Barwon Solar Farm

Application Number: **01457** Commencement Date: **04/10/2022** Status: **Locked**

1. About the project

1.1 Project details

1.1.1 Project title *

Barwon Solar Farm

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 *

02/03/2025

1.1.4 Estimated end date *

02/03/2075

1.2 Proposed Action details

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

The proposed action is to construct and operate a solar farm of up to approximately 330 MWp (Megawatt- peak) and battery energy storage system (BESS) of up to approximately 500MW at 1145-1215 Little River-Ripley Road, Victoria (known as Barwon Solar Farm).

Barwon Solar Farm is a 768.25-hectare site located in the Greater Geelong City Council area. Solar panels will cover approximately 502.09 hectares of the total site area (65%). The footprint for native vegetation disturbance will be 18.33ha (2.38% of site area) with vegeation retention area of 45.68ha (5.9% of site area) and avoidance area of 140.70haha (18.31% of site area)

The facility will consist of the following:

- The installation of 540,690 ground mounted solar photovoltaic (PV) modules (panels), which use a single axis tracking solar technology with an approximate capacity of 330MWp. Each Panel will measure approximately 2.4m (length) x 1.303m (width). Once mounted on the frames and fully tilted, the panels will be capable of reaching an overall height of no more than 3.2 metres above ground level.
- Installation of a battery energy storage system with an approximate capacity of up to 500 MW.
- Installation of approximately 74 inverters/transformers housed in a cabin-like structure of approximately 6m (length) x 2m (width) x 3m (height). Inverters and transformers are combined and are mounted on a concrete base.
- Installation of a 1 x 500MW (approx.) Battery energy system and housing structure, approximately 12 metres (length) x 2.4m (width) x 2.891m (height). The BESS includes approximately 136 Inverters.
- Internal road system (minimum width of 4 metres) – Please refer to attached Transport Impact Assessment, Section 3, page 12-16 for further details regarding the internal road network. There will be no on-site car parking for vehicles accessing the site.
- A 2.3m high chain mesh fence installed around the solar farm. The purpose of the fence is to deter theft or vandalism and prevent unauthorised access to the solar farm.
- A 35m high voltage lattice transmission tower allowing for connection between the substation and the HV network

- Security cameras
- Visual amelioration screen planting.
- Substation control room approximately 13.2m (length) x 5.8m (width) x 4.6m (height).
- Water tanks approximately 4.5m (width) x 3.05m (height)
- Compost toilet

A site plan has been attached titled Barwon Site Plan which shows the extent of the development.

Key Construction details include:

Key construction activities:

Mounting frames - The panels will be attached in a single portrait configuration to horizontal mounting frames. The mounting frames are usually pile driven into the ground, and no concrete foundations are required. The base of the frame piles are thin, 'H' or 'Z' shapes, thus they have very little impact on the ground and do not require any prior excavation. This means that during construction patches of grass are relatively undisturbed and not impacted or lost across the project area. The frames are driven to a depth of approximately 1.5m. At the end of their operational life when the site is decommissioned, the frame piles are simply pulled out from the ground causing minimal ground disturbance. This light construction approach also minimises impact upon potential archaeology remains. In some areas where there is depth to rock is below 2M and piling refuses there is potential for the pile foundations to be pre drilled

Native vegetation removal- Based on the current design, the proposed development will require the removal of a total 18.330 hectares native vegetation, this includes:

- 14.294 hectares of patch vegetation. 5 Patch Trees (2 live Large Old Trees, 1 dead Large Old Tree and 2 smaller live trees)
- 70 Scattered Trees, including:
    - 46 Large Old Trees
    - 4 dead Large Old Trees
    - 20 smaller live trees.

Of this vegetation removal referral under the EPBC Act is required due to potential impacts to Golden Sun Moth habitat and Natural Temperate Grassland of the Victorian Volcanic Plain (NTGVPP).

Construction of internal road network - The proposal will feature an internal road network with 4m all-weather sealed perimeter roads accessible from access points off Little River Ripley Road and Mt Rothwell Road. There are seven access points from the surrounding road network.

The proposed location of vehicle access points and internal road network is outlined in the Transport Impact Assessment included at Attachment C. The access points to the site's internal road network have been designed in accordance with Council, VicRoads and CFA guidelines.

Connection to the Grid / Substation - The site will require a connection to the electricity grid via the 220KV transmission lines that run north to south through 1320 Little River Ripley Road. The project substation will be located immediately west of these powerlines and connect directly via cables on power poles within the projects substation. Connections to the grid will be via a single power pole cable located in the substation compound. Therefore, no new external transmission infrastructure is envisaged to facilitate the connection to the grid.

Installation of fencing and security cameras- An agricultural type stockproof fence will be installed around the boundary of the site, with a 2.3 m high security fence set 5 metres to the inside of it. The 5 m space between the fences will enable the establishment of a buffer planting zone to screen the Proposal from surrounding sensitive viewpoints. To monitor the site and detect any unauthorised access, motion sensor CCTV cameras will be erected around the perimeter of the site and by the access gates on poles (approx. 3m in height) as shown on the layout plans.

Footings for batteries and inverters – All BESS units will be built on concrete foundations.

Landscaping planting - The Project has exposed boundaries to the east, south and west which will be planted with screening species in accordance with the landscape strategy at attachment D.

Referral recommended due to potential impacts to Golden Sun Moth and Natural Temperate Grassland of the Victorian Volcanic Plain (NTGVPP). An review of the activities subject of this referral is contained in the attached flora and fauna assessment, Section 4.1.1, p24.

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

No

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

- Environmental Protection and Biodiversity Conservation Act 1999 due to proposed removal of 5.3 hectares of Golden Sun Moth habitat and 8.409 hectares of Natural Temperate Grassland of the Victorian Volcanic Plain (NTGVPP).
- Flora and Fauna Guarantee Act 1988 (the FFG Act)
    - Threatened taxa, communities and threatening processes listed under Section 10 of the FFG Act and associated action statements and listing advice.

- The study area is predominantly on private land, does not contain any declared ‘critical habitat’ for the purposes of the FFG Act and the flora species within are not being taken for the purpose of commercial sale. A protected flora permit is therefore not required.

- Planning and Environment Act 1987 (incl. Planning Schemes
  - Clause 73.01 of Greater Geelong Planning Scheme, Clause 12.01-2 of State Planning Policy Framework (Native Vegetation Management) and Clause 52.17 (Native Vegetation)

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. *

In summary the following public consulation has occured:

As part of the larger planning process, Elgin Energy and Urbis Planning team were responsible for engagement with the relevant agencies, landowners and land users and stakeholders involved in prospective resource developments (such as owners of mining leases, petroleum production and exploration licences). In addition, Urbis’s Engagement team was responsible for engagement with the broader community. Engagement activities included letterbox drops, project specific website content, community and stakeholder briefings, information drop-in sessions and enquiry management through the duration of the planning process. The processes and outcomes are outlined below:

Local Government

Urbis on behalf of Elgin Energy consulted with officers from the City of Greater Geelong (Council) via phone and email on 20 June 2022, requesting a meeting to outline the project and to provide a briefing information pack. Council declined this invitation due to not being the responsible authority for the development. No feedback from Council has been received to date. While Council is not the responsible authority, Council appreciated being informed of the project details but provided no comments on the proposal. City of Greater Geelong will be a referral authority under S52 of the Greater Geelong Planning Scheme.

Relevant Agencies

Elgin Energy held meetings with DELWP’s Development Approvals and Design - Renewables team to discuss the project in June 2021, 21 January 2022, 23 January 2022 and via various emails and phone calls up to 12 September2022. These discussions were based around the project, its potential impacts in terms of visual impact, cultural heritage and native vegetation as requirements for the planning permit application and stakeholder engagement that was required, including the City of Greater Geelong.
As part of these discussions a meeting was also held with the Barwon South West Regional team specifically around native vegetation impacts, impacts to bird species and mitigation measures to address any impacts. These issues have been specifically addressed as part of this application and also detailed in the Flora and Fauna Assessment (Biosis, February2023).
Letters/emails were also sent to the following agencies:
-Country Fire Authority (CFA)
- Environment Protection Authority (EPA)
- Department of Transport (DoT)
- Emergency Management Victoria - Catchment and Environmental Protection
- Rural water corporation: Southern Rural Water
- Urban Water Corporation: Barwon Water

- Port Philip and Westernport Catchment Management Authority (PPW CMA)

Responses back from the above agencies identified issues related to native vegetation impacts, visual amenity, bushfire hazards and compliance, impacts to bird species and setbacks from waterways. These responses have been recorded and addressed

Also note since a planning permit application has been lodged all these partieds were refered the application.

Near neighbour briefings
Elgin Energy consulted with the neighbours directly bordering the site via a series of phone calls and face to face meetings. Surrounding neighbours were consulted with extensively during the project’s design, which will continue into the construction plan development. Consultation with near neighbours provided them an overview of the proposal (before plans being presented to the broader community) and offered the opportunity for a visual impact assessment to be conducted from their property.
Out of the eight direct neighbours consulted with four opted in for a face-to-face meeting and three requested a visual impact assessment.

Community stakeholder briefings
On 21 April 2022, Elgin Energy attended the Brisbane Rangers Landcare Group meeting to present an overview of the proposal. Around 30 members of the Landcare Group attended the session and had the opportunity to speak directly with the project team, ask questions and project feedback. The briefing was advertised two weeks ahead of the session in the April 2022 Anakie Advocate and via the Brisbane

Rangers Landcare Group database.

