

Department of Planning, Housing and Infrastructure

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# Muswellbrook Solar Farm

State Significant Development Assessment Report (SSD 46543209)

December 2024





# Acknowledgement of Country

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# Preface

This assessment report provides a record of the Department of Planning, Housing and Infrastructure's (the Department) assessment and evaluation of the State significant development (SSD) application for the Muswellbrook Solar Farm, lodged by ESCO Solar Farm 9 PTY LTD as trustee for the ESCO Solar Farm 9 Trust. The report includes:

- an explanation of why the project is considered SSD and who the consent authority is
- an assessment of the project against government policy and statutory requirements, including mandatory considerations
- a demonstration of how matters raised by the community and other stakeholders have been considered
- an explanation of any changes made to the project during the assessment process
- an assessment of the likely environmental, social and economic impacts of the project
- an evaluation which weighs up the likely impacts and benefits of the project, having regard to the proposed mitigations, offsets, community views and expert advice; and provides a view on whether the impacts are on balance, acceptable
- an opinion on whether the project is approvable or not, along with the reasons, to assist the Independent Planning Commission in making an informed decision about whether development consent for the project can be granted and any conditions that should be imposed

# Executive Summary

ESCO Solar Farm 9 PTY LTD as trustee for the ESCO Solar Farm 9 Trust (ESCO) proposes to develop the Muswellbrook Solar Farm (the project), a 135 megawatt (MW) solar farm and 135 MW / 270 MWh battery, approximately 2.5 kilometres (km) east of Muswellbrook in the Muswellbrook Shire local government area (LGA), within the Hunter-Central Coast Renewable Energy Zone (HCC REZ).

The site is located adjacent to and within the existing Muswellbrook Coal Company (MCC) mine site, and surrounds the remaining coal mine infrastructure and remaining open cut pits within areas currently used for agricultural grazing. The project would connect to the existing Ausgrid 132 kilovolt (kV) transmission line to the west of the project area.

The Department of Planning, Housing and Infrastructure (the Department) exhibited the Environmental Impact Statement (EIS) for the project between 22 August 2023 and 18 September 2023 and received 59 public submissions (54 objections, and 5 in support). Muswellbrook Shire Council (Council) provided comment about traffic, biodiversity, visual and accommodation. Advice was also received from 14 government agencies.

The Department consulted with Council and relevant government agencies on key issues, inspected the site and met with nearby sensitive receivers. None of the agencies, Council or utility providers objected to the project, and they each recommended the implementation of appropriate mitigation and management measures.

ESCO provided a Submissions Report and additional information addressing the concerns raised by Council, agencies and public submissions.

The key assessment matters are energy transition, land use compatibility, traffic, biodiversity and visual. The Department has also undertaken a comprehensive assessment of the full range of other potential impacts and recommended a range of detailed conditions, developed in conjunction with agencies and Council, to ensure all potential impacts are effectively minimised, managed or offset.

Land within the site is generally flat to gently undulating and has been predominantly cleared. The site does not contain any mapped Biophysical Strategic Agricultural Land (BSAL) and land within the development footprint is categorised as Class 4 (moderate to high limitations), Class 5 (high limitations) and Class 6 (very high limitations). The project would not significantly reduce the overall agricultural productivity of the region and the site could be returned to agricultural uses in the future.

The development footprint requires the clearing of 310.7 hectares (ha) of native plant community types, however the majority of this is low quality land that has minimal biodiversity values and does not require to be offset (92.2 ha would require offsetting under the NSW Biodiversity Offset Scheme).

The project has been designed and refined to effectively avoid and minimise biodiversity impacts to native vegetation. The Biodiversity Conservation and Science Group within NSW DCCEEW (BCS) advised that it is satisfied all issues raised during the assessment had been adequately addressed and advised that the Biodiversity Development Assessment Report (BDAR) met all relevant requirements. The Department considers that the biodiversity impacts of the project would not be significant, subject to the implementation of a range of mitigations and additional and appropriate measures, and by offsetting the residual biodiversity impacts.

The Department considers the project would not result in unacceptable impacts on the capacity, efficiency or safety of the road network. Potential traffic impacts would be largely restricted to the 31-month construction period and would be suitably managed through road upgrades, restricting vehicles to approved routes, road maintenance and the implementation of a Traffic Management Plan.

The Department has also considered the potential cumulative impacts with other developments in the region and considers that there would be no significant cumulative traffic, visual or noise impacts due to different construction timeframes, distance and different haulage routes.

There are 128 non-associated residences located within 2 km of the development footprint, the majority of which are located within Woodland Ridge Estate and to the south of the project. The solar arrays are relatively low-lying structures and expansive views across the area are limited by topography and established vegetation. While the introduction of the project would represent a change to the local landscape, ESCO has demonstrated that the visual impacts of the project are low for all residential receivers, per the **Department's Large Scale Solar Energy Guideline**.

The project is consistent with the Commonwealth's Renewable Energy Target and NSW's *Climate Change Policy Framework and Net Zero Plan Stage 1: 2020 – 2030*, as it would contribute 135 MW of renewable energy to the National Electricity Market, including a battery with a capacity of 135 MW / 270 MWh. Importantly, the battery would enable the project to store energy for dispatch to the grid outside of daylight hours and / or during periods of peak demand, which has the potential to contribute to increased grid stability and energy security.

The project is located in the HCC REZ, which was formally declared by the Minister for Energy in 2022 under section 24(1) of the *Electricity Infrastructure Investment Act 2020* (the EII Act). The HCC REZ is aimed at encouraging investment in electricity infrastructure and unlocking additional generation capacity in order to ensure secure and reliable energy in NSW.

The Department considers the site appropriate for the project as it has good solar resources, available capacity on the existing electricity network and is consistent with the **Department's Large Scale Solar Energy Guideline**.

The project would also provide flow-on benefits to the local community, including up to 200 construction jobs at its peak, 9 operational jobs and contributions to council through a voluntary

planning agreement (VPA) which would include a monetary contribution of 'the greater of \$850/MWac, or as per any finalised 'Benefit Sharing Guideline', installed, paid annually, and adjusted for consumer price index.

In addition, there would be broader benefits to the State through an injection of \$302 million in capital investment into the NSW economy.

The Department considers the project would not result in any significant impacts on the local community or the environment, and any residual impacts can be managed through the implementation of the recommended conditions.

The Department considers that the project would result in benefits to the State of NSW and the local community and is therefore in the public interest and approvable.

This report details the Department's assessment of the State significant development application SSD-46543209 for the Muswellbrook Solar Farm.

This report will be provided to the Independent Planning Commission (IPC) for their consideration when deciding whether to grant consent to the SSD.

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# 1 Introduction

## 1.1 Project

1. ESCO Solar Farm 9 Pty Ltd (ESCO) proposes to develop a 135 megawatt (MW) State significant development (SSD) solar farm in the Hunter Central Coast Renewable Energy Zone (HCC REZ), approximately 2.5 kilometres (km) east of Muswellbrook in the Muswellbrook Shire local government area (LGA) (see **Figure 1** and **Figure 2**).
2. The project would include a 135 MW / 270 MW-hour (MWh) battery energy storage system (BESS). It also involves the upgrading and decommissioning of project infrastructure over time. The project would connect to the existing Ausgrid 132 kilovolt (kV) transmission line to the west of the project area.
3. The project is comprised of two sections – a northern section and a southern section. The northern section is proposed to hold a solar array area (~48ha), located to the north of the existing Muswellbrook Coal Company (MCC) open cut mine, and would be accessed via Sandy Creek Road. The southern section would hold a larger solar array area (~181 ha), as well as the BESS, switchyard and the proposed transmission connection and would be accessed via Muscle Creek Road to the south. There would be a solar generation split between the two sections, with the northern section generating around 20% (27MW) and the southern 80% (108MW). These two areas would be connected via an overhead line, running adjacent to an existing transmission line. Construction of the project is anticipated to commence in Q4 2025 with an anticipated construction period of approximately 31 months.
4. The key components of the project are summarised in **Table 1**, depicted in **Figure 3**, and described in detail in the Environmental Impact Statement (EIS) and supporting documentation (see **Appendix A**, **Appendix D**, **Appendix E** and **Appendix F**).

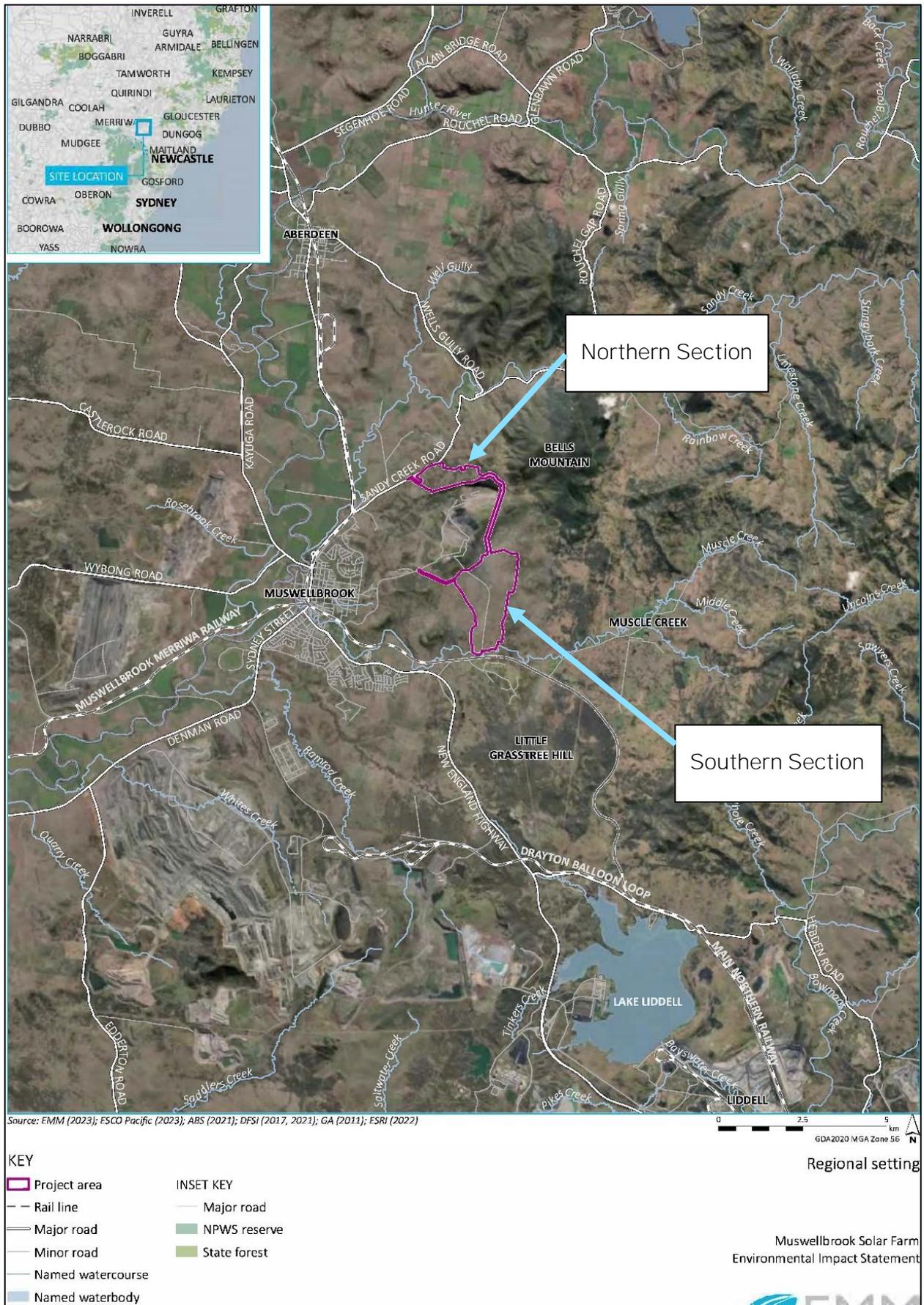


Figure 1 | Regional context map

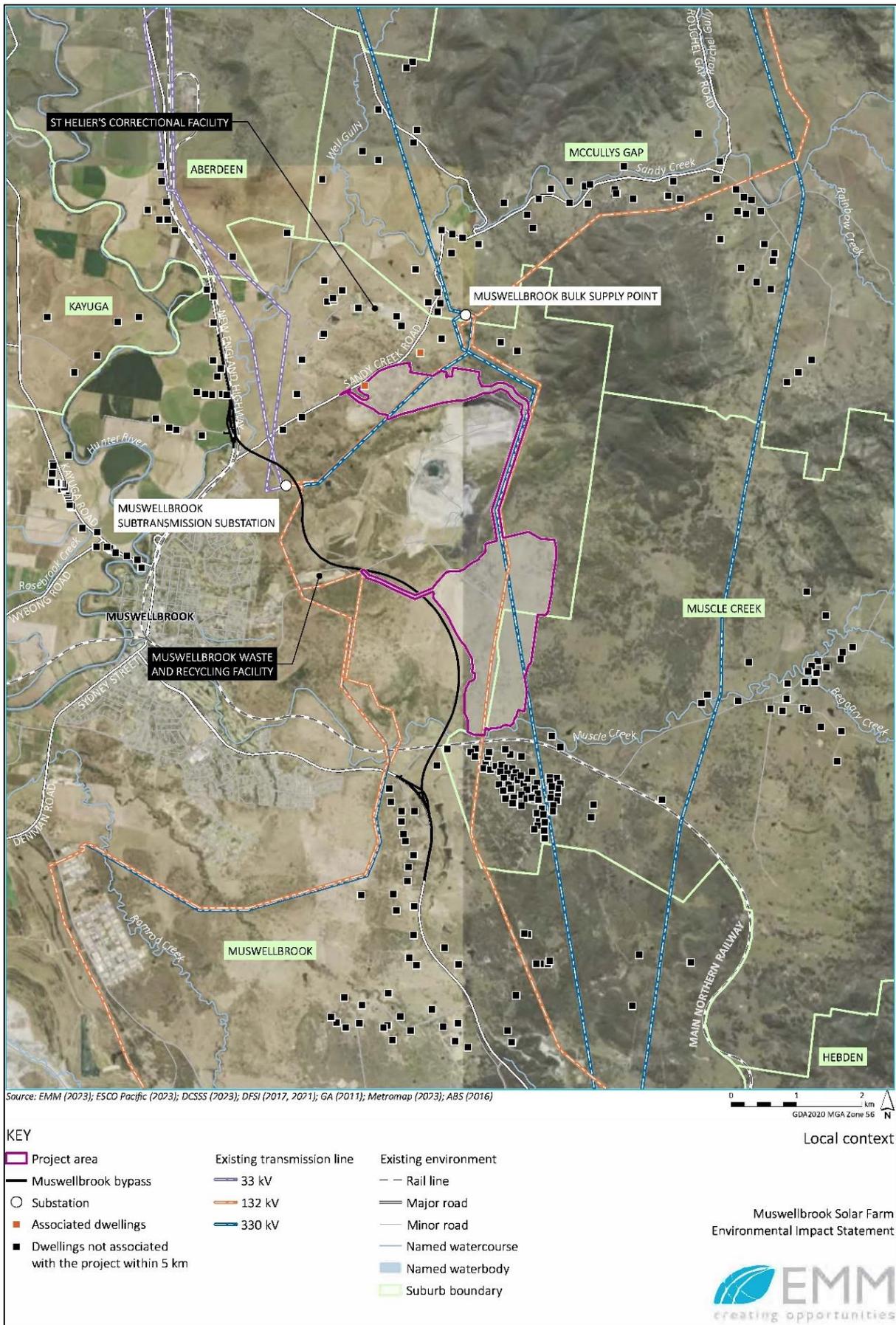
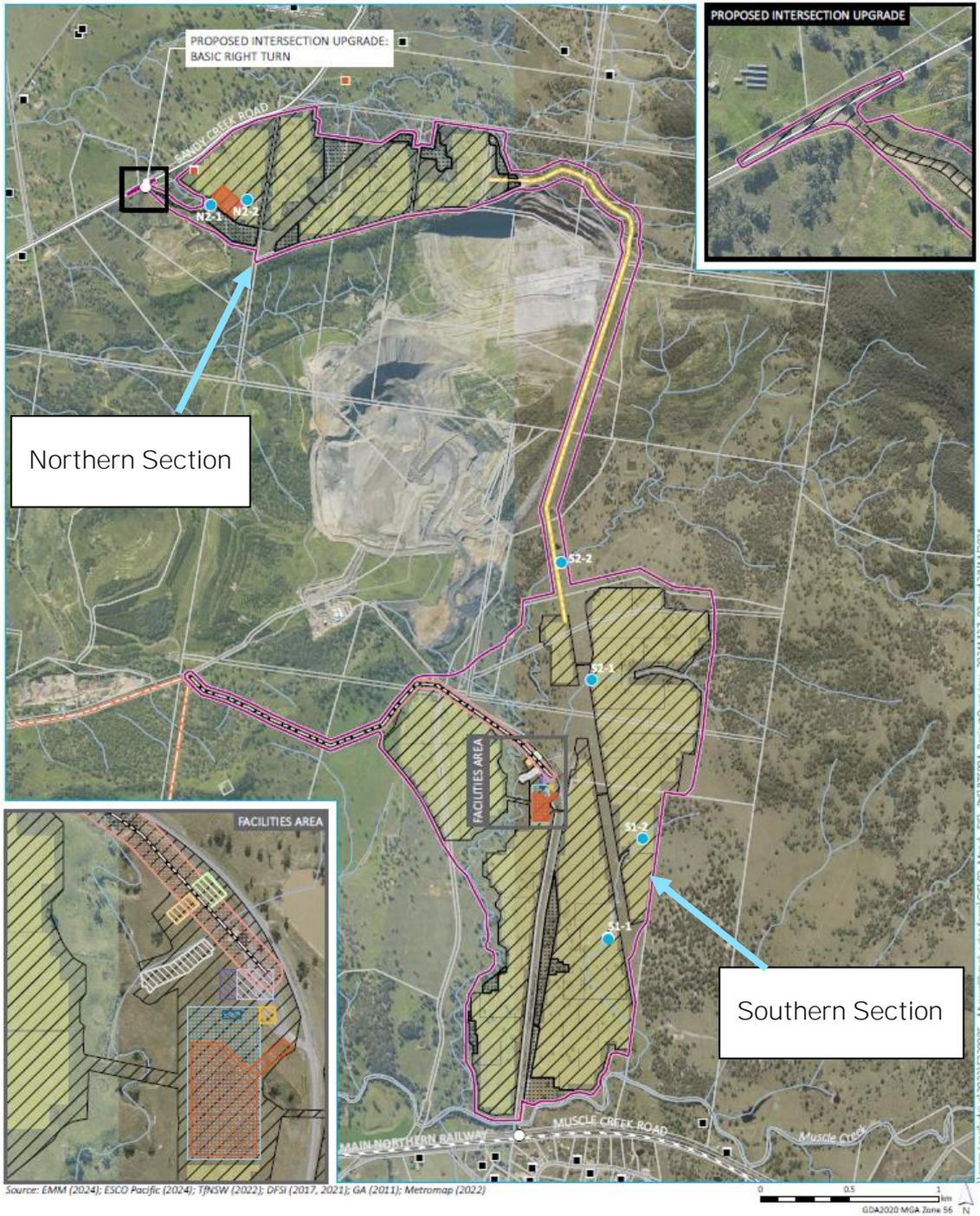


Figure 2 | Local context map

Table 1 | Main aspects of the project

Aspect	Description
Project summary	<p>The project includes:</p> <ul style="list-style-type: none"> <li>• approximately 300,000 solar panels and associated mounting infrastructure with a generation capacity of 135 MW;</li> <li>• a BESS with a capacity of up to 135 MW and a storage duration of 2 hours;</li> <li>• electrical collection and conversion systems including inverter and transformer units, switchyard and control room;</li> <li>• an on-site substation with a connection voltage of up to 132 kV;</li> <li>• underground and above ground cables;</li> <li>• an operational infrastructure area, including demountable offices, amenities, equipment sheds and storage;</li> <li>• parking and internal access roads;</li> <li>• a temporary construction compound (during construction and decommissioning only);</li> <li>• electricity transmission line infrastructure connecting to the grid and connecting the north and south areas of the solar farm; and</li> <li>• a diversion channel and berm.</li> </ul>
Project area	<ul style="list-style-type: none"> <li>• Total site area: approximately 482 hectares (ha)</li> <li>• Development footprint: approximately 318 ha</li> <li>• Solar array area: approximately 300 ha</li> <li>• BESS area: 2.1 ha</li> </ul>
Site entry and access route	<ul style="list-style-type: none"> <li>• The proposed access route is New England Highway and either Muscle Creek Road or Sandy Creek Road.</li> <li>• Access to the northern section of the site would be via Sandy Creek Road and access to the southern portion of the site would be via Muscle Creek Road.</li> <li>• Existing access points for the MCC mine site would be utilised for site access.</li> </ul>
Road upgrades	<ul style="list-style-type: none"> <li>• Road upgrades are proposed on Sandy Creek Road at the site's northern access point. The upgrades would consist of a basic right turn treatment for vehicles turning right into the site from Sandy Creek Road.</li> </ul>
Construction	<ul style="list-style-type: none"> <li>• The construction period would be approximately 31 months, including a 15-18 month construction period for the solar farm, and a 13 month construction period for the BESS.</li> <li>• Construction is planned to commence in the fourth quarter of 2025.</li> <li>• Peak construction is planned to commence in the fourth quarter of 2025.</li> <li>• Construction hours would be limited to Monday to Friday 7 am to 6 pm, and Saturday 8 am to 1 pm.</li> </ul>
Operation	<p>The expected operational life of the infrastructure is approximately 35 years. However, the project may involve infrastructure upgrades that may extend the operational life.</p>
Decommissioning and rehabilitation	<p>The project includes decommissioning at the end of the project life, which would involve removing all infrastructure.</p>
Employment	<p>Up to 200 construction jobs and up to 9 operational jobs.</p>
Capital investment value (CIV)	<p>\$302 million</p>



**KEY**

- Project area
- Site access
- Potential watercourse crossing
- Associated dwellings
- Dwellings not associated with the project within 5 km
- Development footprint
- Indicative panel layout
- Biodiversity exclusion area
- Connection route
- 132 kV connection to 95M
- Internal connection route (33 kV)
- Existing transmission line (132 kV)
- Site element
- BESS (Battery Energy Storage System)
- BESS Collection Station
- Car Park
- Connection internal north to south buffer
- 132 kV connection to 95M buffer
- Laydown
- O&M
- SF Collection Station
- Switchyard
- Transformer Substation
- Existing environment
- Rail line
- Major road
- Minor road
- Watercourse/drainage line
- Cadastral boundary

Figure 3 | Site layout

## 2 Strategic context

### 2.1 Site and Surrounds

5. The site is located adjacent to and within the remaining MCC coal mine infrastructure area and open cut pits (see **Figure 3**). The site is also located within areas currently used for agricultural grazing. The site is largely cleared land, is traversed by existing 132 kV and 330 kV transmission lines and comprises land zoned RU1 Primary Production, SP2 Infrastructure and C3 Environmental Management.
6. Access to the site would be from the New England Highway via either Muscle Creek Road or Sandy Creek Road. An upgrade to the intersection of Sandy Creek Road and the northern site access would be required as part of the proposed development.
7. Land within the site is generally flat to gently undulating and has been predominantly cleared. The site does not contain any mapped Biophysical Agricultural Land (BSAL) and land within the development footprint has been verified as Land Soil Capability (LSC) Class 4 (moderate to high limitations), Class 5 (high limitations) and Class 6 (very high limitations).
8. Several ephemeral watercourses traverse the site which contribute to Muscle Creek in the south and Sandy Creek in the north. Stream orders of the watercourses within the site range from first to fourth order, with the most significant of these contributing to Muscle Creek in the southern section of the site.
9. There are 128 non-associated residences located within 2 km of the development footprint, the vast majority of which being located within Woodland Ridge Estate. Of the non-associated residences, 20 are within 500 metres (m) of the site.
10. The main aspects of the project are provided in detail in the Project Description chapter of the EIS and outlined in **Table 1**.

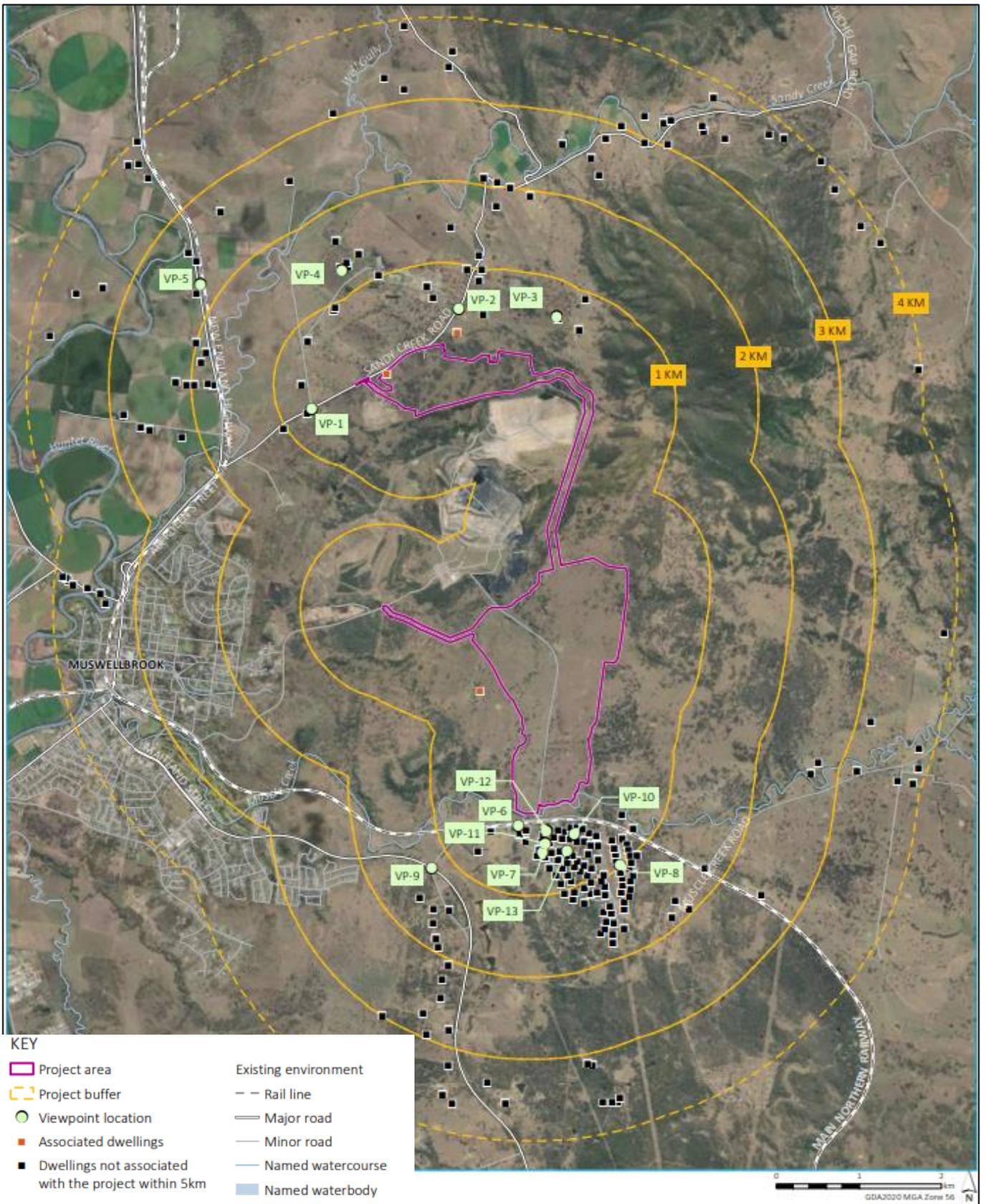


Figure 4 | Nearby associated and non-associated dwellings

## 2.2 Other Energy Projects

11. There are six State Significant renewable projects within 10 km of the site at various stages of the assessment process (see **Table 2**).
12. The Department notes that since the time of lodgement of the development application for this project, an application has also been lodged for the Maison Dieu Solar Farm. As per the **Department’s Cumulative Impact Assessment Guidelines for State Significant Projects 2021**, ESCO and the Department’s assessments of cumulative impacts has considered the relevant future projects to be those that have been exhibited and are currently under assessment.
13. Potential cumulative impacts at a regional level relate to agricultural land, traffic and workforce accommodation, which are discussed further in **Section 5.2**, **Section 5.3** and **Section 5.5** respectively.

