REFERRAL OF A PROJECT FOR A DECISION ON THE NEED FOR ASSESSMENT UNDER THE *ENVIRONMENT EFFECTS ACT 1978*

REFERRAL FORM

The *Environment Effects Act 1978* provides that where proposed works may have a significant effect on the environment, either a proponent or a decision-maker may refer these works (or project) to the Minister for Planning for advice as to whether an Environment Effects Statement (EES) is required.

This Referral Form is designed to assist in the provision of relevant information in accordance with the *Ministerial Guidelines for assessment of environmental effects under the Environment Effects Act 1978* (Seventh Edition, 2006). Where a decision-maker is referring a project, they should complete a Referral Form to the best of their ability, recognising that further information may need to be obtained from the proponent.

It will generally be useful for a proponent to discuss the preparation of a Referral with the Impact Assessment Unit (IAU) at the Department of Environment, Land, Water and Planning (DELWP) before submitting the Referral.

If a proponent believes that effective measures to address environmental risks are available, sufficient information could be provided in the Referral to substantiate this view. In contrast, if a proponent considers that further detailed environmental studies will be needed as part of project investigations, a more general description of potential effects and possible mitigation measures in the Referral may suffice.

In completing a Referral Form, the following should occur:

- Mark relevant boxes by changing the font colour of the 'cross' to black and provide additional information and explanation where requested.
- As a minimum, a brief response should be provided for each item in the Referral Form, with a more detailed response provided where the item is of particular relevance. Cross-references to sections or pages in supporting documents should also be provided. Information need only be provided once in the Referral Form, although relevant cross-referencing should be included.
- Responses should honestly reflect the potential for adverse environmental effects. A Referral will only be accepted for processing once IAU is satisfied that it has been completed appropriately.

- Potentially significant effects should be described in sufficient detail for a reasonable conclusion to be drawn on whether the project could pose a significant risk to environmental assets. Responses should include:
  - a brief description of potential changes or risks to environmental assets resulting from the project.
  - available information on the likelihood and significance of such changes;
  - the sources and accuracy of this information, and associated uncertainties.
- Any attachments, maps and supporting reports should be provided in a secure folder with the Referral Form.
- A USB copy of all documents will be needed, especially if the size of electronic documents may cause email difficulties. **Individual documents should not exceed 10MB as they will be published on the Department's website.**
- A completed form would normally be between 15 and 30 pages in length. Responses should not be constrained by the size of the text boxes provided. Text boxes should be extended to allow for an appropriate level of detail.
- The form should be completed in MS Word and not handwritten.

The party referring a project should submit a covering letter to the Minister for Planning together with a completed Referral Form, attaching supporting reports and other information that may be relevant. This should be sent to:

Postal address	Couriers
Minister for Planning	**Minister for Planning**
PO Box 500	**Level 16, 8 Nicholson Street**
EAST MELBOURNE VIC 8002	**EAST MELBOURNE VIC 3002**

In addition to the submission of the hardcopy to the Minister, separate submission of an electronic copy of the Referral via email to ees.referrals@delwp.vic.gov.au is required. This will assist the timely processing of a referral.

Refer to cover letter at Attachment 23.

PART 1 PROPONENT DETAILS, PROJECT DESCRIPTION & LOCATION

1. Information on proponent and person making Referral

<table>
<tr><td>Name of Proponent:</td><td>Elgin Energy Pty Ltd</td></tr>
<tr><td>Authorised person for proponent:

Position:
Postal address:
Email address:

Phone number:
Facsimile number:</td><td>Tim Averill

Managing Director - Australia
2nd Floor 50 Bridge Street, Sydney, 2000
tim.averill@elgin-energy.com

+61478584307</td></tr>
<tr><td>Person who prepared Referral:
Position:
Organisation:
Postal address:
Email address:

Phone number:
Facsimile number:</td><td>Jon Mills
Director
Urbis Pty Ltd
Level 12, 120 Collins Street, Melbourne VIC 3000
jmills@urbis.com.au

0406368229</td></tr>
<tr><td>Available industry & environmental expertise: (areas of ‘in-house’ expertise & consultancy firms engaged for project)</td><td>Elgin Energy has engaged an extensive team of experienced consultants to undertake technical investigations and assessments to inform the project design and the information within this referral.

The project team is as below:
<table><tr><th>Expertise</th><th>Consultant</th></tr><tr><td>Acoustic</td><td>Norman Disney & Young</td></tr><tr><td>Agricultural</td><td>Ag-Challenge Consulting</td></tr><tr><td>Bushfire</td><td>Eco Logical Australia</td></tr><tr><td>Cultural Heritage</td><td>Eco Logical Australia</td></tr><tr><td>Ecological</td><td>Biosis Pty Ltd</td></tr><tr><td>Engagement</td><td>Urbis</td></tr><tr><td>Hydrology</td><td>Eco Logical Australia</td></tr><tr><td>Landscape</td><td>Urbis</td></tr><tr><td>Survey</td><td>Veris</td></tr></table></td></tr>
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	Town Planning	Urbis
	Traffic	Urbis
	Urban Design	Urbis

2. Project – brief outline

Project title:

Barwon Solar Farm

Project Location:

The project is located on land at on land at (1000 - 1320) Little River-Ripley Road, Little River VIC 3211. The site is made up of the following addresses:

- 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

The AMG Coordinates (Zone 55) are:

- 273,659
- 5,804,876

Refer to Titles Map, Location Plan, Regional Context Plan (Attachment 1, 2 and 3)

Short project description (few sentences)**:**

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

Barwon Solar Farm is a 735-hectare site located in the Greater Geelong City Council area. Solar panels will cover approximately 505 hectares of the total site area (65%).

3. Project description

Aim/objectives of the project (what is its purpose / intended to achieve?):

The proposed development by Elgin energy is to construct and operate a solar farm of approximately 330 MWp (Megawatt- peak) and battery energy storage system (BESS) of approximately 500MW at 1145-1215 Little River-Ripley Road, Victoria (known as Barwon Solar Farm). Barwon Solar Farm is a 735-hectare site located in the Greater Geelong City Council area.

The subject site was considered suitable for a solar energy facility of this size and scope because of its location, flat topography, ease of access and minimal impacts to site conditions and planning constraints. The site also has direct proximity to grid capacity that can support a large-scale project with 500 kV and 220 kV transmission lines that pass through the site This combined with the fact that the site receives an abundance of solar resource, makes it an ideal site for generating solar energy.

Elgin have earmarked this project as a landmark project in their portfolio for Victoria. This will constitute the largest generator of renewable energy in proximity to both Geelong and Melbourne and represents a significant investment in the State of Victoria and helping the State achieve its renewable energy targets. Elgin are committed to the construction of the project and pending planning approval it is shovel ready aiming to be in operation in 2025.

The facility alone will generate enough clean renewable energy to power the equivalent of approximately 98,000 homes annually, creating approximately 150 jobs during construction and investing over 500 million dollars into regional Victoria and the Greater Geelong region. This large scale project will contribute significantly to Victoria's renewable energy generation targets (50% by 2030), aiding in the reduction of greenhouse gas emissions (net zero by 2030)

Background/rationale of project (describe the context / basis for the proposal, e.g. for siting):

The subject site is considered highly suitable for a solar energy facility due to its location, generally flat topography, access and minimal visual exposure due to surrounding site typography. Critically, the site receives an abundance of solar resource and there is in direct proximity to the existing grid with capacity. These aspects combined with the fact that there is minimal site disturbance needed and limited planning constraints makes it an ideal site for generating solar energy.

Furthermore, the subject site performs well against the ideal siting conditions for solar energy facilities identified in the Solar Energy Facilities Design and Development Guidelines 2019. The siting conditions are considered ideal for the following reasons:

- The site is not located near any existing urban areas or designated urban growth areas. The Majority of the surrounding land is made up agricultural land or nature reserve.
- There are no existing solar facilities in this area. The site has been located and designed to minimise or avoid impact to surrounding sensitive uses, areas of cultural sensitivity and native vegetation.
- The undertaken Hydrology Assessment (September 2023) outlines the site does not impact upon a major floodplain, watercourse or wetlands.
- The topographical conditions do not require the need for earthworks or changes to the natural landscape.
- The location of the solar energy facility complies with suitable siting conditions as defined by the CFA 2023 Guidelines.
- As stated in the provided agricultural impact assessment, the subject land is neither highly productive nor highly versatile agricultural land. It is not considered to be significant land or strategically important land from an agricultural perspective.

Renewable energy sources such as solar power have the potential to mitigate climate change through reducing greenhouse gas emissions from fossil fuel combustion. For this reason, the Victorian Government seeks to accelerate the development of well-sited and well-designed renewable energy generation facilities in Victoria, to reduce emissions, create jobs and put downward pressure on energy prices, while meeting legislated generation targets. On balance the proposed site location and layout avoids major removal of native vegetation on site and minimises impacts to biodiversity through appropriate site selection, design and operation management to deliver a large-scale clean energy project that will help facilitate a needed transition to renewable energy in Australia.

Main components of the project (nature, siting & approx. dimensions; attach A4/A3 plan(s) of site layout if available):

The facility will consist of the following:

- The installation of approximately 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 approximately 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 Section 3 of the provided transport impact assessment for further details regarding the internal road network. There will be no on-site car parking for vehicles accessing the site. There would potentially be some minor upgrades to the road network to facilitate the construction or operation of the development where it is proven that the existing road is not adequate.

Refer to the detailed site plans and elevations at Attachments 5.and 6

Ancillary components of the project (e.g. upgraded access roads, new high-pressure gas pipeline; off-site resource processing):

- 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.
- Business identification signage (3 signs).

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 any resident patches of native grass are left relatively undisturbed and not badly impacted or lost from the project area. The frames are driven to a depth of approximately 1.5-2m m. 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 predrilled.

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 and2 smaller live trees)
- 70 Scattered Trees, including:
- 46 Large Old Trees
- 4 dead Large Old Trees
- 20 smaller live trees.

Mapped at Attachment 22

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 10. 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 project's 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 14.

Key operational activities:

- Washing.
- Testing.

- Maintaining landscaping.
- Vegetation management.

During the operational stage of the development, there will be a maximum of two vehicle trips per day accessing the site for maintenance and servicing.

Key decommissioning activities (if applicable):

A decommissioning plan would be implemented in advance of decommissioning, which it is expected would be approximately 40-50 years after commencement of the use.

Is the project an element or stage in a larger project?

No ☒ Yes If yes, please describe: the overall project strategy for delivery of all stages and components; the concept design for the overall project; and the intended scheduling of the design and development of project stages).

All aspects of the development are included in this referral and no further project stages are currently proposed given land availability and constraints.

Is the project related to any other past, current or mooted proposals in the region?

☒ No ☒ Yes If yes, please identify related proposals.

What is the estimated capital expenditure for development of the project?Over $500 million

4. Project alternatives

Brief description of key alternatives considered to date (e.g. locational, scale or design alternatives. If relevant, attach A4/A3 plans):

Other sites in the vicinity of the subject site were considered by Elgin Energy before selecting the subject site. As discussed above, the subject site was selected because of availability of tenure, as well as its proximity to 220KV transmission lines for connection to the grid. Once the site was selected the facility was carefully designed over 18 months to respond to the site's context, opportunities and constraints and DELWP's Solar-Energy-Facilities-Design-and-Development-Guideline-August-2019. The design layout considers:

- Native Vegetation.
- Cultural Heritage.
- Visual Impact to neighbouring properties.
- Bushfire Mitigation.
- Impacts to waterways.
- Noise.
- Efficiency and economic viability of the solar facility.

The design evolution is summarised in three key iterations below. Please see section 3.2.1 of Urbis's Town Planning Report for a detail description of the design stage.

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.

Design 4

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. These include:

- 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. We believe the final design accounts for all constraints on the site whilst balancing constructability and the objectives for solar facility energy generation.

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 by the Biosis report and feedback from Dr. Paul Gibson-Roy, this area is currently significantly impacted by Serrated Tussock expansion which threatens to outcompete many of the native grassland species that currently provide habitat which 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.

Brief description of key alternatives to be further investigated (if known)**:**

No alternative sites are being further investigated.

5. Proposed exclusions

Statement of reasons for the proposed exclusion of any ancillary activities or further project stages from the scope of the project for assessment:

All aspects of the development are included in this referral and no further project stages are currently proposed given land availability and constraints.

6. Project implementation

Implementing organisation (ultimately responsible for project, ie. not contractor)**:**

Elgin Energy Pty Ltd

Implementation timeframe:

Construction is targeted to commence in 2024/5 (subject to relevant approvals).

