MARYVALE SOLAR FARM

MODIFICATION APPLICATION

DEVELOPMENT CONSENT SSD 8777

MAY 2022

PREPARED FOR MARYVALE SOLAR FARM PTY LTD

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ACRONYMS & ABBREVIATIONS

AC	Alternate Current
ALARP	As Low As Reasonably Practical
APZ	Asset Protection Zone
BESS	Battery Energy Storage System
CoC	Condition of Consent
DC	Direct Current
DRC	Dubbo Regional Council
DPIE	Department of Planning, Industry and Environment
EIS	Environmental Impact Statement
LGA	Local Government Area
MW	Megawatt
MWh	Megawatt Hour
MSF	Maryvale Solar Farm
PV	Photovoltaic
RFS	Rural Fire Service
RTS	Response to Submissions
SEARs	Secretary's Environmental Assessment Requirements
SEPP	State Environmental Planning Policy
SSD	State significant development
TfNSW	Transport for New South Wales

EXECUTIVE SUMMARY

The construction and operation of Maryvale Solar Farm (the approved project) is authorised under project approval SSD 8777 (Development Consent) granted by the Minister for Planning on 4 December 2019 under Part 4, Division 4.1 of the *Environmental Planning and Assessment Act 1979* (NSW) (EP&A Act).

This report has been prepared to assess the impacts of the addition of a Battery Storage Energy System (BESS) to the approved project in two potential formats; centralised or distributed. This report supports an application to request that the Minister modify the Development Consent under Section 4.55(2) of the EP&A Act.

The proponent Maryvale Solar Farm Pty Ltd ('the proponent') has engaged Energy Forms to prepare this modification report.

The key environmental impacts that require assessment for this proposal are as follows:

Traffic

A Traffic Impacts Assessment has been prepared by SECA Solution and is included at Appendix B. The traffic assessment concludes that the addition of the BESS will have minor impact on the overall road network and a negligible increase in construction traffic only.

There will be no increase to the traffic volumes, site access or transport arrangements associated with the operational stage of the solar farm. The 2 month increase to the construction window, will extend the length of impacts in terms of temporary increase local traffic, which may cause some inconvenience but no unreasonable impacts on local road access or safety. No mitigation measures are recommended and the minor impacts from construction are considered acceptable.

Visual

A Visual Impact Assessment has been prepared by Envisage and is included at Appendix C. The report serves as an addendum to the Visual Impact Assessment of the original EIS. The report considers both centralised and distributed BESS options proposed and whether either would alter impact levels determined for the approved project.

The assessment concludes that the proposal is able to achieve 'little effect'. Mitigation measures to ensure no increased impact include screen plantings and suitable low impact colouring of battery units. On this basis it is concluded that the modification will not result in any net increase in impacts on the sensitive receivers associated with the proposed modification.

Noise

A Noise Assessment has been prepared by Muller Acoustic Consulting (MAC) and is included at Appendix D. The report functions as an addendum to the original Noise Assessment Report that was prepared by MAC as part of the EIS for the project.

The results of the assessment demonstrate that emissions from the project will not change significantly compared to the EIS Noise Assessment. The revised project with BESS and associated HVAC system would satisfy the operational PNTLs at all relevant identified receivers. The proposed modification does not alter the potential noise impacts as assessed within the EIS. No additional mitigation measures are deemed necessary.

Bushfire

A Bushfire Risk Assessment has been prepared by Ecological Australia and is included at Appendix E.

Key risks were identified in relation to the proposed BESS addition, which relate to potential fire ignition and spread. The assessment rates fire risks associated with the BESS as LOW. Several mitigation measures are identified by the assessment to manage risks to an acceptable level. These mitigation measures are summarised in Section 6.1 of this report.

With the incorporation of the mitigation measures recommended by the Bushfire Risk Assessment the proposed modification will be satisfactory and not increase impacts of the facility compared with the EIS.

Hazards

A Preliminary Hazard Analysis has been prepared by Planager and is included at Appendix F.

Hazards and risks of the proposed BESS are assessed in accordance with SEPP33, including the Department's HIPAP6 and MLRA. The assessment concludes that the main risk of the BESS addition is in relation to theoretical potential to start a fire and spread to areas outside the battery enclosure. Environmental pollution may also be possible.

The risk profile for the BESS is consistently between Moderate and Low risk with no High or Very High risks identified. Hazards can be kept As Low As Reasonably Practical (ALARP).

Eight recommendations are made which are included at the mitigation Section 6.1 of this report. With inclusion of mitigation measures hazards will be kept to an acceptable level.

1 INTRODUCTION

1.1 THE PROPONENT

This report has been prepared by Energy Forms Pty Ltd (Energy Forms) on behalf of the proponent Maryvale Solar Farm Pty Ltd.

Energy Forms is a planning, environment, and engagement consultancy with national experience in major renewables projects.

Maryvale Solar Farm Pty Ltd is wholly owned by WIRSOL Energy Pty Ltd who recently acquired the project from Photon Energy Pty Ltd and Polpo Investments Ltd.

WIRSOL Energy is a renewable energy company that develops, owns and manages utility scale-solar and energy storage solutions and is a subsidiary of the German-owned renewable energy group, Wircon.

WIRSOL Energy is developer, owner, project manager and operator of over 1.5 Gigawatts of utility-scale solar internationally, with over 700MW of renewable energy projects in Australia including:

- 60MW Gannawarra Solar Farm (Vic, completed and operational)
- 25MW Gannawarra Energy Storage System (Vic, completed and operational)
- 69MW Whitsunday Solar Farm (QLD, completed and operational)
- 69MW Hamilton Solar Farm (QLD, completed and operational)
- 110MW Wemen Solar Farm (Vic, completed and operational)
- 90MW Clermont Solar Farm (QLD, completed and operational)
- 149MW Glenrowan West Solar Farm (Vic, completed and operational)
- 85MW Barnawartha Solar Farm (Vic, under development)
- 160MW Maryvale Solar Farm (NSW, under development)

1.2 Overview of the approved project

PROJECT TITLE	Maryvale Solar Farm
ADDRESS	121 Maryvale Road, Maryvale and 801 Cobbora Road, Maryvale
LOCAL GOVERNMENT	Dubbo Regional Council
ENVIRONMENTAL PLAN	Wellington Local Environmental Plan 2012
ZONING	Primary Production (RU1)
APPROVAL	Development Consent SSD 8777 (04-12-2019)

The approved project under Development Consent SSD 8777 involves construction and operation of a 125 MW solar farm using photovoltaic (PV) technology at 121 Maryvale Road and 801 Cobbora Road, Maryvale, approximately 15 kilometres north-east of the Wellington town centre within the Dubbo Regional Council Local Government Area (LGA).

In addition to the solar PV panels the approved project includes the construction of new access roads into the site from Seatonville Road, installation of electrical infrastructure and other ancillary works.

Ancillary works include on-site substation, inverter stations, connection to overhead transmission lines, fencing and landscaping works, and road works.

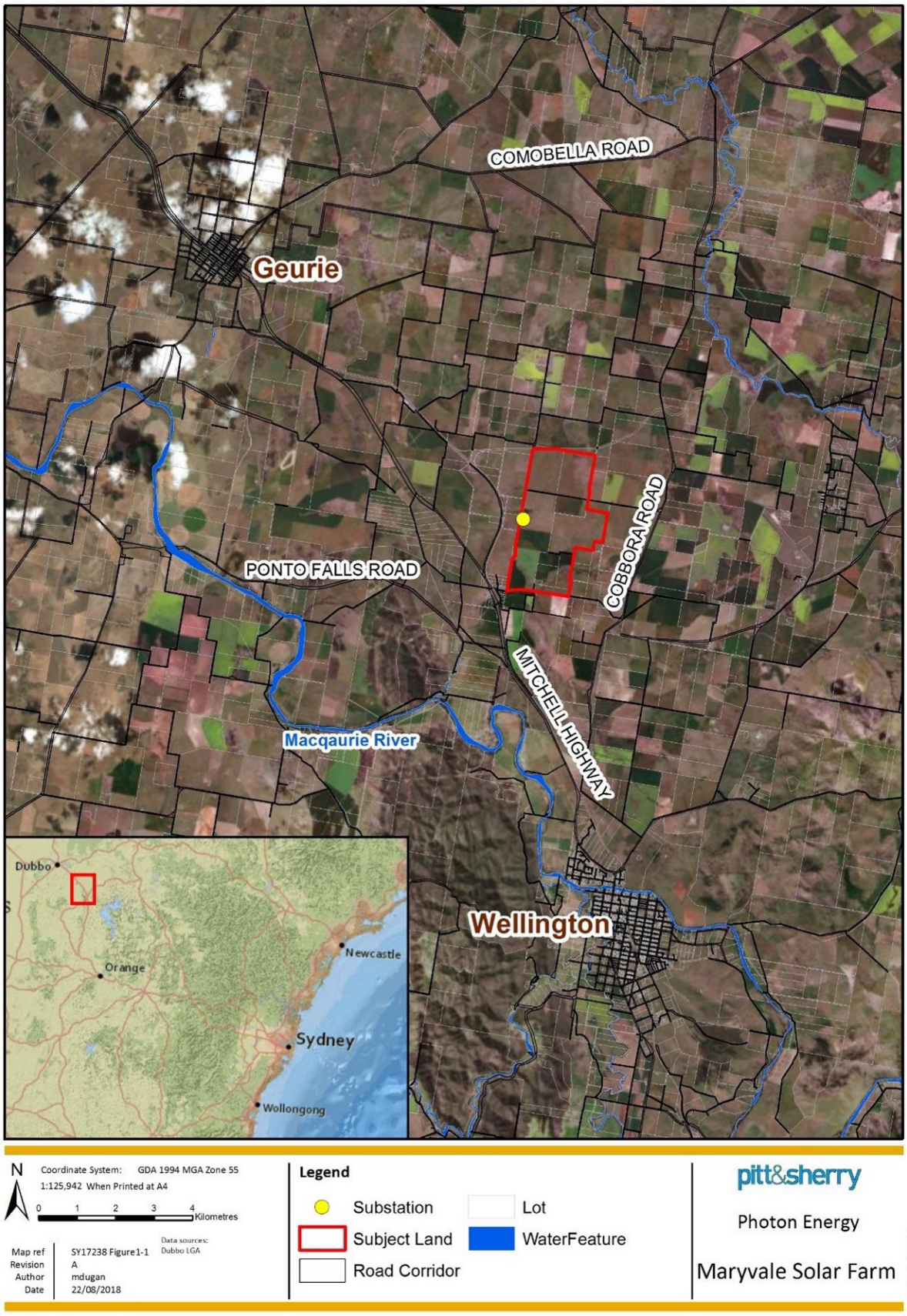

FIGURE 1 EXCERPT FROM ORIGINAL EIS APPLICATION SHOWING THE SITE IN ITS REGIONAL CONTEXT

1.3 Overview of proposed modifications

Maryvale Solar Farm Pty Ltd is proposing to add a BESS to the approved Maryvale Solar Farm by modifying Development Consent SSD 8777. The original development contemplated a 125-megawatt (MW)(AC) solar farm. The addition of the BESS will be incorporated into the approved footprint/impact area of the solar farm.