Table 2 | Nearby Renewable Energy Projects

Project	Capacity (MW)	Status	Approximate distance from the project (km)
Muswellbrook Pumped Hydro Energy Storage Project	500	Proposed (SEARs issued)	Adjacent
Muswellbrook Battery Energy Storage System	150	Approved	1.5 (west)
Maxwell Solar Farm	25	Construction	6 (south)
Upper Hunter BESS	400	Proposed (SEARs issued)	7 (north)
Bowmans Creek Windfarm	336	Approved	8 (east)
Liddell Battery and Bayswater Ancillary Works Project	500	Construction	10 (south)

## 2.3 Energy Context

14. In 2023, NSW derived approximately 36% of its energy from renewable sources. The rest was derived from fossil fuels, including 61% from coal and 3% from gas. NSW is one of the nation's leaders in large-scale renewables, with 45 major operational projects and 86 under construction or planned to be under construction.
15. The Commonwealth and State energy context is described in **Table 3**.
16. The project's alignment with existing Commonwealth and State policies and strategies are considered in **Section 5.1**.

Table 3 | Energy Context

Policy / Year	Summary
<i>Australia's Long Term Emissions Reduction Plan (2021)</i>	Sets a pathway to net zero emissions by 2050 and affirms Australia's commitment to meeting its revised 2030 target (43% below 2005 levels).
<i>Australian Energy Market Operator's 2022 Integrated System Plan (ISP)</i>	Notes that: <ul style="list-style-type: none"> <li>• without coal, investment is urgently needed to meet significantly increased electricity demand requiring a six-fold increase in large-scale variable renewable energy generation; a mix of solar and wind is needed, and they offer complementary daily and seasonal profiles; and</li> <li>• forecasts that there will be a demand for 83 GW of utility-scale wind and solar in the National Electricity Market by 2034-35, and 127 GW by 2049-50.</li> </ul>
NSW: <i>Climate Change Policy Framework (2016), Transmission Infrastructure Strategy (2018), Electricity Strategy (2019), Electricity Infrastructure Roadmap (2020), Net Zero Plan Stage 1: 2020 – 2030 (2020) and Implementation update (2022), Hunter Regional Plan 2036 and Muswellbrook 2020-2040 Local Strategic Planning Statement</i>	Relevant aspects of these policy documents include: <ul style="list-style-type: none"> <li>• aims to achieve net zero emissions in NSW by 2050 and reduce emissions by 70% below 2005 levels by 2035;</li> <li>• notes that all coal fired power plants in NSW are scheduled for closure within the next twenty years;</li> <li>• identifies Renewable Energy Zones (REZs) across NSW aimed at encouraging investment in new electricity infrastructure and unlocking additional generation capacity in order to ensure secure and reliable energy in NSW;</li> <li>• regional goals to support the State's transition to lower emissions and Council goals to promote renewable energy production; and</li> <li>• HCC REZ was declared in December 2022 and is the first step in formalising the REZ under the <i>Electrical Infrastructure Investment Act (EII ACT)</i>.</li> </ul>

## 2.4 NSW Solar Guideline

17. The Department released the revised Large-Scale Solar Energy Guideline (the Guideline) in August 2022 to provide the community, industry, and regulators with guidance on the planning framework for assessing large-scale solar projects and identifying the key planning considerations relevant to solar energy development in NSW.
18. ESCO has considered the potential visual and landscape impacts of the project in accordance with the revised guideline and the Department considers the project is consistent with the principles set out in the revised guideline. The Department released an updated solar guideline in November 2024, which does not change the key outcomes of the assessment.
19. The Guideline recognises that large-scale solar projects could help to reduce reliance on fossil fuels, thereby contributing to reduction in air pollution and greenhouse gas emissions, while also supporting regional NSW through job creation and investment in communities that may not have similar opportunities from other industries.

# 3 Statutory context

## 3.1 State significant development

- 20. The project is classified as SSD under Section 4.36 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). This is because it triggers the criteria in section 20 of Schedule 1 of State Environmental Planning Policy (Planning Systems) 2021 (Planning Systems SEPP), as it is development for the purpose of electricity generating works with a capital investment value of more than \$30 million.
- 21. Under Section 4.5(a) of the EP&A Act and Section 2.7(1)(b) of the Planning Systems SEPP, the Independent Planning Commission (the Commission) is the consent authority for the development as the project has received more than 50 unique public submissions by way of objection during the exhibition period.

## 3.2 Permissibility

- 22. The development site is zoned primarily as RU1 – Primary Production, with the balance of the site comprising SP2 – Infrastructure (Classified Road) and C3 Environmental Management zoned land under the *Muswellbrook Local Environmental Plan 2009* (Muswellbrook LEP), the provisions of which are discussed in **Section 5.2.1**.

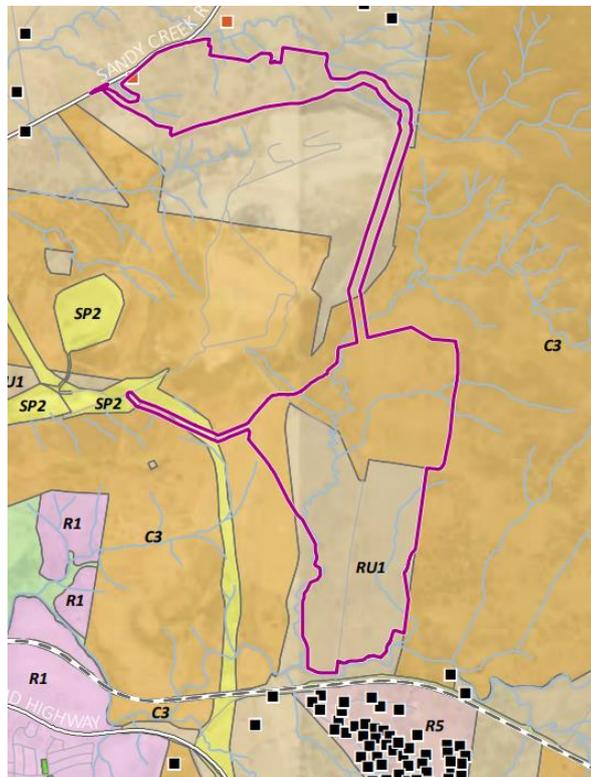


Figure 5 | Project area zonings

23. The project is permissible with consent as electricity generating works are permissible with consent on any land in a prescribed non-residential zone, including RU1 and SP2 zones, under clause 2.36 of the *State Environmental Planning Policy (Transport and Infrastructure) 2021* (Transport and Infrastructure SEPP).
24. Additionally, although land zoned C3 is not a prescribed zone under the Transport and Infrastructure SEPP, Section 4.38(3) of the EP&A Act allows development consent to be granted for SSD applications where the development is partly prohibited.
25. While the consent authority can override a partial prohibition for a SSD, it must assess the merits of such a decision. The Department has considered the merits of such a decision as follows:
  - the project is consistent with State and Local Strategic plans, as set out within **Section 2** of this report;
  - the current section of the site zoned C3 is not currently being used for any environmental management purposes;
  - Muswellbrook Shire Council (Council) raised no objection and ESCO has confirmed via consultation with Council that the C3 zoning does not currently form part of any protected area or reserve, with no planned future uses related to environmental conservation of the land; and
  - the Department has fully considered the impacts of the proposal and consider it can be approved.
26. Based on the above assessment, and via Section 4.38(3) of the EP&A Act, the Department is satisfied that the proposed development is permissible with consent on the project site.

### 3.3 Integrated and other approvals

27. Under Section 4.41 of the EP&A Act, a number of other approvals are integrated into the SSD approval process, and therefore are not required to be separately obtained for the project. Under Section 4.42 of the EP&A Act, a number of further approvals are required, but must be substantially consistent with any development consent for the project (e.g. approvals for any works under the *Roads Act 1993*).
28. The Department has consulted with the relevant government agencies responsible for the integrated and other approvals, including the future network operator EnergyCo NSW, considered their advice in its assessment of the project, and included suitable conditions in the recommended conditions of consent to address these matters (see **Appendix G**).

### 3.4 Commonwealth Approvals

29. On 14 October 2022, a delegate of the Australian Government Department of Climate Change, Energy, the Environment and Water (DCCEEW) determined that the project was a ‘controlled action’ under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), due to its potential impacts on threatened species and communities (see Sections 18 & 18A of the EPBC Act).
30. In its determination, the Australian Government agreed that the proposal may be assessed by the NSW Government, in accordance with the Bilateral Agreement between the NSW and Australian Governments. The Department’s Secretary issued Secretary’s Environmental Assessment Requirements (SEARs) for the project addressing matters of national environmental significance (MNES) on 21 September 2022.
31. The Department consulted with DCCEEW in accordance with the accredited assessment process and provided draft copies of this assessment report and the recommended conditions of consent to DCCEEW for comment. The Department has adopted the comments of DCCEEW within its assessment. **The Department’s assessment of impacts to MNES is provided in Section 5.4 and Appendix J.**

### 3.5 Renewable Energy Zone

32. The EII Act coordinates investment in transmission, generation, storage and firming infrastructure in NSW and gives effect to the Electricity Infrastructure Roadmap. Under Section 19 of the EII Act, the Minister for Energy may declare a renewable energy zone comprising a specified geographical area of the State, and specified generation, storage or network infrastructure.
33. This project is located in the geographical area specified in the HCC REZ declaration, which would comprise all planned, new and existing network infrastructure, with an intended network capacity of 1 gigawatt (GW).

### 3.6 Mandatory matters for consideration

34. Section 4.15 of the EP&A Act outlines the matters that a consent authority must take into consideration when determining development applications. The Department has considered all of these matters in its assessment of the project, as well as ESCO’s consideration of environmental planning instruments in its EIS, as summarised in **Section 3** of this report. The Department has also considered relevant provisions of the environmental planning instruments in **Appendix I**.

# 4 Engagement

## 4.1 Department's engagement on the EIS

35. The Department publicly exhibited the EIS from 22 August 2023 until 18 September 2023, advertised the exhibition in *The Australian* and *Hunter Valley News* and notified nearby landowners.
36. The Department consulted with Council and relevant government agencies throughout the assessment. The Department also inspected the site in April 2024, and visited a nearby landowner to further understand their concerns.
37. The Department notified and sought comment from Ausgrid and Transport for NSW (TfNSW) in accordance with the Transport and Infrastructure SEPP, as discussed further in **Section 4.3** of the report. The Department has also sought comment from EnergyCo as the future network operator of the HCC REZ, who had no comment on the project.

## 4.2 Summary of Council's submission

38. Council provided comments during exhibition of the EIS and following receipt of the Submissions Report, which included comment on matters requiring clarification and recommended conditions of consent.
39. In response to feedback from Council, ESCO provided additional information through the Submissions Report to address many of the matters raised by Council including clarification regarding construction periods and workforce and accommodation requirements, as well as addressing potential traffic, visual and biodiversity impacts.
40. Council has agreed to the general terms (as set out within Council's letter to ESCO dated 12 June 2024) proposed by ESCO for a voluntary planning agreement (VPA) should the project be approved.

## 4.3 Summary of advice received from government agencies

41. During exhibition of the EIS, the Department received advice from 14 government agencies. A summary of the agency advice is provided in **Table 4**. A link to the full copies of the advice is provided in **Appendix C**.
42. The Department also consulted with Ausgrid the current network operator, Transgrid, and the future network operator, EnergyCo NSW, who raised no concerns about the project.

Table 4 | Summary of agency advice

Agency	Advice summary
Biodiversity Conservation and Science Group within NSW DCCEE (BCS)	<p>Requested further information and revisions to the Biodiversity Development Assessment Report (BDAR), including consideration of likely risk of Serious and Irreversible Impact (SAIL), consistency with Biodiversity Assessment Method (BAM) Calculator and further information on impacts to species and survey requirements.</p> <p>ESCO updated the BDAR to address the above matters. BCS confirmed that issues raised had been adequately addressed.</p>
TfNSW	<p>Requested further information and revisions to the Traffic Impact Assessment (TIA), including further analysis of key intersections (in particular interactions with Sandy Creek Road), review of intersection treatments and traffic generation rates, provision of oversize and overmass (OSOM) vehicle routes and further information on mitigation measures required.</p> <p>ESCO provided an addendum to the TIA to provide greater consideration to the matters raised by TfNSW. This included, additional Signalised and unsignalised Intersection Design and Research Aid (traffic engineering software) (SIDRA) analysis, turn warrant assessment and further information regarding potential cumulative impacts.</p>
Heritage NSW Group within NSW DCCEE (Heritage NSW)	<p>Requested updates to the Aboriginal Cultural Heritage Assessment (ACHAR) to include landform mapping using standard classifications, provision of a figure showing the mapped extent of sites partially within and immediately adjacent to the project area, justification on the test excavation strategy used, and clarification on surveys yet to be completed, the mitigation measures proposed for various site and consultation undertaken with Registered Aboriginal Parties (RAPs)</p> <p>ESCO prepared an addendum to the ACHAR to provide greater consideration to the matters raised by Heritage NSW.</p>
Water Group within NSW DCCEE (Water Group)	<p>Requested further information on water demands and water take for the project, confirmation on availability of existing held water access licences (WALs), quantify surface water take and demonstrate the proposed diversion channel would be designed and constructed in accordance with the <i>Guidelines for Controlled Activities</i>.</p> <p>ESCO subsequently provided information regarding project water demands and water supply options, demonstrating their ability to service the site, as well as committing to provide further detail around the proposed diversion channel during detailed design of the project in consultation with Water Group.</p>
DPI Agriculture	<p>Provided comment the issued SEARs and NSW DPI Agriculture's submission to the SEARs, have been addressed.</p>
DPI Fisheries	<p>Raised no objections to the project and noted the presence of an ephemeral 4th order waterway mapped as Key Fish Habitat within the proposed footprint and therefore recommended conditions of approval.</p>
Crown Lands	<p>Satisfied that NSW <i>Crown Land Management Act 2016</i> had been addressed.</p>

Agency	Advice summary
Fire & Rescue NSW (FRNSW)	Recommended preparation of a comprehensive Emergency Plan, Emergency Services Information Package, Emergency Responders Induction Package and Fire Safety Study.
NSW Rural Fire Service (RFS)	Recommended that the recommendations in the bushfire report prepared as part of the EIS be applied in any consent granted.
Ausgrid	Noted ongoing consultation with applicant regarding the project and proposed connection point, and raised no concerns with the project.
Transgrid	Requested that detailed design of internal roads crossing existing Transgrid Easement be prepared in accordance with Transgrid Easement Guideline and provided to Transgrid prior to construction, which was agreed to by the applicant.
EnergyCo	No comments or issues raised.
Mining, Exploration and Geoscience (MEG)	No comments or issues raised.
TfNSW (Sydney Trains)	No comments or issues raised.
Subsidence Advisory NSW	Noted the project area is located within a mine subsidence district and recommended that a geotechnical report be commissioned to characterise the risk of mine subsidence to the proposed infrastructure and subsidence impacts of the project sourcing groundwater from underground mines. ESCO subsequently prepared a geotechnical report addressing the matters raised by the Subsidence Advisory. The report recommended that consideration is given to construction strategies and a monitoring program capable of confirming the magnitude and nature of any further subsidence movements be implemented. ESCO has committed to implementing these recommendations.

#### 4.4 Summary of public submissions

43. During the exhibition period of the EIS, the Department received 59 unique submissions from the public (including six interest groups), of which 54 objected to the project and 5 supported the project.
44. A summary of the proximity of public submissions is provided in **Table 5** and a link to all submissions is provided in **Appendix B**.

Table 5 | Public submissions on the EIS

Submitter distance to development footprint	Number of submissions
<5 km	22
5-100 km	1
> 100 km	30
Other*	6

\* Interstate or not specified

45. Around 37% of submissions were received from residents located within 5 km of the site, 2% were from residents located between 5 – 100 km from the site, and 60% were from residents located over 100 km from the site, interstate or not specified. Submissions on the project typically focused on either local impacts and matters related to the local community, or expressed a more general ‘anti-renewables’ sentiment.
46. The key issues raised in public submissions are summarised in **Figure 6**. The most common matters raised in submissions include the following:
- land use compatibility;
  - use of agricultural land;
  - biodiversity impacts;
  - renewables scepticism;
  - hazards including bushfire risk and risk of contamination from solar farm infrastructure;
  - impacts of decommissioning and rehabilitation;
  - property devaluation;
  - social impacts; and
  - visual impacts on the surrounding landscape, proximity to residents, effectiveness of vegetation screening and glare.
47. Other issues raised in objections included traffic, noise, air quality, cumulative impacts and adequacy of the EIS.
48. A further breakdown and summary of key issues raised by the public is summarised in **Appendix H. Section 5** of this report provides a summary of the Department’s consideration of these matters and recommended conditions.

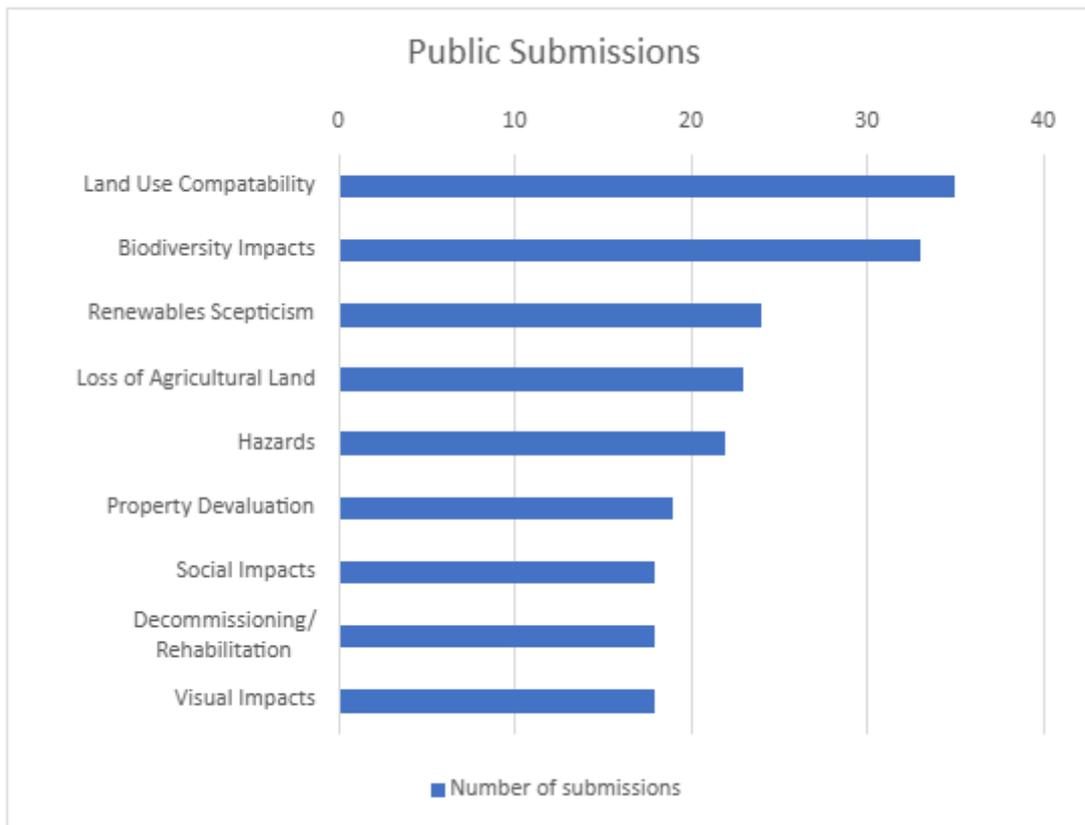


Figure 6 | Key Issues Raised in Public Submissions

## 4.5 Response to submissions

49. Following the public exhibition period, the Department asked ESCO to respond to the issues raised in submissions and the advice received from government agencies.
50. ESCO provided a Submissions Report (**Appendix D**) which was published on the NSW Major Projects Portal in March 2024, and provided additional information during the Department's assessment (see **Appendix F**).
51. The Department published the Submissions Report on the NSW planning portal and forwarded the Submissions Report to relevant government agencies for comment.

# 5 Assessment

- 52. The Department has undertaken a comprehensive assessment of the merits of the project. This report provides a detailed discussion of the key assessment matters for the project, namely energy transition, land use compatibility, traffic, biodiversity and visual impacts.
- 53. The Department has also considered the full range of potential impacts associated with the project and has included a summary of the conclusions in **Section 5.6**.

## 5.1 Energy Transition

- 54. The project aligns with a range of national and state policies (see **Section 2**), which identify the need to diversify the energy generation mix and reduce the carbon emissions intensity of the grid while providing energy security and reliability.
- 55. With a generating capacity of 135 MW, the solar farm would generate enough electricity to power about 52,310 homes. This is consistent with the NSW Climate Change Policy Framework of achieving net zero emissions by 2050.
- 56. The inclusion of a battery (135 MW / 270 MWh) would enable the project to store solar energy for dispatch to the grid outside of daylight hours and/or during peak demand, increasing grid stability and energy security. It would also power 54,000 households during peak household consumption.
- 57. The project is located in the HCC REZ, which is a declared REZ. The project would contribute to the continued growth of renewable energy generation and storage capacity in the REZ, with direct access to the transmission network and abundant solar resources.
- 58. As such, the project would play an important role in increasing renewable energy generation and capacity and contributing to the transition to a cleaner energy system as coal fired generators retire.

## 5.2 Land Use Compatibility

### 5.2.1 Provisions of the LEP

- 59. The site is located on land within the RU1 Primary Production, SP2 Infrastructure and C3 Environmental Management within the Muswellbrook LEP.

60. Under the Transport and Infrastructure SEPP, electricity generating works are permissible with consent on any land in a prescribed non-residential zone, including land zoned RU1 Primary Production and SP2 Infrastructure.
61. Although the Transport and Infrastructure SEPP does not permit electricity generating works on land zoned C3 and the Muswellbrook LEP prohibits this use on land zoned C3, Section 4.38(3) of the EP&A Act enables development consent for State significant development to be granted despite the partial prohibition. While the consent authority can override a partial prohibition for a State Significant Development, it must assess the merits of such a decision. The Department has considered the merits of the use of the C3 Environmental Management zoned land on the subject site in **Section 3.2** of this report, and is satisfied that it is an appropriate use of the land. Consequently, the project is permissible with development consent.
62. In addition, based on a broader reading of the Muswellbrook LEP, and consideration of the objectives of the RU1, SP2 and C3 zones and other strategic documents for the region, such as the Hunter Regional Plan 2036, and the Muswellbrook Local Strategic Planning Statement 2020-2040, the Department considers that there is no clear intention to prevent the development of a solar farm on the subject land.
63. It is noted that the Muswellbrook LEP expressly references the Transport and Infrastructure SEPP and acknowledges that electricity generating works are regulated by the Infrastructure SEPP, rather than the LEP. As described above, a solar farm is permitted with consent on land zoned RU1 and SP2 under the Transport and Infrastructure SEPP.
64. The project is consistent with the objectives of the relevant RU1 and SP2 zonings under the LEP, particularly by:
- providing diversity in primary industry enterprises and systems appropriate for the area;
  - minimising the fragmentation and alienation of resource lands;
  - minimising conflict between land uses within this zone and within adjoining zones;
  - protecting the agricultural potential of rural land not identified for alternative land use, and to minimise the cost to the community of providing, extending and maintaining public amenities and services;
  - providing for infrastructure and related uses; and
  - recognising existing land and enabling future development for utility undertakings and associated purposes.
65. The project is consistent with the C3 zone objectives in that it has been designed to protect and retain areas of ecological value, and by being compatible with the landscape character of the area noting the site and its immediate surrounds are primarily mining and agricultural based activities, and the proposal will improve areas of box gum woodland across the site through the

Additional and Appropriate Measures (AAM's) ESCO has committed to. The project site would also be returned to pre-development conditions. Furthermore, the Department has undertaken an assessment of the biodiversity impacts, outlined in **Section 5.4**, with both the Department and BCS satisfied that the project is unlikely to significantly impact the biodiversity values of the locality, and that the project appropriately minimises impacts to biodiversity values through project design and appropriate mitigation measures. Subject to the implementation of recommended conditions, the Department is satisfied that the proposed development would not result in a significant impact on biodiversity values, and meets the objectives of the zone C3 Zone.

66. While the Muswellbrook LGA has traditionally relied upon agriculture and mining, the introduction of solar energy generation would contribute to a more diverse local economy, thereby supporting the local economy and community. This is consistent with the Muswellbrook 2020-2040 Local Strategic Planning Statement's (MLSPS) Local Strategic Vision of becoming the State's major innovative energy centre. It is also consistent with MLSPS's following Planning Priorities:
- *Planning Priority 1 – Our Shire embraces technology and innovation*  
The planning principles that will apply when making decisions seek to encourage production and distribution of sustainable energy via renewable energy sources such as Solar, as well as the generation and distribution of energy to the region and state through adaptive reuse of existing infrastructure.
  - *Planning Priority 18 – We adapt to climate change and build climate and hazard resilience*  
The planning principles that will apply when making decisions seek to encourage renewable energy generation.
67. The proposed solar farm would encourage renewable energy development, which is consistent with key government strategic planning guidance, including the *Hunter Regional Plan 2041*, which includes an objective to **support the State's transition to net zero by 2050 and deliver the HCC REZ**. The plan identifies renewable energy generation capabilities of the region and the opportunity to leverage the HCC REZ to provide economic benefit to communities.
68. Accordingly, the Department considers that the project is compatible with each LEP Zone Objective and broader strategic planning objectives for the site.

## 5.2.2 Potential Loss of Agricultural Land

69. Thirty-nine objections received during the EIS exhibition period raised concerns about establishing a solar farm on agricultural land.
70. The project covers approximately 482 ha. The northern portion of the site and internal powerline route is dominated by former open cut mining areas, former underground mines, rehabilitated land, disused and grassed over open cut mines, and only a small amount of land that has been avoided by major mining activities. These areas now also feature even aged regrowth of vegetation and occasional use for horse agistment. The southern portion of the site is utilised for some cattle grazing.
71. No sensitive agricultural activities such as intensive plant or intensive livestock agriculture are being undertaken within the project area or its immediate surrounds. It is estimated that no intensive agricultural uses have occurred on the project site for the last 20 years, with the only remaining agricultural use being the grazing of cattle (approx. 60 head), which do not rely solely on the project area as they are rotated in and out of paddocks on the project area and adjoining land.
72. ESCO prepared a Land, Soils and Erosion Assessment, which included soil surveys verifying the Land and Soil capability, to assess the agricultural capability of the site. The assessment found that the majority of land in the project area is moderate capability land (Class 4 – covering 396.1 ha) with portions of low capability lands (Class 6 – covering 60.6 ha) and moderate to low capability lands (Class 5 – covering 25.2 ha). In addition, there is no mapped BSAL or State Significant Agricultural Land present within or surrounding the site.
73. Siting of the project has therefore avoided higher productivity agricultural land, an approach which is consistent with the Large-Scale Solar Energy Guideline's focus on identifying BSAL and land classes 1, 2 and 3 as constraints that should be considered in site selection.
74. The inherent agricultural capability of the land would not be affected by the project due to the relatively low scale of the development, and ESCO has committed to investigating the possibility for continued grazing on the subject lands and to restoring the LSC of lands disturbed through decommissioning and rehabilitation to the existing LSC. Accordingly, the Department has included requirements to maintain the site's current land capability, including ground cover within the development footprint upon completion of any construction or upgrading of the project.
75. The Department notes that neither DPI Agriculture nor Council raised concerns that the project would compromise the long-term use of the land for agricultural purposes, subject to the implementation of a recommended set of conditions which provide suggested management measures from construction to decommissioning. These recommended management

measures consider biosecurity risks, pests, weeds, soil degradation and land degradation to avoid long-term impacts associated with large-scale development of agricultural land.

