

Theodore Wind Farm

NOTICE OF PUBLICATION OF DRAFT PUBLIC ENVIRONMENT REPORT
INVITATION FOR PUBLIC COMMENT

Theodore Energy Development Pty Ltd (the Proponent) proposes to construct, operate and decommission the Theodore Wind Farm (the Project). This will involve up to 170 wind turbine generators and associated ancillary infrastructure. The Theodore Wind Farm is in the Banana Shire region of Queensland, approximately 22 kilometres (km) east of Theodore, 50 km west of Biloela and 150 km south-west of Gladstone.

The Project (EPBC 2024/09842) was determined a controlled action under the Environment Protection and Biodiversity Conservation Act 1999 (the Act), with assessment by Public Environment Report.

The controlling provisions are:

- Sections 18 and 18A: Listed threatened species and ecological communities
- Sections 20 and 20A: Listed migratory species
- Sections 12 and 15C: World Heritage values of a declared World Heritage property
- Sections 15B and 15C: National Heritage values of a National heritage place
- Sections 24B and 24C: The environment in the Great Barrier Reef Marine Park

Pursuant to Section 98(1)(c) of the Act, the draft Public Environment Report is available for public viewing at no cost online at www.theodorewindfarm.com.au, or in hard copy at the following locations:

Banana Shire Council: 62 Valentine Plains Road,Biloela, QLD Australia 4715

Banana Shire Library & Information Services: 71 Grevillea St, Biloela QLD 4715

State Library of Queensland: Stanley Place, South Brisbane, QLD 4101

The draft Public Environment Report may be obtained in hard copy or digital format at no cost from the Proponent upon request, using the contact details below.
Interested persons and organisations are invited to submit comments in writing on the draft Public Environment Report via:

Post:
Theodore Energy Development Pty Ltd
Suite 5, Level 9, 350 Collins Street
Melbourne VIC 3000

Email: theodorewindfarm@rwe.com

The public comment period is for 20 business days and commences on 8 April 2026 at 8am and closes on 6 May 2026 at 5pm. All times are Australian Eastern Standard Time.

Persons with special needs (including those for whom English is a second language or those with a vision impairment) may contact the Proponent for assistance in accessing the documentation on 1800 879 435 or theodorewindfarm@rwe.com

Find out more

1800 879 435

theodorewindfarm@rwe.com

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Theodore Wind Farm

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Australian Government
Department of Climate Change, Energy, the Environment and Water

EPBC 2024/09842

Heidi Creighton
Head of Onshore Wind
Theodore Energy Development Pty Ltd

theodorewindfarm@rwe.com

Direction to publish public environment report – Theodore Wind Farm

Dear Heidi Creighton

On 9 July 2024, a delegate of the Minister for the Environment and Water (the minister) decided that the proposed Theodore Wind Farm (the proposed action) is a controlled action. Under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), further assessment is needed before a decision can be made on whether approval can be granted. On 9 July 2024 it was determined under section 87 of the EPBC Act that the proposed action would be assessed by public environment report (PER).

On 9 August 2024, a delegate of the minister gave you tailored guidelines for the preparation of a draft PER about the relevant impacts of the proposed action, because standard guidelines were not appropriate for the preparation of the draft PER.

I have considered the draft PER you submitted to the department on 1 April 2026 and determined that it is in accordance with the PER guidelines. As a delegate of the minister, I have therefore decided to approve the publication of the draft PER under section 98(1)(b) of the EPBC Act.

Publication requirements

On 1 April 2026, you provided the department with your intended notice inviting public comments on the draft PER. I have determined that this notice meets the requirements of the EPBC Act and the *Environment Protection and Biodiversity Conservation Regulations 2025* (EPBC Regulations). You must now publish this notice, inviting public comment for 20 business days, in accordance with the requirements of section 16.03 and 16.04 of the EPBC Regulations, namely:

- at an appropriate location on the internet;
- in a national and state daily newspaper that circulates in the state or territory in which the action occurs; and
- if practical, in regional newspapers that circulate in any regions of Australia where the action is likely to have a significant impact on a matter protected by a provision of Part 3 of the EPBC Act.

In publishing this material, you must:

- give 2 copies of the material to:
    - at least 1 local authority, or at least 1 local or regional library, for the area where the action is likely to have a significant impact on a matter protected by a provision of Part 3 of the EPBC Act.
    - a state government authority responsible for environmental protection, or a state library, in the state where the action is likely to have a significant impact on a matter protected by a provision of Part 3 of the EPBC Act.
- ask the authority or library to display the material publicly.

Consultation with First Nations people

You may need to consult with First Nations people and communities throughout this process. Please refer to our First Nations engagement guidelines for more information on how and when to engage with First Nations people and communities.

Finalisation of PER after public comment period

Public comments will come directly to you so that you can address any issues raised. After the end of the period specified for public comment, you must finalise the draft PER. Please ensure the final PER takes into account any comments received within the period for public comment and contains a summary of all comments and how they have been addressed.

As soon as practicable after finalising the PER, you must give the department:

- the finalised PER; and
- a copy of any comments received
- if no comments were received within that period – a written statement to that effect.

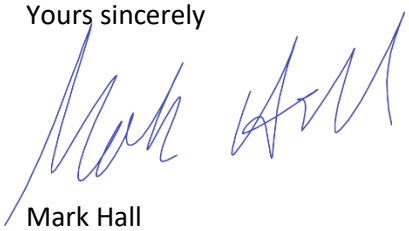
Within 10 business days after you have given the department the above documents, you must publish the finalised PER in accordance with the EPBC Regulations.

Cost recovery

Your assessment is subject to cost recovery. Before stage 3 occurs, you will be provided with a fee schedule that sets out the actual amount payable for each application component of the complexity fee (the Part B complexity fee).

If you have any questions about the assessment process or this decision, please contact the project manager, Kellie Jay by email to kellie.jay@dcceew.gov.au, or telephone (02) 6162 1591, and quote the EPBC reference number at the top of this letter.

Yours sincerely



Mark Hall
Director
Queensland North Assessments

1 April 2026

Theodore Wind Farm

Public Environment Report – Executive Summary

PREPARED FOR

Theodore Energy Development Pty Ltd

DATE
28 February 2026

REFERENCE
0661076



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SIGNATURE PAGE

Theodore Wind Farm

Public Environment Report – Executive Summary

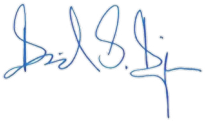
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ACRONYMS AND ABBREVIATIONS

Acronym	Description
BESS	Battery Energy Storage System
BHT	Broad Habitat Types
CHMP	Cultural Heritage Management Plan
DCCEEW	Department of Climate Change, Energy, the Environment and Water
Disturbance Footprint	The area whereby the final layout and impacts have been considered and occupies an area of 1,590.1 ha.
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
ERM	Environmental Resources Management Australia Pty Ltd
Met Mast	Meteorological Mast
MNES	Matters of National Environmental Significance
MW	Megawatts
PER	Public Environment Report
Proposed Action	Theodore Wind Farm
Proponent	Theodore Energy Development Pty Ltd
Project Area	The corridor of land on which the Disturbance Footprint will be located, including a 100 metre buffer for micro-siting.
SIG 1.1	*Significant Impact Guidelines 1.1 – Matters of National Environmental Significance*
Study Area	The 9 land parcels, across 3 properties, and road reserve areas, 46,830 ha, in which the Proposed Action will be located.
WTG	Wind Turbine Generator

EXECUTIVE SUMMARY

INTRODUCTION

Theodore Energy Development Pty Ltd (the Proponent) is proposing to develop the Theodore Wind Farm (Proposed Action) approximately 22 kilometres (km) east of the township of Theodore, 50 km west of Biloela and 150 km south-west of Gladstone, in the Banana Shire Council Local Government Area. Once operational, the Proposed Action will have the capacity to provide 1,054 megawatts (MW) of clean, renewable energy, supporting the progress toward time-critical, State and National decarbonisation objectives.

PURPOSE OF PER

The Proposed Action was referred to the Department of Climate Change, Energy, the Environment and Water (DCCEEW) with a valid referral published on 11 June 2024 (2024/09842). Following assessment of the referral, a controlled action decision was made on 09 July 2024. The assessment approach was confirmed to be by Public Environment Report (PER), and the PER Guidelines published on 09 August 2024.

The purpose of this PER is to provide adequate information to the Minister on the potential impacts of the Proposed Action in relation to Matters of National Environmental Significance (MNES) to meet Commonwealth legislative requirements. The relevant controlling provisions protected under Part 3 of the EPBC Act, associated with the Proposed Action include:

- Listed threatened species and ecological communities (s18 & s18A);
- Listed migratory species (s20 & s20A);
- Work Heritage values of a declared World Heritage property (s12 & s15C);
- National Heritage values of a National heritage place (s15 B & s15C); and
- The environment in the Great Barrier Reef Marine Park (s24B & s24C).

A full introduction, description of the action and assessment of feasible alternatives can be found in Section 1 – 3 of the Theodore Wind Farm PER.

DESCRIPTION OF PROPOSED ACTION

The Study Area is the land/properties, and road reserve areas, containing the Proposed Action and is located within the Rural Zone of the Banana Shire Council, with the predominant land use being cattle grazing (and associated homesteads). The Study Area consists of three working cattle enterprises, and as such, the landscape has been influenced by historical land clearing, with large areas of cleared land featuring no remnant vegetation or regrowth vegetation. In the north-east, the area is dominated by *Eucalyptus crebra* woodland and open woodland, with a modified ground layer due to grazing and presence of introduced flora species. The surrounding landscape within the locality (10 km) has also been influenced by historical land clearing and cattle grazing. The Study Area is approximately 46,830 hectares (ha) in size.

The location and design of the Proposed Action within the Study Area have been designed and refined through consideration of technical, environmental, social, and commercial constraints. The Proposed Action is proposed to consist of up to 170 Wind Turbine Generators (WTGs) with the following associated infrastructure:

- WTG foundations and hardstand areas;
- Temporary infrastructure such as concrete batching plants, laydown areas, temporary construction offices and parking and on-site accommodation;
- Access tracks and electrical reticulation;
- Switching stations and substations;
- Battery Energy Storage Systems (BESS);
- Temporary and permanent meteorological masts; and
- Permanent operation and maintenance facilities, with a variety of associated facilities and storage laydowns.

The Project Area, which includes a 100 metre (m) buffer for micro-siting occupies an area of 6,674.9 hectares (ha). The Disturbance Footprint, area whereby the final layout and impacts have been considered, occupies 1,590.1 ha or 3.4% of the total Study Area. The Proponent is committed to extensive rehabilitation activities, and a significant portion of this disturbance will be rehabilitated or progressively restored. The permanent impact (Operations Footprint) will occupy an area of 559.7 ha, or 1.2% of the total Study Area.

The WTGs have an expected operating life of up to 35 years, at the end of which there are three main options for consideration:

- Continue the use of the Study Area as a wind farm using the existing WTGs (subject to condition of equipment);
- Replace the WTGs with technology current at that time and continue the use of the Study Area as a wind farm for a further term; or
- Decommission the Proposed Action and remove the WTGs and ancillary infrastructure in accordance with a Decommissioning Plan prepared for the Proposed Action.

Where decommissioning occurs, the Study Area will be returned, as far as practicable, to its condition prior to the commencement of construction.

Table E-1 details the phases of development associated with the Proposed Action.

TABLE E-1 PHASES OF DEVELOPMENT

Phase	Associated Activities	Duration
Design	The key activities associated with the design phase of the Proposed Action are: • Desktop review of key habitat and environmental areas on Study Area; • Disturbance Footprint mapping; • Ecological surveys to ground truth onsite vegetation and habitat; • Mapping of constraints applicable to the Study Area and Proposed Action; • Technical engineering to determine appropriate locations for infrastructure while avoiding, minimising and mitigating impact to high value ecological areas; • Ongoing consultation with relevant stakeholders; and • Obtained consent from Landowners, Traditional Owners, government and transmission network services.	Ongoing, commenced in 2021, to be finalised in 2026
Construction	The key activities likely to impact ecological resources during construction are:	~36-60 Months

Phase	Associated Activities	Duration
	• Vegetation clearing for new access tracks, temporary construction compounds and laydown areas, borrow pits, water storages, concrete batching plants, turbine pads, trenches for power and instrumentation cables, electrical substation and overhead powerlines, and associated earthworks; • Excavating trenches; • Blasting for turbine foundations (if required); and • Construction traffic movement and plant operations (rock crushing and concrete batching plant).	
Commissioning and Post-Construction Rehabilitation	Testing, in line with Australian Energy Market Operator Standards. The intention of post-construction rehabilitation is to progressively stabilise areas of disturbance, making them resilient to erosion and weed infestation, and to re-establish appropriate vegetation cover. Rehabilitation of on-ground vegetation will be managed through an adaptive management to ensure rehabilitation acceptance criteria are met.	~ 24 months
Operations	Operational phase activities are anticipated to be of an indirect nature, of lower frequency, and smaller intensity, but will last the lifetime of the Proposed Action. Potential impacts during the operational phase include: • WTG operation; and • Routine maintenance and servicing of WTGs, access tracks, electrical installations and infrastructure as required.	Up to 35 years
Decommissioning	If a decision was taken to decommission the Proposed Action, this would involve: • Dismantling and removal of WTGs; • Removal of electrical reticulation where not part of permanent network infrastructure; • Responsible disposal/recycling/reuse of infrastructure removed from the Study Area in according to the waste hierarchy; and • Rehabilitation of disturbed land in accordance with industry standard good practices at the time and where not required for ongoing grazing or agricultural uses. Underground cabling would be left in situ. Hardstand pads would be left in situ or deep ripped where rehabilitation is required. Turbine foundations may be left up to 500 mm below rehabilitated ground level as they do not present a risk to people or livestock. Excavations would be backfilled and rehabilitated. Access tracks could be retained on site for the continued benefit of the landholder, or they could be rehabilitated.	~5 years

DESCRIPTION OF THE ENVIRONMENT

The Study Area is the land/properties, and road reserve areas, containing the Proposed Action and is located within the Rural Zone of the Banana Shire Council, with the predominant land use being cattle grazing (and associated homesteads). The Study Area consists of three working cattle enterprises, and as such, the landscape has been influenced by historical land clearing, with large areas of cleared land featuring no remnant vegetation or regrowth vegetation. In the north-east, the area is dominated by *Eucalyptus crebra* woodland and open woodland, with a modified ground layer due to grazing and presence of introduced flora species. The surrounding landscape within the locality (10 km) has also been influenced by historical land clearing and cattle grazing. The Study Area is approximately 46,830 hectares (ha) in size.

Ten field investigations have been undertaken across the Study Area between October 2022 and February 2026 (Table E-2) to identify the presence or potential presence of Matters of

National Environmental Significance (MNES). The methods included a desktop review to identify ecological values that may be present, which informed the design of a comprehensive field survey and sampling program to collect field data and describe on-ground conditions and values. The field surveys design and implementation considered the requirements of State Code 23: Wind Farm Developments, the Department of Climate Change, Energy, the Environment and Water (DCCEEW) *Onshore wind farm guidance - best practice approaches when seeking approval under Australia's national environment law* as well as contemporary species specific survey guidelines, conservation and listing advices, and recovery plans where relevant. This data was used to describe on-ground conditions and to assess the known, likely, and potential occurrence of MNES, and their habitat, within the Study Area.

TABLE E-2 SUMMARY OF FIELD SURVEYS UNDERTAKEN IN THE STUDY AREA

Date	Summary	Techniques
17 – 22 October 2022	Four ecologists, six days	• Vegetation and habitat assessment • Targeted fauna surveys • Bird surveys • Bat surveys
13 – 17 February 2023	Two ecologists, five days	• Bird surveys • Bat surveys
27 – 31 March 2023	Four ecologists, five days	• Vegetation and habitat assessment • Targeted fauna surveys • Bird surveys
5 – 9 June 2023	Four ecologists, five days	• Vegetation and habitat assessment • Targeted fauna surveys • Bird surveys
25 September – 13 October 2023	Four ecologists, five days	• Habitat quality assessments • Bird surveys
4 – 8 December 2023	Two ecologists, five days	• Bird surveys
19 – 23 February 2024	Two ecologists, five days	• Bird surveys
10 – 14 June 2024	Four ecologists, four days	• Vegetation assessment • Habitat quality assessment • Bird surveys
23 – 28 September 2024	Four ecologists, six days	• Habitat quality assessments • Targeted flora transects • Habitat assessments • Targeted fauna surveys
17 – 21 February 2026	Four ecologists, five days	• Habitat quality assessments • Quaternary assessments • Targeted fauna surveys

The ecological condition of the Study Area is influenced by historical land clearing and cattle grazing, with large areas of cleared land featuring no remnant vegetation or regrowth vegetation.

No protected areas occur within the boundary of the Study Area, however, the following State Forests are located within the Locality (10 km):

- The Belmont State Forest is located adjacent to the northern boundary of the Study Area and has an area of approximately 8,550 ha;
- The Montour State Forest is located adjacent to the eastern boundary of the Study Area and has an area of approximately 4,222 ha;
- The Camboon State Forest is located adjacent to the southern boundary of the Study Area and has an area of approximately 11,874 ha; and
- The Trevethan State Forest is located approximately 3 km south of the Study Area and has an approximate area of 3,618 ha.

The Study Area is broadly connected to the surrounding landscape and vegetation by a state-mapped terrestrial corridor associated with the Banana Range running north to south from Mt Benn to Trevethan State Forest. The north and western parts of the Study Area are generally cleared, and dominated by open grassland (native and introduced) communities.

The Study Area has been classified into six broad habitat types (BHT), defined based on the vegetation community type and structure:

- Grasslands and cultivated agricultural land;
- Waterbodies and drainage features;
- Riparian woodland and open forest dominated by *E. populnea*, *E. tereticornis* often associated with stream channels;
- Vine Forest/Thickets and Dry Rainforest;
- Eucalypt woodland and open forest dominated by *E. crebra* with a grassy understorey; and
- Brigalow woodlands.

The habitats in the Study Area are generally in a low to moderate condition, with signs of degradation and fragmentation due to cattle grazing, dieback, erosion, and the presence of introduced flora species. Where there are areas of higher quality habitat in a remnant condition, these are in discrete patches and sections of the Study Area. The dominant BHT across the Study Area is grassland and cultivated agricultural land, accounting for almost half of the Study Area.

A full description of the environment can be found in Section 4 of the Theodore Wind Farm PER.

MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

As described above, following detailed desktop investigations, and a comprehensive field campaign across 10 separate survey events, the MNES relevant to the Study Area are summarised in Table E-3. The table summarises the MNES known, likely and with potential to occur in the Study Area. Although there are no recent records of those species with the potential to occur within the Study Area or Locality, and no observations were made during field surveys, their potential future presence cannot be ruled out due to an overlap of distribution and potential general habitat within the Study Area.

TABLE E-3 MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE IN THE STUDY AREA

Matter	Relevance to the Study Area
World heritage properties	There are no world heritage properties within the Study Area.

Matter	Relevance to the Study Area
National heritage properties	There are no national heritage properties within the Study Area.
Wetland of international importance	There are no wetlands of international importance associated with the Study Area.
Threatened species and ecological communities	The PMST identified five EPBC Act listed TECs with potential to occur within the Study Area. Based on in-situ ground-truthing via completion of quaternary vegetation assessments and BioCondition transects, as well as desktop assessment of aerial imagery, **two** TECs have been considered known to occur: • Poplar Box Grassy Woodland on Alluvial Plains (Poplar Box TEC); and • Brigalow (*Acacia harpophylla* dominant and co-dominant) (Brigalow TEC). Based on direct observations of species or species habitat during targeted field surveys, **four** EPBC Act listed threatened species have been concluded as known or likely to occur. • Squatter pigeon (southern) (*Geophaps scripta scripta*) - listed as Vulnerable under the EPBC Act (known); • Koala (*Phascolarctos cinereus*) - listed as Endangered under the EPBC Act (known); • Greater glider (southern and central) (*Petauroides volans*) - listed as Endangered under the EPBC Act (known); and • Large-eared pied bat (*Chalinolobus dwyeri*) – listed as Endangered under the EPBC Act (likely). **Five** additional EPBC Act listed fauna species are considered to have the potential to occur, due to the presence of general habitat for these species observed within the Study Area and recent records in the Locality, including: • Black-breasted buttonquail (*Turnix melanogaster*), listed as Vulnerable under the EPBC Act; • White-throated needletail (*Hirundapus caudacutus*), listed as Vulnerable under the EPBC Act; • Australian painted snipe (*Rostratula australis*), listed as Endangered under the EPBC Act; • Diamond firetail (*Stagonopleura guttata*) listed as Vulnerable under the EPBC Act; and • Yellow-bellied glider (south-eastern) (*Petaurus australis australis*) listed as Vulnerable under the EPBC Act. No listed flora species have been assessed as known or likely to occur within the Study Area. Based on survey effort and habitat suitability, **six** listed threatened flora species have been assessed as having the potential to occur: • Ooline (*Cadellia pentastylis*), listed as Vulnerable under the EPBC Act; • Cossinia (*Cossinia australiana*), listed as Endangered under the EPBC Act; • Austral Cornflower (*Rhaponticum australe*), listed as Vulnerable under the EPBC Act; • *Solanum dissectum*, listed as Endangered under the EPBC Act; • *Solanum johnsonianum*, listed as Endangered under the EPBC Act; and • *Xerothamnella herbacea*, listed as Endangered under the EPBC Act.
Migratory species	There are **two**[1] listed migratory species under the EPBC Act regarded as having the potential to occur within the Study Area: • Fork-tailed swift (*Apus pacificus*); and • White-throated needletail (*Hirundapus caudacutus*).
Commonwealth marine area	There are no Commonwealth marine areas within the Study Area.

Matter	Relevance to the Study Area
The Great Barrier Reef Marine Park	The Great Barrier Reef is not associated with the Study Area, however information relevant to assess the potential impacts of the Proposed Action on the Great Barrier Reef is provided in Section 5.
Nuclear actions	Not Applicable
Water resources	Not Applicable

[1]Satin flycatcher (*Myiagra cyanoleuca*) and rufous fantail (*Rhipidura rufifrons*) were originally included in the referral information and assessed for potential impacts of the Proposed Action. Following recent changes to the EPBC Act Migratory Species list, these de-listed species no longer require assessment under the EPBC Act as MNES and are therefore not assessed as part of this PER.