The proposed BESS is anticipated to have a peak capacity of approximately 125MW and storage capacity of 3 hours (or 375MWh). The BESS technology being proposed is utility scale lithium-based batteries providing short term energy storage services where they are charged and discharged on a regular basis to provide both load shifting and potentially grid support services.

Two alternative battery storage formats are contemplated in this modification application, being centralised or distributed storage options. Both options will be contained within the approved infrastructure/impact areas assessed in the EIS for the Maryvale Solar Farm project defined under the existing Development Consent and associated plans.

Adding the BESS to the approved solar farm project will allow for an integrated self-sufficient (energy generation plus storage) system providing significant value adding opportunities commercially and for the national energy system. It has the potential to help reduce power loss in the transmission network and reduce costs of energy production.

2 STRATEGIC CONTEXT

Australia is a signatory to various international agreements relating to climate change and greenhouse gas emissions, such as the United Nations Framework Convention on Climate Change, the Paris Agreement and more recently the Glasgow Climate Pact. Both the NSW and the Australian Government, particularly the NSW Government, have developed renewable energy targets and strategies to meet these targets, reduce greenhouse gas emissions and provide reliable energy to the public. The proposal will contribute to the market aiming to reach NSW and Australian Government targets and international agreements.

Electricity prices are increasing in NSW and Australia due to increased demand and limited existing supply. In many parts of NSW, constraints on energy supply infrastructure result in energy shortages or uncertainty of reliable supply. Renewable energy generated from large scale solar farms in regional areas allow for distributed generation meaning the energy can be generated in place rather than from large fossil fuel power stations significant distances from the areas of energy use. This increases energy efficiency and reduces energy loss that occurs during transmission of electrical energy across powerlines.

2.1 PARIS AGREEMENT

A global agreement to tackle climate change was made in November 2015 at the COP21 conference in Paris. At the Paris COP21 conference, Australia committed to reducing its emissions to 26-28% of 2005 levels by 2030.

The Australian Government has recently conceded to taking a zero net emissions by 2050 target to the UNFCC 26th Conference of Parties (COP26).

The approved project and proposed BESS will help to reduce emissions associated with electricity generation.

2.2 AUSTRALIA'S RENEWABLE ENERGY TARGET SCHEME

In 2001, the Commonwealth Government introduced the Renewable Energy Target (RET) Scheme to increase the amount of renewable energy being used in Australia's electricity supply.

The RET operates in two parts:

1. Large-scale Renewable Energy Target (LRET)
2. Small-scale Renewable Energy Scheme (SRES)

The LRET encourages the uptake of renewables via the creation of a financial incentive for the establishment or expansion of renewable energy generation facilities and is therefore most relevant to the approved project and proposed modification.

Australia's RET is designed to ensure that at least 33,000 gigawatt hours of Australia's electricity comes from renewable sources by 2020. The Large-scale RET requires high-energy users to acquire a fixed proportion of their electricity from renewable sources. The 33,000 gigawatt hour target was met in September 2019, however the scheme will continue to require high-energy users to meet their obligations under the policy until 2030.

The approved project will produce an estimated 345.9 gigawatt hours (GWh) per year of renewable electricity assisting in meeting the RET objectives, with the addition of a BESS bringing further efficiencies to the system contributing to meeting ongoing LRET obligations.

2.3 NSW RENEWABLE ENERGY ACTION PLAN

The NSW Renewable Energy Action Plan 2013 was created to guide NSW's renewable energy development and to support increasing generation, storage and use of renewable energy in NSW.

Core goals aiming to encourage private sector investment include:

- Attract renewable energy investment and projects

- Build community support for renewable energy
- Attract and grow expertise in renewable energy technology

The approved project and proposed BESS aligns with the goals of the plan. The NSW Renewable Energy Action Plan Completion Report identified that all actions under the 2013 plan has been completed, however the report also states that the NSW Government continues to promote the renewables boom.

2.4 NSW Net Zero Plan Stage 1 2020-2030

The NSW Net Zero Plan details that the NSW Government aims to achieve net zero emissions by 2050. The plan focuses on the period of 2020 to 2030 due to the rapid pace of technological change causing difficulties in identifying the lowest cost path to net zero over a longer timeframe.

The plan identifies actions the government will take to support this goal, including fast-tracking delivery of the first NSW Renewable Energy Zone (REZ) and taking advantage of opportunities for deployment of renewables for economic gain.

2.5 NSW Electricity Infrastructure Roadmap 2020

The Electricity Infrastructure Roadmap is the NSW Government's plan to coordinate investment in transmission, generation, and storage of energy.

The plan sets out a coordinated framework to support private investment in at least 12 gigawatts of renewable energy generation infrastructure and at least 2 gigawatts of long duration storage infrastructure and supporting network infrastructure by 2030. The plan aims to reduce NSW electricity emissions by 90 million tonnes by 2030, working towards net zero emissions by 2050.

Key actions include setting Renewable Energy Zones to guide investment in renewables to specified locations. At the time of writing, the approved project and proposed BESS are within the indicative Central-West Orana Renewable Energy Zone, as shown in Figure 2 below, highlighting the optimal location of the approved project and proposed augmentation through addition of a BESS.

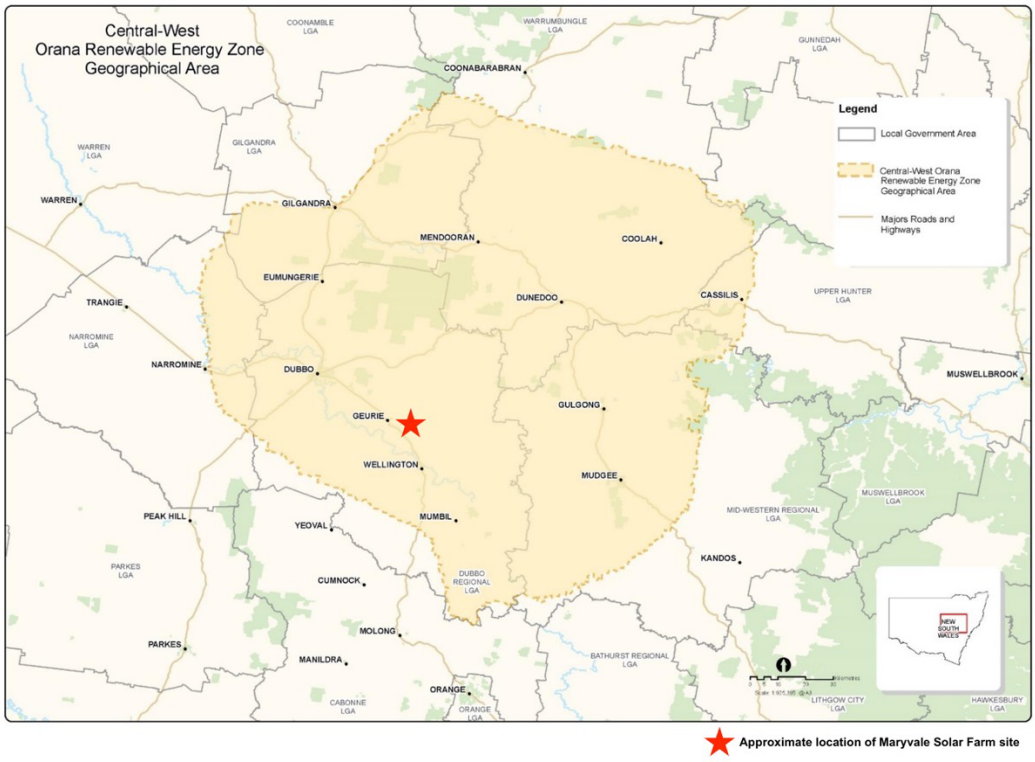

FIGURE 2 EXCERPT FROM EXHIBITION DRAFT OF CENTRAL-WEST ORANA REZ

2.6 NSW Electricity Strategy 2019

The plan sets out 10 actions to secure the State's electricity future, with a preference for the market to deliver investment required to ensure reliable and affordable energy.

The action most relevant to the proposed modification is 'Action 4: Rolling out NSW Renewable Energy Zones'. As part of this action, the NSW Government has committed to supporting transmission upgrades for a pilot REZ in the Central-West which the approved project is within, with a view to use the delivery model to inform the development of other REZs.

Together, the NSW Government and the Federal Government entered into a Memorandum of understanding in November 2019 and agreed on the provision of joint funding for the delivery of the Central-West Orana REZ as NSW's first renewable energy zone, with this expected to commence in 2022.

The NSW Government alone has committed over $40m to the development of the Central-West Orana REZ. The NES also identified that developing the three REZs is expected to reduce average annual electricity bills in NSW by approximately $40 and support $23 bn of investment in regional areas. The approved project is located within the Central-West Orana REZ contributing towards the targeted provision of energy and infrastructure provision as identified in the plan.

2.7 Local and regional context

Several local and regional plans provide further strategic context for the proposed modification, including:

- Central West and Orana Regional Plan 2036
- Our Place 2040 – Mid-Western Regional Local Strategic Planning Statement
- Mid-Western Regional Development Control Plan 2013

Across these plans, increased renewable energy generation is encouraged to support a diversified and prosperous regional economy. The proposed modification supports an existing approved renewable energy project which will further the objectives of these regional plans.

3 DESCRIPTION OF MODIFICATIONS

3.1 PROPOSED MODIFICATIONS OVERVIEW

TABLE 1 BELOW PROVIDES A COMPARATIVE ANALYSIS BETWEEN THE APPROVED DEVELOPMENT AND THE DEVELOPMENT IN ITS PROPOSED MODIFIED FORM. AN UPDATED FULL PROJECT DESCRIPTION FOR MARYVALE SOLAR FARM IS ATTACHED AT

APPENDICES

Appendix A.