Operation is targeted to commence in 2025/2026.

Proposed staging (if applicable):

The site is not proposed to be staged.

7. Description of proposed site or area of investigation

Has a preferred site for the project been selected?

☐ No ☒ Yes If no, please describe area for investigation.

If yes, please describe the preferred site in the next items (if practicable).

General description of preferred site, (including aspects such as topography/landform, soil types/degradation, drainage/ waterways, native/exotic vegetation cover, physical features, built structures, road frontages; attach ground-level photographs of site, as well as A4/A3 aerial/satellite image(s) and/or map(s) of site & surrounds, showing project footprint):

The key features of the site are as follows:

- Site area is approximately 735ha. The development area is approximately 505ha.
- The landform is a flat to gently undulating plain and is part of the extensive landscape of the Werribee Plains. The site survey identifies that elevation varies across the site between approximately 87 metres and 114metres AHD.
- There are several electricity easements that encumber the site. The site has existing 500kV and 220kV transmission lines crossing in the north western and south eastern sections respectively. The solar farm will connect to the 220kV transmission line, which has significant transmission capacity, and the site is therefore well placed for the export of renewable energy.
- The majority of the land is relatively flat, open plain grassland with scattered vegetation particularly to the southeast. Much of the original indigenous vegetation has been removed over the years. Some mature Eucalypts remain sporadically scattered through some the land parcels, along watercourses and along the southern extremity of the Project site.
- The property abuts several roads, some of them unsealed, with Little River-Ripley Road being the main sealed road that runs east-west through the site.
- Currently vehicular access is provided off Little River – Ripley Road. There is also an access road located on Mt Rothwell Road to the north of 1000 Little River-Ripley Road, Little River. In total, seven access points will be provided for the solar farm.
- All sites contained within the subject site are currently utilised for farming and or agriculture, namely broadacre cropping for wheat, barley and oilseeds (canola). There is also a considerable area dedicated to grazing of sheep. These lots are not considered to

be highly productive nor highly versatile agriculturally due to low and unreliable rainfall, soil quality and access to irrigation.

- 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 grasses. One hundred and eighty-eight (188) 'scattered' trees were assessed and determined to be remnant canopy trees of the historical vegetation cover. Several farm dams are also scattered throughout the study area.

- The dominant soil across this landscape is described by Maher and Martin as having a pedal dark reddish brown shallow loam or clay loam surface soils, typically 10 cm deep, underlain by well-structured reddish brown medium or heavy clay.

Site area (if known): 735……. (hectares)

Route length (for linear infrastructure) ……. (km) **and width** …….. (m)

None proposed – site has existing electricity transmission connection within site.

Current land use and development:

The proposed 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. An Agricultural Assessment produced by Ag-Challenge Consulting identified crops of barley, canola and wheat upon an inspection of the site. 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 (1000 and 1050 Little River Ripley Road). It is proposed that sheep grazing will continue during operation of the solar farm.

A pictorial analysis of the existing features is provided as Attachment 25 and 26.

Description of local setting (e.g. adjoining land uses, road access, infrastructure, proximity to residences & urban centres):

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.

A rural residence is located at 2425 Bacchus Marsh Geelong Road, 275m northwest of the proposal (solar panels).

A rural residence is located at 2415 Bacchus Marsh Geelong Road, 1km northwest of the proposal (solar panels).

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. The Mount Rothwell estate is located approximately 170m from proposed solar panels.

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. This translates to surface rocks being present within the subject site. With exception of this geological feature directing the landscape, the landscape is gently undulating too almost flat.

A rural residence is located at 1340 Little River-Ripley Road, 100 m southwest from the Project (solar panels).

A rural residence is located at 1375 Little River-Ripley Road, 125 m southwest from the Project (solar panels).

Further southwest is a residential dwelling at 2230 Bacchus Marsh Road, Balliang, located 1.5km from the proposal (solar panels).

Further southwest is a residential dwelling at 2345 Bacchus Marsh Road, Balliang, located 1km from the proposal (solar panels).

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.

A rural residence is located within the western verge of Bacchus Marsh- Geelong Road, 1.1km west of the proposal (solar panels).

Road Access - Currently vehicular access is provided off Little River – Ripley Road. There is also an access road located on Mt Rothwell Road to the north of 1000 Little River-Ripley Road, Little River.

Please refer to the provided Visual Impact Assessment prepare by Urbis at attachment 11 for further details on surrounding residences located greater than 1.5km form the proposal.

Planning context (e.g. strategic planning, zoning & overlays, management plans):

Under the Planning and Environment Act 1987 and The Greater Geelong Planning Scheme
The site is subject to the:

- Farming Zone.
- Environmental Significance Overlay, Schedule 4 (ESO4) and Schedule 1 (ESO1).
- Significant Landscape Overlay - Schedule 1 (SLO1).
- Bushfire Management Overlay (BMO).

The following planning permit triggers apply to the proposed installation at the subject site:

- Use of land for a Renewable energy facility (other than Wind energy facility) within the Farming Zone pursuant to Clause 35.07-1major renewable energy facilities.
- Building or works associated with a use in Section 2 - Renewable energy facility within the Farming Zone pursuant to Clause 35.07-4.
- To construct a building or construct or carry out works and to remove, destroy or lop any vegetation within the Significant Landscape Overlay pursuant to 42.03-2.
- To construct a building or construct or carry out works and to remove, destroy or lop any vegetation within the Environmental Landscape Overlay (ESO1 and ESO 4) pursuant to Clause 42.01-2.
- Removal or variation of an easement pursuant to Clause 52.02.
- Display of a business identification sign pursuant to Clause 52.05-2.
- Removal of native vegetation, including dead native vegetation pursuant to Clause 52.17-1.

The following particular provisions apply to the proposed installation on the site:

- Clause 52.02 Easements, Restrictions and Reserves.
- Clause 52.05 Signs.
- Clause 52.17 Native Vegetation.
- Clause 52.42 Renewable Energy Facility.

The sections of the Victorian Planning Provisions which are relevant to this application include:

- Clause 11 Settlement
  – 11.01 – Victoria
  – 11.01-1S – Settlement
  – 11.02-1S – Supply of urban land
  – 11.02-2S – Structure planning.
- Clause 12 Environmental and Landscape Values
  – 12.01-1S – Protection of biodiversity
  – 12.01-2S – Native vegetation management
  – 12.03-1S – River corridors, waterways, lakes and wetlands
  – 12.05-2S – Landscapes.
- Clause 13 Environmental Risks and Amenity
  – 13.01-1S – Natural hazards and climate change
  – 13.02-1S – Bushfire planning
  – 13.04-2S – Erosion and landslip
  – 13.04-3S – Salinity
  – 13.05-1S – Noise Management
- Clause 14 Natural Resource Management
  – 14.01-1S – Protection of agricultural land

– 14.01-2S – Sustainable agricultural land use.
- Clause 15 Built Environment and Heritage
  – 15.03-2S – Aboriginal Cultural Heritage.
- Clause 17 Economic Development
  – 17.01-1S – Diversified economy; and
- Clause 19 Infrastructure
  – 19.01-1S – Energy supply
  – 19.01-2S – Renewable energy.

Please refer to the town planning report prepared by Urbis at attachment 4 for an assessment against all relevant planning legislation.

Local government area(s):

City of Greater Geelong

8. Existing environment

Overview of key environmental assets/sensitivities in project area and vicinity
(cf. general description of project site/study area under section 7)**:**

Biodiversity

Biosis was engaged to undertake a Flora and Fauna assessment (February 2023) of the subject site and its surrounding context. The ecological value identified within the study area are as follows:

- The study area supports a range of ecological values including remnant patches of EVC 55_63 Plains Grassy Woodland, EVC 68 Creekline Grassy Woodland, EVC 71 Hills Herb-rich Woodland, EVC 125 Plains Grassy Wetland, EVC 821 Tall Marsh and EVC 132_61 Heavier-soils Plains Grassland. These features are detailed in the provided Biosis report under Table 3 and mapped in Figure 2.

- One hundred and eighty-eight (188) '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*, 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*).

- 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 of the provided Biosis report.

- Numerous farm dams are scattered throughout the study area. Most dams were small and contained Spikerush Eleocharis spp. within the ecotones of the waterbodies.

- 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 florae 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.

On balance the proposal has considered preliminary results of this assessment and amending the solar farm layout to avoid impacts to patch vegetation and scattered trees, where possible.

Spatial data (shapefiles) of proposed vegetation removal were submitted to DELWP's native vegetation support team, who provided a Native Vegetation Removal Report for the project. Based on the current design, the proposed development will require the removal of 18.330 hectares of native vegetation, comprised of 14.294 ha of patch vegetation (which includes 5 trees one of which is dead) and 70 scattered trees (of which only 46 are large and require an offset (also noting 4 of the 46 large trees are dead).

Cultural Heritage

Elgin Energy engaged the services of Ecological Australia (ELA) to produce a Cultural Heritage Management Plan due to mapped areas of Cultural Heritage Sensitivity (see attachment 27. Cultural Heritage Sensitivity mapping). A field survey was undertaken from 15th to 25th March 2022 by three archaeologists and three WTOAC representatives. The results of the Standard Assessment concluded:

- One registered Aboriginal cultural heritage place is located within the activity area - VAHR 7722-0498 (FORD1): Artefact Scatter.
- The activity area contains nine separate Investigation Areas (IAs) based on the presence of various land f forms.
- 839 stone artefacts.
- 3 scarred trees.
- No caves, cave entrances or rock shelters were identified.
- Artefacts are concentrated along watercourses – Primarily Little River and Sandy Creek.
- High densities along sections of Little River.
- Concentrations on granite hills section in southern portion of the activity area.

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.

The permit application and development will comply with the recommendations and mitigation measures provided in each of these reports to ensure protection of Aboriginal cultural heritage continues during construction and operation of the facility.

Noting, the project has been designed to avoid all cultural heritage Artefacts and scarred trees identified within the standard cultural heritage assessment (attachment 27). This includes the incorporation of buffers from waterways (minimum 50m setbacks) are provided to the development footprint and installation area to any artefacts and sensitive landforms identified within the cultural heritage standard assessment in consultation with the RAP).

Built Heritage

There is no heritage mapped under Commonwealth, State or Local registers within the project area or land parcels.

Agricultural values

As stated in the provided agricultural impact assessment, the subject land is neither highly productive nor highly versatile. It is not considered to be significant land or strategically important land from an agricultural perspective. Overall, the combined land parcel is determined to have a Land Capability rating of 3 with the limiting attributes being the imperfect drainage, shallow rooting depth, poor aggregate stability, and presence of surface rock. The land can be described as fair quality land for grazing and for broad acre cropping, but it has no special values. It is currently part of the expansive land resource that supports the grazing and broad acre cropping districts of the Werribee Plains west of Melbourne. As the solar facility will maintain light grazing onsite, the change of use will result in a reduction in the overall usable agricultural asset rather than a complete loss.

Geology, Soil, Water Quality and Hydrology

There are three main overland flow paths / waterways within the site area. The waterway through the middle of the site, an overland flow path across the upper eastern part of the site and Little River, along the northern border of the site. The modelled existing conditions' flood depths showed that the flows are generally concentrated to the waterways and defined overland flow paths in the region with sufficient terrain relief to limit the amount of sheet flow.

Based on the predicted velocities and flood extents, the solar arrays and associated infrastructure at the Barwon Solar Farm are unlikely to affect flood levels or downstream discharge. While there is some potential for flood impacts, the Hydrology Report produced by Ecological notes that this may be considered a "conservative approach," and there is typically higher of levels of infiltration with sandy soil types, that will reduce flow rates and flood extents across the site. Key aspects of flood management methods which have been considered in the final design include.

- The location of the BESS, solar arrays and access roads. The proposed solar panels are elevated and will not impact upon surface run off.
- Other equipment installed on the ground will have a small surface area and have been designed and sited to reduce any significant impact, particularly the BESS.
- Appropriate drainage infrastructure will be proposed to prevent damage through erosion or runoff.

Please refer to the hydrology assessment prepared by Ecological Australia at Attachment 18.and subsequent memo at Attachment 8.

9. Land availability and control

Is the proposal on, or partly on, Crown land?

☒ No ☐ Yes If yes, please provide details.

Current land tenure (provide plan, if practicable):

The land is in private ownership with separate owners (*refer to Attachment 1*).

Intended land tenure (tenure over or access to project land):

It is proposed that the land will be leased for the duration of the operation of the solar farm. This is an initial term of 40 years and 2 x 5 year options to extend the lease.