76. The potential loss of a small area of grazing land in the region must be balanced against the:
  - broader strategic goals of the Commonwealth and NSW governments for the development of renewable energy into the future;
  - environmental benefits of solar energy, particularly with reducing greenhouse gas emissions;
  - economic benefits of solar energy in an area with good solar resources and capacity in the existing electricity network; and
  - benefits of dispatchable energy for grid stability and reliability.
77. Based on these considerations, the Department considers that the proposed solar farm represents an effective and compatible use of the land within the region and that the site is suitable to accommodate the development.
78. The Department considers that the development would not fragment or alienate any resource lands in the LGA and is capable of being returned to usable agricultural land following decommissioning.
79. The Department considers that the project represents an effective and compatible use of the land within the region and that the site is suitable to accommodate the development.

### 5.3 Traffic

80. Nine submissions were received during the EIS exhibition period which raised concerns about the potential traffic impacts on local roads during the construction period.
81. Initially, Council's review of the EIS noted restrictions on heavy vehicles on Sandy Creek Road during school bus hours, weight limits on the Muscle Creek Road rail bridge and safety concerns about the proposed intersection upgrade at Sandy Creek Road and the northern site entrance. TfNSW raised concerns about key intersection analyses, traffic generation rates, and oversized vehicle routing, including the need for alignment with the Muswellbrook Bypass timeline.
82. Construction of the project involves the delivery of plant, equipment and materials, including the movement of heavy vehicles requiring escort, which has the potential to impact on the local and regional road network primarily during construction.
83. In response to submissions and advice received from Council and TfNSW, ESCO prepared an addendum TIA and confirmed the EIS concept plan for the Sandy Creek Road and northern site access intersection had been designed to meet relevant requirements of a Basic Right Turn (BAR) intersection upgrade.

84. The addendum TIA included additional SIDRA analysis and turn warrant assessment for the New England Highway and Sandy Creek Road intersection. ESCO has also committed to implementing a suite of traffic management and mitigation measures to minimise potential for conflict at the New England Highway and Sandy Creek Road intersection. These mitigation measures have been included as recommended conditions of consent.
85. TfNSW and Council have confirmed the matters they raised have been addressed and have no further concerns.

### 5.3.1 Traffic routes and site access

86. Most of the components of the project would be transported from either Port of Newcastle or Port Botany. The haulage route for the project is via the National Highway M31, Pacific Motorway M1, New England Highway, Sandy Creek Road and Muscle Creek Road.
87. All vehicles associated with the project would either access the northern site access point on Sandy Creek Road, located in the north western corner of the site or would access the southern site access point on Muscle Creek Road, located in the southernmost point of the site.
88. Sandy Creek Road is currently only approved for 19 m B-doubles, and B-doubles are currently not permitted on Sandy Creek Road between 7:30 am – 8:30 am and 3:45 pm – 4:45 pm on school days. To ensure no conflict with vehicles during the school peak hours, ESCO has committed to no movements entirely (light or heavy) during this period.
89. TfNSW and Council both noted that heavy vehicles would not be able to turn left onto Sandy Creek from New England Highway due to insufficient space on the existing shoulder of the road. Accordingly, ESCO has committed to have heavy vehicles enter Sandy Creek Road by turning right from the New England Highway only, and exit Sandy Creek Road by turning left only, which has been included as a condition of consent.
90. TfNSW and Council also raised concerns around the safety of vehicles turning right onto Sandy Creek Road as there is a rail line crossing along Sandy Creek Road approximately 40 metres from the intersection, and vehicles could be held up and queue onto the highway if there is a train passing. In response to the concerns, ESCO undertook additional analysis including swept path diagrams to show the design vehicle moving through the intersection, and SIDRA analysis to examine the queue lengths at the intersection.
91. The SIDRA analysis showed that by committing to use shuttle buses to access the north of the site, ESCO could reduce the number of vehicles required during peak hour to an amount (2 heavy vehicle movements, 2 shuttle buses and 10 light vehicle movements) which would not cause queue lengths to be exceeded at the intersection, which was included as a condition of consent. This analysis was accepted by Council and TfNSW who also requested a protocol be

implemented as part of the TMP to manage heavy vehicle movements at the intersection, which has been included as a condition of consent.

92. Importantly, the intersection is already set for upgrade in the future as part of the approved Muswellbrook Bypass – New England Highway project. The peak construction period of the project is likely to only be 2 months in duration, which further reduces the impact of the small number of additional movements.
93. Council noted an existing weight restriction on Muscle Creek Road rail bridge. ESCO has committed to obtaining the relevant National Heavy Vehicle Regulator approvals prior to any OSOM vehicles using Muscle Creek Road. Council has accepted this approach and the Department has recommended a condition of consent that requires this commitment be fulfilled. Neither Council nor TfNSW raised any further matters regarding the southern site access.

### 5.3.2 Traffic volumes

94. The main increase in project related traffic would occur during the 31-month construction with peak periods of construction predicted to occur for a duration of 2 months in approximately Q4 2025 for the solar farm construction and approximately Q2 2027 for the BESS construction.
95. The estimated peak daily vehicle movements during construction would be up to 92 heavy vehicles and 177 light vehicles. Of the peak hourly construction traffic vehicle movements, approximately 80% would travel to the southern section of the site via Muscle Creek Road and 20% of vehicles would travel to the northern section of the site via Sandy Creek Road. Each peak hour would have a maximum of 11 heavy vehicle movements and 2 shuttle buses (4 movements via Sandy Creek Road and 9 movements via Muscle Creek Road).
96. While vehicle movements have been assessed during the network peak hours, construction vehicles would not use Sandy Creek Road from 7:30 am to 8:30 am and 3:45 pm to 4:45 pm during the school term.
97. There would be up to four movements of heavy vehicles requiring escort during construction of the project. As construction activities would be restricted to daytime hours, construction related vehicles would be using Sandy Creek Road and Muscle Creek Road during the day only.
98. Traffic generation during operations would be significantly less than the construction phase (i.e. up to 6 light vehicles per day would be required during operations, with heavy vehicles only occasionally required for replacing larger components of project infrastructure).

### 5.3.3 Road upgrades and maintenance

99. TfNSW and Council commented on the proposed transport route, which has resulted in revisions to the proposed mitigation measures and conditions to support the traffic associated with the project.
100. A turn treatment warrant assessment was undertaken in accordance with *Austroads Guide to Traffic Management*. The assessment identified the need for an upgrade of the Sandy Creek Road and the northern access road intersection to allow for a basic right turn treatment to cater for heavy vehicles accessing the northern section of the project area. This has been committed to by ESCO and included as a condition of consent.
101. A swept path assessment has been undertaken for the OSOM vehicles that would transport the transformer from Glen Waverley, Victoria to the project site's southern access road on Muscle Creek Road. The assessment has determined the proposed OSOM haulage route is satisfactory, with some parking and road infrastructure needing to be temporarily removed at Bettington Street/Vennacher Street, Merriwa. ESCO has consulted with Upper Hunter Shire Council on the potential need for temporary works post-consent to accommodate the swept path. In addition, a permit from the National Heavy Vehicle Regulator (NHVR) would be sought to allow OSOM vehicles to the southern site access from the port of origin.
102. Following the receipt of additional information from ESCO, TfNSW had no further comments on the traffic impacts of the proposal and provided feedback on the conditions of consent.

### 5.3.4 Cumulative impacts

103. There are a number of approved or proposed state significant projects within the region. ESCO's assessment considered that the greatest potential for cumulative impacts with the proposal are associated with construction of the Muswellbrook Bypass and the Muswellbrook BESS, which have the potential to have construction periods which could overlap with the project.

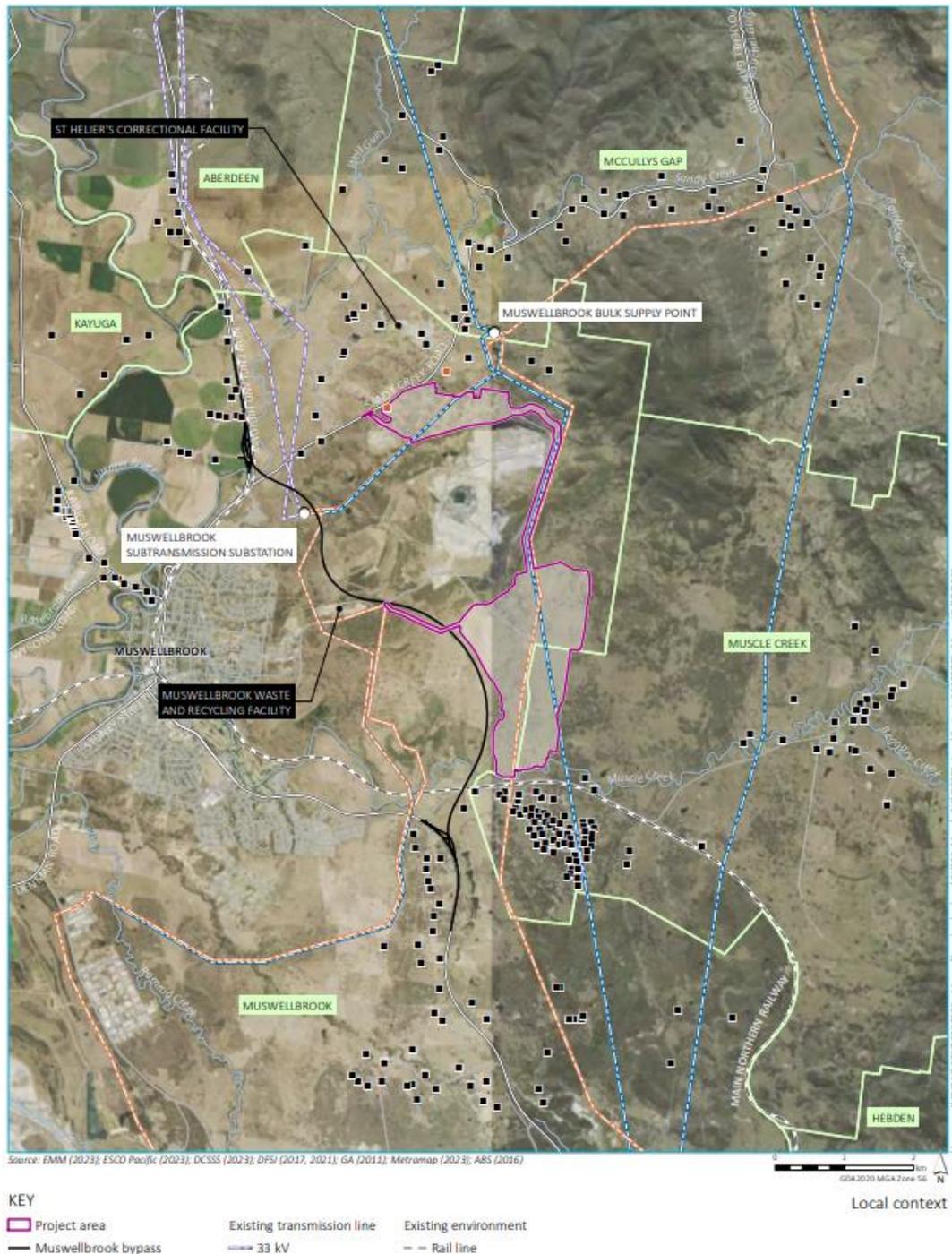


Figure 7 | Approved Muswellbrook Bypass location

104. ESCO's cumulative assessment noted that these projects require heavy vehicle movements during construction and would use the New England Highway, Muscle Creek Road and Sandy Creek Road. The intersection analysis of key intersections in Muswellbrook and the midblock capacity of Muscle Creek Road and Sandy Creek Road indicates that there would not be significant impacts to these intersections and roads as a result of construction traffic. TfNSW and Council had no residual concerns regarding cumulative traffic impacts.

105. For these reasons, the Department considers that there would be no material cumulative traffic impacts on the State or local road network as a result of the project. Notwithstanding, the Department has included a requirement in the Traffic Management Plan to minimise potential cumulative traffic impacts.

### 5.3.5 Recommended conditions

106. The Department has recommended conditions of consent requiring ESCO to:

- undertake the relevant road upgrades prior to the commencement of construction;
- restrict project related vehicles to the use of the approved access route only;
- restrict the number of vehicles during construction, upgrading and decommissioning to the peak volumes identified in the EIS;
- restrict construction vehicle movements between 7.30 am to 8.30 am and 3.45 pm to 4.45 pm during NSW school terms;
- ensure the length of vehicles (excluding heavy vehicles requiring escort) does not exceed 19 m for Sandy Creek Road and 26m for Muscle Creek Road; and
- prepare and implement a TMP in consultation with TfNSW and Council, including a protocol to manage left and right turns at the New England Highway/Sandy Creek Road intersection, provisions for dilapidation surveys, and details of the measures that would be implemented to address road safety.

107. Subject to the recommended conditions, the Department, TfNSW and Council are satisfied that the project would not result in significant impacts on road network capacity, efficiency or safety.

## 5.4 Biodiversity

108. The project has the potential to impact biodiversity through the clearing of native vegetation.

109. The southern area of the site is predominantly comprised of degraded native grasslands and modified pastures with widely scattered remnant paddock trees. The northern area predominantly comprises regenerating even-aged regrowth Ironbark with occasional mature trees, sparsely scattered shrubs and degraded native grasslands.

110. Public submissions expressed concerns about the biodiversity impacts on the threatened species present on site. These issues are discussed further below.

111. A BDAR was prepared for the project under the Biodiversity Conservation Act (BC Act) and BAM, with a revised BDAR prepared in response to matters raised by BCS, including on potential Significant and Irreversible Impacts (SAII), BAM-C amendments, the need for further information

on impacts to species and survey requirements. The revised BDAR was reviewed and accepted by BCS, who advised that all their residual concerns on the project had been resolved.

112. The Department notes that ESCO has proposed additional and appropriate measures to minimise the risk of SAll for Box Gum Woodland, which were accepted by BCS. The Department has also imposed strict clearing limits on the clearing of native vegetation in the recommended conditions.

#### 5.4.1 Avoidance and mitigation

113. ESCO has generally focused on avoidance of impacts through site selection and avoidance of higher quality native vegetation, including intact woodland areas and habitat during the preliminary design process for the project. This is consistent with the Large-Scale Solar Energy Guideline's focus on avoiding or minimising impacts during site selection and design.
114. ESCO has designed the project to avoid and minimise impacts on high quality vegetation and habitat, including:
- avoidance of higher quality vegetation to maintain connectivity where possible;
  - locating the project in areas where the native vegetation or threatened species habitat is in the poorest condition;
  - having regard to **species' biodiversity risk weighting as a means of locating the project in areas that avoid habitat for species and vegetation in high threat categories (e.g. an endangered ecological community (EEC) or critically endangered ecological community (CEEC));**
  - locating the project such that connectivity enabling movement of species and genetic material between areas of adjacent or nearby habitat is maintained;
  - further refining the solar panel array layout in the southern portion of the development footprint during the assessment process, to avoid 5.5 ha of impacts to Box Gum Woodland (zone 4 & 5); and
  - committing to the implementation of additional and appropriate measures to offset SAll.

#### 5.4.2 Native Vegetation

115. The project would affect approximately 310 ha of native vegetation, distributed among several ecological communities, with varying conservation statuses and conditions.
- **PCT 1691 (125.2 ha):** This ecological community is classified as Narrow-leaved Ironbark - Grey Box grassy woodland, predominantly found in the central and upper Hunter region. Under the BC Act areas of PCT 1691 classified as 'Moderate' and 'Low' condition are

recognised as Endangered. Around 10.7 ha of this plant community type (PCT) meets the threshold for offsetting under the BC Act, whereas 114.5 ha of this PCT is of a condition that does not require offsetting. Under the EPBC Act, 10.7 ha of this type meets the critically endangered threshold.

- **PCT 281 (113 ha):** This area consists of Rough-Barked Apple - Red Gum - Yellow Box woodland located on alluvial clay to loam soils in valley flats. It is listed as Critically Endangered under the BC Act and the EPBC Act, falling within the White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland category. The condition of this PCT varies across three zones: 'Low' (scattered paddock trees), 'derived native grassland (DNG) regeneration', and 'DNG - Low'. Around 56 ha of this PCT meets the threshold for offsetting under the BC Act (comprising 7.5 ha of low condition woodland and 48.5 ha of DNG regeneration), whereas 57 ha of this PCT is of a condition that does not require offsetting. Under the EPBC Act, 56 ha of this PCT meets the critically endangered threshold.
- **PCT 1603 (71.3 ha):** This community features Narrow-leaved Ironbark - Bull Oak - Grey Box shrub-grass open forest. It is listed as Endangered under the BC Act. Within this PCT, 24.4 ha meet the condition threshold under the BC Act that necessitates offsetting, while 47 ha of this PCT is of a condition that does not require offsetting. While the PCT is recognised as critically endangered under the EPBC Act, the PCT on site does not fulfill the EPBC Act criteria.
- **PCT 1607 (1.1 ha):** This Blakely's Red Gum - Narrow-leaved Ironbark - Rough-barked Apple shrubby woodland, though not formally recognised as a threatened ecological community (TEC) in the BioNet Vegetation Classification, aligns with the Central Hunter Grey Box - Ironbark Woodland category. It is Endangered under the BC Act and critically endangered under the EPBC Act. A precautionary approach has been applied due to its species assemblage and location, despite the dominant species not being listed in each respective TEC. Under this approach, all PCT 1607 meets the threshold under both the BC Act and EPBC Act.

116. **Table 6** provides a summary of the impacts of the project, and the relevant ecosystem credit liability under the NSW Biodiversity Offset Scheme.

Table 6 | Ecosystem Credits

Plant Community Types (PCT)	Condition	Conservation Status		Disturbance Area (ha)	Ecosystem Credits Required
		BC Act	EPBC		
281 - Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion	Low	CEEC	CEEC (in part)	7.5	275
	DNG - Regeneration	CEEC	CEEC (in part)	48.5	479
	DNG - Low	CEEC	Not Listed	57	0
1691 - Narrow-leaved Ironbark - Grey Box grassy woodland of the central and upper Hunter	Moderate	EEC	CEEC	1	25
	Low	EEC	CEEC (in part)	9.7	207
	Degraded Native Pasture	Not Listed	Not Listed	114.5	0
1603 - Narrow-leaved Ironbark - Bull Oak - Grey Box shrub - grass open forest of the central and lower Hunter	Moderate	EEC	CEEC (In part)	24.4	622
	Degraded Native Grassland	Not Listed	Not Listed	47	0
1607 - Blakely's Red Gum - Narrow-leaved Ironbark - Rough-barked Apple shrubby woodland of the upper Hunter	Moderate	CEEC	CEEC	1.1	21
<b>Total</b>				310.7	1,629

### 5.4.3 Threatened Flora and Fauna Species

117. The project has the potential to affect flora and fauna species listed in the BC Act and EPBC Act through direct habitat loss from vegetation clearing, and from indirect impacts.

#### Ecosystem Credit Species

118. Direct impacts resulting from the development footprint could include loss of habitat for 33 threatened species identified or predicted to occur as ecosystem credit species.

119. Seven species were detected within the site during field surveys (Speckled Warbler, Varied Sittella, Diamond Firetail, Grey-crowned Babbler, Eastern False Pipistrelle, Large bent-winged bat, and Grey-headed flying fox).
120. Potential impacts on these species would be offset via the ecosystem credit offsets detailed in **Table 6**.

Species Credit Species

121. Of the candidate species which were the subject of targeted threatened species surveys, only seven species were recorded within the development footprint. **Table 7** details the conservation significance and the species credit liability for these species.

Table 7 | Species Credit Species

Species Impacts	Occurrence on site	Conservation Status		Species Credits Required
		BC Act	EPBC Act	
Pine Donkey Orchid population in the Muswellbrook local government area ( <i>Diuris tricolor</i> – endangered population)	Present	Endangered Population	Not listed	278
<i>Cymbidium canaliculatum</i> population in the Hunter Catchment ( <i>Cymbidium canaliculatum</i> -endangered population)	Present	Endangered population	Not listed	2
Large-eared pied bat ( <i>Chalinolobus dwyeri</i> )	Present	Vulnerable	Vulnerable	111
Southern Myotis ( <i>Myotis Macropus</i> )	Present	Vulnerable	Not listed	159
Brush-tailed Phascogale ( <i>Phascogale tapaotafa</i> )	Present	Vulnerable	Not listed	452
Squirrel glider ( <i>Petaurus norfolcensis</i> )	Present	Vulnerable	Not listed	829
Hunter Valley Delma ( <i>Delma vescolineata</i> )*	Present (assessed as <i>Delma impar</i> for the purposes of Biodiversity Credits)	Vulnerable	Vulnerable	656
<b>Total</b>				<b>2487</b>

#### 5.4.4 Serious and Irreversible Impacts

122. Through its assessment, ESCO determined the project has candidate SAI values, with the White Box- Box Gum Woodland TEC considered a SAI entity, and the Large-eared pied bat also considered a species credit species at risk of SAI.
123. The project would impact up to 113 ha of Box Gum woodland CEEC, and 3.2 ha of Large-eared Pied Bat habitat (foraging habitat) which are SAI candidate entities.
124. The Department has considered the principles for determining SAI in its assessment, as set out in clause 6.7 of the *Biodiversity Conservation Regulation 2017*, including the *Guidance to assist a decision-maker to determine a serious and irreversible impact*.
125. The development footprint was refined to avoid a further 5.5 ha of the extent of the Box Gum Woodland CEEC (118 ha down to 113 ha). The placement of the development footprint has centred around the area of lowest biodiversity value (degraded native pastures and degraded native grassland) that have had the highest historic grazing pressures, and aimed to minimise impacts to CEEC and species habitat by avoiding higher quality, more intact remaining vegetation surrounding the development footprint.
126. The Department considers the project would not contribute to further decline of the ecological community (Principle 1) and would not materially reduce the population size (Principle 2), noting that the community is widespread across several bioregions across NSW. The Department considers Principles 3 and 4 are not applicable when determining whether the impacts on Box Gum Woodland would result in serious and irreversible impacts. Accordingly, these principles require no further assessment.
127. The Large-eared Pied Bat species is listed as being at risk of SAI due to breeding habitat associated with it being irreplaceable (Principle 4). Noting that surveys identified no breeding habitat, and 3.2 ha of foraging habitat associated with 2 km buffers is proposed to be impacted, the Department considers the project would not impact any breeding habitat (Principle 4).
128. BCS provided advice in their letter dated 21 June 2024 recommending that it would be appropriate for a consent authority to include additional and appropriate measures given the SAI on the Box Gum Woodland species.
129. ESCO has committed to AAMs via one of two options. The first and preferred option is to secure an additional 17 ha of Box Gum Woodland (treed woodland), 12.8 ha of DNG – comprising regeneration and 3.2 ha of DNG (no regeneration), with the commitment to undertake active restoration plantings, totalling an AAM site of 33 ha.
130. If, however, this cannot be secured, ESCO has committed to secure 17 ha of Box Gum Woodland (treed woodland), and 84.16 ha of DNG, comprising both DNG-regen and DNG areas (totalling

101.6 ha). This equates to a total of 101.16 ha, which falls just short (11.4 ha) of the requested 113 ha. BCS supports the approach set out above (and within ESCO's letter dated 25 June 2024) if the nominated AAM area cannot be secured. Given that the VI score of the woodland proposed to be included in the AAMs area has a higher VI score (78.7) and is therefore of better quality than that proposed to be impacted, the management of 17 ha of Moderate condition woodland is considered to fulfil the requirements of the AAMs outcome sought by BCS.

131. The Department and BCS consider that the impacts of the proposed development on SAI entities can be adequately minimised through the proposed additional and appropriate measures. Accordingly, the Department has included the agreed additional and appropriate measures committed to by ESCO as a condition of consent in the recommended conditions.

#### Box Gum Woodland

132. The Department notes that in 2006, the Threatened Species Scientific Committee estimated that the extent of Box Gum Woodland was 250,729 ha, and the Committee's more recent 2020 advice also refers to that figure. Based on that figure, recent assessments (including the BDAR for the Central West Orana REZ Transmission line) estimate that current extent would now be 234,694 ha when combined with estimated annual losses since then.
133. There is also a more recent Commonwealth Conservation Advice (AG DCCEEW, 2023), however it is not directly relevant and more conservative, as it is aimed at protecting higher condition remnants listed under the EPBC Act, and it excludes many areas that are included in the NSW listing under the BC Act.
134. The Department understands that many ecologists consider that the numbers derived from 2006 are out-of-date and likely to substantially underestimate the actual extent of Box Gum Woodland, as listed in NSW. Using the recent State-wide Vegetation Type Map (SVTM) released in 2022, there have been numerous efforts to provide a more up-to-date and accurate estimate of the extent of Box Gum Woodland under the NSW listing.
135. In particular, Dr Col Driscoll recently provided relevant information in relation to the Moolarben Coal Project, which is based on the recent NSW SVTM and estimates that the "there is approximately 1,788,703 ha of extant Box-Gum Woodland CEEC within the SVTM in woodland form". Dr Driscoll also estimated that there is approximately 5,315,040 ha of DNG form, which results in a total of 7,103,743 ha of Box Gum Woodland in NSW. The project would impact up to 113 ha of Box Gum Woodland, which includes approximately 7.5 ha of low condition woodland, and 105.5 ha of DNG, including 57.5 ha of 'DNG-Low' with a Vegetation Integrity score less than 15 that does not trigger a requirement for offsetting under the BAM.
136. As Box Gum Woodland is listed on the basis of 'population size' and 'rate of decline', it is particularly relevant to consider the project's potential impacts on Box Gum Woodland against

the total area remaining in NSW. While the Department considers the estimates of total area based on the recent SVTM are likely to be more appropriate for the NSW listing, it has also considered the updated 2006 figure for comparative purposes. Using the updated estimate from the 2006 Final Determination and Dr Driscoll's estimate, the project would represent an impact of 0.048%, or 0.0016% of the total remaining area in NSW, respectively.

137. The Department considers that it would be very difficult to conclude that an impact in the 0.0016%, or 0.048% range is likely to contribute significantly to the extinction of Box Gum Woodland.
138. It is important to note that ESCO has offered additional measures to minimise the impacts on Box Gum Woodland, which involves securing a conservation site of 33 ha (in addition to the relevant credit obligations). Consequently, the Department is satisfied that the project's impacts would not contribute significantly to the risk of extinction, and would not constitute SAI.

#### Large-eared Pied Bat

139. Female bats give birth and form nursery colonies at maternity sites (also known as 'maternity roosts' or 'maternity camps'). The features of suitable maternity roosts for the Large-eared Pied Bat (e.g. caves in scarps, cliffs and rock overhangs as well as disused mines) cannot be re-created and are considered irreplaceable.
140. For that reason, the relevant SAI principle for this species is the lack of responsiveness to measures to improve its habitat and vegetation integrity (Principle 4). This is a relatively unique principle that only applies to 18 fauna species on the list of 401 potential SAI species, most of which are bats and frogs that have specific, relatively unusual habitats.
141. As described in the 2021 BAM Guide for 'Species credit threatened bats and their habitats', any potential SAI for this species is related to impacts to its breeding habitat. This requires a particular focus on any impacts to the irreplaceable aspect of the habitat, which is the physical structures containing the maternity roosts (e.g. caves and cliffs).
142. For this project, potential breeding structures, including farm sheds and one abandoned dwelling, are present within the development footprint. Each of these structures were subject to additional survey effort (roost surveys and habitat suitability assessment), and no evidence of breeding was recorded at any of them. As the Large-eared pied bat was recorded through ultrasonic detectors, an assessment of potential breeding habitat was undertaken. Accordingly, a species polygon was mapped for the species' associated foraging habitat, with the identified 3.2 ha of foraging habitat set to be impacted upon proposed to be offset per the BAM. Importantly, it was determined that no breeding habitat would be impacted by the proposed development, which is the focus of the SAI Principle 4. Consequently, the Department considers

that the project's impacts would not contribute significantly to the risk of extinction of these species, and would not constitute SAll.