TABLE 1 MODIFIED PROJECT SUMMARY TABLE

Element	Approved Project	Modified Project
Native vegetation clearance	1.2 hectares	No change.
Development size, scale, and footprint.	125MW AC solar farm consisting of approximately 450,000 single axis PV panels on mounting structures up to 4 metres in height and in rows approximately 11 metres apart. Inverters located within each of the solar blocks. Mounting structures of piled steel posts from 1.6 - 4 metres below ground. 132kV substation on western boundary of Lot 2 DP573426 including two transformers and associated switchgear. Maximum dimensions of substation is 60 x 80 metres to a height of 22 metres. The solar farm would occupy approximately 375 hectares with remaining land retained as agricultural land.	No change to development size and scale or alteration to the general location and footprint of ancillary infrastructure such as roads. Addition of BESS in either centralised or distributed arrangement. Centralised Battery Energy Storage Option: a large central BESS will be connected via an electrical feeder to the 33kV bus of the power plant. The BESS is composed of battery packs, additional inverters and transformers + balance of plant. It will be sited adjacent to the proposed substation on site. The BESS will occupy approximately 10 acres of land (4 hectares) and comprise multiple (approx. 180) shipping container style buildings grouped together that will house the batteries and may house additional inverters, transformers and balance of plant required to enable the batteries to interface with the solar farm substation and the grid. This BESS area and associated APZs, in either format, will be located within the proposed indicative solar array areas shown on the existing approved General Layout Plan for the Maryvale Solar Farm. This is equivalent to approximate 2MW of solar array area. This minor loss in solar array (~0.8%) will be made up through increasing efficiencies in technology/module capacity and design optimisation within the approved footprint. Schedule 2, Condition 5 of the Development Approval requires the submission of the final layout plans prior to the commencement of construction. The final plans that will be produced as a result of the final detailed design process will

Element	Approved Project	Modified Project
		demonstrate how these outcomes have been achieved. Distributed Battery Energy Storage Option: this option comprises the same number (approx. 180) of shipping container style buildings housing batteries but distributed across the site co-located with each of the inverter stations located throughout the development which are adjacent to the PV arrays (as described in the development application for the project). There is no current requirement for additional inverters, transformers or balance of plant. The solar farm plus BESS would continue to occupy approximately 375 hectares with the remaining land retained as agricultural land as per the existing approval. Very minor variations in this footprint may emerge out of the detailed design process.
Key infrastructure	No battery.	BESS anticipated to have a peak capacity of 125 MW and storage capacity of 3 hours (or 375 MWh). Approximately 180 battery units deployed in either centralised or distributed format. Each of the units will have approximately the same scale, dimensions as a “forty foot” container (i.e., length 12.2m, width 2.4m and height 2.6m). The maximum height of the battery units will be approximately 3 metres above ground level, which is 1 metre lower than the maximum height of the approved solar field. The dimensions of the inverters, transformers and balance of plant will be the same as in the rest of the site.
	Approximately 450,000 solar panels supported by a mounting system installed on single axis trackers.	No change.
	The panels would be installed including single axis tracking system facing east-west and tilted (to a maximum) 60° along the north-south axis.	No change.
	Inverter stations located within the arrays, centrally to groups of approximately 10,000 PV panels. Each inverter station houses 2-3 inverters.	No change.

Element	Approved Project	Modified Project
	Approximately 40 inverter stations across the site.	
	Above and/or below ground onsite cabling and electrical connections. Majority of electrical cabling underground.	No change.
	Construction laydown, parking and temporary facilities at the south-western corner of the site.	No change.
	Onsite access tracks and hard stand.	The BESS in both formats will lead to an increase in hard stand of approximately 7 acres of semi-permeable hard stand (in one location for the centralised BESS format or spread across the entire site for the distributed BESS format). This will have a negligible impact based on the site characteristics, scale of the project and existing EIS mitigations measures and Conditions of Consent.
	Substation containing a 132 kV transformer and associated 33kV switchgear and directly connected into the existing 132 kV transmission line.	No change.
	Perimeter fence security fence approximately 1.8 metres high.	No change
	Vegetation screening along the northern and western boundaries of the site.	No change.
Subdivision	No subdivision proposed.	No change.
Intensity of agricultural production	Sheep grazing proposed throughout the life of the project.	No change to proposed grazing throughout life of project. A relatively small area of approx. 4.5Ha will no longer be able to be grazed as it will be occupied by the BESS.
Dominant and ancillary land use	The proposed primary use is a solar farm (electricity generating works) including a substation and operations and maintenance and storage buildings. No ancillary uses.	No change - Addition of BESS which is also included under the definition of electricity generating works.
Project life and hours of operation	30-year life span operation during daylight hours.	No change.

3.2 Detailed description of modifications

The modification involves the addition of a BESS to the approved solar farm.

The proposed BESS is anticipated to have peak capacity of approximately 125MW and storage capacity of 3 hours (or 375MWh). The BESS technology being proposed is utility scale lithium-based batteries providing short term energy storage services where they are charged and discharged on a regular basis to provide both load shifting (storage of energy for discharge at a later time) and potentially grid support services. The final battery supplier has not been selected at this stage however the technology will be approved under the relevant Australian Standards.

Two alternative battery storage formats are being considered through the ongoing technical analysis; either a centralised or distributed format. Both BESS formats being proposed are within the approved infrastructure/impact area defined under the Development Consent and the General Layout Plan.

Either of the formats will be comprised of approximately 180 battery units. Each of the units will have approximately the same scale and dimensions as a “forty foot” container (i.e., length 12.2m, width 2.4m and height 2.6m). The maximum height of the battery units will be approximately 3 metres above ground level, which is 1 metre lower than the maximum height of the approved solar field. An example battery unit is shown in Figure 3 below.

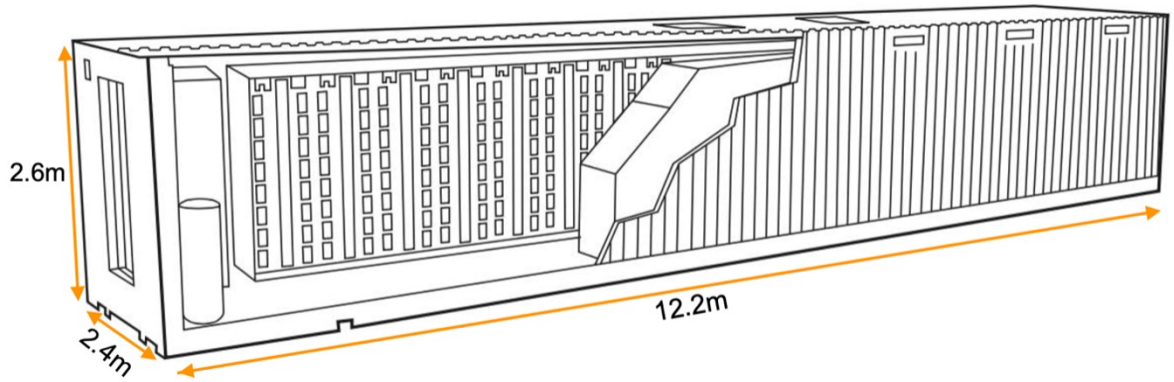

Figure 3 Approximate dimensions of individual battery unit

The key differences between the centralised and distributed formats are described in section 3.2.1 and 3.2.2 below.

3.2.1 Format 1 – Centralised Battery Energy Storage Option

Under this option a large central BESS will be connected into the 33kV bus of the solar farm via additional underground electrical feeder cables. It will be physically located adjacent to the proposed substation on site as shown in the proposed site plans at Appendix H.

This battery will occupy approximately 10 acres of land and comprise multiple (approx. 180) shipping container style buildings grouped together that will house the batteries and the ancillary connection and management equipment enabling the batteries to interface with the solar farm substation and the grid.

The centralised BESS will be set back from the western boundary and will also be screened by the supplementary vegetation screening required along this boundary under the Maryvale Solar Farm Development Consent. This screening will assist in mitigating the visual impacts of the BESS along this boundary. The remainder of the BESS will be partially obscured/screened by the solar farm.

The Figures below are indicative of the general appearance of a BESS when coupled with a solar farm, where all of battery units and ancillary buildings are located together. The BESS proposed

for the Maryvale Solar Farm will be approximately five times the size of this system shown in Figure 4, containing approximately 180 battery units over 10 acres.

Figure 5 shows a close up of an example of the battery units. These images are of existing constructed projects for illustration purposes.

FIGURE 4 ILLUSTRATION OF A TYPE OF BESS COUPLED WITH A SOLAR FARM (SOURCE: WWW.ENERGYAUSTRALIA.COM.AU/ABOUT-US/ENERGY-GENERATION/GANNAWARRA-BATTERY-STORAGE)

FIGURE 5 ILLUSTRATION OF CLOSE UP OF INDICATIVE BATTERY UNITS FOR ONE TYPE OF BESS (SOURCE: WWW.ENERGYAUSTRALIA.COM.AU/ABOUT-US/ENERGY-GENERATION/GANNAWARRA-BATTERY-STORAGE)

FIGURE 6 ILLUSTRATION OF CLOSE UP DETAIL OF INDICATIVE BATTERY UNITS FOR ANOTHER TYPE OF BESS (SOURCE: PV MAGAZINE)

FIGURE 7 PROPOSED SITE LAYOUT OF MODIFIED DEVELOPMENT - CENTRALISED BESS OPTION

3.2.2 Format 2 – Distributed Battery Energy Storage Option

Under this option the same number (approx. 180) of shipping container style buildings housing batteries is proposed but distributed across the site co-located with each of the inverter stations located throughout the development which are adjacent to the PV arrays.

The images in the Figures below are indicative of the general appearance of a solar farm with a distributed BESS, where the battery units (approx. 180 units) are distributed throughout the solar farm, positioned in the vicinity of the inverters. These images are of existing constructed projects and for illustration purposes only.