Other interests in affected land (e.g. easements, native title claims):

Electricity transmission easement

- Easement E-1 (Book 864, No. 761 to State Electricity Commission of Victoria) passes through the site to the west of Sandy Creek Road. The electricity transmission line bisects the project site from southwest to northeast.
- Easement E-2 (Book 822, No. 437) is an electricity transmission line which bisects the site from Little River-Ripley Road in the southwest to Little River in the northeast.
- Easement E-3 (Book 655, No. 933) is an electricity transmission line which runs from a Government Road, northeast through Mount Rothwell Road.

Setbacks from these assets have been observed and included in the design of the proposal.

There are no other interests in the affected land. The relevant Certificate of Titles for this site, including all easements, are detailed at Attachment 1of the Planning Report. Additionally, a Survey Plan is located at Appendix B of the Planning Report

10. Required approvals

State and Commonwealth approvals required for project components (if known):

- *Planning and Environment Act 1987*: A planning permit is required pursuant to the Greater Geelong Planning Scheme, the application for planning approval has been lodged with the Minister for Planning.

- *The Aboriginal Heritage Act 2006 provides* for the protection of Aboriginal Cultural Heritage in Victoria whilst the *Aboriginal Heritage Regulations 2018* sets out the process as to when a Cultural Heritage Management Plan (CHMP) should be prepared for a development. If certain high impact activities are undertaken as stated in the *Aboriginal Heritage Regulations 2018* then preparation of CHMP may be required for approval by the First Peoples – State Relation or the Registered Aboriginal Party (RAP) prior to lodging a planning permit.

  Elgin Energy has engaged the services of Eco Logical Australia to produce a Cultural Heritage Management Plan (CHMP number 18474) in compliance with *the Aboriginal Heritage Regulations 2018.* Specifically, Regulation 7 which states that a CHMP is required if all or part of the activity area for the activity is an area of cultural heritage sensitivity, and all of part of the activity is a high impact activity.

- *Environment Protection and Biodiversity Conservation Act 1999*: The EPBC Act applies to developments and associated activities that have the potential to significantly impact on Matters of National Environmental Significance (MNES) protected under the Act.

An assessment against the EPBC Act policy statements published by the Australian Government which provide guidance on the practical application of EPBC Act has been provided in Table 6 of the provided Flora and Fauna assessment prepared by Biosis (February 2023).

In this assessment any potential habitat for EPBC Act listed species was assessed in accordance with relevant DAWE guidelines (e.g. DEWHA 2009, DSEWPaC 2011). Habitat for one threatened flora and 18 threatened fauna species listed under the EPBC Act were identified within the study area.

Elgin energy have prepared and submitted a referral to the Australian Government (Minister for Planning) to determine whether the projects needs to be considered under the EPBC Act for impacts to these species based on the recommendations of the provided Flora and Fauna assessment prepared by Biosis (February 2023).

This will be submitted to the Commonwealth following the lodgement of this application in May 2023.
Please refer to section 4. Of the Biosis report for further assessment of the project in relation to key biodiversity legislation and government policy.

Have any applications for approval been lodged?

☐ No ☒ Yes If yes, please provide details.

- Planning permit to the Minister for Planning (c/o DELWP) lodged 3/11/22.
- Cultural Heritage Management Plan 18474.

Approval agency consultation (agencies with whom the proposal has been discussed):

- Department of Transport & Planning.
- City of Greater Geelong (the City of Greater Geelong is a referral authority under S52 of the Greater Geelong Planning Scheme).

Other agencies consulted:

- Country Fire Authority (CFA).
- Environment Protection Authority.
- Department of Transport.
- Emergency Management Victoria Catchment and environmental protection.
- Rural water corporations: Southern Rural Water.
- Urban Water Corporation: Barwon Water.
- Port Philip and Western Port Catchment Management Authority.

PART 2 POTENTIAL ENVIRONMENTAL EFFECTS

11. Potentially significant environmental effects

Overview of potentially significant environmental effects (identify key potential effects and comment on their significance and likelihood, as well as key uncertainties):

Flora and Fauna

The Environment Effects Act 1978 establishes a process to assess the environmental impacts of a project. If applicable, the Act requires that an Environment Effects Statement (EES) be prepared by the proponent. The EES is submitted to the Minister for Planning and enables them to assess the potential environmental effects of the proposed development.

The 'Ministerial Guidelines for Assessment of Environmental Effects under the *Environment Effects Act 1978'* (DSE 2005) provide a range of criteria that can be used to determine whether an EES may be required for a project.

As the project, in its current form, requires the removal of more than 10 hectares of native vegetation, removal of a FFG Act listed ecological community (Western Plains Grassland) the application will be referred to the Victorian Government (Minister for Planning) as recommended by the Flora a Fauna report prepared by Biosis.

Biosis was engaged to undertake a Flora and Fauna assessment (February 2023) of the subject site and its surrounding context. The ecological value identified within the study area are as follows:1

- 119 hectares of native patch vegetation comprised of EVC 55_63 Plains Grassy Woodland, EVC 68Creekline Grassy Woodland, EVC 125 Plains Grassy Wetland, EVC 821 Tall Marsh and EVC 132_61Heavier-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 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 florae 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.

In order to achieve the objective of 'no net loss to biodiversity as a result of the removal, destruction or lopping of native vegetation', the applicant has undertaken or committed to a number of measures to protect the existing ecology of the site by avoiding, minimising and offsetting impacts in accordance with Victoria's guidelines for the removal, destruction or lopping of native vegetation. These include:

- Locating the project within modified grazing and cropland that is primarily cleared of native patch vegetation. 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.

- Considering the preliminary results of the Flora and Fauna Assessment (September 2022) the solar farm layout has been significantly altered and reduced to avoid impact to native vegetation. The design has avoided the majority of the Plains grassland within the site and riparian vegetation along the Little River and Sandy creek. The design was again modified in January-February 2023, in response to consultation with DEECA (including the DEECA RFI to the Planning Permit Application). This included:

    - Contraction of the panel area in the cropping paddock to the south of Sandy Creek (north of Little River – Ripley Road), prioritising 11trees for retention, as they assist in improving connectivity and the area of remnant vegetation along Sandy Creek.

    - Alterations to the layout to the south of Little River – Ripley Road, resulting in the avoidance of 2 individual scattered trees, as listed below:

    - Alterations to the panel layout and location of fencing and access tracks in the south-east of the project area, avoiding the removal of 14 scattered trees and patch vegetation (5 trees).

    - Total number of trees retained by the design amendments total 31 trees.

- Primary access to the site has been confined to existing access points to the property where native vegetation does not exist.

- 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.

- Preservation of large areas of native vegetation, riparian habitats and grassland associated with the Little River and Sandy Creek catchments within the site. The site can potentially include an ecological corridor of approximately up to 40 hectares running north to southwest through the site for onsite offsets. This area provides opportunity onsite rehabilitation/conservation including revegetation of site appropriate species and relocation of native habitats for beneficial biodiversity outcomes.

- Purchase of native vegetation credits through the offset register to offset the native vegetation proposed for removal.

- Establish a weed management program and a grassland management program to reduce the expansion of Serrated Tussock and Chilean Needle Grass and enhance native grass species presence. This would provide the opportunity for the recovery of the Native Temperate Grassland of the Victorian Volcanic Plain in the long-term while minimising the impacts of the construction measures on the grassland in the short-term.

In summary, although vegetation removal is required onsite, the proposed installations will not have a significant impact on the ecology of the of the site or surrounding area. The reduction in intensive agricultural practices (grazing and cropping) on the site supported by environmental site management and preservation of large conservation areas will more than likely increase the biological diversity of the area and eventually result in the creation of approximately double the amounts of vegetation proposed to be removed.

Please also refer section 7.5.4 of the town planning report for further assessment of the proposal against the Guidelines for the removal, destruction or lopping of native vegetation.

Refer to Section 12 of this Form and the Flora and Fauna Report (Attachment 19.).

Cultural heritage

Eco Logical Australia undertook a desktop assessment and a Standard Assessment. The assessments identified:

- 839 stone artefacts.
- 3 scarred trees.
- No caves, cave entrances or rock shelters were identified.
- Located within the site is VAHR 7722-0498 (FORD 1): An artefact scatter recorded in 2001 compromising an unspecified number of quartz flakes and chipped stone artefacts identified on ground surface.

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.

Mitigation will include:

- Implement a minimum 50m to 400m setback from waterways to the development footprint and installation areas.
- Avoidance of all river terrace areas due to high sensitivity, as found during archaeological assessment, and supported by the WTOAC.

Refer to Section 15 of this Form and the Cultural Heritage Standard Assessment Report (Attachment 27.).

Acoustic

Solar facilities are known to be relatively silent, however ancillary systems i.e. inverters and BESS storage units do create noise. NDY have conducted a noise emission assessment to determine if the predicted noise levels of the proposed inverters, and BESS storage units from the three most affected residential receivers (between 70m and 840m from the project boundary)

NDY have conducted a noise emission assessment to determine if the predicted noise levels from the site are below the noise limits. The noise limit was determined as 34 dBA at night and 39 d BA in the evening/day periods in accordance with EPA publication 1826.4. The noise sources analysed were

- inverters, each with sound levels of 63 dBA at 10m, BESS storage units, with SPL 65 dBA at 10m, and a.

- Substation with an assumed sound power level of 90 dBA.

The combined noise levels from all sources at the most affected residential receivers is predicted to be compliant at 38dBA during the day period and 34 dBA during the night period.

Acoustic treatment includes barriers installed around the BESS and some inverters. Substation equipment shall be selected with a maximum sound power level of 90 dBA. Where the substation equipment noise levels are higher than this, it may require additional acoustic treatments in the form of acoustic barriers.

Most the noise impacts will be created during the construction phase of the project. This will be due to the machinery needed to install the proposed equipment and build the appropriate access tracks. However, this will be managed by a construction management plan and will only occur within normal working hours.

Please refer to the Noise Assessment prepared by NDY at Attachment 7.

Water Hydrology

Urbis, with support from Elgin Energy, engaged Ecological Australia to produce a hydrology assessment (April 2023) for the Barwon Solar Farm proposal. The report assesses 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 site.

The existing conditions flood depths highlights that the flows are generally concentrated to the waterways and defined overland flow paths in the region, with sufficient terrain relief to limit the amount of sheet flow. The main concentrated overland flow paths/waterways within the site are as follows:

- The waterway through the middle is generally away from the proposed solar arrays, with minimal isolated areas that may be close to the 1% AEP flood inundation area (Please refer to the Hydrology Assessment prepared by Ecological Australia at attachment 18. (Appendix C HEC-RAS). These areas are to the edge of the solar panel regions and depths are shallow and pose little impact on the site.

- The overland flow path across the upper east of the site travels under proposed sections of solar panels and are described as shallow (<0.1m). As the overland flow path progresses downstream, these depths increase to around 0.5m.

- The overflow paths in the south-eastern corner of the site are also considered shallow under the solar arrays in the case of 1% AEP. In the proposed location of the BESS, depths increase up to 0.8m. This will pose minimal impact to overall flood paths due to the close location of the onsite dam immediately downstream of the proposed BESS.

- Little River is located along the northern border of the site, and solar array regions are clear of the 1%AEP extent, except for one location where the overland path joins Little River in the central north of the site. The existing access roads in this location have been designed and sited appropriately to reduce potential flooding impacts.

Velocities across the site are generally low (<0.5m/s) and below the threshold (<2m/s), therefore further infrastructure to protect waterways and features is not required. Few isolated higher velocities (>1m/s) occur through the overland flow path/waterways through the middle of the site, and should erosion form at these locations, erosion mitigation strategies will be implemented.

Based on the predicted velocities and flood extents, the solar arrays and associated infrastructure at the Barwon Solar Farm are unlikely to affect flood levels or downstream discharge.

While there is some potential for flood impacts as discussed above, the Hydrology Report produced by Ecological notes that a conservative approach has been taken, stating there is typically higher of levels of infiltration with sandy soil types, that reduce flow rates and flood extents across the site.

Key aspects of flood management methods which have been considered in the final design include the location of the BESS, solar arrays and access roads. The proposed solar panels are elevated and will not impact upon surface run off. Other equipment installed on the ground will have a small surface area and have been designed and sited to reduce any significant impact, particularly the BESS. Appropriate drainage infrastructure will be implemented to prevent damage through erosion or runoff.

The BESS infrastructure will be raised to minimise any potential for flooding impacts to the equipment.

