receptor's property line and dwelling.</p>
Viewpoint impacts:	<ul style="list-style-type: none">• Nil – vegetation between the receptor and the <i>proposal</i> block views of the <i>proposal</i>.



Figure 37: Viewpoint 24 – View from Lot 30 DP755292 (east of the proposal). Photo: Dylan Del Moro - Alexandria Digital Communication

4.2.24.2 Assessment of potential visual impacts

For Viewpoint 24 refer to Table 33 for an assessment of sensitivity, magnitude of change and potential *visual impacts* based on the current *proposal*.

Table 33: Viewpoint 24 - Assessment of potential visual impacts

Sensitivity	Magnitude of change	Overall potential visual impact rating
<p>"Capacity of a landscape or view to accommodate change without losing valued attributes." (Australian Institute of Landscape Architects, 2018)</p>	<p>"The extent of change that will be experienced by receptors. This change may be adverse or beneficial." (Australian Institute of Landscape Architects, 2018)</p>	<p>Rankings for sensitivity and magnitude of change are combined to generate the overall potential visual impact.</p>
Low sensitivity	Nil magnitude of change	Nil visual impact
<ul style="list-style-type: none"> • View is from rural property. • The view is considered a rural agricultural type setting consistent with the LEP. • Some endemic vegetation is noted in the view. • Based on the rural agricultural type character, and the community's attitudes to this type of environment, the view has moderate capacity for change without impacting its valued attributes. 	<ul style="list-style-type: none"> • Nil – the <i>proposal</i> cannot be seen from this viewpoint. • Given the <i>proposal</i> cannot be seen from this viewpoint there are no cumulative impacts associated with the addition of the BESS. 	

4.2.25 Viewpoint 25: View from Lot 47 DP755292 – Southeast of Proposal

4.2.25.1 Viewpoint Description

Viewpoint description	
Latitude, Longitude:	-31.829827, 147.72031
Distance to Proposal:	1km
Existing viewpoint description:	<ul style="list-style-type: none"> • The foreground is unformed roadway with stands of trees in low grasslands. • Powerlines lead to existing solar facility. • Vegetation across the horizon line.
Viewpoint impacts (as assessed from the habital building on the lot):	<ul style="list-style-type: none"> • Shed on property and vegetation in the landscape substantially block views to the <i>proposal</i>.



Figure 38: Viewpoint 25 – View from Lot 47 DP755292 – Southeast of *proposal* Photo: Supplied by Elliot Green Power

4.2.25.2 Assessment of potential visual impacts

For Viewpoint 25 refer to **Table 34** for an assessment of sensitivity, magnitude of change and potential *visual impacts* based on the current *proposal*.

Table 34: Viewpoint 25 - Assessment of potential visual impacts

Sensitivity	Magnitude of change	Overall potential visual impact rating
<p>"Capacity of a landscape or view to accommodate change without losing valued attributes." (Australian Institute of Landscape Architects, 2018)</p>	<p>"The extent of change that will be experienced by receptors. This change may be adverse or beneficial." (Australian Institute of Landscape Architects, 2018)</p>	<p>Rankings for sensitivity and magnitude of change are combined to generate the overall potential visual impact.</p>
Moderate sensitivity	Low magnitude of change	Moderate – Low visual impact
<ul style="list-style-type: none"> The view is considered a rural setting consistent with the LEP. Vegetation is noted in the view. Based on the rural agricultural type character, and the community's attitudes to this type of environment, the view has moderate capacity for change without impacting its valued attributes. 	<ul style="list-style-type: none"> Negligible – the view to the <i>proposal</i> is substantially blocked from the habitable building by the onsite shed and vegetation within the landscape. The <i>proposal</i> is visible from other parts of the property. Given the <i>proposal</i> cannot be seen from the habitual building on the property at this viewpoint there are negligible cumulative impacts associated with the addition of the BESS. 	

4.3 Summary of Visual Impact Assessment

Refer to **Table 35** for a summary of the *visual impacts* across all 24 *viewpoints*.

Table 35: Summary of Visual Impact Assessment

View-point	Location	Sensitivity	Magnitude of change	Overall potential visual impact	Distance to proposal	Representative of a residential receiver?
1	Mitchell Highway – Northwest of <i>proposal</i>	Low sensitivity	Nil magnitude of change	Nil visual impact	5.6km	No
2	Mitchell Highway – Northwest of <i>proposal</i>	Low sensitivity	Nil magnitude of change	Nil visual impact	6.8km	No
3	Mitchell Highway – Northwest of <i>proposal</i>	Low sensitivity	Nil magnitude of change	Nil visual impact	3.1km	No
4	Mitchell Highway Southeast of the Township of Nevertire	Moderate sensitivity	Nil magnitude of change	Nil visual impact	2.3km	No
5	Mitchell Highway Southeast of the Township of Nevertire	Moderate sensitivity	Nil magnitude of change	Nil visual impact	4.8km	No
6	Noel Waters Oval and Recreation Ground	Low sensitivity	Low magnitude of change	Low visual impact	0.9km	No
7	Gunningbar Street, Nevertire	Moderate sensitivity	Nil magnitude of change	Nil visual impact	1.1km	Yes
8	14 Narromine Street, Nevertire	Moderate sensitivity	Nil magnitude of change	Nil visual impact	1.5km	Yes
9	Corner of Narromine and Clyde Streets	Moderate sensitivity	Nil magnitude of change	Nil visual impact	1.3km	Yes
10	Nevertire-Bogan Southwest of the Township of Nevertire	Moderate sensitivity	Nil magnitude of change	Nil visual impact	2.5km	No
11	Nevertire-Bogan Southwest of the Township of Nevertire	Moderate sensitivity	Nil magnitude of change	Nil visual impact	4.3km	No
12	Nevertire-Bogan Southwest of the Township of Nevertire	Low sensitivity	Low magnitude of change	Low visual impact	2.2km	No
13	Corner of Gunningbar and Clyde Streets	Moderate sensitivity	Nil magnitude of change	Nil visual impact	1.3km	Yes
14	Oxley Highway, North Northeast of the township of Nevertire	Moderate sensitivity	Nil magnitude of change	Nil visual impact	2.9km	No
15	Oxley Highway, North Northeast of the township of Nevertire	Moderate sensitivity	Nil magnitude of change	Nil visual impact	7.2km	No
16	Mitchell Highway, 300m west of the Solar Farm Entry	Low sensitivity	Nil magnitude of change	Nil visual impact	1.0km	Yes
17	Mitchell Highway, west of the Nevertire Solar Farm	Low sensitivity	Nil magnitude of change	Nil visual impact	2.2km	No
18	View from Mitchell Highway – South of the <i>proposal</i>	Low sensitivity	Low magnitude of change	Low visual impact	1.1km	No
19	Mitchell Highway, at Solar Farm Entry	Low sensitivity	Low magnitude of change	Low visual impact	0.8km	No

