Wattle Creek Energy Hub Battery Energy Storage System Project

Application Number: **02425** Commencement Date: **29/05/2024** Status: **Locked**

1. About the project

1.1 Project details

1.1.1 Project title *

Wattle Creek Energy Hub Battery Energy Storage System Project

1.1.2 Project industry type *

Energy Generation and Supply (renewable)

1.1.3 Project industry sub-type

Solar Farm

1.1.4 Estimated start date *

01/12/2025

1.1.4 Estimated end date *

01/01/2067

1.2 Proposed Action details

1.2.1 Provide an overview of the proposed action, including all proposed activities. *

Wattle Creek Energy Hub Pty Ltd (the Proponent) is proposing the construction and operation of the Wattle Creek Battery Energy Storage System (BESS) Project (the Proposed Action) to be developed by Spark Renewables Pty Ltd (the Developer). The Proposed Action forms part of the Wattle Creek Energy Hub which includes the Proposed Action (350 MW (AC or DC coupled) and up to four (4) hours of storage (1400 MWh))

and a separate large-scale solar PV generation facility (265 MW(AC)) with a storage capacity of 100MW (approximately 2 hours). The BESS and Solar/BESS components also have related infrastructure which are common to both components. The solar and BESS components will be progressed through separate NSW State Significant Development (SSD) approval pathways, this Referral (2024/09970) relates to the BESS and component only, the Wattle Creek Solar Farm has been referred to under Referral 2024/09969.

The Proposed Action includes the installation, operation, maintenance and decommissioning of a large-scale BESS facility, ancillary infrastructure, and temporary facilities within the broader Wattle Creek Energy Hub. The current design of the BESS allows for a capacity of approximately 350 MW (AC or DC coupled) and will have provision for up to four (4) hours of storage (1400 MWh)).

The Proposed Action for consideration in this referral consists of the following main components as illustrated in the attached figures including **Figure 1** (Project Location), **Figure 2** (Proposed Wattle Creek Energy Hub BESS Layout), **Figure 3** (EPBC Act Referral Area).

The Project Area Boundary (herein referred to as the Referral Area) is the maximum spatial extent associated with the Wattle Creek Energy Hub (approximately 6,300 ha) defined by all current land access available to Spark. It includes the entire Arthursleigh Property and encompasses all aspects of the Proposed Action except for the off-site transport route. A ‘Survey Area’ is used to describe the area included in the detailed biodiversity surveys and includes avoidance areas from previous iterations of the Disturbance Area boundary. The survey area was established based on the original investigation area associated with the Wattle Creek Energy Hub (including wind component). The wind component is no longer proposed however data collected from these areas is being used to inform the assessment. Since removal of the wind component survey undertaken within the Referral Area has focussed on the BESS and Solar components only.

The Disturbance Area describes the area directly and indirectly impacted by the Proposed Action within the Referral Area, refer to **Figure 3**. The Disturbance Area is defined as the area within which the BESS and associated ancillary infrastructure will be placed.

The Proposed Action's key components include:

- Batteries – most likely a lithium-ion technology.
- Inverters – bi-directional inverters to convert DC current to AC current (when exporting electricity) and vice versa (when importing electricity).
- Transformers – skid-mounted transformers will be installed adjacent to each inverter to step up the voltage to the internal reticulation voltage of the plant.

Battery modules are the key building block in a utility-scale BESS and are capable of both storing and discharging energy at a rapid rate. Battery modules are installed in racks, with the racks wired together in strings, and strings of batteries then connected to the inverter stations.

The batteries will either be containerised in self-contained steel enclosures resembling shipping containers or alternatively within a building resembling a large industrial shed. Due to rapidly evolving technology, the final technology choice and battery storage capacity is yet to be confirmed and is subject to final selection and detailed design.

The following infrastructure are Common Ancillary Features to both the Solar Farm and BESS Projects and are assessed in both Referrals within the total Disturbance Area:

- Substation and transmission connection – on-site collector substation and overhead powerlines to connect the BESS to the electricity transmission network via Marulan Substation. A substation communication mast of up to 80 m in height is also included at the substation location.
- Two transmission line options are being investigated, to allow for optionality during the assessment process and greater flexibility in the connection design. One transmission option will be constructed for each option, (i.e. one transmission option for the solar farm project, and a separate transmission option for the standalone BESS), however, optionality to connect to the substation via one

transmission line only is also being investigated therefore the two options are being assessed separately.

- A research Test-Bed Facility – comprising of a 1.4 ha hard standing area, demountable buildings, security fencing, parking, 200kVA power supply and 100kVA dummy load (simulated electrical load for testing purposes). The facility will be used in the development and research of novel clean energy technologies, such as innovative battery systems developed by Gelion, a company started by researchers from the University in 2015.
- Electrical connections – a combination of underground cables and overhead powerlines connecting solar facility to the on-site collector substation.
- Operations and maintenance (O&M) facility – including control rooms, O&M buildings, amenities, equipment sheds, storage, a hardstand and bench, and parking areas.
- Minor upgrades to the existing site access point from Canyonleigh Road and internal access roads.
- Temporary construction infrastructure – to facilitate construction and likely to include laydown and storage areas and site offices.
- Security fencing – to prevent unauthorised access to the site and guard high voltage or dangerous equipment.

The indicative layout of the key components within the Disturbance Area is shown on **Figure 2**.

Construction of the Proposed Action is expected to be completed over approximately 13 months. Temporary infrastructure required during construction will include temporary construction compounds, site offices, concrete batching plants, rock crushing facilities, stockpile, material storage and laydown areas, and internal access tracks. Earthworks will be required for the BESS foundation excavation, hardstand and access track formation and drainage works. Where required, additional or improved drainage channels, sediment control ponds and dust control measures will be implemented. Laydown areas, waste handling, fuel and chemical storage areas will be strategically placed to minimise potential environmental impacts during construction.

A workforce of approximately 73 personnel will be required on-site during peak construction. Councils and local business owners will be consulted throughout the development and assessment of the Proposed Action, particularly relating to the management of potential impacts and opportunities for accommodation of the construction workforce.

The construction workforce will be sourced from the local area as far as practicable. Accommodation for non-local construction staff will likely be sourced through available rental properties, hotels/motels, and other forms of accommodation in surrounding townships and regional centres including (but not limited to) Marulan, Goulburn, Moss Vale, Bowral, and Crookwell.

Operation of the Proposed Action is expected to be continuous for 35 years. Key activities during operations will be energy generation and energy storage. Once operational, up to 15 full-time employees will be required. Operations will be supported by contractor roles for vegetation, weed and pest management, annual module cleaning and equipment calibration, internal road maintenance and facility cleaning. Regular maintenance will be required throughout operations. Site maintenance activities will include management of internal roads, drainage, fencing and vegetation (and management of sheep grazing under panels). Additional maintenance of key infrastructure will also be required and will include service, repair or replacement of inverters, transformers, substation, or switchyard. The remainder of the Referral Area will continue to be used for agricultural purposes throughout operations. Light vehicle access will be required throughout operations and occasional heavy vehicles may also be required.

Decomissioning - once the Proposed Action reaches the end of its operational life, a decision will be made to either decommission or re-power the facility, subject to land agreements and approval requirements. If the Proposed Action is decommissioned, all aboveground structures built as part of the Proposed Action will be removed and the site rehabilitated generally to its pre-existing land use, as far as practicable. The disposal and recycling of infrastructure will be undertaken in accordance with waste management legislation at the

time of decommissioning. Whenever possible, efforts will be made to reduce the amount going to landfill in line with best-practice sustainability principles. If re-powering is proposed, an appropriate stakeholder consultation process will be undertaken, and all necessary approvals will be sought.

Proposed Action – For the purposes of this referral, a Disturbance Area of approximately 75 hectares (ha) has been identified, refer to **Figure 3**. This Disturbance Area includes the BESS footprint and the common ancillary features footprint. The Proposed Action has the potential for impact to MNES as detailed in this referral associated with vegetation clearance and groundworks/excavation for underground cable laying (trenching or boring) for the construction and operation of the Proposed Action.

1.2.2 Is the project action part of a staged development or related to other actions or proposals in the region?

Yes

1.2.3 Is the proposed action the first stage of a staged development (or a larger project)?

Yes

1.2.5 Provide information about the staged development (or relevant larger project).

The Wattle Creek Energy Hub is the overall combination of both the Proposed Action and the Wattle Creek Solar Farm (Referral 2024/09969).

The Wattle Creek Solar Farm Project includes the installation, operation, maintenance and decommissioning of a large-scale solar photovoltaic (PV) generation facility with an energy storage capacity of 100MW (approximately 2 hours) and temporary facilities associated with the construction of the solar farm. The BESS and Solar components will be progressed through separate NSW State Significant Development (SSD) approval pathways and are therefore subject to separate referrals.