Please refer to the Hydrology Assessment prepared by Ecological Australia at attachment 18.

Visual impact

The most visible changes to the landscape character of the existing setting will result to views from three adjacent residences. However, following amelioration, comprised of the establishment of locally indigenous screening vegetation along the Project boundaries, the landscape character will appear similar to the remainder of the regional agricultural landscape and other bands of vegetation that occur through the landscape of the region.

The landscape of the Project setting has a generally high landscape absorptive capacity, as the flat topography does not allow for significant overlooking and the scattered, and occasionally dense vegetation in the area surrounding the Project. A Landscape strategy has been prepared

by Urbis Pty Ltd (February 2023) to support the amelioration recommendations of a preliminary Landscape Visual Impact Assessment (LVIA) attachment 11. And 14. 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.

A Glint & Glare assessment has been prepared by Urbis and identifies that there will be no impacts to road users and residents in close proximity the Project (refer to Landscape and Visual Impact Assessment at Attachment 11 and 14. As a result, there would also be no interference expected for viewpoints located at greater distances from the project site.

Given the tilting solar panels, the flat topography with limited opportunities for overlooking of the Project, the potential for impact resulting from reflection or glare is considered to be low.

Furthermore, risk of glare and glint for road users, and surrounding residences by proposed perimeter buffer landscaping which, once established, will ensure that surfaces of the panels are not visible, screening any reflections that would have occurred across the flat terrain. The area to the north of the site is a significant wetland with no residences or transport corridors to be assessed for glare and glint

12. Native vegetation, flora and fauna

Native vegetation

Is any native vegetation likely to be cleared or otherwise affected by the project?

☒ NYD ☒ No ☒ Yes If yes, answer the following questions and attach details.

What investigation of native vegetation in the project area has been done? (briefly describe)

Detailed flora site investigations were undertaken by Senior Ecologist Matt Gibson, Project Zoologist Erin Baldwin and Consultant Botanist Jane Kenny between 17 February and 20 May 2022 to collect a list of flora species. Additional flora information has also been recorded when on site for targeted surveys. This list has been submitted to DEECA for incorporation into the Victorian Biodiversity Atlas. Planted species have not been recorded unless they are naturalised. Native vegetation is defined in the Victoria Planning Provisions as 'plants that are indigenous to Victoria, including trees, shrubs, herbs, and grasses' (Clause 73.01).

A Vegetation Quality Assessment (VQA) was undertaken for all patches of native vegetation identified in the study area. This assessment is consistent with DEECA's habitat hectare method (DSE 2004) and the Guidelines (DELWP 2017a).

Botanists were on site for a combined total of 25 person days, from April 2020 until May 2022. This included targeted surveys for Spiny Rice Flower 14 days in total between 29 of July 2020 and 10 of September 2020. Other threatened species would have been recorded within the transects. At all times on site, botanists recorded additional species when encountered. No other specific spring surveys for cryptic species with short flowering periods were undertaken, as the initial assessment was of low likelihood of presence within subject site for these species.

What is the maximum area of native vegetation that may need to be cleared?

☒ NYD Estimated area ……18.33…….(hectares)

The proposed removal includes:

- 14.294 hectares of patch vegetation, including 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.

Spatial data of proposed vegetation removal were submitted to DEECA's native vegetation support team, who provided a Native Vegetation Removal Report for the project. This is provided in Attachment 9.

How much of this clearing would be authorised under a Forest Management Plan or Fire Protection Plan?

☒ N/A …… (if applicable)

Which Ecological Vegetation Classes may be affected? (if not authorised as above)

☐ NYD ☒ Preliminary/detailed assessment completed. If assessed, please list.

The only Ecological Vegetation Classes that may be affected are listed below. Natural scrub heathland and riparian vegetation alongside Little River will not be affected as set in setback/buffer areas and management of these to prevent impacts will be included in the Construction Environmental Management Plan and Operational Management Plan to be prepared for the development once a planning permit has been issued and to be endorsed prior to construction.

HZ Number	EVC	Impacted Area (ha)
VQA_03a	Plains Grassy Wetland 125	0.02
VQA_03b	Plains Grassy Wetland 125	0.39
VQA_06	Plains Grassy Woodland 55_61	0.32
VQA_28	Plains Grassy Woodland 55_61	0.24
VQA_05	Heavier-soils Plains Grassland 132_61	4.89
VQA_16	Heavier-soils Plains Grassland 132_61	3.53
VQA_19	Heavier-soils Plains Grassland 132_61	0.36
VQA_21	Heavier-soils Plains Grassland 132_61	0.44
VQA_30	Heavier-soils Plains Grassland 132_61	6.08
VQA_32	Heavier-soils Plains Grassland 132_61	0.02
VQA_33	Hills Herb Rich Woodland 71	0.05

Non-impacted Habitat Zone have been excluded. *Refer to Appendix 6 of the Flora and Fauna Assessment (Attachment 19*).

Have potential vegetation offsets been identified as yet?

☐ NYD ☒ Yes If yes, please briefly describe.

A combination of on-site offsetting and purchase of offsets through the offset register is proposed. 4.855 general habitat units with a minimum Strategic Biodiversity Value Score of 0.348 will be secured. The offsets would be secured following issue of a planning permit.

Other information/comments? (e.g. Accuracy of information)

NYD = not yet determined

Flora and fauna

What investigations of flora and fauna in the project area have been done?

(provide overview here and attach details of method and results of any surveys for the project & describe their accuracy)

Biosis Pty Ltd (Biosis) was commissioned by Elgin Energy Pty Ltd (Elgin Energy) to undertake a flora and fauna assessment for a 735 hectare area of land proposed for development of a solar farm located at Little River, Victoria, approximately 49 kilometres southwest of Melbourne. Please refer to site map at attachment 5. The study area is private land, zoned as FZ – farming, is north of the You Yangs Regional Park (PCRZ – Public Conservation and Resource Zone) and directly abuts the Mt Rothwell Conservation and Research Reserve directly to the east (RCZ – Rural Conservation).

The study area is within the following management areas relating to biodiversity:

- Victorian Volcanic Plain and Central Victorian Uplands bioregions.
- Moorabool River Basin.
- Corangamite Catchment Management Authority (CMA).
- City of Greater Geelong.

A preliminary biodiversity assessment of the initial investigation area was undertaken by Senior Ecologist Matt Gibson and Botanist Jane Kenny on the 9 April 2020. The objectives of the preliminary biodiversity assessment were to identify the ecological values and constraints related to the proposed development of a solar farm.

Following delivery of the preliminary biodiversity report, Biosis was commissioned to undertake targeted surveys for a range of threatened species listed under the provisions of *the Environment Protection and Biodiversity Conservation Act 1999* whose habitat was identified within the initial study area. Desktop research: Information about flora and fauna from within 5 kilometres of the study area was obtained from relevant biodiversity databases, many of which are maintained by the Victorian Government Department of Environment, Land, Water and Planning (DELWP) or the Australian Government Department of Agriculture, Water and the Environment (DAWE).

As discussed above detailed flora site investigations were undertaken by Senior Ecologist Matt Gibson, Project Zoologist Erin Baldwin and Consultant Botanist Jane Kenny between 17 February and 20 May 2022 to collect a list of flora species.

Fauna site investigations were also undertaken by Senior Ecologist Matt Gibson and Erin Baldwin between 17 February and 20 May 2022.

Please refer to section 2.4 of the Biosis report for a detailed breakdown of the present Flora and Fauna assessment and methodology.

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 of the Biosis report.

Of these species, the following targeted surveys were undertaken:

- Targeted surveys for Spiny Rice-flower Pimelea spinescens subsp. spinescens within the initial investigation area was undertaken on the 28-30 July 2020 and 10 September 2020 by Botanists Jane Kenny, Matt Dell, Damien Magner and Samantha Barron.
- Targeted surveys for Striped Legless Lizard Delma impar, using the artificial shelter (tiles) method, were undertaken between September and December 2020.
- Targeted surveys for Golden Sun Moth Synemon plana were undertaken within the initial investigation area during the 2020-21 local flight season, between 14/12/2020 and 08/01/2021.
- Desktop research: Information about flora and fauna from within 5 kilometres of the study area was obtained from relevant biodiversity databases, many of which are maintained by the Victorian Government Department of Environment, Land, Water and Planning (DELWP) or the Australian Government Department of Agriculture, Water and the Environment (DAWE).

Please refer to section 2.3 of the biodiversity assessment at Attachment 19 for detailed breakdown of all targeted surveys. Results of all studies are also discussed in section 3.

Have any threatened or migratory species or listed communities been recorded from the local area?

☐ NYD ☐ No ☒ Yes If yes, please:

- List species/communities recorded in recent surveys and/or past observations.
- Indicate which of these have been recorded from the project site or nearby.

Summary of EPBC and FFG Act listed species most likely to occur in the study area (Table 4 of the Flora and Fauna Report)

Threatened species recorded or predicted to occur within 5 kilometres of the study area are listed in Appendix 1 (flora) and Appendix 2 (fauna). An assessment of the likelihood of these species occurring in the study area and an indication of where within the site (i.e. which habitats or features of relevance to the species) is included. A summary of those species recorded or with a medium or higher likelihood of occurring in the study area is provided below.

Species name	**Listing status** (Abbreviations detailed in Appendix 1 of the Flora and Fauna Report)	**Area of value within the subject site.**
Spiny Rice-flower	Cr under EPBC Act cr under FFG Act	Not recorded during targeted surveys of potential habitat to the south of Little River. Targeted surveys have not been conducted in the section of the study area to the north of Little River.
Swift Parrot	Cr under EPBC Act cr under FFG Act	May forage on woodland patch and scattered Eucalypts, particularly Melbourne Yellow Gum (a favoured foraging source), during overwintering.
Striped Legless Lizard	VU under EPBC Act e under FFG Act	The Striped Legless Lizard was not detected during targeted surveys. Tile grids were located within suitable habitat within the initial investigation area and surveys were conducted during optimal weather conditions. While recorded within the local area, results of targeted surveys suggest there is a low likelihood for Striped Legless Lizard to occur within the study area.
Grassland Earless Dragon	Cr Under EPBC Act Cr under FFG Act	Not recorded during targeted surveys for Stripped Legless Lizard. While initially thought extinct in Victoria for several decades, its recent rediscovery in June 2023 has increased its presence likelihood to medium within the subject site. Further targeted surveys will be required and thus implemented prior to construction to assess its presence within the subject site.
White-throated Needletail	VU under EPBC Act v under FFG Act	May be present in airspace above the study area on regular basis but unlikely to impacted by ground based activities.
Grey-headed Flying-fox	VU under EPBC Act v under FFG Act	May forage on woodland patch and scattered Eucalypts, when flowering.
Growling Grass Frog	VU under EPBC Act v under FFG Act	May utilise aquatic and riparian environments of Little River and Sandy Creek for dispersal, foraging and over-wintering activities.
Yarra Pygmy Perch	VU under EPBC Act v under FFG Act	Recorded within similar habitat within the Moorabool River catchment. May occur within aquatic environments of Little River intercepting the study area.
Golden Sun Moth	VU under EPBC Act v under FFG Act	Recorded within patches of native tussock forming grasses (e.g. Spear Grasses and Wallaby Grasses) within the initial investigation area (see Section 3.2.2 of this report). High likelihood for this species to be present in suitable grassland areas throughout study area.

Little Eagle	v under FFG Act	May forage over wooded and modified, open areas within the study area on occasion.
Square-tailed Kite	v under FFG Act	May forage over wooded and modified, open areas within the study area on occasion.
Black Falcon	cr under FFG Act	May forage over wooded, modified, open areas and creeklines within the study area on occasion. Nesting pair observed in study area by neighbouring landholder.
Barking Owl	cr under FFG Act	Recorded in wooded areas south of study area. May nest in wooded area in south-east corner of study area and/or forage over wooded and modified, open areas within the study area on occasion.
Hooded Robin	v under FFG Act	Occasional use of woodland patches possible; scattered trees may provide steppingstones across the landscape.
Speckled Warbler	e under FFG Act	Occasional use of woodland and creekline grassy woodland patches possible; scattered trees may provide steppingstones across the landscape.
Diamond Firetail	v under FFG Act	Occasional use of woodland patches possible; scattered trees may provide steppingstones across the landscape.
Brush-tailed Phascogale	v under FFG Act	Occasional use of woodland patches possible; scattered trees may provide steppingstones across the landscape
Eastern Bent-winged Bat	Cr under FFG Act	May forage over modified, open areas and creeklines within the study area on occasion.
Tussock Skink	e under FFG Act	Recorded within native, tussock forming grasses within study area and road reserves.
Brown Toadlet	e under FFG Act	May occur in seasonally damp depressions containing an abundance of organic matter within Creekline Grassy Woodland.