#### 5.4.5 Significant impacts on Commonwealth-listed species and communities

143. ESCO identified and addressed all threatened species and communities included in the Commonwealth Referral Decision (EPBC 2022/09303) (Referral Decision).
144. Assessments of significance were undertaken for threatened species and communities that were recorded during field surveys or were identified as having a moderate or higher potential to occur within the project area, including two threatened ecological community and 15 threatened fauna species, noting that no threatened flora species were considered likely to occur.
145. Assessments of significance concluded that the project has the potential to significantly impact two threatened ecological community (White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland and Central *Hunter Valley eucalypt forest and woodland*) and four threatened fauna species (Regent Honeyeater, Hunter Valley Delma, Grey-headed Flying Fox and Koala).
146. The Department considered Commonwealth matters in consultation with BCS and the Commonwealth DCCEEW, including consideration of ESCO's assessments of significance. DCCEEW provided feedback on the assessment package which has been adopted.
147. A summary of this assessment is provided in **Appendix J**.

#### 5.4.6 Biodiversity offsets

148. ESCO has committed to delivering a biodiversity offset strategy that appropriately compensates for the unavoidable loss of ecological values as a result of the project. The biodiversity offset strategy for the project consists of the following:
  - establishment of 33 ha AAM area/1:1 ratio or 113 ha of Box Gum Woodland (7.5 ha woodland and 105.5 ha of native grassland);
  - retirement of 2,487 species credits; and
  - retirement of 1,629 ecosystem credits.
149. Regarding the *Delma vescolineata*, the Department notes that during the time of assessment, the *vescolineata* was not recognised under NSW legislation and as such biodiversity credits could not be generated for it.
150. ESCO intends to offset their credit liability for the species through credits generated from a nearby site which contains the *vescolineata*.

151. The Department notes that ESCO and BCS/the Assurance and Biodiversity Stewardship Branch have agreed that while “*Delma vescolineata* is not legally recognised, all occurrences within the *Delma impar* species complex are to be identified and assessed as *Delma impar* for NSW planning matters until a formal assessment has been completed” and that BCS “would support all occurrences within the *Delma impar* species complex being assessed as *Delma impar* for the purposes of preparing the BSSAR, the associated BAM\_C calculations and species polygons”. Accordingly, the Department has prepared recommended conditions of consent which reflect this, with the offset obligation generated for the *Delma impar*.

#### 5.4.7 Recommended Conditions

152. The Department has recommended ESCO retire the ecosystem and species credits outlined in **Table 6**, and **Table 7** in accordance with the NSW Biodiversity Offsets Scheme prior to carrying out any development that could directly or indirectly impact the biodiversity values requiring offset.

153. Further, the Department has recommended conditions requiring ESCO to prepare and implement a Biodiversity Management Plan which would include a description of measures undertaken to:

- avoid the disturbance of native vegetation or fauna habitat located outside the development footprint;
- implement clearing and operational management protocols;
- minimise clearing and avoiding unnecessary disturbance of vegetation that is associated with the construction and operation of the development;
- avoid and minimise impacts on potential SAI entities and provide minimisation measures for these entities to mitigate harm to Box Gum Woodland and the Large-eared Pied Bat;
- minimise the impacts to fauna on site and implement fauna management protocols;
- rehabilitate and restore temporary disturbance areas and maximise the salvage of resources within the approved disturbance area for beneficial reuse (such as fauna habitat enhancement) during the rehabilitation and restoration of the project;
- prepare and implement an incidental threatened species finds protocol to avoid and/or minimise and/or offset options to be implemented if additional threatened species are discovered on the site;
- controls weeds; and
- provide a detailed program to monitor and report on the effectiveness of these measures.

154. With these measures, BCS have advised that they are satisfied that all issues they had raised during the assessment previously had been adequately addressed. Accordingly, the Department

considers that the project is unlikely to significantly impact the biodiversity values of the locality.

155. Overall, the Department considers the project appropriately minimises impacts to biodiversity values through project design and appropriate mitigation measures, and, subject to the implementation of recommended conditions, would not result in a significant impact on biodiversity values, including no serious or irreversible impacts.

## 5.5 Visual

156. Eighteen submissions were received during the EIS exhibition period that raised concerns about visual impacts, including several nearby residences. These concerns included potential impacts on the visual landscape and scenic quality of the region, as well as glint and glare impacts.
157. ESCO provided a Landscape and Visual Impact Assessment (LVIA) with the EIS, as well as two addendums to the LVIA. The first LVIA addendum was provided at the Response to Submissions stage following feedback received from the public through submissions. This first addendum assessed visual impacts on properties along Babler Crescent following clearing of vegetation which had previously provided screening. The second LVIA addendum has been provided to assess additional representative viewpoints, and provides an updated assessment of viewpoints in accordance with the Large-Scale Solar Energy Guideline 2022 technical supplement – *Landscape and Visual Impact Assessment*.
158. The Department visited the site and nearby non-associated residences to assess visual impacts **and to further understand residents' concerns**.
159. The Department assessed the proposed development against the provisions of the Large-Scale Solar Energy Guideline (2022) and accompanying *Technical Supplement - Landscape and Visual Impact Assessment*, which provides a detailed description of the landscape character and visual impact assessment process for large-scale solar energy development in NSW.

### 5.5.1 Visual context

160. The site is located adjacent to and within the existing Muswellbrook Coal Company site and surrounds the remaining coal mine infrastructure and remaining open cut pits.
161. The area immediately surrounding the site contains rural residences and properties used for grazing, as well as environmental conservation land. The Muswellbrook township is located approximately 2.5 km west of the project.
162. The Woodland Ridge large lot residential estate is located south of the project beyond Muscle Creek Road and the Mian Northern Railway line. The estate comprises 91 residences, the closest of which is located 205 m from the project boundary (R7). It is noted that there are 128 non-

associated residences located within 2 km of the development footprint, the vast majority of which are located within Woodland Ridge estate (see Figure 8 below).

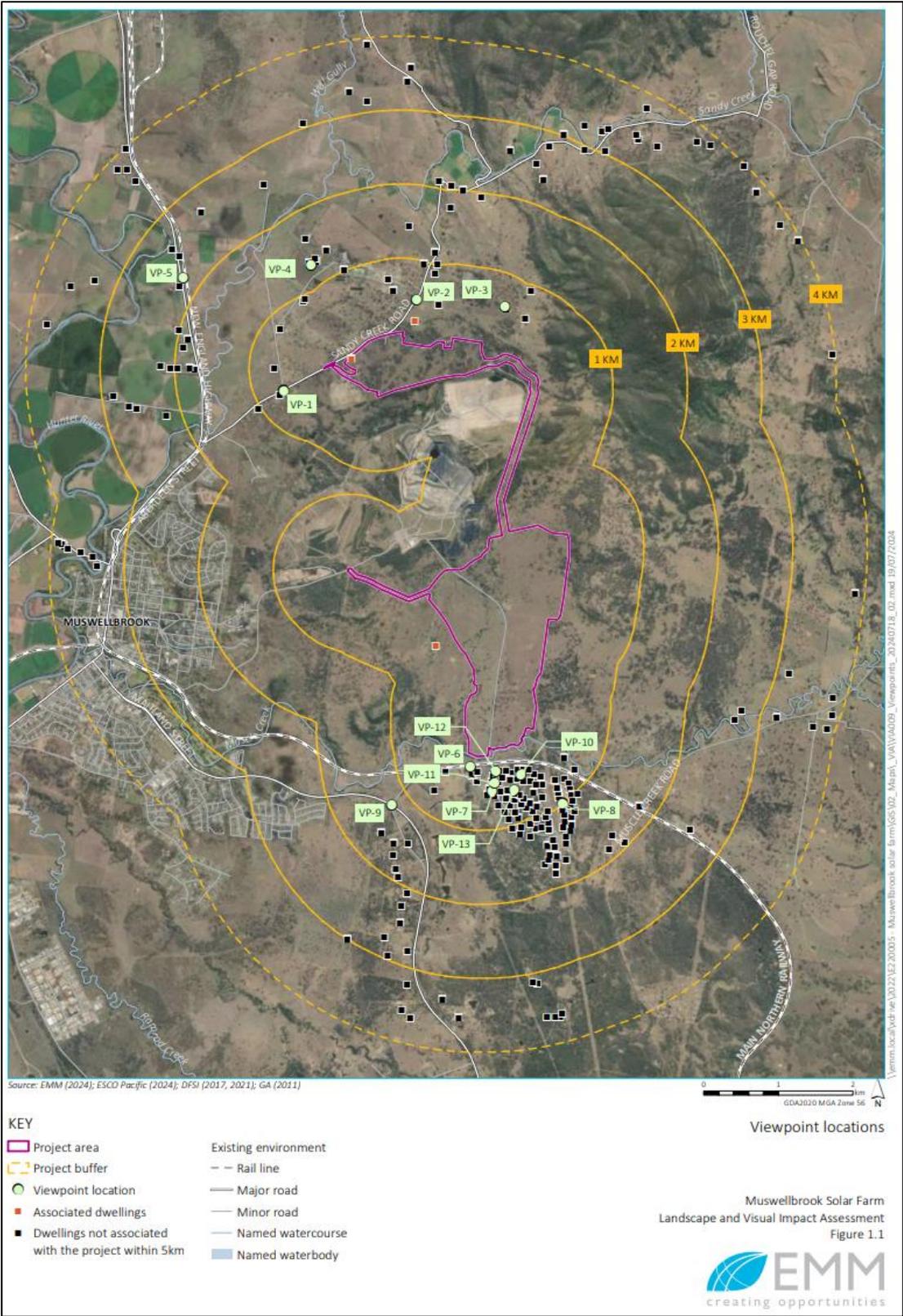


Figure 8 | Nearby Residences

### 5.5.2 Visual mitigation

163. The original project layout submitted at the EIS stage was developed in consideration of potential visual impacts, taking advantage of existing site topography and surrounding vegetative screening.
164. Mitigation measures were introduced at the EIS stage, primarily involving siting of specific elements of the project to minimise visibility and preservation of key vegetative screening. These mitigation measures were then further developed at the Submissions Report stage through the retention of additional roadside vegetation in the form of an exclusion area at the southern access to the site. ESCO has also proposed additional mitigation measures including solar array backtracking adjustments to account for the future Muswellbrook Bypass following consultation with TfNSW.
165. All residential receivers have been assessed against the *2022 Large Scale Solar Energy Guideline's Technical Supplement – Landscape and Visual Impact Assessment*. No non-associated residences were identified as experiencing moderate visual impacts. Accordingly, no further mitigation measures beyond those which informed the development footprint layout have been proposed to mitigate impacts on specific potential receivers.

### 5.5.3 Assessment

166. The Department has assessed the potential visual impacts of the project on the surrounding landscape character, residential receivers and public viewpoints and considers these impacts would be low. Further details of the Department's assessment are discussed in the following sections.
167. The Department considers site selection and project design is consistent with the Department's Large-Scale Solar Energy Guideline, particularly in avoiding sites with high visibility such as those on prominent or high ground positions.

#### *Landscape*

168. Public submissions highlight that the rural landscape is valued by the community for its scenic character. However, the Department notes that the land uses within the site and in its immediate surrounds are primarily mining and agricultural, with the project straddling an open cut mine (solar arrays proposed to the north and south of the mine operation). The Department also notes that the site topography and existing vegetation screening would minimise views of the project from the surrounding area. Impacts on the local landscape have also been reduced through project design, including a reduction in the development footprint.

169. The Department considers the development would have a limited impact beyond the project's immediate vicinity. Accordingly, the Department considers the project would have a limited impact on the broader landscape character of the area as a whole.

### *Residences*

170. Due to the topography and existing vegetation on and immediately surrounding the site, the visibility of the project to nearby residences would be low.

171. The Department also notes that visibility from surrounding residences would be minimised due to the proposed solar panels being low lying (up to 4 m high), and the BESS and substation being centrally located towards the middle of the site with low visibility.

172. Of the 128 non-associated residences located within 2 km of the development footprint, the visual assessment undertaken by ESCO concluded that no residences would experience moderate or high visual impacts, with all non-associated residences to experience, low, very low or nil visual impacts when assessed against the 2022 Large Scale Solar Energy Guideline Technical Supplement.

173. A summary of the visual impact assessment for all residences located within 1 km of the development footprint is provided in **Table 8** below.

174. The Department considers that both the direct and cumulative visual impacts on all potentially affected residences would be low, very low or nil, due to the separation distance, the undulating topography of land surrounding the site and intervening existing vegetation.

175. The Department has assessed the potential cumulative visual impacts from other renewables projects in the region. The approved Muswellbrook BESS and proposed Muswellbrook Pumped Hydro project are located approximately 1.5 km west and east of the development site respectively. The Maxwell Solar Farm (approved) is 6 km south, Upper Hunter BESS (proposed) is 7 km north, and Bowmans Creek Wind Farm (BCWF) (approved) is 8 km to the east. The Department considers that there is potential for low cumulative visual impacts with the BCWF due to distance, topography and intervening vegetation. There are no cumulative visual impacts anticipated with the approved Maxwell Solar farm. The further proposed SSD renewable projects in the vicinity, being the Muswellbrook Pumped Hydro project and Upper Hunter BESS, are at early stages of the assessment process and would be required to undertake a full assessment of cumulative impacts against the Muswellbrook Solar Farm, per the Cumulative Impact Assessment Guidelines for State Significant Projects.

Table 8 | Summary of visual impacts to non-associated residences

Residence ID and distance from development footprint	ESCO's visual impact rating	Department's assessment
R21, R8, R7, R9, R97, R96, R10, R99, R98, R286, (205 m - 449 m)	Low	<ul style="list-style-type: none"> <li>Intervening existing vegetation along Muscle Creek and topography of the site and intervening topography would limit views of the project, resulting in low visual impacts.</li> </ul>
R2 (487 m)	Low	<ul style="list-style-type: none"> <li>Topography and existing vegetation along Sandy Creek Road and waterways would screen the project infrastructure, resulting in low visual impacts.</li> </ul>
R287, R288, R289, R296, R298 (300 m - 365 m)	Low	<ul style="list-style-type: none"> <li>Existing vegetation along Muscle Creek Road and Muscle Creek, and between each respective property and the site, would screen the project infrastructure, resulting in low visual impacts.</li> </ul>
R299, R291, R292, R293 (370 m - 495 m)	Low	<ul style="list-style-type: none"> <li>Existing vegetation along Muscle Creek Road, Babblers Crescent, and Muscle Creek would screen the project infrastructure, resulting in low visual impacts.</li> </ul>
R22, R11, R12, R13, R14, R15, R16, R17, R18, R19, R20 (500 m - 776 m)	Low	<ul style="list-style-type: none"> <li>Topography and existing vegetation along Muscle Creek would screen the project infrastructure, resulting in low visual impacts.</li> </ul>
R100 - R111, R113, R114 (501 m - 960 m)	Low	<ul style="list-style-type: none"> <li>Topography and existing vegetation along Muscle Creek Road and Muscle Creek would screen the project infrastructure, resulting in low visual impacts.</li> </ul>
R285 (624 m)	Low	<ul style="list-style-type: none"> <li>Topography and existing vegetation along Muscle Creek Road and Muscle Creek and would screen the project infrastructure, resulting in a low visual impact.</li> <li>*BCWF, located ~8km east of the receiver, would result in negligible visual impact, resulting in a low level of cumulative visual impacts for this receiver.</li> </ul>
R284 (662 m)	Low	<ul style="list-style-type: none"> <li>Topography and existing vegetation along Muscle Creek Road and Muscle Creek and would screen the project infrastructure, resulting in low visual impacts.</li> </ul>
R40, R41 (540 m - 564 m)	Low	<ul style="list-style-type: none"> <li>Topography and existing vegetation along site boundary lines would screen the project infrastructure, resulting in low visual impacts.</li> </ul>
R3, R4, R5 (888 m - 996 m)	Low	<ul style="list-style-type: none"> <li>Topography and existing vegetation along Sandy Creek Road and waterways would screen the project infrastructure, resulting in low visual impacts.</li> </ul>
R31, R32, R62, R63 (527 m - 998 m)	Low	<ul style="list-style-type: none"> <li>Topography and existing vegetation along Sandy Creek Road/St Heliers Road and waterways would screen the project infrastructure, resulting in low visual impacts.</li> </ul>

Residence ID and distance from development footprint	ESCO's visual Impact rating	Department's assessment
R295 (940 m)	Low	<ul style="list-style-type: none"> <li>Topography and existing vegetation along site boundary lines would screen the project infrastructure, resulting in low visual impacts.</li> </ul>
R290, R300 - R311 (540 m - 1,000 m)	Low	<ul style="list-style-type: none"> <li>Topography and existing vegetation along Muscle Creek Road, Babbler Crescent, and Muscle Creek currently screen the project infrastructure, resulting in low visual impact.</li> <li>*BCWF, located ~8km east of the receivers, would result in a low to nil level of visual impact. Overall, this may result in a negligible level of cumulative visual impacts for these receivers.</li> </ul>

\* Cumulative visual impacts of the project with BCWF

176. All residences beyond 1 km from the development footprint would have low to nil visual impacts. While potential cumulative impacts associated with BCWF to the east are recognised for some residences, the overall visual impact on these properties would remain low.

#### *Public recreation areas and viewpoints*

177. 12 public receptor viewpoints were assessed, the closest of which is located 2.8 km west of the development footprint. A further three main roads (New England Highway, Muscle Creek Road and Sandy Creek Road) and a rail line were also assessed.

178. The project would have low to nil visual impacts on all major transport routes. Overall, all public views would have low visual impacts.

#### *Glint and Glare*

179. While photovoltaic panels are designed to absorb rather than reflect sunlight, the Department recognises that some project components have the potential to generate glare or reflection, including the galvanised steel used for the solar panel mounting framework, but that this diminishes over time.

180. As part of the EIS package, ESCO prepared a glint and glare analysis, which was based on a worst-case scenario. The glint and glare analysis identified the potential for temporary glare to be experienced by 16 residential receivers and along roads and railway adjacent to the project. The glare analysis indicated the locations most likely to be impacted would be along Muscle Creek Road and the railway adjacent to the southern boundary of the project. Through the exhibition process, TfNSW raised road safety concerns for the proposed Muswellbrook Bypass project due to glare from the solar panels during operation.

181. To address the glint and glare impacts identified within the original EIS assessment, ESCO has proposed a scenario of solar panel backtracking which, even in worst-case scenarios that do not account for existing intervening vegetation, produces no glare for all receivers. ESCO's backtracking scenario specifies the tilt angle for various groups of panels in specific locations across the solar farm, which if applied would result in light being reflected away from identified receivers which would eliminate glare production.
182. The Department has recommended conditions requiring ESCO to implement the backtracking scenario proposed as a means of minimising the off-site visual impacts of the development, including the potential for any glare or reflection. Recommended conditions also seek to ensure the visual appearance of all ancillary infrastructure (including paint colours) blends in as far as possible with the surrounding landscape. Subject to the recommended conditions, the Department is satisfied that the project would not cause significant glint or glare to nearby receivers.

#### 5.5.4 Recommended Conditions

183. The Department has recommended conditions of consent requiring ESCO to:
- limit the angle of solar panel backtracking in accordance with the scenario set out within the additional information provided by the Applicant to the Department dated 21 October 2024;
  - minimise the off-site visual impacts of the development, including the potential for any glare or reflection (including existing and future road users, and to the Muswellbrook Bypass);
  - ensure the visual appearance of all ancillary infrastructure (including paint colours) blends in as far as possible with the surrounding landscape; and
  - minimise the off-site lighting impacts of the development.
184. Subject to the recommended conditions, the Department is satisfied that the project would not result in significant visual impacts. The site selection and project design are consistent with the **Department's Large-Scale Solar Energy Guideline**, particularly in avoiding sites with high visibility such as those on prominent or high ground positions.

## 5.6 Other issues

185. The Department’s consideration of other issues is summarised in **Table 9** below.

Table 9 | Assessment of other issues

Issue	Recommended conditions
Amenity	
<p><u>Noise</u></p> <ul style="list-style-type: none"> <li>Noise generated during construction, upgrading and decommissioning activities is predicted to be well below the ‘highly noise affected’ criterion of 75dB(A) in the Environment Protection Authority’s (EPA) <i>Interim Construction Noise Guideline</i> (the ICNG) at all non-associated residential receivers and construction is limited to daytime hours.</li> <li>Construction noise levels are predicted to exceed the ‘noise management level’ of 45 dB(A) in the ICNG during site preparation and cable installation works. These exceedances will only occur for a short amount of time when construction activities are nearest to the site boundary as set out below within Scenario 1 and Scenario 3 construction activities.</li> <li>Scenario 1 construction activities, which comprise site preparation and clearing at the northern and southern site extents, would produce noise exceedances of 1dB-11dB for 29 receivers. Of the 29 receivers that would experience these impacts, 19 receivers would experience noise exceedances of 5dB or less. The greatest noise exceedance of 11dB would impact one residence (R7). The construction activities which would generate these impacts would last approximately one month.</li> <li>Scenario 3 construction activities, which comprise installation of underground cabling at the northern and southern site extents, would produce minor noise exceedances of 1-4dB for seven receivers. The greatest noise exceedance of 4dB would impact one resident (R7). The construction activities which would generate these impacts would occur for a maximum of 1 month.</li> <li>ESCO prepared a Noise Management Plan which identifies a range of mitigation measures, that would be implemented to mitigate noise impacts for the project, including minimising the need for</li> </ul>	<ul style="list-style-type: none"> <li>Minimise noise generated by the construction, upgrading or decommissioning activities on site in accordance with best practice requirements outlined in the ICNG.</li> <li>Comply with the noise management levels as derived from the NSW Noise Policy for Industry (EPA, 2017) at any non-associated residence.</li> <li>ESCO must prepare and submit a Noise Monitoring Report for the development to the satisfaction of the Planning Secretary.</li> <li>Restrict construction hours to Monday to Friday, 7am to 6 pm and Saturday, 8 am to 1 pm.</li> <li>Minimise dust generated by the development.</li> </ul>

vehicle reversing, operation of plant and equipment in accordance with manufacturer specifications in the quietest and most efficient manner, and scheduling construction activities to occur within standard construction hours.

- Operational noise would comply with the relevant noise criteria, as calculated in accordance with the *NSW Noise Policy for Industry* (NPfI), at all residences.
- Consistent with the impacts identified above, consideration of cumulative noise impacts found that no residences would experience exceedances of the highly affected noise management criterion in the event that Muswellbrook Bypass and Muswellbrook BESS were constructed concurrently.
- Cumulative traffic noise impacts were found to be above the relevant criteria found in the EPA's *Road Noise Policy* (RNP), however, the cumulative noise level increase would be less than 2dB, which complies with the relevant criteria in the RNP. ESCO have identified the need to consult between Firm Power and TfNSW to manage potential construction noise impacts at nearby assessment locations when necessary.
- The Department considers that noise generated during construction and operation of the project can be appropriately managed through implementation of the proposed mitigation measures and adherence with the recommended conditions.

#### Dust

- The project would require earthworks/excavation, including piling works and trenching. These works have the potential to adversely impact on local air quality through generation of dust and vehicle emissions.
- To manage dust suppression during construction, a water truck would be used along internal unsealed access roads and disturbed areas. Vehicle speeds and movements would also be minimised where practicable.
- In addition, the Department considers the likelihood of dust generation during operation of the project is low given ground cover would be quickly established across the site.

## Issue

## Recommended conditions

- The Department considers that dust generated during construction and operation of the project could be appropriately managed through implementation of the proposed mitigation measures and adherence with the recommended conditions.

## Water and erosion

### Flooding

- The project is located within the Hunter River catchment and is traversed by several first, second, third and fourth order streams which are tributaries of Muscle Creek and Sandy Creek.
- Flood modelling demonstrated that the project is not predicted to have a significant impact on flood behaviour for the 1% annual exceedance probability (AEP) event, with flood levels, depths, velocities and hazards remaining largely unchanged.
- Parts of the southern section of the site may be at risk of minor flooding during 1% AEP events, however, safety hazards to workers is considered low.
- Flood modelling demonstrates that the BESS would be located on land which would be subject to flooding during the 1 in 100 year flood event.
- As a means of mitigating flood impacts on the BESS, ESCO has proposed to construct a bund and diversion channel to ensure the BESS area remains unimpacted by the 1 in 100 year flood event. Water Group within NSW DCCEEW has not raised any concerns with this approach.
- Water would be diverted into a non-minor tributary of Muscle Creek, resulting in minor localised increases in velocity, drainage times and flood depths, ranging from 0.1 m to 0.3 m. ESCO has committed to designing the clean water diversion and flood protection bund in consultation with Water Group within NSW DCCEEW.
- No additional impacts are predicted to occur outside of the development site, with no changes to Muscle Creek flows predicted.
- Flooding impacts within the northern portion of the site are typically limited to gullies with depths reaching less than 0.2 m in the 1% AEP event.

- Prepare and implement a Soil and Water Management Plan (which includes the detailed design of the diversion channel and bund) in consultation with DPI Fisheries, BCS and Water Group, prior to the commencement of construction.
- Ensure the project is designed, constructed and maintained to reduce impacts on water resources.
- Minimise erosion in accordance with **NSW Environment and Heritage's *Managing Stormwater: Soils and Construction Manual*** (Landcom, 2004) and ensure that the project is constructed and maintained to avoid causing erosion.
- Ensure all works are undertaken in accordance with *Guidelines for Controlled Activities on Waterfront Land* (NRAR, 2018).

## Issue

## Recommended conditions

- Flood modelling confirmed that the project would result in a negligible impact on peak water surface height and peak flows across the site due to the minimal obstruction to floodwaters presented by spaced PV panel support posts and proposed mitigation measures. Although there may be minor localised changes to flood behaviour, these are not predicted to adversely affect adjoining properties.
- ESCO has prepared this approach in consultation with the Water Group within NSW DCCEEW and has committed to undertaking ongoing consultation as well as fulfilling the requirements of the recommended set of conditions, which the Water Group support.

### Water Demand

- The project would require around 77.8 ML per annum of water during construction for dust suppression and other construction purposes. The project would require 6.6 ML per annum during operation, most of which would be allocated for cleaning of solar panels, with remaining water being allocated to other maintenance activities, including fire protection and washing of equipment.
- Water usage required during the construction and operational phases of the project would primarily be sourced from groundwater via existing dewatering bores. However, potable water would be delivered to the site via trucks and stored in tanks.
- ESCO would utilise the existing water access licenses currently held by MCC, which was previously utilising the site for underground mining.
- Water Group within NSW DCCEEW has reviewed this approach set forward by ESCO and raised no concerns.

### Erosion and Sediment

- Any erosion and sedimentation risks associated with the project can be effectively managed using best practice construction techniques and mitigation measures along identified water courses.
- The project is not expected to affect groundwater resources or groundwater dependent ecosystems.
- Subject to the recommended conditions, the Department considers that the project would not result in significant impacts on water resources.