Figure 8 Image illustrating the appearance of battery units distributed throughout a solar farm (source: https://en.sungrowpower.com/)

Figure 9 Close up example of distributed battery unit with inverter adjacent to solar panels (source: https://en.sungrowpower.com/NewsDetail/2127

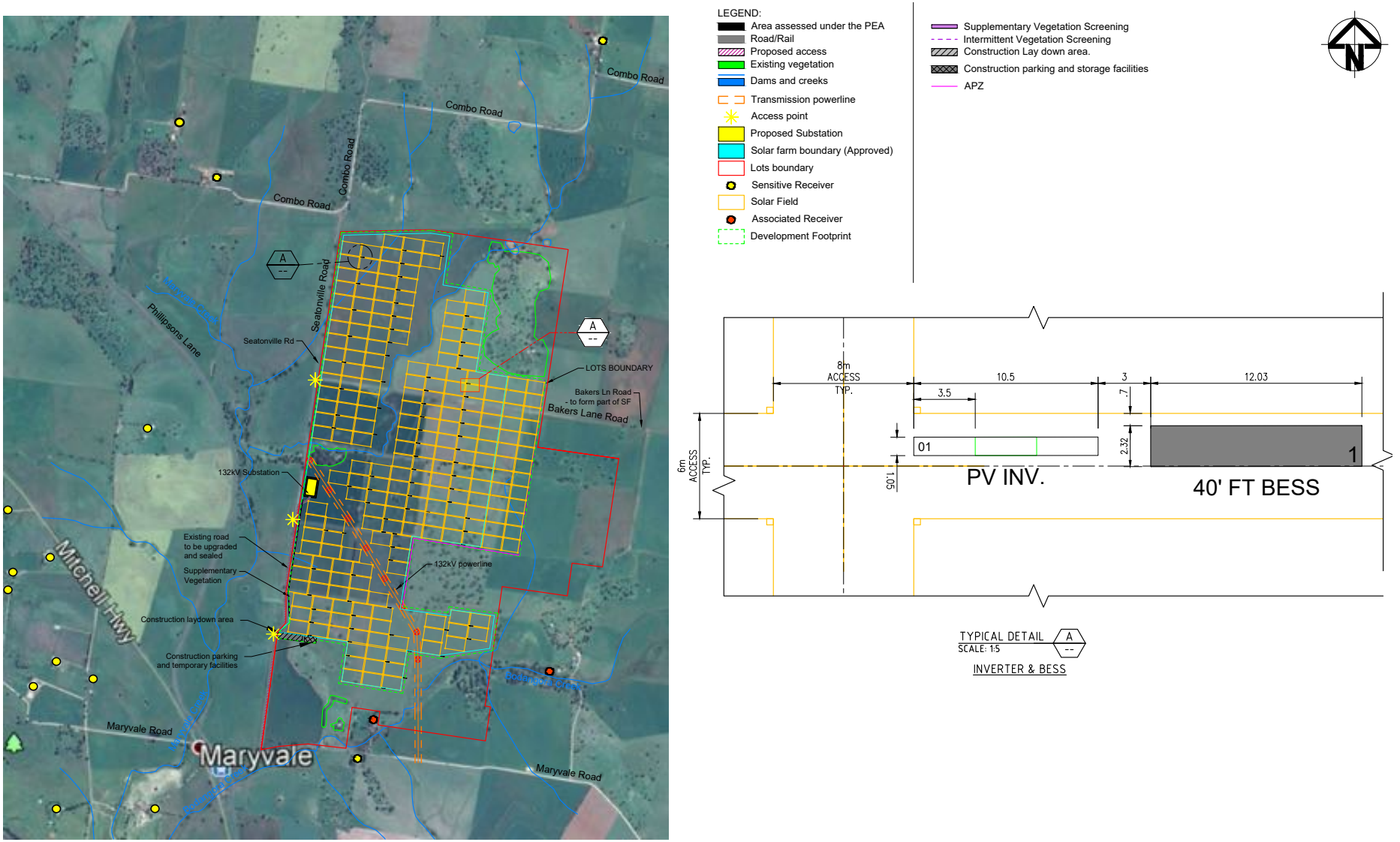

FIGURE 10 PROPOSED SITE LAYOUT OF MODIFIED DEVELOPMENT – DISTRIBUTED BESS OPTION

3.3 Construction and Commissioning

3.3.1 Construction Activities

The construction and commissioning phase of the BESS will form part of the construction process for the approved Maryvale Solar Farm project. The entire construction process is expected to last approximately 14 months (and increase of 2 months to allow for inclusion of the proposed BESS construction), commencing 2022.

The construction and commissioning activities for the BESS are consistent with the activities already being undertaken for the solar farm and summarised below in Table 1 and detailed further at Appendix A. The key change will be the preparation of the foundations for the BESS and delivery and installation of the battery units.

Table 2 Main construction activities by stage

Stage	Main activities
Site Establishment	• Installation of security measures including fencing • Establishment of site compound, material layout and equipment wash down areas • Establishment of tree and vegetation protection measures as required. • Ground preparation • Installation of environmental controls in accordance with a detailed Construction Environmental Management Plan (CEMP) • Vegetation clearing • Targeted clearance of low laying vegetation around trenching areas • Pile driven installation of PV mounting structures to minimise disturbance to existing ground cover • Establishment of additional sedimentation and erosion controls as required
Road upgrades	• Upgrade to the intersection of Cobbora Road and Maryvale Road • Strengthen the waterway structure and widen the road in places to facilitate passing of two semi-trailers on Maryvale Road • Upgrade to the intersection of Maryvale Road and Seatonville Road • Widen Seatonville road from Maryvale Road to site access to facilitate passing of two semi-trailers
Preliminary civil works	• Setting up foundations for the substation and inverter stations • Drainage works (as required)
Install PV systems and cables	• Installation of steel post and rail foundation system for the solar panels • Installation of PV panels and DC wiring beneath the panels

	• Installation of electrical cabling including trenching for underground cabling and installation of inverter stations
Construction of BESS	• Delivery of 180 x forty-foot(similar) containers to the site • Installation and integration works including underground Addition water storage for BESS fire safety. • cabling, fencing and asset protection zones. • Formalising Asset Protection Zones • Additional fencing around the centralised BESS if required
Construction of 132kV substation	• Site Establishment and clearing (if required) • Bulk earthworks • Detailed civil works including earthing, foundations • Erection of steelwork, equipment, demountable buildings and transformers • Electrical connections • Install new poles • Transmission line stringing for new conductor and OPGW from substation to existing 132 kV transmission line
Site Rehabilitation and Commissioning	• Testing of electrical infrastructure • Removal of temporary construction facilities and rehabilitation of disturbed areas • Landscaping works based on the Landscape Plan

3.4 Operation

The BESS would be operated in line with the approved solar farm, which includes:

- Remote 24/7 on-line monitoring
- Scheduled visual inspections and general maintenance
- Repair and cleaning operations (as required)
- Replacement of equipment and infrastructure (as required), and
- Land management monitoring and activities including
    - Maintenance of groundcover vegetation
    - Livestock management
    - Weed control
    - Erosion and Sediment control
    - Pest and vermin control
- The site will be monitored for security by a local security contractor, and this will include 24hr response should a security event occur.

3.4.1 Hours of Operation

Daily operations and maintenance by site staff would be undertaken during standard working hours of:

- Monday – Friday 7am to 6pm
- Saturday - 8am to 1pm

These times are in accordance with the approved project.

3.4.2 DECOMMISSIONING

The operational timeline of the BESS and solar farm is expected to be approximately 30 years. This is an increase of 5 years from the approved project.

The BESS may be recommissioned to remain in place with the substation to service the locality subject to review of viability by Essential Energy in the event that the solar array is decommissioned and removed from the site.

3.5 CATEGORY OF MODIFICATION AND CONDITIONS TO BE MODIFIED

Based on the foregoing information, the proposed modification is considered to represent substantially the same development as the approved development. The battery energy storage systems formats proposed are a modest addition to the proposed development and are within the existing approved footprint and do not significantly change the overall form or scale of the approved project.

The modification application is of minimal environmental impact as outlined in the assessment sections of this report. There will be minimal impact of increased traffic volumes for BESS infrastructure, and additional mitigation measures required for visual and hazards risk impacts which do not have any unreasonable additional impacts. All other areas of environmental assessment will have no increased impacts and existing mitigation measures are satisfactory.

The modification is within the existing development envelope and will result in an approximate increase of 4.5 hectares of site coverage that cannot be grazed with sheep with the remainder of the site remaining under agricultural production (grazing) in conjunction with the project. This increase in site coverage will be the same whether the BESS is in centralised or distributed format. As noted above, the BESS areas associated APZs, in either format, will be located within the proposed indicative solar array areas shown on the existing approved General Layout Plan for the Maryvale Solar Farm. This is equivalent to approximate 2MW of solar array area. This minor loss in solar array (~0.8%) will be made up through increasing efficiencies in technology/module capacity and design optimisation within the approved footprint

It is therefore submitted that the modification is substantially the same development as the development for which the consent was originally granted and the application for modification can be made under Section 4.55(2), Other Modifications, of the EP&A Act.

Table 3 below outlines the conditions of the development consent SSD 8777 that are required to be modified for the modification to be incorporated into the approved project.

TABLE 3 CONDITIONS TO BE MODIFIED

Condition	Modification required
Schedule 3, Condition 1. Battery storage not permitted	Delete condition to allow battery storage.
Schedule 3, Condition 18 (b) Visual	Confirm the department is satisfied that the BESS is covered by “ancillary infrastructure”
Schedule 3, Condition 27(b) Operating Conditions	Add “Battery Energy Storage System”

Further conditions may also be updated to incorporate mitigation measures relating to visual and hazards impacts as outlined within the body of this report. The General Layout of Development Plan and relevant strategies, plans or programs required under the consent may also require updating in accordance with Condition 2 Schedule 4 of the development consent. An updated General Layout of the Development Plan has been provided at Appendix G.

4 STATUTORY CONTEXT

Development Consent for the project was provided by the Minister for Planning and Public Spaces on 4 December 2019, Application Number SSD 8777 under Section 4.38 of the EP&A Act.

The below statutory provisions are relevant to the proposed modification.

4.1 ENVIRONMENT PLANNING & ASSESSMENT ACT 1979

This request for a modification is made under Section 4.55(2) of the EP&A Act. Correspondence with DPIE dated 14 July 2021 confirmed this as the appropriate pathway.