A full assessment of MNES within the Study Area can be found in Section 5.

IMPACT IDENTIFICATION, AVOIDANCE, MITIGATION AND MANAGEMENT

The Proposed Action has the potential to impact on ecological values in the Study Area during the construction, operation and decommissioning phases. The following direct and indirect impacts associated with the Proposed Action have been identified:

- Vegetation clearance, habitat loss and individual mortality;
- Habitat fragmentation and patch isolation;
- Prevalence of invasive plants;
- Vehicle impacts;
- Fire regimes and bushfire risk;
- Altered hydrology;
- Environmental pollution and hazardous materials;
- Individual mortality and injury from turbine collision and barotrauma;
- Site alienation;
- Cumulative impacts; and
- Climate change.

The Proponent is committed to avoiding, minimising, mitigating and managing potential impacts to MNES within the Disturbance Footprint and broader Study Area.

The EPBC Act mitigation hierarchy is a tool that is used to limit the amount of damage an action, such as a development, will have on the environment. The three tiers of the hierarchy, which must be followed preferentially from first to last and explored in full before moving on to the next, are:

1. Avoid
2. Mitigate
3. Offset

The Proponent has endeavoured to follow the mitigation hierarchy, and has proposed avoidance and mitigation measures relevant to each stage of the Proposed Action.

Since the conception of the Proposed Action, the design of the Disturbance Footprint has evolved with consideration of technical, environmental, social, and commercial constraints. Initial reviews determined that the Study Area has the maximum capacity to host up to 260 WTGs. A Draft Disturbance Footprint was designed to host up to 260 WTGs and associated

infrastructure. The design of the Disturbance Footprint was refined to be up to 170 WTGs to minimise impacts to sensitive ecological areas, minimise potential visual impacts to surrounding dwellings and maximise commercial output.

Specific Management Plans have been developed with the aim to manage and mitigate impacts to MNES. These management plans are attached to this PER and include:

- Bird and Bat Management Plan (Appendix D);
- Preliminary Vegetation and Fauna Management Plan (Appendix G); and
- Construction Environmental Management Plan (Appendix H).

More general management plans that will be developed for the Proposed Action and are likely to include relevant measures outlined in species-specific management plans and include:

- Construction Environmental Management Plan;
- Bushfire Management Plan; and
- Operational Environmental Management Plan.

A full description of the avoidance, mitigation and management measures can be found in Section 7 of the Theodore Wind Farm PER.

SIGNIFICANT IMPACT ASSESSMENTS

Potential impacts from the Proposed Action to MNES have been assessed against the *Significant Impact Guidelines 1.1 – Matters of National Environmental Significance* (SIG 1.1). These significant impact assessments (SIA) have been completed assuming the proposed avoidance, minimisation, mitigation and management measures will be implemented. The results of the SIAs are summarised below in Table E-4.

TABLE E-4 SUMMARY OF MNES SIGNIFICANT IMPACT ASSESSMENT

MNES	Likelihood of Occurrence	Significant Residual Impact
Threatened Ecological Communities		
Brigalow TEC	Known	**Unlikely**
Poplar Box TEC	Known	**Likely**
Listed Threatened Species		
Greater glider (southern and central)	Known	**Likely**
Yellow-bellied glider (south-eastern)	Potential	**Unlikely**
Koala	Known	**Likely**
Large-eared pied bat	Likely	**Unlikely**
Squatter Pigeon (southern)	Known	**Likely**
White-throated needletail	Potential	**Unlikely**
Black-breasted buttonquail	Potential	**Unlikely**
Australian painted snipe	Potential	**Unlikely**
Diamond firetail	Potential	**Potential**
Ooline	Potential	**Unlikely**

MNES	Likelihood of Occurrence	Significant Residual Impact
Cossinia	Potential	**Unlikely**
Austral cornflower	Potential	**Unlikely**
Solanum dissectum	Potential	**Unlikely**
Solanum johnsonianum	Potential	**Unlikely**
Xerothamnella herbacea	Potential	**Unlikely**
Migratory Species		
Fork-tailed swift	Potential	**Unlikely**

A full assessment of potential impacts associated with the Proposed Action can be found in Section 6.

REHABILITATION

Following the completion of construction as well as at the end-of life decommissioning phase, areas not required for ongoing operational disturbance will be rehabilitated and or regenerated in accordance with rehabilitation management practices established in Section 8 of the PER and where not required for ongoing grazing or agricultural practices.

In both cases, the intention is to progressively stabilise areas of disturbance, making them resilient to erosion and weed infestation, and to re-establish appropriate vegetation cover. Rehabilitation of on-ground vegetation will be managed through an adaptive management to ensure rehabilitation acceptance criteria are met.

A full description of rehabilitation can be found in Section 8 of the Theodore Wind Farm PER.

OFFSETS

As identified in Table 0-3, the Proposed Action is likely to have a Significant Residual Impact on the following MNES:

- Poplar Box TEC;
- Greater glider (southern and central);
- Koala; and
- Squatter Pigeon (southern).

Additionally, the Proposed Action has the potential to have a Significant Residual Impact on diamond firetail.

A Draft Offset Management Plan has been developed and provided as Appendix F. Offsets for bird and bat species at risk of turbine collision, where a threshold of mortality has been exceeded, is specifically addressed in the Bird and Bat Management Plan.

In order to achieve conservation outcomes for all species and meet policy requirements, a land-based offset is proposed to be delivered within the Study Area. Field surveys have been undertaken across the offset areas in order to ground truth the values for the above protected matters.

A full description and assessment of potential offsets can be found in Section 9 of the Theodore Wind Farm PER.

ECONOMIC AND SOCIAL MATTERS

The Proponent has engaged with stakeholders regarding the Proposed Action since 2021. The focus has been on building transparent and constructive relationships with landholders, neighbours, the community, Traditional Owners, and other interested parties.

Additionally, a Socio-Economic Impact Analysis has been undertaken to provide a high-level understanding of the socio-economic context of the surrounding local communities of relevance to the Proposed Action, including the potential social and economic impacts that may be experienced.

The Proponents commitment to working closely with the Wulli Wulli People, the Traditional Owners of the Study Area, has been demonstrated through regular meetings since 2023. The Proponent have signed an early works agreement, and various site visits have been undertaken by Wulli Wulli Elders, Wulli Wulli Nation Aboriginal Corporation board members and cultural heritage monitors. The Proponent have also agreed to undertake additional survey works in collaboration with the Wulli Wulli People and have agreed to a Cultural Heritage Management Plan under Part 7 of the *Aboriginal Cultural Heritage Act 2003* (Qld).

A full description of the economic and social matters can be found in Section 10 – 16 of the Theodore Wind Farm PER.

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Theodore Wind Farm

Public Environment Report – Introduction and Background (Section 1 – 3)

PREPARED FOR

Theodore Energy Development Pty Ltd

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Theodore Wind Farm

Public Environment Report – Introduction and Background (Section 1 – 3)

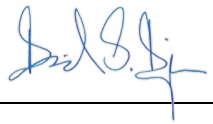
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ACRONYMS AND ABBREVIATIONS

Acronym	Description
BESS	Battery Energy Storage System
CHMP	Cultural Heritage Management Plan
DCCEEW	Department of Climate Change, Energy, the Environment and Water
Disturbance Footprint	The area whereby the final layout and impacts have been considered and occupies an area of 1,590.1 ha.
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
ERM	Environmental Resources Management Australia Pty Ltd
Met Mast	Meteorological Mast
MNES	Matters of National Environmental Significance
PER	Public Environment Report
Proposed Action	Theodore Wind Farm
Project Area	The corridor of land on which the Disturbance Footprint will be located, including a 100 metre buffer for micro-siting.
Study Area	The 9 land parcels, across 3 properties, and road reserve areas, 46,830 ha, in which the Proposed Action will be located.
The Proponent	Theodore Energy Development Pty Ltd
WTG	Wind Turbine Generator

1. GENERAL INFORMATION

Theodore Energy Development Pty Ltd (the Proponent) is developing the Theodore Wind Farm (the Proposed Action) approximately 22 km east of the township of Theodore, 50 km west of Biloela and 150 km south-west of Gladstone, in the Banana Shire Council Local Government Area. The Proposed Action consists of up to 170 wind turbine generators (WTG), and ancillary infrastructure including, foundations and hardstands, temporary infrastructure such as concrete batching plants, laydown areas, construction offices, parking and on-site accommodation, access tracks and electrical reticulation, switching stations and substations, Battery Energy Storage Systems (BESS), meteorological masts (met masts), and operation and maintenance facilities. The Proposed Action is located over 9 land parcels, across three properties and road reserve areas across an area of 46,830 hectares (ha) (Study Area). The Study Area is shown on Figure 1-1.

For the purposes of this Public Environment Report (PER), the following definitions apply:

- **The Disturbance Footprint**: The area whereby the final layout and impacts have been considered occupies 1,590.1 ha or 3.4% of the total Study Area;
- **The Project Area**: The corridor of land on which the Disturbance Footprint will be located which includes a 100 metre (m) buffer for micro-siting occupies an area of 6,674.9 ha.

Environmental Resources Management Australia Pty Ltd (ERM) has been commissioned by the Proponent to undertake detailed ecological studies to inform the layout and design of the Proposed Action as well as obtaining site based information to meet regulatory approval requirements, including assessment under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Detailed ecological field investigations were undertaken across 10 separate field surveys in 2022 (October), 2023 (February, March, June, September/October and December), 2024 (February, June and September) and 2026 (February).

The Proposed Action was referred to the Department of Climate Change, Energy, the Environment and Water (DCCEEW) with a valid referral published on 11 June 2024 (2024/09842). Following assessment of the referral, a controlled action decision was made on 09 July 2024. The assessment approach was confirmed to be by Public Environment Report (PER), and the PER Guidelines published on 09 August 2024.

The purpose of this PER is to provide adequate information to the Minister on the potential impacts of the Proposed Action in relation to Matters of National Environmental Significance (MNES) to meet Commonwealth legislative requirements. The relevant controlling provisions protected under Part 3 of the EPBC Act, associated with the Proposed Action include:

- Listed threatened species and ecological communities (s18 & s18A);
- Listed migratory species (s20 & s20A);
- World Heritage values of a declared World Heritage property (s12 & s15C);
- National Heritage values of a National heritage place (s15 B & s15C); and
- The environment in the Great Barrier Reef Marine Park (s24B & s24C).

The PER follows the specific structure outlined in the PER Guidelines and directly responds to information requested by DCCEEW (Appendix A).

1.1 DESIGNATED PROPONENT

The Proponent seeking approval under the EPBC Act is Theodore Energy Development Pty Ltd, a wholly owned subsidiary of RWE Renewables Europe & Australia (RWE). Background information relevant to RWE is provided below:

- RWE is one of the largest energy utilities in Europe and now operates in 18 countries around the world;
- RWE's core business model is to develop, own and operate renewable energy projects;
- Signed MoU with Stanwell to partner on 1.8 GW of wind projects in Queensland;
- Awarded LTESA LDS in 2023 by the New South Wales government to deliver and operate Australia's first eight-hour battery, Limondale BESS;
- Extensive history of developing strong relationships with landowners, host communities and stakeholders, ensuring a strong alignment of interest over the project lifetime;
- Australia is a key priority growth market for RWE;
- Entered Australian market in 2018 with the 249 MW Limondale Solar Farm in NSW;
- Developing around 3.0 GW of wind, solar, and storage projects across Queensland, New South Wales and Victoria.

The Proponents contact person in relation to the preparation and assessment of the PER is:

Matthew Walker
Development Manager
Suite 5, Level 9, 350 Collins Street, Melbourne VIC 3000
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1.2 OBJECTIVE

The objective of the Proposed Action is to construct a wind farm for the supply of renewable energy, this supports the progress toward time-critical, State and National decarbonisation objectives.

The Queensland Government is committed to achieving net zero emissions by 2050, and is committed to developing a net zero roadmap that will outline the overall vision and priorities (Queensland Goverment , 2025a).

In April 2025, the Queensland Government released a statement outlining their intent for a 5-year Energy Roadmap to deliver affordable, reliable and sustainable electricity. The 5-year Energy Roadmap is expected to be published by the end of 2025 (Queensland Goverment , 2025b).

Additionally in June 2025, the Queensland Government Budget was released which included the 5-year Energy Roadmap with more than $5 billion for Queensland's State-owned energy businesses to invest across the energy supply chain (Queensland Govermnet , 2025c).

It is noted, that while the 5-year Energy Roadmap and net zero plan are yet to be published, the Proposed Action is seen to be in line with the overall intent, receiving Queensland Government approval for a Development Permit in June 2025.

1.3 LOCATION

The Proposed Action involves the development, construction and operation of a large-scale wind farm approximately 22 km east of the township of Theodore and 50 km south of Biloela in the Banana Shire Council Local Government Area, Queensland. The closest major town is Gladstone, 150 km northeast of the Proposed Action, with Queensland's capital, Brisbane located 380 km southeast of the Proposed Action.

The Study Area is the land/properties containing the Proposed Action and is located within the Rural Zone of the Banana Shire Council, with the predominant land use being cattle grazing (and associated homesteads). The Study Area consists of three working cattle properties, and as such, the landscape has been majorly influenced by historical land clearing, with large patches of cleared land featuring no remnant vegetation. The surrounding landscape within the locality (10 km) have also been influenced by historical land clearing and cattle grazing.

The Study Area lies adjacent to and within the locality (10 km) of several State Forests:

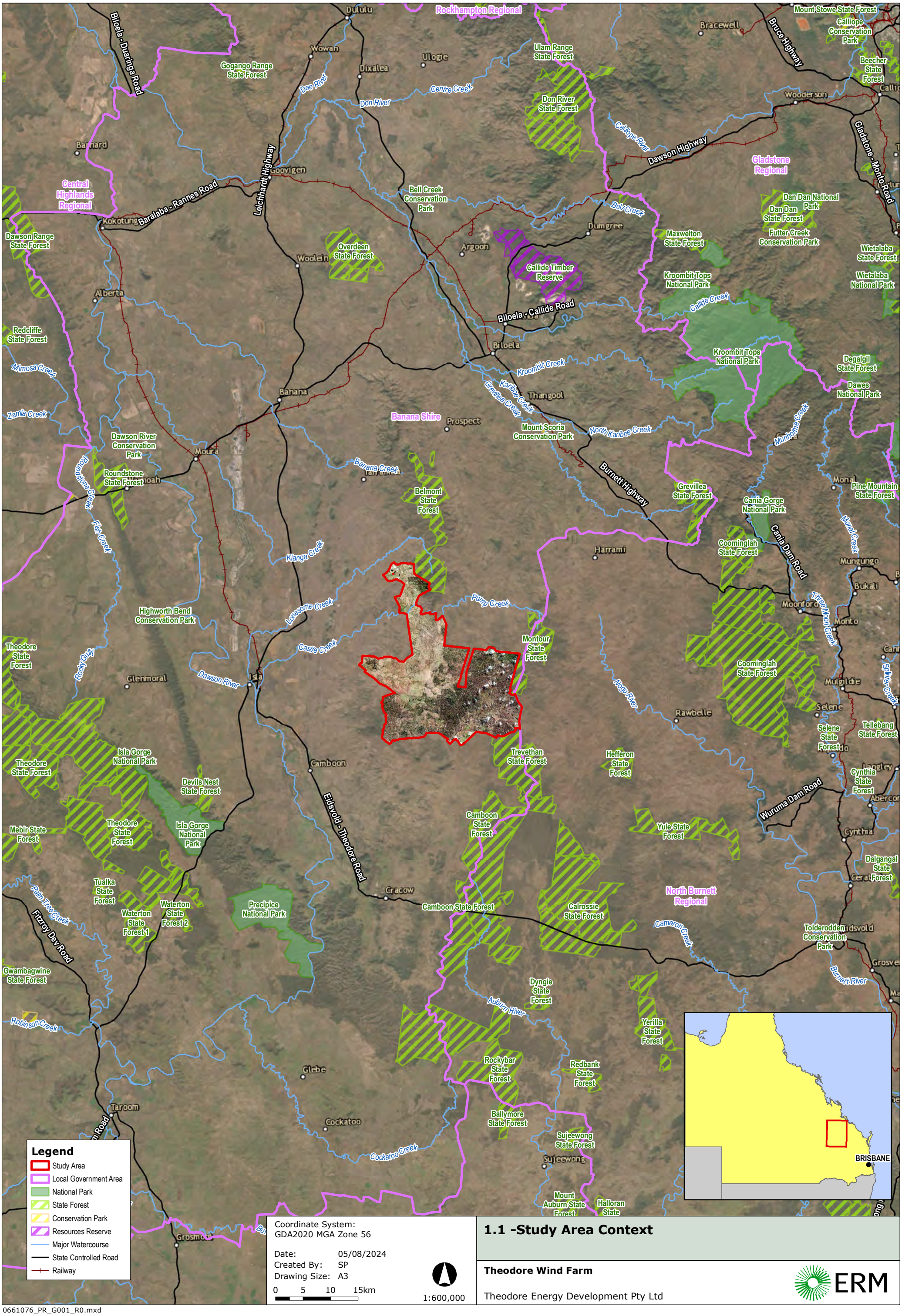
- The Belmont State Forest is located on the northern boundary of the Study Area and has an area of approximately 8,550 ha;
- The Montour State Forest is located to the eastern boundary of the Study Area and has an area of approximately 4,222 ha;
- The Camboon State Forest is located on the southern boundary of the Study Area and has an area of approximately 11,874 ha; and
- The Trevethan State Forest is located approximately 3 km south of the Study Area and has an approximate area of 3,618 ha.

The Study Area is approximately 46,830 ha in size (refer to Figure 1-1) and consists of nine lots on three properties. The property lots and sizes are described in Table 1-1.

A small land parcel, represented as a small dot on figures, Lot 28 on DW557, located in the north of the Study Area hosts Telstra infrastructure and as such is not included in the Study Area.

TABLE 1-1 STUDY AREA PROPERTY LIST

Property	Lot on Plan	Tenure
Landowner 1	Lot 4 on SP131475	Freehold
	Lot 2 on RP617749	Freehold
	Lot 1 on RP617748	Freehold
	Lot 8 on DW2	Freehold
Landowner 2	Lot 17 on DW49	Freehold
	Lot 18 on DW550	Freehold
Landowner 3	Lot 11 on DW446	Freehold
	Lot 19 on DW551	Freehold
	Lot 20 on SP100500	Freehold
Road Reserves	Part of Defence Road	Road Reserve
	Part of Crowsdale Camboon Road	Road Reserve
	Unnamed Road Reserves	Road Reserve



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1.4 BACKGROUND

The Proposed Action was conceived and explored by the Proponent in 2021. The Proponent reviewed high level wind data for the locality and proceeded to analyse this through the deployment of LiDARs and Meteorological Masts within the Study Area. Extensive engagement with landholders, primarily through face-to-face meetings allowed the Proponent to secure all relevant land agreements. The Proponent is continuing to maintain open and transparent communications with all landholders to ensure they are informed of the progress and outcomes of Proposed Action works. Key constraints such as port access and equipment procurement were taken into consideration given the location of the Study Area, however it was determined given the quality of the roads and limited required upgrades, the Study Area was viable from this perspective. The Proponent through internal engineering and construction capability, and engagement with engineering consultants, developed a preliminary Disturbance Footprint in order to complete a high-level analysis of potential WTG locations and project viability.

Following, the Proponent engaged ERM to undertake a Planning and Environment Due Diligence Assessment which reviewed key constraints and fatal flaws of the Study Area, including the presence of vegetation and fauna, land tenure, aviation impacts, electromagnetic inference impacts, traffic and transport routes and location of sensitive receptors.

The first ecological field survey was undertaken in October 2022 which focused on vegetation and fauna assessments, targeted fauna surveys and bird and bat surveys. The data collected from the field survey was used to map preliminary habitat for listed threatened species to inform the layout design. Subsequent ecological field surveys were conducted to confirm and update habitat mapping for listed threatened species and amend the layout design. In 2023, the Proponent developed a preliminary Disturbance Footprint. The preliminary Disturbance Footprint was used to undertake an Ecological Assessment Report, preliminary Aviation Impact Assessment and Electromagnetic Interference Assessment. The disturbance footprint (including location of wind turbine generators (WTGs), access tracks, batching plant, laydown areas, substations etc.) has been refined as part of an iterative process and informed by the presence of ecological values related to MNES and MSES.

Additionally, in 2023 the Proponent applied to the Banana Shire Council for a Building Permit for the erection of three meteorological masts to undertake wind and weather monitoring within the Study Area. Following approval of the Building Permit, the meteorological masts were erected, data collected was used to further inform the layout design to maximise productivity of the Proposed Action.

In 2024, the Disturbance Footprint was updated and additional technical studies undertaken to support the EPBC Act Referral and *Planning Act 2016* Development Application. The following technical studies have been undertaken for the Proposed Action:

- Aviation Impact Assessment – Aviation Projects;
- Ecological Assessment Report – ERM;
- Electromagnetic Impact Assessment – Middleton Group;
- Landscape and Visual Impact Assessment – Moir Studio;
- Natural Hazard Risk Assessment – Covey Associates;
- Noise Impact Assessment and Background Noise Monitoring – Echo Acoustic Consulting;

- Site Access and Route Assessment – Cambray Consulting;
- Socio-economic Impact Analysis and Accommodation Options Report – ERM;
- Stormwater and Erosion Risk Assessment – ERM;
- Traffic Impact Assessment – Cambray Consulting;
- Community Engagement Report – Attexo; and
- Workforce Accommodation and Infrastructure Report – Attexo.

In February 2024, the Proponent lodged a Relevant Purpose Determination under Section 22A of the *Vegetation Management Act 1999* to support the Operational Works Development Application for the Proposed Action for the clearing of native vegetation within the Study Area. On 05 July 2024, the Queensland Government Department of Resources confirmed that the proposed clearing of Regulated Vegetation is for Relevant Infrastructure Activities.