## Hazards and Risks

Bushfire Risk

- 17 public submissions received during the exhibition period raised concerns regarding bushfire impacts.
- The project area is mapped as bushfire prone land. ESCO prepared a bushfire impact assessment and would be required to comply with RFS's *Planning for Bushfire Protection 2019*.
- ESCO state that the project would not present a substantial bushfire threat or represent an unacceptable hazard in the event of a bushfire affecting the project site, subject to the implementation of mitigation measures set out within the EIS including:
  - adequate setbacks, access and firefighting facilities maintained on site;
  - control of grass fuels, including maintenance of groundcover within the development footprint;
  - proper design and maintenance of equipment; and
  - application of best practice and technical standards.
- The Department considers that bushfire risks can be suitably controlled through the implementation of standard procedures and recommendations made by FRNSW and RFS, including:
  - asset protection zones (APZs);
  - preparation of a Fire Safety Study in consultation with FRNSW;
  - development of a comprehensive Emergency Response Plan;
  - development of an Emergency Services Information Package; and
  - development of an Emergency Responders Induction Package,
- all of which ESCO has committed to.
- Subject to the recommended conditions, the Department, FRNSW and RFS are satisfied that risks associated with the project would be minimal.

- The BESS must not exceed the proposed total capacity of 135 MW across the project site and must be installed in an arrangement consistent with the EIS.
- Prepare a Fire Safety Study and an Emergency Plan for the development.
- Ensure the project complies with the relevant asset protection requirements in the RFS's *Planning for Bushfire Protection 2019* and Standards for APZs.
- All chemicals, fuels and oils to be stored in accordance with Australian Standards and EPA requirements.

### Battery Storage

- ESCO prepared a Preliminary Hazard Analysis (PHA) in accordance with relevant guidelines, including *Hazard Industry Planning Advisory Paper No. 4 & 6* and *Victorian Big Battery Fire Statement of Technical Findings* (Energy Safe Victoria 2021). The PHA concluded that the risk profile of the project was tolerable and that the resulting consequences are not expected to have significant off-site impacts.
- The project would comply with the *International Commission on Non-Ionizing Radiation Protection* (INCIRP) guidelines for electric, magnetic and electromagnetic fields.

### Contamination

- 22 public submissions received during the exhibition period raised concerns regarding contamination.
- Section 4.6 of *State Environmental Planning Policy (Resilience and Hazards) 2021* is referenced by ESCO in Section 4.6 of its EIS. In this section, ESCO noted that agricultural activities have occurred on and near the development footprint, however no potentially contaminated locations have been identified to date.
- ESCO has committed to implementing an unexpected finds protocol to manage any contamination which may be identified during construction. This will include handling and disposal procedures in accordance with NSW EPA guidelines, Australian Standards, and relevant industry codes of practice.
- Regarding the possible contamination of the site from the solar farm itself, the Department's *Frequently Asked Questions – Large Scale Solar Guideline* document outlines that the use of metals in solar panels has not been found to pose a risk to the environment as they are enclosed in thin layers between sheets of glass or plastic within the solar panel. To readily release contaminants into the environment, solar panels would need to be ground to a fine dust. As such, contamination of soil resulting from the proposal is not expected.
- The Department considers that the proposed use of the land is not intensive and low risk noting the very low number of people required to access the site during operation.

- Accordingly, the Department considers that the site is suitable for the proposed development and that the proposed mitigation is sufficient to minimise risk of the development.

#### Subsidence

- ESCO prepared a geotechnical report to assess the risk of subsidence on the subject site. The outcomes of the geotechnical report determined that there is no significant risk of pillar instability in areas of historic mining below the solar farm based on available mine plans, and that there is a low probability of further ground movement around the periphery of an area of full extraction.
- The geotechnical report recommended that consideration be given to construction strategies that can accommodate ground movements and facilitate remediation should any subsidence occur. It also recommended that monitoring programs be implemented to monitor magnitude and nature of any future subsidence movements.
- ESCO has committed to implementing the recommendations set out within the geotechnical report.
- The NSW Subsidence Advisory has endorsed the recommendations of the geotechnical report and has raised no further concerns. Accordingly, the Department is satisfied that the risk of subsidence would be adequately managed through ESCO's commitment to implement recommended measures.

#### Existing Transmission Infrastructure

- ESCO has determined a preferred transmission connection point through consultation with Ausgrid, being the 132 kV 95M transmission line identified to the west of the project area. Ausgrid raised no concerns with the proposed transmission connection and noted ongoing consultation with the applicant.
- The project site would also require a number of crossing points across a Transgrid easement running north to south through the site. Transgrid provided comment through the assessment process around their requirements for easement crossings, including the requirement to seek separate approval from them to work within the Easement.
- ESCO has working with Transgrid in the finalisation of the detailed design, and committed to operating in accordance with all relevant Transgrid Easement guidelines, which Transgrid were satisfied with.

## Issue

- The Department is satisfied that through these commitments, the interface between proposed development and existing transmission infrastructure can be effectively managed.
- The internal transmission line connecting the northern and southern solar array areas would be located adjacent to, but not within the existing 330kV Transgrid transmission easement to the east of the existing mine pit. The internal transmission line would be constructed to avoid the existing Transgrid easement, in accordance with the Transgrid Easement Guideline.

## Recommended conditions

## Heritage

### Aboriginal Cultural Heritage

- ESCO commissioned a survey of the project site with representatives from six RAPs.
- The results of the survey re-identified one previously documented site (AHIMS #37-2-1845) and 11 previously undocumented Aboriginal objects and/or sites. These 11 undocumented sites included three stone artefact scatters (MSF-AS1 – MSF-AS3), seven isolated stone artefacts (MSD-IF1 – MSF-IF7) and one culturally modified tree (MSF-CMT1).
- The identified isolated stone artefacts (MSF-IF1 – MSF-IF7) and low density artefact scatters (MSF-AS1– MSF-AS3) all hold low significance. ESCO has committed to avoiding/minimising harm of these sites in accordance with the ACHAR. These sites all form part of the background scatter over the whole site (MSF-BS1).
- The development footprint was refined to avoid impacts on MSF-CMT1, a tree now registered as and Aboriginal Item. The Department has recommended conditions which require the avoidance and protection of the tree during construction.
- Two areas of past foci and activity (MSF-FA1 and MSF-FA2) were also identified within the project area. MSF-FA 1 & MSF-FA2 are two artefact scatters of moderate significance which ESCO has committed to undertaking salvage excavation of in accordance with the ACHAR.
- With these measures, the Department and Heritage NSW consider that the project would not significantly impact the Aboriginal heritage values of the locality.

- Ensure the development does not cause any direct or indirect impacts on any items located within exclusion zones or outside the approved development footprint.
- Salvage and relocate Aboriginal items in consultation with RAPs.
- Prepare and implement an Aboriginal Cultural Management Plan in consultation with RAPs.
- Cease any works and notify the NSW Police and Heritage NSW if human remains are identified over the life of the project.

Issue	Recommended conditions
<p><u>Historic Heritage</u></p> <ul style="list-style-type: none"> <li>• There are no items of historical heritage within or in close proximity to the site.</li> <li>• The assessment concluded that there would be no impact on any listed heritage item.</li> <li>• Council raised no concerns regarding historic heritage.</li> <li>• The Department is satisfied that the project would not have any adverse impacts on any items of historic heritage significance.</li> </ul>	
<p>Waste</p>	
<ul style="list-style-type: none"> <li>• ESCO has indicated that Council operates a waste management facility adjacent to the project area which is licensed to accept most waste streams.</li> <li>• ESCO has prepared a Waste Management Plan in consultation with waste and resource recovery facilities, and has committed to implementing appropriate consultation frameworks with Council, neighbouring councils and licensed waste management facilities through the ongoing development of the WMP. Council has acknowledged and supported this commitment.</li> <li>• Waste vehicle movements have been accounted for within ESCO's Traffic Impact Assessment.</li> <li>• The Department is satisfied that waste produced in association with the development is capable of being effectively managed, subject to formal arrangements being finalised prior to construction.</li> </ul>	<ul style="list-style-type: none"> <li>• Minimise waste generated by the development, classify and store waste according to appropriate guidelines and ensure all waste is reused, recycled, or sent to an appropriately licenced waste facility for disposal.</li> </ul>
<p>Cumulative Impacts</p>	
<ul style="list-style-type: none"> <li>• An assessment has been completed with reference to the <i>Cumulative Impact Assessment Guidelines for State Significant Projects</i>. Potential cumulative impacts have been identified with the nearby Muswellbrook BESS, Muswellbrook Pumped Hydro, Muswellbrook Bypass, and BCWF.</li> <li>• ESCO has undertaken a cumulative impact assessment considering potential impacts on traffic, noise, visual amenity, biodiversity, land compatibility, and pressure on accommodation, facilities, goods and services.</li> </ul>	<ul style="list-style-type: none"> <li>• Prepare an Accommodation and Employment Strategy for the project in consultation with Council.</li> <li>• Prepare a Traffic Management Plan in consultation with TfNSW and Muswellbrook Shire Council.</li> </ul>

## Issue

- The relative distance of each project in respect of one another, as well as the staggered timeline of development largely negates, potential cumulative impacts as discussed in further detail in the relevant sections of this report.
- The Department has recommended various conditions that require consideration of potential cumulative impacts, including the requirement to prepare an Accommodation and Employment Strategy and Traffic Management Plan.
- Subject to the implementation of the recommended conditions, the Department is satisfied that the project has been designed to minimise potential cumulative impacts.

## Recommended conditions

## Community benefit

- The Department considers that, in addition to its contribution to energy transition, the project would generate direct and indirect benefits to the local community, including:
    - up to 200 construction workers during the peak construction period;
    - expenditure on accommodation and business in the local economy by workers who would reside in the area; and
    - the procurement of goods and services by ESCO and associated contractors.
  - Further, ESCO has reached an in-principle agreement with Muswellbrook Shire Council to enter into a VPA. The VPA consists of:
    - monetary contribution of \$850 per MW paid annually, and adjusted for consumer price index.
    - annual instalments spent in the following ratios:
      - 10% specialist staff contribution;
      - 45% Muswellbrook Shire Community Benefit Fund contribution (incorporating training and scholarships, provided these are not in lieu of ESCO employing trainees and apprentices); and
- ESCO implement the VPA offer agreed with Council.

Issue	Recommended conditions
<ul style="list-style-type: none"> <li>○ 45% neighbour benefits contribution (administered via Council).</li> <li>• Noting the above, the Department considers that the project would have a positive socio-economic impact on the local community.</li> </ul>	
Land value	
<ul style="list-style-type: none"> <li>• 19 public submissions received during the exhibition period raised concerns regarding property devaluation.</li> <li>• The Department considers that the project would not result in any significant or widespread reduction in land values in areas surrounding the project.</li> <li>• The Department notes that: <ul style="list-style-type: none"> <li>○ the project is partly permissible with development consent under both the Transport and Infrastructure SEPP and the EP&amp;A Act;</li> <li>○ a detailed assessment of the merits of the project has found that the project is unlikely to generate significant economic, environmental or social impacts;</li> <li>○ the impacts of the project can be further minimised by imposing suitable conditions on the project, and requiring a range of standard mitigation measures;</li> <li>○ the Department considers that the visual impacts of the project on the surrounding residences and road users would not be significant; and</li> <li>○ the Land and Environment Court has ruled on several occasions that the assessment of the impacts of projects on individual property values is not generally a relevant consideration under the EP&amp;A Act, unless the project would have significant and widespread economic impacts on the locality, which is not the case in this instance.</li> </ul> </li> </ul>	No specific condition required.
Insurance	
<ul style="list-style-type: none"> <li>• Two public submissions received during the exhibition period raised concerns regarding increased insurance costs.</li> </ul>	No specific condition required.

Issue	Recommended conditions
<ul style="list-style-type: none"> <li>The Department notes that the Insurance Council of Australia is not aware of any instances where Insurance Council Members have been unable to provide insurance or have increased premiums as a result of a farm (or a neighbouring property) hosting energy infrastructure.</li> </ul>	
Accommodation and workforce	
<ul style="list-style-type: none"> <li>Up to 200 workers would be required during the peak construction period.</li> <li>It is expected that 108 construction workers (54%) would be from the local and regional area and therefore not require accommodation. ESCO has committed to maximising local employment to reduce pressure on local accommodation and services. The remaining 92 construction workers (46%) would be non-local workers and would require accommodation in the local area.</li> <li>ESCO has identified a temporary accommodation provider that has confirmed they can accommodate the remaining construction workers in need of accommodation.</li> <li>ESCO has prepared an Accommodation and Employment Strategy and has committed to undertaking a detailed review closer to construction to determine the level of current workforce being accommodated in the region on projects which have already begun construction and how this is impacting occupancy rates. The strategy would also consider seasonal tourism demands and seek to minimise impacts on the tourism industry, as recommended by Council.</li> <li>The Department considers that with the implementation of an Accommodation and Employment Strategy, potential impacts on housing and short-term accommodation availability can be appropriately managed.</li> </ul>	<ul style="list-style-type: none"> <li>Prepare an Accommodation and Employment Strategy for the project in consultation with Council, with consideration to prioritising the employment of local workers.</li> </ul>
Decommissioning and rehabilitation	
<ul style="list-style-type: none"> <li>The operational life of a large-scale solar project is likely to range between 20 to 30 years, however they have the potential to operate for a long period of time if solar panels are upgraded over time, which would be permitted under the recommended conditions of consent.</li> </ul>	<ul style="list-style-type: none"> <li>Include rehabilitation objectives requiring the site to be rehabilitated within 18 months of cessation of operations.</li> </ul>

Issue

Recommended conditions

- The Large-Scale Solar Energy Guideline identifies four key decommissioning and rehabilitation principles for circumstances where an applicant ceases operating a project, which are the removal of project infrastructure, returning the land to its pre-existing use, including rehabilitating and restoring the pre-existing LSC Class where previously used for agricultural purposes, and the owner/operator of the project should be responsible for the decommissioning and rehabilitation and this should be reflected in an agreement with the host landowner(s).
- With the implementation of objective-based conditions and monitoring requirements, which are consistent with these key principles, the Department considers that the solar farm would be suitably decommissioned at the end of the project life, or within 18 months if operations cease unexpectedly, and that the site be appropriately rehabilitated.

## 6 Evaluation

186. The Department has assessed the development application, EIS, Submissions Report, Amendment Report and additional information and has carefully considered:
- submissions received from members of the community;
  - comments provided by Council; and
  - advice received from State and local Government agencies.
187. The Department has also considered the objectives of the EP&A Act, including the Ecologically Sustainable Development principles, and relevant considerations under Section 4.15(1) of the EP&A Act. The Department has given consideration to ESCO's evaluation of the project's merits against applicable statutory and strategic planning requirements.
188. The project is a permissible land use with consent under the provisions of the Transport and Infrastructure SEPP in RU1 and SP2 zones, and is considered permissible in the relevant C3 zone via Section 4.38(3) of the EP&A Act. The site is located in the HCC REZ, an area traditionally associated with agricultural and mining practices, with 128 non-associated residences located within 2 km of the development footprint. The site has good solar resources, direct access to the regional road network and would have good access to the electricity network via the Ausgrid transmission lines that traverse the site with available capacity.
189. The project has been designed to utilise topography and existing vegetation to minimise impacts, while also largely avoid key constraints, including amenity impacts to nearby non-associated residences, agricultural land, watercourses, remnant native vegetation and Aboriginal heritage sites. Any residual impacts would be relatively minor and can be managed through the recommended conditions of consent.
190. The project would not result in any significant reduction in the overall agricultural productivity of the region, and it would avoid all areas of BSAL. Following decommissioning, the site could return to agricultural land as the inherent agricultural capability of the land would not be affected in the long term. The Department considers that there would be no significant visual impacts on surrounding residences, due to distance from non-residences or intervening topography and vegetation providing screening.
191. To address the residual impacts including traffic and transport, surface water, flooding, erosion and hazards, the Department has recommended a range of stringent conditions, developed in consultation with agencies and council, to ensure these impacts are effectively minimised, managed or offset.

192. The Department considered the submissions made through the exhibition of the project and the issues raised by the community and agencies during consultation. These matters have been addressed through changes to the project and the recommended conditions of consent.
193. Importantly, the project would assist in transitioning the electricity sector from coal and gas-fired power stations to low emissions sources and is consistent with the goals of the NSW's *Climate Change Policy Framework*, the *Net Zero Plan Stage 1: 2020 – 2030*. It would have a generating capacity of 135 MW of clean electricity, which is enough to power approximately 52,310 homes, and 135 MW / 270 MWh of energy storage to dispatch energy to the grid when the energy generation from renewable resources is limited.
194. The Department considers that the project achieves an appropriate balance between maximising the efficiency of the solar resource development and minimising the potential impacts on surrounding land users and the environment. Through job creation and capital investment and a planning agreement with Council, the project would also stimulate economic investment in renewable energy and provide flow-on benefits to the local community.
195. On balance, the Department considers that the project is in the public interest and is approvable, subject to the recommended conditions of consent (see **Appendix G**).
196. This assessment report is hereby presented to the Commission to determine the application.

Prepared by:

Nestor Tsambos, Team Leader

Cameron Ashe, Environmental Assessment Officer

Recommended by:



18/12/2024

Iwan Davies

Director

Energy Assessments



18/12/2024

Chris Ritchie

A/Executive Director

Energy, Resources and Industry  
Assessments

# Appendices

Appendix A – Environmental Impact Statement

Appendix B – Submissions

Appendix C – Agency advice

Appendix D – Submissions Report

Appendix E – Amendment Report

Appendix F – Additional Information

Appendix G – Recommended development consent

Appendices A to G available at: <https://www.planningportal.nsw.gov.au/major-projects/projects/muswellbrook-solar-farm>

## Appendix H – Consideration of community views

The Department publicly exhibited the EIS from 22 August 2023 until 18 September 2023, advertised the exhibition in *The Australian* and *Hunter Valley News* and notified landowners adjacent to the project boundary. The Department received 59 submissions from the public (including six interest groups), of which 54 objected to the project and, 5 supported the project.

The Department consulted with government agencies, Council, Transgrid, EnergyCo and Ausgrid throughout the assessment process.

The key issues raised by the community (including in public submissions) and considered in the Department's Assessment Report include land use compatibility, biodiversity, impacts of renewable energy development, hazards, decommissioning and rehabilitation, property devaluation, social impacts and visual impacts.

Other issues are addressed in detail in the Department's Assessment Report.

Issue	Consideration
<p>Compatibility of the proposed land use</p> <p>Loss of agricultural land</p> <p>Impacts on neighbouring agricultural activities (including weeds, pests, soil and erosion)</p> <p>Impacts on neighbouring residential land use</p>	<p>Assessment</p> <p>The development site is zoned primarily as RU1 – Primary Production, with the balance of the site comprising SP2 – Infrastructure (Classified Road) and C3 Environmental Management zoned land under the Muswellbrook LEP.</p> <p>The project is permissible with consent as electricity generating works are permissible with consent on any land in a prescribed rural or special use zone, including RU1 and SP2 zones, under clause 2.36 of the Transport and Infrastructure SEPP.</p> <p>Additionally, although land zoned C3 is not a prescribed zone under the Transport and Infrastructure SEPP, Section 4.38(3) of the EP&amp;A Act allows development consent to be granted for SSD applications where the development is partly prohibited.</p> <p>The site was verified as holding LSC Class 4, Class 5 and Class 6, being land of moderate, moderate-low and low capability, indicating that agricultural uses are largely restricted to moderate to low impact uses such as grazing. There is no mapped BSAL or State Significant Agricultural Land present within the site. The nearest BSAL is located approximately 0.5 km south west from the site.</p> <p>The potential cumulative impacts of the project and other approved and/or operational SSD solar farms on agricultural land are expected to be minimal, temporary, and limited to the project area. It is noted that the project area comprises 482 ha, which represents only 0.06% of the 826,769 ha of agricultural land in the Hunter Valley in 2020-2021, excluding the Newcastle Statistical area.</p> <p>The impacts of the project on the region are summarised as the following:</p> <ul style="list-style-type: none"> <li>• temporary removal of 482 ha from agricultural land use within the project area;</li> <li>• temporary removal of potential agricultural primary productivity to the estimated value of \$83,759 to \$198,562 per annum per year of project life;</li> <li>• temporary removal of potential agricultural secondary productivity to the estimated value of \$182,494 to \$432,627 per annum per year of project life; and</li> <li>• temporary impacts on soil resources within the project area where surface disturbance occurs.</li> </ul> <p>The site would continue to be used for grazing purposes during operation and is to be returned to agricultural use following decommissioning. Accordingly, the</p>

Issue	Consideration
	<p>Department is satisfied that the project would not result in any significant reduction in agricultural productivity of the region or of local agribusiness.</p> <p>Measures would be implemented to manage potential impacts on adjoining agricultural operations, including strict land management measures to control weeds, erosion and sediment controls, and noise and dust controls.</p> <p>Impacts on neighbouring residential land uses have been assessed and predicted to be minimal, with noise levels predicted to meet relevant criteria, and all visual receptors assessed as experiencing low to very low visual impacts post-mitigation.</p> <p>Recommended Conditions:</p> <p>Restore land capability to pre-existing use.</p> <p>Restore the groundcover of the site following construction or upgrading, maintain the groundcover with appropriate perennial species and manage weeds.</p> <p>Minimise any soil erosion associated with the construction, upgrading or decommissioning of the development.</p> <p>Ensure that the development does not cause any water pollution.</p> <p>Ensure that noise associated with the construction, operation, upgrading and decommissioning of the project complies with the relevant noise criteria.</p> <p>Minimise dust generated by the development.</p>
<p>Impacts on Ecology and Biodiversity</p> <p>Wildlife and vegetation impacts</p>	<p>Assessment</p> <p>The development would require the clearing of approximately 310 ha of native vegetation, of which only 92.2 ha is of a condition which requires offsetting under the BAM. This would be offset via 1,629 ecosystem credits.</p> <p>The proposed development would generate 2,487 species credits under the BC Act to be offset for the site.</p> <p>Overall, the Department considers that the project is unlikely to result in a significant impact on biodiversity values, subject to ESCO fulfilling the recommended conditions of consent.</p> <p>Recommended Conditions:</p> <p>ESCO must not clear any native vegetation or fauna habitat located outside the approved disturbance areas.</p> <p>Retire the applicable biodiversity offset credits.</p>

Issue	Consideration
	<p>Avoid and minimise impacts on potential SAI entities and provide minimisation measures for these entities to mitigate harm to Box Gum Woodland and the Large-eared Pied Bat.</p> <p>Prepare and implement a Biodiversity Management Plan in consultation with BCS.</p>
<p>Energy Transition</p> <p>Impacts of renewable energy development</p>	<p>Assessment</p> <p>Community submissions raised concerns regarding the impacts of renewable energy development</p> <p>The project aligns with national and state policies by diversifying energy generation, reducing carbon emissions, and enhancing energy security, with a solar capacity of 135 MW capable of powering about 52,310 homes and contributing to NSW's net zero emissions goal by 2050.</p> <p>The inclusion of a 135 MW / 270 MWh battery would improve grid stability by storing solar energy for use during peak demand, while the project's location in the HCC REZ facilitates growth in renewable energy generation and storage.</p> <p>As such, the project would play an important role in increasing renewable energy generation and capacity and contributing to the transition to a cleaner energy system as coal fired generators retire.</p>
<p>Hazards</p> <p>Bushfire risk</p> <p>Risk of contamination from solar farm infrastructure</p>	<p>Assessment</p> <p><u>Bushfire</u></p> <p>Multiple public submissions had concerns with the safe operation of solar farm infrastructure, particularly risks associated with bushfire and contamination.</p> <p>The project area is mapped as bushfire prone land.</p> <p>As part of the EIS, ESCO prepared a bushfire impact assessment which determined that the project would not present a substantial bushfire threat or represent an unacceptable hazard in the event of a bushfire affecting the project site, subject to the implementation of mitigation measures set out within the EIS.</p> <p><u>Contamination</u></p> <p>Community submissions raised concerns regarding contamination of the subject site. ESCO noted that agricultural activities have occurred on and near the development footprint, however no potentially contaminated locations have been identified to date.</p> <p>ESCO has committed to implementing an unexpected finds protocol to manage any contamination which may be identified during construction. This will include</p>

Issue	Consideration
	<p>handling and disposal procedures in accordance with NSW EPA guidelines, Australian Standards, and relevant industry codes of practice.</p> <p>Regarding the possible contamination of the site from the solar farm itself, the <b>Department’s Frequently Asked Questions – Large Scale Solar Guideline</b> document outlines that the use of metals in solar panels has not been found to pose a risk to the environment as they are enclosed in thin layers between sheets of glass or plastic within the solar panel. To readily release contaminants into the environment, solar panels would need to be ground to a fine dust. As such, contamination of soil resulting from the proposal is not expected.</p> <p>The Department considers that the proposed use of the land is not intensive and low risk noting the very low number of people required to access the site during operation.</p> <p>Accordingly, the Department considers that the site is suitable for the proposed development and that the proposed mitigation is sufficient to minimise risk of the development.</p> <p><b>Recommended Conditions</b></p> <p>The BESS must not exceed the proposed total capacity of 135 MW across the project site and must be installed in an arrangement consistent with the EIS.</p> <p>Prepare a Fire Safety Study and an Emergency Plan for the development.</p> <ul style="list-style-type: none"> <li>•Ensure the project complies with the relevant asset protection requirements in the RFS’s <b>Planning for Bushfire Protection 2019</b> and <b>Standards for APZs</b>.</li> </ul> <p>All chemicals, fuels and oils to be stored in accordance with Australian Standards and EPA requirements.</p>
Decommissioning and Rehabilitation	<p><b>Assessment</b></p> <p>The operational life of a large-scale solar project is likely to range between 20 to 30 years, however they have the potential to operate for a long period of time if solar panels are upgraded over time, which would be permitted under the recommended conditions of consent.</p> <p>The Large-Scale Solar Energy Guideline identifies four key decommissioning and rehabilitation principles for circumstances where an applicant ceases operating a project, which are the removal of project infrastructure, returning the land to its pre-existing use, including rehabilitating and restoring the pre-existing LSC Class where previously used for agricultural purposes, and the owner/operator of the project should be responsible for the decommissioning and rehabilitation and this should be reflected in an agreement with the host landowner(s).</p>

Issue	Consideration
	<p>With the implementation of objective-based conditions and monitoring requirements, which are consistent with these key principles, the Department considers that the solar farm would be suitably decommissioned at the end of the project life, or within 18 months if operations cease unexpectedly, and that the site be appropriately rehabilitated.</p>
<p>Land Devaluation</p> <p>Concern for the potential devaluation of properties in proximity of the solar farm</p>	<p>Under the Transport and Infrastructure SEPP, electricity generating works are permissible on any land in a prescribed rural, industrial or special use zone, including land zoned RU1 Primary Production and SP2 Infrastructure.</p> <p>Although the Transport and Infrastructure SEPP does not permit, and the Muswellbrook LEP prohibits electricity generating works on land zoned C3, Section 4.38(3) of the EP&amp;A Act enables development consent for State significant development to be granted despite the partial prohibition. While the consent authority can override a partial prohibition for a State Significant Development, it must assess the merits of such a decision. The Department has considered the merits of the use of the C3 Environmental Management zoned land on the subject site in <b>Section 3.2</b> of this report, and is satisfied that it is an appropriate use of the land. Consequently, the project is permissible with development consent.</p> <p>The project is permissible in the RU1 and SP2 land zonings, and is considered permissible in the C3 land zoning via Section 4.38(3) of the EP&amp;A Act. Furthermore, the project is consistent with relevant environmental planning instruments and energy policy framework.</p> <p>The site is considered suitable for the development due to its good solar resources, direct access to the regional road network and the electricity network.</p> <p>The project is not predicted to result in any unacceptable offsite impacts to the amenity or safety of the surrounding environment or community, and is considered to be compatible with surrounds land uses.</p>
<p>Social Impacts</p> <p>Employment impacts</p> <p>Stress and mental wellbeing</p> <p>intergenerational wealth</p> <p>Burden on future generations</p>	<p>Assessment</p> <p>The project would create social benefits in the local community through job creation and economic opportunities. Nevertheless, potential negative impacts include increased pressure on local services and facilities affecting the social dynamics of the community.</p> <p>The Department considers that the project would not result in any significant or widespread reduction in land values in the areas surrounding the solar farm as the project is permissible with consent under applicable planning instruments.</p>

Issue	Consideration
<p>Future community disintegration</p>	<p>ESCO has committed to enter into a Voluntary Planning Agreement (VPA) with Council. The VPA consists of:</p> <p>monetary contribution of ‘the greater of \$850/MWac, or as per any finalised ‘Benefit Sharing Guideline’, installed, paid annually, and adjusted for consumer price index; and</p> <p>annual instalments spent in the following ratios:</p> <ul style="list-style-type: none"> <li>o 10% Specialist staff contribution;</li> <li>o 45% Muswellbrook Shire Community Benefit Fund contribution (incorporating training and scholarships, provided these are not in lieu of the Proponent employing trainees and apprentices); and</li> <li>o 45% neighbour benefits contribution (administered via Council).</li> </ul> <p>Noting the above, the Department considers that the project would have a positive socio-economic impact on the local community.</p> <p>Recommended Conditions</p> <p>ESCO implement its offer to enter into a planning agreement with Council.</p> <p>Prepare an Accommodation and Employment Strategy for the project in consultation with Council, with consideration to prioritising the employment of local workers.</p>
<p>Visual Amenity</p> <p>Impacts on landscape views and rural character</p> <p>Glint and glare impacts</p>	<p>Assessment</p> <p>The project has been designed to minimise potential impacts on surrounding receivers and has been amended to reduce the extent of the solar array, reducing visual impacts.</p> <p>Per ESCO’s LVIA, all residential and public viewpoint locations within 2 km of the development footprint would experience low to very low visual impacts.</p> <p>The potential for glint and glare at nearby receptors and the public road network has been mitigated through the implementation of an operational backtracking control on the solar array panel, which has been included as a recommended condition of consent.</p> <p>The Department recognises that the introduction of the proposed solar farm would result in a change to the local landscape, but considers the development would have a limited impact beyond the project’s immediate vicinity. Accordingly, the Department considers the project would have a limited impact on the visual landscape character of the region as a whole.</p> <p>Recommended Conditions:</p>

Issue	Consideration
	<p>Limit the operation of solar panel backtracking accordance with the scenario set out in ESCO's letter dated 21 October 2024.</p> <p>Minimise and mitigate the off-site visual impacts of the development, including the potential for any glare or reflection (including existing and future road users, and to the Muswellbrook Bypass).</p> <p>Ensure the visual appearance of all ancillary infrastructure blends in with the surrounding landscape, where reasonable and feasible.</p> <p>Minimise the off-site lighting impacts of the development.</p>

## Appendix I – Statutory considerations

### Objects of the EP&A Act

In line with the requirements of Section 4.15 of the EP&A Act, the Department's assessment of the project has given detailed consideration to a number of statutory requirements. These include:

- the objects found in Section 1.3 of the EP&A Act; and
- the matters listed under Section 4.15(1) of the EP&A Act, including applicable environmental planning instruments and regulations.