View-point	Location	Sensitivity	Magnitude of change	Overall potential visual impact	Distance to proposal	Representative of a residential receiver?
20	North of the Solar Farm lot, on alignment from potential receptors north-west of the <i>proposal</i>	Moderate sensitivity	Nil magnitude of change	Nil visual impact	1.2km	Yes
21	North of the <i>proposal</i>	Low sensitivity	Negligible magnitude of change	Negligible visual impact	0.9km	No
22	Nevertire-Bogan Southwest of the Township of Nevertire	Moderate sensitivity	Nil magnitude of change	Nil visual impact	5.8km	No
23	Oxley Highway, North Northeast of the township of Nevertire	Moderate sensitivity	Nil magnitude of change	Nil visual impact	5.1km	No
24	Lot 30 DP755292 (east of the <i>proposal</i>)	Low sensitivity	Nil magnitude of change	Nil visual impact	4.1km	Yes
25	Lot 47 DP755292 (southeast of <i>proposal</i>)	Low sensitivity	Nil magnitude of change	Moderate low visual impact	1.0km	Yes

5 CONCLUSION AND SAFEGUARDS

5.1 Conclusion

A key consideration in the visual impact assessment of the *proposal* will be the sensitivity of residents and other stakeholders to specific elements, which may result in a variety of responses, both positive and negative. Whilst the degree to which the scale of the *proposal* is visible, from certain vantage points can be quantified. Ultimately, the residents and users of the landscape surrounding the site would reflect a range of sensitivities. The degree to which the changes to the landscape are perceived would depend on the values of the actual users / residents.

Our assessment has been undertaken on the basis that the community view on renewables infrastructure is as described in *Visual Impact assessment - Nevertire Solar Farm* (NGH Environmental, 2017); that is that the local community “were not generally concerned about the view of the *proposal* from Nevertire or the Mitchell Highway.” (NGH Environmental, 2017)

In the preparation of undertaking the visual impact assessment views from habitable room windows and private outdoor areas of residences are treated as sensitive receptors. Views from residual land beyond the primary outdoor area (such as driveways, roadways, easements) are treated as less sensitive receptors.

This report also adopts the standard methodology of sensitivity relating to proximity, in that the greater the distance between the visual receptor and the *proposal*, the lesser the visual sensitivity.

The *proposal* would result in nil, negligible, low or low-moderate impacts for all the selected *viewpoints* based on:

- The visual baseline data collected through the landscape character zones process,
- The landscape values extrapolated from the *Warren Shire Local Environmental Plan – 2012 (amended 14 July 2021)* and
- The community perception as ascertained from *Visual Impact assessment - Nevertire Solar Farm* (NGH Environmental, 2017).

In reviewing potential *visual impacts*, cumulative impacts were considered from each of the *viewpoints*. There were either no, or very low levels cumulative impacts associated with the addition of BESS infrastructure to the existing solar facility.

Section 5.2 proposes safeguard measures to assist with maintaining the desired visual quality of the landscape as extrapolated from the *Warren Shire Local Environmental Plan – 2012 (amended 14 July 2021)*.

5.2 Safeguards

A number of safeguards are proposed to manage and minimise the potential *visual impacts*.

5.2.1 Design Safeguards

- The proposed materials and finishes should be implemented.
- Review and limit the impacts of the construction laydown areas on the site.
- Review lighting design to mitigate its impact on adjacent residential areas.

5.2.2 Construction Safeguards

- Avoid unnecessary loss or damage to other vegetation adjacent to the *proposal* by protecting vegetation not proposed for removal prior to construction.
- Minimise light spill from the development areas by directing construction lighting into the construction areas and ensuring the site is not over-lit. This includes the sensitive placement and specification of lighting to minimise any potential increase in light pollution.
- Temporary hoardings, barriers, traffic management and signage would be removed immediately when no longer required.

- The site is to be kept tidy and well maintained, including removal of all rubbish at regular intervals. There should be no storage of materials beyond the construction boundaries.
- Damage to fencing, Graffiti and other visual nuisance should be removed during construction to maintain the visual appearance of the facility.