Although adjacent to each other, the BESS and Solar Farm could be registered as separate generating units in the NEM and will be developed and operated independently. The solar energy generated may be exported to the grid or used to charge the BESS. When discharging, the BESS would export its electricity to the grid. As such, all components are independent but related uses of the broader Wattle Creek Energy Hub.

The BESS and Solar Farm Disturbance Areas overlap as the associated ancillary infrastructure is common to both components, refer to **Figure 4**. This approach provides for flexibility during the detailed design phase and for the components to progress individually if required. The Solar, BESS and common infrastructure areas are being assessed separately, this separate assessment will be included in the EIS and will inform the conditions of consent (should the Project be approved) to ensure no areas of impact are missed and also to avoid any double counting of impacts.

1.2.6 What Commonwealth or state legislation, planning frameworks or policy documents are relevant to the proposed action, and how are they relevant? *

Commonwealth

Environment Protection and Biodiversity Conservation Act 1999 - the Proposed Action has potential to significantly impact Matters of National Environmental Significance (MNES) protected under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), including threatened species and ecological

communities, and migratory specie.

Native Title Act 1993 - this Act provides for the recognition and protection of native title. Within the Referral Area there are currently no active native title claims and no registered Indigenous Land Usage Agreements (ILUAs), however, the provisions of the Native Title Act will be considered in the design and assessment of the Proposed Action as relevant.

NSW

Environmental Planning and Assessment Act 1979 (EP&A Act) - the Proposed Action will require approval under the *Environmental Planning and Assessment Act 1979* (EP&A Act). The Proposed Action also requires approval under NSW legislation. In NSW the Proposed Action is classed as a State Significant Development (SSD) under the NSW State *Environmental Planning Policy (Planning Systems) 2021* (Planning Systems SEPP) as the Projct is development for the purpose of electricity generation with a capital investment value (CIV) of more than $30 million (estimated Proposed Action CIV of approximately $652 million). A development application (DA) is required to be submitted under Part 4 of the NSW EP&A Act. The DA will be accompanied by an Environmental Impact Statement (EIS) that will assess the environmental and social impacts of the Proposed Action.

Other NSW approvals/assessments will also be required under the *Biodiversity Conservation Act 2016*, *Roads Act 1993* (approval for works to public roads), *Crown Land Management Act 1997* (works associated with Crown Land within the Referral Area), and the *Water Management Act 2000* (construction and operational water licence requirements).

1.2.7 Describe any public consultation that has been, is being or will be undertaken regarding the project area, including with Indigenous stakeholders. Attach any completed consultation documentations, if relevant. *

Extensive stakeholder consultation has been undertaken with relevant Authorities and key stakeholders by the Proponent. Engagement with local community commenced in February 2023 led by Spark Renewables staff and supported by Umwelt.

Initial Public Authority consultation included the Upper Lachlan Council, Wingecarribee Council, Goulburn-Mulwaree Council, the Australian Energy and Market Operator (AMEO), the Australian Renewable Energy Agency (ARENA) and relevant service providers such as Transgrid and Essential Energy.

Consultation is also being under with Aboriginal Stakeholders through the preparation of the Social Impact Assessment (SIA). Consultation is also being undertaken with the Registered Aboriginal Parties through the preparation of an Aboriginal Cultural Heritage Assessment for the Proposed Action.

Community stakeholder engagement has also been undertaken during the scoping phase of the NSW assessment process to build relationships with near neighbours and key stakeholders in relation to the Proposed Action, as well as to inform design and development planning. This has assisted in identifying and understanding the perceived issues and impacts early in the planning and assessment process. The Community and Stakeholder Engagement Plan (CSEP) developed and implemented for the Proposed Action is provided in **Attachment 1**.

A range of engagement mechanisms have been undertaken including:

- Website and online feedback survey (established April 2022).
- Dedicated community line and email address (established April 2022).
- Media release (first release distributed in April 2022).
- Newsletters (first newsletter distributed in May 2022 and December 2023 additional newsletters planned).

Community information sessions (first session held in April 2023, second session held in December 2023, third session held in May 2024).

- Briefings (initial briefings held in March and April 2023, additional briefings undertaken in November and December 2023).
- Personal meetings/interviews (initial meetings held in April and May 2023, November and December 2023, January and February 2024 and May through to August 2024).
- Service provider surveys (phone surveys undertaken in December and January).

Ongoing consultation with all Stakeholders is being undertaken through the development of the EIS, refer to **Attachment 1**.

1.3.1 Identity: Referring party

Privacy Notice:

Personal information means information or an opinion about an identified individual, or an individual who is reasonably identifiable.

By completing and submitting this form, you consent to the collection of all personal information contained in this form. If you are providing the personal information of other individuals in this form, please ensure you have their consent before doing so.

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1.3.1.1 Is Referring party an organisation or business? *

Yes

Referring party organisation details

ABN/ACN	18059519041

Organisation name	UMWELT (AUSTRALIA) PTY. LTD.
Organisation address	2284 NSW

Referring party details

Name	Nadia Aurisch
Job title	Environmental Consultant
Phone	1300793267
Email	naurisch@umwelt.com.au
Address	75 York Street Teralba NSW 2284

1.3.2 Identity: Person proposing to take the action

1.3.2.1 Are the Person proposing to take the action details the same as the Referring party details? *

No

1.3.2.2 Is Person proposing to take the action an organisation or business? *

Yes

Person proposing to take the action organisation details

ABN/ACN	664148958
Organisation name	WATTLE CREEK ENERGY HUB PTY LTD
Organisation address	2095 NSW

Person proposing to take the action details

Name	Daniel Leahy
Job title	Senior Development Manager

Phone	0400210325
Email	daniel.leahy@sparkrenewables.com
Address	Level 4, 1A Rialto Lane, Manly, NSW 2095

1.3.2.14 Are you proposing the action as part of a Joint Venture? *

No

1.3.2.15 Are you proposing the action as part of a Trust? *

Yes

1.3.2.16 Describe the nature of the trust arrangement in relation to the proposed action. *

The Proposed Action will be undertaken by Wattle Creek Energy Hub Pty Ltd ACN 664 148 958 as trustee for the Wattle Creek Energy Hub Trust. Spark Renewables Pty Ltd are the Project developers.

Please refer to **Attachment 2 - Redacted**, the Trust Deed. Note that detail relating to third-party personal and private information has been removed from the redacted version of Attachment 2 - Redacted for sensitivity reasons, a full version of this attachment has been provided to DCCEEW.

1.3.2.17 Describe the Person proposing the action's history of responsible environmental management including details of any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources against the Person proposing to take the action. *

Wattle Creek Energy Hub Pty Ltd is a trustee for the Wattle Creek Energy Hub Trust entered into by Spark Renewables Pty Limited (ACN 632 860 023) as the developer of the Proposed Action. Wattle Creek Energy Hub Pty Ltd does not have any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources against them.

As the developer of the Proposed Action and an initial unitholder of the Wattle Creek Energy Hub Trust of which Wattle Creek Energy Hub Pty Ltd is a trustee for, Spark Renewables is owned by Tenaga Nasional Berhad, a large Malaysian utility. Spark Renewables has a satisfactory record of responsible environment management and do not have any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources against them. Spark Renewables is a leading developer, long-term owner, and operator of renewable energy projects. The

company's portfolio comprises the Bomen Solar Farm, operational since 2020, and Spark Renewables is currently developing more than 7 GW of solar, wind, and renewable storage projects across the NEM, including the Dinawan Energy Hub and Mallee Wind Farm within NSW.

1.3.2.18 If the person proposing to take the action is a corporation, provide details of the corporation's environmental policy and planning framework

Wattle Creek Energy Hub Pty Ltd is a trustee for the Wattle Creek Energy Hub Trust entered into by Spark Renewables Pty Limited (ACN 632 860 023) as the developer of the Proposed Action. Wattle Creek Energy Hub Pty Ltd will utilise Spark Renewables' existing environmental policy and planning framework, as the developer of the Proposed Action and an initial unitholder of the Wattle Creek Energy Hub Trust of which Wattle Creek Energy Hub Pty Ltd is a trustee for.

Spark Renewables is committed to responsible environmental management and the development of projects that deliver long term benefits to the communities in which we operate. Spark Renewables will comply with all relevant environmental guidelines and legislation in the development of the project and seek to deliver benefits to the community and environment by responsibly designing our projects and mitigating impacts via management plans.
Spark Renewables is currently developing its health & Safety and environmental management policies following its acquisition by Tenaga. Wattle Creek Energy Hub (and all other projects in our portfolio) will be developed, constructed, and operated in compliance with all relevant health & safety and environmental management legislation.

Spark Renewables does not have a specific environmental policy or planning framework for the Project.