Community newsletter

The community newsletter outlined key features of the project and invited feedback. It included details of the project email and phone number managed by Urbis Engagement to answer questions and collect feedback. The newsletter was also used to promote the community information drop-in sessions to the community.
It was distributed on Tuesday 19 April 2022 by letterbox drop to 755 homes and businesses located the postcode areas below:
- Little River (postcode: 3211)
- Balliang (postcode: 3340)

Community information drop in sessions
Two, three-hour community information drop-in sessions were held at the Little River Mechanics Institute on the following dates:
- Wednesday, 25 May 2022 (2pm – 5pm)
- Thursday, 26 May 2022 (5pm – 8pm).
Around 25 members of the community attended one of the sessions.
The two sessions offered the opportunity for the community to drop in, speak directly to the project team, ask questions and provide feedback on the proposal.
The following was available for the community to view and discuss at the session:
- 10 information boards (refer to Appendix B)
- Visual assessment (photo montages)
- Draft design and site maps
- Constraint maps (showing protected environmental elements)
- Feedback forms
- Community newsletter with contact details.
The sessions were advertised via:
- Community newsletter distributed to 755 homes and businesses in Balliang and Little River
- Brisbane Rangers Community Newsletter (refer to Appendix D)
- Anakie Community House - noticeboard
- Email to 13 community groups, businesses and residents who registered interest
- Lions Club of Little River – Facebook page
- Little River Historical Society – Facebook page

A project website and 1800 num,ber and email were also set up for feedback to the project.

The Victorian Department of Transport and Planning have alsio undertake puiblic notification on the planning permit (PA2201886) on 23rd May 2023 until 6th June 2023. The project has also been advertiesed as part of the Environmental Effects Statement referral (2023-R05) in October/November 2023.

Indigenous Stakeholders

Engagement wuith the Wadawurrung Tradional Owners Aborginal Corporation (WTOAC) has occured since 2021. A Cultrual Heritage Managemernt Plan has been prepared for the projet and is expected to be approved by March 2024. As part of this process has involved numopurouis meetinfs to discuss the project and amend the design to respond to cultrual heritage as well as field investigations and archcieologcal investigations with the WTOAC to assess the cultrual heritage vaklues of the site. The Victorian Department of Transport and PLanning have also enegaged wuth the WTOAC as a reffferal enitity as part of the planning permit application.

Refer to section 4, P22-24 of the Barwon Town Planning report for details of community and indigenous stakeholder engagement

- Community and stakeholder engagement outcomes report
- Desktop and Standard Assessment for preparation of a Cultural Heritage Management Plan
- Preliminary Complex Assessment Result

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.

The Department of Climate Change, Energy, the Environment and Water (the department) collects your personal information (as defined by the Privacy Act 1988) through this platform for the purposes of enabling the department to consider your submission and contact you in relation to your submission. If you fail to provide some or all of the personal information requested on this platform (name and email address),

the department will be unable to contact you to seek further information (if required) and subsequently may impact the consideration given to your submission.

Personal information may be disclosed to other Australian government agencies, persons or organisations where necessary for the above purposes, provided the disclosure is consistent with relevant laws, in particular the Privacy Act 1988 (Privacy Act). Your personal information will be used and stored in accordance with the Australian Privacy Principles.

See our Privacy Policy to learn more about accessing or correcting personal information or making a complaint. Alternatively, email us at privacy@awe.gov.au.

☑ **Confirm that you have read and understand this Privacy Notice ***

1.3.1.1 Is Referring party an organisation or business? *

Yes

Referring party organisation details

ABN/ACN	50105256228
Organisation name	URBIS PTY LTD
Organisation address	3000 VIC

Referring party details

Name	Jon Mills
Job title	Director
Phone	0406368229
Email	JMills@urbis.com.au
Address	Lvl 10, 477 Collins Street, Melbourne, VIC, 3000

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	95629627416
Organisation name	ELGIN ENERGY PTY LTD
Organisation address	4000 QLD

Person proposing to take the action details

Name	Tim Averill
Job title	Managing Director - Australia
Phone	+61 478 584 307
Email	tim.averill@elgin-energy.com
Address	Waterfront Place, Level 10, 1 Eagle Street, Brisbane City, QLD, 4000

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? *

No

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. *

The person undertaking the proposed action has no negative record of responsible environment management. There are no past or present proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources against Elgin Energy who are the company/person proposing the action.

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

Please see Elgin Energy ESG Policy

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	95629627416
Organisation name	ELGIN ENERGY PTY LTD
Organisation address	4000 QLD

Proposed designated proponent details

Name	Tim Averill
Job title	Managing Director - Australia
Phone	+61 478 584 307
Email	tim.averill@elgin-energy.com
Address	Waterfront Place, Level 10, 1 Eagle Street, Brisbane City, QLD, 4000

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	50105256228
Organisation name	URBIS PTY LTD
Organisation address	3000 VIC
Representative's name	Jon Mills
Representative's job title	Director
Phone	0406368229
Email	JMills@urbis.com.au
Address	Lvl 10, 477 Collins Street, Melbourne, VIC, 3000

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	95629627416
Organisation name	ELGIN ENERGY PTY LTD
Organisation address	4000 QLD
Representative's name	Tim Averill
Representative's job title	Managing Director - Australia
Phone	+61 478 584 307
Email	tim.averill@elgin-energy.com
Address	Waterfront Place, Level 10, 1 Eagle Street, Brisbane City, QLD, 4000

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

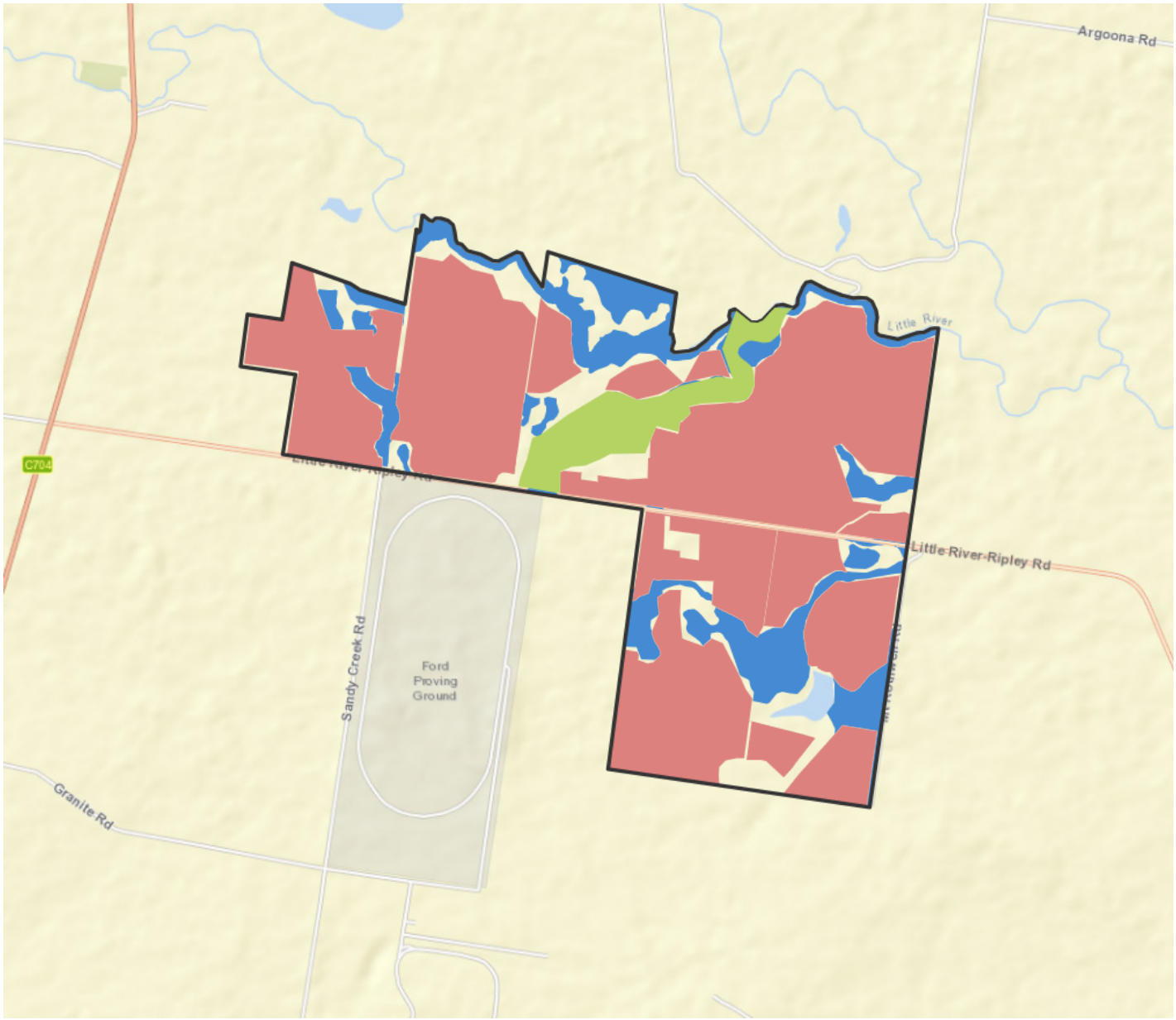
1.4 Payment details: Payment allocation

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


Argoona Rd
Little River
C704
Little River-Ripley Rd
Sandy Creek Rd
Ford
Proving
Ground
Granite Rd

2.2 Footprint details

2.2.1 What is the address of the proposed action? *

Little River Ripley Road, Little River/Balliang

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

Victoria

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 land is privately held / freehold land from 7 landowners across the following land

1000 Little River - Ripley Road, Little River. Formally known as: Allot. 24 Parish of Wurdi-Youang
1050 Little River - Ripley Road, Little River. Formally known as: Lot 2 TP15944
1085 -1135 Ripley Road, Little River. Formally known as: Allot. 23 Parish of Wurdi-Youang
1145-1215 Ripley Road, Little River. Formally known as: Allot. 22 Parish of Wurdi-Youang
1150-1190 Little River - Ripley Road Little River, this property has 2 parcels formally known as: Lot 1PS434520C and Lot 1 TP15944.
1240 Little River - Ripley Road, Balliang, formally known as: Por. 17 Parish of Wurdi-Youang
1320 Little River - Ripley Road, Balliang, formally known as: Lot 2 of LP140470

All land will be leased to Elgin Energy.