5.2.3 Operational Safeguards

- Minimise light spill from the development areas by directing operational lighting into the site and ensuring the site is not over-lit. This includes the sensitive placement and specification of lighting to mitigate increase in light pollution.
- Undertake regular maintenance work to the area around the *proposal* to maintain a clean and safe working environment.
- Damage to fencing, Graffiti and other visual nuisance should be removed during operation to maintain the visual appearance of the facility.
- Review any future changes to the facility in relation to their impacts on visual amenity.

6 REFERENCES

Australian Institute of Landscape Architects Landscape and Visual Assessment AILA Guidance Note for Queensland [Online] // Australian Institute of Landscape Architects. - June 2018. - 2. - 1 10 2020. - https://www.aila.org.au/documents/AILA/QLD/2018/AILA_GNLVA_June_2018V2.pdf.

NGH Environmental Landscaping Plan - Nevertire Solar Farm [Online] // Nevertire Solar Farm. - 10 August 2018. - V2.2. - 17 August 2021. - http://nevertiresolarfarm.com.au/wp-content/uploads/2019/01/NSF-LP-Final-180810_FULLL.pdf.

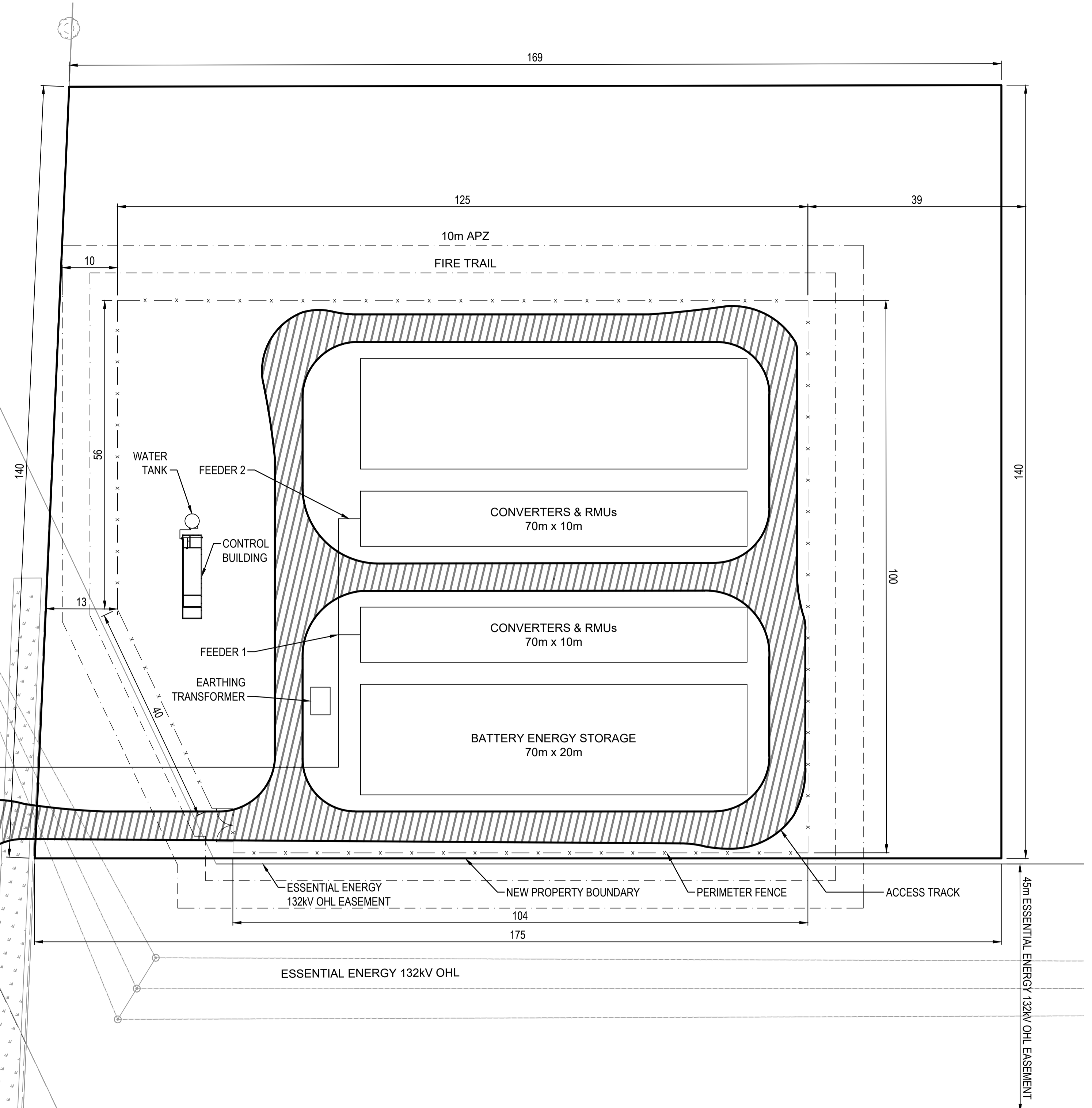
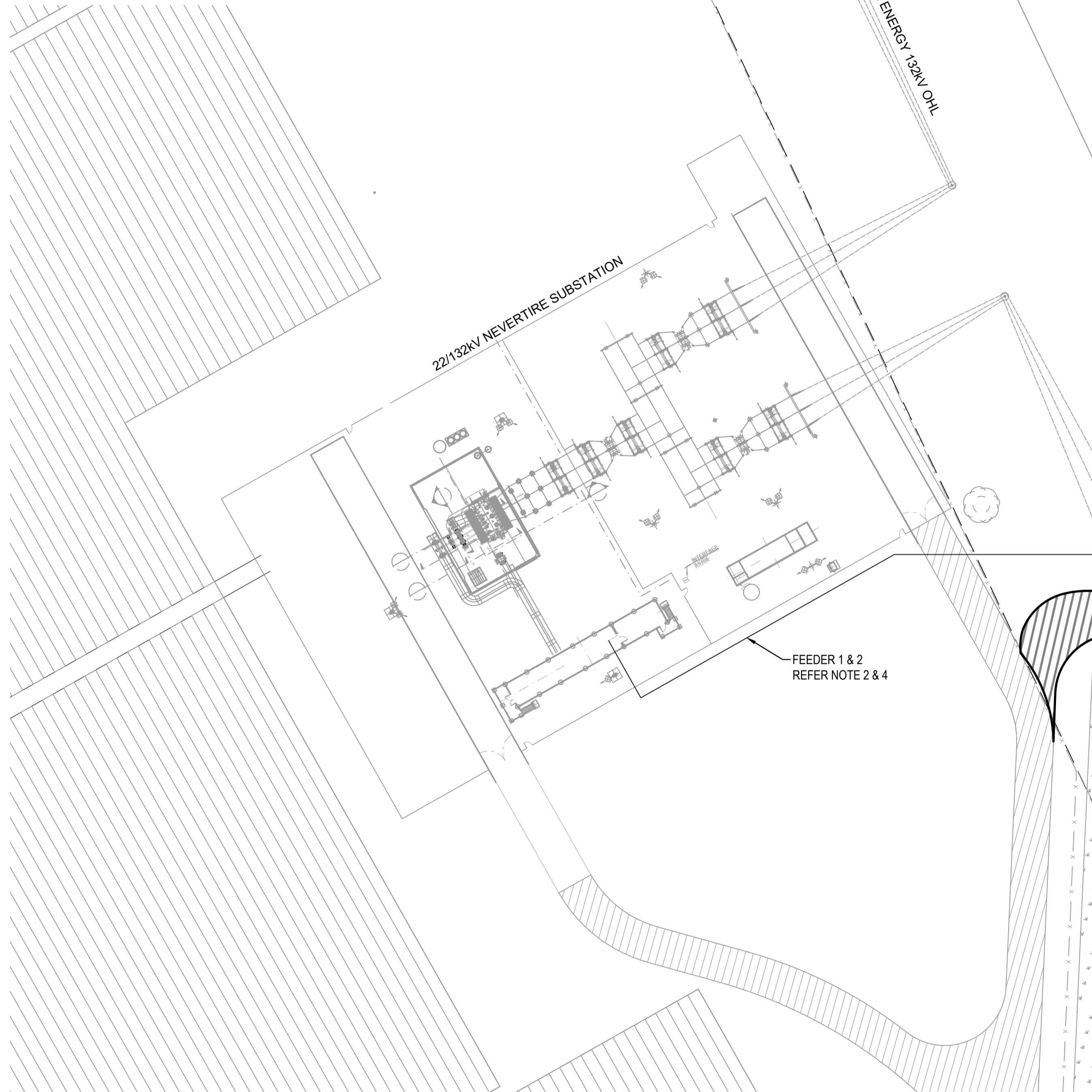
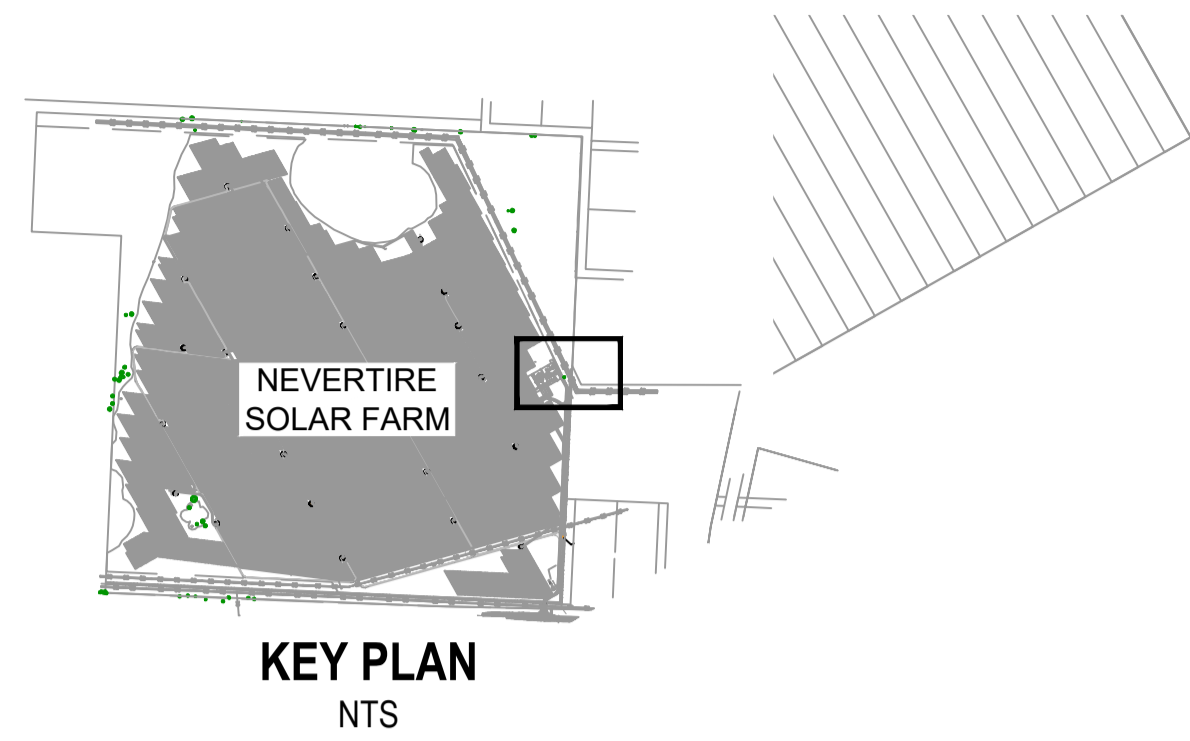
NGH Environmental Visual Impact Assessment - Nevertire Solar Farm [Report]. - Canberra : NGH Environmental, 2017.