1.3.3 Identity: Proposed designated proponent

1.3.3.1 Are the Proposed designated proponent details the same as the Person proposing to take the action? *

Yes

Proposed designated proponent organisation details

ABN/ACN	664148958
Organisation name	WATTLE CREEK ENERGY HUB PTY LTD
Organisation address	2095 NSW

Proposed designated proponent details

Name	Daniel Leahy

Job title	Senior Development Manager
Phone	0400210325
Email	daniel.leahy@sparkrenewables.com
Address	Level 4, 1A Rialto Lane, Manly, NSW 2095

1.3.4 Identity: Summary of allocation

Confirmed Referring party's identity

The Referring party is the person preparing the information in this referral.

ABN/ACN	18059519041
Organisation name	UMWELT (AUSTRALIA) PTY. LTD.
Organisation address	2284 NSW
Representative's name	Nadia Aurisch
Representative's job title	Environmental Consultant
Phone	1300793267
Email	naurisch@umwelt.com.au
Address	75 York Street Teralba NSW 2284

Confirmed Person proposing to take the action's identity

The Person proposing to take the action is the individual, business, government agency or trustee that will be responsible for the proposed action.

ABN/ACN	664148958
Organisation name	WATTLE CREEK ENERGY HUB PTY LTD
Organisation address	2095 NSW
Representative's name	Daniel Leahy
Representative's job title	Senior Development Manager
Phone	0400210325

Email	daniel.leahy@sparkrenewables.com
Address	Level 4, 1A Rialto Lane, Manly, NSW 2095

Confirmed Proposed designated proponent's identity

The Person proposing to take the action is the individual or organisation proposed to be responsible for meeting the requirements of the EPBC Act during the assessment process, if the Minister decides that this project is a controlled action.

Same as Person proposing to take the action information.

1.4 Payment details: Payment exemption and fee waiver

1.4.1 Do you qualify for an exemption from fees under EPBC Regulation 5.23 (1) (a)? *

No

1.4.3 Have you applied for or been granted a waiver for full or partial fees under Regulation 5.21A? *

No

1.4.5 Are you going to apply for a waiver of full or partial fees under EPBC Regulation 5.21A?

No

1.4.7 Has the department issued you with a credit note? *

No

1.4.9 Would you like to add a purchase order number to your invoice? *

No

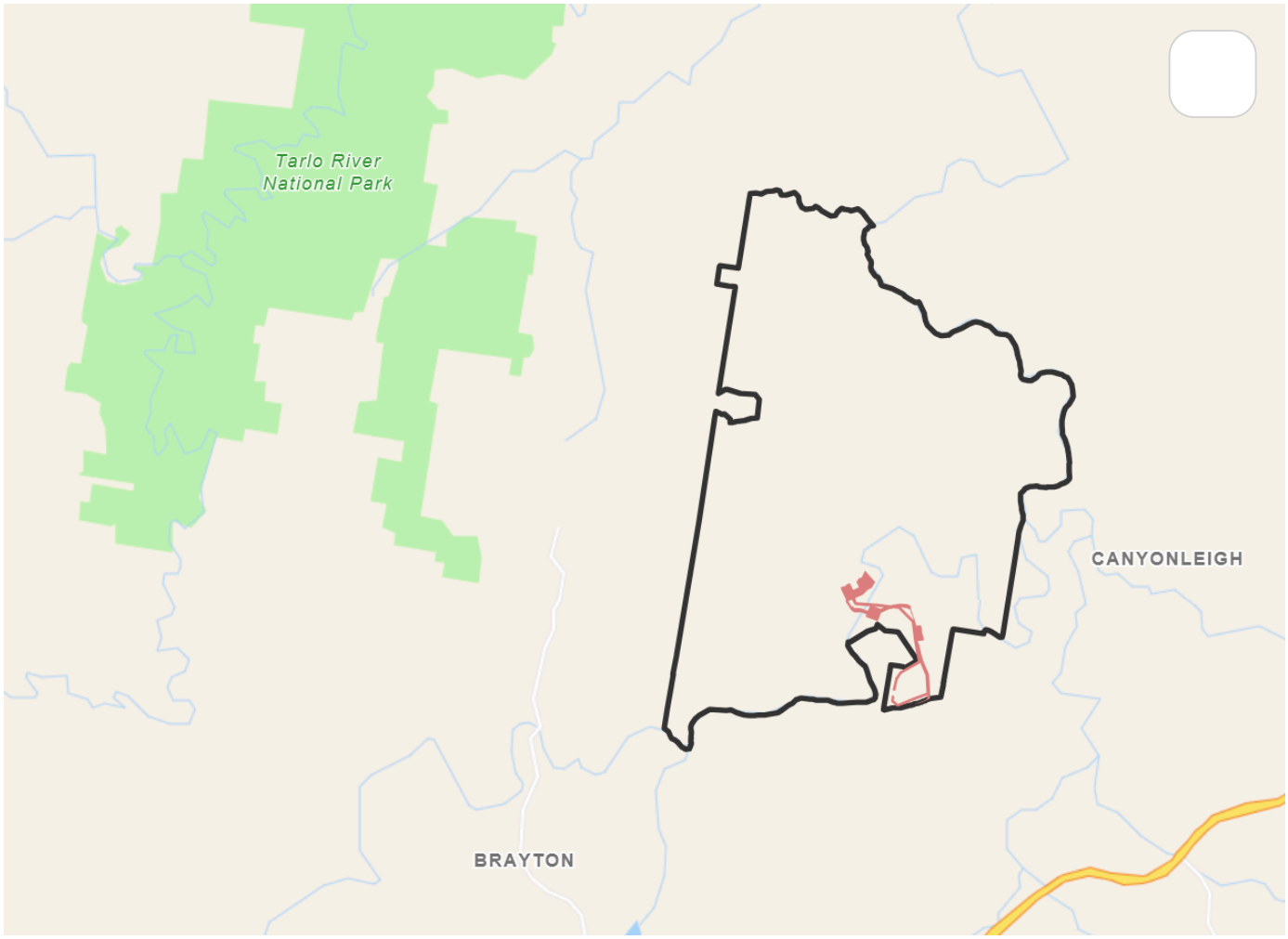
1.4 Payment details: Payment allocation

1.4.11 Who would you like to allocate as the entity responsible for payment? *

Person proposing to take the action

2. Location

2.1 Project footprint



Project area (6326.47 Ha) Disturbance footprint (75.64 Ha)

Maptaskr © 2024

Powered By Esri - Sources: Esri, TomTom, Garmin, F…

2.2 Footprint details

2.2.1 What is the address of the proposed action? *

1001 Canyonleigh Road Brayton NSW 2579

2.2.2 Where is the primary jurisdiction of the proposed action? *

New South Wales

2.2.3 Is there a secondary jurisdiction for this proposed action? *

No

2.2.5 What is the tenure of the action area relevant to the project area? *

The Proposed Action is located within the Authursleigh property, a freehold property owned by the University of Sydney. Spark Renewables was selected by the University of Sydney to investigate and develop a hybrid renewable energy facility on the University's Arthursleigh property. As part of this process, a high-level investigation area was initially identified for the Proposed Action in 2021 to inform the preliminary design. Several studies were undertaken within this investigation area to assess the feasibility of the Proposed Actionand identify key environmental constraints, including biodiversity and heritage. Preliminary biodiversity assessments commenced in March 2021 for the Proposed Action, which identified key biodiversity constraints within the investigation area (ARCADIS, 2021). The investigation area was confirmed in February 2023 to become the current Referral Area (as identified in this Referral), following the signed agreement between Spark Renewables and the University of Sydney (UoS) to secure the land tenure.

There is no Crown Land within the Referral Area, there is one crown waterway (the Wollondilly River), one road crossing is proposed over this waterway (refer to **Figure 5**) for which relevant licences, leases, or permits would be sought to secure tenure (following confirmation of corridor). There are Crown Land

Reserves adjacent to the southeast and northwest portions of the Referral Area, no works are proposed within these Crown Land Reserves.

3. Existing environment

3.1 Physical description

3.1.1 Describe the current condition of the project area's environment.

The Referral Area is located in a rural setting, within the Upper Lachlan Local Environmental Plan LGA and covers approximately 6,300 ha. Extensive areas within and surrounding the Referral Area is generally consistent with that of a rural/rural residential setting. There are approximately 47 non-associated dwellings within 4 km of the Referral Area. The township of Big Hill is directly north-west of the Referral Area and is the closest town in the Upper Lachlan Shire LGA to the Referral Area. The township of Marulan is the nearest population centre (population 819) to the Referral Area. The next nearest residence is located to the south, approximately 2.1 km. There are two dwellings within the Referral Area being a permanently residence of the on-site farm manager and a dwelling infrequently used as temporary accommodation by research staff and students of the University.

The Proposed Action is located within the South Eastern Highlands Interim Biogeographic Regionalisation for Australia (IBRA) Region, and the Bungonia IBRA sub-region. The Tarlo River National Park is the closest national park which is approximately 4 km to the west, northwest and the Kerrawary Nature Reserve is located about 7 km to the north of the Referral Area.