3. Existing environment

3.1 Physical description

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

The project area is 30 Kilometres north of the Geelong CBD and 45 kilometres west of the Melbourne CBD.

The site is located in the Farming Zone and there will be no changes to zoning for this activity.

Land adjacent to the site on the eastern side is Rural Conservation Zone land (along half of the length the boundary). Land on all other sides of the site is also Farming Zone land.

There are six proposed access points, which will be used to service the site, five of which will be from Little River Ripley Road an the sixth being from Mt Rothwell Road. The access from Mt Rothwell Road is the access that will be used to access the battery storage system and the substation for operation and maintenance purposes. Little River Ripley Road separates the northern and southern portions of the site and is a sealed road with one lane in each direction. It connects with Bacchus Marsh Road to the west and You Yangs Road to the southeast, which leads into the town of Little River. Mt Rothwell Road is unsealed.

The access point which is used on a day-to-day basis will vary based on the type of work that is being undertaken at the site on that specific day and will be at the discretion of the service vehicle operator. All of the entry points will be designed to accommodate a CFA firefighting vehicle at a minimum.

The site is approximately 732ha Ha in size, is relatively flat. The site is highly modified due to farming practices and is currently still being utilised predominantly for agricultural purposes, with majority of the land used for dryland cropping. Crops of vetch and dun peas have also been grown on the property in the past. Grazing of sheep are also currently being undertaken on two of the properties. There are a few scattered structures on the site, the largest of which is the farmhouse located on the southern portion of the site.

Please refer to Section 1.1, 1.2 and 1.3 on pages 2-8 of the attached Barwon Solar Farm Town Planning Report for land and locality description

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

The predominant land uses surrounding the subject site include farming, agriculture, rural residential and reserves. The area is sparsely populated and is made-up of mainly large lots. The surrounding landscape is generally flat, with little variance in the topography. Other than the reserves, most lots are sparsely populated with trees, generally planted for agricultural purposes.

North

Little River Immediately abuts the project site to the north and generally flows east through the Werribee plains to form part of the Port Phillip catchment. This section of Little River is joined by a minor tributary (Sandy Creek) which runs north-east through No. 1150-1190 and No. 1050 Little River – Ripley Road, Little River. Part of 1150-1190 Little River – Ripley Road, Little River is located on the northern side of Little River.

East

The Western Grassland Nature Conservation Reserve is located east of the project site and spans 15,000-hectares of Urban Growth Boundary south-east of Melton and west of Werribee. The area contains the largest and highest-quality example of Natural Temperate Grassland remaining in Victoria, and is a key biodiversity asset for the state. The reserve also protects a range of habitat types including ephemeral wetlands, waterways, Red Gum swamps, rocky knolls and open grassy woodlands.
Part of the reserve has already been acquired by the Department of Environment Land and Water (DELWP). DELWP is actively seeking to negotiate further acquisitions. Parks Victoria has taken on the management of the land acquired so far and is undertaking extensive restoration and rehabilitation works for improve the quality of the Natural Temperate Grassland and habitat for threatened species.
Immediately east of the site's southern lots, separated by Mt Rothwell Road, is the Mt Rothwell Estate and homestead which is listed on the Victorian Heritage register. The entrance to this property is adjacent to site entrance along Mt Rothwell Road and the main entrance to the Mt Rothwell conservation centre directly to the south.

South

Extensive granitic crops to the south of the site has influenced southern landforms, notably the small granite outcrop Mount Rothwell, as well as the dominant granite monolith known as the You Yangs.
The Mount Rothwell Conservation and Research Reserve is an immediate neighbour to the south of the site. Comprising of importantly predator free land along with a Biodiversity Interpretation Centre. The conservation reserve is a critical location for the management of high conservation values species breeding and research programs. Located at 5 Mount Rothwell Road, Little River, the 420-hectare fenced site is dedicated to the research, conservation and protection of endangered species in a predator-free zone.
The You Yangs are found further south of the site, which are a series of granite ridges that dominate the skyline up to 319m above the low-lying Werribee Plain. The name "You Yangs" comes from the traditional Aboriginal words Wurdi Youang or Ude Youang, which has the broad meaning Big mountain in the middle of a plain or large hill. A dominant geological feature, the You Yangs are prominent remnants of old volcanic vents and granite monoliths within the plains. With exception of this geological feature directing the landscape, the landscape is gently undulating too almost flat.

West

A part of the old landscape which predates basaltic extrusions, the west of the site is underlain by highly weathered sandstones and siltstones.
The Ford Proving Ground is to the west of the site, where the development and validating testing of new vehicles occurs. It is important to note that although the site is in the Farming Zone, it is considered an industrial use rather than agricultural use. There is unlikely to be any visual or amenity impacts from the proposed development to this site.
The more recent expansion of the metropolitan Melbourne area to the hinterland north of Werribee, along with an improvement to the rail link connecting Melbourne and Geelong, has generated an increased interest in the Little River and Bacchus Marsh area. Limited subdivision and closer residential development to rural properties around Balliang and Anakie is evident, particularly to the west of the project site.

Please refer to Section 1.1, 1.2 and 1.3 on pages 2-8 of the attached Barwon Solar Farm Town Planning Report for land and locality description

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

Key ecological values identified within the site include:

- 119 hectares of native patch vegetation comprised of EVC 55_63 Plains Grassy Woodland, EVC 68 Creekline Grassy Woodland, EVC 125 Plains Grassy Wetland, EVC 821 Tall Marsh and EVC 132_61 Heavier-soils Plains Grassland.
- 188 scattered trees (River Red-gum Eucalyptus camaldulensis, Melbourne Yellow Gum Eucalyptus leucoxylon subsp. connata, Yellow box Eucalyptus melliodora, Buloke Allocasuarina luehmannii, Grey Box Eucalyptus microcarpa, Manna Gum Eucalyptus viminalis).

- Two threatened ecological communities including 92 hectares of Natural Temperate Grassland of the Victorian Volcanic Plain (NTGVPP) and 1.4 hectares of Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia.
- Habitat for one threatened flora listed under the EPBC Act and three additional flora listed under the FFG Act (Appendix 2).
- Habitat for 18 threatened fauna; including seven species listed under the EPBC Act and 11 species listed under the FFG Act (Appendix 2).

Large, intact areas of native vegetation within the broader area exist within the nearby You Yangs Regional Park and Mt Rothwell Conservation and Research Reserve, stream or creek corridors, scattered trees and remnant patches of native grassland and woodlands existing within private land primarily used for pastoral activities. Consequently, scattered trees and native vegetation remaining in these areas and study area function as important corridors and steppingstones for the movement of a diversity of locally common and threatened fauna species across the landscape.

Please refer to Section 1.1, 1.2 and 1.3 on pages 2-8 of the attached Barwon Solar Farm Town Planning Report for land and locality description. Also refer to Section 5.2.3 P36-38, Section 7.5.4 P84-87 and Section 8.3 P95-96 for description of outstanding features and vegetation of the site

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 of the study area and broader landscape within the northern sections of the search area is characterised as flat (site: 87-101 m ASL). South of the site area, the topography rises within the nearby You Yangs Regional Park to a maximum of 319 metres above sea level (ASL)

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.

As outlined in the summary of the Flora and Fauna Assessment

Field studies and Targeted surveys have been undertaken at the site. Key ecological values identified within the study area are as follows:

- 119 hectares of native patch vegetation comprised of EVC_VPP 55_63 Plains Grassy Woodland, EVC_VPP 68 Creekline Grassy Woodland, EVC_VPP 125 Plains Grassy Wetland, EVC_VPP 821 Tall Marsh and EVC_VPP 132_61 Heavier-soils Plains Grassland.
- 187 scattered trees (River Red-gum Eucalyptus camaldulensis, Melbourne Yellow Gum Eucalyptus leucoxylon subsp. connata, Yellow box Eucalyptus melliodora, Buloke Allocasuarina luehmannii, Grey Box Eucalyptus microcarpa, Manna Gum Eucalyptus viminalis) and 38 large patch trees (River Red-gum Eucalyptus camaldulensis, Melbourne Yellow Gum Eucalyptus leucoxylon subsp. connata, Yellow box Eucalyptus melliodora, Grey Box Eucalyptus microcarpa and Manna Gum Eucalyptus viminalis).
- Two threatened ecological communities including 84 hectares of Natural Temperate Grassland of the Victorian Volcanic Plain (NTGVPP) and 1.4 hectares of Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia.
- Habitat for one threatened flora listed under the EPBC Act and three additional flora listed under the FFG Act.
- Habitat for 18 threatened fauna; including seven species listed under the EPBC Act and 11 species listed under the FFG Act.