Transport for NSW Beyond the Pavement - 2020 [Online] // Transport for NSW. - 08 2020. - 25 09 2020. - <https://www.rms.nsw.gov.au/business-industry/partners-suppliers/documents/centre-for-urban-design/beyond-pavement.pdf>.

Transport for NSW Guidelines Landscape Character and Visual Assessment [Online] // Transport for NSW. - Centre for Urban Design - Transport for NSW, 21 08 2020. - 2.2. - 25 09 2020. - <https://www.rms.nsw.gov.au/business-industry/partners-suppliers/documents/centre-for-urban-design/guideline-landscape-character-and-visual-impact.pdf>.

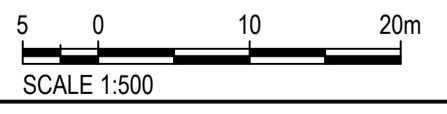
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Appendix A
Design Drawings



SITE PLAN
1:500

- NOTES:**
1. ALL DIMENSIONS IN METERS UNLESS NOTED OTHERWISE.
 2. BESS LAYOUT IS INDICATIVE CONTRACTOR MAY PROPOSE ALTERNATIVE LAYOUT.
 3. CONTRACTOR TO IDENTIFY AND AVOID ALL UNDERGROUND AND OVERHEAD SERVICES PRIOR TO CONSTRUCTION.
 4. CONTRACTOR TO REINSTATE ALL EXISTING SERVICES AND INFRASTRUCTURE TO FORMER QUALITY PRIOR TO COMPLETION.
 5. FEEDER CABLE ROUTE IS INDICATIVE ONLY AND WILL HAVE TO BE CONFIRMED LATER BASED ON SURVEYING ETC.
 6. CONTRACTOR IS TO ALLOW FOR FUTURE EXTENSION OF BESS FACILITY
 7. ACCESS TRACK 5m WIDE
 8. ASSET PROTECTION ZONE (APZ) 10m WIDE TO INCLUDE GRAVEL FIRE TRAIL AROUND WHOLE OUTSIDE



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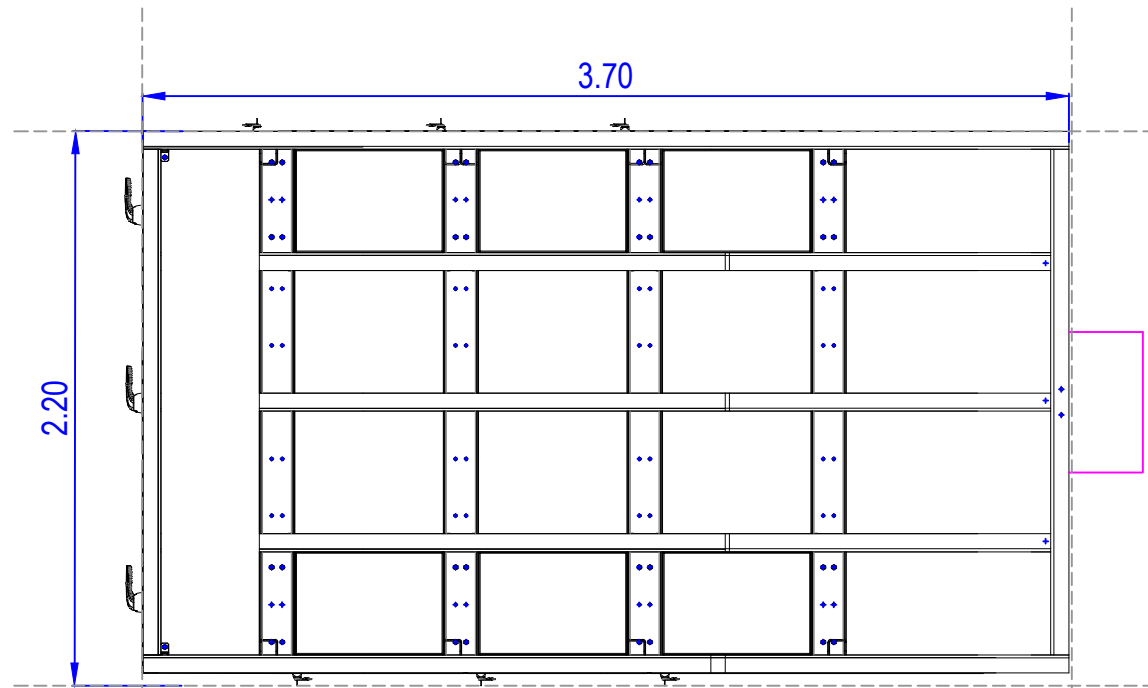