The Referral Area largely comprises areas that have previously been disturbed and historically cleared for agricultural purposes, including cropping land and grazed land. A review of the NSW Departement of Planning, Housing and Infrastructure (DPHI) (formerly the Department of Planning and Environment (DPE)) Land Management Framework, draft Native Vegetation Regulatory Map identifies that parts of the Referral Area have been classified as Category 1 – exempt land for the purposes of Part 5A of the *NSW Local Land Services Act 2013* (LLS Act) that is, land cleared of native vegetation before 1990 or low conservation grassland.

The remnant vegetation is predominantly comprised of grassy woodland communities, with smaller patches of shrubby open forest and riparian forests along the waterways. These areas are scattered across the Referral Area. Grassland habitat within the Referral Area is in varying condition, with evidence of historic grazing and recent cultivation of pastures. The dominant groundcover species within the Referral Area is serrated tussock (*Nassella trichotoma*), a Weed of National Significance (WONS). While serrated tussock provides little nutritional value to native fauna, its dense tussock formations can provide refuge and foraging habitat to small reptiles and mammals. The sheep and cattle provide a disturbance pressure that many threatened species are not tolerant of, reducing the likelihood that large areas of the Referral Area provide suitable habitat for threatened flora or fauna species. The native grasslands and native pastures within the Referral Area allow for many small reptiles and flora species to persist

The Referral Area is located within the Hawkesbury River basin, situated within the localised catchment of the Wollondilly River. The Referral Area is located on undulating terrain, with the natural surface drainage generally from west to east across the Referral Area through well-defined watercourses and drainage lines. Flow is conveyed towards the Wollondilly River, which flows along the eastern and southern Referral Area boundary. The lowest elevation of the Referral Area is along the north-eastern boundary, at approximately 520 m AHD.

3.1.2 Describe any existing or proposed uses for the project area.

The Referral Area encompasses one privately-owned property (Arthursleigh property), the property was bequeathed to the University in 1979 and is primarily used for agricultural purposes as a working farm. However, it is also used for education and research by the Faculties of Science (Agriculture and Veterinary Science Schools) and Engineering (Aviation and Robotics).

In addition to the proposed use of the Referral Area for BESS related purposes, the Proposed Action also includes the establishment of a Research Test-Bed Facility, this Test Bed Facility is also included in the Wattle Creek Solar Farm project under Referral 2024/09969 as its located in the Common Ancillary Features Disturbance Area which is assessed across both projects. The proposed Facility will be approximately 2 ha in size comprised of the following elements:

- A hard standing area.
- Parking.
- 200kVA power supply and 100kVA dummy load (to simulate electrical load).

The facility will be used in the development and research of novel clean energy technologies, such as innovative battery systems developed by Gelion, a company started by researchers from the University in 2015. The research facility will contribute to the research objectives of the Research and Development Roadmap by the NSW Chief Scientist & Engineering (2022).

3.1.3 Describe any outstanding natural features and/or any other important or unique values that applies to the project area.

The Referral Area does not contain world heritage areas, national heritage places, or within the catchment of any wetlands of international importance (listed under the Ramsar Convention).
The Referral Area is dissected by a number of larger waterways including Dead Mans Creek, Wattle Creek and Sandy Creek in the north, Island Creek in the centre, and the Wollondilly River in the south. Only the Wollondilly River sits within the proposed Disturbance Area. There is also Pivets Creek which is the eastern boundary of the Referral Area, these and a number of tributaries provide habitat for a number of amphibian species and provide foraging and drinking water for many fauna species. There are a large number of farm dams and low-lying areas which provide suitable habitat for a number of threatened flora and fauna species. Rocky outcrops are common throughout the Referral Area, existing as exposed bedrock, exfoliated surfaces and crevices and loose surface rock. These habitat features provide refuge for a range of threatened and non-threatened reptile species which rely on these rocky habitats for over-wintering, thermoregulation, and shelter, and as a refuge for juveniles and prey species. Only very small areas of loose surface rock and suitable habitat for the Pink-tailed legless lizard (*Aprasia parapulchella*) is located within the Referral Area, with most of the surface rock deeply embedded in the soil. The patches of the rocky outcrops are generally small and unlikely to provide important habitat for the brush-tailed rock-wallaby (*Petrogale penicillata*).

3.1.4 Describe the gradient (or depth range if action is to be taken in a marine area) relevant to the project area.

The topography across the Referral Area includes valley floor, hillslopes, and ridges. The elevation ranges from between 520 m – 720 m Australian Height Datum (AHD). The topography of the development area ranges from 580 m to 676 m AHD, refer to **Figure 8**.

3.2 Flora and fauna

3.2.1 Describe the flora and fauna within the affected area and attach any investigations of surveys if applicable.

Across the Referral Area there are large patches of woodland vegetation and abundant isolated paddock trees that have the potential to support a range of threatened fauna species. The understory in the timbered areas with limited grazing and disturbance pressure and a relatively intact canopy cover has potential for threatened flora habitat.

Grassland habitat within the Referral Area is in varying condition, with evidence of historic grazing and recent cultivation of pastures. The dominant groundcover species within the Referral Area is serrated tussock (*Nassella trichotoma*), a Weed of National Significance (WONS).

Vegetation surveys conducted by Umwelt to date have confirmed the presence of six different plant community types (PCTs) across 11 vegetation zones within the Referral Area, including:

- PCT3643 Bungonia Tableland Silvertop Ash-Stringybark Forest
- PCT4063 Central and Southern Tableland River Oak Forests
- PCT3373 Goulburn Tableland Box-Gum Grassy Forest
- PCT3347 Southern Tableland Creekflat Ribbon Gum Forest
- PCT3374 Goulburn Tableland Peppermint Grassy Forest
- PCT3376 Southern Tableland Grassy Box Woodland

No threatened flora species listed under the EPBC Act have been observed within the Referral Area. Other flora species recorded in the Referal Area include:

- Camden Woollybutt or Paddy's River Box (*Eucalyptus macarthurii*)
- Narrow-leaved Black Peppermint or Willow Peppermint (*Eucalyptus nicholii*)

Investigations undertaken to date within the Disturbance Area have included vegetation integrity floristic plots, threatened flora surveys, and threatened fauna surveys and have focussed on threatened species and endangered ecological communities. Further biodiversity investigations are proposed to allow the ecological values of the Disturbance Area to be defined.

The following EPBC Act-listed threatened fauna species have been recorded in the Referral Area:

- Gang-gang Cockatoo (*Callocephalon fimbriatum*)
- South-eastern Glossy Black-cockatoo (*Calyptorhynchus lathami lathami*).
- Diamond Firetail (*Stagonopleura guttata*).

Only the Gang-gang Cockatoo (*Callocephalon fimbriatum*) have been recorded in the Disturbance Area. Other fauna species not listed under the EPBC Act but recorded within the Referral Area include:

- Squirrel Glider (*Petaurus norfolcensis*)
- Dusky woodswallow (*Artamus cyanopterus*)
- Scarlet Robin (*Petroica boodang*)
- Speckled warbler (*Pyrrholaemus sagittatus*)
- Spotted Harrier (*Circus assimilis*)
- Varied sittella (*Daphoenositta chrysoptera*)

Refer to **Attachment 3, Section 2, Pages 8 - 15** (Note: this document has been redacted as it contains sensitive species information, including locational data) for further information.

3.2.2 Describe the vegetation (including the status of native vegetation and soil) within the project area.

Mapping of vegetation communities (referred to as Plant Community Types following the NSW biodiversity assessment methodology) within the Referral Area is provided in **Attachment 3, Section 2, Pages 8-15** (Note: this document has been redacted as it contains sensitive species information, including locational data). This includes potential occurence of threatened ecological communities and threatened flora species.

Four Mitchell soil landscapes are located within the Referral Area (Mitchell 2002) (refer to **Figure 6**): the Bungonia Tableland and Gorge, the Moss Vale Highlands, Robertson Basalts and Wollondilly -Bindook Tablelands and Gorges (refer to **Figure 6**). The Bungonia Tableland and Gorge soil landscape is situated on Ordovician and Devonian slate, phyllite and quartzite, a small Carboniferous granodiorite stock, caps of Tertiary quartz sands and gravels and limited basalt. The margin of the tableland is the Great Escarpment and is cut by a 400m deep gorge with vertical walls through west dipping Silurian limestones. Numerous deep caves and sinkholes are present. General elevation 600 to 800m, local relief 500m. Red-brown well-structured clay with alkaline pH on limestone, skeletal rubble on scree slopes from slates and volcanics, red and red-yellow texture-contrast profiles over sedimentary rocks on the tableland (Mitchell 2002, p.131). The Moss Vale Highlands soil landscape comprises Rolling hills and rounded peaks with deep channel incision on horizontal Triassic alternating quartz sandstone and shale, general elevation 700 to 850mm, local relief 80m. Widespread yellow and grey texture-contrast soils, deep yellow earth on friable sandstone often with concretionary ironstone and accumulations of clan quartz sand in valleys (Mitchell 2002, pp. 117-118). The Robertson Basalts soil landscape consists of flat top hills and small plateau standing above undulating shale hills of the Moss Vale Highlands landscape on Tertiary basalt flows, general elevation 800 to 850m, local relief of 40m. Red and red-brown structured loam and clay loam with uniform or gradational profiles, good water holding capacity and high fertility (Mitchell 2002, p. 118). Dissected tablelands, marginal gorges and scree slopes on massive Devonian quartz porphyry and small areas of massive Devonian granite. General elevation 600 to 900m, local relief 250m. Thin gritty uniform profiles on steep slopes and around rock outcrops, grey and yellow texture-contrast profiles on flatter slopes.