The Proposed Action was referred to DCCEEW with a valid referral published on 11 June 2024 (2024/09842). Following assessment of the referral, a controlled action decision was made on 09 July 2024. The assessment approach was confirmed to be by PER, and the PER Guidelines published on 09 August 2024.

On 27 September 2024, the Proponent lodged a Development Application to the Queensland State Assessment and Referral Agency for a Material Change of Use (Wind Farm) and Operational Works (Native Vegetation Clearing) for the Proposed Action. On 20 June 2025, the Queensland State Assessment and Referral Agency granted a Development Permit for Material Change of Use (Wind Farm) and Operational Works (Native Vegetation Clearing) for the Proposed Action.

1.5 OTHER ACTIONS IN THE LOCALITY

There is one project within the locality of the Proposed Action being the Banana Range Wind Farm, located approximately 20 km north of the Proposed Action.

The Proposed Action is proposed to be connected to the grid network via the Banana Range Wind Farm Connection project 275 kV transmission line approximately 50 km north of the Study Area. The transmission line, while under separate ownership and approvals processes, is considered a 'facilitated impact'.

1.6 STATUS

On 20 June 2025, the Queensland State Assessment and Referral Agency granted a Development Permit for Material Change of Use (Wind Farm) and Operational Works (Native Vegetation Clearing) for the Proposed Action.

The Proponent has engaged in further detailed design of the Disturbance Footprint and intends to undertaking geotechnical works in order to progress with the civil design and constructability of the Proposed Action.

1.7 CONSEQUENCES OF NOT PROCEEDING

There are two major consequences of not proceeding with the Proposed Action, being the loss of potential renewable energy generation, including the loss of potential alternate environmentally superior renewable energy sources, and the investment loss.

As discussed in Section 1.2, the Proposed Action has an estimated generation capacity of 1,152 MW, assisting to reach the Queensland net zero roadmap (Queensland Goverment , 2025a), and the Federal Governments 82% renewable energy generation target by 2030 (Australian Government, 2024). Additionally, the Proposed Action will contribute to the 12,200 MW of new wind generation capacity required to support these targets.

Additionally, the Proposed Action will result in significant direct and indirect local, state and national investment during construction and operation. The high-level potential economic impact of the Project on the Australian economy is depicted in Table 1-2 (Environmental Resources Management Australia Pty Ltd , 2024).

TABLE 1-2 IMPACT ON THE AUSTRALIAN ECONOMY

	Direct Economic Impact	Indirect Economic Impact[1]
Construction Phase		
Local	$0.5 billion	$0.835 billion
State	$0.425 billion	$0.71 billion
National	$0.29 billion	$0.485 billion
Operation Phase (nominal total over 35 years)[2]		
Local	$0.78 billion	$1.3 billion
State	$0.4 billion	$0.66 billion
National	$0.1 billion	$0.167 billion

1.8 CONSULTATION

The Proponent has engaged with stakeholders regarding the Theodore Wind Farm since 2021. The focus has been on building transparent and constructive relationships with landholders, near neighbours, the community, Traditional Owners, and other interested parties.

The Proponent has delivered a comprehensive stakeholder and community engagement program with an approach underpinned by the principles of honesty, respect, adaptability, consistency and consideration. The Proposed has:

- Worked closely with the Banana Shire Council from the outset of project development to inform project design, workforce accommodation plans, and to provide long-term housing benefits to the wider community, with Banana Shire Council a strong supporter of the Proposed Action, evidenced in a letter of support;
- Increased the duration of community drop-in sessions to all day events to provide people in the community with a greater opportunity to attend;

[1] Gross Regional Product values assume an economic output multiplier of 1.67 can be applied to direct spend values to estimate the indirect and induced economic impacts of the renewable energy project ("NSW Renewable Energy Zone: Economic Impact Assessment," – ARENA). The economic output multiplier of 1.67 means that for every $1 million invested in the project, the total economic output in the region is expected to increase by $1.67 million.
[2] Interest adjustments related to discounts have not been applied, i.e., these are nominal figures. It is assumed that all operational costs are indexed to inflation (CPI).

- Provided technical reports to the community, addressing queries and questions about potential impacts and management measures;
- Proactively engaged with directly impacted stakeholders on aerial mustering, workforce accommodation, noise, traffic and local procurement, to identify issues, opportunities and management measures;
- Engaged early with the Wulli Wulli people to guide project design and applied the avoidance principle to cultural heritage management. It is noted that the Cultural Heritage Management Plan for the Proposed Action has been completed;
- Received positive feedback from the community and a representative of the Federal Member of Parliament regarding their approach to community engagement;
- Provided $100,000 of social investment to grassroots community engagement, with an ongoing public commitment to $100,000 in community funds per year of development, and $500,000 per year during construction and lifetime operations.
- Established a complaints channel both via email and a toll-free number as a platform for the community to resolve issues. To date, no formal complaints have been received.

The community is largely supportive of the Proposed Action. Queries received from the community about the Proposed Action related to noise, visual amenity, local housing, biodiversity, cultural heritage, and traffic. These issues have been or will be addressed in relevant technical assessments and management plans. Several matters require ongoing stakeholder and community engagement including workforce accommodation, construction traffic, potential demands on council infrastructure, services and materials. Agreements are currently in development with key stakeholders regarding potential project impacts and benefits, including a memorandum of understanding (MOU) and infrastructure agreement with Banana Shire Council.

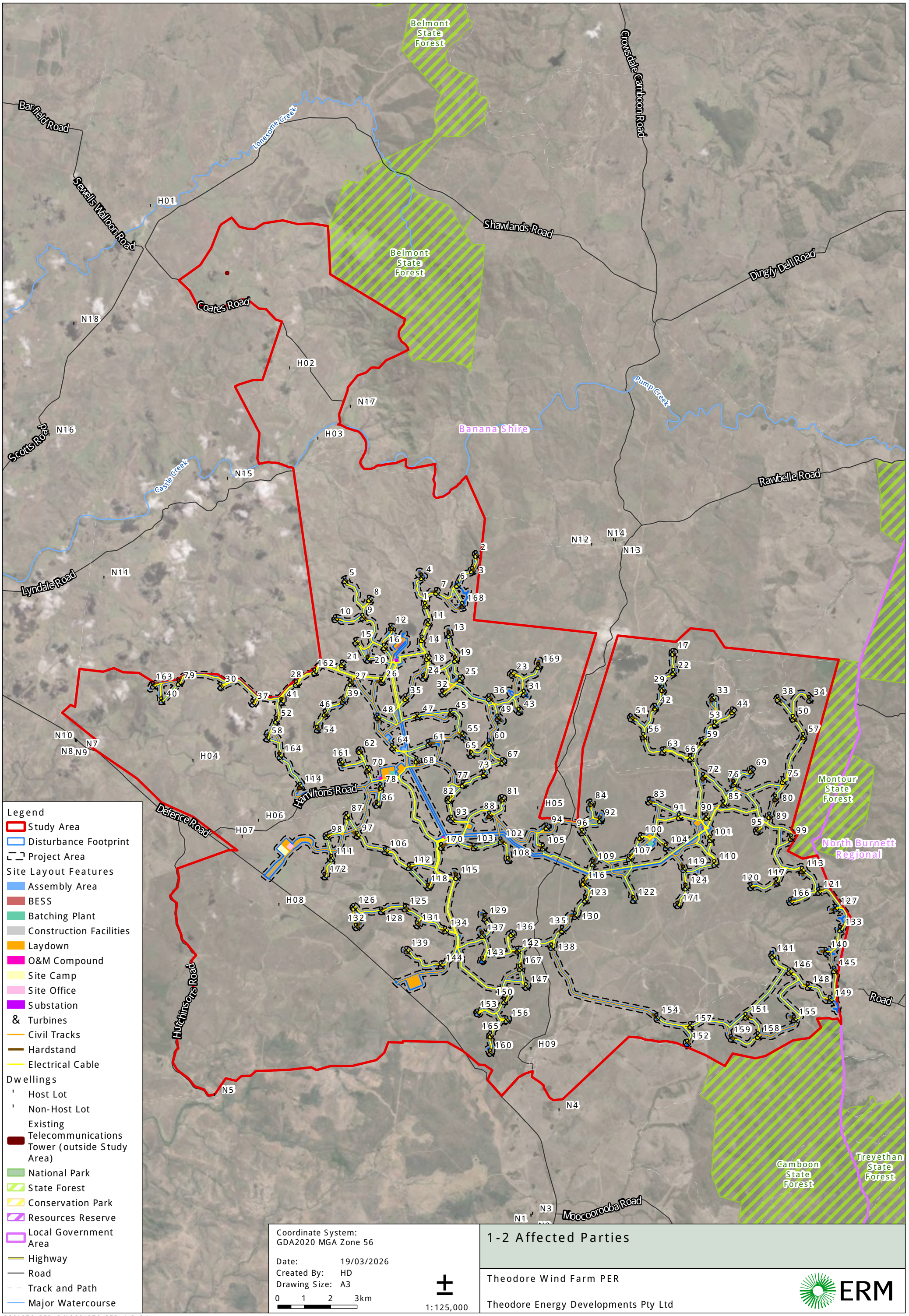
Further information on community engagement undertaken can be found in Appendix L.

1.9 AFFECTED PARTIES

The Study Area is made up of 9 lots owned by 3 landowners. Within the Study Area there are 9 host dwellings, as mapped on Figure 1-2.

There are 18 non-host dwellings located on lots adjacent to the Study Area, as mapped on Figure 1-2.

Details on consultation undertaken and outcomes of consultation are further described in Section 14.



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2. DESCRIPTION OF THE ACTION

2.1 PROPOSED ACTION

The Proposed Action is proposed to consist of up to 170 WTGs with the following associated infrastructure:

- WTG foundations and hardstand areas;
- Temporary infrastructure such as concrete batching plants, laydown areas, temporary construction offices and parking and on-site accommodation;
- Access tracks and electrical reticulation;
- Switching stations and substations;
- Battery Energy Storage System (BESS);
- Temporary and permanent meteorological masts; and
- Permanent operation and maintenance facilities, with a variety of associated facilities and storage laydowns.

The Project Area, which includes a 100 metre (m) buffer for micro-siting occupies an area of 6,674.9 ha. The Disturbance Footprint, area whereby the final layout and impacts have been considered, occupies 1,590.1 ha or 3.4% of the total Study Area.

The precise location of infrastructure within the Disturbance Footprint is described below in Table 2-1, WTG locations are on Table 2-2 and shown in Figure 2-1.

TABLE 2-1 PROPOSED ACTION COMPONENTS

Component	Description	Location
Wind Turbine Generators (WTG)	The Proposed Action will accommodate up to 170 WTGs with a blade tip reaching up to 270 m. The WTGs will be of the horizontal axis type, with a rotor consisting of 3 blades with a maximum rotor diameter of up to 175 m.	See Table 2-2 below.
Turbine Hardstand	The WTG hardstand area has been designed to minimie disturbance. Each WTG hardstand, will be approximately 2.67 ha in size. The hardstand areas also act as a bushfire setback for the ongoing operation of the WTG.	
Access and Infrastructure Corridors	Access corridors have been designed to utilise existing topography of the land, minimising the impact corridor to 40 m wide in most areas (including cleared areas for construction and infrastructure).	Mapped in Figure 2-1.
Temporary Infrastructure	The preliminary Disturbance Footprint includes 12 construction laydown areas, totalling 102 ha in size. The preliminary Disturbance Footprint includes 3 concrete batching plants, totalling 11.2 ha.	Mapped in Figure 2-1.
Electrical Connections and Substations	A 33kV underground reticulation will be installed to transfer the power from each WTG to a substation. Above-ground 275kV overhead transmission line supported by poles will transfer power from the substations to the BESS. There will be a total of 3 substations. The nominal size of the substations is approximately 1.5 ha each.	Mapped in Figure 2-1.

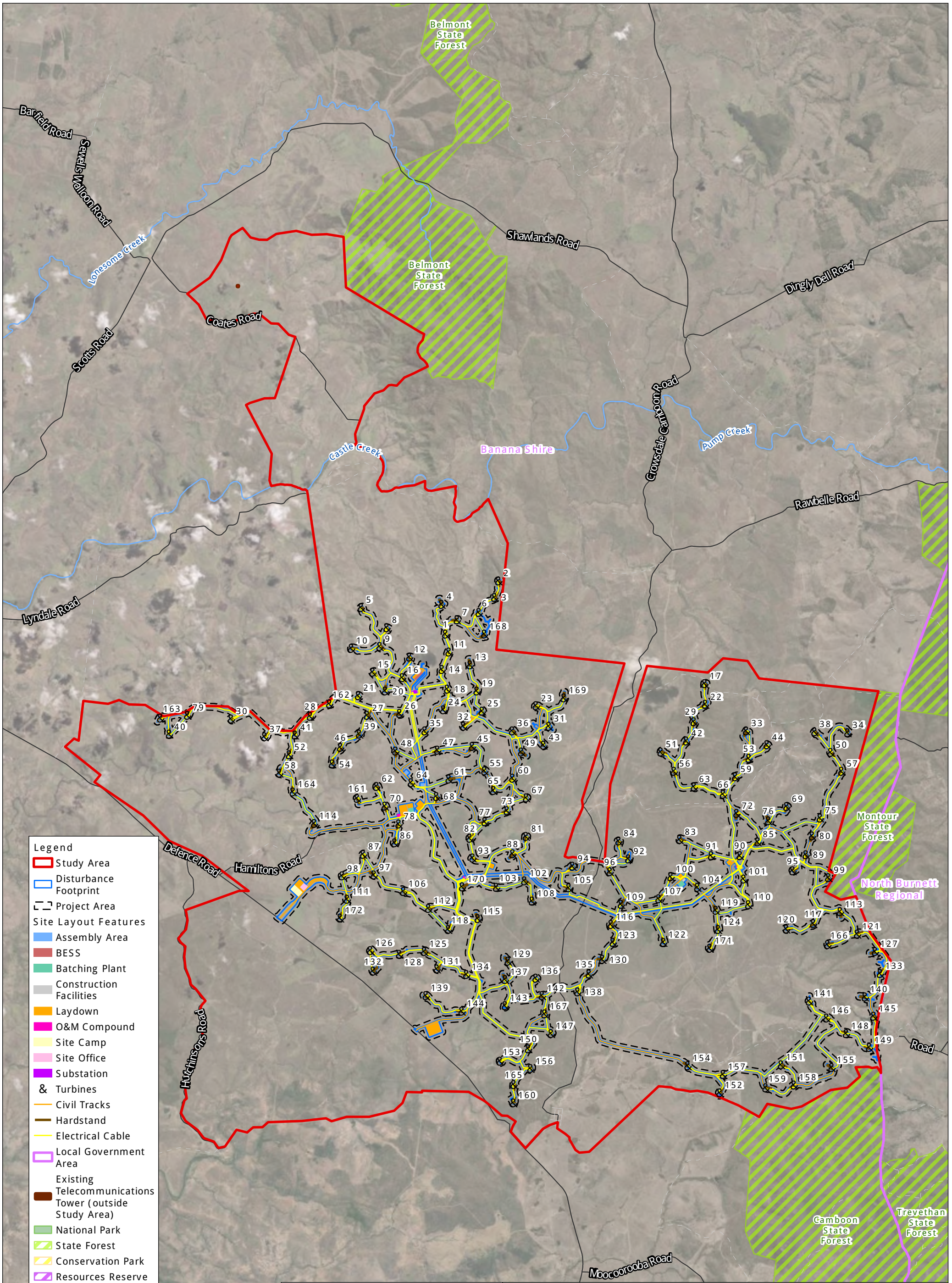
Component	Description	Location
Battery Energy Storage System	The BESS is located adjacent to a substation and laydown. The total area associated with the BESS is 3.2 ha in size with the adjacent laydown being 2.4 ha.	Mapped in Figure 2-1.
Meteorological Masts	Approximately 6 met masts are to be installed to monitor wind conditions for the operation of the Proposed Action. Proposed meteorological masts will be up to 200 m in height.	Mapped in Figure 2-1.
Central Operational and Maintenance Facility	The Proposed Action includes 2 operations and maintenance facilities, which are approximately 1.5 ha in total size.	Mapped in Figure 2-1.

TABLE 2-2 WTG LOCATIONS (GDA 94, MGA 56)

WTG ID	Easting	Northing	WTG ID	Easting	Northing
WTG 1	237000	7246091	**WTG 86**	239423	7238175
WTG 2	238910	7248019	**WTG 87**	249991	7238146
WTG 3	238766	7247426	**WTG 88**	247614	7238116
WTG 4	236860	7247174	**WTG 89**	246583	7238107
WTG 5	233957	7247054	**WTG 90**	243593	7237989
WTG 6	238207	7246878	**WTG 91**	237982	7238021
WTG 7	237418	7246613	**WTG 92**	241582	7237727
WTG 8	234884	7246325	**WTG 93**	249518	7237567
WTG 9	234632	7245646	**WTG 94**	242928	7237531
WTG 10	233604	7245590	**WTG 95**	234422	7237412
WTG 11	237120	7245448	**WTG 96**	233272	7237374
WTG 12	235697	7245268	**WTG 97**	250809	7237317
WTG 13	237888	7244991	**WTG 98**	245123	7237356
WTG 14	236872	7244824	**WTG 99**	247747	7237263
WTG 15	234378	7244726	**WTG 100**	239848	7237196
WTG 16	235444	7244523	**WTG 101**	238837	7236966
WTG 17	246345	7244317	**WTG 102**	246083	7236975
WTG 18	237065	7244113	**WTG 103**	241445	7236958
WTG 19	238129	7244052	**WTG 104**	235486	7236815
WTG 20	234830	7244043	**WTG 105**	244688	7236550
WTG 21	233857	7243876	**WTG 106**	240125	7236479
WTG 22	246368	7243560	**WTG 107**	243328	7236349

WTG ID	Easting	Northing	WTG ID	Easting	Northing
WTG 23	240261	7243510	**WTG 108**	247920	7236343
WTG 24	236926	7243370	**WTG 109**	233456	7236533
WTG 25	238324	7243323	**WTG 110**	236389	7236203
WTG 26	235345	7243239	**WTG 111**	251225	7236084
WTG 27	234176	7243161	**WTG 112**	232270	7239264
WTG 28	232125	7243141	**WTG 113**	238167	7235838
WTG 29	245953	7242944	**WTG 114**	242965	7235626
WTG 30	229273	7243037	**WTG 115**	250259	7235665
WTG 31	240728	7242777	**WTG 116**	237106	7235453
WTG 32	237649	7242770	**WTG 117**	246745	7236141
WTG 33	247844	7242604	**WTG 118**	249287	7235465
WTG 34	251496	7242544	**WTG 119**	251846	7235283
WTG 35	236255	7242605	**WTG 120**	244858	7234985
WTG 36	239410	7242604	**WTG 121**	243039	7234976
WTG 37	230479	7242398	**WTG 122**	246830	7235451
WTG 38	250305	7242578	**WTG 123**	236240	7234652
WTG 39	233889	7242498	**WTG 124**	234295	7234690
WTG 40	227041	7242484	**WTG 125**	252490	7234660
WTG 41	231579	7242459	**WTG 126**	235333	7234561
WTG 42	245681	7242247	**WTG 127**	239255	7234299
WTG 43	240539	7242093	**WTG 128**	242661	7234370
WTG 44	248589	7242105	**WTG 129**	236693	7234024
WTG 45	237963	7242047	**WTG 130**	234393	7233944
WTG 46	233213	7242008	**WTG 131**	252670	7233856
WTG 47	236713	7241918	**WTG 132**	237762	7233828
WTG 48	235205	7241884	**WTG 133**	242171	7233841
WTG 49	239734	7241844	**WTG 134**	240256	7233687
WTG 50	250883	7241836	**WTG 135**	239155	7233650
WTG 51	244761	7241849	**WTG 136**	241765	7233198
WTG 52	231369	7241752	**WTG 137**	236292	7233066
WTG 53	247939	7241608	**WTG 138**	252124	7233025
WTG 54	232915	7241413	**WTG 139**	250106	7232867
WTG 55	238411	7241167	**WTG 140**	240481	7233060

WTG ID	Easting	Northing	WTG ID	Easting	Northing
WTG 56	245239	7241153	**WTG 141**	239147	7232697
WTG 57	251276	7241148	**WTG 142**	237590	7232506
WTG 58	231016	7241081	**WTG 143**	252433	7232330
WTG 59	247447	7240951	**WTG 144**	250734	7232262
WTG 60	239419	7240903	**WTG 145**	240804	7231695
WTG 61	237122	7240864	**WTG 146**	251449	7231702
WTG 62	234514	7240601	**WTG 147**	252279	7231190
WTG 63	245957	7240595	**WTG 148**	239988	7231153
WTG 64	235762	7240745	**WTG 149**	249099	7230565
WTG 65	238729	7240452	**WTG 150**	246892	7229560
WTG 66	247013	7240318	**WTG 151**	238965	7230701
WTG 67	239916	7240189	**WTG 152**	245735	7230540
WTG 68	236673	7240242	**WTG 153**	250925	7230466
WTG 69	249299	7239881	**WTG 154**	240070	7230431
WTG 70	234816	7239898	**WTG 155**	247009	7230224
WTG 71	247497	7239626	**WTG 156**	249562	7229837
WTG 72	239220	7239723	**WTG 157**	248543	7229742
WTG 73	250502	7239469	**WTG 158**	239444	7229198
WTG 74	248641	7239358	**WTG 159**	233815	7240177
WTG 75	238421	7239326	**WTG 160**	232819	7243578
WTG 76	235312	7239249	**WTG 161**	226721	7243071
WTG 77	227701	7243168	**WTG 162**	231503	7240412
WTG 78	250220	7238825	**WTG 163**	239460	7229854
WTG 79	239904	7238799	**WTG 164**	250776	7234900
WTG 80	237877	7238735	**WTG 165**	240578	7232411
WTG 81	245442	7238693	**WTG 166**	238403	7246101
WTG 82	243242	7238636	**WTG 167**	241271	7243797
WTG 83	248254	7238609	**WTG 168**	237604	7236981
WTG 84	235172	7238566	**WTG 169**	246529	7234775
WTG 85	234031	7238155	**WTG 170**	233205	7235867



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2.1.1 WIND TURBINE GENERATORS (WTG)

The Proposed Action will accommodate WTGs with an upper blade tip of up to 270 m in height. The WTGs will be of the horizontal axis type, with a rotor consisting of 3 blades with a maximum rotor diameter of up to 175 m. The turbine specifications are summarised in Table 2-3.