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B	2021-09-21	ISSUED FOR TENDER	PF
A	2021-09-13	ISSUED FOR REVIEW	PF

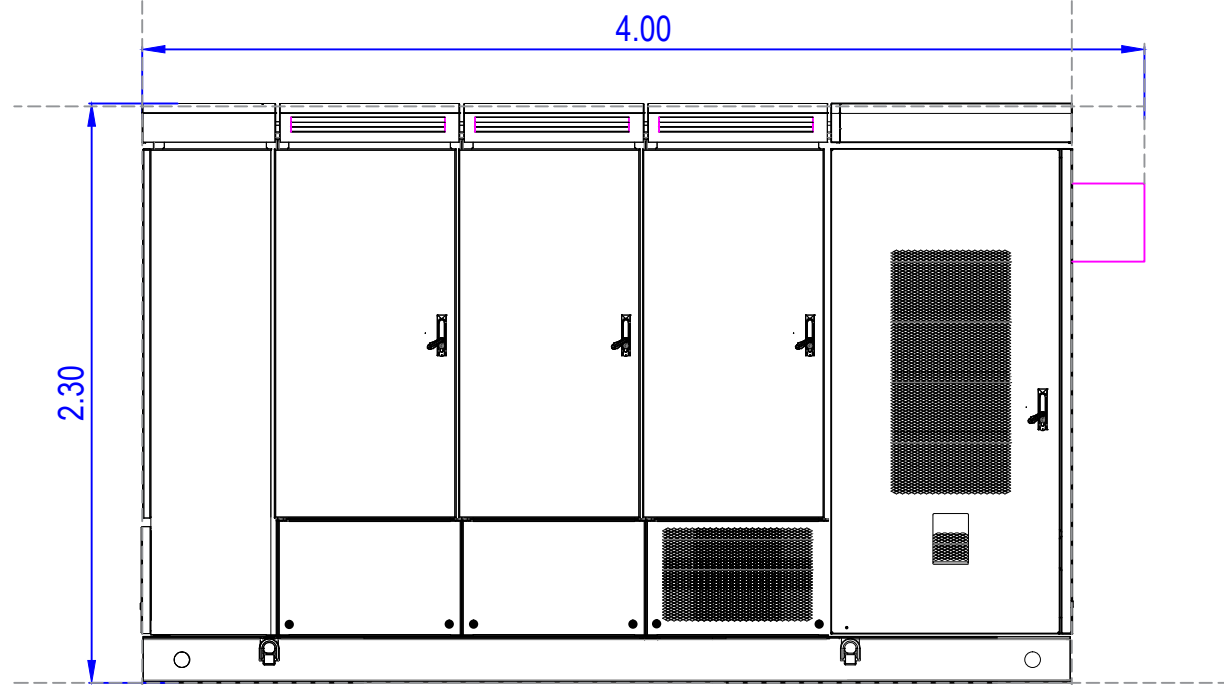
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N. LECORDEUR	
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P. FAGGION	
REVIEWED	
A. LAUBI	

TENDER	APPROVED
NOT FOR CONSTRUCTION	
	DATE

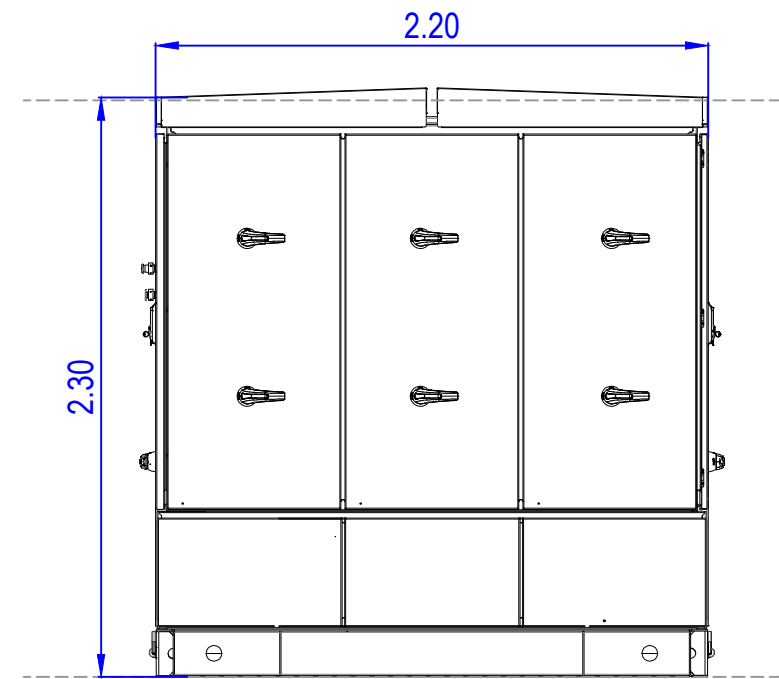
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REV	REV
	C