The EPBC Protected Matters Search Tool indicates that five Threatened Ecological Communities (TECs) occur or have potential to occur in the local area.
These are:

- Grassy Eucalypt Woodland of the Victorian Volcanic Plain.
- Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia.
- Natural Damp Grassland of Victorian Coastal Plains.
- Natural Temperate Grassland of the Victorian Volcanic Plain.
- Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains.
- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native 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 or Austrostipa by at least 50 percent.

One patch (VQA 14) 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*.

DEECA vegetation modelling also suggests there is potential for two State listed TECs to occur or have potential to occur within the local area. These include:

- Western Basalt Plains (River Red Gum) Grassy Woodland Floristic Community 55-04.
- Western (Basalt) Plains Grasslands Community.

Most patches of Plains Grassland within the study area would represent examples of the Western (Basalt) Plains Grassland Community. The Western Basalt Plains (River Red Gum) Grassy Woodland community is not present.

Two patches of EVC 125 Plains Grassy Wetland were mapped associated with the constructed dam in the south-east section of the study area. These patches are not considered to represent examples of 'Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains' as they are associated with a constructed dam, and the area would not have supported wetland plants prior to the construction of the dam.

If known, what threatening processes affecting these species or communities may be exacerbated by the project? (e.g., Loss or fragmentation of habitats) Please describe briefly.

The developments and associated activities have the potential to significantly impact on Matters of National Environmental Significance (MNES) protected under the EPBC Act. The relevant impacts likely to occur to the following species are summarised in below:

Assessment of Golden Sun Moth (listed vulnerable species) in relation to Significant Impact Criteria for vulnerable species under the EPCB ACT.

Significant Impact Criteria	**Likelihood of Triggering**	**Assessment against significant impact guidelines**
Lead to a long-term decrease in the size of an important population of a species	Possible	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 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 would be considered to trigger this criterion.
Reduce the area of occupancy of an important population	Possible	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), 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	Unlikely	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	Unlikely	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	Unlikely	There is an opportunity to improve management of retained habitat areas to benefit the species.

Assessment of Natural Temperate Grassland of the Victorian Volcanic Plain (listed vulnerable species) in relation to Significant Impact Criteria for critically endangered or endangered ecological communities under the EPBC Act.

Significant Impact Criteria	**Likelihood of Triggering**	**Assessment against significant impact guidelines**
Reduce the extent of an ecological community	Likely	Project design involves the Removal of 8.409 hectares of Natural Temperate Grassland of the Victorian Volcanic Plain (NTVVP). 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	Unlikely	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.	Unlikely	No Recovery Plan has been prepared or adopted for this threatened ecological community (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. None of these areas are currently managed for protection of biodiversity values and have degraded due to farming practices. All these areas are subject impacts from adjacent land, including grazing by stock and weed infestations. In agricultural landscapes, which are often intensively managed and species-poor,

		there is potential for benefits if deployed and managed strategically. 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.
Modify or destroy abiotic (non-living) 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.
Cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to: • Assisting invasive species, that are harmful to the listed ecological community, to become established, or • Causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community, or	Impacts limited to the project footprint	The change in land use presents an opportunity to improve management of retained patches, including improved weed control, discontinuation of fertiliser use and management of grazing regime for biodiversity outcomes.
Interfere with the recovery of an ecological community.	Impacts limited to the project footprint	No Recovery Plan has been prepared or adopted for this TEC and therefore recovery priorities (actions and locations) have not been formerly articulated by the Australian Government. As noted above the project presents an opportunity to improve the management of retained patches.

Are any threatened or migratory species, other species of conservation significance or listed communities potentially affected by the project?

☒ NYD ☒ No ☒ Yes If yes, please:

- List these species/communities:
- Indicate which species or communities could be subject to a major or extensive impact (including the loss of a genetically important population of a species listed or nominated for listing) Comment on likelihood of effects and associated uncertainties, if practicable.

EPBC Act listed species

Forty-three EPBC Act listed species have predicted to occur in the project search area. The likelihood and predicted location of these species occurring in the study area is assessed in Appendix 1 (flora) and Appendix 2 (fauna) of the Biosis report.

The majority of these species are unlikely to occur within the study area. This conclusion is attributed to the highly modified nature of the study area, paucity of recent local records and absence of suitable habitat. Spiny Rice-flower has a medium likelihood to occur within the study area. Based on the results of targeted surveys and the current design footprint, it is considered a low likelihood that the proposed Barwon Solar Farm will result in a significant impact on a population of Spiny-rice Flower.

White-throated Needletail has a medium potential to fly over the study area on occasion. However, as White-throated Needletail is considered an almost exclusively aerial species in Australia (outside of densely forested environments where it may occasionally roost), ground-based activities proposed by the Barwon Solar Farm are considered unlikely to impact the species.

Migratory and volant species including Grey-headed Flying-fox and Swift Parrot have a medium likelihood to forage on flowering Eucalypts or lerp within the study area; with Melbourne Yellow Gum being a preferred tree species of Swift Parrot. However, as these trees form a very small component of a much larger network of foraging habitat utilised across much of Victoria and parts of South Australia, New South Wales and Queensland the proposed removal of any of these trees is considered unlikely to result in a significant impact on either of these species (as assessed in accordance with Significant Impact Guidelines 1.1 –Matters of National Environmental Significance).

Yarra Pygmy Perch has a medium likelihood to occur within aquatic environments of Little River intercepting the study area. It is considered a low likelihood that the proposed Barwon Solar Farm would result in a significant impact on this species, as long as a site-specific Construction Environmental Management Plan (CEMP) implementing suitable erosion and pollutant control measures are applied.

Growling Grass Frog has a medium likelihood to utilise aquatic or terrestrial environments within the study area. Whilst farm dams within the study area are considered unlikely to provide suitable breeding habitat (i.e., dense submergent and floating macrophytes), the species has been recorded within Little River and is highly mobile; dependent on the migration of adults between waterbodies, and between breeding and non-breeding habitats (Clemann & Gillespie 2012).

Significant impact thresholds for the Growling Grass Frog (DEWHA 2009c) identify the potential for a significant impact to the species to occur where permanent removal or degradation of terrestrial habitat within 200 metres of a known waterbody is proposed, resulting in the loss of dispersal or overwintering activities. Installation of panels is proposed within 200 m of Little River and Sandy Creek in some areas, however these areas are grazing or cropping land that does not support overwintering habitat such as dense vegetation, rocks or coarse woody debris, and they are unlikely to be used for dispersal as aquatic habitats are limited to the two waterways. If some

occasional dispersal does occur, installation of solar panels is unlikely to limit dispersal activities as the ground layer will still be vegetated.

Farm dams within the study area represent low quality habitat for Growling Grass Frog and are considered unsuitable to support breeding activities The local viability of Growling Grass Frog is not considered dependent on these waterbodies, singly or in combination. As such, the Growling Grass Frog was not considered for targeted surveys.

It is considered a low likelihood that the proposed Barwon Solar Farm will result in a significant impact on a population of Striped Legless Lizard. This species was not detected during targeted surveys of the initial investigation area, despite tile grids being located within suitable habitat and surveys occurring during optimal weather conditions. As per the EPBC guidelines, the current proposal is considered likely to result in a significant impact on the Golden Sun Moth; which was recorded during targeted surveys of the initial investigation area. However, the construction methods for solar panel frames via piling would not translate into a complete removal of the habitat as vegetation species and Golden Sun Moth habitat can and indeed does survive and thrive under the panels. This point is reinforced by a review of literature sources (Kannenberg et al., 2023; Guerin, 2017; NREL U.S. Department of Energy, 2017; Semchenko et al., 2012) and the views of Biosis (project ecologists) and Dr Paul Gibson Roy (grassland restoration experts).

The Grassland Earless Dragon was not recorded during targeted surveys for the Stripped Legless Lizard. While initially thought extinct in Victoria for several decades, its recent rediscovery in June 2023 has increased its presence likelihood to medium within the subject site, thus further targeted surveys will be undertaken to assess its presence in the area prior to construction. Biosis has 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.

Survey methodology and timing will be consulted with expert Peter Robertson and DEECA prior to deployment to confirm endorsement of the proposed survey plan. These surveys would be conducted post-permit prior to construction and, noting that species guidelines are still to be formulated, 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.

A summary of those species recorded or with a medium or higher likelihood of occurring in the study area is provided below.

Species name	**Listing status** (Abbreviations detailed in Appendix 1 of the Flora and Fauna Report)	**Area of value within the subject site.**
Spiny Rice-flower	Cr under EPBC Act cr under FFG Act	Not recorded during targeted surveys of potential habitat to the south of Little River. Targeted surveys have not been conducted in the section of the study area to the north of Little River.
Swift Parrot	Cr under EPBC Act cr under FFG Act	May forage on woodland patch and scattered Eucalypts, particularly Melbourne Yellow Gum (a favoured foraging source), during overwintering.
Striped Legless Lizard	VU under EPBC Act e under FFG Act	The Striped Legless Lizard was not detected during targeted surveys. Tile grids were located within suitable habitat within the initial investigation area and surveys were conducted during optimal weather conditions. While recorded within the local area, results of targeted surveys suggest there is a low likelihood for Striped Legless Lizard to occur within the study area.

Grassland Earless Dragon	Cr Under EPBC Act Cr under FFG Act	Not recorded during targeted surveys for Stripped Legless Lizard. While initially thought extinct in Victoria for several decades, its recent rediscovery in June 2023 has increased its presence likelihood to medium within the subject site. Further targeted surveys will be required and thus implemented prior to construction to assess its presence within the subject site.
White-throated Needletail	VU under EPBC Act v under FFG Act	May be present in airspace above the study area on regular basis but unlikely to impacted by ground-based activities.
Grey-headed Flying-fox	VU under EPBC Act v under FFG Act	May forage on woodland patch and scattered Eucalypts, when flowering.
Growling Grass Frog	VU under EPBC Act v under FFG Act	May utilise aquatic and riparian environments of Little River and Sandy Creek for dispersal, foraging and over-wintering activities.
Yarra Pygmy Perch	VU under EPBC Act v under FFG Act	Recorded within similar habitat within the Moorabool River catchment. May occur within aquatic environments of Little River intercepting the study area.
Golden Sun Moth	VU under EPBC Act v under FFG Act	Recorded within patches of native tussock forming grasses (e.g., Spear Grasses and Wallaby Grasses) within the initial investigation area (see Section 3.2.2 of this report). High likelihood for this species to be present in suitable grassland areas throughout study area.
Little Eagle	v under FFG Act	May forage over wooded and modified, open areas within the study area on occasion.
Square-tailed Kite	v under FFG Act	May forage over wooded and modified, open areas within the study area on occasion.
Black Falcon	cr under FFG Act	May forage over wooded, modified, open areas and creeklines within the study area on occasion. Nesting pair observed in study area by neighbouring landholder.
Barking Owl	cr under FFG Act	Recorded in wooded areas south of study area. May nest in wooded area in south-east corner of study area and/or forage over wooded and modified, open areas within the study area on occasion.
Hooded Robin	v under FFG Act	Occasional use of woodland patches possible; scattered trees may provide steppingstones across the landscape.
Speckled Warbler	e under FFG Act	Occasional use of woodland and creekline grassy woodland patches possible; scattered trees may provide steppingstones across the landscape.
Diamond Firetail	v under FFG Act	Occasional use of woodland patches possible; scattered trees may provide steppingstones across the landscape.
Brush-tailed Phascogale	v under FFG Act	Occasional use of woodland patches possible; scattered trees may provide steppingstones across the landscape
Eastern Bent-winged Bat	Cr under FFG Act	May forage over modified, open areas and creeklines within the study area on occasion.

Tussock Skink	e under FFG Act	Recorded within native, tussock forming grasses within study area and road reserves.
Brown Toadlet	e under FFG Act	May occur in seasonally damp depressions containing an abundance of organic matter within Creekline Grassy Woodland.

EPBC Act listed ecological communities

Six EPBC Act listed threatened ecological communities (TECs) have been recorded or predicted to occur in the project search area. The likelihood of these TECs occurring in the study area is assessed in Appendix 1(flora) of the Biosis report.