TABLE 2-3 KEY GENERATION AND TURBINE SPECIFICATIONS

Feature	Statistic
Estimated generation capacity	1152 MW*
Turbine electrical output	Up to 8 MW
Number of WTG	Up to 170
Hub height**	Up to 169 m
Tip height**	Up to 250 m
Rotor radius**	Up to 81 m
Rotor Swept Area (RSA) height**	88 - 250 m
Number of blades	3
Chord width of blade	Up to 4.4 m
Average pitch angle of rotor	14.5°
Average rotation period of turbine	6.3 seconds

*The actual output of the wind farm will depend on the size and type of turbine chosen during the detailed design phase. Regardless of the size of the wind farm generation capacity, the Proposed Action will still need to comply with the Queensland Wind Farm State Code and supporting Planning Guidelines, particularly in relation to acoustic amenity and setback criteria.

**The specifications contained within the table are based on current, projected turbine size. Whilst they are an estimated maximum, changes in technology and constructability may result in larger turbines being installed

2.1.2 WTG FOUNDATIONS AND HARDSTAND FOUNDATIONS

Each WTG foundation will consist of a mass concrete footing or rock anchor foundation where suitable. WTG foundations may vary in size depending on the selected WTG, imposed loadings, ground conditions, construction methodology and the drainage design. The detailed design of the foundations will be undertaken prior to construction of the Proposed Action.

The final design will also consider the geotechnical conditions identified through detailed Study Area investigations. The ground surrounding the WTG will be finished, so it is tidy and usable for shared agricultural purposes. This may include mounding. At each WTG site, a hardstand area may be established for the laydown of key WTG equipment including the crane boom laydown and assembly area, nacelle, tower sections, blades, and other WTG components. The hardstand is the area used for the assembly, construction, and erection of the WTG. Each WTG foundation and hardstand area will be approximately 2.67 ha in size. Where suitable, just in time delivery and tower cranes may be utilised which may result in a smaller hardstand area. The smaller hardstand area is dependent on geotechnical studies and detailed engineering design including construction methodology review.

2.1.3 TEMPORARY INFRASTRUCTURE

The preliminary Disturbance Footprint includes 12 construction laydown areas, totally 102 ha in size. Temporary construction laydown areas are proposed for the storage of WTG components when initially delivered to the Study Area as well as other construction items, stockpiling of materials and temporary amenities. These temporary laydown areas are also intended to be used for concrete batching plants.

Additionally, a temporary construction camp is located in the south-west of the Study Area, adjacent to the site office and a laydown area, totalling 8.9 ha in size.

2.1.4 ACCESS AND UNDERGROUND CABLING AND OVERHEAD TRANSMISSION LINES

Up to 218 km of access roads will be required for the Proposed Action within the Study Area. Access tracks between the existing road network and the Proposed Action components will be established and or upgraded to allow access to the site for construction and operational traffic. Considerations in the establishment of these routes will include load requirements, turning radii, topography of the land, soils, watercourse crossings, vegetation clearing and potential colocation of wind farm infrastructure. The onsite access road layout will be designed to utilise existing tracks where appropriate and usage does not significantly impact on planned agricultural activities.

The proposed access/infrastructure corridors are at the minimum width achievable given the design maturity. This width is necessary to accommodate the access road, elements of the electrical collection system between the WTGs and where co-located, parts of the transmission system. Proposed access/infrastructure corridors will be further refined in the detailed design phase prior to construction.

The road formation will generally not exceed 12 m in width (table drain – table drain), with regular widening to accommodate passing bays. The area of the corridors outside the road formation may be cleared for the installation of reticulation/overhead lines. Access corridors will be their widest during the construction phase, and areas outside the final road formation will undergo progressive restoration of grass species post construction activities.

2.1.5 ELECTRICAL CONNECTIONS, SUBSTATIONS AND BATTERY ENERGY STORAGE SYSTEM

A 33kV underground reticulation will be installed to transfer the power from each WTG to the substations. Above-ground 275kV overhead transmission line supported by poles will transfer power to the BESS.

Currently 3 substations are proposed. The substations will include equipment necessary to collect the power flow from each WTG, increase the voltage and dispatch to the electricity grid. Hardware would include switches, breakers, transformers, meters, synchronous condensers (as needed), the earthing grid, and other electrical equipment. The nominal size of the substations is approximately 1.5 ha each. The voltage will be “stepped up” at the substations (up to 275kV).

A BESS for the storage of produced electricity will be installed at one location adjacent to a laydown and in proximity of a substation in the north-west of the Disturbance Footprint. The

BESS has been designed to provide storage for export, system strength, and firming support. The area occupied by the BESS is 3.2 ha.

2.1.6 METEOROLOGICAL MASTS

Three met masts have been erected within the Study Area, for data collection purposes for Proposed Action feasibility. The installed meteorological masts are 160 m in height.

Approximately 6 met masts are to be installed to monitor wind conditions for the operation of the Proposed Action. Proposed meteorological masts will be up to 200 m in height. These met masts may be used to conduct power performance testing for the installed WTGs alongside the general monitoring of wind conditions.

2.1.7 CENTRAL OPERATIONAL AND MAINTENANCE FACILITIES

The Proposed Action includes 2 operations and maintenance facilities, which are approximately 1.5 ha in total size. The operational infrastructure for the Proposed Action will include management offices, workshops, storage, equipment laydown, and warehousing facilities.

2.2 PHASES OF DEVELOPMENT

A summary of the Proposed Action activities and associated durations are outlined in Table 2-4. Please note that this list is not exhaustive and other relevant activities will occur during these periods.

TABLE 2-4 PHASES OF DEVELOPMENT

Phase	Associated Activities	Duration
Design	The key activities associated with the design phase of the Project are: • Desktop review of key habitat and environmental areas on Study Area; • Disturbance Footprint mapping; • Ecological surveys to ground truth onsite vegetation and habitat; • Mapping of constraints applicable to the Study Area and Proposed Action; • Technical engineering to determine appropriate locations for infrastructure while avoiding, minimising and mitigating impact to high value ecological areas; • Ongoing consultation with relevant stakeholders; and • Obtained consent from land owners, Traditional Owners, government and transmission network services.	Ongoing, commenced in 2021, to be finalised in 2026
Construction	The key activities likely to impact ecological resources during construction are: • Vegetation clearing for new access tracks, temporary construction compounds and laydown areas, borrow pits, water storages, concrete batching plants, turbine pads, trenches for power and instrumentation cables, electrical substation and overhead powerlines, and associated earthworks; • Excavating trenches; • Blasting for turbine foundations (if required); and • Construction traffic movement and plant operations (rock crushing and concrete batching plant).	~36-60 months
Commissioning and Post-	Testing, in line with Australian Energy Market Operator Standards.	~24 months

Phase	Associated Activities	Duration
construction rehabilitation	The intention of post-construction rehabilitation is to progressively stabilise areas of disturbance, making them resilient to erosion and weed infestation, and to re-establish appropriate vegetation cover. Rehabilitation of on-ground vegetation will be managed through an adaptive management to ensure rehabilitation acceptance criteria are met.	
Operations	Operational phase activities are anticipated to be of an indirect nature, of lower frequency, and smaller intensity, but will last the lifetime of the Proposed Action. Potential impacts during the operational phase include: • WTG operation; and • Routine maintenance and servicing of WTGs, access tracks, electrical installations and infrastructure as required.	Up to 35 years
Decommissioning	If a decision was taken to decommission the Proposed Action, this would involve: • Dismantling and removal of WTG; • Removal of electrical reticulation where not part of permanent network infrastructure; • Responsible disposal/recycling/reuse of infrastructure removed from the Study Area in according to the waste hierarchy; and • Rehabilitation of disturbed land in accordance with industry standard good practices at the time and where not required for ongoing grazing or agricultural uses. Underground cabling would be left in situ. Hardstand pads would be left in situ or deep ripped where rehabilitation is required. Turbine foundations may be left up to 500 mm below rehabilitated ground level as they do not present a risk to people or livestock. Excavations would be backfilled and rehabilitated. Access tracks could be retained on site for the continued benefit of the landholder, or they could be rehabilitated.	~5 years

2.2.1 DESIGN DETAILS

During the pre-approval design phase of the Proposed Action, key activities included undertaking technical assessments, and erecting meteorological masts to collect wind and weather data within the Study Area. The Proponent utilised the outcomes of the impact assessment and wind data to develop the Disturbance Footprint. Additionally, technical engineering and constructability assessments were undertaken to progress the Disturbance Footprint design.

As part of the development assessment process prior to receiving a Development Permit under the *Planning Act 2016*, further detailed design of the Disturbance Footprint was undertaken, with a focus on reducing areas of fragmentation. This resulted in removal of redundant infrastructure, and consolidation of impact areas with particular focus on the access tracks and electrical reticulation, specifically, the key changes included:

- Reduction from 4 substations to 3 substations;
- Consolidation of the Battery Energy Storage System (BESS) from being distributed amongst the site substations to a consolidated area within a largely cleared area.
- Reduction of electrical reticulation corridors:
    - Reduced total length of 275kV overhead line and associated corridors (achieved through the reduction in the number of substations);
    - Change of all identified 33kV overhead lines to underground designs;

  - 33kV corridors narrowed, where possible;
  - 33kV corridors co-located with track, where possible;
- Number and location of laydown areas have been further refined; and
- Earthworks and track detailed design have resulted in significant track alignment improvements.

Overall, these optimisations resulted in reducing the Disturbance Footprint by a further 344.4 ha.

During the post-approval design phase of the Proposed Action, the Proponent will undertake further design refinement and assessments in order to further solidify the Disturbance Footprint design.

2.2.2 CONSTRUCTION DETAILS

The detailed construction methodology will be delivered by the WTG supply and install contractors and the balance of plant contractors, in alliance with the Proponent. It is anticipated that the construction work (subject to geotechnical conditions) will include the following:

- Cut and fill earthworks (including excavating, hammering, ripping, crushing, material haulage, blasting, compacting, moisture conditioning, testing etc.);
- Erection of turbines (including component delivery, cranage, fitting of ancillary items);
- Cabling works (including trenching and laying of cables by various methods);
- Substation construction;
- Vegetation clearing (utilising appropriate methods);
- Construction of site compounds, camps and facilities; and
- Delivery of various Project components.

It is anticipated that an on-site borrow pit will be utilised to source much of the required construction material, where possible. The location of an on-site borrow pit will be located to avoid impacts to mapped MNES.

2.2.3 COMMISSIONING AND POST-CONSTRUCTION REHABILITATION DETAILS

Following the completion of construction, areas not required for ongoing operational disturbance will be rehabilitated and or regenerated in accordance with rehabilitation management practices established in Section 8 of the PER and where not required for ongoing grazing or agricultural practices. Post-construction will result in two types of rehabilitation:

- Type 1 – Natural regeneration measures restricted to low shrubbery and grass; and
- Type 2 – Revegetation reinstated of equivalent pre-construction vegetation without height restrictions.

Rehabilitation objectives have been developed with consideration for the existing condition, potential ongoing direct and indirect impacts, the need to maintain setbacks to reduce bushfire risk, and the need for disturbance for decommissioning. Where areas will need to be utilised for decommissioning and maintenance revegetation will be limited to low shrubbery and grass to avoid additional impacts due to habitat loss.

2.2.4 OPERATION DETAILS

The power output from an operational wind farm at any given time largely depends on the strength of the wind blowing across the site. During the operation of the Proposed Action, the WTGs will automatically start, stop and alter their output as determined by wind speed and other environmental, operational, maintenance, and electrical conditions.

It is anticipated that existing land management practices will be largely unaffected by the Proposed Action, with the participating properties continuing to be used for grazing and animal husbandry activities. To monitor and maintain the wind farm facility, a number of permanent operations and maintenance facilities will be established on site. This will include administrative areas, control buildings, workshops, warehousing, parts storage and ablution facilities, etc.

Over the course of the lifetime of the WTG, regular and unscheduled maintenance will occur. Occasionally this may include replacement/exchange of major components of the WTG including, gearboxes, generators, shafts, and blades. These works may require some form of crane to perform the maintenance.

2.2.5 END OF LIFE DECOMMISSIONING AND REHABILITATION

The WTGs have an expected operating life of up to 35 years, at the end of which there are three main options for consideration:

- Continue the use of the Study Area as a wind farm using the existing WTGs (subject to condition of equipment);
- Replace the WTGs with technology current at that time and continue the use of the Study Area as a wind farm for a further term; or
- Decommission the Proposed Action and remove the WTGs and ancillary infrastructure in accordance with a Decommissioning Plan prepared for the Proposed Action.

When decommissioning occurs:

- All above ground infrastructure not required for the ongoing agricultural use of the land, including the WTGs, substations, and operation and maintenance facilities will be removed and the land rehabilitated;
- Access tracks and hardstands not requested by the landowner to be retained will be removed and land rehabilitated and returned to agricultural use; and
- Below ground infrastructure, including cabling and the WTG foundations, will be left in situ to avoid further disturbance and minimise clearing of revegetated areas. Rehabilitated areas will be adequately graded to reflect the slope of the surrounding area and to mitigate the risk of soil erosion.

All materials removed from the Study Area will be sorted and packaged for reuse and/or recycled where possible in accordance with the waste hierarchy.

A Decommissioning and Rehabilitation Plan will be prepared for the Proposed Action no less than five years prior to decommissioning and / or in accordance with any Proposed Action approval requirements. It is anticipated that the decommissioning and rehabilitation phase may take up to five years to complete, with vegetation communities dominated by non-woody vegetation within the Study Area (identified in Section 8 of the PER) being returned to its pre-construction condition.

2.3 CHANGES SINCE REFERRAL

The Proponent is committed to refining the layout to reduce impacts to protected matters through the design phase, as such, since referral of the Proposed Action, changes to the Disturbance Footprint have been made. These changes represent the outcomes of further detailed design resulting in a reduction in the Disturbance Footprint by removing redundant infrastructure, and consolidating impact areas. Key changes include:

- Reduction from 4 substations to 3 substations;
- Consolidation of the BESS from being distributed amongst the substations to a consolidated areas within largely cleared area;
- Reduction of electrical reticulation corridors:
  - Reduced total length of 275 kV overhead line and associated corridors (achieved through the reduction in the number of substations);
  - Change of all identified 33kV overhead lines to underground lines;
  - 33kV corridors narrowed, where possible; and
  - 33kV corridors co-located with tracks, where possible;
- Number and location of layout areas have been further refined;
- Earthworks and track detailed design have resulted in significant track realignment improvements.

Overall, the optimisations resulted in a reduction of the Disturbance Footprint of approximately 341.3 ha. The reduction has resulted in a significant reduction in impacts to vegetated areas.

Figure 2-2 depicts the changes.

Legend

- Study Area
- Disturbance Footprint
- Areas removed from disturbance footprint since EPBC referral
- Areas added to disturbance footprint since EPBC referral

Coordinate System:
GDA2020 MGA Zone 56

Date: 27/05/2025
Created By: HD
Drawing Size: A3

0 1 2 3km

1:100,000

F2-2 Change Since Referral

Theodore Wind Farm PER

Theodore Energy Developments Pty Ltd

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3. FEASIBLE ALTERNATIVE

In addition to the Proposed Action assessed in detail in this PER, alternative Proposed Action concepts have been considered by the Proponent including:

- Draft Disturbance Footprint (up to 260 WTG and associated infrastructure);
- Final Disturbance Footprint (up to 170 WTG and associated infrastructure); and
- Take no action.

The following sections outline the design evolution of the Disturbance Footprint and consideration of impact minimisation in the final Disturbance Footprint. Additionally, the alternative of taking no action is explored.

3.1 DESIGN EVOLUTION AND IMPACT MINIMISATION

Since the conception of the Proposed Action, the design of the Disturbance Footprint has evolved with consideration of technical, environmental, social, and commercial constraints. This has included consideration of the outcomes of engagement with host landowners, non-host landowners, the community and local government.

Initial reviews determined that the Study Area has the maximum capacity to host up to 260 WTGs. A Draft Disturbance Footprint was designed to host up to 260 WTGs and associated infrastructure.

The design of the Disturbance Footprint was refined to be up to 170 WTGs to be compliant with export constraints and avoid sensitive ecological areas. Table 3-1 describes the extent of impact avoided by implementing the proposed Disturbance Footprint compared to the Draft Disturbance Footprint.

3.2 TAKING NO ACTION

In the Proponents view, not proceeding with the Proposed Action is not a feasible alternative. This is in the context of the evidence showing that climate change is accelerating and its impacts are projected to become more severe and devastating across Australia. The energy sector is the largest contributor to emissions in Australia. Most of the emissions are from aging coal power generators, which are reaching end of their design life. In order to meet the Australian Governments targets and decarbonise the electricity sector the renewable sector will need to grow rapidly (Australian Government Department of Climate Change, Energy, the Environment and Water , 2023). The Proposed Action will support reaching renewable energy targets and decarbonisation efforts identified by both State and Federal Government.

Additionally, as discussed in Section 1.2, the Proposed Action has an estimated generation capacity of 1,152 MW, assisting Queensland Governments target of 70% renewable energy generation by 2032 and reducing the CO2 emissions from electricity generation sources. Additionally, the Proposed Action will increase the reliability of electricity generation by inclusion of storage infrastructure and a strong generation profile complementing solar generation.

Furthermore, if no action was taken, landholders have the right to clear areas mapped as Category X under Queensland State based Regulated Vegetation Mapping. As such, Table 3-1 provides a calculation of the area of Category X vegetation within mapped threatened species habitat. Figure 3-1 depicts State Mapped Regulated Vegetation within the Study Area.

TABLE 3-1 COMPARISON OF ALTERNATIVES

Threatened or migratory species		Draft Disturbance Footprint (up to 260 WTGs) (ha)	Draft Disturbance Footprint (up to 170 WTGs) (ha)	Final Disturbance Footprint (up to 170 WTGs) (ha)	Taking No Action (ha)
Poplar Box Threatened Ecological Community		7.7	6.4	1.2	4.4
Greater glider (southern and central)	Likely/Current Denning Habitat	46.1	27.7	19	231.2
	Potential Denning Habitat	7.6	3.1	0.8	135.7
	Foraging and Dispersal Habitat	785.7	810.3	623.9	5292.8
Koala	Preferred Foraging and Breeding Habitat	29.9	16.5	6.2	507.3
	General Foraging and Breeding Habitat	831.7	851.7	657.3	5563.9
	Dispersal Habitat	212.1	322.3	237.9	6204.5
Squatter Pigeon (southern)	Breeding Habitat	261.8	433.8	128.3	3,900.7
	Foraging and Dispersal Habitat	84	439.7	57.6	562.4

Barfield Road
Shawlands Road
Sewells Walloon Road
Coates Road
Scotts Road
Dingly Dell Road
Rawbelle Road
Lyndale Road
Crowsdale Camboon Road
Hamiltons Road
Defence Road
Road
Hutchinsons Road
Moocoorooba Road

Legend

- Study Area

Regulated Vegetation

- Category A area
- Category B area
- Category C area
- Category R area
- Category X area
- Water
- Road
- Track and Path

Coordinate System:
GDA2020 MGA Zone 56

Date: 13/12/2024
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Drawing Size: A3

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F3-1 Regulated Vegetation within the Study Area

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0661076_Rehab_R1\0661076_Rehab_3-1_R1

Base Data: QSpatial, 2024

SECTION 1-3 REFERENCES

Australian Government. (2024). *Net Zero*. Retrieved from Department of Climate Change, Energy, the Environment and Water : https://www.dcceew.gov.au/climate-change/emissions-reduction/net-zero

Australian Government Department of Climate Change, Energy, the Environment and Water . (2023). *Annual Climate Change Statement 2023.* Commonwealth of Australia .

Environmental Resources Management Australia Pty Ltd . (2024). *Socio-Economic Impact Analysis.*

Queensland Goverment . (2025a, June). *Net zero roadmap* . Retrieved from Queensland Treasury: https://www.energyandclimate.qld.gov.au/climate/net-zero-roadmap

Queensland Goverment . (2025b). *Energy Roadmap to deliver affordable, reliable and sustainable electricity* . Retrieved from The Queensland Cabinet and Ministerial Directory: https://statements.qld.gov.au/statements/102355

Queensland Govermnet . (2025c). *Energy and Home Ownership Budget to help deliver reliable energy system and home ownership dreams*. Retrieved from The Queensland Cabinet and Ministerial Directory: https://statements.qld.gov.au/statements/102868

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Theodore Wind Farm

Public Environment Report – Existing Environment (Section 4)

PREPARED FOR

Theodore Energy Development Pty Ltd

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SIGNATURE PAGE

Theodore Wind Farm

Public Environment Report – Existing Environment (Section 4)

0661076



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ACRONYMS AND ABBREVIATIONS

Acronym	Description
ALA	Atlas of Living Australia
BACI	Before-After-Control-Impact
BUS	Bird Utilisation Survey
CRM	Collision Risk Model
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DESI	Department of Environment, Science and Innovation
DEWHA	Department of Environment, Water, Heritage and the Arts
Disturbance Footprint	The area whereby the final layout and impacts have been considered and occupies an area of 1,590.1 ha.
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
MHQA	Modified Habitat Quality Assessment
MNES	Matters of National Environmental Significance
NC Act	Queensland *Nature Conservation Act 1992*
PMST	Protected Matters Search Tool
Project Area	The corridor of land on which the Disturbance Footprint will be located, including a 100 metre buffer for micro-siting.
Proposed Action	Theodore Wind Farm
SATs	Spot Assessment Technique
SIG 1.1	*Significant Impact Guidelines 1.1 - Matters of National Environmental Significance*
State Code 23	Queensland *State Code 23 - Wind farm developments*
Study Area	The 9 land parcels, across 3 properties, and road reserve areas, 46,830 ha, in which the Proposed Action will be located.
TECs	Threatened Ecological Community
The Proponent	Theodore Energy Development Pty Ltd
WTG	Wind Turbine Generator

4. DESCRIPTION OF THE ENVIRONMENT

The Study Area is located within the Rural Zone of the Banana Shire Council Local Government Area. It has been historically used for agricultural purposes, predominantly cattle grazing (and associated homesteads) which remains the primary use. The Study Area consists of three working cattle properties which have influenced the land management practices, including historical land clearing with large patches of cleared land featuring no remnant vegetation. The surrounding landscapes within the locality (10 km) have similarly been influenced by historical land clearing and cattle grazing.