3.3 Heritage

3.3.1 Describe any Commonwealth heritage places overseas or other places recognised as having heritage values that apply to the project area.

Desktop searches have confirmed that there are no World Heritage, Commonwealth Heritage, National Heritage or State Heritage sites, or Interim Heritage Orders applicable to the Referral Area and 10 km buffer zone.

3.3.2 Describe any Indigenous heritage values that apply to the project area.

Previous assessments suggest that the Marulan area is the junction point for the following Aboriginal nations:

- Ngunawal who inhabited the area from Goulburn, Yass, and Canberra.
- Wandandian who inhabited the area from Ulladulla to Nowra and west to the mountains of the Great Dividing Range.
- Dharawal, whose lands extended north of the Shoalhaven River to Wollongong and west to Goulburn.
- Gundangara who inhabited from Camden to south of Marulan.

Desktop searches of NSW registered Aboriginal sites (objects) via the Aboriginal Heritage Information Management System (AHIMS) identified 68 Aboriginal archaeological sites within a 10-kilometre search area centred on the proposed Referral Area, including artefacts and potential archaeological deposits (PAD) (refer to **Figure 7 - redacted**). Note that the detail relating to Aboriginal Cultural Heritage has been redacted from the public version of this referral for sensitivity reasons, a full version of the Figure 7 has been provided to DCCEEW for review.

3.4 Hydrology

3.4.1 Describe the hydrology characteristics that apply to the project area and attach any hydrological investigations or surveys if applicable. *

Hydrological features within the Referral Area include Wattle Creek, Deadmans Creek, Sandy Creek, and Island Creek. There is also Pivets Creek which is the eastern boundary of the Referral Area. There are a large number of farm dams and low-lying areas in the surrounds of the Referral Area (refer to **Figure 8**).

The Referral Area is located within the local catchment of the Wollondilly River and due to the extensive waterway network and topography of the Referral Area, it is likely that the Referral Area experiences flood inundation for both in channel and overland flow. Flood modelling will be undertaken during the further studies of the Referral Area to estimate design flood inundation across the Referral Area and proposed Disturbance Area and the potential impact to receiving waterways.

4. Impacts and mitigation

4.1 Impact details

Potential Matters of National Environmental Significance (MNES) relevant to your proposed action area.

EPBC Act section	Controlling provision	Impacted	Reviewed
S12	World Heritage	No	Yes
S15B	National Heritage	No	Yes
S16	Ramsar Wetland	No	Yes
S18	Threatened Species and Ecological Communities	Yes	Yes
S20	Migratory Species	No	Yes
S21	Nuclear	No	Yes
S23	Commonwealth Marine Area	No	Yes
S24B	Great Barrier Reef	No	Yes
S24D	Water resource in relation to large coal mining development or coal seam gas	No	Yes
S26	Commonwealth Land	No	Yes
S27B	Commonwealth Heritage Places Overseas	No	Yes
S28	Commonwealth or Commonwealth Agency	No	Yes

4.1.1 World Heritage

You have identified your proposed action will likely directly and/or indirectly impact the following protected matters.

A direct impact is a direct consequence of an action taken – for example, clearing of habitat for a threatened species or permanent shading on an ecological community as the result of installing solar panels.

An indirect impact is an 'indirect consequence' such as a downstream impact or a facilitated third-party action.

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4.1.1.1 Is the proposed action likely to have any direct and/or indirect impact on any of these protected matters? *

No

4.1.1.3 Briefly describe why your action is unlikely to have a direct and/or indirect impact. *

There are no World Heritage properties located within or in the vicinity of the Referral Area.

4.1.2 National Heritage

You have identified your proposed action will likely directly and/or indirectly impact the following protected matters.

A direct impact is a direct consequence of an action taken – for example, clearing of habitat for a threatened species or permanent shading on an ecological community as the result of installing solar panels.

An indirect impact is an 'indirect consequence' such as a downstream impact or a facilitated third-party action.

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4.1.2.1 Is the proposed action likely to have any direct and/or indirect impact on any of these protected matters? *

No

4.1.2.3 Briefly describe why your action is unlikely to have a direct and/or indirect impact. *

There are no National Heritage places located within or in the vicinity of the Referral Area.

4.1.3 Ramsar Wetland

You have identified your proposed action will likely directly and/or indirectly impact the following protected matters.

A direct impact is a direct consequence of an action taken – for example, clearing of habitat for a threatened species or permanent shading on an ecological community as the result of installing solar panels.

An indirect impact is an 'indirect consequence' such as a downstream impact or a facilitated third-party action.

—

4.1.3.1 Is the proposed action likely to have any direct and/or indirect impact on any of these protected matters? *

No

4.1.3.3 Briefly describe why your action is unlikely to have a direct and/or indirect impact. *

There are no Ramsar listed wetlands located within or in the vicinity of the Referral Area. The nearest Ramsar Wetland is identified to be the Hunter Estuary Wetland and the Fivebough and Tuckerbill Swamps and approximately 294 km north-east and 336 km west respectively.

4.1.4 Threatened Species and Ecological Communities

You have identified your proposed action will likely directly and/or indirectly impact the following protected matters.

A direct impact is a direct consequence of an action taken – for example, clearing of habitat for a threatened species or permanent shading on an ecological community as the result of installing solar panels.

An indirect impact is an 'indirect consequence' such as a downstream impact or a facilitated third-party action.

Threatened species

Direct impact	Indirect impact	Species	Common name
No	No	Acacia bynoeana	Bynoe's Wattle, Tiny Wattle
No	No	Anthochaera phrygia	Regent Honeyeater
No	No	Aphelocephala leucopsis	Southern Whiteface

Direct impact	Indirect impact	Species	Common name
No	No	Aprasia parapulchella	Pink-tailed Worm-lizard, Pink-tailed Legless Lizard
No	No	Baloskion longipes	Dense Cord-rush
No	No	Botaurus poiciloptilus	Australasian Bittern
No	No	Caladenia tessellata	Thick-lipped Spider-orchid, Daddy Long-legs
No	No	Calidris acuminata	Sharp-tailed Sandpiper
No	No	Calidris ferruginea	Curlew Sandpiper
Yes	Yes	Callocephalon fimbriatum	Gang-gang Cockatoo
Yes	Yes	Calyptorhynchus lathami lathami	South-eastern Glossy Black-Cockatoo
No	No	Chalinolobus dwyeri	Large-eared Pied Bat, Large Pied Bat
No	No	Climacteris picumnus victoriae	Brown Treecreeper (south-eastern)
No	No	Commersonia prostrata	Dwarf Kerrawang
No	No	Dasyurus maculatus maculatus (SE mainland population)	Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population)
Yes	Yes	Delma impar	Striped Legless Lizard, Striped Snake-lizard
No	No	Dodonaea procumbens	Trailing Hop-bush
No	No	Eucalyptus aggregata	Black Gum
No	No	Eucalyptus aquatica	Mountain Swamp Gum, Broad-leaved Sallee, Broad-leaved Sally
No	No	Eucalyptus macarthurii	Camden Woollybutt, Paddys River Box
No	No	Falco hypoleucos	Grey Falcon
No	No	Gallinago hardwickii	Latham's Snipe, Japanese Snipe
No	No	Genoplesium baueri	Yellow Gnat-orchid, Bauer's Midge Orchid, Brittle Midge Orchid
No	No	Genoplesium plumosum	Plumed Midge-orchid, Tallong Midge Orchid
No	No	Gentiana wingecarribiensis	Wingecarribee Gentian
No	No	Grantiella picta	Painted Honeyeater
No	No	Grevillea raybrownii	