Two TECs were detected within the study area during ground-based site assessments. The study area contains 1.4 hectares of Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia, corresponding with a patch of Plains Grassy Woodland. As this patch has been excluded by the project's design it is considered unlikely the proposed Barwon Solar Farm would result in a significant impact on this community (as assessed in accordance with criteria outlined in EPBC Act policy documents).

The study area contains 92 hectares of NTGVVP, of which the proposed Barwon Solar Farm proposes to remove 8.4 hectares. Referral of the project to the Australian Government (Minister for the Environment) to determine whether the proposed action requires approval under the EPBC Act is recommended.

Migratory species

Eleven migratory species have been recorded or predicted to occur in the project search area (Appendix 2) of the Biosis report.

The majority of these majority of these species are unlikely to occur within the study area. This conclusion is attributed to the highly modified nature of the study area, paucity of recent local records and 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 important habitat for an ecologically significant proportion of any of these species. Referral is not considered necessary for this MNES.

Is mitigation of potential effects on indigenous flora and fauna proposed?

☒ NYD ☒ No ☒ Yes If yes, please briefly describe.

The three-step approach has been undertaken at this site and is detailed within section 5.1 of the Biosis Flora and Fauna assessment. The three-step approach (avoid, minimise, offset) is the key policy in relation to the removal of native vegetation to achieve no net loss to biodiversity as a result of the removal, destruction or lopping of native vegetation.

The development proposes to remove 18.330 hectares of native vegetation, comprised of 14.294ha of patch vegetation,), 46 large, scattered trees, 20 small live scattered trees and 4 large dead scattered trees.

The primary measure to reduce impacts to biodiversity values is to avoid and minimise removal of native vegetation, both patches and scattered trees. Construction works will delineate the total extent of works including access tracks and road batters, drainage infrastructure, underground or overhead services, and provision for future works where this is foreseeable to ensure no unanticipated impacts on native vegetation during construction.

Avoidance measures implemented during the design of the Barwon Solar Farm include:

- Locating the project within modified grazing and cropland that is primarily cleared of native patch vegetation. The design has avoided the majority of Heavier-soils Plains Grassland

132_61 and Plains Grassy Woodland within the site, and all riparian vegetation along Little River and Sandy Creek.

- Using existing gateways for site access and positioning any new site access points away from identified areas of native vegetation.
- Considering the preliminary results of this assessment and amending the solar farm layout so as to avoid impacts to patch vegetation and scattered trees, where possible, including avoidance of scattered trees near the south-eastern section and north-western sections of the site.
- 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).

Avoidance

The proposed site layout of the solar facility demonstrates significant consideration has been given to avoiding the removal of native vegetation, including:

- 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 Natural Temperate Grassland of the Victorian Volcanic Plain is likely to continue to decline.
    - The design has avoided the majority of the Plains Grassland within the site 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)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).
- Patches of native vegetation (14.294ha) 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 subject to grazing pressure. 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, patches of plains grassland can actually thrive and recover under the solar panels providing an increase to the biodiversity condition of these areas.

The design was again modified in January-February 2023, in response to consultation with DEECA (including the DEECA RFI to the Planning Permit Application). The resulting changes are discussed in section 18 of this from.

Minimise

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 negatively 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 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 revitalizes soils, restores grassland ecosystems and increases biodiversity while maintaining light agricultural production. An integrated weed management plan along with a native enhance strategy (i.e., via reseeding) for the area has the potential to improve the ecological condition of the site while reducing the presence of noxious weeds that threaten to outcompete native communities that sustain threatened fauna species.

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. Noise from construction will be managed as per EPA requirements regarding construction hours and operational noise has been modelled and mitigation proposed in the form of acoustic barriers around the BESS to prevent noise limits exceed EPA thresholds thus impacts not only to residences but also to fauna.

Additionally, where possible primary access to the site has been confined to existing access points to the property where native vegetation does not exist.

Offset

In order to compensate for the loss to biodiversity from the removal of native vegetation offsets are required.

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). Please refer the quotation for the supply of native vegetation credits to identify suitable third party offsets at Attachment 21.

Furthermore, as a secondary offset Elgin Energy is considering the potential of rehabilitating an ecological corridor of native vegetation, riparian habitats and grassland associated with the Little River and Sandy Creek catchments subject to the landowners consent. This is located within the site and indicated on the site plan. 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, including seed banking. 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.

Restoration Ecologist Dr. Paul Gibson-Roy and the Biosis team have highlighted that weed control, in particular for introduced Needle Grasses, is the most pressing issue for the conservation of native grasslands at the proposed development site. For Serrated Tussock and Chilean Needle Grass the risk is that both 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:

- 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/sheep grazing/cropping after the decommissioning of the solar farm, thus not comprising the long-term agricultural value of the land for the community.

In coordination with Biosis, the proposal will include a Grassland Earless Dragon Habitat Management Plan post-approval which will outline detailed actions to follow if the Grassland Earless Dragon is discovered during pre-construction surveys or incidentally during construction. Some of the action points will include, but may not be limited to:

- The introduction of controlled well-managed grazing for grassland maintenance. 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 use of pesticide. 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 island of grassland and reduce habitat fragmentation.

Other information/comments? (e.g. Accuracy of information)

13. Water environments

Will the project require significant volumes of fresh water (e.g. > 1 Gl/yr)?

☐ NYD ☒ No ☐ Yes If yes, indicate approximate volume and likely source.

Will the project discharge waste water or runoff to water environments?

☐ NYD ☒ No ☐ Yes If yes, specify types of discharges and which environments.

Note: A small volume of waste water would be produced when panels are periodically cleaned. The project Hydrology report states that the soils are of a sandy nature and would have greater infiltration prior to run off. Further the infrastructure may change the runoff characteristics of the catchment. However, this infrastructure, including the solar panels, where water runs off onto the ground underneath and between the panels and can seep into the ground, are not considered directly connected to the waterways.

Are any waterways, wetlands, estuaries or marine environments likely to be affected?

☐ NYD ☒ No ☐ Yes If yes, specify which water environments, answer the following questions and attach any relevant details.

Note: there are waterways within the site, to which minimum 50m setbacks are provided to the development footprint and installation areas.

Are any of these water environments likely to support threatened or migratory species?

☐ NYD ☐ No ☐ Yes If yes, specify which water environments.

(Answer to previous question was 'No')

Are any potentially affected wetlands listed under the Ramsar Convention or in 'A Directory of Important Wetlands in Australia'?

☐ NYD ☒ No ☐ Yes If yes, please specify.

Could the project affect stream flows?

☐ NYD ☒ No ☐ Yes If yes, briefly describe implications for streamflows.

Could regional groundwater resources be affected by the project?

☐ NYD ☒ No ☐ Yes If yes, describe in what way.

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.

Could environmental values (beneficial uses) of water environments be affected?

☐ NYD ☒ No ☐ Yes If yes, identify waterways/water bodies and beneficial uses (as recognised by State Environment Protection Policies)

Could aquatic, estuarine or marine ecosystems be affected by the project?

☐ NYD ☒ No ☐ Yes If yes, describe in what way.

Is there a potential for extensive or major effects on the health or biodiversity of aquatic, estuarine or marine ecosystems over the long-term?

☒ No ☐ Yes If yes, please describe. Comment on likelihood of effects and associated uncertainties, if practicable.

Is mitigation of potential effects on water environments proposed?

☐ NYD ☐ No ☒ Yes If yes, please briefly describe.

Minimum 50m setbacks are provided between waterways and the development footprint and installation areas. Soil and erosion controls will also be implemented and will be documented in management plans.

Other information/comments? (e.g. Accuracy of information)

14. Landscape and soils

Landscape

Has a preliminary landscape assessment been prepared?

☐ No ☒ Yes If yes, please attach.

Although the Project results in a significantly different landscape character from the existing setting when viewed from the air, its low profile will ensure that from ground-based viewing locations, only localised changes to the landscape character will result. The most visible changes to the landscape character of the existing setting will result to views from three adjacent residences. However, following amelioration, comprised of the establishment of locally indigenous screening vegetation along the Project boundaries, the landscape character will appear similar to the remainder of the regional agricultural landscape and other bands of vegetation that occur through the landscape of the region.

The landscape of the Project setting has a generally high landscape absorptive capacity, as the flat topography does not allow for significant overlooking and the scattered, and occasionally dense vegetation in the area surrounding the Project, provides visual screening, with the extent of screening increasing with distance from the Project.

Prior to amelioration, three sensitive uses proximate to the Project will result in high levels of impact (*refer to Attachment 11*). Apart from these locations, overall, the Project is assessed as having a low level of visual impact on surrounding sensitive viewpoints, primarily due to the limited number of sensitive viewpoints and the relative lack of visibility resulting from existing vegetation throughout the landscape and rising topography. The residual visual impact will typically reduce to very low after the establishment of amelioration measures.

Within the Category E2 environmental lighting zone the Project does not result in an increased lighting impact due to there being no requirement for operational lighting. Therefore, the lighting impacts are considered low.

Tilting solar panels proposed and the flat topography provides no opportunities for overlooking of the Project at a sufficient angle to cause impacts from reflection or glare. Therefore the potential for impact resulting from reflection or glare is considered to be low. A resting angle of 45° for the Project will minimise predicted glare. Additionally, proposed screen planting around the perimeter of the Project will mitigate this impact.

Refer to the Landscape and Visual Impact Assessment (refer to Attachment 11)

Is the project to be located either within or near an area that is:

- **Subject to a Landscape Significance Overlay or Environmental Significance Overlay?**

☐ NYD ☐ No ☒ Yes If yes, provide plan showing footprint relative to overlay.

Parts of the site are within ESO1, ESO4 and SLO1 overlays (*refer to section 5 of the Town Planning Report at Attachment 4 for maps of development footprint relative to the overlays*).

- Schedule 1 to the Environmental Significance Overlay relates specifically to areas of flora and fauna habitat and of geological and natural interest. Many of these sites contain remnant vegetation, marsh flats, bird and wildlife habitats and corridors, natural scrub heathland vegetation, and river and streamside corridor.
- Schedule 4 to the Environmental Significance Overlay relates specifically to the Grasslands within the Werribee plains hinterland. Werribee plains hinterland contain some large areas of predominantly native vegetation as well as some high quality

wetlands, which are important for many threatened fauna species. The major issue for biodiversity conservation in the Werribee plains hinterland is loss of native vegetation and habitat through clearing for urban development, cropping and infrastructure.

- Schedule 1 to the Significant Landscape Overlay relates specifically to the Foothills of the You Yangs. This area is comprised of treeless foothills and plains at the base of the You Yangs. The surrounding foothills and plains create an open view path to the You Yangs, visually exposing them when viewed from the surrounding basalt plains.

- **Identified as of regional or State significance in a reputable study of landscape values?**

  ☐ NYD ☒ No ☐ Yes If yes, please specify.

Note: The You Yangs, located 5km to the south of the Project, are the dominant feature of the regional landscape. They rise progressively from the north to a maximum elevation of 319 m at Flinders Peak, located to the south of the range.

- **Within or adjoining land reserved under the *National Parks Act 1975* ?**

  ☐ NYD ☒ No ☐ Yes If yes, please specify.

- **Within or adjoining other public land used for conservation or recreational purposes ?**

  ☐ NYD ☐ No ☒ Yes If yes, please specify.

Land adjacent to the site on the eastern side is Rural Conservation Zone land. Relevant objectives of the RCZ are:

- To provide for agricultural use consistent with the conservation of environmental and landscape values of the area.
- To conserve and enhance the cultural significance and character of open rural and scenic non-urban landscapes.

Is any clearing vegetation or alteration of landforms likely to affect landscape values?

☐ NYD ☒ No ☐ Yes If yes, please briefly describe.

Outside of native vegetation, the majority of vegetation is crop, pasture grasses, introduced trees, weeds and planted vegetation.

The site is mostly flat and treeless, with any substantial vegetation confined to road and paddock boundaries or waterways. Vegetation clearing as part of the project is therefore not significant in terms of visual impact to landscape values. It is unavoidable that vegetation will be lost due to the nature of the installation. However, assessments have been undertaken to identify vegetation of significance and value that can be retained, and offsets will be provided for the vegetation lost. These offsets include a combination of new planting and relocation of vegetation within a designated ecological corridor that runs north to southwest through the site, and the purchase of native vegetation credits.

Is there a potential for effects on landscape values of regional or State importance?

☐ NYD ☒ No ☐ Yes Please briefly explain response.

Is mitigation of potential landscape effects proposed?

☐ NYD ☐ No ☒ Yes If yes, please briefly describe.