Section 4.55(2) identifies that for *Other modifications, A consent authority may, on application being made by the applicant or any other person entitled to act on a consent granted by the consent authority and subject to and in accordance with the regulations, modify the consent if—*

> *(a) it is satisfied that the development to which the consent as modified relates is substantially the same development as the development for which consent was originally granted and before that consent as originally granted was modified (if at all), and*
>
> *(b) it has consulted with the relevant Minister, public authority or approval body (within the meaning of Division 4.8) in respect of a condition imposed as a requirement of a concurrence to the consent or in accordance with the general terms of an approval proposed to be granted by the approval body and that Minister, authority or body has not, within 21 days after being consulted, objected to the modification of that consent, and*
>
> *(c) it has notified the application in accordance with—*
>
> > *(i) the regulations, if the regulations so require, or*
> >
> > *(ii) a development control plan, if the consent authority is a council that has made a development control plan that requires the notification or advertising of applications for modification of a development consent, and*
>
> *(d) it has considered any submissions made concerning the proposed modification within the period prescribed by the regulations or provided by the development control plan, as the case may be.*
>
> *Subsections (1) and (1A) do not apply to such a modification.*

The modification application may appropriately be dealt with under section 4.55(2) for the following reasons:

- The modification will effect a distinct change in the proposed development through the addition of a BESS, in accordance with recent court direction under *Buyozo Pty Limited v Ku-ring-gai Council* [2021] NSWLEC 2
- The change in development will be substantially the same as the approved development:
  - No net increase in environmental impacts
  - Consistent with shape and form of existing approval including inverter stations and other solar farm elements
  - Setbacks from sensitive receivers remain the same, with no overall change in development footprint
  - No infrastructure upgrades are required to the power network to facilitate the development, no capacity increase in the solar field
  - Will remain constructed as one project by one proponent

For these reasons the powers conferred under 4.55(2) may be applied to the proposed modification. The minor extent of the change and likely impacts is discussed further throughout this report.

4.2 Environmental Planning and Assessment Regulation 2000

Clause 115AA relates to applications for modification of development consents for SSD.

This application has been prepared in accordance with the relevant sections of the regulations, including having regard to the *State significant development guidelines,* in particular *Appendix E State significant development guidelines -preparing a modification report July 2021.*

4.3 Large-scale solar energy guideline for State Significant Development December 2018

As outlined under Section 1.2 of the Large-scale solar energy guideline for State Significant Development, the guideline applies to applications to modify an approved State significant solar energy project.

Section 5 details that if the project includes battery energy storage, the applicant should undertake a preliminary risk screening in accordance with State Environmental Planning Policy No 33 – Hazardous and Offensive Development. If the preliminary risk screening indicates the development is "potentially hazardous", a Preliminary Hazard Analysis must be prepared in accordance with Hazard Industry Planning Advisory Paper No. 6 – Guidelines for Hazard Analysis (DoP, 2011) and Multi-Level Risk Assessment (DoP, 2011).

4.4 State Environmental Planning Policies

4.4.1 State Environmental Planning Policy (State and Regional Development) 2011

The SRD SEPP applies to the whole of NSW. Its aim is to identify development that is significant to the State. The approved project is designated as SSD under clause 8 of the SRD SEPP.

4.4.2 State Environmental Planning Policy (Infrastructure) 2007

The aim of State Environmental Planning Policy (Infrastructure) 2007 (ISEPP) is to facilitate the effective delivery of infrastructure across the State.

Clause 34 outlines electricity generating works (which includes electricity storage) as development permitted with consent.

In addition, clause 45 of the ISEPP applies to a development application for development comprising or involving any of the following:

a) The penetration of ground within 2m of an underground electricity power line or an electricity distribution pole or within 10m of any part of an electricity tower.

b) Development carried out-

(i) Within or immediately adjacent to an easement for electricity purposes (whether or not the electricity infrastructure exists), or

(ii) Immediately adjacent to an electricity substation, or

(iii) Within 5 m of an exposed overhead power line.

The approved project is situated on an existing transmission line and the proposed BESS addition will be situated in proximity to this overhead electricity transmission line.

Clause 45(2) under the ISEPP states that *'before determining a development application (or an application for modification of a consent) for development to which this clause applies, the consent authority must:*

a) Give written notice to the electricity supply authority for the area in which the development is to be carried out, inviting comments about potential safety risks, and

b) Take into consideration any response to the notice that is received within 21 days after the notice is given.

4.4.3 State Environmental Planning Policy No 33 – Hazardous and Offensive Development

The State Environmental Planning Policy No. 33 – Hazardous and Offensive Development (SEPP 33) defines and regulates the assessment and approval of potentially hazardous or offensive development.

SEPP 33 applies to any projects that fall under the policy's definition of 'potentially hazardous industry' or 'potentially offensive industry'.

Under clause 12 a person who proposes to make a development application to carry out development for the purposes of a potentially hazardous industry must prepare a Preliminary Hazard Analysis in accordance with relevant circulars/guidelines published by the Department.

DPIE requested a Preliminary Hazards Analysis be prepared in correspondence dated 14 July 2021, in accordance with the Department's Hazardous Industry Planning Advisory Paper No 6 'Hazard Analysis' (HIPAP 6) and a Multi-Level Risk Assessment (MLRA).

A Preliminary Hazards Analysis for the BESS has been completed by Planager and is included at Appendix F. A summary of the outcomes of the PA is included under the assessment section of this report outlining that the proposal will not constitute a high risk and residual risks can be appropriately managed. The BESS is identified as not hazardous and does not require further assessment.

4.1 Wellington Local Environmental Plan 2012

The site is located within the Dubbo LGA which has two Local Environmental Plans. The site is within the area of and subject to the provisions of the Wellington Local Environmental Plan 2012 (Wellington LEP).

The site is within the RU1 Primary Production Zone under the Wellington LEP. The objectives of the zone seek to encourage primary industry productivity and manage any potential land use conflicts. Electricity generation is allowable with consent under the State Environmental Planning Policy (Infrastructure) 2007 (ISEPP) overriding the consent requirements under the zone. Development Consent for the solar energy facility was given 4 December 2019.

It is noted that the Planning Proposal for the draft Dubbo Regional Local Environmental Plan 2021 was exhibited from 2 June 2021 until 30 June 2021. The intent of the Planning Proposal is to consolidate and rationalise the existing provisions of the Dubbo LEP 2011 and Welling LEP 2012 to create a new consolidated LEP for the Dubbo Region. The Planning Proposal for the consolidated LEP was forwarded to the Department late 2021.

4.2 Planning for Bushfire Protection NSW Rural Fire Service 2019

Planning for Bushfire Protection 2019 provides development standards for designing and building on bush fire prone land in New South Wales.

It was legislatively adopted in the Environmental Planning and Assessment Regulations on 1 March 2020. Relevant guidance for solar farms is found at Section 8.3.5 Wind and solar farms.

Solar farms require special consideration and should be provided with adequate clearances to combustible vegetation as well as firefighting access and water including a minimum 10m Asset Protection Zone (APZ) for the structures and associated buildings/infrastructure, excluding road access to the site and power or other services to the site and associated fencing.

A Bush Fire Emergency Management and Operations Plan should identify all relevant risks and mitigation measures associated with the construction and operation of a solar farm.

Consultation with Emma Jensen from RFS was conducted on 19 October 2021. It was advised that a bushfire specialist should provide advice on the project. Following the receipt of this advice further consultation was held with Emma Jenson on 17 November 2021 to review the necessity of the requirement for a 10m APZ around each individual battery energy storage unit in the Distributed BESS format. The question raised was could the 10m APZ be reduced for this format as there is only a single battery unit (rather than multiple battery units) connected to the inverter stations spread throughout the solar farm, grass (fuel loads) within the solar farm will be maintained and the site is further protected by an APZ around the site perimeter. The outcome of this consultation was that this matter would be assessed when RFS receive the full modification application for review.

A Bushfire Risk Assessment has been provided at Appendix E.

5 CONSULTATION

The following engagement has occurred to support this modification application having regard to the Department's *Preparing an Environmental Impact Statement* and *Undertaking Engagement Guidelines for State Significant Projects*.

5.1 CONSULTATION WITH NEIGHBOURS

Private landowners (including land currently not developed with a dwelling) within 2 kilometres from the site boundary (23 properties, as shown in Figure 11 below) were mailed information about the proposed modification on 29 September 2021 and 26 October 2021. The 2km radius was selected as it was deemed the impacts of the proposed modification would be negligible beyond this distance due to the scale, location and context of the proposed BESS, the typical operational impacts of the proposed BESS and the mitigation measures required under the existing Development Consent.

Mailout information on 29 September included:

- Covering letter containing an overview of the proposal
- Detailed information on the two BESS options (i.e. centralised vs distributed), including text description, illustrative images, and layout plans
- 'Factsheet' of frequently asked questions including an overview of the likely impacts in areas of noise, fire, visual, traffic and environmental risks
- Link to the Maryvale Solar Farm website at www.photonenergy.com/de/photon-energy/maryvale-solar-farm.html
- Phone and email contact information for any follow up questions from neighbours

Mailout information on 26 October sought to clarify an error on the plans in the original mailout and included the following information:

- Covering letter explaining updates to the information
- Current Approved General Layout Plan Approved 4 December 2019
- Updated layout plans for the two BESS options (i.e. centralised vs distributed)

The package of information that was sent in the two mailouts is included at Appendix I.