The Department has considered all these matters in its assessment of the project and has provided a summary of this assessment below.

### Summary

#### Objects of the EP&A Act

The objects of most relevance to the Consent Authority's decision on whether to approve the project are found in Section 1.3(a), (b), (c), (e) and (f) of the EP&A Act.

The Department considers the project encourages the proper development of natural resources (Object 1.3(a)) and the promotion of orderly and economic use of land (Object 1.3(c)), particularly as the project:

- is a permissible land use with consent under the provisions of the Transport and Infrastructure SEPP in RU1 and SP2 zones, and is prohibited in the C3, though is approvable in this zone via section 4.38(3) of the EP&A Act;
- is located in a logical location for efficient solar energy development;
- is able to be managed such that the impacts of the project could be adequately minimised, managed, or at least compensated for, to an acceptable standard;
- would contribute to a more diverse local industry, thereby supporting the local economy and community;
- would not fragment or alienate resource lands in the LGA; and
- **is consistent with the goals of NSW's *Climate Change Policy Framework* and *Net Zero Plan Stage 1: 2020 – 2030* and would assist in meeting Australia's renewable energy targets whilst reducing greenhouse gas emissions.**

## Summary

The Department has considered the encouragement of Ecologically Sustainable Development (ESD) (Object 1.3 (b)) in its assessment of the project. This assessment integrates all significant socio-economic and environmental considerations and seeks to avoid any potential serious or irreversible environmental damage, based on an assessment of risk-weighted consequences.

In addition, the Department considers that appropriately designed SSD solar facility development, in itself, is consistent with many of the principles of ESD. ESCO has also considered the project against the principles of ESD. Following its consideration, the Department considers that the project can be carried out in a manner that is consistent with the principles of ESD.

Consideration of environmental protection (Object 1.3(e)) is provided in Section 5 of this report. Following its consideration, the Department considers that the project could be undertaken in a manner that would at least maintain the biodiversity values of the locality over the medium to long term and would not significantly impact threatened species and ecological communities of the locality. The Department is also satisfied that any residual biodiversity impacts could be managed and/or mitigated by imposing appropriate conditions and retiring the required biodiversity offset credits.

Consideration of the sustainable management of built and cultural heritage (Object 1.3(f)) is also provided in Section 5.6 of this report. Following its consideration, the Department considers the project would not significantly impact the built or cultural heritage of the locality, and any residual impacts can be managed and/or mitigated by imposing appropriate conditions.

## State significant development

Under Section 4.36 of the EP&A Act the project is State significant development.

Under Section 4.5(a) of the EP&A Act and Clause 1(b) of Section 2.7 of the Planning Systems SEPP, the Independent Planning Commission is the consent authority for the development as the project received more than 50 unique public submissions by way of objection to the application.

## Environmental Planning Instruments (EPIs)

The *Muswellbrook Local Environmental Plan 2013* (the LEP) applies to the extent of determining the permissibility of the project. The project is a permissible land use with consent under the provisions of the Transport and Infrastructure SEPP in RU1 and SP2 zones, and is prohibited in the C3, though is approvable in this zone via Section 4.38(3) of the EP&A Act.

In accordance with the Transport and Infrastructure SEPP, the Department has given written notice of the project to Transgrid and TfNSW (s2.48). The Department has considered the advice received and, where appropriate, developed conditions of consent to address the recommendations and advice of these authorities. The Department considers that such conditions would provide appropriate protection for public infrastructure. The development does not have frontage to any classified roads (s2.119).

ESCO completed a preliminary risk screening in accordance with *State Environmental Planning Policy (Resilience and Hazards) 2021* (Resilience and Hazards SEPP) and confirmed the project was not categorised as potentially hazardous or potentially offensive development (Ch 3). A preliminary hazard analysis (PHA) prepared for the project concluded the risk profile of the project was tolerable and that there was negligible risk of off-site consequences associated with project. ESCO has committed to implementing all controls recommended by the PHA. Accordingly, the Department is satisfied that the proposed development is not potentially hazardous or potentially offensive development and does not pose an unacceptable risk to community or environment.

## Summary

The Department has also considered the contaminated land provisions of the Resilience and Hazards SEPP (Ch 4). Given the site has historically been used for agricultural uses, the Department considers the site would be suitable for the proposed development. ESCO has committed to implementing management plans which would minimise the potential for contamination of the site associated with the development and has also committed to implementing an unexpected finds protocol to manage any contamination which may be identified during construction.

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## Appendix J – Assessment of Matters of National Environmental Significance

In accordance with the Bilateral Agreement between the Australian Government and NSW Government, the Department provides the following additional information required by the Commonwealth Minister, in deciding whether to approve a proposed action (i.e. the project) under the EPBC Act.

The Department's assessment has been prepared based on the assessment contained in the Muswellbrook Solar Farm EIS, Submissions Report, BDAR and additional information provided during the assessment process, public submissions, and advice provided by the BCS, other NSW government agencies and the Commonwealth Department of Climate Change, Energy, Environment and Water (DCCEEW).

This appendix is supplementary to, and should be read in conjunction with, the assessment included in **Section 5.4** of this assessment report, which includes consideration of impacts to listed threatened species and communities, and mitigation and offsetting measures for threatened species and communities, including MNES.

### Controlled Action Decision – EPBC 2022/09303

On 14 October 2022, the Muswellbrook Solar Farm was determined to be a Controlled Action by the Commonwealth DCCEEW for the controlling provision of listed threatened communities and species. The Commonwealth Referral Decision (EPBC 2022/09303) (Referral Decision) was based on likely significant impacts to:

- Central Hunter Valley eucalypt forest and woodland – critically endangered;
- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland – critically endangered;
- Regent Honeyeater (*Anthochaera phrygia*) – critically endangered;
- Grey-headed Flying-fox (*Pteropus poliocephalus*) – vulnerable; and
- Striped Legless Lizard (*Delma impar*) – vulnerable.

Additionally, the Commonwealth DCCEEW identified there was some risk that there may be significant impacts on the following matters:

- Koala (*Phascolarctos cinereus* combined populations of Qld, NSW, and the ACT) – endangered;
- Swift Parrot (*Lathamus discolor*) – critically endangered;
- Pink-tailed Worm-lizard (*Aprasia parapulchella*) – vulnerable;
- Spotted-tail Quoll (*Dasyurus maculatus maculatus*, SE mainland population) – endangered;

- Gang-gang Cockatoo (*Callocephalon fimbriatum*) – endangered;
- Large-eared Pied Bat (*Chalinolobus dwyeri*) – vulnerable;
- Grey Falcon (*Falco hypoleucos*) – vulnerable;
- South-eastern Glossy Black Cockatoo (*Calyptorhynchus lathami lathami*) – vulnerable; and
- Corben’s Long-eared Bat (*Nyctophilus corbeni*) – vulnerable.

All entities identified above as requiring an assessment were considered in ESCO’s EIS as outlined in the following sections.

### Impacts on EPBC Act Listed Threatened Species and Communities

Section 5.4 of this report describes the biodiversity assessment undertaken for the project and the resulting BDAR.

All entities that were identified as requiring an assessment of significance were assessed. Table 10 provides a summary of the likelihood of occurrence for each of the species identified above by the Commonwealth DCCEEW as requiring consideration.

Table 10 | Likelihood of occurrence of MNES identified in Commonwealth DCCEEW SEARs

Entity	Conservation Status	Likelihood of Occurrence	Comments
Threatened Ecological Communities			
Box Gum Woodland and DNG	Critically endangered (CE)	Present	Community is associated with areas of PCT 281 which meet condition threshold requirements.
Central Hunter Valley Eucalypt Forest and Woodland	CE	Present	PCT’s 1691, 1603 and 1607 associated with this TEC were found present on the subject site which meet the condition threshold requirements.
Threatened Fauna Species			

Entity	Conservation Status	Likelihood of Occurrence	Comments
Regent Honeyeater ( <i>Anthochaera phrygia</i> )	CE	Not recorded in surveys.	<p>Not identified on important area mapping. This species was not detected during targeted diurnal bird surveys, or during any surveys across the Development footprint.</p> <p>Associated with PCT's 281, 1603, 1691 and 1607</p> <p>Significantly, despite this area being mapped as 'likely to occur', ESCO undertook surveys that did not detect the species. The development footprint is not mapped as 'Important Habitat' for this species. The removal of this potential foraging habitat is considered unlikely to lead to any long-term decrease in the size of the regent honeyeater population.</p>
Grey-headed Flying-fox ( <i>Pteropus poliocephalus</i> )	Vulnerable (V)	Recorded in locality	<p>Identified flying over development footprint during field surveys, however not recorded on the site. No breeding camps were identified within the development footprint; however the project would remove 43.7 ha of potential foraging habitat associated with PCT's 281, 1603, 1691 within development footprint which would be offset via ecosystem credits.</p>
Striped Legless Lizard ( <i>Delma impar</i> ) / Hunter Valley Delma ( <i>Delma vescolineata</i> )	Not listed at time of BDAR – now listed as endangered (E)	Present (assessed as <i>Delma impar</i> for the purposes of Biodiversity Credit Calculations)	<p>Identified in surveys on site. Credit obligation generated using <i>Delma impar</i> noting that the <i>Delma vescolineata</i> was not listed at the time of survey. ESCO has proposed to meet credit obligation through a nearby offset site.</p> <p>BCS have agreed that the site identified for offsetting credits generated for <i>Delma impar</i> is appropriate for offsetting impacts to <i>Delma vescolineata</i> per the below:</p> <p><i>"Delma vescolineata is not legally recognised, all occurrences within the Delma impar species complex are to be identified and assessed as Delma impar for NSW planning matters until a formal assessment has been completed."</i></p>

Entity	Conservation Status	Likelihood of Occurrence	Comments
Koala ( <i>Phascolarctos cinereus</i> ) (Combined Population of QLD, NSW and the ACT)	E	Unlikely	Not recorded during targeted surveys conducted in accordance with relevant guidelines.  However, removal of 43.7ha of potential foraging habitat associated with PCT's 281, 1603, 1691, 1607 which would be offset via ecosystem credits.
Swift Parrot ( <i>Lathamus discolor</i> )	CE	Unlikely	Not identified on important area mapping and not identified in targeted surveys.  Removal of 43.7 ha of potential foraging habitat associated with PCT's 281, 1603 and 1691 which would be offset via ecosystem credits.
Pink tailed Worm-lizard ( <i>Aprasia parapulchella</i> )	V	Unlikely	Not recorded during targeted surveys conducted in accordance with relevant guidelines and no PCTs associated with the species are mapped on site.
Spotted-tailed Quoll ( <i>Dasyurus maculatus maculatus</i> (South-east mainland population))	E	Unlikely	Not identified in targeted surveys.  Species associated with PCT's 281, 1603, 1607 and 1691 which would be offset via ecosystem credits.
Gang-gang Cockatoo ( <i>Callocephalon fimbriatum</i> )	E	Unlikely	Not identified in targeted surveys.  Species associated with PCT's 281, 1603 and 1691 which would be offset via ecosystem credits.
Large-eared Pied Bat ( <i>Chalinolobus dwyeri</i> )	V	Present	Identified within the subject land in low numbers. The occurrence of this species within the development footprint is not considered to be an important population.  Species credits generated. Impacts associated with this species would be sufficiently offset through the species credit obligations.
Grey Falcon ( <i>Falco hypoleucos</i> )	V	Unlikely	Not recorded during targeted surveys conducted in accordance with relevant guidelines and no PCTs associated with the species are mapped on site.

Entity	Conservation Status	Likelihood of Occurrence	Comments
South-eastern Glossy Black Cockatoo ( <i>Calyptorhynchus lathami lathami</i> )	V	Unlikely	Not recorded during targeted surveys.  Species associated with PCT's 1603 and 1691 which would be offset via ecosystem credits outlined in <b>Section Biodiversity5.4</b> of this report.
Corben's Long-eared Bat ( <i>Nyctophilus corbeni</i> )	V	Unlikely	Not recorded during targeted surveys conducted in accordance with relevant guidelines and no PCTs associated with the species are mapped on site.
Rufous Fantail ( <i>Rhipidura rufifrons</i> )	Migratory (M)	Present	Removal of native vegetation which acts as foraging habitat. Removal of 43.7 ha of potential foraging habitat.

### Impacts on threatened ecological communities

As described in **Section 5.4.1** of this report, ESCO has generally focused on avoidance of impacts through site selection and avoidance of higher quality native vegetation and habitat during the preliminary design process.

Notwithstanding, the development would result in the clearance of approximately 113 ha of Box Gum Woodland, of which 56 ha meets the conditions thresholds under the EPBC Act. This includes approximately:

- 7.5 ha of Low condition woodland; and
- 48.5 ha of DNG – regeneration.

As a result, the assessments of significance contained within the MNES Assessment concluded that the action may have a significant impact on this community.

ESCO has proposed additional and appropriate measures to offset the residual biodiversity impacts of the action. The proposed AAM's include securing and retiring 17 ha of Box Gum Woodland (treed woodland), and 84.16 ha of DNG, comprising both DNG-regeneration and DNG areas. The Department and BCS consider that impacts to this community would be appropriately offset via the implementation of these additional and appropriate measures.

The proposed development would also result in the clearance of 31.8 ha of Central Hunter Valley eucalypt forest and woodland. This includes approximately:

- 6.7 ha of PCT 1691 'moderate' woodland;
- 24. ha of PCT 1603 'moderate' woodland; and

- 1.1 ha of PCT 1607 ‘moderate’ woodland.

As a result, the assessments of significance contained within the MNES assessment concluded that the action may have a significant impact on this community.

ESCO would offset the residual biodiversity impacts of the action in accordance with the requirements of NSW Biodiversity Offset Scheme. The Department considers that impacts to this community would be appropriately offset via the ecosystem credit requirements detailed in **Section 5.4** of this report.

### Impacts on threatened flora species

No threatened flora species listed under the EPBC Act were recorded or considered likely to occur within the action area.

### Impacts on threatened fauna species

Assessments of significance were undertaken for threatened species that were recorded during field surveys or were identified as having a moderate or higher potential to occur within the project area, including 15 threatened fauna species.

ESCO’s assessments of significance for these species considers that the project is unlikely to have a significant impact on any threatened fauna species.

Notwithstanding, the development would have the following impacts on threatened species:

#### Regent Honeyeater

The action would impact approximately 43.7 ha of mapped ‘important habitat’ for the Regent Honeyeater. Significantly, despite this area being mapped as ‘important habitat’, the area proposed to be cleared has been ‘ground-truthed’ as potential seasonal foraging habitat. The removal of this habitat is considered unlikely to lead to any long-term decrease in the size of the regent honeyeater population.

#### Hunter Valley Delma

The action would impact 267 ha of potential Hunter Valley Delma habitat. The project would increase the habitat fragmentation in the local area and reduce the area of occupancy. This impact is considered significant. The Department considers that the species identified would be appropriately offset via the species credit requirements detailed in **Section 5.4** of this report.

#### Grey-headed Flying Fox

The action would impact approximately 43.7 ha of PCT’s associated with the Grey-headed Flying Fox. While the proposed action is recognised as having the potential to increase fragmentation, habitat areas of higher quality will be retained within the locality.

## Koala

The proposed works would include the removal of up to 43.7 ha of potential foraging habitat. This habitat is mainly in the southern portion of the Development footprint (19.7 ha), comprising of 'feed tree' species *Eucalyptus tereticornis* and Koala 'use trees'. While the proposed action is recognised as having the potential to increase fragmentation, Koala populations are considered unlikely to be impacted. The Department considers that the species identified would be appropriately offset via the ecosystem credit requirements detailed in **Section 5.4** of this report.

## Swift parrot

The removal of 43.7 ha of potential seasonal foraging habitat is unlikely to lead to any long-term decrease in the size of the swift parrot population. The Department considers that the ecosystem credit requirements set out in **Section 5.4** of this report would adequately offset any potential impacts.

## Spotted-tail quail

The removal of 43.7 ha of potential foraging habitat is unlikely to reduce the area of occupancy of a population. The Department considers that the ecosystem credit requirements set out in **Section 5.4** of this report would adequately offset any potential impacts.

## Gang-gang cockatoo

The removal of 43.7 ha of potential foraging habitat is unlikely to reduce the area of occupancy of a population. The Department considers that the ecosystem credit requirements set out in **Section 5.4** of this report would adequately offset any potential impacts.

## Large-eared pied bat

The project would remove 3.2 ha potential foraging habitat for the species. Unlikely to have a significant impact. The occurrence of this species within the Development footprint is not considered to be an important population as described in *Matters of National Environmental Significance Significant impact guidelines 1.1*.

## Corben's long eared bat

The project will remove 45 ha of potential foraging habitat for the species. This habitat is not considered habitat critical to the survival of the species. The occurrence of this species within the Development footprint is not considered to be an important population as described in *Matters of National Environmental Significance Significant impact guidelines 1.1*.

## White-throated needletail

The project would remove 43.7 ha potential foraging habitat for the species. The project is considered unlikely to have a significant impact on the White-throated Needletail and this species is likely to continue foraging in the locality and over the project area post-construction.

Overall, the Department considers that the species identified would be appropriately offset via the ecosystem credit requirements detailed in **Section 5.4** of this report. The Department has recommended conditions and additional measures to avoid or minimise impacts on threatened fauna species as detailed in **Section 5.4.7** of this report.

### Additional EPBC Act Considerations

**Table 11** contains the additional mandatory considerations, factors to be taken into account and factors to have regard to under the EPBC Act that are additional to those already discussed.

Table 11 | Additional considerations for the Commonwealth Minister under the EPBC Act

EPBC Act Section Considerations	Conclusion
<b>Mandatory considerations</b>	
<p><b>Part 1, 3A, 391(2)</b></p> <p>Principles of ecologically sustainable development (ESD), including the precautionary principle, have been taken into account, in particular:</p> <p>the long term and short term economic, environmental, social and equitable considerations that are relevant to this decision;</p> <p>conditions that restrict environmental impacts and impose monitoring and adaptive management, reduce any lack of certainty related to the potential impacts of the project;</p> <p>conditions requiring the project to be delivered and operated in a sustainable way to protect the environment for future generations and conserving the relevant matters of national environmental significance;</p> <p>advice provided within this report reflects the importance of conserving biological diversity, ecological and cultural integrity in relation to all of the controlling provisions for this project; and mitigation measures to be implemented which reflect improved valuation, pricing and incentive mechanisms are promoted by placing a financial cost on the proponent to mitigate the environmental impacts of the project.</p>	<p>The Department considers that the project, if undertaken in accordance with the recommended conditions of consent, would be consistent with the principles of ESD.</p>

Subdivision D 20	Requirement for approval of activities with a significant impact on a listed migratory species	The project has been determined not to have a significant impact on any listed migratory species.
Part 9 Division 1 Subdivision B 136(1)b	Economic and social matters are discussed in <b>Section 5.6</b> of this report.	<p>The project would provide benefits for the local and regional economy and is of public benefit for up to 35 years. Up to 200 workers would be required during the construction period.</p> <p>Impacts on the local community would primarily occur during the construction period, which has been considered in the assessment report. The recommended conditions require the proponent to minimise potential traffic and amenity impacts including noise, dust, and visual impacts.</p>
136(2)(e)	Other information on the relevant impacts of the action.	The Department considers that all information relevant to the impacts of the project has been taken into account in its assessment.
139(1)	Requirements for decisions about threatened species and endangered communities	<p>Australia's obligations under the Convention on Biological Diversity (Biodiversity Convention) include the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilisation of genetic resources, including by appropriate access to genetic resources and by appropriate transfer of relevant technologies, taking into account all rights over those resources and technologies, and by appropriate funding.</p> <p>The recommendations of this assessment report are consistent with the Biodiversity Convention, which promotes environmental impact assessment (such as this process) to avoid and minimise adverse impacts on biological diversity. Accordingly, the recommended development consent requires avoidance, mitigation and management measures for listed threatened species, and all information related to the project is required to be publicly available to ensure equitable sharing of information and improved knowledge relating to biodiversity.</p>
140	<p>Requirements for decisions about migratory species</p> <p><i>In deciding whether or not to approve for the purposes of section 20 or 20A the taking of an action relating to a listed migratory species, and what conditions to attach to such an approval,</i></p>	The project has been determined not to have a significant impact on any listed migratory species.

	<p><i>the Minister must not act inconsistently with Australia's obligations under whichever of the following conventions and agreements because of which the species is listed:</i></p> <p><i>(a) the Bonn Convention;</i></p> <p><i>(b) CAMBA;</i></p> <p><i>(c) JAMBA;</i></p> <p><i>(d) an international agreement approved under subsection 209(4).</i></p>	
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**Factors to have regard to**

176(5)	Bioregional plans	There is no approved bioregional plan related to the activity.
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**Consideration on deciding conditions**

134(4)	<p>Must consider:</p> <p>Information provided by the person proposing to take the action or by the designated Applicant of the action; and</p> <p>The desirability of ensuring as far as practicable that the condition is a cost effective means for the Commonwealth and the person taking the action to achieve the object of the condition.</p>	<p>All project related documentation is available from the Department's website <a href="http://www.planningportal.nsw.gov.au">www.planningportal.nsw.gov.au</a></p> <p>The Department considers that the recommended conditions at <b>Appendix G</b> are a cost effective means of achieving their purpose. The conditions are based on material provided by ESCO that was prepared in consultation with the Department, BCS and other government agencies.</p>
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**Conclusions on Controlling Provisions**

For the reasons set out in **Section 5.4** of this report and this appendix, the Department considers that the impacts of the action would be acceptable, subject to the avoidance and mitigation measures described in the EIS, Amendment Reports, BDAR, and the recommended conditions of consent in **Appendix G**.

**BCS GUIDANCE NOTE  
PROJECT ASSESSMENT OF  
EPBC ACT LISTED THREATENED SPECIES AND COMMUNITIES**

## **1. Purpose and Scope**

This Guidance Note is intended for use by Biodiversity, Conservation and Science Directorate (BCS) teams, in their review of project-related biodiversity assessment documentation and the provision of expert advice to the project assessment teams within Department of Planning, Housing and Infrastructure (DPHI) on matters of national environment significance (MNES) under the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act).

This Guidance Note applies to projects determined to be a 'controlled action' by the Australian Government Minister for the Environment and where the NSW Minister for Planning and Public Spaces (as delegated) has provided notice that the project will be assessed by an assessment process accredited under the Assessment Bilateral Agreement between NSW and the Commonwealth.

For these projects, the NSW Government has committed to undertaking an assessment of matters protected by Part 3 of the EPBC Act relating to the relevant controlling provisions and can include species and communities, world heritage values and ecological character of Ramsar sites. These matters are often described as MNES. Governments are working to streamline the assessment and where the NSW *Biodiversity Offset Scheme's* (BOS's) *Biodiversity Assessment Method* (BAM) (2020) can provide an adequate assessment of EPBC-listed threatened species and communities, this should be reflected in the Biodiversity Development Assessment Report (BDAR). Where the assessment of MNES cannot be assessed by applying the BAM, the assessment must be presented elsewhere in the assessment documentation in accordance with the Secretary's Environmental Assessment Requirements (SEARs).

To assist in this process, DPHI has developed this Guidance Note and the attached checklist templates for use by BCS teams when providing advice on EPBC-listed species and communities.

## **2. Role of BCS Officers**

The key role for BCS teams in the Bilateral process is to provide comments and advice to DPHI on the adequacy of a proponent's assessment of the impacts and offsets for EPBC Act-listed threatened species and communities within an Environmental Impact Statement (EIS), or in the case of a modification to an approved project, a Modification Report, and associated Biodiversity Development Assessment Report (BDAR).

Additionally, BCS is required to verify whether the BAM has been appropriately applied. BCS is also required to advise whether projects are consistent with applicable Australian Government guidelines and policy statements.

During the assessment process, DPHI will typically seek expert advice from BCS in response to an EIS and/or a report prepared by a proponent.

In reviewing assessment documentation, it is particularly important for BCS assessment officers to provide expert advice in relation to the adequacy of evidence-based justifications for decisions about methods, techniques and outcomes. This is required to demonstrate the scientific rigor of the assessments and determine a level of confidence in DPHI's decision making process.