Surveys took place for a combined total of 25 person days from April 2020 to May 2022. During these surveys, the site was examined in detail and Biosis captured comprehensively the vegetation condition and likelihood of threatened species being present. As document in the Flora and Fauna Assessment, due to historic land use impacts the likelihood of any cryptic herbaceous species was deemed as low. No specific spring surveys for cryptic species with short flowering periods were organised, but any species encountered would have been recorded within the surveys if present on site.

The following targeted surveys were conducted for the following EPBC Act listed species:

- Targeted surveys for the Spiny Rice Flower Pimelea spinescens subsp. spinescens of 14 days in total between 29/07/2020 and 10/09/2020. The species was not detected within the area.

- Targeted surveys for the Striped Legless Lizard Delma impar of 10 grids checked 8 times each between 9/10/2020 and 23/12/2020. The species was not detected within the area.
- Targeted surveys for the Golden Sun Month of 4 days in total between 9/12/2020 and 8/01/2021. The presence of the species was confirmed in the area.
- Targeted surveys for the Grassland Earless Dragon Tympanocryptis pinguicolla have not been conducted to date. The species was rediscovered in Victoria in June 2023, thus increasing the likelihood of occurrence in the subject site. Herpetologists on site didn't detect it during surveys for other reptile species. Targeted surveys may be conducted to assess possible impacts if detected.

Please refer to Section 1.1, 1.2 and 1.3 on pages 2-8 of the attached Barwon Solar Farm Town Planning Report for land and locality description. Also refer to Section 5.2.3 P36-38, Section 7.5.4 P84-87 and Section 8.3 P95-96 for description of outstanding features and vegetation of the site.

Please refer to the Barwon Solar farm Fauna and Fauna Assessment and Vegetation Mapping for detailed vegetation descriptions and mapping.

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

Landscape context

The topography of the study area and broader landscape within the northern sections of the search area is characterised as flat (study area: 87-101 m ASL). South of the study area, the topography rises within the nearby You Yangs Regional Park to a maximum of 319 metres above sea level (ASL). The study area and broader landscape within the search area are predominantly comprised of texture contrast soils including dense, sodic subsoils (sodosols) utilised for cropping and pastoral activities. Geology of the nearby You Yangs Regional Park and Mt Rothwell Conservation and Research Reserve consist of a series of granite ridges exposed by the processes of weathering and erosion. Prior to European settlement, the majority of the study area and broader search area would have been comprised of grasslands and open woodlands. Large, intact areas of native vegetation within the broader search area exist within the nearby You Yangs Regional Park and Mt Rothwell Conservation and Research Reserve, stream or creek corridors, scattered trees and remnant patches of native grassland and woodlands existing within private land primarily used for pastoral activities. Consequently, scattered trees and native vegetation remaining in these areas and study area function as important corridors and steppingstones for the movement of a diversity of locally common and threatened fauna species across the landscape.

Flora and fauna

One hundred and forty-two flora species and sixty-two fauna species were recorded within the study area. A list of these species is provided in Appendix 1 and Appendix 2 in the Biosis Flora and Fauna Assessment. Unless of particular note, these species are not discussed further. Whilst the study area has been cleared for broad-acre cropping and is utilised for pastoral activities, significant areas of the study area are dominated by native, short to medium height, tussock-forming grasses including Kangaroo Grass Themeda triandra, Spear Grass (Rough Spear-grass Austrostipa scabra and Austrostipa spp.) and Wallaby Grass (Common Wallaby-grass Rytidosperma caespitosum, Brown-back Wallabygrass Rytidosperma duttonianum, Copper-awned Wallaby-grass Rytidosperma fulvum, Slender Wallaby-grass Rytidosperma racemosum var. racemosum and Bristly Wallaby-grass Rytidosperma setaceum). The identification of these grasses has subsequently resulted in many of these areas meeting the definition of a ‘patch’ of native vegetation (DELWP 2017) and the description of EVC 132_61 Heavier-soils Plains Grassland.

Most patches of EVC 132_61 Heavier-soils Plains Grassland identified within the study area also meet the key diagnostic characteristics and condition thresholds for the EPBC Act listed community Natural Temperate Grassland of the Victorian Volcanic Plain; whereby the total perennial tussock cover within each patch is represented by the native grass genera Themeda, Rytidosperma (formally Austrodanthonia) or Austrostipa by at least 50 percent. The EPBC Act listed community Natural Temperate Grassland of the Victorian Volcanic Plain community is known to provide habitat or foraging resources for a diversity of flora and fauna species, including skinks, snakes, birds of prey (raptors) and ground-dwelling birds. The identification of perennial tussock grassland growing on deep cracking clay soils within patches of EVC 132_61 Heavier-soils Plains Grassland and EVC 55_63 Plains Grassy Woodland are considered to provide a suitable habitat for EPBC Act threatened species Striped Legless Lizard, Golden Sun Moth and Spiny Riceflower.

Targeted surveys for these species undertaken within the initial investigation area are discussed in Section 3.2.1-3.2.3 of this report. Some wooded areas of the study area retain important structural elements, including large trees, canopy cover and fallen timber. The identification of these features has subsequently resulted in some areas of the study area meeting the definition of a ‘patch’ of EVC 55_63 Plains Grassy Woodland.

One patch of EVC 55_63 Plains Grassy Woodland identified within the study area also meets the key diagnostic characteristics and condition thresholds for the EPBC Act listed community Grey Box (Eucalyptus macrocarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia; whereby at least 50 percent of the ground cover in the ground layer is made up of perennial native species and dominated by an overstorey of Grey Box Eucalyptus mircocarpa. This ecological community is known to provide valuable habitat for a plethora of threatened species (e.g. Golden Sun Moth, Striped Legless Lizard, etc.) and foraging resources for a number of bird fauna representative of temperate forest and woodland ecosystems as well as species from drier inland semi-arid environments.

One hundred and eighty-eight (187) ‘scattered’ trees (DELWP 2017) were assessed and determined to be remnant canopy trees of the historical vegetation cover; with approximately 70% of these trees classified as large trees according to the EVC benchmark for their

location (Appendix 6). Scattered trees were identified as River Red-gum Eucalyptus camaldulensis, Yellow Box Eucalyptus melliodora, Grey Box Eucalyptus microcarpa, Mana Gum Eucalyptus viminalis or the FFG At listed species Buloke Allocasuarina luehmannii and Melbourne Yellow Gum Eucalyptus leucoxylon subs. connata.

Sixty two (62) scattered trees and canopy trees (within patches, otherwise referred to in this report as 'patch trees') throughout the study area were observed to contain hollows. Additional trees present within riparian vegetation along Little River and Sandy Creek were not assessed. Trees within the site provide roosting and/or nesting opportunities for a range of locally common, hollow-dependent woodland avifauna, arboreal mammals and microbats. A Barn Owl Tyto alba was observed flying into a hollow during the present assessment and some records of the threatened Barking Owl Ninox connivens have been recorded in a patch of EVC 55_63 Plains Grassy Woodland adjoining the south east border of the site.

There is also potential for the canopies of scattered trees and patch trees to provide nesting opportunities for diurnal raptors and seasonal foraging resources (nectar and/or lerp) for a range of common migratory and/or volant fauna, as well as threatened species such as the Swift Parrot Lathamus discolor and Grey-headed Flying Fox Pteropus poliocephalus. Diurnal raptors recorded within the study area include Wedge-tailed eagle Aquila audax, Collared Sparrowhawk Accipiter cirrocephalus, Brown Falcon Falco berigora, Black-shouldered Kite Elanus axillaris. Neighboring landholders have noted that a nesting pair of the FFG Act listed Black Falcon Falco subniger is known from the study area.

Several farm dams are scattered throughout the study area, with one found to contain a patch of EVC 821 Tall Marsh. The majority of dams were small and contained Spikerush Eleocharis spp. within the ecotones of the waterbodies. Aquatic and riparian areas of the smaller dams were heard to provide habitat for a diversity of common frog species including Striped Marsh Frog Limnodynastes peronii, Common Froglet Crinia signifera, Southern Brown Tree Frog Litoria ewingii and Pobblebonk Frog Limnodynastes dumerilii dumerilii. Two larger dams were found to provide habitat for a diversity of common waterbird and one shorebird species.

Please refer to Section 1.1, 1.2 and 1.3 on pages 2-8 of the attached Barwon Solar Farm Town Planning Report for land and locality description. Also refer to Section 5.2.3 P36-38, Section 7.5.4 P84-87 and Section 8.3 P95-96 for description of outstanding features and vegetation of the site.

Please refer to the Barwon Solar farm Fauna and Fauna Assessment and Vegetation Mapping for detailed vegetation descriptions and mapping

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.

There are no Commonwealth heritage places within the project area.

Immediately east of the site's southern lots, separated by Mt Rothwell Road, is the Mt Rothwell Estate and homestead which is listed on the Victorian Heritage register.

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

The project area is located on Wadawurrung country.

A desktop assessment was undertaken by Eco Logical Australia. The results identified the following:

- A total of 405 registered Aboriginal cultural heritage places are located within the geographic region, which was defined as a 10 km buffer around the activity area.

- One previously registered Aboriginal cultural heritage place is located within the activity area: VAHR 7722-0498 (FORD 1): a surface stone artefact scatter.
- A further six Aboriginal cultural heritage places are also located within 200 m of the activity area boundary, including a multicomponent place, VAHR 7722-0036 (Aboriginal Ancestral Remains (Burial)
- Artefact scatters and LDADs make up 93% of these places. Scarred trees, stone features, earth features, Aboriginal Ancestral Remains are also represented within the geographic region.