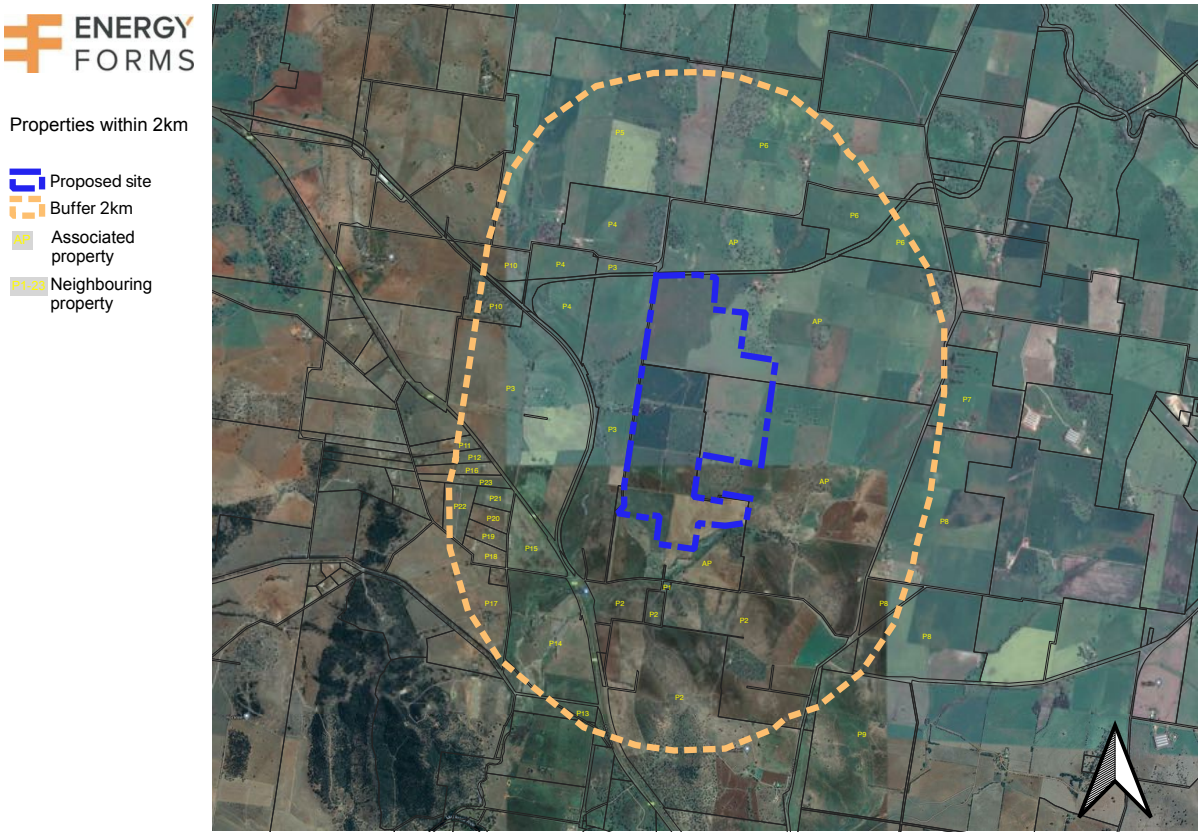

FIGURE 11: NEIGHBOURING PROPERTIES WITHIN 2 KILOMETRES FROM THE SITE BOUNDARY NOTIFIED OF THE MODIFICATION

No contacts or calls have been received from the recipients as a result of sending out this information. Energy Forms then sought to reach out to the recipients via phone, where contact numbers could be located. Contact numbers for 11 of the 23 were identified. Of these 11, discussions were held with 7 of the residents. Only 1 resident located approximately 1.4km to the west of the project had concerns regarding the proposed BESS. These concerns related to visual impacts, traffic risks and fire risks of the approved project and the proposed BESS. This owner also raised concerns in relation to potential security risks when large numbers of people will be present in the area during the construction process.

A map of sensitive receivers (lots containing a dwelling) for the project is provided below in Figure 12 and attached in full at Appendix L for reference. A total of 17 sensitive receivers are located within 2km of the site. As noted above properties or receivers within 2km were deemed to be potentially affected by the proposed modification based on the scale, location on the site, context and mitigation measures required under the existing Development Consent. There are also two associated receivers shown on the map. It is noted this approach to select all dwellings within 2km as sensitive receivers yields a slightly different result to original EIS which selected specific dwellings which considered to be impacted by the solar farm as a whole.

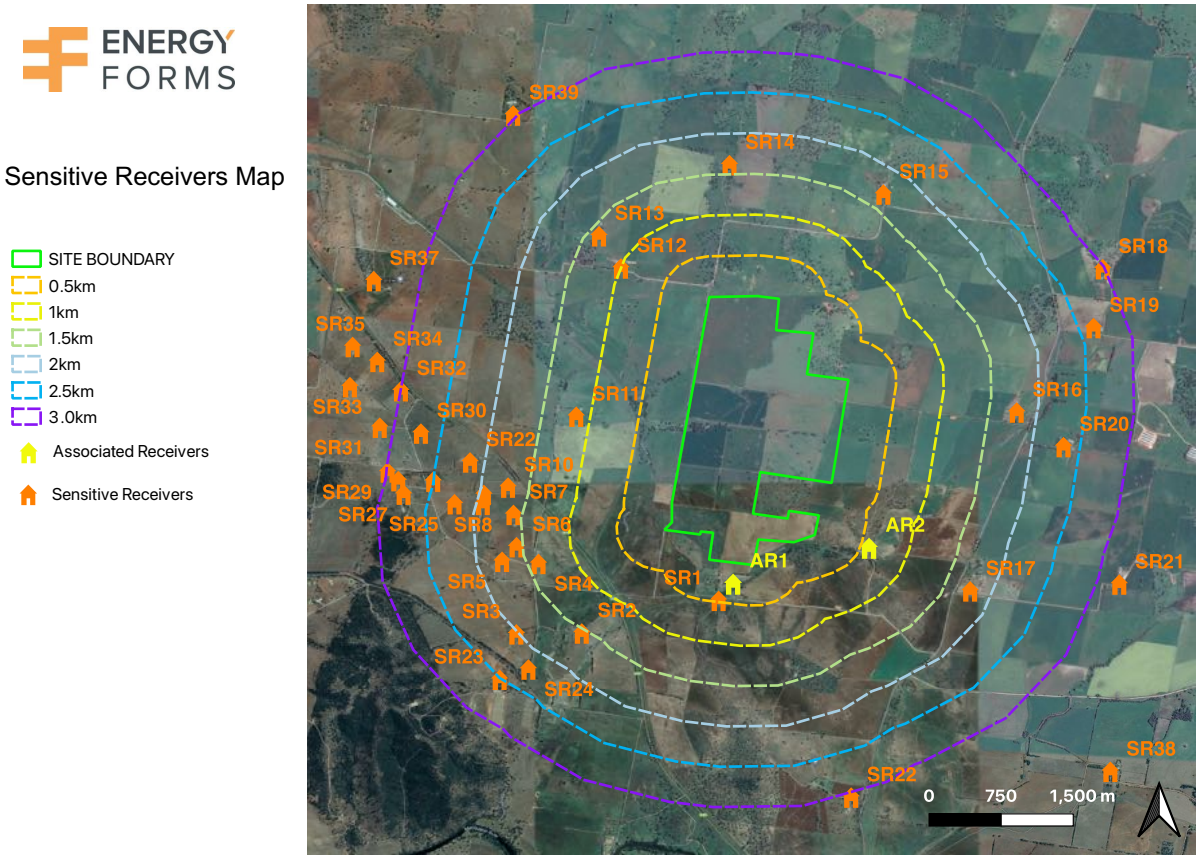

FIGURE 12: SENSITIVE RECEIVERS MAP

5.2 KEY STAKEHOLDER CONSULTATION

5.2.1 DEPARTMENT OF PLANNING, INDUSTRY AND ENVIRONMENT

As part of preparation of this modification application, DPIE was consulted including a scoping meeting and formal request to prepare a modification. DPIE provided advice on correspondence dated 14 July 2021, which has been integrated into this report as relevant. A copy of this response is attached at Appendix K.

5.2.2 DUBBO REGIONAL COUNCIL

Dubbo Regional Council were consulted on the project via email correspondence on 7 October 2021, being provided with the same package of information as residents within 2 kilometres outlined above and as attached at Appendix I. Council raised no objection to the proposed modification application and noted they would await a formal notice from DPIE. Council was subsequently provided with the updated plans that corrected the error in the plans.

5.2.3 RURAL FIRE SERVICE

The Rural Fire Service were contacted via phone on 11th October to discuss the project who advised the modification application should demonstrate compliance with the Planning for Bushfire Protection 2019 guide and in particular Section 8.3.5 of the guide. It was also advised that the fire risks of proposed BESS should be assessed by a specialist consultant, and it was confirmed that his was our approach.

In a follow up discussion on 17th November 2021, options for reducing the 10m APZ in the distributed BESS format was raised as there is only a single battery unit (rather than multiple

battery units) connected to the inverter stations spread throughout the solar farm, grass (fuel loads) within the solar farm will be maintained and the site is further protected by an APZ around the site perimeter. The outcome of this further discussion was that this matter would be assessed when RFS receive the full modification application for review.

5.2.4 TRANSGRID & ESSENTIAL ENERGY

Ongoing consultation with TransGrid and Essential Energy are taking place as part of the grid connection discussions associated with the original solar farm project and subsequent addition of the BESS.

5.2.5 TRANSPORT FOR NSW

Transport for NSW(TfNSW) were consulted during the preparation of the modification. During our discussion we noted that our expert traffic advisor indicated the proposed BESS will not result in any unreasonable increase in traffic impacts and would not warrant any changes to the current Conditions of Consent. TfNSW did not raise any immediate concerns and noted they will assess the proposal in further detail through application process.

6 Environmental Impact Assessment

An updated Environmental Impact Assessment for the proposed modification is provided below in Table 4 below.

Table 4 Environmental Impact Assessment for Proposed Modification

Impact Area	Response	Environment Impact
Biodiversity	The proposed modification adding a BESS to the project, with forma options, occupies a footprint that sits entirely within the approved project footprint. The proposed position(s) for the BESS will not impact on any additional native vegetation. Any additional landscaping provided as part of mitigation for visual impact of the BESS will provide opportunity to deliver additional biodiversity outcomes.	No increased impact.
Transport	A Traffic Impacts Assessment has been prepared by SECA Solution and is included at Appendix B. The main conclusions from this assessment are summarised below: • Overall, it is concluded that the installation of the BESS equipment shall have a minor impact upon the overall road network, with no change to construction routes or access from the approval solar farm. This minor impact will be temporary and associated with construction only. • Of particular relevance the maximum traffic numbers accessing the site during construction or operation would not be increased and the traffic required construction of the BESS would be accommodated through extending the construction time frame. • For installation of the BESS, there will be approximately 20 light vehicle movements per direction and less than 10 heavy vehicle movements, over a duration of 4 weeks. • There will be no change to the traffic volumes, site access or transport arrangements associated with the operational stage of the solar farm. • No mitigation measures are recommended and the minor impacts from construction are considered acceptable.	No increased impact during operation. Minor increase in traffic numbers during construction but not maximum vehicles accessing the site on a given day.
Heritage	The proposed modification has no impact on known heritage values of the site identified in the Aboriginal Heritage Assessment undertaken as part of the Environmental Impact	No increased impact.