## **3. Reference Documentation**

Key information typically required to be reviewed by BCS officers includes the project EIS (or Modification Report), BDAR and the associated BAM Calculator (BAM-C) report, and any supplementary information provided during the assessment process (including any revisions of the BDAR and associated documentation). Officers may also need to refer to additional information, including but not limited to:

- Referral documentation from the Australian Government Department of Agriculture, Water and the Environment (DAWE), including the referral decision brief;
- Secretary's Environmental Assessment Requirements (SEARs) in relation to Commonwealth matters;
- Supporting databases and directories (such as the NSW BioNet Vegetation Classification, NSW BioNet Threatened Biodiversity Data Collection, NSW BioNet Atlas, NSW BioNet (Mitchell) Landscapes, Commonwealth Species Profile and Threats Database and the Directory of Important Wetlands in Australia, and Biogeographic Regionalisation for Australia);
- Australian Government plans and agreements (such as International environmental obligations, Recovery Plans, Approved Conservation Advice and Threat Abatement Plans) <http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl> ; and
- NSW and Australian Government policies and guidelines (such as DPHI's Guidance to Assist a Decision-Maker to Determine a Serious and Irreversible Impact and the Australian Government's Significant Impact Guideline).

#### 4. Information Requirements

**Tables 1 and 2** provide checklist templates for use by the BCS teams when providing project assessment advice to DPHI on Australian Government matters. The templates generally follow the minimum information requirements for BDARs (refer to Appendix K of the BAM) but focus on and include additional information relevant to MNES.

The **Table 1** template requires BCS officers to verify whether the assessment documentation includes relevant required information by crossing boxes and providing written advice on the adequacy of the information, and/or any additional information requirements. In addition, the **Table 1** template requires officers:

- to provide summaries of proposed impact avoidance, minimisation, mitigation and management measures;
- to confirm the EPBC Act listed threatened species and communities that occur on the subject land, or in the vicinity (i.e.. on land to which impacts may extend), that have been identified in the BDAR/EIS;
- for **each** EPBC Act listed threatened species and/or community, to provide summaries of the:
  - nature and consequences of impacts (i.e. direct and indirect);
  - duration of impact;
  - quantum of impact;
  - consequences of impacts on the species, the population and / or extent of the community at local, state and national scales, and
  - confirmation of the level of predicted impact (likely high risk or low risk of impact).
- to confirm impacts requiring offsetting, the number and class of biodiversity credits needed in accordance with the BAM and, if known, the proposed offsetting approach;
- to consider any relevant Australian Government guidelines and policy statements, and
- to recommend any conditions of development consent.

The BCS officer will need to add or delete dot points and rows in this table, as required for each MNES.

The **Table 2** template requires BCS officers to complete a MNES impact and offsets summary table. Information in both **Table 1** and **2** will provide the basis of the information to be included in the Secretary's Assessment Report.

**DOC24/668254 – Muswellbrook Solar Farm (SSD – 46543209)  
EPBC Bilateral Assessment**

**TABLE 1: BCS OFFICER PROJECT ADVICE TO DPHI ON EPBC ACT LISTED THREATENED SPECIES AND COMMUNITIES**

Requirement	Information	Reference (BAM / BLA <sup>1</sup> )
<b>Background &amp; Description of Action</b>	<p>Does the EIS/BDAR<sup>2</sup>:</p> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> clearly show how operational and construction footprints, including clearing boundaries, structures to be built and elements of the action are situated with regard to MNES</li> <li><input type="checkbox"/> depict stages and timing of the action that may impact on MNES</li> <li><input checked="" type="checkbox"/> provide a map(s) of the subject land boundary showing the final proposal/disturbance footprint with respect to location of MNES, including GIS shape files</li> </ul> <p>Include references to where this detail is provided.</p> <hr/> <p><b>Provide advice on the adequacy of the background and action description with respect to MNES and identify any recommended additional information requirements:</b></p> <p>The bilateral assessment for this project relates to the construction of a solar farm with a development footprint of approximately 318 hectares (ha). The project comprises the following key components:</p> <ul style="list-style-type: none"> <li>• Development of a large-scale solar farm with a generation capacity of approximately 135 megawatt alternating current (MWac).</li> <li>• Development of a utility scale battery energy storage system (BESS) with a capacity of approximately 135 MWac and have provision for up to two hours storage.</li> <li>• Grid connection and electricity transmission line infrastructure.</li> </ul> <p>The proposed solar farm consists of Photovoltaic (PV) panels, which would have a combined capacity of approximately 135 MWac and have provision for up to two hours storage. The development footprint includes both the operational and construction (temporary construction facilities and infrastructure) footprints required to install and operate the solar farm. The Development</p>	BAM Chapters 3, 4, 5 and 8

<sup>1</sup> Bilateral agreement (BLA) made under section 45 of the EPBC Act, including Amending Agreement No. 1 (2020)

<sup>2</sup> Or revisions of the BDAR and associated documentation made as a result of previous reviews or project changes post-exhibition.

Requirement	Information	Reference (BAM / BLA <sup>1</sup> )
	<p>footprint covers approximately 318 ha and is roughly divided into two distinct areas (northern and southern) which are separated by infrastructure and landforms associated with the Muswellbrook Coal Mine. These two areas are connected by linear corridors required for electricity transmission infrastructure.</p> <p>The locations of MNES in relation to the development are located in the following figures within the BDAR:</p> <ul style="list-style-type: none"> <li>• Figure 4 – Plant Community Types</li> <li>• Figure 8 – EPBC Act TECs</li> <li>• Figure 9 – Vegetation Zones and Plots</li> <li>• Figure 20 –Threatened/migratory diurnal avifauna results</li> <li>• Figure 22 – Threatened Microchiropteran bat results</li> <li>• Figure 28 – Results reptiles - Hunter Valley Delma (<i>Delma vescolineata</i>)</li> <li>• Figure 30 – Species polygon Large-eared Pied Bat (<i>Chalinolobus dwyeri</i>)</li> <li>• Figure 34 – Species polygon – Hunter Valley Delma (<i>Delma vescolineata</i>)</li> <li>• Figure 41 – Impacts requiring offset, impacts not requiring offset, and impacts excluded from assessment</li> <li>• Figure 45 – MNES identified in the Development footprint</li> </ul>	
<b>Landscape Context of the MNES</b>	<p><b>Provide advice on the adequacy of the landscape context information and identify any additional information requirements:</b></p> <p>Section 2 'Landscape Features' of the BDAR describes the landscape context and features of the project. This section includes information which meets the requirements of the BAM. No additional information is required.</p>	BAM Section 3.1 BLA clause 7.4

Requirement	Information	Reference (BAM / BLA <sup>1</sup> )
<b>EPBC Act Listed Threatened Species &amp; Communities</b>	<p>Verify that the EIS/BDAR includes relevant information on the identification of all EPBC Act listed threatened species and communities on the site or in the vicinity<sup>3</sup> via:</p> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> field based survey effort</li> <li><input type="checkbox"/> published peer reviewed literature</li> <li><input type="checkbox"/> local data</li> <li><input checked="" type="checkbox"/> supporting databases (such as the NSW BioNet Vegetation Classification, NSW BioNet Threatened Biodiversity Data Collection, NSW BioNet Atlas, Commonwealth Species Profile and Threats Database search results)</li> <li><input type="checkbox"/> Verify that the EIS/BDAR includes appropriate mapping of all EPBC Act listed threatened species and communities in accordance with the relevant Commonwealth Listing Advice. The EIS/BDAR should include important populations and critical habitat as defined in Approved Listing Advice, Approved Conservation Advice and Recovery Action Plans.</li> </ul> <p><b>Provide advice on the adequacy of the identification methods and mapping information / any additional information requirements:</b></p> <p><b>Field-based survey effort:</b></p> <p>The survey methodology for assessing native vegetation (vegetation integrity plots and native vegetation mapping), threatened flora survey methodologies and effort, and threatened fauna survey effort are described in various sub-sections of section 3 and 4 of the BDAR. Floristic and vegetation integrity data was collected in accordance with the minimum requirements under the BAM.</p> <p>Two EPBC Act listed communities and four EPBC Act listed threatened fauna species were recorded within the development footprint.</p> <p>Vegetation surveys identified <i>White Box-Yellow Box- Blakely's Red Gum Grassy Woodlands and Derived Native Grassland</i> (Box-Gum Woodland) Critically Endangered Ecological Community (CEEC) within the proposed development area. 36.2 ha is proposed for impact within the development footprint (Table 14 of the BDAR).</p>	BAM Chapters 4 and 5

<sup>3</sup> On land to which impacts may extend

Requirement	Information	Reference (BAM / BLA <sup>1</sup> )
	<p>Vegetation surveys identified <i>Central Hunter Valley eucalypt forest and woodland</i> CEEC within the proposed development area. 36.2 ha is proposed for impact within the development footprint (Table 14 of the BDAR).</p> <p>Targeted surveys were conducted and the following EPBC threatened species were recorded within the site; Large-eared Pied Bat, Hunter Valley Delma, Rufus Fantail and Grey-headed Flying Fox.</p> <p><b>Published peer-reviewed literature:</b></p> <p>Section 10 'References' of the BDAR details additional information on databases and literature used. There are a number of references to NSW or Commonwealth Government websites, and these are considered to be current and contain reliable information about all MNES considered for this project.</p> <p>No local data has been used to inform decisions in either BDAR. No expert reports were included within the BDAR.</p> <p><b>Supporting databases:</b></p> <p>Eight databases were used for the MNES assessment:</p> <ul style="list-style-type: none"> <li>• NSW DCCEEW BioNet Vegetation Information System (VIS)</li> <li>• NSW DCCEEW BioNet Threatened Biodiversity Data Collection (TBDC)</li> <li>• NSW DCCEEW BioNet Atlas</li> <li>• NSW DCCEEW Bam Important Areas Viewer</li> <li>• DCCEEW EPBC Protected Matters Search Tool (PMST)</li> <li>• PlantNET (The NSW Plant Information Network System). Royal Botanic Gardens and Domain Trust, Sydney (PlantNET 2023)</li> <li>• Atlas of Living Australia (ALA 2023)</li> <li>• Australian Virtual Herbarium (AVH 2023)</li> </ul>	

Requirement	Information	Reference (BAM / BLA <sup>1</sup> )
	<p><b>Appropriate mapping of all EPBC Act-listed species and communities in accordance with relevant Commonwealth Listing Advice:</b></p> <p><b>Assessment of EPBC Act Key diagnostic characteristics against PCTs</b></p> <p><i>Central Hunter Valley eucalypt forest and woodland</i> CEEC has been assessed within the development footprint against the Approved Conservation Advice criteria published by the Commonwealth Threatened Species Scientific Committee (TSSC). The assessment of the CEEC has been provided in section 3.7.3.1 and Table 11 and 12 of the BDAR. <i>Central Hunter Valley eucalypt forest and woodland</i> CEEC that will be impacted by the proposed development is depicted in Figure 8 of the BDAR.</p> <p>BCS considers that sufficient information has been provided to justify the allocation of Plant Community Types (PCTs) 1691, 1607 and 1603 and that the following vegetation zones conform to the CEEC:</p> <ul style="list-style-type: none"> <li>• PCT 1691 <i>Narrow-leaved Ironbark - Grey Box grassy woodland of the central and upper Hunter</i>. Three condition zones have been mapped for PCT 1691, being 'Moderate', 'Low' (Scattered Paddock trees) and 'Degraded Native Pasture'. PCT 1691 'Moderate' and 'Low' are consistent with <i>Central Hunter Valley eucalypt forest and woodland</i> listed as Critically Endangered under the EPBC Act.</li> <li>• PCT 1607 <i>Central Hunter Grey Box – Ironbark Woodland in the New South Wales North Coast and Sydney Basin Bioregion</i> is consistent with <i>Central Hunter Valley eucalypt forest and woodland</i> listed as Critically Endangered under the EPBC Act.</li> <li>• PCT 1603 <i>Narrow-leaved Ironbark - Bull Oak - Grey Box shrub - grass open forest of the central and lower Hunter</i>. Two condition zones have been mapped for PCT 1603, being 'Moderate' and 'Degraded Native Grasslands'. PCT 1603 'Moderate' is consistent with <i>Central Hunter Valley eucalypt forest and woodland</i> listed as Critically Endangered under the EPBC Act.</li> </ul> <p><i>White Box-Yellow Box- Blakely's Red Gum Grassy Woodlands and Derived Native Grassland</i> CEEC has not been assessed within the development footprint against the Approved Conservation Advice</p>	

Requirement	Information	Reference (BAM / BLA <sup>1</sup> )
	<p>criteria published by the Commonwealth Threatened Species Scientific Committee (TSSC). The assessment for Box-Gum Woodland CEEC has been provided in section 3.7.3.2 and Table 12 of the BDAR. Box-Gum Woodland CEEC that will be impacted by the proposed development is depicted in Figure 8 of the BDAR. BCS considers that sufficient information has been provided to justify the allocation of PCT 281 and that the following vegetation zones conform to the CEEC:</p> <ul style="list-style-type: none"> <li>• PCT 281 <i>Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats</i>. Three condition zones have been mapped for PCT 281, being 'Low', 'DNG-Regen', and DNG-Low'. 'Low' and 'DNG-Regen' conforms to <i>White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland</i> listed as Critically Endangered under the EPBC Act.</li> </ul> <p><b><i>Delma vescolineata</i> (Hunter Valley Delma)/ <i>Delma impar</i> (Striped Legless Lizard)</b></p> <p>The population of <i>Delma impar</i> (Striped Legless Lizard) found in the Hunter has recently been separated and described as a new species <i>Delma vescolineata</i> (Hunter Valley Delma). This was discovered and presented in a new peer reviewed study. Given this finding is so recent it has yet to be recognised under NSW legislation. Therefore all occurrences within the <i>Delma impar</i> species complex are to be identified and assessed as <i>Delma impar</i> for NSW planning matters until a formal assessment of <i>Delma vescolineata</i> has been completed by the NSW Threatened Species Scientific Committee. Since the time of assessment <i>Delma vescolineata</i> has been listed as Endangered under the EPBC Act. Therefore, <i>Delma vescolineata</i> has been assessed in accordance with the Commonwealth's Significant Impact Guidelines 1.1 (Endangered species) and the Departments Conservation Advice for <i>Delma vescolineata</i> (Hunter Valley Delma). No such assessment (e.g. SAIL) was undertaken for the species under state legislation as the species is not yet recognised.</p> <p>The newly described species <i>Delma vescolineata</i> was recorded during artificial shelter targeted surveys undertaken for the project and was present at eight of the ten tile arrays (Appendix K of the BDAR). This species was confirmed on site by Stephen Mahony, a Research Associate of Herpetology and Mammalogy, Australian Museum; and Research Assistant, University of Newcastle. Photos were taken of all <i>Delma vescolineata</i> captured for identification and confirmation, to ensure all specimens were not <i>Delma impar</i>, photos of captured <i>Delma vescolineata</i> are presented in Photograph 31 and Photograph 32 of the BDAR.</p>	

Requirement	Information	Reference (BAM / BLA <sup>1</sup> )
	<p>The BDAR states that <i>Delma impar</i> will not be affected by the project and no further assessment was undertaken. The BDAR recognises that the project will impact <i>Delma vescolineata</i> but given it is not recognised under NSW legislation credits for this species have been generated for <i>Delma impar</i> to satisfy offset requirements for <i>Delma vescolineata</i>.</p> <p>BCS requested that all relevant sections of the BDAR and BAM-C address <i>Delma vescolineata</i> as <i>Delma impar</i> when applying the BAM. However, the BDAR does not include an assessment of impacts or exploration of avoid and minimise for either species. <i>Delma impar</i> has been used as a substitute for <i>Delma vescolineata</i> to generate credits for the purposes of the BDAR.</p> <p>The species polygon for <i>Delma impar</i> has not been generated in accordance with <i>NSW Threatened reptiles - Biodiversity Assessment Method survey guide</i> as the species polygon does not encompass the full extent of all suitable habitat on the subject land. This should include all PCTs on the subject land where the species was located and/ or are associated with the species in the TBDC. The BDAR has removed areas containing trees as being suitable habitat for the species. This issue was raised in correspondence from BCS on the proponent's response to submissions on 15 April 2024.</p> <p>Apart from the above, BCS is of the view that all other spatial data and the areas of impact to MNES in the BDAR are consistent.</p> <p><b>Any important populations and critical habitat, as defined in Approved Listing Advice, Approved Conservation Advice and Recovery Action Plans:</b></p> <p>The following important populations and critical habitat as defined in Approved Listing Advice, Approved Conservation Advice and Recovery Action Plans are located within the site for the following species:</p> <ul style="list-style-type: none"> <li>• Grey-headed Flying-fox</li> <li>• <i>Delma vescolineata</i></li> <li>• Regent Honeyeater</li> <li>• Koala</li> </ul>	

Requirement	Information	Reference (BAM / BLA <sup>1</sup> )
	<p><b>Advise whether there is appropriate justification and supporting evidence for the addition and/or exclusion of any EPBC Act listed threatened species and/or communities from the list:</b></p> <p>Table 58 of the BDAR contains an assessment for EPBC Act-listed species for the proposed development. BCS is satisfied that that appropriate justification has been provided for the species excluded.</p>	
<p><b>Avoidance, Minimisation, Mitigation &amp; Management</b></p>	<p>Verify that the EIS/BDAR demonstrates all feasible alternatives and efforts to avoid and minimise impacts on EPBC Act listed threatened species and communities (including direct, indirect and prescribed impacts) including an analysis of alternative:</p> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> designs and engineering solutions</li> <li><input checked="" type="checkbox"/> modes or technologies</li> <li><input checked="" type="checkbox"/> routes and locations of facilities</li> <li><input checked="" type="checkbox"/> sites within the subject site</li> <li><input checked="" type="checkbox"/> Verify that the EIS/BDAR identifies any other site constraints in determining the location and design of the proposal (such as bushfire protection requirements, flood planning levels, servicing constraints, etc).</li> </ul> <p>Verify that the EIS/BDAR provides feasible measures to mitigate and/or manage impacts on EPBC Act listed threatened species and communities (including direct, indirect and prescribed impacts) including:</p> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> techniques, timing, frequency and responsibility</li> <li><input checked="" type="checkbox"/> identify measures for which there is risk of failure</li> <li><input checked="" type="checkbox"/> evaluate the risk and consequence of any residual impacts</li> <li><input type="checkbox"/> any adaptive management strategy proposed to monitor and respond to impacts.</li> </ul> <p><b>Confirm that all feasible alternatives and efforts have been made to avoid and minimise impacts on EPBC Act listed threatened species and communities.</b></p> <p>Section 5 of the BDAR 'Avoiding and Minimising Impacts on Biodiversity Values' addresses the measures that have been taken to avoid and minimise impacts to biodiversity. The BDAR states:</p>	<p>BAM Chapters 6, 7 and 8 BLA clause 7.1</p>

Requirement	Information	Reference (BAM / BLA <sup>1</sup> )
	<p><i>Following preliminary feasibility studies, the Development footprint has been subject to a number of revisions in collaboration between ELA and ESCO, to avoid and minimise impacts on biodiversity. An initial biodiversity assessment was completed in mid-2021 that involved a preliminary feasibility 'study area' (Figure 36). Preliminary PCT mapping was completed for the majority of areas within this study area. Based on this mapping, significant areas of more intact woodland were identified as occurring, particularly in the following key areas:</i></p> <ul style="list-style-type: none"> <li><i>• mapped PCT 1691 woodland in the north-eastern portion of the study area connecting to larger intact woodland to the east.</i></li> <li><i>• mapped PCT 1691 woodland in the south-western portion of the study area.</i></li> <li><i>• mapped PCT 281 (Moderate) woodland along the 4th Order stream in the riparian corridor in the south.</i></li> <li><i>• mapped PCT 1603 woodland in the northern portion of the study area along the northern boundary.</i></li> </ul> <p><i>Based on the preliminary mapping and advice provided to ESCO, the study area was refined to avoid these key larger, intact woodland areas with the updated 'Indicative Subject Land' developed in June 2021 and the 'Indicative Solar Panel Footprint provided in November 2021 (Figure 36).</i></p> <p><i>After the completion of vegetation integrity plots in March 2022, the preliminary PCT mapping was further refined (Figure 36) and from this, large areas of PCT 1691 Degraded Native Pasture, PCT 281 Degraded Native Grassland and PCT 281 DNG low condition were identified.</i></p> <p><i>The avoidance of high value vegetation such as CEECs and threatened flora and fauna habitat was considered a priority and influenced the placement and design of solar panel arrays and associated infrastructure. An 'avoid and minimise' GIS workshop, between ELA ecologists and ESCO project manager, technical and GIS staff was undertaken in July 2022 to further refine the project footprint with the following in mind:</i></p> <ul style="list-style-type: none"> <li><i>• utilise to the greatest extent possible the areas of degraded pastures/grassland;</i></li> </ul>	

Requirement	Information	Reference (BAM / BLA <sup>1</sup> )
	<ul style="list-style-type: none"> <li>• <i>avoid impacts to small, yet more intact areas of PCT 281 'Low' woodland (Biodiversity Exclusion Zone);</i></li> <li>• <i>further refine and avoid impacts to PCT 281 woodland along the 4th Order stream</i></li> </ul> <p><u>BCS Comments:</u></p> <p>The appropriateness of avoidance measures in relation to <i>Delma vescolineata</i> cannot be determined this was not described in the BDAR.</p> <p><b>Verify that the EIS/BDAR provides feasible measures to mitigate and/or manage impacts on EPBC Act listed threatened species and communities (including direct, indirect, and prescribed impacts)</b></p> <p>Section 6 of the BDAR contains details on measures to mitigate and/or manage impacts on EPBC Act listed threatened species and communities (including direct, indirect, and prescribed impacts). As well as measures proposed to mitigate and manage impacts at the Development footprint before, during and after construction.</p> <p><b>Box Gum Woodland CEEC</b></p> <p>BCS's previous advice identified that a SAIL is likely for Box Gum Woodland CEEC based on the proposed project footprint. The proponent has revised the project footprint between the EIS and RTS, resulting in an additional 5 hectares (ha) of impacts to Box Gum Woodland CEEC being avoided. This means the proposed impact is now 113 ha (i.e. the reduction in the impact between EIS and RTS is 4.24 per cent of the original impact).</p> <p>BCS considers the residual impact to 56 ha of Box Gum Woodland CEEC is considerable. BCS requested additional information on the proposed BSA and the mitigation measures for addressing the SAIL principles for Box-Gum Woodland CEEC these have been provided and are generally accepted.</p> <p><b><i>Delma vescolineata/ Delma impar</i></b></p> <p>The BDAR does not provide measures to mitigate and/or manage the impacts to either <i>Delma vescolineata</i> or <i>Delma impar</i>.</p>	

Requirement	Information	Reference (BAM / BLA <sup>1</sup> )
<b>Impact Assessment</b>	<p>Verify that the EIS/BDAR:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> identifies the residual adverse impacts likely to occur to <b>each</b> EPBC Act listed threatened species and/or community after the proposed avoidance and mitigation measures are taken into account</li> <li><input checked="" type="checkbox"/> provides adequate justification and evidence for the predicted level of impact, with reference to the: <ul style="list-style-type: none"> <li>• Commonwealth’s Significant Impact Guideline: <a href="https://www.environment.gov.au/system/files/resources/42f84df4-720b-4dcf-b262-48679a3aba58/files/nes-guidelines_1.pdf">https://www.environment.gov.au/system/files/resources/42f84df4-720b-4dcf-b262-48679a3aba58/files/nes-guidelines_1.pdf</a></li> <li>• DPHI Guidance to Assist a Decision-Maker to Determine a Serious and Irreversible Impact (SAII): (<a href="https://www.environment.gov.au/system/files/resources/42f84df4-720b-4dcf-b262-48679a3aba58/files/nes-guidelines_1.pdf">https://www.environment.gov.au/system/files/resources/42f84df4-720b-4dcf-b262-48679a3aba58/files/nes-guidelines_1.pdf</a>)</li> </ul> </li> </ul> <p>Section 7 and Appendix B contain additional impact assessment provisions for threatened entities at risk of SAI. Box-Gum Woodland CEEC and Large-eared Pied Bat were identified as SAI entities within the BDAR. Section 9.2.1 provides assessment of impacts with reference to Commonwealth’s Significant Impact Guideline. The BDAR states that two EPBC listed threatened communities are likely to be significantly impacted. No significant impact assessment was undertaken for <i>Delma vescolineata</i>, and risk of significant impact was considered low for Regent Honeyeater, Koala and Grey-headed Flying Fox. BCS considers that the proposal poses a risk of significant impact to <i>Delma vescolineata</i>, Regent Honeyeater, Koala and Grey-headed Flying Fox.</p> <p>The BDAR (Section 5) states that throughout the development of the project layout, design decisions have been implemented to avoid impacts to threatened ecological communities. Table 41 and 42 in section 6 of the BDAR provides a summary of the impacts to Box-Gum Woodland CEEC, <i>Central Hunter Valley eucalypt forest and woodland CEEC</i>, <i>Delma vescolineata</i> and Large-eared Pied Bat.</p> <p><b><i>Delma vescolineata/ Delma impar</i></b></p> <p>The species was not listed under either the BC Act or the EPBC Act at the time of assessment. As such the BCS requested the following occur:</p>	<p>BAM Chapters 8 and 9 BLA clauses 6.2(b)(i)-(ii) and 7.1</p>

Requirement	Information	Reference (BAM / BLA <sup>1</sup> )
	<p>“Amend all relevant sections of the BDAR and BAM-C to assess, avoid, minimise and offset Hunter Valley delma as the BC Act and EPBC Act listing status of striped legless lizard”.</p> <p>The BDAR does not consider the outcomes to the species from the proposed impacts or avoid, minimise measures to reduce the considerable impact to <i>Delma vescolineata/ Delma impar</i>. Therefore, the level of impact to the species and associated outcomes was not determined within the BDAR. The removal of 267 ha of critical habitat for the species is considered likely to significantly impact the species.</p> <p><b>Regent Honeyeater</b></p> <p>The disturbance footprint is located within the area described as ‘species likely to occur’ as defined by the distribution map of The National Recovery Plan for the Regent Honeyeater (DoE, 2016a). These areas are defined as habitat critical for the survival of the species. BCS notes that the disturbance footprint is not covered by BCS’s Important Habitat Map for the species.</p> <p>In accordance with the Department’s Significant Impact Guidelines 1.1 (critically endangered and endangered species), an action is likely to have a significant impact on a critically endangered or endangered species if the action will adversely affect habitat critical to the survival of a species. The proposal intends to impact 47.3ha of critical habitat identified by the National Recovery Plan and therefore a significant impact is considered likely.</p> <p><b>Grey-headed Flying Fox</b></p> <p>In accordance with the department’s Significant Impact Guidelines 1.1 (vulnerable species), an action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will adversely affect habitat critical to the survival of a species, modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline or lead to a long-term decrease in the size of an important population of a species. The proposal intends to impact 47.3ha of critical habitat and therefore a significant impact is considered likely.</p> <p><b>Koala</b></p> <p>In accordance with the Department’s Significant Impact Guidelines 1.1 (critically endangered and endangered species), an action is likely to have a significant impact on a critically endangered or</p>	

Requirement	Information	Reference (BAM / BLA <sup>1</sup> )
	<p>endangered species if the action will adversely affect habitat critical to the survival of a species. The proposal intends to impact 45ha of critical habitat as identified by the Conservation Advice for <i>Phascolarctos cinereus</i> (Koala) combined populations of Queensland, New South Wales and the Australian Capital Territory February 2022, therefore a significant impact is considered likely.</p> <p><b>Complete the following information for each EPBC Act listed threatened species and/or community (add/remove rows as necessary):</b></p> <ul style="list-style-type: none"> <li>• EPBC Act listed threatened species and/or community</li> <li>• nature and consequences of impacts (i.e. direct and indirect)</li> <li>• duration of impact (e.g. construction, operation, life of project)</li> <li>• quantum of impact</li> <li>• consequences of impacts on the species, the population and / or extent of the community at local, state and national scales</li> </ul> <p>Confirm the level of predicted impact (cross appropriate):  <input type="checkbox"/> high risk of impact (requiring offsets)<sup>#</sup> or SAIL      <input checked="" type="checkbox"/> Low risk of impact (not requiring offsets)</p> <p><sup>#</sup>For purposes of EPBC approval, as a minimum, significant adverse residual impacts <b>must</b> be offset (significant impact can be evaluated with reference to the significance impact guidelines)</p> <p><b>Confirm that all EPBC Act listed threatened species and communities that occur on the subject land, or in the vicinity, have been identified in the BDAR/EIS including those that are ecosystem credit species.</b></p> <p>As <i>Delma vescolineata</i> was not a listed species under either the NSW BC Act or the Commonwealth EPBC Act at the time of assessment, it has not been considered within the BDAR.</p> <p>BCS requested that all relevant sections of the BDAR and BAM-C assess, avoid, minimise and offset <i>Delma vescolineata</i> as the BC Act and EPBC Act listing status of <i>Delma impar</i>, apart from credit generation this was not undertaken for either species.</p>	