A standard assessment was undertaken by Eco Logical Australia. Included a 9-day survey (15-16, 18 and 21-25 March 2022) and a team of six (three archaeologists and three WTOAC representatives).

The results identified the following:

- 839 stone artefacts
- 3 scarred trees
- No caves, cave entrances or rock shelters were identified.

A Complex Assessment was undertaken and completed by September 2023. The summary of results were as follows:

1A-1 - Volcanic Plain - 60 Pits - 142 artefacts

1A2- Drainage Line - 7 Pits - 1 artefect

1A3 - Granite Hills - 37 Pits - 25 artefacts

1A-4 - Flood Plain - 40 Pits - 2 artefacts

1A-5 - Stone Outcrops - 3 Pits - 0 artefacts

A meeting was held with WTOAC on 13th September 2022 to discuss the results of the Standard Assessment and present a methodology for a Complex Assessment, to support the CHMP being finalised and assessed. Based on this discussion Complex Assessment fieldwork has been undertaken and CHMP has been developed and estimated to be submitted by 14th November 2023 to WTOAC with approval date expected 12th January 2024.

Please Refer to Cultural Heritage Desktop and Standard Assessment and Complex assessment for indigenous heritage values

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. *

Eco Logical Australia Pty Ltd (ELA) assessed hydrological conditions associated with the existing and proposed conditions under 10%, 5%, 2%, 1%, 0.5%, 0.2% and 0.1% Annual Exceedance Probability (AEP) flood events for the proposed Barwon Solar Farm.

There are three main overland flow paths / waterways within the site area. The waterway through the middle is, in general, away from the proposed solar arrays, however there are isolated areas on the edge of the solar panel regions that may be close to or encroach upon the 1% AEP flood inundation area. Depths in some of these areas are shallow and will be able to pass under the arrays, however some points do have greater water depths (> 1 m) and an existing or proposed access track crosses the inundation area. An overland flow path across the upper eastern part of the site travels under proposed sections of solar arrays. For the most part the 1% AEP depths are shallow (< 0.1 m) however as the overland flow path progresses downstream these depths increase to around 0.5 metre with the array region. A third overland flow path and waterway in the south-eastern corner of the site also travels under the proposed solar array regions and across the proposed placement of the BESS facility. The 1% AEP depths are in general shallow (< 0.1 m) underneath the arrays and the proposed BESS location.

Adjusting the ground surface to raise the BESS facility above these flood waters would alter the localised flow paths of the area, however with an onsite farm dam immediately downstream of this, minimal impact to overall flood paths would occur.

The last key flood feature is Little River, along the northern border of the site. The solar array regions are clear of the 1% AEP extent for Little River in all areas except one small location where the overland flow path joins Little River in the central north of the site. There are existing access roads that cross Little River, the efficacy of these crossings within the 1% AEP flood event have not been assessed, as they are assumed to already be designed and sited appropriately.

The modelled velocities show that, in general, velocities across the site tend to be low (< 0.5 m/s) and below the threshold (i.e. < 2 m/s) where rock armouring to protect waterways and features is required. Some isolated higher velocities (> 1 m/s) occur through the overland flow path/waterway through the middle of the site and at other isolated locations under the current conditions. Should erosion form at these locations then erosion mitigation strategies should be implemented.

Flow velocities within the watercourses and overland flow paths vary such that most areas are below the level that might be expected to require artificial protection (i.e. rock armouring). During detailed design, this should be reviewed to ensure appropriate waterway protection is in place.

Please refer to Barwon Solar Farm Hydrology Assessment for more detailed information.

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 locations within the site.

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 items within the site.

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.

Direct impact	Indirect impact	Ramsar wetland
No	No	Port Phillip Bay (Western Shoreline) and Bellarine Peninsula

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. *

The study area is identified as being within 10 kilometres of the Port Phillip Bay (western shoreline) and Bellarine Peninsula Ramsar site. However, the study area does not drain directly into this or any other Ramsar site and thus considered unlikely to result in a significant impact.

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
No	No	Amphibromus fluitans
No	No	Anthochaera phrygia
No	No	Aphelocephala leucopsis
No	No	Aprasia parapulchella
No	No	Botaurus poiciloptilus
No	No	Calidris ferruginea
No	No	Callocephalon fimbriatum
No	No	Climacteris picumnus victoriae
No	No	Dasyurus maculatus maculatus (SE mainland population)
No	No	Delma impar
No	No	Dianella amoena
No	No	Diuris basaltica
No	No	Diuris fragrantissima
No	No	Dodonaea procumbens
No	No	Falco hypoleucos
No	No	Galaxiella pusilla
No	No	Glycine latrobeana
No	No	Grantiella picta
No	No	Hirundapus caudacutus
No	No	Lachnagrostis adamsonii
No	No	Lathamus discolor
No	No	Lepidium aschersonii
No	No	Lepidium hyssopifolium
No	No	Leucochrysum albicans subsp. tricolor
No	No	Lissolepis coventryi
No	No	Litoria raniformis
No	No	Melanodryas cucullata cucullata
No	No	Nannoperca obscura
No	No	Neophema chrysostoma

Direct impact	Indirect impact	Species
No	No	Numenius madagascariensis
No	No	Pedionomus torquatus
No	No	Perameles gunnii Victorian subspecies
No	No	Pimelea spinescens subsp. spinescens
No	No	Prototroctes maraena
No	No	Pteropus poliocephalus
No	No	Pterostylis cucullata
No	No	Rostratula australis
No	No	Rutidosis leptorhynchoides
No	No	Senecio macrocarpus
No	No	Stagonopleura guttata
Yes	Yes	Synemon plana
No	No	Thelymitra orientalis
No	No	Tympanocryptis pinguicolla
No	No	Xerochrysum palustre

Ecological communities

Direct impact	Indirect impact	Ecological community
No	No	Grassy Eucalypt Woodland of the Victorian Volcanic Plain
No	No	Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia
Yes	Yes	Natural Temperate Grassland of the Victorian Volcanic Plain
No	No	Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains
No	No	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. *

The proposed development will require removal of the following biodiversity on the site:

Total Removal: 14.294 hectares of patch vegetation. 5 Patch Trees (2 live Large Old Trees, 1 dead Large Old Tree and2 smaller live trees) 70 Scattered Trees, including:
– 46 Large Old Trees
– 4 dead Large Old Trees
– 20 smaller live trees.

This includes 5.3 ha of Golden Sun Moth Habitat and 8.409 ha Natural Temperate Grassland of the Victorian Volcanic Plain (NTGVVP) which is a threatened species and ecological community respectively. A review of impacts of both is provided below. Please refer to Barwon Solar Farm Vegetation Mapping attached

Synemon plana (Golden Sun Moth)

Lead to a long-term decrease in the size of an important population of a species

The Conservation Advice (DAWE 2021) does not provide a clear definition of an 'important population' and there has been no update to the species' significant impact guidelines since the revision the status of the Golden Sun Moth to vulnerable. The Conservation Advice does state, however, that all occupied habitat is important for the breeding activity of the associated sub-population. The advice also states that large sub-populations or smaller well-connected subpopulations occurring in high quality habitat would classify for their importance in the long term maintenance of the species, including maintenance of genetic diversity. The populations recorded within the study area would be considered small-medium sized populations, based on the area of habitat, but these are associated with larger populations within extensive areas of grassland to the north of the study area. Based on this, the populations present within the study area are likely to be considered important populations, and removal of habitat, particularly habitat zone VQA5 and VQA21 in the north-eastern section of the site may trigger this criterion.

Reduce the area of occupancy of an important population

Impacts to VQA5 and VQA21 results in the loss of 5.3 ha of habitat for the species.

Fragment an existing important population into two or more populations
Possible Removal of VQA5 and VQA21 potentially isolates other areas of recorded habitat within the site (VQA4 and VQA2 which have been avoided), however it is likely that the species may be able to disperse across the site.
Adversely affect habitat critical to the survival of a species
Impacts limited to the project footprint. There is an opportunity to improve management of retained habitat areas to benefit the species.
Disrupt the breeding cycle of an important population
Impacts limited to the project footprint**.** All occupied habitat is used for breeding.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline
Loss of habitat resulting from this project is relatively minor in the context of our current understanding of the distribution of the species.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat
There is an opportunity to improve management of retained habitat areas to benefit the species.
Introduce disease that may cause the species to decline
Unlikely
Interfere substantially with the recovery of the species
There is an opportunity to improve management of retained habitat areas to benefit the species.

Natural Temperate Grassland of the Victorian Volcanic Plain (NTGVVP)

The proposed Barwon Solar Farm proposes to remove 8.409 hectares of NTGVVP. An assessment has been undertaken against the Significant Impact Guidelines as follows:

Reduce the extent of an ecological community

Project design involves the Removal of 8.409 hectares of Natural Temperate Grassland of the Victorian Volcanic Plain. Most grassland is in relatively poor condition and are not currently managed to reduce threats, however poor condition examples of the community are still protected under the EPBC Act.
Fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines
NTVVP within the site is patchy in distribution. Larger patches have been preserved within the design and poor quality patches have been identified for removal, particularly where the project design requires access to adjacent cleared areas.
Adversely affect habitat critical to the survival of an ecological community.
No Recovery Plan has been prepared or adopted for this TEC and no critical habitats have been formerly identified by the Australian Government. However, given that less than 2% of the TEC is estimated to still exist, most areas that continue to support the TEC are likely to be considered critical habitat, particularly if those areas support moderate to high quality examples of the TEC. This example of NTGVVP is of low to moderate quality. Given the NTGVVP is located within farmland, without active management, this vegetation is likely to continue to degrade in
quality over-time.
Modify or destroy abiotic (nonliving) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns.
Likely, but impacts are limited to the project footprint. The project hydrology report (Eco Logical Australia 2022) has
determined that the project will not result in hydrological changes that would impact adjacent, protected areas of the
community.
Cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting Impacts limited to the project footprint
The project hydrology report (Eco Logical Australia 2022) has determined that the project will not result in hydrological
changes that would impact adjacent protected areas of the community.