Impact Area	Response	Environment Impact
	Assessment for the project. No sites of environmental or historic heritage significance or archaeological sites are located on or adjacent the site.	
Land use	The proposed modification occupies an area that is entirely within the approved development footprint. The Development Consent requires the final detailed plans be submitted to the Secretary, including any details of siting of solar panels and ancillary infrastructure. This modified layout shows the BESS in the proposed location, in alternate Centralised or Distributed options. Approval of both layout options is required to continue with the grid connection and other development activities for the project. Both potential options comprise approximately 4 hectares of land within the existing development footprint and will amount to approximately 180 shipping container scale buildings/structures. There will not be any significant increase in the level of excavation or other high impact works than already contemplated by the approved development. The proposed modification does not alter potential impacts to land resources beyond those assessed within the original Environmental Impact Assessment.	No increased impact.
Visual	A Visual Impact Assessment has been prepared by Envisage and is included at Appendix C. The report serves as an addendum to the Visual Impact Assessment that was submitted with the original EIS for the solar farm, following the same methodology to assess landscape and viewpoint visual impacts. The report considers both Centralised and Distributed BESS options and whether either would alter impact levels determined for the approved project. The assessment concludes that the proposal is able to achieve 'little effect' with mitigation screen plantings and suitable colouring of battery units, resulting in no increased impact. This conclusion is given in relation to both impacts to landscape and impacts on surrounding viewpoints. On this basis it is concluded that the modification will not result in any net increase in visual impacts to the sensitive receivers associated with the proposed modification.	No increased impact subject to mitigation measures include vegetation screening and low impact colouring of battery infrastructure.
Water	The modification would not directly affect surface water quality. Indirectly the project would involve a range of activities during construction and operation that could disturb soils, potentially leading to erosion and sediment laden runoff. The project will increase the semi-	No increased impact.

Impact Area	Response	Environment Impact
	permeable hard stand of the project by approximately 7 acres in one area for the centralised format or in approximately 180 small parts across the site. The EIS noted that "Under the Wellington LEP (2012), the Site has not been identified as flood prone, wetland or riparian land. The unnamed water course running through the Site is a small first order stream and at the intersection a second order tributary and the topography is undulating which allows surface water to drain from the Site without ponding and causing flooding. The distributed additional semi-permeable hard stand will represent very small areas spread across a large site which will only have very localised minor runoff impacts. The semi-permeable hard stand for the centralised BESS is expected to have a minor increase in runoff however given the low flood/drainage risks of the site based in its topography, waterways, and soil types it is considered this minor increase will be comfortable managed through existing Mitigation Measures set out in the EIS which include: *SW1. A Soil and Water Management Plan (SWMP) will be prepared and implemented by the Contractor as part of the CEMP, this will include use of onsite water for dust mitigation measures.* *SW2. Minimise the footprint of disturbance at any one time by implementing progressive construction and remediation works* Further protection is provided by conditions in the Development Consent (Schedule 3 Conditions 24 and 25) which require the applicant ensure • the development does not cause water pollution and that the construction, upgrading and decommissioning be in accordance with the Managing Urban Stormwater. Soils and Construction (Landcom, 2004) or its latest version; and • the solar panels and ancillary infrastructure are designed, constructed, and maintained to avoid causing any erosion on site.	

Impact Area	Response	Environment Impact
	The proposed development is not considered to impact on flood behaviour that could be detrimental to other developments or land. Water impacts stated in the EIS for construction and operation is unlikely to change.	
Soil	There will be no significant impacts on soil due to the addition of battery infrastructure. Additional erosion risks are considered to be negligible based on the above. The Preliminary Hazards Analysis assessed environmental risk from spills causing land contamination and rated this risk a LOW based on the battery being housed in enclosed structures and the develop. Detailed design and management planning would address these risks.	No increased impact.
Bushfire	A Bushfire Risk Assessment has been prepared by Ecological Australia and is included at Appendix E. The following key risks were identified in relation to bushfire as outlined in the assessment: • Risks to fire fighter safety-electrocution, arcing / fire & explosion, hazardous chemicals (toxic fumes, burns, explosions) • Likelihood of fire ignition and spread to the facility • Likelihood of fire ignition and spread from the facility The assessment rates these risks as LOW. Several mitigation measures are identified by the assessment to manage risks to an acceptable level. These mitigation measures are summarised in Section 6.1 of this report. These measures include but are not limited to: • Additional Asset Protection Zones around the BESS • Fuel load (grass) management across the site • Additional water storage for firefighting purposes • Development Fire Safety Plan With the incorporation of the mitigation measures recommended by the Bushfire Risk Assessment the proposed modification will not increase impacts of the facility compared with the EIS.	No increased impact.

Impact Area	Response	Environment Impact
Noise	A Noise Assessment has been prepared by Muller Acoustic Consulting (MAC) and is included at Appendix D. The report functions as an addendum to the original Noise Assessment Report that was prepared by MAC as part of the original EIS for the project. The results of the assessment demonstrate no increased impact and are summarised below: • The results of the Noise Assessment demonstrate that emissions from the project will not change significantly compared to the EIS Noise Assessment and the revised project with BESS and associated HVAC system would satisfy the operational PNTLs at all identified receivers. • Sleep disturbance is not anticipated as there are no operation noise sources that generate significant maximum noise events and noise emissions from the project are predicted to satisfy the EPA maximum noise level criteria. • There are no other noise related issues. Given these results, the proposed modification does not alter the potential noise impacts as assessed within the EIS.	No increased impact.
Air quality	There will no air pollution or emissions associated with the addition of the BESS. A heating ventilating and air conditioning system would maintain the batteries in the enclosures within safe operational temperature limits.	No increased impact.
Hazards	The proposed modification adds a BESS to the development. SEPP 33 is the main relevant statutory provision relevant to hazards assessment for the proposal. A Preliminary Hazard Analysis has been prepared by Planager and is included at Appendix F. The analysis assesses the hazards and risk of the proposed BESS in accordance with SEPP33, including the Department's HIPAP6 and MLRA, with risk criteria calibrated using the Department's HIPAP4. The main conclusions of the assessment, including the identified hazards for the BESS, are summarised below: - A BESS fire has the theoretical potential to propagate to areas outside of the battery enclosure and even to initiate a bushfire in the surrounding grass land.	No increased impact.

Impact Area	Response	Environment Impact
	- This presents the only potential impact from the BESS to society outside of the approved project site area. - Provided the batteries and the battery enclosures are designed and tested to withstand a credible fire scenario, and that sufficient separation is established within the BESS and between the BESS and the surrounding grassland, the risk of propagation from one battery enclosure to another, and to surrounding grassland, can be managed ALARP. Environmental pollution may be possible, subject to detailed design, in the event of a failure to contain pollutants at the BESS: - If a spill is not contained, there is a potential to affect adjacent land use. - Measures to prevent a loss of containment from occurring, and for secondary containment, would be addressed in the detailed design phase for the BESS. - Provided that the likelihood of a serious loss of containment event associated with this BESS are eliminated or designed to *Unlikely* or *Rare* levels, the risk of environmental pollution can be managed to ALARP principles. The assessment concludes the main potential hazard for the BESS outside the project area is limited to fire. The risk profile for the BESS is consistently between Moderate and Low risk with no High or Very High risks identified. ALARP can be established. Eight recommendations are made and are outlined in the following mitigations section of this report.	
Waste	The Preliminary Hazards Assessment identified that no significant hazardous wastes were relevant for the operation of the BESS. Wastes relevant to construction may be managed by appropriate management plans outlined under the EIS.	No increased impact.

6.1 MITIGATION MEASURES

Any additional mitigation measures from those provided as part of the EIS are included in Table 5 below.

TABLE 5 MITIGATION RESPONSES

Issue	Mitigation response
Biodiversity	There are no biodiversity issues identified in this modification report. The mitigation measures and safeguards under the EIS, RTS and CoC are considered sufficient. (CoC Schedule 3 Condition 12, 13 & 14)
Transport	Operational traffic numbers will not increase with the proposed BESS addition. The daily heavy vehicle limits will not be exceeded. There will be a minor increase in the delivery vehicles to account for delivery of BESS components. The mitigation measures and safeguards under the EIS, RTS and CoC and Traffic Impacts Assessment at Appendix B are considered sufficient.
Heritage	There are no aboriginal or non-aboriginal heritage issues identified in this modification report. The mitigation measures and safeguards under the EIS are considered sufficient.
Land use	There are no land use issues identified in this modification report. The mitigation measures and safeguards under the EIS, RTS and CoC are considered sufficient.
Visual	Additional visual screening measures and battery housing colour treatments are recommended as identified in the Visual Impact Assessment at Appendix C. These measures together with those under the EIS, RTS and CoC are considered sufficient to mitigate impacts to an acceptable level.
Water	Potential for minor increase in runoff has been addressed in this modification report. The mitigation measures and safeguards under the EIS, RTS and CoC are considered sufficient.
Soil	Potential for minor increase in runoff related erosion has been addressed in this modification report. The mitigation measures and safeguards under the EIS, RTS and CoC are considered sufficient.
Bushfire	Several mitigation measures are identified under the Bushfire Risk Assessment at Appendix E that are associated with the addition of a BESS to the approved project. This includes: • APZ mineral fire break around farm perimeter-15m. • APZ substation-20m • APZ BESS-10m • Construction-APZ construct prior, fire appliance on site, and hot works suspended on elevated fire danger days. • Operation-maintain minimal fuel loading grazing, slashing, or mowing. Suspend site maintenance on elevated fire danger days. • Fire fighter safety-avoid firefighting in solar farm footprint. Avoid operating downwind of burning solar farm components. Emergency response plan prepared & stored on site.