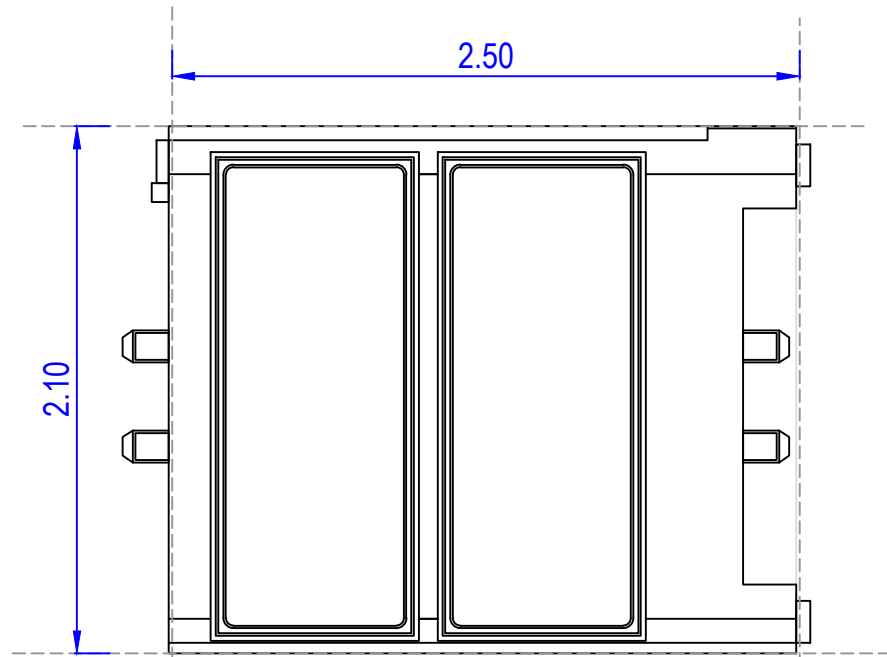
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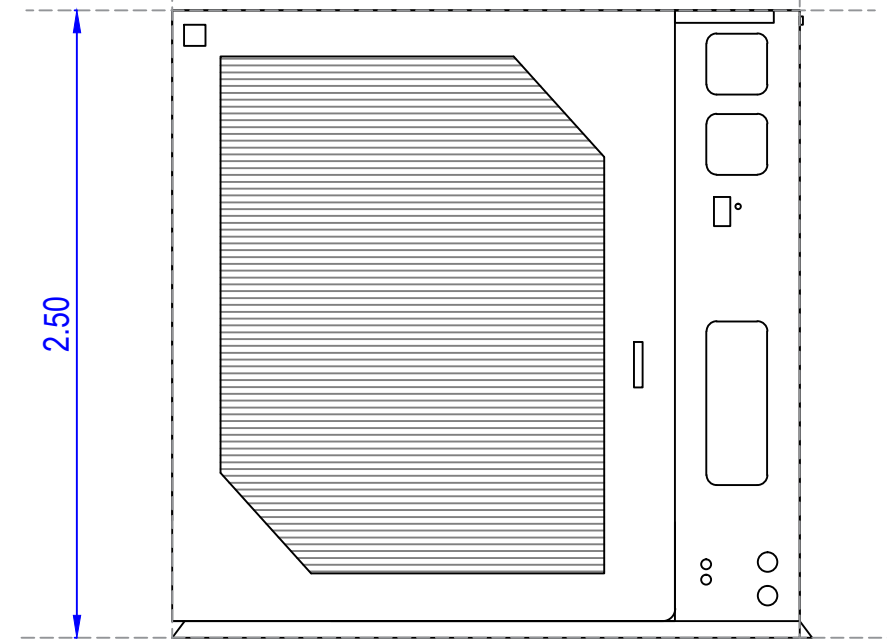
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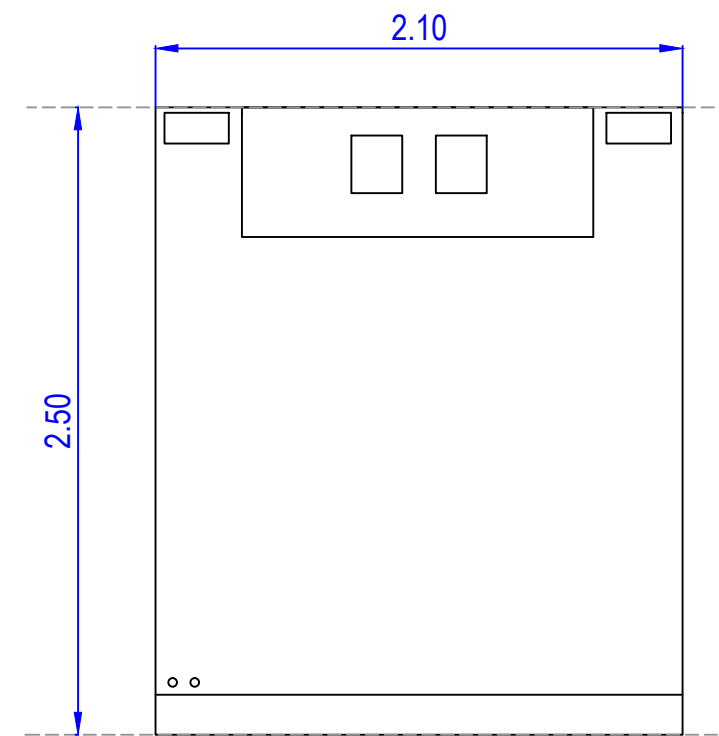
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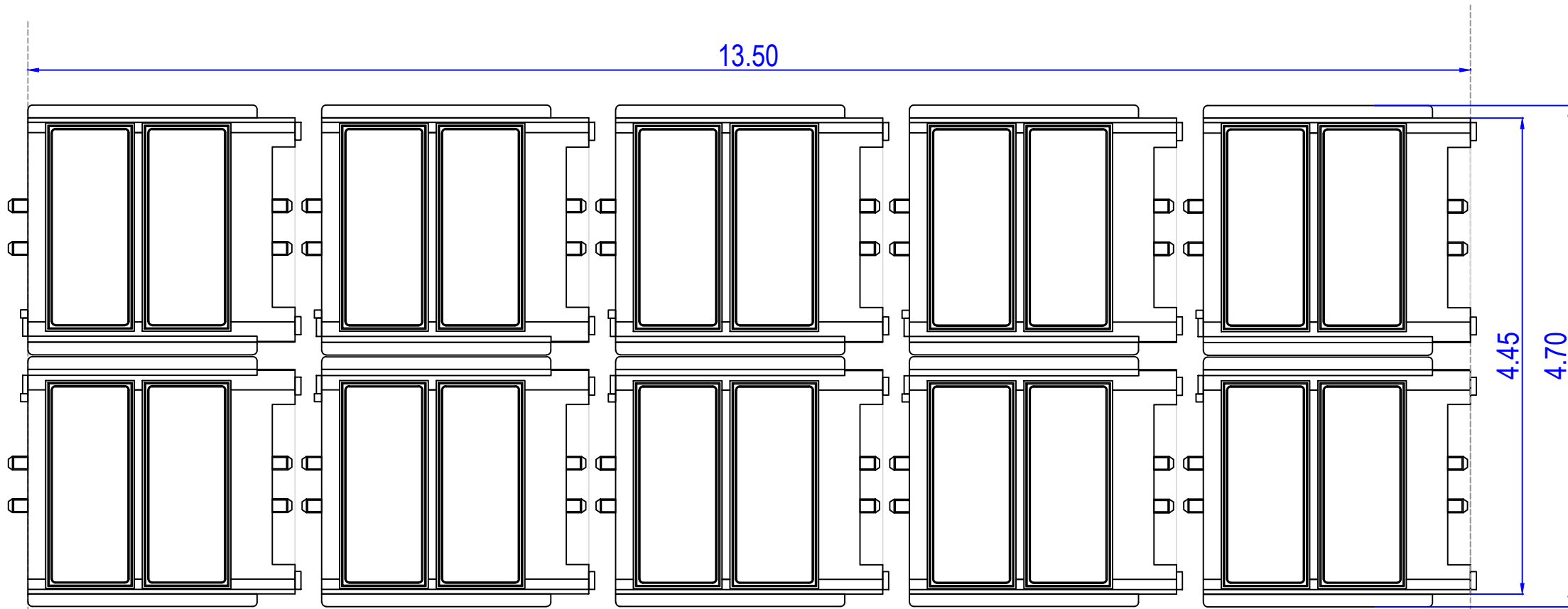
1 PLAN