The Study Area lies within the Brigalow Belt bioregion as defined by the Interim Biogeographic Regionalization for Australia framework, within the Banana – Auburn Ranges subregion. The Brigalow Belt bioregion covers 365,281 km^2, approximately 21% of Queensland, from Townsville to the border of New South Wales. The general landform of the bioregion is dominated by ranges that fringe or divide three major catchments – Burdekin and Fitzroy in the north and Condamine – Warrego in the south (DES, 2018).

4.1 CLIMATE

Climatically, the bioregion lies in the 500 – 700 mm annual rainfall belt and encompasses a gradient from eastern mesic and western xeric environments. In the west, there is a general increase in rainfall variability, annual evaporation and the incidence of drought, and decrease in total rainfall (DES, 2018), evidenced through weather data from the closest Bureau of Meteorology weather station to the Study Area, being the Thangool weather station (039089), located approximately 50 km north-east of the Study Area. A summary of climate statistics for this station is provided in Table 4-1.

TABLE 4-1 CLIMATE SUMMARY FOR THANGOOL WEATHER STATION (BUREAU OF METEROLOGY , 2024)

Statistic	Average (between 1992 and 2024)
Annual maximum temperature (°C)	29.2
Annual minimum temperature (°C)	13.3
Annual rainfall (mm)	655.2

4.2 SOILS

A review of the Atlas of Australia Soils identified eight soil types within the Study Area:

- Firm shallow siliceous loams (Fz10) – uniform medium, below A1 horizon coherent and non calc of value/chroma=2/3;
- Black self-mulching cracking clays (Kb20, Kb17) – uniform fine cracking, smooth faced peds, dark clay horizon underlain by weathered rock before 1.5 m;
- Hard pedal mottled-yellow duplex soils (Ub70) – duplex yellow-grey, hard setting A horizon, A2 horizon conspic bleached, neut pedal mottled B horizon;
- Hard pedal red duplex soils (Qa7) – duplex red, hard setting A horizon, no A2 horizon, neut pedal whole col B horizon;

- Siliceous sands (Bz6) – uniform coarse, non calc weakly coherent below A1 horizon of value/chrome = 2/3;
- Black smooth-ped earths (Mm11) – gradational black, no A2 horizon, alk smooth-ped whole col B horizon;
- Bleached sands (Cd11) – uniform coarse, non calc, A2 horizon conspic bleached with non calc pan below A2 horizon; and
- Hilly to mountainous terrain (LK13).

4.3 TOPOGRAPHY

The Study Area is topographically characterised by rolling hills and flat plains. Across the Study Area the landscape features vary in geology, from torsdale volcanic mixed with camboon volcanics, to rocky outcrops of large boulders, open flat areas on tops of ridges, and sedimentary stratigraphy on the western extent of the Study Area.

4.4 WATERWAYS

The Study Area is located in the Fitzroy catchment, with the most notable of the waterways within the proposed Study Area being Castle Creek, classified as Stream Order 5 under the Strahler system of stream order. Castle Creek intersects the Study Area in the north. Other notable waterways include Oxtrack Creek, a Stream Order 4 waterway in the south of the Project, and several Stream Order 3 waterways situated throughout the Study Area (Boam Creek, South Creek, Keen Creek, and Six Mile Creek). Several other ephemeral Stream Order 1 and 2 tributaries of Castle Creek (and other surrounding waterways) flow through the Study Area. Based on the topography and the Strahler system of stream order, Castle Creek flows east to west where it joins the nearby Dawson River approximately 30 km west of the Study Area just south of the township of Theodore.

4.5 PROTECTED AREAS

No protected areas occur within the boundary of the Study Area, however, the following State Forests are located within the locality (10 km):

- The Belmont State Forest is located on the northern boundary of the Study Area and has an area of approximately 8,550 ha;
- The Montour State Forest is located to the eastern boundary of the Study Area and has an area of approximately 4,222 ha;
- The Camboon State Forest is located on the southern boundary of the Study Area and has an area of approximately 11,874 ha; and
- The Trevethan State Forest is located approximately 3 km south of the Study Area and has an approximate area of 3,618 ha.

4.6 ECOLOGICAL CONDITION

The ecological condition of the Study Area is majorly influenced by historical land clearing and cattle grazing, with large patches of cleared land featuring no remnant vegetation occurring throughout. This is the most prominent in the centre and north of the Study Area, though some large swathes of cleared land also occur in the southeast of the Study Area. These areas have current grazing leases.

The Study Area is broadly connected to the surrounding landscapes and vegetation by a regional terrestrial corridor, which is situated in a north to south alignment throughout the Study Area.

Terrestrial corridors are mapped by the Queensland Government where there are large areas of remnant vegetation and maintain ecological and evolutionary processes at a landscape scale. The combined area of Belmont State Forest and Camboon State Forest provides an important terrestrial corridor within the regional landscape. The Biodiversity Planning Assessment undertaken for the Brigalow Belt Bioregion (Version 2.1 released on 6 March 2018) identifies terrestrial and riparian corridors in more detail. It identifies the function of a regional terrestrial corridor is to maintain long term evolutionary/genetic processes that allow change in distributions and connectivity, maintain landscape/ecosystem processes to allow for responses to climate change, maintain migration and movement of fauna, and maximise connectivity between large tracts/patches of remnant vegetation. The corridor mapped over the Study Area is associated with the Banana Range running north to south from Mt Benn to Trevethan State Forest (DES, 2018).

Riparian corridors are vegetated areas along major watercourses and maintain and encourage connectivity of riparian and associated ecosystems. Four regional riparian corridors intersect the Study Area associated with Oxtrack Creek, Keen Creek, Castle Creek and Boam Creek. Regional riparian corridors in the Brigalow Belt bioregion were identified by the Biodiversity Planning Assessment as areas associated with Stream Order 3 and 4 watercourses. Riparian corridors function is to provide migratory and dispersal pathways and contain important habitat resources as well as refugia during periods of drought (DES, 2018).

4.7 BROAD HABITAT TYPES WITHIN THE STUDY AREA

The Study Area has been classified into six broad habitat types (BHT), defined based on vegetation community type and structure. These habitat types have been considered as respective foraging, breeding, roosting, denning, dispersal and movement functions for listed threatened and/or migratory species that are known, likely or have the potential to occur within the Study Area. Ground-truthed habitat mapping, based on the findings of the 10 field investigations between October 2022 and February 2026, has been informed by these six habitat types, and subsequently used to identify areas of habitat for listed threatened species.

The habitats in the Study Area are generally in a moderate to low condition, with signs of degradation and fragmentation due to cattle grazing, dieback, erosion, and the presence of introduced flora species. Where there are areas of higher quality habitat in a remnant condition, these are in discrete patches and sections of the Study Area. The dominant BHT across the Study Area is grassland and cultivated agricultural land, accounting for almost half of the Study Area. A summary of these habitat types, along with their vegetation community classifications and attributes, are provided in Table 4-2 and presented in Figure 4-1.

TABLE 4-2 BROAD HABITAT TYPES

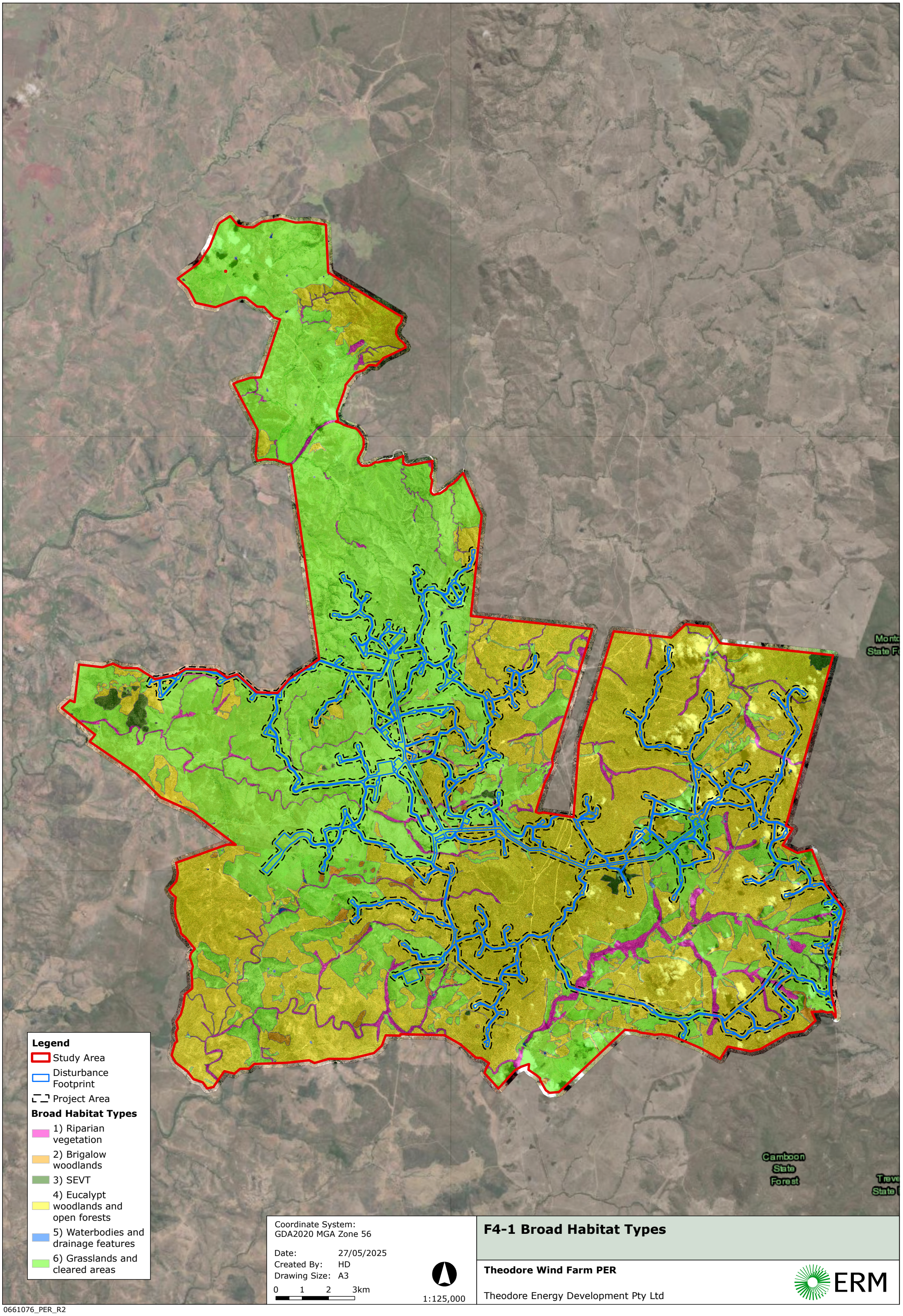
Habitat Type and Occurrence in Study Area[1]	Structure	Habitat Features / Condition	Photographic Example
Grasslands and cultivated agricultural land including cultivated alluvial plains, and grassland with occasional presence of *Eucalyptus sp.*, often in the form of small regrowth patches or small clusters of mature paddock trees. Indicative habitat available: 22,684.9 ha*	**Tree layer:** Sparse eucalyptus paddock trees, dead stags sporadic throughout. Minimal habitat values. **Shrub layer:** Sparse to absent. Mainly *Acacia* sp. **Ground microhabitat layer:** Native and exotic grasses. Suitable cover and habitat for ground foraging species such as squatter pigeon.	This BHT is often found linking denser eucalypt woodlands to riparian habitats. There is limited habitat value present due to the lack of dense vegetation. Longer native and non-native grass species can be used for sheltering and dispersal by smaller mammal species. Very limited to low necessary microhabitat features for reptiles.	

Habitat Type and Occurrence in Study Area[1]	Structure	Habitat Features / Condition	Photographic Example
Waterbodies and drainage features located throughout Study Area. These were mainly farm dams which were found in conjunction with cleared agricultural land and creeks. Indicative habitat available: 56 ha*	**Tree layer:** *Eucalyptus* sp. and or *Melaleuca* sp. **Shrub layer:** sparse often weedy. Presence of Acacia spp. **Ground microhabitat layer:** Native and exotic grassland	The farm dams are generally in a poor condition due to being eroded from heavy cattle use. These farm dams provide a refuge for a range of bird species, including birds of prey. Drainage features in the Study Area including rivers, creeks, and adjacent remnant vegetation provide value for a range of species of birds, mammals and reptiles.	
Riparian woodland and open forest dominated by *Eucalyptus populnea*, *E. tereticornis* often associated with stream channels. *Associated commonly with C. tessellaris +/- E. camaldulensis.* Indicative habitat available: 1,726 ha*	**Tree layer:** *Eucalyptus tereticornis, E. camaldulensis*, and *Melaleuca bracteata* **Shrub layer:** *Melaleuca* and *Acacia sp.* usually sparse. **Ground microhabitat layer:** Native and exotic grasses and sedge tufts, minimal habitat value. Woody debris often present along active parts of creek beds such as depositions/ meanders which provide habitat for smaller mammals and reptiles.	This habitat was generally of moderate to poor condition due to presence of weedy species of grasses and shrubs such as L*antana camara* and erosion caused by cattle, high grazing pressures.	

Habitat Type and Occurrence in Study Area[1]	Structure	Habitat Features / Condition	Photographic Example
Vine Forest/Thickets and Dry Rainforest Including *Brachychiton sp*. *+/-Flindersia sp*. Indicative habitat available: 277.4 ha*	**Tree layer:** *Brachychiton* sp. *+/-Flindersia* sp. **Shrub layer:** Commonly vine thicket species such as Wilga (*Geijera parviflora*) and *Eremophila* sp. **Ground microhabitat layer:** Native and exotic grasses. Suitable cover and habitat for ground foraging species such as squatter pigeon.	Trees present may provide habitat for birds and mammals. However, these areas are quite isolated and degraded. Woody debris generally absent. The ground layer largely consists of natives such as *Aristida* sp. (wire grass), *Heteropogon* sp. grass), and *Bothriochloa decipiens.*	
Eucalypt woodland and open forest dominated by *E. crebra* with a grassy understorey *+/- Eucalyptus populnea +/- C. tessellaris +/- E. tereticornis +/- C. erythrophloia +/- E. melanophloia +/- C. citriodora.* Indicative habitat available: 21,768.5 ha*	**Tree layer:** dominated by *E. crebra, E. populnea +/- C. tessellaris +/- E. tereticornis +/- C. erythrophloia +/- E. melanophloia +/- C. citriodora.* **Shrub layer:** sparse often weedy. Presence of Acacia spp. **Ground microhabitat layer:** Native and exotic grasses. Suitable cover and habitat for ground foraging species such as squatter pigeon.	The trees present may provide habitat for birds and mammals. However, habitat for arboreal mammals is likely to be sparse due to the limited amount of hollow bearing and mature trees observed within the Study Area. The ground layer largely consists of natives such as *Aristida* sp. (wire grass), *Heteropogon* sp. grass), and *Bothriochloa decipiens.*	

Habitat Type and Occurrence in Study Area[1]	Structure	Habitat Features / Condition	Photographic Example
Brigalow woodlands- dominated by *Acacia harpophylla +/- Casuarina* sp. Indicative habitat available: 277.4 ha*	**Tree layer:** *Acacia harpophylla* dominant. **Shrub layer:** Sparse cover which can include species such as Wilga (*Geijera parviflora*) and *Acacia* sp. **Ground microhabitat layer:** Sparse grasses, saltbush and woody debris. Occasionally cracking clay soils creating gilgai.	Habitat is suitable for some threatened species such as *Denisonia maculata*, where cracking clay depressions are readily available and there is a moderate presence of woody debris. Also potential habitat for *Solanum* sp., as well as *Xerothamnella* sp. where water pools. Often observed as heavily grazed in pure stands on alluvial soils. Condition varies depending on grazing pressure and access to cattle as well as presence of weedy vegetation.	

**Due to the projection of spatial data, the areas (ha) listed as indicative habitat available for each Broad Habitat Type do not equate to the same total area indicated for the Study Area (46,830 ha).*



F4-1 Broad Habitat Types

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4.8 ECOLOGICAL INVESTIGATIONS

4.8.1 OVERVIEW

This section outlines the methods implemented to identify Matters of National Environmental Significance (MNES) in the Study Area. The methods include a desktop review to identify ecological values that may be present, which informed the design of field surveys and the sampling program to collect field data. Ten field investigations were undertaken across the Study Area between October 2022 and February 2026. Field data was used to describe on-ground conditions and to assess the known, likely, and potential occurrence of MNES, and their habitat, within the Study Area.

4.8.2 EXPERT CONSULTATION

Supervision, guidance, and technical review has been undertaken by Dr David Dique, a lead partner at ERM with 30 years of ecology experience, for each field survey investigation. David has led the design of all field surveys. Over the last 20 years, David has become recognised as a specialist in koala ecology research, conservation, and mapping planning. David completed his PhD on koalas in South-east Queensland in 2004, and since has played key roles on expert panels for State and Federal Governments in koala management policy development. This includes developing the Queensland koala habitat mapping, participating as an invited expert on a panel for the review of the status of the koala in Australia and contributing as an invited expert for the development of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) koala referral guidelines.

Oversight, guidance, and technical review has been undertaken by ERM Principal Ecologist Matt Davis, a 20 year experienced ecologist who has experience in both flora and fauna assessments.

Threatened fauna surveys were led by Adam Pavitt, a senior ERM ecologist with 10 years' experience. Vegetation assessments, including ground truthing and mapping of Threatened Ecological Communities (TECs), were led by Timothy Callaghan, also a senior ERM ecologist, with 10 years' experience specialising in botany and vegetation. The extended field team supporting these senior ecologists included a range of suitably qualified ecologists and botanists who were able to gather and analyse the results of the field surveys.

The bat surveys were undertaken with the use of ultrasonic detectors (i.e. Anabats) and as such, an expert with the ability to understand the frequency of bat calls was consulted to analyse these results. This was done by expert Kelly Mathews, who is the Director of Green Tape Solutions and is a Certified Environmental Practitioner. Kelly has over 16 years' experience in ecology including the reporting and interpretation of bat detector results.

A peer review of the approach performed for the Collision Risk Model (CRM) for the Proposed Action has been undertaken by Peter Wright, Principal Ecologist in ERM Scotland. Given his extensive experience with CRM for onshore wind farm projects in the northern hemisphere no further consultation with experts/field specialists was required.

4.8.3 DESKTOP REVIEW

Databases and other desktop sources reviewed included State, Commonwealth and other publicly available information sources (Table 4-3). A search encompassing the Study Area and a 10 km buffer (the Locality) was utilised for database searches.

Queensland Department of Environment, Science and Innovation (DESI) WildNet searches were produced using a central point with a buffer used to ensure searches captured WildNet database records with 10km of the Study Area at a minimum. As a result, some records captured in the search may be further than 10 km from the Study Area boundary, in particular to the east and west.

Department of Climate Change, Energy, the Environment and Water (DCCEEW) Protected Matters Search Tool (PMST) and WildNet search results were cross-referenced with Atlas of Living Australia (ALA) to further interrogate records of MNES for recency and distribution within the Locality. Search results for PMST and WildNet are presented in Appendix B.

Results of the desktop review were used to produce a preliminary likelihood of occurrence analysis for significant species, as detailed in Section 4.8.4 of this Report. Preliminary likelihood of occurrence analysis informed the methods and survey locations for targeted listed threatened species surveys. This preliminary likelihood of occurrence was then refined to produce a final likelihood of occurrence (Appendix C) informed by field survey data, based on ground-truthed habitat characteristics in the Study Area.

TABLE 4-3 DATABASES REVIEWED FOR DESKTOP ANALYSIS

Information Source	Name	Data Description
Department of Climate Change, Energy, the Environment and Water (DCCEEW)	Protected Matters Search Tool (PMST) *The PMST report for this PER was generated on 26 August 2024*	The search tool provides predictive results of matters of national environmental significance based on mapping of known and potential species distribution, habitat, ecological communities and wetlands. The outputs are based on modelling results and do not necessarily reflect known records of species or communities. The features highlighted by the search are considered further through a likelihood of occurrence assessment (Appendix C). The PMST is available as Appendix B. Search area: Study Area Boundary .shp file (with a 10 km buffer, referred to as the Locality, around this area drawn in the PMST interactive search map).
Department of Resources (DoR)	Regional Ecosystem Version 13 mapping	This product maps remnant and regrowth vegetation communities across Queensland and identifies communities listed as Endangered, Of Concern or Least Concern status as defined by the QLD Vegetation Management Act 1999.
DoR	Property Maps of Assessable Vegetation mapping (published 4 May 2017)	This product provides certified property scale maps indicating where landholders can clear regrowth in 'Category X' areas without further approval.
Queensland Government	MSES version 4.1 mapping	This product maps areas of MSES as defined under the QLD State Planning Policy.
DoR	Queensland Globe	A Queensland Government based product that allows viewing of spatial data and imagery covering Queensland.
Department of Environment, Science and Innovation (DESI)	WildNet records – Through Environmental Reports Online	A database that contains records of wildlife sightings including threatened flora and fauna species (protected under the NC Act) that have been provided to the agency by Government departments and external organizations. Search area: all Lots within the Study Area

Information Source	Name	Data Description
	The WildNet report for this PER was generated on 26 August 2024	
Atlas of Living Australia website at http://www.ala.org.au.	Atlas of Living Australia (ALA) *Atlas of Living Australia occurrence download. Accessed 26 August 2024*	Australia national biodiversity database (supported by the National Collaborative Research Infrastructure Strategy, CSIRO). Database contains records accessed through an interactive spatial portal. Threatened species are searched to identify known records in proximity to the Study Area.
DCCEEW	Species Profile and Threats Database (SPRAT)	The SPRAT profiles and associated conservation advice documents were consulted as they provide detailed information for the likelihood of occurrence assessment on: • Species distribution; and • Species habitat preferred and general. The conservation advice documents are particularly important for assessing TECs found in field surveys, against the listed TEC guidelines.