	• Research ignition, flammability, and toxicity of solar farm components to improve future mitigation measures. • Water storage-minimum 20,000L. Consideration by proponent to increased capacity in line with CFA guidelines. These measures together with those under the EIS, RTS and CoC will manage impacts of the approved project plus BESS to an acceptable level.
Noise	The Noise Assessment at Appendix D. The noise assessment identifies there will be full compliance with the relevant criteria and policies and there will be no noise related issues that extend from the additional of the BESS to the approved solar farm. The mitigation measures identified under the EIS, RTS and CoC are considered sufficient as they stand.
Air quality	There are no air quality issues identified in this modification report. The mitigation measures and safeguards under the EIS, RTS and CoC are considered sufficient.
Hazards	The Preliminary Hazards Assessment at Appendix F. Appendix F identified eight recommendations to manage the risk of the BESS addition to the facility and are reproduced below: • The separation distance between infrastructure within the BESS is to be determined in accordance with Codes and Standards and manufacturer's recommendations so that the preferred strategy of allowing a fire in one battery enclosure or inverter to burn without the risk of propagating to other infrastructure can be maintained without the need for external firefighting • The separation distance within the BESS is to be determined in accordance with Codes and Standards and manufacturer's recommendations to allow safe escape from the BESS in case of a fire • All relevant requirements in the Australian Standard 5139 (2019) are to be adhered to at the BESS. The BESS should also adhere to requirements in international Standards applicable to major BESS, for example, to the US NFPA 855 (2020). • Procurement of a battery system that is certified to UL 9540 and/or IEC 62619, proving that a credible fire within a battery unit will not propagate to other battery units • Detailed firefighting response and need for fire water containment should be assessed and reported (e.g. in the format of a Fire Safety Study) post development approval, for review by the DPIE, NSWFR and the RFS • Measures to prevent a leak occurring at the BESS, and for containment of a spill of pollutant from the BESS, should be addressed in the detailed design phase for the BESS • The specific risk associated with the potential for dust storms and ingress of dust causing damage to infrastructure needs to be integrated into the design and the BESS manufacturers, Project

	contractors and the Applicant's staff need to be aware of this threat during BESS design, construction, and operation • The register of commitment (Appendix 1 of the Preliminary Hazards Analysis) is integrated into the BESS. This includes integration of 29 individual commitments, including for the design, installation and maintenance of the BESS automatic shutdown system on exceedance of safe limits; installation of deflagration venting and fire protection inside the battery enclosures; design of the BESS such that the risk of pollution from a release is reduced to ALARP; installation of protective barriers e.g. at the transformers and fire resistance of the battery enclosures; and application of a rigorous and formal management of change process for the BESS, including detailed hazard identification and risk assessment processes. With inclusion of these mitigation measures in addition to those within the EIS, RTS and CoC it is considered hazard issues will be managed to an acceptable level.
Waste	There are no waste issues identified in this modification report. The mitigation measures and safeguards under the EIS, RTS and CoC are considered sufficient.

7 JUSTIFICATION OF MODIFIED PROJECT

The additional of a BESS will result in negligible impacts and is an acceptable addition for the reasons as outlined below.

7.1 SUMMARY

This modification report has considered all relevant potential impacts of the proposed addition of a BESS to the approved Maryvale Solar Farm project, with particular consideration of the following areas of potential impact:

- Traffic and Transport
- Visual amenity
- Noise
- Bush Fire
- Hazards

A summary of the justification of the proposal in relation to these potential impacts and overall is provided below. Appropriate mitigation and management measures outlined in previous sections of this report will be carried out during the construction, operation, and decommissioning phases.

The submitted layout in the EIS was concept only and anticipated changes to the layout based on ongoing grid connection negotiations and the detailed design process. The proposed BESS is within the impact footprint that forms part of the approved project and is consistent with the scale and elements that form part of the approved solar farm.

The addition does not result in the removal of any native trees or plantings to be retained and will not change the amount of vegetation to be removed. There will be negligible impacts on biodiversity, heritage, land use, water, soil, air quality and waste issues.

There will be no change to the response of the project against the objectives of the EP&A Act. The modification will support these objectives as outlined under the EIS.

Ecologically sustainable development, intergenerational equity, and Conservation of Biological Diversity and Ecological Integrity will be supported as outlined under the EIS. The BESS addition supports efficient deployment of renewable energy, minimising greenhouse gases and aiding mitigation of climate change. It may also provide additional support services to the electricity network allowing increased penetration of renewable energy generation into the grid.

Specialist studies were undertaken to provide accurate information to assist with the evaluation and development of the proposal. Mitigation measures have been provided to ensure potential impacts are managed to an acceptable level.

7.2 TRAFFIC

A Traffic Impacts Assessment has been prepared by SECA Solution and is included at Appendix B.

The main conclusions from this assessment are summarised below:

- Overall, it is concluded that the installation of the BESS equipment shall have a minor impact upon the overall road network, with no change to construction routes or access from the approval solar farm. This minor impact will be temporary and associated with construction only.
- For installation of the BESS, there will be approximately 20 light vehicle movements per direction and less than 10 heavy vehicle movements, over a duration of 4 weeks.
- There will be no change to the traffic volumes, site access or transport arrangements associated with the operational stage of the solar farm.

No mitigation measures are recommended and the minor impacts from construction are considered acceptable.

It is recognised that during the construction phase of the project there will be an increase in the number of heavy vehicle movements along local roads and major transport networks.

It is expected that the total traffic flows on the regional road network will remain well within acceptable limits and will continue to operate to a good level of service for all road users. It is considered the additional traffic movements will have a minimal and acceptable impact upon the operation of the local roads and the heavy vehicle route can safely accommodate the additional traffic movements.

7.3 VISUAL

A Visual Impact Assessment has been prepared by Envisage and is included at Appendix C. The report serves as an addendum to the Visual Impact Assessment that was submitted with the original EIS, following the same methodology to assess landscape and viewpoint visual impacts. The report considers both Centralised and Distributed BESS options and whether either would alter impact levels determined for the approved project.

The assessment concludes that the proposal is able to achieve 'little effect' with mitigation screen plantings and suitable colouring of battery units, resulting in no increased impact. This conclusion is given in relation to both impacts to landscape and impacts on surrounding viewpoints.

On this basis it is concluded that the modification will not result in any net increase in impacts on the sensitive receivers associated with the proposed modification. The EIS included a visual impact assessment with subsequent mitigation measures to be integrated into the development. The addition of a BESS will not result in any increase in visual impacts on the relevant sensitive receivers associated with the project with mitigation measures as outlined in this report and the Visual Impact Assessment.

7.4 NOISE

A Noise Assessment has been prepared by Muller Acoustic Consulting (MAC) and is included at Appendix D. The report functions as an addendum to the original Noise Assessment Report that was prepared by MAC as part of the original EIS for the project.

The results of the assessment demonstrate no increased impact and are summarised below:

- The results of the Noise Assessment demonstrate that emissions from the project will not change significantly compared to the EIS Noise Assessment and the revised project with BESS and associated HVAC system would satisfy the operational PNTLs at all identified receivers.
- Sleep disturbance is not anticipated as there are no operation noise sources that generate significant maximum noise events and noise emissions from the project are predicted to satisfy the EPA maximum noise level criteria.
- There are no other noise related issues.

Given these results, the proposed modification does not alter the potential noise impacts as assessed within the EIS and is an acceptable addition.

7.5 BUSHFIRE

A Bushfire Risk Assessment has been prepared by Ecological Australia and is included at Appendix E.

The following key risks were identified in relation to bushfire as outlined in the assessment:

- Risks to fire fighter safety-electrocution, arcing / fire & explosion, hazardous chemicals (toxic fumes, burns, explosions)
- Likelihood of fire ignition and spread to the facility
- Likelihood of fire ignition and spread from the facility

The assessment rates these risks as LOW.

Several mitigation measures are identified by the assessment to manage risks to an acceptable level. These mitigation measures are summarised in Section 6.1 of this report.

With the incorporation of appropriate mitigation measures recommended by the Bushfire Risk Assessment the proposed modification will not increase impacts of the facility compared with the EIS.

7.6 HAZARDS

The proposed modification adds a BESS to the development. SEPP 33 is the main relevant statutory provision relevant to hazards assessment for the proposal.

A Preliminary Hazard Analysis has been prepared by Planager and is included at Appendix F. The Preliminary Hazards Analysis assesses the hazards and risk of the proposed BESS in accordance with SEPP33, including the Department's HIPAP6 and MLRA, with risk criteria calibrated using the Department's HIPAP4.

Potential risks associated with the BESS were assessed including:

- Risk from reactions and fires associated with electrical infrastructure and flammable material, including spontaneous ignition from a runaway reaction at the BESS
- Environmental risk from spills causing land contamination
- Health and safety risk to the community
- Health and safety risks to staff and to contractors from major, high consequence process safety incidents.

The main conclusions of the assessment, including the identified hazards for the BESS, are summarised below:

- A BESS fire has the theoretical potential to propagate to areas outside of the battery enclosure and even to initiate a bushfire in the surrounding grass land.
- This presents the only potential impact from the BESS to society outside of the approved project site area.
- Provided the batteries and the battery enclosures are designed and tested to withstand a credible fire scenario, and that sufficient separation is established within the BESS and between the BESS and the surrounding grassland, the risk of propagation from one battery enclosure to another, and to surrounding grassland, can be managed ALARP.

Environmental pollution may be possible, subject to detailed design, in the event of a failure to contain pollutants at the BESS:

- If a spill is not contained, there is a potential to affect adjacent land use.
- Measures to prevent a loss of containment from occurring, and for secondary containment, would be addressed in the detailed design phase for the BESS.

- Provided that the likelihood of a serious loss of containment event associated with this BESS are eliminated or designed to *Unlikely* or *Rare* levels, the risk of environmental pollution can be managed to ALARP principles.

The assessment concludes the main potential hazard for the BESS outside the project area is limited to fire. The risk profile for the BESS is consistently between Moderate and Low risk with no High or Very High risks identified. ALARP can be established.

8 CONCLUSION

This assessment concludes that the proposed modification is substantially the same development as for which the original proposal was granted consent, and that potential impacts associated with the proposed modification are minimal.

Furthermore, with the implementation of the proposed mitigation actions (in addition to those already identified within the original Environmental Impact Assessment and Response To Submissions and Conditions of Consent), potential environmental impacts of the modification are not considered to be greater, and some instances reduced from that of the approved development.

Based on the advice provided in this submission, it is anticipated that the proposed modification could be enacted in accordance with Section 4.55(2) of the EP&A Act.

APPENDICES

APPENDIX A - UPDATED PROJECT DESCRIPTION

APPENDIX B - TRAFFIC IMPACTS ASSESSMENT

APPENDIX C - VISUAL IMPACT ASSESSMENT

APPENDIX D - NOISE ASSESSMENT

APPENDIX E - BUSHFIRE RISK ASSESSMENT

APPENDIX F - PRELIMINARY HAZARD ANALYSIS

APPENDIX G – MODIFIED GENERAL LAYOUT PLAN

APPENDIX H – PROPOSED SITE PLANS

APPENDIX I - MAILOUT INFORMATION

APPENDIX J - STATUTORY COMPLIANCE TABLE

APPENDIX K - DPIE MODIFICATION ADVICE

APPENDIX L – SENSITIVE RECEIVERS PLAN