Requirement	Information	Reference (BAM / BLA <sup>1</sup> )
	<p>BCS confirms that all other EPBC Act listed threatened species and communities that occur on the subject land, or in the vicinity, have been identified in the BDAR (see further information below).</p> <p><b>If any species and communities identified in the referral documentation (provided by DAWE) have been ruled out because they don't occur on or near the site, verify that there is robust analysis and justification for why these species can be ruled out.</b></p> <p>This project was referred to the Commonwealth Minister for the Environment in 2022, and was declared a controlled action due to potential significant impacts to two TECs being Box Gum Woodland CEEC and Central Hunter Valley eucalypt forest and woodland CEEC (Referral 2022/09303). Three additional threatened species were also considered to be potentially significantly impacted being:</p> <ul style="list-style-type: none"> <li>• Regent Honeyeater (<i>Anthochaera phrygia</i>) – Critically Endangered</li> <li>• Grey-headed Flying-fox (<i>Pteropus poliocephalus</i>) – Vulnerable</li> <li>• Striped Legless Lizard (<i>Delma impar</i>) – Vulnerable*</li> </ul> <p>The presence of additional EPBC Act listed threatened species within 5 km of the proposed action area which may be impacted by the proposed action include the following:</p> <ul style="list-style-type: none"> <li>• Koala (<i>Phascolarctos cinereus</i> combined populations of Qld, NSW, and the ACT) – Endangered</li> <li>• Swift Parrot (<i>Lathamus discolor</i>) – Critically Endangered</li> <li>• Pink-tailed Worm-lizard (<i>Aprasia parapulchella</i>) – Vulnerable</li> <li>• Spotted-tail Quoll (<i>Dasyurus maculatus maculatus</i>, SE mainland population) – Endangered</li> <li>• Gang-gang Cockatoo (<i>Callocephalon fimbriatum</i>) – Endangered</li> <li>• Large-eared Pied Bat (<i>Chalinolobus dwyeri</i>) – Vulnerable</li> <li>• Grey Falcon (<i>Falco hypoleucos</i>) – Vulnerable</li> </ul>	

Requirement	Information	Reference (BAM / BLA <sup>1</sup> )
	<ul style="list-style-type: none"> <li>• South-eastern Glossy Black Cockatoo (<i>Calyptorhynchus lathami lathami</i>) – Vulnerable</li> <li>• Corben’s Long-eared Bat (<i>Nyctophilus corbeni</i>) – Vulnerable</li> <li>• Rufous Fantail (<i>Rhipidura rufifrons</i>) - Migratory</li> </ul> <p>The list of all identified MNES and whether they may be impacted is described in Table 58.</p> <p>Two additional species were considered to have potential to occur in the proposed action area being:</p> <ul style="list-style-type: none"> <li>• White-throated Needletail (<i>Hirundapus caudacutus</i>) (Vulnerable and Migratory)</li> <li>• Fork-tailed Swift (<i>Apus pacificus</i>) (Migratory)</li> </ul> <p><b>Provide advice on whether there are any other MNES species or communities that are missing from the assessment based on BCS knowledge and experience.</b></p> <p>As above <i>Delma vescolineata</i> was not a listed species under the NSW BC Act or the Commonwealth EPBC Act at the time of assessment, as such it has not been adequately considered within the BDAR.</p> <p>BCS is satisfied that all other MNES species and communities have been included within the assessment.</p> <p><b>Advise whether there is appropriate justification and supporting evidence for the addition and/or exclusion of any EPBC Act listed threatened species and/or communities from the list (if applicable):</b></p> <p>BCS considers that the proponent has provided sufficient evidence that the following species are unlikely to be impacted by the proposed development.</p> <p><b><i>Pink-tailed Worm Lizard</i></b></p>	

Requirement	Information	Reference (BAM / BLA <sup>1</sup> )
	<p>Supported. Not identified by field surveys. The species will therefore not be affected by the project, and no further assessment required.</p> <p><b><i>Grey Falcon</i></b></p> <p>Supported. Not identified by field surveys. The species will therefore not be affected by the project, and no further assessment required.</p> <p><b><i>South-eastern Glossy Black-Cockatoo</i></b></p> <p>Supported. This species was not detected during targeted diurnal bird surveys, or during any surveys across the Development footprint. No optimal foraging habitat occurs within the Development footprint. Although the site supports suitable breeding habitat the species or signs of breeding were not detected nor do any records exist within close proximity to the development site.</p> <p><b><i>Corben's Long-eared Bat</i></b></p> <p>Supported. Not identified by field surveys. The species will therefore not be affected by the project, and no further assessment required.</p> <p><b>Provide advice on whether adequate justification and evidence is provided for species and communities that have been identified as being at low risk of impact.</b></p> <p>The BDAR concludes that two threatened communities are likely to be significantly impacted by the proposed development. Further assessment undertaken for another 8 threatened species concluded that significant impact was unlikely. BCS has undertaken an assessment and is satisfied that adequate justification has been provided to conclude that the proposed development will have a low impact on Rufous Fantail, Swift Parrot, Gang-gang Cockatoo, South-eastern Glossy Black-Cockatoo, Spotted-tail Quoll, and Large-eared Pied Bat.</p> <p>BCS considers the following additional species are at risk of significant impact from the proposed development:</p> <ul style="list-style-type: none"> <li>• Regent Honeyeater</li> </ul>	

Requirement	Information	Reference (BAM / BLA <sup>1</sup> )
	<p>The disturbance footprint is located within the area described as ‘species likely to occur’ as defined by the distribution map of The National Recovery Plan for the Regent Honeyeater (DoE, 2016a). The Hunter Valley is considered a regular area used by regent honeyeaters for foraging and breeding and a key tree for the species (<i>Eucalyptus melliodora</i>) is present within the development footprint.</p> <p>In accordance with the Department’s Significant Impact Guidelines 1.1 (critically endangered and endangered species), an action is likely to have a significant impact on a critically endangered or endangered species if the action will adversely affect habitat critical to the survival of a species. The proposal intends to impact 47.3ha of critical habitat and is therefore considered a significant impact. Two records also exist within close proximity to the site.</p> <ul style="list-style-type: none"> <li>• Grey-headed Flying Fox</li> </ul> <p>Critical habitat for the Grey-headed Flying-fox has been defined by the National Recovery Plan (DAWE, 2021b) as important winter and spring flowering vegetation communities which sustain foraging habitat over drier periods for the species. The following winter and spring flowering canopy species, described as critical habitat to the Grey-headed Flying-fox, occur within the disturbance footprint being <i>Eucalyptus tereticornis</i>, <i>Eucalyptus crebra</i> and <i>Eucalyptus Melliodora</i>. The National Recovery Plan (DAWE, 2021b) also states that habitat critical to the survival of the Grey-headed Flying-fox includes species used for foraging which occur within 20 km of a nationally important camp as identified by the Department. A nationally important camp is identified in Muswellbrook, located approximately 4 km to the east of the disturbance footprint (DCCEEW, 2022b). The species was also recorded within the site.</p> <p>In accordance with the department’s Significant Impact Guidelines 1.1 (vulnerable species), an action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will adversely affect habitat critical to the survival of a species, modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline or lead to a long-term decrease in the size of an important population of a species. The proposal intends to impact 47.3ha of critical habitat and is therefore considered a significant impact.</p>	

Requirement	Information	Reference (BAM / BLA <sup>1</sup> )
	<ul style="list-style-type: none"> <li>• <i>Delma vescolineata</i></li> </ul> <p>In accordance with the Conservation Advice for <i>Delma vescolineata</i> habitat critical to the survival of a species refers to areas that are necessary:</p> <ul style="list-style-type: none"> <li>○ For activities such as foraging, breeding or dispersal.</li> <li>○ For the long-term maintenance of the species (including the maintenance of species/subspecies essential to the survival of the species).</li> <li>○ To maintain genetic diversity and long-term evolutionary development.</li> <li>○ For the reintroduction of populations or recovery of the species.</li> </ul> <p>The newly described species was recorded during artificial shelter targeted surveys and was present at eight of the ten tile arrays (Appendix K of the BDAR).</p> <p>In accordance with the Conservation Advice for <i>Delma vescolineata</i> all populations of <i>Delma vescolineata</i> are important for the conservation of the species across its range. Due to the limited area of occupancy, extent of occurrence and habitat decline, all sites where <i>Delma vescolineata</i> has been detected are potentially important for the species survival. Removal of 267ha of habitat critical, where the species has been recorded is considered a significant impact for the species.</p> <ul style="list-style-type: none"> <li>• Koala</li> </ul> <p>In accordance with Conservation Advice for <i>Phascolarctos cinereus</i> (Koala) combined populations of Queensland, New South Wales and the Australian Capital Territory February 2022 habitat critical to the survival of a species is defined as the areas that the species relies on to avoid or halt decline and promote the recovery of the species. Under the EPBC Act, the following factors and any other relevant factors may be considered when identifying habitat that is critical to the survival of a species:</p> <ul style="list-style-type: none"> <li>○ Whether the habitat is used during periods of stress (examples: flood, drought or fire).</li> </ul>	

Requirement	Information	Reference (BAM / BLA <sup>1</sup> )										
	<ul style="list-style-type: none"> <li>○ Whether the habitat is used to meet essential life cycle requirements (examples: foraging, breeding, nesting, roosting, social behaviour patterns or seed dispersal processes).</li> <li>○ The extent to which the habitat is used by important populations.</li> <li>○ Whether the habitat is necessary to maintain genetic diversity and long-term evolutionary development</li> <li>○ Whether the habitat is necessary for use as corridors to allow the species to move freely between sites used to meet essential life cycle requirements;</li> <li>○ Whether the habitat is necessary to ensure the long-term future of the species or ecological community through reintroduction or re-colonisation;</li> <li>○ Any other way in which habitat may be critical to the survival of a listed threatened species or a listed threatened ecological community. Such areas, if identified, would be expected to include habitat occupied and habitat currently unoccupied, areas necessary for population processes and maintenance of genetic diversity and evolutionary potential, and areas required to accommodate future population increase, recolonisation, reintroduction, or as climate refugia.</li> </ul> <p>In accordance with the Department's Significant Impact Guidelines 1.1 (critically endangered and endangered species), an action is likely to have a significant impact on a critically endangered or endangered species if the action will adversely affect habitat critical to the survival of a species. The proposal intends to impact 45ha of critical habitat and is therefore considered a significant impact. 15 records also exist within close proximity to the site and three are located within the site.</p> <p><b>Assess the consequences of impacts on the species, the population and / or extent of the community at local, state and national scales.</b></p> <table border="1" data-bbox="472 1182 1778 1340"> <thead> <tr> <th data-bbox="472 1182 741 1262">MNES Entity</th> <th data-bbox="741 1182 954 1262">Area of Impact (ha)</th> <th data-bbox="954 1182 1189 1262">Local Consequence</th> <th data-bbox="1189 1182 1491 1262">State Consequence</th> <th data-bbox="1491 1182 1778 1262">National Consequence</th> </tr> </thead> <tbody> <tr> <td data-bbox="472 1262 741 1340">White Box-Yellow Box-Blakely's Red</td> <td data-bbox="741 1262 954 1340">56</td> <td data-bbox="954 1262 1189 1340">The project will reduce the</td> <td data-bbox="1189 1262 1491 1340">Current extent in NSW is</td> <td data-bbox="1491 1262 1778 1340">Current national extent of</td> </tr> </tbody> </table>	MNES Entity	Area of Impact (ha)	Local Consequence	State Consequence	National Consequence	White Box-Yellow Box-Blakely's Red	56	The project will reduce the	Current extent in NSW is	Current national extent of	
MNES Entity	Area of Impact (ha)	Local Consequence	State Consequence	National Consequence								
White Box-Yellow Box-Blakely's Red	56	The project will reduce the	Current extent in NSW is	Current national extent of								

Requirement	Information				Reference (BAM / BLA <sup>1</sup> )	
	Gum Grassy Woodland and Derived Native Grassland		extent and increase the fragmentation of this community within the landscape.	approximately 250,000 ha. The amount of this community to impacted is small in the context of the NSW community occurrence (0.02%)	approximately 416,000 ha. The amount of this community to be impacted in the context of the country is small (0.01%).	
	Central Hunter Valley eucalypt forest and woodland	36.2	The project will reduce the extent and increase the fragmentation of this community within the landscape.	Current extent in NSW is approximately 37,000 ha. The amount of this community to impacted is small in the context of the NSW community occurrence (0.08%)	Current national extent is approximately 37,000 ha. The amount of this community to impacted is small in the context of the country is small (0.08%)	
	Regent honeyeater	43.7	The project will reduce the amount of suitable habitat for the species, increase the habitat fragmentation in the local area and reduce the area of occupancy in the local area.	The project will increase the habitat fragmentation in the local area and reduce the area of occupancy in the state of NSW.	The project will increase the habitat fragmentation in the local area and reduce the area of occupancy. This impact has the potential to be significant.	

Requirement	Information					Reference (BAM / BLA <sup>1</sup> )
	Hunter Valley Delma	267	The project will reduce the amount of suitable habitat for the species, increase the habitat fragmentation in the local area and reduce the area of occupancy in the local area.	The project will increase the habitat fragmentation in the local area and reduce the area of occupancy in the state of NSW.	The project will increase the habitat fragmentation in the local area and reduce the area of occupancy. This impact is considered significant.	
	Grey-headed Flying Fox	43.7	The project will reduce the amount of suitable habitat for the species, increase the habitat fragmentation and reduce the area of occupancy in the local area.	The project will reduce the amount of suitable habitat for the species, increase the habitat fragmentation in the local area and reduce the area of occupancy in the local area.	The project will increase the habitat fragmentation in the local area and reduce the area of occupancy. This impact has the potential to be significant.	
	Koala	43.7	The project will reduce the amount of suitable habitat for the species, increase the habitat	The project will reduce the amount of suitable habitat for the species, increase the habitat fragmentation in the local area and	The project will reduce the amount of suitable habitat for the species, increase the habitat fragmentation in the local area and	

Requirement	Information					Reference (BAM / BLA <sup>1</sup> )
			fragmentation in the local area and reduce the area of occupancy in the local area.	reduce the area of occupancy in the local area.	reduce the area of occupancy in the local area. This impact has the potential to be significant.	
	Swift Parrot	43.7	Species not recorded in development footprint and suitable habitat is sparse.	Unlikely to have a significant impact.	Unlikely to have a significant impact.	
	Spotted- tail Quoll	43.7	The project will reduce the amount of suitable habitat for the species, increase the habitat fragmentation and reduce the area of occupancy in the local area.	Unlikely to have a significant impact.	Unlikely to have a significant impact.	
	Gang-gang Cockatoo	43.7	The project will reduce the amount of suitable habitat for the species, increase the habitat	Unlikely to have a significant impact.	Unlikely to have a significant impact.	

Requirement	Information				Reference (BAM / BLA <sup>1</sup> )	
			fragmentation and reduce the area of occupancy in the local area.			
	Large-eared Pied Bat	43.7	The species was recorded onsite. The project will reduce the amount of suitable foraging habitat for the species, increase the habitat fragmentation in the local area and reduce the area of occupancy in the local area.	Unlikely to have a significant impact.	Unlikely to have a significant impact.	
	White-throated Needletail and Fork-tailed Swift – Migratory listing	43.7	Species not recorded in development footprint. Suitable habitat exists onsite.	Unlikely to have a significant impact.	Unlikely to have a significant impact.	
	Rufous Fantail – Migratory listing	43.7	The species was recorded onsite. The	Unlikely to have a significant impact.	Unlikely to have a significant impact.	

Requirement	Information	Reference (BAM / BLA <sup>1</sup> )
	<p>project will reduce the amount of suitable habitat for the species.</p>	
<b>Offsets</b>	<p>Verify that the EIS/BDAR:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> identifies any MNES that haven't been offset using the BAM</li> <li><input type="checkbox"/> identifies how impacts requiring offsets correlate to MNES impacts</li> <li><input type="checkbox"/> identifies the plant community types (PCTs) requiring offset and the number and type of ecosystem credits required for impacts to MNES</li> <li><input type="checkbox"/> identifies threatened species requiring offset and the number of species credits required for impacts to MNES</li> <li><input type="checkbox"/> correctly uses the BAM (and BAM calculator) to identify the number and class of biodiversity credits that need to be offset to achieve a standard of 'no net loss' of biodiversity</li> <li><input checked="" type="checkbox"/> identifies if ecological rehabilitation and/or biodiversity conservation actions are proposed for offsetting</li> </ul>	BAM Chapter 10 BLA clauses 7.1 and 7.2

Requirement	Information	Reference (BAM / BLA <sup>1</sup> )
	<p data-bbox="472 248 1774 347">☒ if known, identifies any other offsetting approach proposed, such as land-based offsets, retiring credits by payment into the Biodiversity Conservation Fund and/or through supplementary measures<sup>#</sup>.</p> <p data-bbox="472 387 1379 416"><b>Complete the Impacts and Offsets Summary table below (Table 2)</b></p> <p data-bbox="472 456 1733 517"><b>Provide advice on the adequacy of the proposed offsets in meeting the requirements of the BAM:</b></p> <p data-bbox="472 557 1760 687">Impacts to MNES that require offsetting are addressed Section 7.2 of the BDAR. Table 55 of the BDAR lists the PCTs that require offsetting and the number of ecosystem credits required and Table 56 lists the species that require offsetting and the number of species credits required. There is no information to specify specific requirements for MNES entities.</p> <p data-bbox="472 727 1778 890">Section 8 of the BDAR details the proposed offsetting approaches intended to be used. The applicant is proposing to establish a BSA over two parcels of land, adjacent to the southern portion of the Development footprint, that are proposed for BSA sites (Figure 44 of the BDAR). Site 1 is approximately 288 ha and occurs directly to the west of the Development footprint. Site 2 is approximately 366 ha and located to the north and north-east of the Development footprint.</p> <p data-bbox="472 951 752 979"><b><i>Box Gum Woodland</i></b></p> <p data-bbox="472 1007 1771 1169">BCS's review of the BDAR concluded that the residual impact to 56 ha of Box Gum Woodland CEEC was considerable and that the proponent should be required to provide additional and appropriate measures commensurate to the residual impact of the project on this CEEC, in accordance with section 7.16(3) of the BC Act. The proponent should develop the additional and appropriate measures in collaboration with BCS.</p> <p data-bbox="472 1198 1765 1297">The proponent has proposed to secure an additional 17 ha of Box Gum Woodland (treed woodland), 12.8 ha of Derived Native Grassland (DNG) – comprising regeneration and 3.2 ha of DNG (no regeneration) (Table 2), with the intention to undertake active restoration plantings.</p> <p data-bbox="472 1326 1559 1355">BCS has generally accepted the proposed additional measures, noting the following:</p>	

Requirement	Information	Reference (BAM / BLA <sup>1</sup> )
	<ul style="list-style-type: none"> <li>• BCS does not support the method used to adjust the additional and appropriate measure (AAM) area in hectares based on vegetation integrity (VI) score ratios.</li> <li>• BCS agrees that no additional credit generation should occur for candidate threatened species in the AAM area.</li> <li>• It BCS's preference for a biodiversity stewardship agreement to be established on the AAM site and as such, a BSA expression of interest should be submitted to the BCT for the AAM area. If a BSA is not possible, a Conservation Agreement should be sought (noting that this may result in funding being made available for restoration and management activities). If a Conservation Agreement is not possible, a restrictive covenant should be applied to protect the area.</li> </ul> <p><b><i>Delma vescolineata</i></b></p> <p>To calculate offsets for <i>Delma vescolineata</i>, <i>Delma impar</i> has been used as a substitute to generate credits, being a 267 ha species polygon, generating 656 credits.</p> <p>As the species is not listed under the BC Act it cannot be determined if credits generated for the BC Act listed Vulnerable <i>Delma impar</i> are appropriate to offset the impacts to the EPBC Act listed <i>Delma vescolineata</i>. As described above given the species highly restricted area of occupancy and extent of occurrence it is unable to be determined if offsetting the removal of 267ha of critical habitat for the species is an adequate measure to ensure the survival of the species.</p> <p>The proponent has undertaken consultation with the Credit Supply Taskforce (Taskforce) on 14 December 2023 regarding the two proposed Biodiversity Stewardship Sites (outlined in Section 8) and generation of credits for use in offsetting the credit liability of the Project. As part of targeted surveys for these projects, <i>Delma vescolineata</i> has been identified within the grassland habitats of both these proposed Stewardship Sites.</p> <p>The Taskforce confirmed that should this species be listed, and evidence is suitably documented to prove presence of this species across the proposed Stewardship sites, they would accept generation of credits as part of a Stewardship Site Agreement. The Taskforce stated that they would not allow</p>	

Requirement	Information	Reference (BAM / BLA <sup>1</sup> )
	<p>the generation of credits for <i>Delma impar</i> as a substitute for <i>Delma vescolineata</i>, as this was not the species identified.</p> <p>The proponent proposes the following:</p> <ol style="list-style-type: none"> <li>1. Create species polygons across grassland habitat in which <i>Delma vescolineata</i> was recorded.</li> <li>2. Calculate impacts for <i>Delma vescolineata</i> (<i>Delma impar</i> as substitute for <i>Delma vescolineata</i>) as per the 267 ha species polygon, generating 656 credits.</li> <li>3. If the species <i>Delma vescolineata</i> is listed under the BC Act and/or EPBC Act from project approval and identified in the TBDC as a species credit species, the proponent will retire the credits calculated appropriately over the 267ha identified in this BDAR and meet the 656 credit liability within 24 months from the date the species is listed.</li> <li>4. The proponent seeks written confirmation within the conditions of consent that the credit obligation for <i>Delma impar</i> can be offset with the credits generated for <i>Delma vescolineata</i>. It must also be specified that if, <i>Delma vescolineata</i> is not listed under the BC Act at the time of project approval, that the <i>Delma impar</i> credit obligation is not required to be met.</li> </ol> <p>The proponent has suggested it would be open to discussion regarding the possibility of funding a biodiversity conservation action for this species under the Ancillary rules (Clause 6.5 of the Biodiversity Conservation Regulation 2017), noting that this species has not, as yet been listed in Table 1 of the BC Regulation.</p> <p>As well as this the species the species polygon generated for <i>Delma impar</i> is not in accordance with Threatened reptiles - Biodiversity Assessment Method survey guide as previously detailed. The proponent should map the species polygon to the full extent of all suitable habitat on the subject land which will include all PCTs on the subject land where the species was located and/ or are associated with the species in the TBDC. Removal of areas containing trees within suitable habitat/ PCTs is not in accordance with the BAM.</p> <p>The BAM and BAM-C have been used correctly for all other MNES entities.</p>	

Requirement	Information	Reference (BAM / BLA <sup>1</sup> )
<b>Other Considerations</b>	<p>Verify if any relevant Commonwealth guidelines and policy statements are applicable to the action and listed threatened species and/or community, including but not limited to:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> International environmental obligations</li> <li><input type="checkbox"/> Recovery Plans</li> <li><input type="checkbox"/> Approved Conservation Advice</li> <li><input type="checkbox"/> Threat Abatement Plans</li> </ul> <p><i>The relevant Commonwealth guidelines and policy statements for each species and community are available at: <a href="http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl">http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl</a></i></p> <hr/> <p><b>For each EPBC Act listed threatened species and/or community, provide advice on whether the assessment has been adequately informed by applicable Commonwealth guidelines and/or policy statements. For example, the interaction between the proposed action and important populations or critical habitat identified in policy documents and/or the interaction between the proposed action and threatening processes or recommended conservation actions outlined in Commonwealth policies and plans.</b></p> <p>The significant impact assessment for <i>Central Hunter Valley eucalypt forest and woodland</i> CEEC does not directly consider the <i>Approved Conservation Advice (including listing advice) for the Central Hunter Valley eucalypt forest and woodland ecological community</i>.</p> <p>The significant impact assessment for <i>White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland</i> does not directly consider the <i>White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland National Recovery Plan or the Conservation Advice for the White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland</i>.</p> <p>The assessment does not consider published conservation advice or National Recovery Plans for the Hunter Valley delma, Regent Honeyeater, Koala, Grey-headed Flying-fox, Swift Parrot, Spotted-tail Quoll, Gang-gang Cockatoo, Large-eared Pied Bat, White-throated needletail, Fork-tailed Swift or Rufous Fantail.</p>	BLA clauses 6.2(b)(iv), 7.2(c), 7.3 and 7.4

Requirement	Information	Reference (BAM / BLA <sup>1</sup> )
	The applicant does propose to establish two Biodiversity Stewardship Sites, which will serve to contribute to the offsetting of the residual impacts of the proposed development.	
<b>Recommended Conditions</b>	<b>Provide advice on any recommended conditions and reasons for imposing the conditions:</b> None	BLA clause 6.2(c)(iii)

**TABLE 2: MNES IMPACT AND OFFSET SUMMARY**

Threatened Species / Community listed under EPBC Act	PCTs associated with the ecosystem credit species / ecological community (if applicable)	Area of Impact (ha)	Credits Required	Offsetting Approach	Reference (EIS, BDAR)
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	PCT 281 (Low), 281 (DNG-Regen)	56	232 (ecosystem credits)	<p>Two Biodiversity Stewardship Agreement (BSA) are proposed in adjoining lands. Site 1 is approximately 288 ha and occurs directly to the west of the Development footprint. Site 2 is approximately 366 ha and located to the north and north-east of the Development footprint.</p> <p>Retirement of residual credits across two existing BSAs.</p> <p>Payment into the BCF.</p>	Section 7.2 of the BDAR.
Central Hunter Valley eucalypt forest and woodland	PCT 1603 (Moderate), 1607 (Moderate), 1691 (Low and Moderate)	36.2	875 (ecosystem credits)	<p>Two Biodiversity Stewardship Agreement (BSA) are proposed in adjoining lands. Site 1 is approximately 288 ha and occurs directly to the west of the Development footprint. Site 2 is approximately 366 ha and located to the north and north-east of the Development footprint.</p> <p>Retirement of residual credits across two existing BSAs.</p> <p>Payment into the BCF.</p>	Section 7.2 of the BDAR.
Large-eared Pied Bat ( <i>Chalinolobus dwyeri</i> )	PCT 1691, 1603, 1607	3.2ha	111 (species credits)	Two Biodiversity Stewardship Agreement (BSA) are proposed in	Section 7.2 of the BDAR.

				<p>adjoining lands. Site 1 is approximately 288 ha and occurs directly to the west of the Development footprint. Site 2 is approximately 366 ha and located to the north and north-east of the Development footprint.</p> <p>Retirement of residual credits across two existing BSAs.</p> <p>Payment into the BCF.</p>	
Delma impar / Striped Legless Lizard	PCT 281, 1691, 1603, 1607	267	656 (species credits)	<p>Two Biodiversity Stewardship Agreement (BSA) are proposed in adjoining lands. Site 1 is approximately 288 ha and occurs directly to the west of the Development footprint. Site 2 is approximately 366 ha and located to the north and north-east of the Development footprint.</p> <p>Retirement of residual credits across two existing BSAs.</p> <p>Payment into the BCF.</p>	Section 7.2 of the BDAR.