4.8.4 LIKELIHOOD OF OCCURRENCE

As outlined above, a preliminary likelihood of occurrence assessment was refined using site-specific and species-specific habitat information obtained from field surveys and observations from senior field ecologists to produce a final likelihood of occurrence (Appendix C).

The assessment ranks the likelihood of the species occurring within the Study Area through analysis of species distribution information and the presence of specific habitat attributes as identified through the desktop analysis and field survey. The criteria are outlined in Table 4-4.

The *Significant Impact Guidelines 1.1 – Matters of National Environmental Significance* (SIG 1.1) (DoE, 2013) provides overarching guidance on determining whether an action is likely to have a significant impact on MNES, and refers to 'habitat critical to the survival of a species' and 'important habitat' (see Section 4.8.6.1). This approach has been adopted for the likelihood of occurrence, with consideration of the *Queensland Method for Mapping Matters of state environmental significance* (DES, 2020) which defines habitat for threatened species as preferred and general habitat.

Preferred habitat is defined as areas or locations which have the potential to provide necessary resources needed for the maintenance of a population. This includes the presence of desired habitat features for a species whereby activities such as breeding, nesting, and foraging contribute to the maintenance of the population. Preferred habitat can also include habitat critical to the survival of the species, whether denoted by the relevant species guidelines (such as conservation advice, recovery plans or scientific literature), or by the definition provided by SIG 1.1, and may support elements such as species dispersal requirements.

General habitat is defined as areas or locations which have the potential to host a species for a limited amount of time or to support an ecological function (such as dispersal) that is not restricted to that area. General habitat may be considered suitable for a species, but not preferred, where there are some desired features present but not all. Areas within general

habitat may not maintain a population, may have poor connectivity to known preferred habitat, or may be known to be disturbed.

Habitat and distribution information for MNES is sourced from Species Profile and Threats Database profiles and/or Conservation Advice where available, supplemented by other primary sources (e.g. published literature). In regard to species records, these were sourced from WildNet and/or ALA. Where species presence cannot be discounted, they are categorized as potentially occurring.

All records of species identified within the Study Area or Locality were noted in the likelihood of occurrence assessment. For defining recent records of threatened species within the Locality, only those that have been recorded in databases searches within the previous 20 years have been considered.

TABLE 4-4 LIKELIHOOD OF OCCURRENCE CRITERIA

	Preferred habitat exists	General habitat exists[1]	Habitat does not exist[2]
Records within the Study Area (based field investigations)	Known	Known	Known
Recent[3] records in the Locality[4]	Likely	Potential	Unlikely
No records in the Locality, but the Study Area is within the known distribution	Potential	Potential	Unlikely
No records in the Locality, and the Study Area is outside of the known distribution	Unlikely	Unlikely	Unlikely

1. *Habitat may be considered general, but not preferred because: some desired habitat features may be present, but not all; habitat may have poor connectivity; or habitat may be known to be disturbed.*
2. *Based on sources reviewed and/or field survey results.*
3. *'Recent' means records within the previous 20 years.*
4. *'Locality' refers to a 10 km radius centred on the Study Area.*

4.8.5 ECOLOGICAL SURVEYS

This section summarises the survey guidelines and methodology utilised during field investigations for the Proposed Action.

4.8.5.1 SURVEY GUIDELINES

Table 4-5 provides an overview of relevant State and Commonwealth adopted survey guideline documents that were consulted to inform the field survey program.

TABLE 4-5 SURVEY GUIDELINES RELEVANT TO FIELD INVESTIGATION

Guideline Level and Source	Guideline and Reference
Commonwealth Guidelines	
Department of Climate Change, Energy, the Environment and Water (DCCEEW), May 2024	Onshore Wind Farm Guidance - Best practice approaches when seeking approval under Australia's national environment law (draft for consultation)

Guideline Level and Source	Guideline and Reference
Department of Sustainability, Environment, Water, Population and Communities (DSEWPC), 2011	Survey guidelines for Australia's threatened mammals
Department of Environment, Water, Heritage and the Arts (DEWHA), 2017	Survey guidelines for Australia's threatened birds
Department of the Environment (DoE), 2015	Draft referral guidelines for 14 birds listed as migratory species under the EPBC Act
DSEWPC, 2011	Survey guidelines for Australia's threatened reptiles
DSEWPC, 2011	Draft referral guidelines for nationally listed Brigalow Belt reptiles
DEWHA, 2010	Survey guidelines for Australia's threatened bats
DEWHA, 2017	Survey Guidelines for Australia's Threatened Birds: Guidelines for detecting birds listed as threatened under the Environment Protection and Biodiversity Conservation Act 1999
Department of Environment and Energy (DoEE), 2017	Industry guidelines for avoiding, assessing and mitigating impacts on EPBC Act listed migratory shorebird species
DoE, 2014	EPBC Act Referral Guidelines for the vulnerable koala (combined populations of Queensland, New South Wales and the Australian Capital Territory)
Youngentob et.al., 2021	A review of koala habitat assessment criteria and methods (Commonwealth Information Sheet)
State Guidelines	
DES, 2018	Terrestrial Vertebrate Fauna Survey Guidelines for Queensland
DES, 2020	Flora Survey Guidelines - Protected Plants under the NC Act
Eyre et al., 2022	Guide to greater glider habitat in Queensland - report prepared for the Department of Agriculture, Water and the Environment, Canberra

4.8.5.2 SURVEY SUMMARY AND TECHNIQUES

Ten field investigations have been undertaken across the Study Area between October 2022 and February 2026. Field survey timing, techniques and survey effort are summarized in Table 4-6. The locations of survey effort undertaken during these events are presented in Figure 4-2. Field investigation techniques undertaken across the Study Area were based on an assessment of target species considered to potentially occur in the Study Area from the preliminary likelihood of occurrence. Field survey plans were developed to meet required effort and seasonality requirements as defined in relevant State and Commonwealth guidelines (see Section 4.8.5.1).

A summary of the survey effort is provided in Figure 4-2 and a description of survey techniques is detailed in the Sections below.

Legend

- Study Area
- Disturbance Footprint
- Project Area
- Flora Transect Point
- Habitat Quality Assessment
- QLD Quaternary Assessment
- Road
- Track and Path
- BioCondition Transects

Coordinate System:
GDA2020 MGA Zone 56

Date: 27/02/2026
Created By: SP
Drawing Size: A3

0 1 2 3km

1:125,000

F4-2a - Survey Effort and Locations in the Study Area - Vegetation and Habitat Quality Assessments and Targeted Flora Surveys

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Legend

- Study Area
- Disturbance Footprint
- Project Area
- Fauna Transect Point
- Anabat Songmeter
- Koala SAT
- Camera Traps
- Call Playback (Yellow-bellied Glider and Koala)
- Call Playback (Diamond Firetail)
- Spotlighting Tracks
- Road
- Track and Path

Coordinate System:
GDA2020 MGA Zone 56

Date: 27/05/2025
Created By: SP/HD
Drawing Size: A3

0 1 2 3km

1:125,000

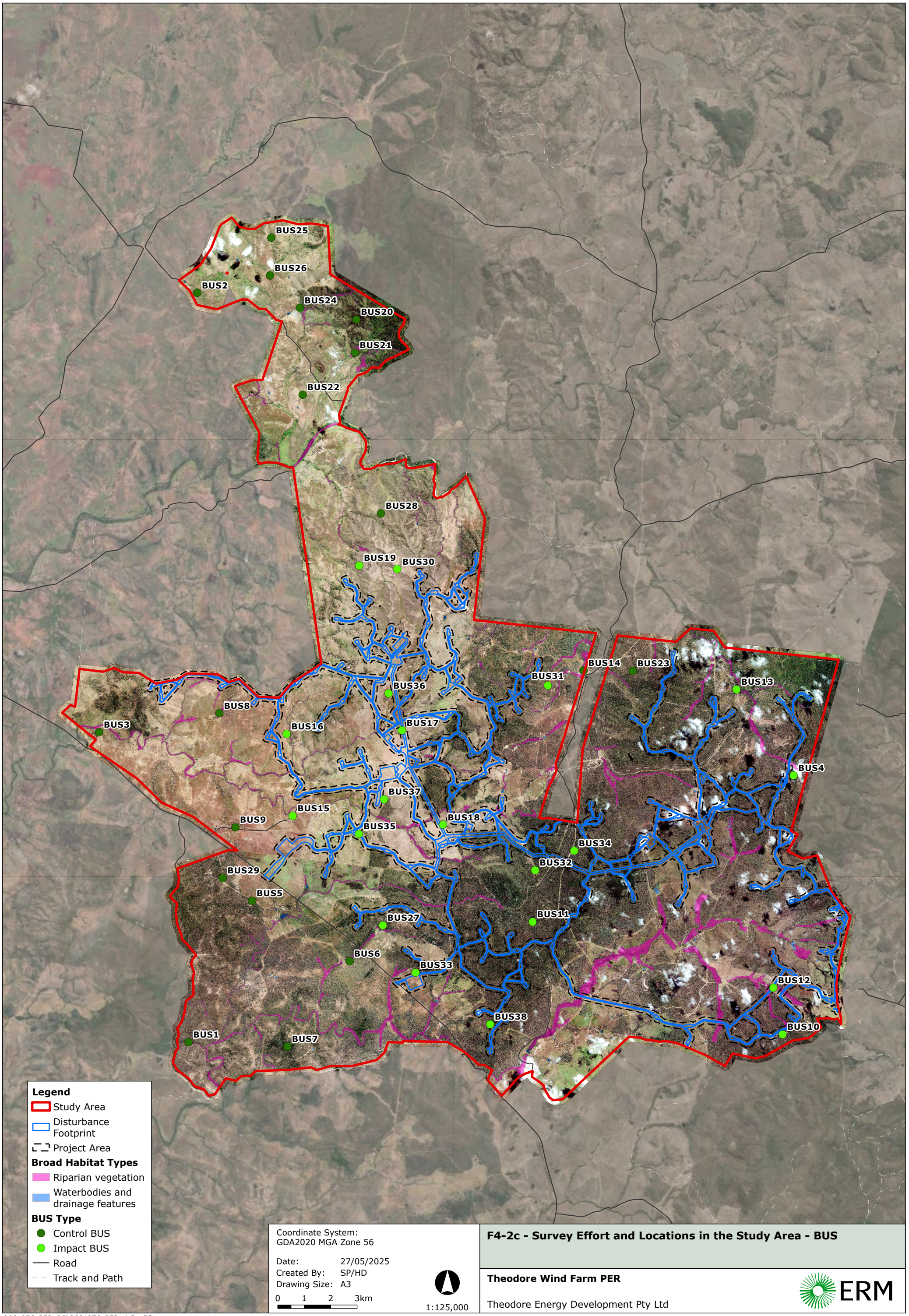
F4-2b - Survey Effort and Locations in the Study Area - Targeted Surveys for Listed Fauna Species

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TABLE 4-6 SUMMARY OF FIELD SURVEYS UNDERTAKEN WITHIN THE STUDY AREA

Dates	Summary	Target	Techniques	Survey Effort
17-22 October 2022	Four ecologists undertook a six-day ecological survey within the Study Area, for a total of 240 person hours.	Vegetation and habitat assessment (including targeted threatened species surveys)	• Assessment of habitat features present relating to relative cover and abundance of nesting/shelter/basking sites, presence of aquatic habitats, presence of foraging resources, dominant canopy species, connectivity and disturbances. • Representative sampling for regional ecosystem verification using quaternary vegetation sampling (Neldner, et al., 2022). • Targeted surveys for threatened species identified with potential to occur, as described in the likelihood of occurrence analysis (Appendix C) including surveys for signs (e.g. scats) with techniques outlined in the Sections below.	• 36 individual survey locations where habitat assessments, vegetation assessments and targeted surveys were completed.
		Targeted fauna surveys	• Deployment of baited camera traps to target terrestrial mammals. • Targeted spotlighting transects.	• 4 camera traps deployed for 4 consecutive nights, totalling 16 trap nights. • 2 nights spotlighting transects along Defence Road.
		Bird surveys	• Bird utilization surveys (BUS)	• 23 BUS
		Bat surveys	• Bat detection via the use of ultrasonic devices (Anabats).	• 2 Anabat locations recording for 4 consecutive nights, totalling 8 trap nights.
13-17 February 2023	Two ecologists undertook a five-day bird and bat survey within the Study Area, for a total of 100 person hours.	Bird surveys	• BUS	• 32 BUS
		Bat surveys	• Bat detection via the use of ultrasonic devices (Anabats).	• 4 Anabat locations recording for 4 consecutive nights, totalling 16 trap nights.
27-31 March 2023	Four ecologists undertook a five-day ecological survey within	Vegetation and habitat assessment (including targeted	• Assessment of habitat features present relating to relative cover and abundance of nesting/shelter/basking sites, presence of aquatic	• 60 individual survey locations where habitat assessments, vegetation

Dates	Summary	Target	Techniques	Survey Effort
	the Study Area, for a total of 200 person hours.	threatened species surveys)	habitats, presence of foraging resources, dominant canopy species, connectivity and disturbances. • Representative sampling for RE verification using quaternary vegetation sampling (Neldner, et al., 2022). • Targeted surveys for threatened species identified with potential to occur, as described in the likelihood of occurrence analysis (Appendix C) including surveys for signs (e.g. scats) with techniques outlined in the Sections below.	assessments and targeted surveys were completed.
		Bird surveys	• BUS	• 27 BUS
		Bat surveys	• Bat detection via the use of ultrasonic devices (Anabats).	• 4 Anabat locations recording for 4 consecutive nights, totalling 16 trap nights.
5-9 June 2023	Four ecologists undertook a five-day ecological survey within the Study Area, for a total of 200 person hours.	Vegetation and habitat assessment (including targeted threatened species surveys)	• Assessment of habitat features present relating to relative cover and abundance of nesting/shelter/basking sites, presence of aquatic habitats, presence of foraging resources, dominant canopy species, connectivity and disturbances. • Representative sampling for RE verification using quaternary vegetation sampling (Neldner, et al., 2022). • Targeted surveys for threatened species identified with potential to occur, as described in the likelihood of occurrence analysis (Appendix C) including surveys for signs (e.g. scats) with techniques outlined in the Sections below.	• 48 individual survey locations where habitat assessments, vegetation assessments and targeted surveys were completed.
		Additional targeted fauna surveys	• Targeted spotlighting transects. • Koala Spot Assessment Technique (SATs).	• 4 spotlighting nights totalling 12 hours survey effort. • 7 koala SATs
		Bird surveys	• BUS	• 24 BUS

Dates	Summary	Target	Techniques	Survey Effort
25 September - 13 October 2023	Two ecologists undertook a five-day ecological survey within the Study Area from 25th of September to the 29th of September 2023, then another five-day ecology survey from the 9th of October to the 13th of October 2023, for a total of 200 person hours.	Habitat quality assessments	• Modified Habitat Quality Assessment (MHQA) and BioCondition Assessments.	• 17 transects
		Bird surveys	• BUS	• 26 BUS
4-8 December 2023	Two ecologists undertook a five-day ecology survey within the Study Area, for a total of 100 people.	Bird surveys	• BUS	• 40 BUS
19 – 23 February 2024	Two ecologists undertook a five-day ecology survey within the Study Area, for a total of 100 person hours.	Bird surveys	• BUS	• 27 BUS
10 – 14 June 2024	Four ecologists undertook a four-day ecology survey within the Study Area, for a total of 160 person hours.	Vegetation assessments	• Representative sampling for RE verification using quaternary vegetation sampling (Neldner, et al., 2022).	• 31 individual survey locations where habitat assessments, vegetation assessments and targeted surveys were completed.
		Habitat quality assessments	• MHQA and BioCondition Assessments.	• 8 transects
		Bird surveys	• BUS	• 18 BUS
	Four ecologists undertook a six-day	Habitat quality assessments	• MHQA and BioCondition Assessments.	• 13 transects

Dates	Summary	Target	Techniques	Survey Effort
23 – 28 September 2024	ecology survey within the Study Area, for a total of 240 person hours.	Targeted Flora Transects	• Targeted flora transects within impact areas for potentially occurring threatened flora: Ooline (*Cadellia pentatylis*), Cossinia (*Cossinia australiana*), Austral cornflower (*Rhaponticum australe*), *Solanum dissectum*, *Solanum johnsonianum* and *Xerothamnella herbacea*.	• 17 transects in impact areas ranging from 30 minutes to an hour.
		Habitat assessment (including targeted threatened species surveys)	• Assessment of habitat features present relating to relative cover and abundance of roosting/shelter/basking sites, presence of aquatic habitats, presence of foraging resources, dominant canopy species, connectivity and disturbances. • Targeted surveys for threatened species identified with potential to occur, as described in the likelihood of occurrence analysis (Appendix C). Surveys focused on the presence of suitable habitat for threatened reptiles and white-throated needletail roosting/foraging habitat.	• 4 assessments in impact areas for reptiles. • 6 assessments atop ridgelines for white-throated needletail.
		Additional targeted fauna surveys	• Targeted spotlighting transects. • Call playback.	• 2 spotlighting nights totalling 8 hours survey effort. • 8 call playback sessions for yellow-bellied glider and koala. • 6 call playback sessions for diamond firetail.
17 – 21 February 2026	Four ecologists undertook a five-day ecological survey within the Study Area, for a total of 120 person hours.	Habitat quality and quaternary assessments (targeted for yellow-bellied glider)	• Habitat quality and quaternary assessments to verify the extent of habitat for yellow-bellied glider within the Study Area. • This included refinement based on expert guidance advice, focusing on species identification, floristic diversity and composition, and identification of areas to be excluded from habitat mapping including poplar box communities, areas of sparse vegetation (including regrowth) and disconnected vegetation patches.	• 22 additional quaternary surveys.

Dates	Summary	Target	Techniques	Survey Effort
		Habitat quality assessments	• MHQA and BioCondition Assessments.	• 19 BioCondition assessments.

Vegetation and Habitat Quality Assessments

Vegetation assessments and habitat quality assessments were undertaken to describe the type and condition of the vegetation communities within the Study Area. The outcomes of these assessments were used to inform a final likelihood of occurrence (Appendix C) of listed threatened species and TECs. The assessments undertaken include:

- Representative sampling of REs. This included quaternary assessments in accordance with (Neldner, et al., 2022);
- Assessment of water features (such as dams) and habitat values;
- Recording of topographical features; and
- Defining barriers of both disturbed and undisturbed areas.

Parameters measured during assessments critical to identifying potential habitat include:

- Context with regard to landscape features (connectivity, proximity to water);
- Condition (weeds, evidence of disturbance, invasive species);
- Breeding and roosting habitat features (e.g. hollows, nests, caves);
- Foraging sources (flowering tree species, termite mounds);
- Microhabitat presence (woody debris, leaf litter specifically important for small mammals and reptiles);
- Wetland presence (presence of aquatic vegetation, water depth); and
- Signs of threatened species (such as scats, scratches and tracks).

Vegetation communities identified as potentially meeting the key diagnostic criteria and condition thresholds of EPBC Act listed TECs were sampled with a greater scrutiny to verify the status of these communities.

Targeted surveys for listed flora and fauna identified with potential to occur in the Study Area (refer to Appendix C) were undertaken at the same location as habitat assessments. The survey locations are shown in Figure 4-2.

Targeted Surveys for Listed Flora Species

Ten flora species recognized as MNES were identified through desktop assessment. Targeted surveys were undertaken during field survey events in October 2022, March, June and September/October 2023, and September 2024 for listed flora species assessed as potentially occurring within the Study Area. Following field surveys, this was refined down to six potentially occurring species:

- Ooline (*Cadelia pentastylis*);
- Cossinia (*Cossinia australiana*);
- Austral cornflower (*Rhaponticum australe*);
- *Solanum dissectum*;
- *Solanum johnsonianum*; and
- *Xerothamnella herbacea*.

Targeted flora surveys for these species were undertaken concurrently with vegetation and habitat assessments throughout the Study Area. Listed flora species targeted during the field

surveys, their survey guideline requirements, as well as whether the survey effort has met guideline requirements, are discussed further in Section 5 of the Theodore Wind Farm PER.

Targeted Surveys for Listed Fauna Species

Targeted surveys were undertaken during all field survey events for listed fauna species with potential habitat identified from desktop analysis and the preliminary likelihood of occurrence assessment (see Appendix C):

- Greater glider (southern and central) (*Petauroides Volans*);
- Yellow-bellied glider (south-eastern) (*Petaurus australis australis*);
- Koala (*Phascolarctos cinereus*);
- Large-eared pied-bat (*Chalinolobus dwyeri*);
- South-eastern long-eared bat (*Nyctophilus corbeni*); and
- Ornamental snake (*Denisonia maculata*).

Details on all the EPBC Act listed fauna species targeted during the field surveys, their survey guideline requirements, as well as whether the survey effort has met guideline requirements are discussed further in Section 5 of the Theodore Wind Farm PER.

The following Sections summarise the main techniques used when targeting listed threatened mammals, birds and reptiles within the Study Area.

Terrestrial and Arboreal Mammals

Koala, greater glider (southern and central) and yellow-bellied glider (south-eastern) have been considered to potentially occur in the Study Area (Appendix C) and have been targeted during field surveys.

A targeted survey approach was implemented to assess the presence of these species in line with *Survey guidelines for Australia's threatened mammals* (DSEWPC, 2011), *Terrestrial Vertebrate Fauna Survey Guidelines for Queensland* (DES, 2022), *A review of koala habitat assessment criteria and methods* (Youngentob, Marsh, & Skewes, 2021) and *Guide to greater glider habitat in Queensland* (Eyre, et al., 2022). Surveys techniques adopted were as follows:

- Koala:
  - Nocturnal spotlighting for smaller sites to determine presence and density;
  - SAT which involves looking at the base of koala food trees for presence of koala scats and the trunks of smooth bark gums for koala scratches; and
  - Call playback playing a downloaded koala call through a speaker for 3 minutes followed by listening for a response prior to spotlighting.
- Greater glider (southern and central):
  - Two (2) people, 30-minute spotlight searches of 100 x 100 m survey sites; and
  - Scat and sign search can coincide with the systematic diurnal active searches, within 50 x 50 m quadrats of the survey site.
- Yellow-bellied glider (south-eastern):
  - Two (2) people, 30-minute spotlight searches of 100 x 100 m survey sites; and
  - Daytime searches for signs of activity (feeding marks on trees).