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. *

Impacts to VQA5 and VQA21 could result in the loss of 5.3 hectares of habitat for the Golden Sun Moth Synemon plana, which is consider as a Significant Impact against the EPBC criteria of 'Reducing the area of occupancy of an important population', 'Fragment an existing important population into two or more populations' and 'Lead to a long-term decrease in the size of an important population of a species'.

Impacts to the Natural Temperate Grassland of the Victorian Volcanic Plain could result in the loss of 8.409 hectares of the ecological community, which is consider as a Significant Impact against the EPBC criteria of 'Reduce the extent of an ecological community'.

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

No

4.1.4.9 Please elaborate why you do not think your proposed action is a controlled action. *

The Barwon Solar Farm Flora and Fauna Assessment prepared by Biosis has considered the likelihood of threatened species within the site and the potential likelihood of impacts on threatened species. Justification as to why this is not a controlled action is contained within the report section 4.1.

The reasons for this are as follows:

- The habitat is highly fragmented and degraded with low numbers present and not considered critical habitat.
- The presence of noxious and invasive species is widespread and will continue to occur and increase due to its current land uses.
- The proposed activity will not interfere with the recovery of the species. Furthermore the solar panels proposed in the areas of VQ5 and VQ21 will be installed via driven piles without foundations. The integrity of the grasslands underneath will be maintained after construction and there is literature evidence supporting this statement. This would translate into the viability of the habitat for Golden Sun Moth not being compromised in the long term and in the species being able to thrive on the site. Moreover, the interruption of highly risk activities for the species (such as pesticide use, clearing, or uncontrolled overgrazing linked to agriculture) and an integrated weed management plan to ensure the presence of native habitat species will greatly enhance the population recovery in the long-term.

Impacts on the NTGVVP will affect patches in a poor condition of a total of 8.409 hectares. Justification as to why this is not a controlled action is contained within the report section 4.1 and follows a similar line of thought as the aforementioned rationale:

- The community on site is in poor condition and highly degraded and are not currently managed to reduce threats.
- The presence of noxious and invasive species is widespread and will continue to occur and increase due to its current land uses.
- The proposed activity and its consequential change in land use present an opportunity for recovery and improved management of retained patches.

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. *

Locating the project within modified grazing and cropland that is primarily cleared of native patch vegetation. The design has avoided the majority of NTGV within the site, and riparian vegetation along Little River and Sandy Creek. There have been a number of layout designs of the project to avoid and mitigate impacts for this action.

This includes amending the design to avoid locations of key ecological features such as habitat for threatened species, locations of FFG Act listed trees and FFG Act and EPBC Act listed threatened ecological communities.
The following features were prioritised for avoidance:
– Creekline Grassy Woodland associated with Little River and Sandy Creek.
– Remnant vegetation within the Little River-Ripley Road reserve.
– Areas of Plains Grassy Woodland, including VQA 13 and VQA 28.
– Plains Grassland corresponding with the definition of the EPBC Act listed threatened ecological community Natural Temperate Grassland of the Victorian Volcanic Plain and the FFG Act listed Western (Basalt) Plains Grasslands.
– Plains Grassland where Golden Sun-moth (listed as Vulnerable under the EPBC Act) were recorded.
– A group of scattered trees including and near the Black Falcon nest, to the south of Little River Ripley Road (directly south-east of VQA 31).
– A further revised design seeks further avoidance by removing the installation of solar panels immediately south-east of the ecological corridor in order to preserve a greater number of scattered trees. These trees have been prioritised for retention, as they assist in improving connectivity and the area of remnant vegetation along Sandy Creek. Following further consultation with the Victorian Department of Energy,

Environment and Climate Action on the 15th December 2022 the design has been modified In the design reducing loss of scattered trees to 70 trees and patch reduced to 5 trees. This equates to 33% of all the trees mapped within the study area (reduced from 47% of all the trees originally proposed in design irritation 3).
Patches of native vegetation (16.34ha) proposed to be removed has been deliberately targeted to be patches of poor quality vegetation and avoid any areas of medium to high quality vegetation or areas. The poor quality areas have degraded due to farming practices across the land. It is anticipated that these areas being under solar panels would not necessarily be lost due to the nature of the panels construction and as evidenced on other solar farms across Australia the patches of plains grassland can actually thrive and recover under the solar panels providing an increase to the biodiversity condition of these areas providing a net increase in native vegetation due to these areas being under development.
Current land use, and ongoing management in the absence of the solar development were also considerations in the design. Most remnant grasslands within the study area were located in areas unsuitable for cultivation. None of these areas are currently managed for protection of biodiversity values. All areas are subject impacts from adjacent land, including grazing by stock and weed infestations. High threat weeds are common throughout the study area, and pose a major risk to the ongoing viability of biodiversity values within grassland areas, unless there is a change to the management regime. The following species are of particular concern.
– Serrated Tussock Nassella trichotoma
– Chilean Needle-grass Nassella neesiana
– Cane Needle-grass Nassella hyalina
– Galenia Aizoon pubescens
– Cape Weed Arctotheca calendula
– Saffron Thistle Carthamus lanatus
– Boneseed Chrysanthemoides monilifera
– African Box-thorn Lycium ferocissimum
– Horehound Marrubium vulgare
– Tiger Pear Opuntia aurantiaca

Considering the preliminary results of the Flora and Fauna Assessment the solar farm layout has significantly altered and reduced the amount of native vegetation that has to be removed, with particular focus on preserving and relocating endangered species and habitats identified in the assessment.
We note the site is currently used for medium to heavy agricultural practices which can be considered to be equally detrimental to the surrounding native vegetation and ecosystem. This is particularly relevant to patches of Plains Grassland on the site which are considered to be in relatively poor condition due to existing land use and management practices.
Large scale land use changes and the removal of native vegetation such as this would commonly lead to negative impacts upon some species through altering or degrading habitat. However, in agricultural landscapes, which are often intensively managed and species-poor, there is potential for benefits if deployed and managed strategically. The nature of construction for this land use is considered to be low impact, avoiding heavy duty foundations and disturbance to the land. The mounting frames are pile driven or drilled into the ground, and no concrete foundations are required causing minimal ground disturbance, which significantly reduces environmental impacts in comparison to other built form development. This leads to opportunities for regenerative land management which revitalises soils, restores grassland ecosystems and increases biodiversity while maintain light agricultural production. This is further as described in Section 5.2.3, P36, 37 and 38 of the Barwon Solar Farm Town Planning Report.

An integrated grassland management plan could be implemented to reduce the presence of noxious weeds, enhance local biodiversity, and ensure long-term ecology and agricultural values. In addition to extensive weed control, re-seeding of native grasses could be implemented to enhance the recovery of the NTGVVP and, by extension, the Golden Sun Moth habitat. Controlled and suitable grazing with selective stock could also be adapted to ensure the sustainable maintenance of the grassland for habitat adequacy for threatened species, bushfire control and appropriate regenerative economic practices.

Tympanocryptis pinguicolla (Victorian Grassland Earless Dragon) was recently rediscovered in Victoria in June 2023. Due to the lack of information and guidelines, a precautionary approach will be undertaken post-permit prior to construction. After consultation with Biosis and species expert Peter Robertson (author of its latest National Recovery Plan), it is proposed to deploy 150 artificial spider burrow traps and 10 pitfall trap lines throughout suitable habitats, conducting 10 days of trap checks. This would be supplemented with endoscope surveys of existing natural spider burrows if found in likely habitat areas such as small rocky patches. A management plan would be prepared in accordance with the results of the proposed surveys and timing, outlining mitigation measures that can be implemented and required to be reported on. Some of the action points will include, but may not be limited to:

- The introduction of controlled well-managed grazing for grassland maintenance, which synergises with the aforementioned grassland strategy and weed management plan. Uncontrolled overgrazing is a high-risk activity for the grassland habitat and its dependent species. However, a well-timed controlled grazing strategy not only poses opportunities for sustainable economic development (agrovoltaics) but also greatly helps maintain grassland density and composition, which in turn will improve the Grassland Earless Dragon habitat as demonstrated by the location of the recent discovery.
- Minimise where possible the use of pesticides. Pesticides would eliminate the Grassland Earless Dragon prey. By transitioning into a land use that won't require their constant use, such as the proposed solar farm, any potential populations would benefit.
- Revegetating the area with local native tussock grass to create habitat corridors between potential habitats. This would be implemented and synergise with both the integrated weed and grassland management plans as well as the landscape strategy.
- Cat and Fox management will be conducted regularly to reduce the risk of direct predation. Pest control will be increased after potential bushfire events.
- Width of internal roads would be minimised where possible to reduce habitat fragmentation. Less used roads will be left grassy where possible to further reduce habitat fragmentation.

- Road design will be accommodated to reduce isolated islands of grassland and reduce habitat fragmentation.

The proponent is open to discussing with the relevant agencies further actions within the potential management plan for pre- and post-construction actions to be consolidated as a condition of consent.