Direct impact	Indirect impact	Species	Common name
No	No	Haloragis exalata subsp. exalata	Wingless Raspwort, Square Raspwort
No	No	Helichrysum calvertianum	
No	No	Hibbertia acaulothrix	
No	No	Hirundapus caudacutus	White-throated Needletail
No	No	Hoplocephalus bungaroides	Broad-headed Snake
No	No	Keyacris scurra	Key's Matchstick Grasshopper
No	No	Kunzea cambagei	
No	No	Lathamus discolor	Swift Parrot
No	No	Leucochrysum albicans subsp. tricolor	Hoary Sunray, Grassland Paper-daisy
No	No	Litoria watsoni	Southern Heath Frog, Watson's Tree Frog
No	No	Macquaria australasica	Macquarie Perch
No	No	Melanodryas cucullata cucullata	South-eastern Hooded Robin, Hooded Robin (south-eastern)
No	No	Neophema chrysostoma	Blue-winged Parrot
No	No	Persicaria elatior	Knotweed, Tall Knotweed
No	No	Persoonia mollis subsp. revoluta	
No	No	Persoonia oxycoccoides	
No	No	Petauroides volans	Greater Glider (southern and central)
No	No	Petaurus australis australis	Yellow-bellied Glider (south-eastern)
No	No	Petrogale penicillata	Brush-tailed Rock-wallaby
No	No	Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)	Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory)
No	No	Phyllota humifusa	Dwarf Phyllota
No	No	Polytelis swainsonii	Superb Parrot
No	No	Pomaderris brunnea	Rufous Pomaderris, Brown Pomaderris
No	No	Pomaderris cotoneaster	Cotoneaster Pomaderris

Direct impact	Indirect impact	Species	Common name
No	No	Pomaderris pallida	Pale Pomaderris
No	No	Prototroctes maraena	Australian Grayling
No	No	Pseudomys novaehollandiae	New Holland Mouse, Pookila
No	No	Pteropus poliocephalus	Grey-headed Flying-fox
No	No	Pycnoptilus floccosus	Pilotbird
No	No	Rhizanthella slateri	Eastern Underground Orchid
No	No	Rostratula australis	Australian Painted Snipe
No	No	Rutidosis leptorhynchoides	Button Wrinklewort
Yes	Yes	Stagonopleura guttata	Diamond Firetail
No	No	Thelymitra kangaloonica	Kangaloon Sun Orchid
No	No	Thesium australe	Austral Toadflax, Toadflax
No	No	Xerochrysum palustre	Swamp Everlasting, Swamp Paper Daisy
No	No	Zieria murphyi	Velvet Zieria

Ecological communities

Direct impact	Indirect impact	Ecological community
No	No	Natural Temperate Grassland of the South Eastern Highlands
No	No	Southern Highlands Shale Forest and Woodland in the Sydney Basin Bioregion
No	No	Temperate Highland Peat Swamps on Sandstone
No	No	Upland Basalt Eucalypt Forests of the Sydney Basin Bioregion
Yes	Yes	White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland

4.1.4.1 Is the proposed action likely to have any direct and/or indirect impact on any of these protected matters? *

Yes

4.1.4.2 Briefly describe why your action has a direct and/or indirect impact on these protected matters. *

Assessments of impacts to MNES predicted to occur are provided in **Attachment 3 - Redated, Section 3.0, Pages 42-81** (Note: this document has been redacted as it contains sensitive species information, including locational data). The PMST identified five endangered ecological communities and 64 threatened species with potential to occur within the Referral Area. The endangered ecological communities predicted to occur include:

- Natural Temperate Grassland of the South Eastern Highlands
- Southern Highlands Shale Forest and Woodland in the Sydney Basin Bioregion
- Temperate Highland Peat Swamps on Sandstone
- Upland Basalt Eucalypt Forests of the Sydney Basin Bioregion
- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland

Four of the five endangered ecological communities have not been recorded within the Referral Area and are unlikely to occur based on habitat requirements and known distribution.

Surveys undertaken have identified the following EPBC Act listed species and communities have been recorded in the Disturbance Area and have the potential to be impacted by the Proposed Action:

- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland (0.89 ha).

Potential impacts to the White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland that could theoretically occur as a result of the Proposed Action may include:

- direct impacts through removal of native vegetation and habitat during construction
- decline in water quality due to increased turbidity during construction and/or disturbance of potential acid sulphate and/or contaminated sediments
- introduction of pest species
- noise and vibration impacts during construction.

Interaction with areas of mapped EPBC Threatened Ecological Communities is largely avoided. The Disturbance Area has been redesigned to avoid any patch of vegetation that meets the relevant condition thresholds of this ecological community with regards to the Proposed Action.

Surveys undertaken have also identified the following EPBC Act listed species within the Referral Area and have the potential to be impacted by the Proposed Action:

- Gang-gang Cockatoo (*Callocephalon fimbriatum*)
- Diamond Firetail (*Stagonopleura guttata*) and
- South-eastern Glossy Black-Cockatoo (*Calyptorhynchus lathami lathami)*

Potentially significant direct and indirect impacts on the following EPBC listed species with a moderate or high likelihood of occurrence may occur as a result of the Proposed Action:

- Reptiles (Striped Legless Lizard (*Delma impar*)

These species are likely to use the Referral Area for habitat and foraging, breeding and/or migration and would therefore be susceptible to direct and indirect impacts through removal of native vegetation and habitat during construction as a result of the Proposed Action.

4.1.4.4 Do you consider this likely direct and/or indirect impact to be a Significant Impact? *

Yes

4.1.4.5 Describe why you consider this to be a Significant Impact. *

Assessments of significance are provided in **Attachment 3 - Redacted, Section 3.0, Pages 42-81** (Note: this document has been redacted as it contains sensitive species information, including locational data). The proponent is working to minimise the disturbance footprint by avoiding higher risk areas where possible, but it is possible that the Proposed Action could impact threatened species or ecological communities listed as MNES under the EPBC Act. It is for this reason that the Proposed Action is considered to be a controlled action.

Potentially significant impacts on the following EPBC Act listed species and communities may result from the Proposed Action:

- Endangered Species: Gang-gang Cockatoo (*Callocephalon fimbriatum*).
- Vulnerable Species: South-eastern Glossy Black Cockatoo (*Calyptorhynchus lathami lathami*) and Diamond Firetail (*Stagonopleura guttata*).

The Proposed Action also has the potential to result in a significant impact to the Striped Legless Lizard (*Delma impar*), further surveys are proposed to determine the presence/absence of the species in the Referral Area. The findings of these surveys will be made available to DCCEEW upon completion.

4.1.4.7 Do you think your proposed action is a controlled action? *

Yes

4.1.4.8 Please elaborate why you think your proposed action is a controlled action. *

It is considered that the Proposed Action will have a potentially significant impact on the Gang-gang Cockatoo (*Callocephalon fimbriatum*),Diamond Firetail (*Stagonopleura guttata*) and South-eastern Glossy Black Cockatoo (*Calyptorhynchus lathami lathami*) listed under the EPBC Act due to the removal of native vegetation and habitat during construction. It is therefore considered that the proposal is likely to constitute a controlled action and require assessment under the EPBC Act.

4.1.4.10 Please describe any avoidance or mitigation measures proposed for this action and attach any supporting documentation for these avoidance and mitigation measures. *

Through the completion of desktop assessments and field studies to ground-truth the presence of these species, the Proposed Action design will be reviewed to consider any further opportunity to avoid direct impacts to threatened species or communities. Where practicable infrastructure has currently been located on previously cleared land to limit ecological effects. Further information on avoidance measures implemented are provided in **Attachment 3 - Redacted, Section 3.4, Pages 78-81** (Note: this document has been redacted as it contains sensitive species information, including locational data).

A range of mitigation measures are proposed to reduce any potential impacts on MNES. Furthermore, a Biodiversity Management Plan (BMP) will be developed for the Proposed Action in accordance with the relevant NSW and Commonwealth legislation and/or policies. It is expected that the BMP will detail the

following:

- a pre-clearing procedure to be implemented to minimise the potential for impacts on native fauna species (focusing on threatened species, hollow-dependent and other microhabitat-dependent fauna) as a result of the clearing of hollow-bearing trees
- staged progressive clearance limits clearly demarcated to prevent unnecessary disturbance
- salvage of resources and habitat features (e.g. seed collection, topsoil, timber and native mulch) and translocation to a re-establishment site
- placement of habitat features (e.g. hollow logs, tree hollows, fallen timber and rocks/boulders) for quarry rehabilitation
- weed management
- traffic control measures
- pathogen management
- pest animal control
- fencing and access control
- bushfire management
- erosion and sedimentation control
- providing appropriate environmental management measures as part of the operations to minimise the potential for indirect impacts including:
    - water management systems that seek to minimise the potential for damage to flora and fauna and their habitats from erosion, sedimentation and unnatural flooding events
    - noise control systems to minimise noise impacts
    - dust control measures to minimise dust impacts
    - lighting controls to minimise night time light impacts, and
    - blasting controls to minimise blast overpressure and vibration impacts.
- employee education and training.

Other potential mitigation measure opportunities will be explored and identified during further environmental investigations to be undertaken for the Proposed Action.

4.1.4.11 Please describe any proposed offsets and attach any supporting documentation relevant to these measures. *

A comprehensive Biodiversity Offset Strategy (BOS) will be developed for the Proposed Action in accordance with relevant NSW legislation and/or policies, currently being assessed under the BAM in accordance with the *Biodiversity Conservation Act 2016* (NSW). Accordingly, the offset strategy for the Proposed Action will be developed in consultation with the DPE.