- Call playback playing a downloaded yellow-bellied glider call through a speaker for 3 minutes followed by listening for a response during spotlighting.

Reptiles

Targeted searches were undertaken for all for listed reptiles with potential habitat identified within the Study Area, though were primarily focused on identification of the ornamental snake, as per the likelihood of occurrence assessment (Appendix C). These searches were undertaken in accordance with the following guidelines:

- Survey guidelines for Australia's threatened reptiles (DSEWPC, 2011):
  - Searches of suitable gilgai habitat (small depressions and mounds in clay soils) while preferred prey species (frogs) are active;
  - Diurnal searches under sheltering sites such as rocks, logs or other large objects on the ground.
- EPBC Act - Draft Referral guidelines for the nationally listed Brigalow Belt reptiles (DCCEEW, 2023):
  - Spotlighting transects targeting water-inundated gilgais, wetlands, riparian habitats and surrounding environments and large logs between dusk and early morning hours, ideally on warm and humid evenings;
  - Opportunistic road surveys while driving along roadways in the identified study area, especially following large rainfall events and on warm evenings; and
  - Microhabitat searches during the coolest parts of the day, including carefully turning woody debris, rocks and artificial debris, raking the soil surface or leaf litter beneath trees.

Birds

Surveys for birds within the Study Area focused on identification of species listed as threatened or migratory, particularly those considered known, likely or potentially occurring within the Study Area as per the likelihood of occurrence assessment (Appendix C):

- Squatter pigeon (southern) (*Geophaps scripta scripta*);
- White-throated needletail (*Hirundapus caudacutus*);
- Australian painted snipe (*Rostratula australis*);
- Diamond firetail (*Stagonopleura guttata*);
- Black-breasted button-quail (*Turnix melanogaster*); and
- Fork-tailed swift (*Apus pacificus*).

Surveys for diurnal birds were conducted in line with *Survey Guidelines for Australia's threatened birds* (DEWHA, 2017) and *Draft referral guidelines for 14 birds listed as migratory species under the EPBC Act* (DoE, 2015). Various surveys targeting birds within the Study Area were completed following the methods described below. All bird survey locations are shown in Figure 4-2.

Bird Utilisation Surveys

BUS involve 20-minute fixed point surveys to provide data based on the species present and their height, speed and direction of flight as required to complete collision risk modelling using

the Band Model (SNH, 2016; Band, 2000). The current *Onshore wind farm guidance - best practice approaches when seeking approval under Australia's national environment law* (Onshore Wind Farm Guidance) (DCCEEW, 2024) outlines the need to improve the understanding of the Study Area (and surrounds) utilisation through survey work for each relevant species. It is reiterated that species-specific survey methodologies and requirements were also consulted and implemented in the field survey program, as detailed in the following Sections.

Each fixed-point BUS site was located to provide a search radius of at least 100 m for small birds and up to 800 m for large birds with range finders used to determine distances. This fulfills the non-specific DEWHA (2017) requirements for diurnal bird surveys. As well as targeting threatened species, BUS focused on birds most likely to be affected by the development, such as raptors (birds of prey) and large flocks of birds. This technical requirement for BUS is outlined in AusWind's Report, *Wind Farms and Birds: Interim Standards for Risk Assessment* (AusWEA, 2006), Onshore Wind Farm Guidance (DCCEEW, 2024) and Queensland *State Code 23 – Wind farm developments* (State Code 23) (DSDILGP, 2022).

As surveys commenced in October 2022, the BUS survey design was implemented with reference to the *Onshore Wind Farms – interim guidance on bird and bat management* (DAWE, 2021), which required BUSs to be completed over each relevant season over a minimum of 24 months prior to commissioning of a wind farm. This survey effort is also consistent with the requirements of the updated Onshore Wind Farm Guidance (DCCEEW, 2024), which requires site utilisation surveys to be undertaken for each relevant season over at least two years (up to 8 survey events).

There are two distinct seasons in Queensland, wet season and dry season. The Study Area experiences a higher mean rainfall and higher mean temperatures between November and February (often extending into March). This also coincides with the season for migratory birds, including wetland birds.

To meet survey timing requirements and inform species use across the Study Area as part of the risk assessment for threatened birds with the potential to be impacted by Wind Turbine Generator (WTG) strike, eight BUS survey trips have been conducted to date across these two seasons (four surveys in the wet season and four surveys in the dry season), consecutively over a 2-year period. BUS points were dispersed across the Study Area during the first two sampling events in October 2022 and February 2023, with the same sites subject to repeat visits in both the morning and afternoon period during all subsequent sampling events. A summary of the BUS survey effort is described in Table 4-7.

TABLE 4-7 SUMMARY OF BUS EFFORT

BUS Survey Event	BUS survey effort
October 2022 Dry season	23 surveys, 12 morning and 11 afternoon
February 2023 Wet season	32 surveys, repeat visits to BUS points including 16 morning and 16 afternoon surveys
March 2023 Wet season	28 surveys, repeat visits to BUS points including 14 morning and 14 afternoon surveys

BUS Survey Event	BUS survey effort
June 2023 Dry season	24 surveys repeat visits to BUS points including 12 morning and 12 afternoon surveys
September/October 2023 Dry season	26 surveys, repeat visits to BUS points including 12 morning and 14 afternoon surveys
December 2023 Wet season	40 surveys, repeat visits to BUS points including 20 morning and 20 afternoon surveys
February 2024 Wet season	27 surveys, repeat visits to BUS points including 13 morning and 14 afternoon surveys
June 2024 Dry season	18 surveys, repeat visits to BUS points including 9 morning and 9 afternoon surveys

DEHWA (2017) outlines steps that aid in determining survey effort and timing, noting a particular focus on optimal timing for surveys of 'target' taxa. With the timing of surveys critical to species detection, it is important that surveys be timed to maximise potential detection across the year. As such, eight BUS events have been completed over the two distinct seasons observed within Central Queensland (wet and dry).

State Code 23 details the requirement for BUS for wind farm developments. Such surveys identify avian species, numbers present, height flown and site utilisation. The eight field investigations undertook BUS at waterbodies and in open areas for birds of prey. Thus, the survey effort was performed in accordance with State Code 23 requirements.

The updated DCCEEW draft guidelines on the management of bird and bat species in onshore wind farms details the need to undertake a risk assessment for birds and bats following bird utilisation surveys for the Study Area (DCCEEW, 2024). A risk assessment has been completed, and takes into account the likelihood and consequences of events including collision with wind turbines and the impact of construction and operation on the Proposed Action causing changes in site utilisation by bird and bat species.

DCCEEW (2024) and State Code 23 also recommend Before-After-Control-Impact (BACI) design principle for surveys where the Study Area is determined to support significant bird species. The aim of the BACI design is to compare environmental variables before and after a human activity and between the areas affected by the development (impact site) and areas unaffected by the Proposed Action (control sites). In this instance, this would compare control and impact BUS sites, before and after the construction of the Proposed Action, to determine if there are any avian impacts as a result of the Proposed Action. For the Proposed Action, impact sites are generally located within 1 km of the proposed turbine locations. Control sites are defined as sites that are placed at a sufficient distance from the proposed turbine locations to obtain data outside the zone of influence of the turbines, as defined in State Code 23 (DSDILGP, 2022).

Twenty potential impact sites and 18 potential control sites were visited over the eight survey events between October 2022 and June 2024 (see Figure 4-2). These areas will be revisited and resurveyed during construction and after construction (operation phase) of the Proposed Action development, in accordance with the Proposed Action's Bird and Bat Management Plan (BBMP).

Draft guidance from DCCEEW on the management of birds and bats for onshore wind farms details how CRM must be undertaken for listed threatened species (MNES) where risks from the Proposed Action, particularly collision risks, have been identified (DCCEEW, 2024). State

Code 23 also requires CRM and Population Viability Analysis be conducted when a collision risk assessment identifies a risk to significant species, such as threatened birds, raptors and wetland birds. To satisfy these requirements, CRM has been undertaken in accordance with the Band CRM Method (Band, W., Madders, M., & Whitfield, D.P, 2007) for listed threatened and/or migratory species, and non-threatened raptor species, recorded in the Study Area and assessed as having a potential collision risk. CRM results are discussed in Section 6 and presented in full within the BBMP, Appendix D.

Point Surveys

Point surveys were conducted to target diurnal woodland and riparian bird species. Four ecologists during the October 2022 surveys, two ecologists during the February 2023 surveys, four ecologists during the March 2023 surveys and four ecologists during the June 2023 surveys traversed suitable woodland and riparian habitats and conducted 20-minute timed surveys for all birds in the area. This survey effort was targeted for listed threatened birds and is additional to the BUS effort.

Transect Surveys

Transect surveys were conducted in order to diurnal woodland and riparian bird species. Two ecologists during the February 2023 surveys, four ecologists during the March 2023 surveys and four ecologists during the June 2023 surveys traversed suitable riparian habitats and conducted transect walks for all birds in the area. This survey effort was targeted for listed threatened birds and is additional to the BUS effort.

Waterbody Surveys

Waterbody surveys were conducted in order to target aquatic species and woodland species utilising the waterbody. Observations were made from a stationary position, and birds were identified by call detection and visual observations. The Study Area contained several artificial waterbodies, likely to act as important water sources in the landscape, particularly during dry conditions. This survey effort was targeted for listed threatened birds and is additional to the BUS effort.

Call Playback

Call playback surveys were conducted in suitable habitat for diamond firetail (*Stagonopleura guttata*) during the September 2024 surveys. Six call playback sessions using downloaded diamond firetail calls broadcast through a speaker were conducted in *Eucalyptus* open forest with a grassy understory.

Squatter Pigeon Surveys

Squatter pigeon (southern) was identified via the likelihood of occurrence assessment as known to occur within the Study Area (Appendix C). This species' survey guidelines are different to most avifauna due to being a mostly ground-dwelling species. Searches were undertaken in accordance with the following guidelines:

- *Survey guidelines for Australia's threatened birds* (DEWHA, 2017):
    - Recommended methods include 15 hours of flushing surveys over a 3-day survey period; and

- 10 hours of area searches or transect surveys over a 3-day survey period in suitable habitat (short, grassy understory of eucalypt woodland, nearly always near permanent water).

Bat Surveys

Microbat surveys were conducted to determine the presence/absence of bats within and surrounding the Study Area, with four ultrasonic bat detectors (Anabats) placed throughout the relevant properties in the Study Area. The four Anabat devices were placed in 10 total locations throughout the Study Area over the October 2022, February and March 2023 field surveys. Anabats were not deployed during the June 2023 winter surveys. These devices were used to detect ultrasonic signals from bat species in the Study Area, for either two or four consecutive survey nights.

The bat detectors were placed across representative remnant vegetation/habitat types. This included riparian woodlands and eucalypt or acacia open forest or woodlands. The detectors were specifically placed in areas that were in close proximity to potential flight paths/water sources (farm dams) and in relative proximity to proposed turbine locations. The survey locations were selected on the basis that they provided the greatest likelihood of detecting an abundance and diversity of bat species.

The detectors were secured onto trees at approximately 1.8 m above the ground. They were collected and the information recorded on the Anabats was then analysed by a specialist to determine the species recorded.

The BACI design has also been implemented for bat surveys (explained in Bird Utilisation Surveys), in order to identify any impacts on bats as a result of the Proposed Action, with control sites determined based on the current Preliminary Design and locations of WTGs.

The survey requirements and recommended survey effort and methods for bats is as follows:

- *Survey guidelines for Australia's threatened bats* (DEWHA, 2010):
  - Trapping methods such as harp traps are recommended. Such effort is not precisely stated, but studies have found that the use of 20 or more traps a night a good for detection (Schulz, 1999). Harp trapping was not utilised as the target species, ghost bat (*Macroderma gigas*), can be detected via various other methods including however not limited to acoustic monitoring and spotlighting;
  - Echolocation call detection to be carried out for a recommended 30-60 minutes per night for four to five survey nights. Detectors were deployed to exceed these minimum requirements and set to record from dusk through to dawn during each sampling event;
  - Recommended that a variety of trapping and call detection methods are used together, where possible.

The full echolocation analyses for the Anabats deployed during October 2022, February and March 2023 field investigations are presented in Appendix E. The bat survey locations are shown in Figure 4-2.

4.8.5.3 CLIMATIC CONDITIONS

During all field investigation periods, the weather typically remained dry (with the exception of the October 2022 and September 2024 survey periods). Moderate wind conditions and

temperatures were typical for the periods that each survey took place. A summary of the daily weather observations for each survey period is presented in Table 4-8 to Table 4-18.

It should be noted that creek flooding occurred within the Study Area during the October 2022 survey period, which impacted access between survey sites.

Weather observations were sourced from the Thangool weather station (station number 039089), located approximately 50 km north-east of the Study Area.

TABLE 4-8 DAILY WEATHER OBSERVATIONS OCTOBER 2022 - THANGOOL QUEENSLAND

	Daily Temp		Rain	9:00AM				3:00 PM			
	Min	Max	mm	Temp	RH	Dir	Spd	Temp	RH	Dir	Spd
	°C	°C		°C	%		km/hr	°C	%		km/hr
17/10/22	16.6	29.3	7	22.5	79	NW	7	24.5	71	SE	13
18/10/22	14.8	28.9	0	25.5	65	NNE	20	26.8	53	N	20
19/10/22	19	23.9	1.4	21.5	89	NE	7	23.1	78	NNE	9
20/10/22	19.3	25.5	24.2	21.2	93	WNW	6	24.2	73	NE	15
21/10/22	17.1	29.5	14.6	25.4	72	NNE	11	28.3	52	NNE	22
22/10/22	17.6	27.2	23.2	18.2	99	ESE	13	25.2	59	ESE	13

Dir = wind direction; Spd = wind speed; RH = relative humidity
Blue denotes the lowest daily temperature; Red denotes the highest daily temperature.
Source: Australian Government Bureau of Meteorology, www.bom.gov.au

TABLE 4-9 DAILY WEATHER OBSERVATIONS FEBRUARY 2023 - THANGOOL QUEENSLAND

	Daily Temp		Rain	9:00 AM				3:00 PM			
	Min	Max	mm	Temp	RH	Dir	Spd	Temp	RH	Dir	Spd
	°C	°C		°C	%		km/hr	°C	%		km/hr
13/02/23	19.4	37.9	0	29.4	58	NW	11	37.5	31	NNW	9
14/02/23	19	38.1	0	30.8	57	N	19	37.3	28	NNW	22
15/02/23	20.4	32.4	9.6	28.1	66	E	13	31	49	NNE	11
16/02/23	19	33.3	0.2	25.9	58	E	17	32	36	SE	11
17/02/23	15	32.2	0	25.9	53	E	6	31.2	38	SSE	13

Dir = wind direction; Spd = wind speed; RH = relative humidity
Blue denotes the lowest daily temperature; Red denotes the highest daily temperature.
Source: Australian Government Bureau of Meteorology, www.bom.gov.au

TABLE 4-10 DAILY WEATHER OBSERVATIONS MARCH 2023 - THANGOOL QUEENSLAND

	Daily Temp		Rain	9:00 AM				3:00 PM			
	Min	Max	mm	Temp	RH	Dir	Spd	Temp	RH	Dir	Spd
	°C	°C		°C	%		km/hr	°C	%		km/hr
27/03/23	17	33.7	0	26	63	NE	4	33.4	38	WNW	13

	Daily Temp		Rain	9:00 AM				3:00 PM			
	Min	Max	mm	Temp	RH	Dir	Spd	Temp	RH	Dir	Spd
	°C	°C		°C	%		km/hr	°C	%		km/hr
28/03/23	16.6	34.6	0	26.6	70	ENE	2	33	37	NE	7
29/03/23	18.6	32	0	25.7	71	N	11	30.8	48	W	6
30/03/23	21.1	33.3	0	25.8	73	NW	13	31.7	44	SW	13
31/03/23	15.4	32.4	2.2	25	46	ESE	9	31.4	23	W	9

Dir = wind direction; Spd = wind speed; RH = relative humidity
Blue denotes the lowest daily temperature; Red denotes the highest daily temperature.
Source: Australian Government Bureau of Meteorology, www.bom.gov.au

TABLE 4-11 DAILY WEATHER OBSERVATIONS JUNE 2023 - THANGOOL QUEENSLAND

	Daily Temp		Rain	9:00 AM				3:00 PM			
	Min	Max	mm	Temp	RH	Dir	Spd	Temp	RH	Dir	Spd
	°C	°C		°C	%		km/hr	°C	%		km/hr
05/06/23	14	26.8	0	21.1	66	ESE	22	25.5	41	ENE	22
06/06/23	12.1	24.9	0	18.8	74	ESE	17	22.5	54	ESE	17
07/06/23	9.4	26.4	0	19.2	68	ESE	15	25.6	38	ESE	9
08/06/23	4.7	26.4	0	16	82	SE	6	25.3	34	NNW	9
09/06/23	7.9	27.7	0	17.6	69	E	7	24.9	40	SSW	13

Dir = wind direction; Spd = wind speed; RH = relative humidity
Blue denotes the lowest daily temperature; Red denotes the highest daily temperature.
Source: Australian Government Bureau of Meteorology, www.bom.gov.au

TABLE 4-12 DAILY WEATHER OBSERVATIONS SEPTEMBER 2023 – THANGOOL QUEENSLAND

	Temp		Rain	9:00 AM				3:00 PM			
	Min	Max	mm	Temp	RH	Dir	Spd	Temp	RH	Dir	Spd
	°C	°C		°C	%		km/hr	°C	%		km/hr
25/09/2023	8.1	27.9	0	20.9	51	ESE	17	26	30	ESE	7
26/09/2023	6.9	29.8	0	21.0	53	SSE	7	29.2	19	SW	6
27/09/2023	8.2	31.4	0	21.6	58	NNW	9	29.3	22	NNE	15
28/09/2023	9.3	32.9	0	21.7	58	NNW	7	31.9	18	ESE	9
29/09/2023	13.5	31.9	0	23.3	54	NNE	9	29.5	28	ESE	11

Dir = wind direction; Spd = wind speed; RH = relative humidity
Blue denotes the lowest daily temperature; Red denotes the highest daily temperature.
Source: Australian Government Bureau of Meteorology, www.bom.gov.au

TABLE 4-13 DAILY WEATHER OBSERVATIONS OCTOBER 2023 - THANGOOL QUEENSLAND

	Temp		Rain	9:00 AM				3:00 PM			
	Min	Max	mm	Temp	RH	Dir	Spd	Temp	RH	Dir	Spd
	°C	°C		°C	%		km/hr	°C	%		km/hr
09/10/2023	8.3	28.9	0	23.1	35	E	13	26.6	26	SE	11
10/10/2023	8.1	30.0	0	22	54	S	7	27	31	ENE	7
11/10/2023	9.5	31.9	0	23.2	48	ENE	9	31.3	21	E	11
12/10/2023	11	32.2	0	23.7	52	WSW	9	30.6	25	NNW	9
13/10/2023	10.5	33.2	0	23.8	53	NNW	15	32.5	21	SSW	9

Dir = wind direction; Spd = wind speed; RH = relative humidity
Blue denotes the lowest daily temperature; Red denotes the highest daily temperature.
Source: Australian Government Bureau of Meteorology, www.bom.gov.au

TABLE 4-14 DAILY WEATHER OBSERVATIONS DECEMBER 2023 - THANGOOL QUEENSLAND

	Temp		Rain	9:00 AM				3:00 PM			
	Min	Max	mm	Temp	RH	Dir	Spd	Temp	RH	Dir	Spd
	°C	°C		°C	%		km/hr	°C	%		km/hr
04/12/2023	20.7	38.7	0	31.1	53	NE	7	36.6	27	SW	6
05/12/2023	19.4	35.8	0	28.9	55	N	13	34.1	33	WNW	17
06/12/2023	17.5	38.4	0	29.3	47	WSW	6	36.5	18	ESE	17
07/12/2023	14.9	38.6	0	26.8	49	SE	7	37.1	16	NE	31
08/12/2023	15.1	37.7	0	28.5	45	SE	15	36.3	22	E	20

Dir = wind direction; Spd = wind speed; RH = relative humidity
Blue denotes the lowest daily temperature; Red denotes the highest daily temperature.
Source: Australian Government Bureau of Meteorology, www.bom.gov.au

TABLE 4-15 DAILY WEATHER OBSERVATIONS FEBRUARY 2024 - THANGOOL QUEENSLAND

	Temp		Rain	9:00 AM				3:00 PM			
	Min	Max	mm	Temp	RH	Dir	Spd	Temp	RH	Dir	Spd
	°C	°C		°C	%		km/hr	°C	%		km/hr
19/02/2024	17.6	34.5	0	27	63	ESE	20	34.4	34	SE	11
20/02/2024	19.8	34.4	0	27.4	58	SE	9	32.4	37	S	7
21/02/2024	20.2	34.2	0	27.5	62	W	4	31.4	46	NE	20
22/02/2024	19.1	34.3	0	27.7	63	W	4	32.1	43	NNW	11
23/02/2024	19.4	35.6	0	28.1	66	N	4	34.5	35	SE	9

Dir = wind direction; Spd = wind speed; RH = relative humidity
Blue denotes the lowest daily temperature; Red denotes the highest daily temperature.
Source: Australian Government Bureau of Meteorology, www.bom.gov.au

TABLE 4-16 DAILY WEATHER OBSERVATIONS JUNE 2024 – THANGOOL QUEENSLAND

	Temp		Rain	9:00 AM				3:00 PM			
	Min	Max	mm	Temp	RH	Dir	Spd	Temp	RH	Dir	Spd
	°C	°C		°C	%		km/hr	°C	%		km/hr
11/06/2024	2.6	26.1	0	14.8	57	SE	11	25.9	19	NW	6
12/06/2024	2.3	26.2	0	13.6	60	SSE	2	25.5	19	SSW	17
13/06/2024	0.9	24.0	0	14.7	51	SE	13	22.7	19	SSE	9
14/06/2024	1.6	24.0	0	12.6	47	E	7	23.3	17	N	11

Dir = wind direction; Spd = wind speed; RH = relative humidity
Blue denotes the lowest daily temperature; Red denotes the highest daily temperature.
Source: Australian Government Bureau of Meteorology, www.bom.gov.au

TABLE 4-17 DAILY WEATHER OBSERVATIONS SEPTEMBER 2024 – THANGOOL QUEENSLAND

	Temp		Rain	9:00 AM				3:00 PM			
	Min	Max	mm	Temp	RH	Dir	Spd	Temp	RH	Dir	Spd
	°C	°C		°C	%		km/hr	°C	%		km/hr
23/09/2024	5	29.9	0	22.3	57	SE	11	28.6	26	NE	13
24/09/2024	8	30	0	22.4	49	SSE	6	28.8	24	NE	19
25/09/2024	7.1	29.5	0	22.8	49	NNE	13	28.1	29	N	17
26/09/2024	9.3	30.6	0	23.1	51	NNW	13	29.7	36	NNW	15
27/09/2024	17.7	27.2	12.2	20.3	81	S	9	26.6	30	SW	15
28/09/2024	9	26.7	0	20.7	50	SE	9	25.9	27	SW	17

Dir = wind direction; Spd = wind speed; RH = relative humidity
Blue denotes the lowest daily temperature; Red denotes the highest daily temperature.
Source: Australian Government Bureau of Meteorology, www.bom.gov.au

TABLE 4-18 DAILY WEATHER OBSERVATIONS FEBRUARY 2026 – THANGOOL QUEENSLAND

	Temp		Rain	9:00 AM				3:00 PM			
	Min	Max	mm	Temp	RH	Dir	Spd	Temp	RH	Dir	Spd
	°C	°C		°C	%		km/hr	°C	%		km/hr
17/02/2026	21.1	30.3	0	25.3	65	ESE	17	29.5	52	E	13
18/02/2026	18.8	32.6	0	26.5	63	S	7	31	48	NE	9
19/02/2026	20.9	34.2	0	28.3	64	SE	4	32.7	39	E	15
20/02/2026	16.6	31.8	0	25.2	65	ESE	17	31.2	37	E	19
21/02/2026	17.8	32.5	0	26.9	62	ESE	17	31.2	43	E	11

Dir = wind direction; Spd = wind speed; RH = relative humidity
Blue denotes the lowest daily temperature; Red denotes the highest daily temperature.
Source: Australian Government Bureau of Meteorology, www.bom.gov.au

4.8.5.4 SURVEY ADEQUACY

A survey adequacy review has been undertaken for the survey effort applied across the Study Area, with a full list of the targeted MNES flora and fauna assessed as known, likely or potentially occurring. Survey guideline requirements and survey adequacy is outlined in Table 4-19 and Table 4-20.