Measures to minimise the amenity and environmental impacts during the construction, operation and decommissioning of the solar energy facility will be addressed in the preparation of management plans (EMP) and relevant subplans in accordance with the solar energy facilities design and development guidelines. Specifically appropriate sediment control measures to ensure run-off during construction does not impact potential habitat for threatened species Growling Grass Frog and Yarra Pygmy Perch.
Additionally, where possible primary access to the site has been confined to existing access points to the property where native vegetation does not exist.
Given all the design amendments and targeted vegetation enhancements to the site including a thorough approach to site selection and design, there is no feasible opportunities to further avoid and minimise impacts on native vegetation without undermining the key objectives of the proposal. Any further reduction in development area would render the project economically unviable and the project would not be able to proceed.

See Barwon Solar Farm Town Planning Report Section 5.1, P34-38

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

The applicant intends to satisfy additional offset requirements through the purchase native vegetation credits through the offset register and/or first party offsets from areas underdeveloped on the land such as the area north of Little River (1PS/434520).
Furthermore, as a secondary offset Elgin Energy is prepared to preserve and rehabilitate a large ecological corridor of native vegetation, riparian habitats and grassland associated with the Little River and Sandy Creek catchments. This is located within the site and indicated on the site plan (Elgin Energy, October 2022). This could also provide for significant onsite offsets areas. This area (potentially up to 40ha) provides opportunity for onsite rehabilitation/conservation including revegetation of site appropriate species and relocation of native habitats (i.e dead trees and creation of hollows) for beneficial biodiversity outcomes. Combined with the environmental benefits of green energy generation, the Project represents a significant net environmental positive to the State.
Key actions would include weed control, biomass management and potentially seeding with locally sourced seed to improve native herb cover and diversity and to extend/join the grassland patches into previously disturbed areas as recommended in the flora and Fauna assessment.

Considering the grassland management and the integrity of this threatened community, the risk is that weeds will outcompete and inevitably displace resident native grasses that currently provide critical habitat for threatened native fauna in the area. Local farmers have also stressed the impacts on agricultural production that these weeds are increasingly producing. To mitigate this risk, an integrated weed management and restoration plan would be developed to enhance the conservation value of the subject site long term, for which there could be several scenarios and measures:

- Applying Flupropanate-based herbicide (boom or spot spray) which is known to have good control outcomes for Serrated Tussock and Needle Grasses. Noting that Flupropanate has a residual effect in soils to treat emerging weed seedlings – where this is considered it may risk affecting particular native grasses (such as Spear Grasses), lowered application rates, and/or 2,2-DPA (Propon, for flupropanate resistant weeds) or Glyphosate would be considered as alternatives. Lower application rates have been proven to achieve good control of weed persistence in the Sydney Region over the recent years as a precedent.
- Over-sowing or planting native grasses into ‘gaps’ following weed removal.
- In areas where current soil nutrient levels are low, supplementary seeding with native grasses at high rates to achieve high plant densities would enhance their capacity to outcompete residual weeds.
- In areas where current soil nutrient levels are high (i.e., in comparison to reference grassland sites), soil manipulation (e.g., via topsoil removal) could assist in removing high nutrient loads and weed seed banks.
- Herbicide use could also be reduced using complementary controls such as mechanical approaches (robot mowers - Spider 2SGS), controlled well-managed grazing (i.e., agrovoltaics using sheep under timed methods), or a combination of both methods.
    - The biological control agent Chilean grass rust fungus (Puccinia nassellae) has not yet received regulatory approval as of 2023, due to concerns about host-specificity. However, this and other biological approaches would be examined as part of integrated weed management approaches.
- Increased moisture levels are known to occur under solar panels, and these conditions are likely to favour some resident species. However, to increase the likelihood of natives benefiting from these conditions restoration actions could reseed under panels with high rates of moisture and shade-tolerant species (such as Weeping Grass, Red-legged Grass and Kangaroo Grass) and conversely sow species that preferred drier and high light conditions (such as Wallaby Grass, Spear Grass, Plume Grass) between panels in open rows.
- Seeding outcomes could be enhanced by sowing into semi-prepared seed beds (i.e., creating small surface indentations into existing areas where biomass has been removed) prior to panel installation. In this scenario, sowing outcomes are likely improved where there is a higher chance that sown seeds fall into indents providing them with improved soil contact and protection.

Continuation of current land uses will almost certainly negatively affect the condition of the native grasslands in the area. This is due to prevailing high-risk activities that include overgrazing, pesticide use, and ongoing agricultural land modification disrupting soil conditions, along with the threat that extensive weed presence within the area poses. The proposed solar development and its associated vegetation management and ecological restorative action planning would by comparison significantly reduce these processes and impacts providing

the opportunity and potential for enhanced native values, and vegetation community health in the long-term. Moreover, this management proposal also maintains adequate conditions for cattle use after the decommissioning of the solar farm, thus not comprising the long-term agricultural value of the land for the community.

Furthermore, Needle Grasses produce greater amounts of biomass compared to native grasses, which may result in increased bushfire fuel during high-risk conditions. This integrated management plan would help reduce overall bushfire risk in the area to safeguard communities and natural habitats.

The proposed site layout of the solar facility demonstrates significant consideration has been given to avoiding the removal of native vegetation, including several design iterations undertaken as knowledge of the site was improved, in particular the locations of key ecological features such as habitat for threatened species, locations of FFG Act listed trees and FFG Act and EPBC Act listed threatened ecological communities.

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
No	No	Actitis hypoleucos
No	No	Apus pacificus
No	No	Calidris acuminata
No	No	Calidris ferruginea
No	No	Calidris melanotos
No	No	Gallinago hardwickii
No	No	Hirundapus caudacutus
No	No	Motacilla flava
No	No	Myiagra cyanoleuca
No	No	Numenius madagascariensis
No	No	Rhipidura rufifrons
No	No	Tringa nebularia

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. *

Although twelve migratory have been recorded or predicted to occur in the project search area, the majority of these species are unlikely to occur within the study area. This is attributed to the highly modified nature of the study area, paucity of recent local records and the absence of suitable aquatic habitat.

While some species would be expected to use the study area on occasions, and some of them may do so regularly or may be resident, it does not provide an important habitat for an ecologically significant proportion of any of these species. It is unlikely that the proposed activity would have a significant measurable impact on the species, as the local area supports plenty of alternative roosting and foraging habitat.

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. *

There are no Nuclear areas within the site.

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. *

There are no Commonwealth Marine Areas within the site.

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. *

There are no Great Barrier Reef areas within the site.

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 project will not have any impacts on water resources and is not proximate to coal mining or coal seam gas projects.

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 is no Commonwealth land within the site.

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. *

There are no overseas Commonwealth heritage places within the site.

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. *

A robust and lengthy approach to site selection was undertaken noting the need to avoid significant native vegetation impacts. Elgin Energy needed to find land for lease that had access to the 220KW power lines that run across the site to connect to the grid. Noting this, they started engaging with nearby landowners from 2019. At this time, they canvassed all landowners on all land adjacent to the current site boundaries (as well as the existing site boundaries). Given the large capacity available in the grid it was thought a minimum of 550ha of developable land was required to make the site economically viable. Noting land would be lost to factors such as:
– Native Vegetation
– Cultural Heritage
– Land features (water ways etc)
– Easements
– High gradient land
– Land unsuitable for construction (i.e. shallow rock)
Elgin knew they would need a larger area to accommodate these constraints. Elgin Energy after engaging for 2 years with landowners secured the 7 parcels of land for this site which make up 735ha (of which only 505ha can be developed noting the above constraints). However, the developer notes that this is on the threshold of what can be considered economically viable, and this may be enough land dependent of types of panels or size of BESS that can be incorporated. These details would be known nearer to the time of construction). Elgin Energy is willing to undertake this risk to ensure the site goes into operation but achieves its net nature and environment (both ecology and in terms of carbon emissions) goals.
Reasons nearby land was unable to be leased included:
– Owners not interested due to seeking to sell or rezone land for future residential.
– Surrounding Land use zoning include the Rural Conservation Zone which is reserved for preservation of plains grassland (by the Victorian government under agreement with the Commonwealth)
– Land being land banked by overseas corporation for rezoning or land being incorporated into Melbourne Growth Areas

Locating the project site within modified grazing and cropping land that is primarily cleared of native patch vegetation. The site is not considered to be significant land or strategically important land from an agricultural perspective. Under the current management regime (use of the land for grazing and cropping) the scatted trees and patches of native vegetation, including the threatened Plains Grassland, is likely to continue to decline.
The design has avoided the majority of the NTGV within the site and riparian vegetation along the Little River and Sandy creek. This includes the incorporation of 15m setbacks along all boundaries(including a 30m setback along the western boundary).

The subject site was selected after consideration of the balance between environmental protection and achieving a viable development. Alternatives are therefore not considered possible from an electricity generation and economic viability perspective.

There were 3 rounds of previous Designs considered for this activity:

Design 1

- Urbis and Elgin Energy mapped all the ecology constraints surveyed by Biosis, as well as the results of the standard Cultural Heritage assessment.
- An initial design was produced that sought to develop over all areas of patch vegetation recorded as low quality and to avoid all areas of cultural heritage recorded. This design resulted in a development footprint of 580ha (providing for 350MW).
- Once this design was reviewed it was found that it removed 70ha of patch vegetation (plains grassland) and although this was recorded as poor quality it was considered that this would have an unacceptable impact on native vegetation, in particular Golden Sun Moth habitat. A second design iteration was therefore required to demonstrate further avoidance whilst maintaining yield.