Planting along the western and eastern boundaries, as well sections of the boundaries adjacent to Little River-Ripley Road, will mitigate impacts to VP2, VP3 and VP4, receptors with the highest levels of visual impact.

The low-profile form of the majority of the Project, primarily the solar array, which is approximately 4.3 m in height at full tilt, will ensure that planting will be able to provide screening within a relatively short period of time. Taller elements such as transformers and switching substations will be clad with non-reflective materials and be finished in a natural or neutral colour, as found in the landscape of the setting.

Refer to the Landscape Strategy (Attachment 14). Materials and Finished Schedule (Attachment 13.)

Other information/comments? (e.g. Accuracy of information)

Note: A preliminary landscape assessment is a specific requirement for a referral of a wind energy facility. This should provide a description of:

- The landscape character of the site and surrounding areas including landform, vegetation types and coverage, water features, any other notable features and current land use.
- The location of nearby dwellings, townships, recreation areas, major roads, above-ground utilities, tourist routes and walking tracks.
- Views to the site and to the proposed location of wind turbines from key vantage points (including views showing existing nearby dwellings and views from major roads, walking tracks and tourist routes) sufficient to give a sense of the overall site in its setting.

Soils

Is there a potential for effects on land stability, acid sulphate soils or highly erodible soils?

☐ NYD ☐ No ☒ Yes If yes, please briefly describe.

The area is mapped as having low potential for acid sulphate soils which is backed up by the results of a geotechnical study on the project area. Surface runoff will be dispersed and slowed as far as practically possible around the site, so that no higher storm runoff occurs within any natural or manmade waterway.

The Agricultural Assessment undertaken by Ag-Challenge Consulting (March 2022) indicates the concentration of runoff from the panels onto the soil surface may initiate soil erosion. Although, the Hydrology Assessment produced by Ecological Australia (September 2022) identifies that velocities across the site tend to be low and below the threshold where rock armouring to protect waterways and features is required. Should erosion occur, mitigation strategies will be implemented.

An annual review will be undertaken for the first five years of operation, following which additional measures to prevent soil loss can be introduced if required.

Based on this and mitigation measures proposed as part of the construction environmental management plan and operational management plan including a soil and erosion plan we would not expect any effects from the development on land stability or highly erodible soils.

Refer to the Agricultural Assessment (Attachment 17).

Are there geotechnical hazards that may either affect the project or be affected by it?

☐ NYD ☒ No ☐ Yes If yes, please briefly describe.

Other information/comments? (e.g. Accuracy of information)

15. Social environments

Is the project likely to generate significant volumes of road traffic, during construction or operation?

☐ NYD ☒ No ☐ Yes If yes, provide estimate of traffic volume(s) if practicable.

During construction the following vehicle movements are expected:

Vehicle Type	**Peak vehicle movements per day**	
	Daily	Peak hour
Light Vehicles	53	22
Medium and Heavy Rigid Vehicles	Variable based on the construction schedule	2
Articulated Vehicles	Variable based on the construction schedule	3
Oversized / Overmass vehicles	Variable based on the construction schedule	2

During operation, road traffic impacts will be negligible. While the facility is to operate 24 hours a day seven days a week, there is only expected to be one staff member on site during the day (between 9 AM and 5 PM) to carry out routine maintenance and cleaning. This staff member will access the site with a utility vehicle or van carrying maintenance or cleaning materials. The operational function of the site will be managed remotely in an offsite location.

Refer to the Traffic Impact Assessment (Attachment 10).

Is there a potential for significant effects on the amenity of residents, due to emissions of dust or odours or changes in visual, noise or traffic conditions?

☐ NYD ☒ No ☐ Yes If yes, briefly describe the nature of the changes in amenity conditions and the possible areas affected.

Project is assessed as having a low level of visual impact on surrounding sensitive viewpoints, primarily due to the limited number of sensitive viewpoints and the relative lack of visibility resulting from existing vegetation throughout the landscape and rising topography. The residual visual impact will typically reduce to very low after the establishment of amelioration measures Please see Appendix L for the visual impact assessment prepared by Urbis or the above sections, which provides a detailed assessment of glint and glare impacts.

Noise will be generated during the installation of the solar facility, by the machinery required on site to position and install the proposed equipment and to construct access tracks. Construction noise impacts will be subject to a construction management plan and construction will occur only within normal working hours.

A traffic impact assessment has been undertaken by Urbis (September 2022) and concludes, traffic from the proposed development will have a negligible impact on the surrounding road network during the operation stage.

A Construction Traffic Management Plan will be prepared prior to the issue of a Construction Certificate, detailing the construction trip generation and haulage routes.

Is there a potential for exposure of a human community to health or safety hazards, due to emissions to air or water or noise or chemical hazards or associated transport?

☐ NYD ☒ No ☐ Yes If yes, briefly describe the hazards and possible implications.

Urbis engaged the services of Norman Disney & Young (NDY) to provide an Acoustic Report outlining the acoustic assessment (February 2023) for the proposed solar farm against the requirements of the Noise from Industry in Regional Victoria (NIRV) guidelines. The report concludes that following a noise emission assessment, the proposal is compliant with NIRV limits and thus will not adversely impact community amenity and human health. Recommendations for treatment to protect potential impacts have also been provided and considered in the design of the solar farm.

Most the noise impacts will be created during the construction phase of the project. This will be due to the machinery needed to install the proposed equipment and build the appropriate access tracks. However, this will be managed by a construction management plan and will only occur within normal working hours.

Is there a potential for displacement of residences or severance of residential access to community resources due to the proposed development?

☐ NYD ☒ No ☐ Yes If yes, briefly describe potential effects.

There is an existing residence located on the site. The owner has signed a lease agreement with the solar farm developer and setbacks have also been provided from his property. A copy of the lease is attached as attachment 24.

Are non-residential land use activities likely to be displaced as a result of the project?

☐ NYD ☒ No ☐ Yes If yes, briefly describe the likely effects.

The Assessment outlines that the potential impacts to the agricultural amenity of the region or surrounding farm businesses are not significant. While cropping may no longer be practical with the development of a solar energy facility, with appropriate panel design, sheep are still be able to graze the land, thus retaining some of the current level of agricultural productivity. Therefore, agricultural productivity will be reduced, rather than lost.

We note, the proposed solar farm is considered to be entirely appropriate under the land use provisions of the Farming Zone (Clause 35.07). and the intent of the broader Greater Geelong Planning Scheme.

Please refer to the Agricultural Assessment at Attachment 17.

Do any expected changes in non-residential land use activities have a potential to cause adverse effects on local residents/communities, social groups or industries?

☐ NYD ☐ No ☒ Yes If yes, briefly describe the potential effects.

- Acoustic impacts from equipment and during construction
- Visual amenity impacts caused by new equipment and structures

Is mitigation of potential social effects proposed?

☒ NYD ☒ No ☒ Yes If yes, please briefly describe.

The proposal will not negatively impact upon the amenity of surrounding properties and agriculture uses. The passive nature of the solar farm once operational ensures limited noise pollution to neighbouring properties and visual impacts have been mitigated through landscaping screening measures.

NDY have conducted a noise emission assessment to determine if the predicted noise levels from the site are below the noise limits. The noise limit was determined as 34 dBA at night and 39 dBA in the evening/day periods in accordance with EPA publication 1826.4.This will include acoustic barriers installed around the BESS and some of the inverters. Measures to be implemented during construction to mitigate traffic and construction noise will be detailed in a CEMP.

Visual impacts are to be mitigated through the design of the facility, particularly the positioning of components and through provision of landscaping (refer to Section 14 of this Form for additional details).

Other information/comments? (e.g., accuracy of information)

Cultural heritage

Have relevant Indigenous organisations been consulted on the occurrence of Aboriginal cultural heritage within the project area?

☒ No If no, list any organisations that it is proposed to consult.

☒ Yes If yes, list the organisations so far consulted.

Wadawurrung Traditional Owner Aboriginal Corporation

What investigations of cultural heritage in the project area have been done?

(attach details of method and results of any surveys for the project & describe their accuracy)

Eco Logical Australia undertook a desktop assessment and a Standard Assessment.

The details of the Standard Assessment are as follows:

- A 9-day survey (15-16, 18 and 21-25 March 2022).
- A team of six (three archaeologists and three WTOAC representatives) undertook the assessment which included a foot-survey using a combination of
    - Survey of areas of archaeological potential identified in desktop assessment:
        - Surfaces along watercourses.
        - Exposures and outcrops on Granite hill landforms.
    - Pedestrian transects undertaken across broad landforms:
        - Flood plain.

- Volcanic plain.
- Stony outcrops.

- Systematic inspection of all identified exposures
- Examination of all mature indigenous trees.
- Checked for the presence of caves and rock shelters.
- Excavation of 26 manual auger probes.

A Complex assessment has also been undertaken with the following findings:

Summary of results
The findings to-date are in keeping with the outcomes of the standard assessment, with artefacts identified on the Granite Hills and locations in proximity to watercourses.

Row Labels	Landform	Number of pits completed	Sum of artefacts
IA-1	Volcanic Plain	68	142
IA-2	Drainage line	7	1
IA-3	Granite Hills	37	25
IA-4	Flood plain	40	2
IA-5	Stone Outcrops	3	0
Grand Total		**154**	**170**

The site and development area does not overlay with the Aboriginal Heritage Place identified in the schedule to the Heritage Overlay H0294.

In regard to historic heritage there is no intersection on impacts to historical heritage. The nearest items are on adjoining land parcels, and this is mapped in attachment 15 and 16. This shows they do not overlap with the site in anyway.

Is any Aboriginal cultural heritage known from the project area?

☒ NYD ☒ No ☒ Yes If yes, briefly describe:

- Any sites listed on the AAV Site Register.
- Sites or areas of sensitivity recorded in recent surveys from the project site or nearby.
- Sites or areas of sensitivity identified by representatives of Indigenous organisations.

The desktop assessment identified:

- A total of 405 registered Aboriginal cultural heritage places are located within the region, as defined by a 10km buffer around the activity area.
- Majority of these places contain stone artefacts (93%), as well as scarred trees, stone features, earth features, Aboriginal Ancestral Remains, Aboriginal Cultural Places, Aboriginal Historical Places and a quarry.
- Clustering of places is evident along major, small and ephemeral water ways in the region, notably Little River, Hovells Creek and Sandy Creek.
- Located within the site is VAHR 7722-0498 (FORD 1): An artefact scatter recorded in 2001 compromising an unspecified number of quartz flakes and chipped stone artefacts identified on ground surface.
- A total of six Aboriginal cultural heritage places are also located within 200 metres of the activity area boundary:
  - VAHR 7722-0036 (Mount Rothwell Burial): Multicomponent Place – Aboriginal Ancestral Remains (Burial) and Artefact Scatter.
  - VAHR 7722-1121 (Ford Proving Ground): LDAD.

- Four Object Collections comprising reburied artefacts collected as a part of CHMP 14184.

The Standard Assessment identified:

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

A Complex Assessment was then undertaken and the summary of findings is as follows:

Summary of results
The findings to-date are in keeping with the outcomes of the standard assessment, with artefacts identified on the Granite Hills and locations in proximity to watercourses.

Row Labels	Landform	Number of pits completed	Sum of artefacts
IA-1	Volcanic Plain	68	142
IA-2	Drainage line	7	1
IA-3	Granite Hills	37	25
IA-4	Flood plain	40	2
IA-5	Stone Outcrops	3	0
Grand Total		**154**	**170**

Refer to the Cultural Heritage Management Plan 18474 report and Preliminary Complex Testing Results (Attachment 28 and 29).

Are there any cultural heritage places listed on the Heritage Register or the Archaeological Inventory under the *Heritage Act 1995* within the project area?

☐ NYD ☐ No ☒ Yes If yes, please list.

Located within the site is VAHR 7722-0498 (FORD 1): An artefact scatter recorded in 2001 compromising an unspecified number of quartz flakes and chipped stone artefacts identified on ground surface.

Is mitigation of potential cultural heritage effects proposed?

☐ NYD ☐ No ☒ Yes If yes, please briefly describe.

Implement a minimum 50m to 400m setback from waterways to the development footprint and installation areas. Avoidance of all river terrace areas due to high sensitivity, as found during archaeological assessment, and supported by the RAP.

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 it is expected that the Complex Assessment fieldwork will be undertaken mid-2023 and CHMP can be considered for approval in Q3 of 2023.

Other information/comments? (eg. accuracy of information)

16. Energy, wastes & greenhouse gas emissions

What are the main sources of energy that the project facility would consume/generate?