The NSW and Commonwealth governments agree that endorsement of the NSW BOS to avoid, minimise and offset biodiversity impacts on both NSW and Commonwealth listed entities provides for the best biodiversity and streamlining outcomes. The Commonwealth government supports the use of the BAM as the underpinning methodology for calculating biodiversity credit requirements.

The NSW Biodiversity Conservation Trust (BCT) is required to meet the Commonwealth offset requirement component in a like-for-like manner. This is by retiring like-for-like credits, by funding conservation actions that are listed in the Ancillary rules: Reasonable steps to seek like-for-like biodiversity credits for the purpose of applying the variation rules (OEH 2017) approved by the NSW Minister for Environment that directly benefit the entity impacted.

Where an action will impact on a Commonwealth listed entity that is not listed under NSW law, the Commonwealth government will set the assessment requirements and consent conditions for that entity. The NSW government is investigating options for including all Commonwealth listed entities under the BOS to avoid separate offset requirements and achieve further streamlining benefits.

4.1.5 Migratory Species

You have identified your proposed action will likely directly and/or indirectly impact the following protected matters.

A direct impact is a direct consequence of an action taken – for example, clearing of habitat for a threatened species or permanent shading on an ecological community as the result of installing solar panels.

An indirect impact is an 'indirect consequence' such as a downstream impact or a facilitated third-party action.

Direct impact	Indirect impact	Species	Common name
No	No	Actitis hypoleucos	Common Sandpiper
No	No	Apus pacificus	Fork-tailed Swift
No	No	Calidris acuminata	Sharp-tailed Sandpiper
No	No	Calidris ferruginea	Curlew Sandpiper
No	No	Calidris melanotos	Pectoral Sandpiper
No	No	Gallinago hardwickii	Latham's Snipe, Japanese Snipe
No	No	Hirundapus caudacutus	White-throated Needletail
No	No	Monarcha melanopsis	Black-faced Monarch
No	No	Motacilla flava	Yellow Wagtail
No	No	Myiagra cyanoleuca	Satin Flycatcher
No	No	Pandion haliaetus	Osprey
No	No	Rhipidura rufifrons	Rufous Fantail

4.1.5.1 Is the proposed action likely to have any direct and/or indirect impact on any of these protected matters? *

No

4.1.5.3 Briefly describe why your action is unlikely to have a direct and/or indirect impact. *

The PMST identified 12 migratory species with potential to occur within the Referral Area.

Potential impacts to migratory species that could theoretically occur as a as a result of the Proposed Action may include:

- direct impacts through removal of native vegetation and habitat during construction
- entanglement of species in transmission cables
- decline in water quality due to increased turbidity during construction and/or disturbance of acidic and/or contaminated substrates
- introduction of pest species
- noise and vibration impacts during construction and operation
- behavioural changes induced by electromagnetic fields and/or light pollution

- changes to hydrodynamic processes causing changes to sediment and food chain dynamics.

The Proposed Action design has sought to minimise native vegetation clearing by utilising historically cleared areas as far as practicable, that are presently subject to cropping and considered to be Category 1 – Exempt Land with minimal ecological value.

Assessments of significance are provided in **Attachment 3 - Redacted, Section 3, Pages 42 - 81** (Note: this document has been redacted as it contains sensitive species information, including locational data). While the Proposed Action will remove potential foraging habitat associated with the following migratory species, these areas will not be significant and therefore any potential impact to migratory species is not expected to be significant:

- Terrestrial birds (Satin flycatcher (*Myiagra cyanoleuca*), Fork-tailed Swift (*Apus pacificus*), Rufous Fantail (*Rhipidura rufifrons*), Black-faced Monarch (*Monarcha melanopsis),* Yellow Wagtail (*Motacilla flava*)
- Wetland birds (Sharp-tailed Sandpiper (*Calidris acuminata*), Osprey (*Pandion haliaetus*), Pectoral Sandpiper (*Calidris melanotos*), Common Sandpiper (*Actitis hypoleucos*), Latham's Snipe (*Gallinago hardwickii).*

It is unlikely that the Proposed Action will result in an impact to these species. The actual impacts that may occur as part of the Proposed Action will be determined through the assessment process.

4.1.6 Nuclear

4.1.6.1 Is the proposed action likely to have any direct and/or indirect impact on this protected matter? *

No

4.1.6.3 Briefly describe why your action is unlikely to have a direct and/or indirect impact. *

The Proposed Action is not a nuclear action.

4.1.7 Commonwealth Marine Area

You have identified your proposed action will likely directly and/or indirectly impact the following protected matters.

A direct impact is a direct consequence of an action taken – for example, clearing of habitat for a threatened species or permanent shading on an ecological community as the result of installing solar panels.

An indirect impact is an 'indirect consequence' such as a downstream impact or a facilitated third-party action.

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4.1.7.1 Is the proposed action likely to have any direct and/or indirect impact on any of these protected matters? *

No

4.1.7.3 Briefly describe why your action is unlikely to have a direct and/or indirect impact. *

The Referral Area is not within or in proximity to a Commonwealth Marine Area.

4.1.8 Great Barrier Reef

4.1.8.1 Is the proposed action likely to have any direct and/or indirect impact on this protected matter? *

No

4.1.8.3 Briefly describe why your action is unlikely to have a direct and/or indirect impact. *

The Referral Area is over 1,000 km from the Great Barrier Reef and will not impact the reef.

4.1.9 Water resource in relation to large coal mining development or coal seam gas

4.1.9.1 Is the proposed action likely to have any direct and/or indirect impact on this protected matter? *

No

4.1.9.3 Briefly describe why your action is unlikely to have a direct and/or indirect impact. *

The Proposed Action is not a coal seam gas or large mining development.

4.1.10 Commonwealth Land

You have identified your proposed action will likely directly and/or indirectly impact the following protected matters.

A direct impact is a direct consequence of an action taken – for example, clearing of habitat for a threatened species or permanent shading on an ecological community as the result of installing solar panels.

An indirect impact is an 'indirect consequence' such as a downstream impact or a facilitated third-party action.

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4.1.10.1 Is the proposed action likely to have any direct and/or indirect impact on any of these protected matters? *

No

4.1.10.3 Briefly describe why your action is unlikely to have a direct and/or indirect impact. *

There are no Commonwealth lands located within the Referral Area, however there are 4 sites located within the 10 km buffer area. These sites are either communications or airservices sites which are removed from the Proposed Action and are unlikely to be impacted, either directly or indirectly.

4.1.11 Commonwealth Heritage Places Overseas

You have identified your proposed action will likely directly and/or indirectly impact the following protected matters.

A direct impact is a direct consequence of an action taken – for example, clearing of habitat for a threatened species or permanent shading on an ecological community as the result of installing solar panels.

An indirect impact is an 'indirect consequence' such as a downstream impact or a facilitated third-party action.

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4.1.11.1 Is the proposed action likely to have any direct and/or indirect impact on any of these protected matters? *

No

4.1.11.3 Briefly describe why your action is unlikely to have a direct and/or indirect impact. *

The Proposed Action will have no impacts on Commonwealth heritage places overseas.

4.1.12 Commonwealth or Commonwealth Agency

4.1.12.1 Is the proposed action to be taken by the Commonwealth or a Commonwealth Agency? *

No

4.2 Impact summary

Conclusion on the likelihood of significant impacts

You have indicated that the proposed action will likely have a significant impact on the following Matters of National Environmental Significance:

- Threatened Species and Ecological Communities (S18)

Conclusion on the likelihood of unlikely significant impacts

You have indicated that the proposed action will unlikely have a significant impact on the following Matters of National Environmental Significance:

- World Heritage (S12)
- National Heritage (S15B)
- Ramsar Wetland (S16)
- Migratory Species (S20)
- Nuclear (S21)
- Commonwealth Marine Area (S23)
- Great Barrier Reef (S24B)
- Water resource in relation to large coal mining development or coal seam gas (S24D)
- Commonwealth Land (S26)
- Commonwealth Heritage Places Overseas (S27B)
- Commonwealth or Commonwealth Agency (S28)

4.3 Alternatives

4.3.1 Do you have any possible alternatives for your proposed action to be considered as part of your referral? *

No

4.3.8 Describe why alternatives for your proposed action were not possible. *

The location of the Referral Area was selected due to:

- The landowner objectives for renewable energy development on the property.
- Its position and proximity to the existing Marulan substation and critical ‘Sydney ring’ transmission infrastructure.
- Much of the Referral Area being historically cleared for agricultural use, resulting in generally homogenous agricultural land within and surrounding the Referral Area.
- The Proposed Action being compatible with existing pastoral land uses, with minimal impact to current agricultural activities being anticipated during both construction and operation of the Proposed Action.
- Proximity to the existing public road network and access to several existing internal roads.
- Consideration of environmental values present through preliminary constraints analysis.