Design 2

- The second design sought to avoid all areas of patch native vegetation by increasing setbacks from waterways and impacting into some areas of cultural heritage sensitivity.
- This design ended up with a development footprint of 450ha. However, the resulting yield was below a threshold that would be considered economically viable to connect to the 220kV powerlines. Furthermore, the complex assessment testing would be significant and provide risks to the project of the CHMP not being approved.

- Finally, this design provided a fragmented design that would not connect to areas of panels in effect 2 separate developments that would not be developable from a constructability perspective. Given these issues a revised design was required.

Design 3

The third design was revised from design 2 to:

- Increase all setbacks from waterways to a minimum of 50m and maximum of 300m to avoid all river terrace areas as they have high sensitivity, as found during archaeological assessment, and supported by the RAP.
- Further limited patch vegetation by only removing poor quality vegetation impacted by farming practices (total 18.3ha including scattered trees). All other areas of patch vegetation were retained (all areas of high quality and majority of poor-quality vegetation).
- Avoid removal of any patches of trees.
- Specifically avoid tree removal from 22/PP3910 to avoid observed black falcon nests.
- Relocate the BESS and substation as a result of consultation with nearby neighbours, to reduce visual impacts to their properties.
- Adjust setbacks from western and eastern neighbouring properties to 30m.
- Investigate potentially conserving up to 40ha of land either side of Sandy Creek for revegetation, relocation of trees for creation of habitat and the opportunity to potentially provide access for the Wadawurrung Traditional Owners Aboriginal Corporation (WTOAC) for the life of the solar farm.

Final Design

Following feedback from Department of Environment, Energy and Climate Action (DEECA) further refinements were undertaken on the design to further minimise impacts on native vegetation. The final design (included in this referral) includes:

- Adjusting the locations of fences and access tracks, to avoid individual trees where possible.
- Protecting a number of scattered trees in the central portion of the site to increase the area of retained vegetation and improve connectivity.
- Review Sections of low quality VQA 16 and VQA 19 to provide additional panel area and connection through the site in order to minimise removal of scattered trees. Most remnant grasslands within these study areas were unsuitable for cultivation, including rocky areas, or low-lying seasonally wet areas and thus no additional vegetation was impacted upon conclusion of this review.

The final design develops 505ha of land and provides the minimum system size to make the development economically viable.

This design avoids the majority of native vegetation, protects amenity to neighbouring properties and also avoids impacts to cultural heritage recorded from the standard assessment, as well as avoiding anticipated areas of further heritage sites expected from the complex assessment. As outlined above, this design process has been adjusted and refined over 12 months using evidence gathered from field studies, taking into account feedback from the local community and other stakeholders in a considered design response. The final design accounts for all constraints on the site whilst balancing constructability and the objectives for solar facility energy generation.

Do-nothing approach

The final alternative considered would be a Do-nothing approach. A situation where existing land uses continue would almost inevitably result in the continued degradation and potential collapse of the current native vegetation classes. As outlined in the Biosis report and feedback from Dr. Paul Gibson-Roy, this area is currently significantly impacted by weed expansion which threatens to outcompete many of the native grassland species that currently provide habitat that helps sustain several protected species, including the Golden Sun Moth.

A do-nothing approach, where there is no weed management or native enhancement strategy in place (i.e., restoration via seeding and planting) would almost certainly translate into an ongoing decay of the ecological values and quality of the current grassland patches, towards an eventual complete displacement by exotics.

Please refer to Section 3.2.1 P12 and 13 and P85 and 86 of the Barwon Solar Farm Town Planning Report

5. Lodgement

5.1 Attachments

1.2.1 Overview of the proposed action

	Type	Name	Date	Sensitivity	Confidence
#1.	Document	6. BarwonSolar Detailed Plans.pdf Detailed Site Plans of proposal also showing vegetation removal	14/04/2023	No	High
#2.	Document	Barwon Solar Farm Flora and Fauna Assessment.pdf Flora and Fauna Assessment	28/02/2023		High
#3.	Document	Barwon Solar Farm Transport Impact Assessment.pdf Traffic Impact Assessment	14/04/2023	No	High

1.2.7 Public consultation regarding the project area

	Type	Name	Date	Sensitivity	Confidence
#1.	Document	22MEL4137_PrelimComplex_20230215.pdf Preliminary Complex Assessment Results (Cultural Heritage)	16/02/2023	Yes	High
#2.	Document	Barwon Solar Farm - Community and Stakeholder Engagement Outcomes Report.pdf Community Stakeholder Outcomes Report	10/10/2022		High
#3.	Document	Barwon Solar farm Town Planning Report.pdf Barwon Solar Farm Town Planning Report	13/04/2023		High
#4.	Document	CHMP18474_Barwon Solar Farm_V1_desktop.pdf Cultural Heritage Desktop Assessment	17/10/2022	No	High
#5.	Document	Standard Assessment meeting presentation.pdf Cultural Heritage Standard assessment Meeting presentation	12/10/2022		High

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

	Type	Name	Date	Sensitivity	Confidence
#1.	Document	Elgin-Energy-ESG-1.pdf Elgin Energy ESG Policy	02/05/2023	No	Medium

3.1.1 Current condition of the project area's environment

	Type	Name	Date	Sensitivity	Confidence
#1.	Document	Barwon Solar farm Town Planning Report.pdf Barwon Solar Farm Town Planning Report	14/04/2023	No	High

3.1.2 Existing or proposed uses for the project area

	Type	Name	Date	Sensitivity	Confidence
#1.	Document	Barwon Solar farm Town Planning Report.pdf Barwon Solar Farm Town Planning Report	13/04/2023	No	High

3.2.1 Flora and fauna within the affected area

	Type	Name	Date	Sensitivity	Confidence
#1.	Document	Barwon Solar Farm Flora and Fauna Assessment.pdf Flora and Fauna Assessment	27/02/2023		High
#2.	Document	Barwon Solar farm Town Planning Report.pdf Barwon Solar Farm Town Planning Report	13/04/2023		High
#3.	Document	Barwon Solar Farm Vegetation Mapping.pdf Barwon Solar Farm Vegetation Mapping	27/02/2023		High

3.2.2 Vegetation within the project area

	Type	Name	Date	Sensitivity	Confidence
#1.	Document	Barwon Solar Farm Flora and Fauna Assessment.pdf Flora and Fauna Assessment	27/02/2023		High
#2.	Document	Barwon Solar farm Town Planning Report.pdf Barwon Solar Farm Town Planning Report	13/04/2023		High
#3.	Document	Barwon Solar Farm Vegetation Mapping.pdf Barwon Solar Farm Vegetation Mapping	27/02/2023		High

3.3.2 Indigenous heritage values that apply to the project area

	Type	Name	Date	Sensitivity	Confidence
#1.	Document				

		22MEL4137_PrelimComplex_20230215.pdf Preliminary Complex Assessment Results (Cultural Heritage)	15/02/2023	High	
#2.	Document	Cultural Heritage Desktop Assessment Cultural Heritage Desktop Assessment		No	High
#3.	Document	Cultural Heritage Standard Assessment Cultural Heritage Standard Assessment		No	High

3.4.1 Hydrology characteristics that apply to the project area

	Type	Name	Date	Sensitivity	Confidence
#1.	Document	Barwon Solar Farm Hydrology Assessment.pdf Hydrology Assessment	14/04/2023	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	Sensitivity	Confidence
#1.	Document	Barwon Solar Farm Hydrology Assessment.pdf Project Hydrology Report	14/04/2023		High
#2.	Document	Barwon Solar Farm Vegetation Mapping.pdf Barwon Solar Farm Vegetation Mapping	28/02/2023	No	High

4.1.4.6 (Threatened Species and Ecological Communities) Why you do not consider the direct and/or indirect impact to be a Significant Impact

	Type	Name	Date	Sensitivity	Confidence
#1.	Document	Barwon Solar Farm: Flora and fauna assessment Details and findings of fieldwork and desktop flora and fauna studies.	28/02/2023	No	High

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

	Type	Name	Date	Sensitivity	Confidence
#1.	Document	Barwon Solar Farm Flora and Fauna Assessment.pdf Flora and Fauna Assessment	27/02/2023		High
#2.	Document	Barwon Solar farm Town Planning Report.pdf Barwon Solar Farm Town Planning Report	13/04/2023		High

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

	Type	Name	Date	Sensitivity	Confidence
#1.	Document	VLQ-9020 Biosis GHUs.pdf Quote for Vegetation offsets for the project	06/03/2023	Yes	High

4.3.8 Why alternatives for your proposed action were not possible

	Type	Name	Date	Sensitivity	Confidence
#1.	Document	Barwon Solar farm Town Planning Report.pdf Barwon Solar Farm Town Planning Report	13/04/2023		High

5.2 Declarations

Completed Referring party's declaration

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

ABN/ACN 50105256228

Organisation name	URBIS PTY LTD
Organisation address	3000 VIC
Representative's name	Jon Mills
Representative's job title	Director
Phone	0406368229
Email	JMills@urbis.com.au
Address	Lvl 10, 477 Collins Street, Melbourne, VIC, 3000

☑ 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, **Jon Mills of URBIS 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	95629627416
Organisation name	ELGIN ENERGY PTY LTD
Organisation address	4000 QLD
Representative's name	Tim Averill
Representative's job title	Managing Director - Australia
Phone	+61 478 584 307
Email	tim.averill@elgin-energy.com
Address	Waterfront Place, Level 10, 1 Eagle Street, Brisbane City, QLD, 4000

☑ 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, **Tim Averill of ELGIN ENERGY 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, **Tim Averill of ELGIN ENERGY 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. *