☒ Electricity network. If possible, estimate power requirement/output …….

☒ Natural gas network. If possible, estimate gas requirement/output ……

☒ Generated on-site. If possible, estimate power capacity/output ……330MWP/530 sGWh

☒ Other. Please describe.

Please add any relevant additional information.

The facility would use electricity from the grid as part of its normal operation. However, as a solar farm the facility will generate substantially more power than it would consume.

What are the main forms of waste that would be generated by the project facility?

☒ Wastewater. Describe briefly.

There will be no on-site effluent disposal. The site will have a compost toilet for maintenance workers which will be maintained on a regular basis with any compost waste being disposed of off-site A small volume of wastewater would be produced when panels are periodically cleaned.

☒ Solid chemical wastes. Describe briefly.

☒ Excavated material. Describe briefly.

☒ Other. Describe briefly.

Please provide relevant further information, including proposed management of wastes.

Construction waste would be generated during construction however this would be recycled or disposed of appropriately, with the approach detailed a CEMP.

What level of greenhouse gas emissions is expected to result directly from operation of the project facility?

☒ Less than 50,000 tonnes of CO_2 equivalent per annum

☒ Between 50,000 and 100,000 tonnes of CO_2 equivalent per annum

☒ Between 100,000 and 200,000 tonnes of CO_2 equivalent per annum

☒ More than 200,000 tonnes of CO_2 equivalent per annum

Please add any relevant additional information, including any identified mitigation options.

The proposed land use seeks to provide a source of renewable energy for the surrounding area with no waste impacts as a result of its operation. CO_2 emissions generated during construction and operation will be offset by the renewable energy generated.

The Barwon Solar Farm represents one of the largest solar projects in Victoria to date. The facility alone will generate enough clean renewable energy to power the equivalent of approximately 98,000 homes annually, creating approximately150 jobs during construction and investing over

500 million dollars into regional Victoria and the Greater Geelong region. This large scale project will contribute significantly to Victoria's renewable energy generation targets (50% by 2030), aiding in the reduction of greenhouse gas emissions (net zero by 2050)

17. Other environmental issues

Are there any other environmental issues arising from the proposed project?

☒ No ☒ Yes If yes, briefly describe.

18. Environmental management

What measures are currently proposed to avoid, minimise or manage the main potential adverse environmental effects? (if not already described above)

☒ Siting: Please describe briefly

Site Selection – 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 Plains Grassland 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).

Avoidance

The proposed site layout of the solar facility demonstrates significant consideration has been given to avoiding the removal of native vegetation, including:

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.

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.

Minimise

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 negatively 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 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 revitalizes soils, restores grassland ecosystems and increases biodiversity while maintaining light agricultural production. Additionally, an integrated weed management plan along with a native enhancement strategy (i.e., via reseeding) has the potential to improve the ecological condition of the area while reducing the presence of noxious weeds that threaten to outcompete native communities that sustain threatened fauna species (see below section).

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.

Offset

In order to compensate for the loss to biodiversity from the removal of native vegetation offsets are required.

The applicant intends to satisfy additional offset requirements through the purchase of 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 could potentially 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. 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.

Restoration Ecologist Dr. Paul Gibson-Roy and the Biosis team have highlighted that weed control, in particular for introduced Needle Grasses, is the most pressing issue for the conservation of native grasslands at the proposed development site. For Serrated Tussock and Chilean Needle Grass the risk is that both 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:

- 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/sheep grazing and cropping use after the decommissioning of the solar farm, thus not comprising the long-term agricultural value of the land for the community.

In coordination with Biosis, the proposal will include a Grassland Earless Dragon Habitat Management Plan post-approval which will outline detailed actions to follow if the Grassland Earless Dragon is discovered during pre-construction surveys or incidentally during construction. Some of the action points will include, but may not be limited to:

- The introduction of controlled well-managed grazing for grassland maintenance. 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 use of pesticide. 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 island of grassland and reduce habitat fragmentation.

☒ Design: Please describe briefly

The design has avoided the majority of the Plains Grassland 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).

Several design iterations were 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. The following features were prioritised for avoidance:

- Creek line 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 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 DEECA 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).

☒ Environmental management: Please describe briefly.

- Preparation of management plans
- No-go areas / no works in avoidance areas including the installation of appropriate exclusion fencing around trees and vegetation to be retained:
    - Appropriate signage such as 'No Go Zone' or 'Environmental Protection Area' should be installed.
    - Identify the location of any 'No Go Zones' in site inductions.
    - Fencing should be star pickets with high visibility bunting, or temporary fencing.
    - All works should be conducted from the existing tracks or road surface.
- All material stockpiles, vehicle parking and machinery storage will be located within cleared areas or areas proposed for clearing.
- A licenced wildlife salvage team should be onsite during tree removal to catch and relocate (if appropriate) any wildlife encountered in hollow bearing trees.
- Dust suppression / soil erosion/sedimentation
    - Dust suppression measures should be implemented during construction.
    - Implementation of temporary stormwater controls during construction is necessary to ensure that discharges are consistent with existing conditions and adhere to Environmental Reference Standards.
    - Sediment and erosion control measures should be implemented prior to construction works commencing (e.g., silt fences, sediment traps), to prevent runoff into watercourses and drainage lines. These should conform to relevant guidelines, should be maintained throughout the construction period and should be carefully removed following the completion of works.
    - Sediment controls should be monitored weekly or after rainfall events.

- Weed control on site: All fill, soil or rocks transported on site should be weed and pathogen free and all vehicles operating on site should be washed down prior to works commencing. 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.
- Pathogen control: Develop and implement protocols to prevent the introduction of any pathogens.
- 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.

☒ Other: Please describe briefly

Add any relevant additional information.

19. Other activities

Are there any other activities in the vicinity of the proposed project that have a potential for cumulative effects?

☒ NYD ☒ No ☒ Yes If yes, briefly describe.

Surrounding sites are predominantly agricultural sites and therefore would be expected to have minimal environmental impacts in the context of this referral, however the following is noted:

- There may be acoustic and air quality impacts emanating from the Ford Proving Ground southwest of the site.

- The closest solar farm to the proposed site is in Anakie, a proposed 5MW solar farm on an 11ha site, which is currently under assessment, and would be located at 1435-1475 Ballan Road, Anakie (9km away).

20. Investigation program

Study program

Have any environmental studies not referred to above been conducted for the project?

☐ No ☒ Yes If yes, please list here and attach if relevant.

The full list of relevant environmental studies are:

Fire Risk Assessment (ELA, April 2023 - attachment 12.)

A list of all attachments provided can be found at the end of this document.

Has a program for future environmental studies been developed?

☒ No ☐ Yes If yes, briefly describe.

No future environmental studies are proposed prior to planning permit being issued, other than cultural heritage fieldwork. Management plans would be prepared following issue of a planning permit including any preclearance surveys (including target surveys for Grassland Earless Dragon) and surveys required for Fauna Translocation and relocation, Vegetation removal and rehabilitation. This will occur prior to construction commencing.

Consultation program

Has a consultation program conducted to date for the project?

☐ No ☒ Yes If yes, outline the consultation activities and the stakeholder groups or organisations consulted.

The table below summarises the consultation undertaken.

Stakeholder	Engagement objective	Forms of engagement
Local Councils, specifically: City of Greater Geelong Council	**Consult:** Obtain feedback on the proposal by providing balanced and objective information to assist in understanding the proposal's impacts and benefits	• Phone • Direct emails

Relevant agencies • Department of Environment, Land, Water and Planning Development Approvals and Design - Renewables team . • Country Fire Authority (CFA) Rural water corporations: • Southern Rural Water Urban Water Corporation: • Barwon Water • Port Philip and Western Port Catchment Management Authority • Melbourne Water	Consult: Obtain feedback on the proposal and understand how the proposal may impact each agencies' service.	• Phone • Direct emails • Virtual meetings
Landowners and land users • Traditional Custodians • RAP	Consult: Obtain feedback on the proposal by providing balanced and objective information to assist in understanding the proposal's impacts and benefits.	• Virtual Meetings • Face to Face meetings • Email
Community, landowners and land users, including: • Existing land occupiers • Direct neighbours	Involve: Working directly with near neighbours throughout the planning process to ensure all concerns and aspirations and continually understood and considered by Elgin Energy.	• Face to face meetings • Virtual meetings • Community newsletter • Direct emails • Phone calls • Community information drop in sessions
Broader community, specifically: • All the people who live within the Little River postcode area (postcode: 3211) • All the people who live within the Balliang postcode area (postcode: 3340).	Consult: Obtain feedback on the proposal as they may be interested in visual impact, traffic associated with construction, environmental impacts.	• Community newsletter • Community information drop in sessions
• Environmental groups / organisations: • Brisbane Rangers Landcare Group • Little River Community Landcare group • Mt Rothwell Interpretation Centre	Consult: Obtain feedback on the proposal.	• Face to face meetings • Direct emails • Phone calls • Community information drop in sessions
Businesses / organisations located in the Town of Little River, specifically:	Consult: Obtain feedback on the proposal as they may be interested in visual impact, traffic associated with	• Direct email • Community newsletter • Community information drop in sessions

• Little River Mechanics Institute Hall • Charitable Society • Little River General Store (Ampol & Post Office) • Rothwell Run • XLB Group Pty	construction, environmental impacts.	
Local schools: • Little River Primary School	Consult:: Obtain feedback on the proposal.	• Community newsletter • Community information drop-in sessions
Community groups • Town of Little River – Facebook page • Lions Club of Little River • Little River Historical Society	Consult: Obtain feedback on the proposal.	• Direct email • Community newsletter • Community information drop in sessions

Further details are provided in the Community and Stakeholder Engagement Outcomes Report (Attachment 20).

Has a program for future consultation been developed?

☐ NYD ☐ No ☒ Yes If yes, briefly describe.

The project developer will continue to keep stakeholders and the community informed of the project approval process and, if approved, pre-construction, construction and operation phases by:

- Continuing to engage with the community about the project, its impacts, and the approval process
- Providing information through a letterbox drop on how the community's views have been addressed
- Enabling the community to seek clarification about the project through the two-way communication channels.

Further details are provided in Section 5 of the Community and Stakeholder Engagement Outcomes Report (Attachment 20).

Consultation with the Wadawurrung Traditional Owner Aboriginal Corporation will also continue throughout the development of the project.

Authorised person for proponent:

I, Tim Averill (full name),

Managing Director, Elgin Energy Pty Ltd (position), confirm that the information contained in this form is, to my knowledge, true and not misleading.

Signature: 

Date: 6 October 2023

Person who prepared this referral:

I, Jonathan Mills (full name),

Director, Urbis Pty Ltd (position), confirm that the information contained in this form is, to my knowledge, true and not misleading.

Signature:

Date: 6 October 2023

Attachments

1. Titles Map
2. Location Plan
3. Regional Context plan
4. Town Planning Report
5. Detailed Site plan (a,b,c)
6. Elevation and Signage Plan
7. Noise Assessment
8. Hydrology Assessment
9. Native Vegetation Removal Report
10. Transport Impact Assessment
11. LVIA
12. Fire Risk Assessment
13. Materials and Finishes Schedule
14. Landscape strategy
15. Heritage Overlay 294
16. Heritage Overlay 295
17. Agricultural Assessment
18. Hydrology Assessment
19. Flora And Fauna Assessment
20. Community and Stakeholder Engagement Outcome Report
21. Offset Strategy
22. Vegetation Mapping
23. EES Referral Cover Letter
24. Lease agreement
25. Photo _ habitat Zones
26. Photo – Trees
27. Standard assessment
28. CHMP 18474

References

Beatty, B., Macknick, J., McCall, J. & Braus, G. Native Vegetation Performance under a Solar PV Array at the National Wind Technology Center. Technical Report. NREL. U.S Department of Energy (2017).
Guerin, T. A case study identifying and mitigating the environmental and community impacts from construction of a utility-scale solar photovoltaic power plant in eastern Australia. Solar Energy, 146, pp.94–104 (2017). https://doi.org/10.1016/j.solener.2017.02.020.
Kannenberg, S.A., Sturchio, M.A., Venturas, M.D. et al. Grassland carbon-water cycling is minimally impacted by a photovoltaic array. Commun Earth Environ 4, 238 (2023). https://doi.org/10.1038/s43247-023-00904-4
Semchenko, M., M. Lepik, L. Götzenberger, and K. Zobel. Positive Effect of Shade on Plant Growth: Amelioration of Stress or Active Regulation of Growth Rate? Journal of Ecology 100 (2): 459–66 (2012).