Spark Renewables are proposing the development in response to an extensive market selection process conducted by the University of Sydney. Consultation with UoS as the sole-landholder started in December 2021. The indicative Proposed Action layout (refer **Figure 2**), informed by discussions with local neighbours, has been subject to several design iterations to incorporate feedback received during this stage of the Proposed Action.

The conceptual layout will be subject to further refinement during the EIS and ongoing design development will aim to minimise impacts on the environment and community. This will be informed by further technical and environmental studies and continued community and stakeholder engagement. The specific technology provider for the BESS components are yet to be selected and may change during future stages of development. As such, reasonable worst-case assumptions have been used in the preparation of the preliminary studies and may also be used to facilitate impact assessment in the EIS.

5. Lodgement

5.1 Attachments

1.2.1 Overview of the proposed action

	Type	Name	Date	Sensitivity	Confidence
#1.	Document	Figure 1.pdf Figure of Project Location	13/08/2024	No	High
#2.	Document	Figure 2.pdf Figure of Project Layout	13/08/2024	No	High
#3.	Document	Figure 3.pdf Figure of Referral and Disturbance Area	13/08/2024	No	High

1.2.5 Information about the staged development

	Type	Name	Date	Sensitivity	Confidence
#1.	Document	Figure 4.pdf Figure of Related Developments	17/10/2024	No	High

1.2.7 Public consultation regarding the project area

	Type	Name	Date	Sensitivity	Confidence
#1.	Document	Attachment 1.pdf Community and Stakeholder Engagement Plan	03/10/2023	No	High

1.3.2.16 (Person proposing to take the action) Nature of the trust arrangement in relation to the proposed action

	Type	Name	Date	Sensitivity	Confidence
#1.	Document	Attachment 2.pdf	13/08/2024	No	

2.2.5 Tenure of the action area relevant to the project area

	Type	Name	Date	Sensitivity	Confidence
#1.	Document	Figure 5.pdf Figure of Landownership	13/08/2024	No	High

3.1.2 Existing or proposed uses for the project area

	Type	Name	Date	Sensitivity	Confidence
#1.	Link	NSW 20-Year R&D Roadmap https://www.chiefscientist.nsw.gov.au/rd-action-..			High

3.1.4 Gradient relevant to the project area

	Type	Name	Date	Sensitivity	Confidence
#1.	Document	Figure 8.pdf Figure of Referral Area Topography and Hydrology	12/08/2024	No	High

3.2.1 Flora and fauna within the affected area

	Type	Name	Date	Sensitivity	Confidence
#1.	Document	Attachment 3 - REDACTED.pdf Redacted Report on Matters of National Environmental Significance within Referral Area	09/10/2024	No	High
#2.	Document	Attachment 3.pdf Report on Matters of National Environmental Significance within Referral Area	11/08/2024	Yes	High

3.2.2 Vegetation within the project area

	Type	Name	Date	Sensitivity	Confidence
#1.	Document	Attachment 3 - REDACTED.pdf Redacted Report on Matters of National Environmental Significance within Referral Area	09/10/2024	No	High
#2.	Document	Attachment 3.pdf Report on Matters of National Environmental Significance within Referral Area	11/08/2024	Yes	High
#3.	Document	Figure 6.pdf Figure of Soils in Referral Area	13/08/2024	No	High
#4.	Link	Descriptions for NSW (Mitchell) Landscapes https://www.environment.nsw.gov.au/resources/con..			High

3.3.2 Indigenous heritage values that apply to the project area

	Type	Name	Date	Sensitivity	Confidence

#1.	Document	Figure 7 - REDACTED.pdf Redacted Figure of Heritage Values	09/10/2024	No	High
#2.	Document	Figure 7.pdf Figure of Heritage Values	13/08/2024	Yes	High

3.4.1 Hydrology characteristics that apply to the project area

	Type	Name	Date	Sensitive	Confidence
#1.	Document	Figure 8.pdf Figure of Referral Area Topography and Hydrology	13/08/2024	No	High

4.1.4.2 (Threatened Species and Ecological Communities) Why your action has a direct and/or indirect impact on the identified protected matters

	Type	Name	Date	Sensitive	Confidence
#1.	Document	Attachment 3 - REDACTED.pdf Redacted Report on Matters of National Environmental Significance within Referral Area	09/10/2024	No	High
#2.	Document	Attachment 3.pdf Report on Matters of National Environmental Significance within Referral Area	11/08/2024	Yes	High

4.1.4.5 (Threatened Species and Ecological Communities) Why you consider the direct and/or indirect impact to be a Significant Impact

	Type	Name	Date	Sensitive	Confidence
#1.	Document	Attachment 3 - REDACTED.pdf Redacted Report on Matters of National Environmental Significance within Referral Area	09/10/2024	No	High
#2.	Document	Attachment 3.pdf Report on Matters of National Environmental Significance within Referral Area	11/08/2024	Yes	High

4.1.4.10 (Threatened Species and Ecological Communities) Avoidance or mitigation measures proposed for this action

	Type	Name	Date	Sensitive	Confidence
#1.	Document	Attachment 3 - REDACTED.pdf Redacted Report on Matters of National Environmental Significance within Referral Area	09/10/2024	No	High
#2.	Document	Attachment 3.pdf Report on Matters of National Environmental Significance within Referral Area	11/08/2024	Yes	High

4.1.4.11 (Threatened Species and Ecological Communities) Proposed offsets relevant to avoidance or mitigation measures

	Type	Name	Date	Sensitive	Confidence
#1.	Link				

		Ancillary rules: Reasonable steps to seek like-for-like biodiversity credits for the purpose of a https://www.environment.nsw.gov.au/-/media/OEH/C..			High

4.1.5.3 (Migratory Species) Why your action is unlikely to have a direct and/or indirect impact

	Type	Name	Date	Sensitive	Confidence
#1.	Document	Attachment 3 - REDACTED.pdf Redacted Report on Matters of National Environmental Significance within Referral Area	09/10/2024	No	High
#2.	Document	Attachment 3.pdf Report on Matters of National Environmental Significance within Referral Area	11/08/2024	Yes	High

4.3.8 Why alternatives for your proposed action were not possible

	Type	Name	Date	Sensitive	Confidence
#1.	Document	Figure 2.pdf Figure of Project Layout	13/08/2024	No	High

5.2 Declarations

Completed Referring party's declaration

The Referring party is the person preparing the information in this referral.

ABN/ACN	18059519041
Organisation name	UMWELT (AUSTRALIA) PTY. LTD.
Organisation address	2284 NSW
Representative's name	Nadia Aurisch
Representative's job title	Environmental Consultant
Phone	1300793267
Email	naurisch@umwelt.com.au
Address	75 York Street Teralba NSW 2284

☑ Check this box to indicate you have read the referral form. *

☑ I would like to receive notifications and track the referral progress through the EPBC portal. *

☑ By checking this box, I, **Nadia Aurisch of UMWELT (AUSTRALIA) PTY. LTD.**, declare that to the best of my knowledge the information I have given on, or attached to this EPBC Act Referral is complete, current and correct. I understand that giving false or misleading information is a serious offence. *

☑ I would like to receive notifications and track the referral progress through the EPBC portal. *

Completed Person proposing to take the action's declaration

The Person proposing to take the action is the individual, business, government agency or trustee that will be responsible for the proposed action.

ABN/ACN	664148958
Organisation name	WATTLE CREEK ENERGY HUB PTY LTD
Organisation address	2095 NSW
Representative's name	Daniel Leahy
Representative's job title	Senior Development Manager
Phone	0400210325
Email	daniel.leahy@sparkrenewables.com
Address	Level 4, 1A Rialto Lane, Manly, NSW 2095

☑ Check this box to indicate you have read the referral form. *

☑ I would like to receive notifications and track the referral progress through the EPBC portal. *

☑ I, **Daniel Leahy of WATTLE CREEK ENERGY HUB PTY LTD**, declare that to the best of my knowledge the information I have given on, or attached to the EPBC Act Referral is complete, current and correct. I understand that giving false or misleading information is a serious offence. I declare that I am not taking the action on behalf or for the benefit of any other person or entity. *

☑ I would like to receive notifications and track the referral progress through the EPBC portal. *

Completed Proposed designated proponent's declaration

The Proposed designated proponent is the individual or organisation proposed to be responsible for meeting the requirements of the EPBC Act during the assessment process, if the Minister decides that this project is a controlled action.

Same as Person proposing to take the action information.

☑ Check this box to indicate you have read the referral form. *

☑ I would like to receive notifications and track the referral progress through the EPBC portal. *

☑ I, **Daniel Leahy of WATTLE CREEK ENERGY HUB PTY LTD**, the Proposed designated proponent, consent to the designation of myself as the Proposed designated proponent for the purposes of the action described in this EPBC Act Referral. *

☐ I would like to receive notifications and track the referral progress through the EPBC portal. *