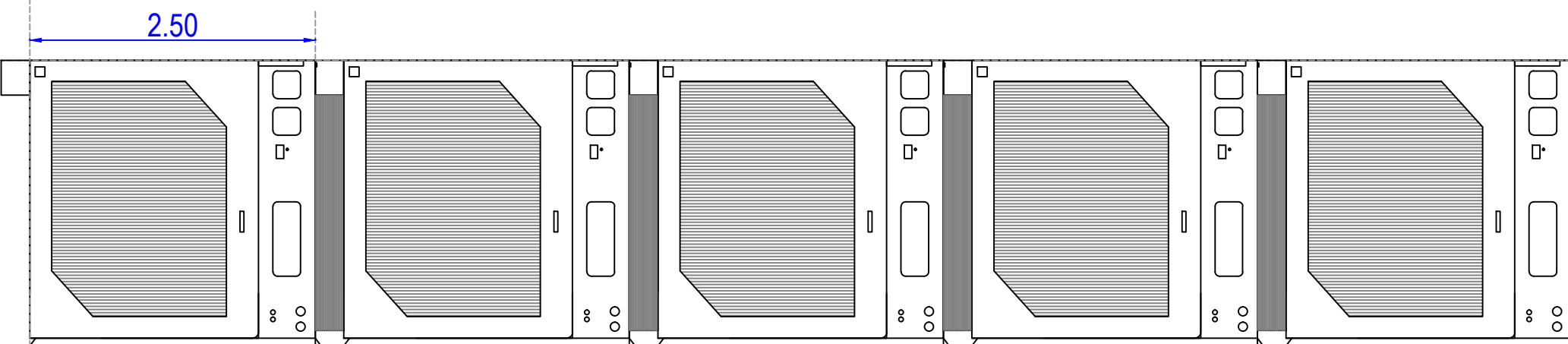
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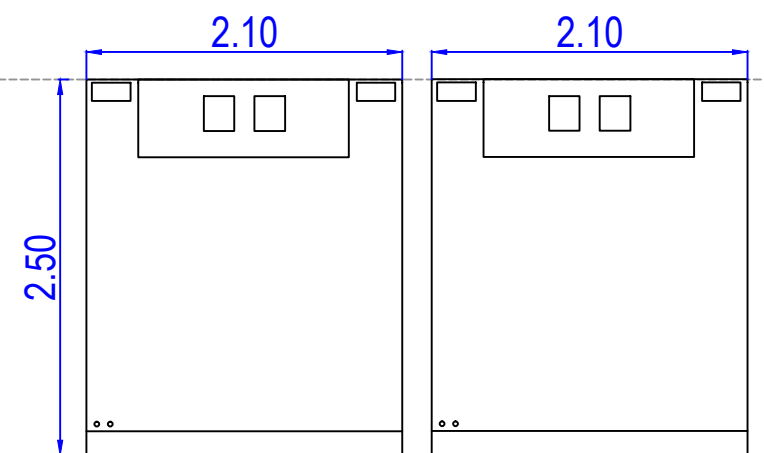
3 SIDE ELEVATION



1 PLAN



2 FRONT ELEVATION



3 SIDE ELEVATION