TABLE 4-19 SURVEY ADEQUACY FOR LISTED THREATENED FLORA WITH THE POTENTIAL TO OCCUR

Target Species	Listing Status		Survey Guidelines and Requirements	Sampling Technique / Effort	Comment on Survey Adequacy
	NC Act[1]	EPBC Act[2]			
Ooline (*Cadellia pentastylsis*)	VU	V	*Flora Survey Guidelines – Protected Plants, Nature Conservation Act 1992* (DES, 2020) Random, non-selective traverses of all habitat types throughout the Study Area, whether identified as suitable or un-suitable habitat for threatened flora.	245 vegetation and habitat assessments were completed across 10 survey periods. Meander searches were undertaken at the same time as vegetation and habitat assessments within flora trigger areas of the Study Area. 17 targeted flora transects conducted during the September 2024 survey period in impact areas ranging from 30 minutes to an hour.	*Survey effort considered adequate* This species has not been observed during field surveys, despite suitable habitat being identified.
Cossinia (*Cossinia australiana)*	EN	E	*Flora Survey Guidelines – Protected Plants, Nature Conservation Act 1992* (DES, 2020) Random, non-selective traverses of all habitat types throughout the Study Area, whether identified as suitable or un-suitable habitat for threatened flora.	245 vegetation and habitat assessments were completed across 10 survey periods. Meander searches were undertaken at the same time as vegetation and habitat assessments within flora trigger areas of the Study Area. 17 targeted flora transects conducted during the September 2024 survey period in impact areas ranging from 30 minutes to an hour.	*Survey effort considered adequate* This species has not been observed during field surveys, despite suitable habitat being identified.

Target Species	Listing Status		Survey Guidelines and Requirements	Sampling Technique / Effort	Comment on Survey Adequacy
	NC Act[1]	EPBC Act[2]			
Austral cornflower (*Rhaponticum australe)*	VU	V	*Flora Survey Guidelines – Protected Plants, Nature Conservation Act 1992* (DES, 2020) Random, non-selective traverses of all habitat types throughout the Study Area, whether identified as suitable or un-suitable habitat for threatened flora.	245 vegetation and habitat assessments were completed across 10 survey periods. Meander searches were undertaken at the same time as vegetation and habitat assessments within flora trigger areas of the Study Area. 17 targeted flora transects conducted during the September 2024 survey period in impact areas ranging from 30 minutes to an hour.	*Survey effort considered adequate* This species has not been observed during field surveys, despite suitable habitat being identified.
Solanum dissectum	EN	E	*Flora Survey Guidelines – Protected Plants, Nature Conservation Act 1992* (DES, 2020) Random, non-selective traverses of all habitat types throughout the Study Area, whether identified as suitable or un-suitable habitat for threatened flora.	245 vegetation and habitat assessments were completed across 10 survey periods. Meander searches were undertaken at the same time as vegetation and habitat assessments within flora trigger areas of the Study Area. 17 targeted flora transects conducted during the September 2024 survey period in impact areas ranging from 30 minutes to an hour.	*Survey effort considered adequate* This species has not been observed during field surveys, despite suitable habitat being identified.
Solanum johnsonianum	EN	E	*Flora Survey Guidelines – Protected Plants, Nature Conservation Act 1992* (DES, 2020) Random, non-selective traverses of all habitat types throughout the Study Area, whether identified as suitable or un-suitable habitat for threatened flora.	245 vegetation and habitat assessments were completed across 10 survey periods. Meander searches were undertaken at the same time as vegetation and habitat assessments within flora trigger areas of the Study Area. 17 targeted flora transects conducted during the September 2024 survey period in impact areas ranging from 30 minutes to an hour.	*Survey effort considered adequate* This species has not been observed during field surveys, despite suitable habitat being identified.

Target Species	Listing Status		Survey Guidelines and Requirements	Sampling Technique / Effort	Comment on Survey Adequacy
	NC Act[1]	EPBC Act[2]			
Xerothamnella herbacea	EN	E	*Flora Survey Guidelines – Protected Plants, Nature Conservation Act 1992* (DES, 2020) Random, non-selective traverses of all habitat types throughout the Study Area, whether identified as suitable or un-suitable habitat for threatened flora.	245 vegetation and habitat assessments were completed across 10 survey periods. Meander searches were undertaken at the same time as vegetation and habitat assessments within flora trigger areas of the Study Area. 17 targeted flora transects conducted during the September 2024 survey period in impact areas ranging from 30 minutes to an hour.	*Survey effort considered adequate* This species has not been observed during field surveys, despite suitable habitat being identified.

[1] NC Act status: EN = endangered; VU = vulnerable
[2] EPBC Act status: E = endangered; V = vulnerable

TABLE 4-20 SURVEY ADEQUACY FOR LISTED THREATENED OR MIGRATORY FAUNA KNOWN, LIKELY OR POTENTIAL TO OCCUR

Target Species	Listing Status		Survey Guidelines and Requirements	Sampling Technique / Effort	Comment on Survey Adequacy
	NC Act[1]	EPBC Act[2]			
Birds[3]					
Squatter pigeon (southern) (*Geophaps scripta scripta*)	VU	V	*Survey guidelines for Australia's threatened birds: Guidelines for detecting birds listed as threatened under the EPBC Act* (DEWHA, 2017) Area searches or transect surveys in suitable habitat. Flushing surveys also likely to be useful. Area searches or transect surveys for 15 hours over 3 days. Flushing surveys for 10 hours over 3 days.	171 dawn and dusk timed surveys (20 minutes), bird utilisation surveys across 38 locations in the Study Area. 3 area/transect searches were also conducted during bird utilisation surveys in appropriate habitat. These area/transect searches were completed by 2 ecologists for 1.5 hours each (9 total hours).	*Survey effort considered adequate* The southern squatter has been observed on one occasion during the October 2022 survey at a farm dam located in the northern section of the Study Area, on one occasion during the September/October 2023 survey in the north-western section of the Study Area, and on one occasion during December 2023 survey. Surveys were conducted throughout the Study Area, in suitable patches of open eucalypt woodlands and areas close to permanent bodies like farm dams and waterways.
Black-breasted buttonquail (*Turnix melanogaster)*	VU	V	*Survey guidelines for Australia's threatened birds: Guidelines for detecting birds listed as threatened under the EPBC Act* (DEWHA, 2017) Area searches of suitable habitat with detection of flushing birds or hearing of foraging scratching for 15 hours over 3 days.	171 dawn and dusk timed surveys (20 minutes), bird utilisation surveys across 38 locations in the Study Area. 245 vegetation and habitat assessments were completed across 10 survey periods determining the presence of any suitable habitat features for the species.	*Survey effort considered adequate* Suitable habitat for the species was detected within the Study Area, with flushing surveys being conducted within this habitat during habitat assessments. The species was not observed in any surveys.

Target Species	Listing Status		Survey Guidelines and Requirements	Sampling Technique / Effort	Comment on Survey Adequacy
	NC Act[1]	EPBC Act[2]			
White-throated needletail (*Hirundapus caudacutus)*	VU	V, Mi	*Draft referral guidelines for 14 birds listed as migratory species under the EPBC Act* (DoE, 2015) No survey guidelines specific to white-throated needletail, however, recommended to focus survey efforts from high vantage points. Observations should be made as late as possible in the evening of birds coming in to roost. This species is almost exclusively aerial, from heights of less than 1 m up to more than 1000 m above the ground and have been recorded over most types of habitat.	171 dawn and dusk timed surveys (20 minutes), bird utilisation surveys across 38 locations in the Study Area. 6 targeted assessments atop ridgelines for potential white-throated needletail roosting habitat during the September 2024 surveys.	*Survey effort considered adequate* Surveys were conducted from vantage points in the Study Area within the appropriate time frame to detect the species. The species was not detected in any of the surveys. The habitat in the Study Area was not deemed suitable for the species to roost in.
Australian painted snipe (*Rostratula australis)*	EN	E	*Survey guidelines for Australia's threatened birds: Guidelines for detecting birds listed as threatened under the EPBC Act* (DEWHA, 2017) Area searches or transects through suitable wetlands; detection by sighting and flushing. Conducted for 10 hours over 3 days. Targeted stationary observations at dawn and dusk of suitable foraging locations within wetlands; detection by sighting. Conducted for 10 hours over 5 days. Also a brief spotlight search shortly after dusk may detect birds.	171 dawn and dusk timed surveys (20 minutes), bird utilisation surveys across 38 locations in the Study Area. 245 vegetation and habitat assessments were completed across 10 survey periods determining the presence of any suitable habitat features for the species. 6 hours of spotlighting over two nights in October 2022. (Impacted by inclement weather). 12 hours of spotlighting over four nights in June 2023. 8 hours of spotlighting over two nights in September 2024.	*Survey effort considered adequate* Waterbodies were surveyed across the Study Area, with flushing being conducted habitat assessments and timed stationary surveys being conducted at dawn and dusk. Spotlighting was also conducted. The species was not observed in any surveys.

Target Species	Listing Status		Survey Guidelines and Requirements	Sampling Technique / Effort	Comment on Survey Adequacy
	NC Act[1]	EPBC Act[2]			
Diamond firetail (*Stagonopleura guttata*)	V	V	*Survey guidelines for Australia's threatened birds: Guidelines for detecting birds listed as threatened under the EPBC Act* (DEWHA, 2017) There are no targeted survey guidelines for this species. Active searches or transects whilst recording any sightings and calls within suitable habitat is recommended. Suitable habitats include; grassy eucalypt, acacia, or casuarina woodlands, other suitable habitat include open forests, mallees or natural temperate grasslands. Active searches for microhabitat features include; globular structured nests within the shrubby understorey of woodland areas.	171 dawn and dusk timed surveys (20 minutes), bird utilisation surveys across 38 locations in the Study Area. 6 call playback sessions in suitable habitat. 245 vegetation and habitat assessments were completed across 10 survey periods determining the presence of any suitable habitat features for the species.	*Survey effort considered adequate* Survey effort was conducted in a range of habitats throughout the Study Area by suitably qualified ecologists, including suitable habitat of grassy eucalyptus woodlands and grasslands. No observation of the species occurred during field surveys however suitable habitat for breeding, foraging and dispersal was detected within the Study Area.
Fork-tailed swift (*Apus pacificus)*	-	Mi	*Draft referral guidelines for 14 birds listed as migratory species under the EPBC Act* (DoE, 2015) No survey guidelines specific to the fork-tailed swift – however, recommended to focus survey efforts from high vantage points. This species is found across a range of habitats (non-breeding habitats only), from inland plains to wooded areas. It is exclusively aerial.	171 dawn and dusk timed surveys (20 minutes), bird utilisation surveys across 38 locations in the Study Area.	*Survey effort considered adequate* Surveys were conducted from vantage points in the Study Area and done at the appropriate timing to detect the species. The species was not detected in any of the survey. The habitat in the Study Area, was not deemed suitable for the species to forage and roost in.

Target Species	Listing Status		Survey Guidelines and Requirements	Sampling Technique / Effort	Comment on Survey Adequacy
	NC Act[1]	EPBC Act[2]			
Listed Threatened Mammals					
Greater glider (southern & central) (*Petauroides volans)*	EN	E	*Terrestrial Vertebrate Fauna Survey Guidelines for Queensland* (DES, 2018) Requires two-person 30-minute spotlight searches of 100 x 100 m survey site across multiple nights. This can include spotlighting up one side of the 100 x 100 m area and then spotlighting back the other side of the 100 x 100 m area. Scat and sign search can coincide with the systematic diurnal active searches, within 50 x 50 m quadrates of the survey site. *Survey Guidelines for Australia's Threatened Mammals* (DSEWPC, 2011) Bright moonlight aids in detecting greater gliders. Spotlighting should be at least two 200 m transects per 5 ha sites. It is also recommended there be 100 m between survey transects.	245 vegetation and habitat assessments were completed across 10 survey periods determining the presence of any suitable habitat features for the species, including any hollow-bearing trees within mature forests. 6 hours of spotlighting over two nights in October 2022. (Impacted by inclement weather). 12 hours of spotlighting over four nights in June 2023. 8 hours of spotlighting over two nights in September 2024. 5 x camera traps for 4 trap nights in suitable habitats.	*Survey effort considered adequate* This species was observed on 14 occasions during June 2023 surveys, and on 10 occasions during the September 2024 surveys. Diurnal searches were undertaken in areas of potential habitat for this species with the aim of identifying suitable microhabitat features, namely mature hollow-bearing trees with >20cm diameter hollows in areas of eucalypt forest. Spotlighting surveys were undertaken by foot and slow vehicle within suitable habitats and vegetation communities, totalling 26 hours and 8 nights of survey effort.

Target Species	Listing Status		Survey Guidelines and Requirements	Sampling Technique / Effort	Comment on Survey Adequacy
	NC Act[1]	EPBC Act[2]			
Koala (*Phascolarctos cinereus)*	EN	E	*Terrestrial Vertebrate Fauna Survey Guidelines for Queensland* (DES, 2018*)* Requires two- person 30-minute spotlight searches of 100 x 100 m survey site across multiple nights. This can include spotlighting up one side of the 100 x 100 m area and then spotlighting back the other side of the 100 x 100m area. Scat and sign search can coincide with the systematic diurnal active searches, within 50 x 50 m quadrates of the survey site. *EPBC Act referral guidelines for the vulnerable koala* (DoE, 2014) Strip transects which involve diurnal distance sampling and density searches. Nocturnal spotlighting for smaller sites to determine presence and density. Scats – Spot Assessment Technique (SAT) which involves looking at food trees for presence of koala scats.	245 vegetation and habitat assessments were completed across 10 survey periods determining the presence of any suitable habitat features for the species, including any eucalypt forest and riparian vegetation. 5 x camera traps for 4 trap nights in suitable habitats. 6 hours of spotlighting over two nights in October 2022. (Impacted by inclement weather). 12 hours of spotlighting over four nights in June 2023. 8 hours of spotlighting over two nights in September 2024, which included 8 call playback sessions for koala. 12 koala SATs conducted in suitable habitat to detect the species (diurnal searches).	*Survey effort considered adequate* This species was not directly observed, a single faecal pellet was recorded during field surveys. One koala was also heard bellowing within the Survey Area at dusk during the September 2024 survey period prior to any call playback. Diurnal searches during habitat assessments were conducted to indicate presence. Spotlighting surveys were undertaken by foot and slow vehicle within suitable habitats and vegetation communities, totaling 26 hours and 8 nights of survey effort.
Large-eared pied-bat (*Chalinolobus dwyeri*)	VU	V	*Survey guidelines for Australia's threatened bats* (DEWHA, 2010) A combination of survey efforts is recommended for this species. This includes unattended bat detectors	10 Anabats have been deployed in 10 locations within the Study Area (all for 4 nights), for a total of 40 Anabat trapping nights.	*Survey effort considered adequate to detect large-eared pied bat.* This species' call was recorded as 'probable' on Anabat devices deployed across five locations in

Target Species	Listing Status		Survey Guidelines and Requirements	Sampling Technique / Effort	Comment on Survey Adequacy
	NC Act[1]	EPBC Act[2]			
			for 16 detector nights for a minimum of four nights and attended bat detectors for six detector hours for a minimum of three nights. It is also including harp traps and/or mist nets for 16 trap or net nights for a minimum of four nights. Surveys are best undertaken from October through to March.	245 vegetation and habitat assessments were completed across 10 survey periods determining the presence of any suitable habitat features for the species, including any camps or roosting sites. Assessment of potential roosting sites was extended to areas adjacent the Study Area.	the October 2022, February and March 2023 surveys. Surveys were conducted in suitable habitat of well-vegetated areas such as eucalypt forest and in the appropriate seasons of October to March.
Yellow-bellied glider (south-eastern) (*Petaurus australis australis)*	VU	V	*Terrestrial Vertebrate Fauna Survey Guidelines for Queensland* (Eyre et al. 2022) Feeding mark searches on trees are an effective way to identify this species. This is because these gliders use their teeth to incise tree bark for feeding. A list of tree species the yellow-bellied glider prefers is found in the guidelines. Call playback is another method that can detect this species. This method involves conducting playback on two occasions over different nights in a survey area. This is then followed by a 5-minute listening period for un-elicited calls. These surveys must be done on numerous occasions however, given the species large home range and mobility.	245 vegetation and habitat assessments were completed across 10 survey periods determining the presence of any suitable habitat features for the species, including any hollow-bearing trees within mature forests. 6 hours of spotlighting over two nights in October 2022. (Impacted by inclement weather). 12 hours of spotlighting over four nights in June 2023. 8 hours of spotlighting over two nights in September 2024, which included 8 call playback sessions for yellow-bellied glider. 5 x camera traps for 4 trap nights in suitable habitats.	*Survey effort considered adequate* No yellow-bellied gliders were observed from diurnal surveys, nocturnal surveys, or by the presence of feeding marks located within the Study Area. Suitable foraging habitat was observed, therefore the species is considered as potentially occurring.

Target Species	Listing Status		Survey Guidelines and Requirements	Sampling Technique / Effort	Comment on Survey Adequacy
	NC Act[1]	EPBC Act[2]			
			Recommended four spotlight/call playback surveys to a site (two in each survey event).		
South-eastern long-eared bat (*Nyctophilus corbeni*)	VU	V	*Survey guidelines for Australia's threatened bats* (DEWHA, 2010) A combination of survey efforts is recommended for this species. This includes unattended bat detectors for 16 detector nights for a minimum of four nights and attended bat detectors for six detector hours for a minimum of three nights. It also includes harp traps and/or mist nets for 16 trap or net nights for a minimum of four nights. Surveys are best undertaken from October through to March.	10 Anabats have been deployed in 10 locations within the Study Area (all for 4 nights), for a total of 40 Anabat trapping nights across the October 2022, February and March 2023 survey periods. 245 vegetation and habitat assessments were completed across 10 survey periods determining the presence of any suitable habitat features for the species, including any camps or roosting sites. Assessment of potential roosting sites was extended to areas adjacent the Study Area.	*Survey effort considered adequate to detect south-eastern long-eared bat* Diurnal habitat assessments were conducted, which identified potential foraging and roosting habitat of ironbark woodland present within the Study Area. Anabats were deployed in suitable habitat of well-vegetated areas such as eucalypt forest and in the appropriate seasons of October to March. A *Nyctophilus sp*. call was recorded as 'possible' at detectors deployed across seven locations in the October 2022, February 2023 and March 2023 surveys.
Ornamental snake (*Denisonia maculata*)	VU	V	*Survey guidelines for Australia's threatened reptiles* (DSEWPC, 2011) Searches of suitable gilgai habitat (small depressions and mounds in clay soils) while preferred prey species (frogs) are active. Diurnal searches under sheltering sites such as rocks, logs or other large objects on the ground.	245 vegetation and habitat assessments were completed across 10 survey periods determining the presence of any suitable habitat features for the species, including any *Acacia*-dominated vegetation communities, areas with cracking clay soils or gilgais. Searches for reptiles involved turning over potential sheltering sites such as	*Survey effort considered adequate* No ornamental snakes were observed from diurnal searches. No suitable habitat was identified during field surveys due to the absence of microhabitat features and the abundance of cane toads observed.

Target Species	Listing Status		Survey Guidelines and Requirements	Sampling Technique / Effort	Comment on Survey Adequacy
	NC Act[1]	EPBC Act[2]			
			EPBC Act - Draft Referral guidelines for the nationally listed Brigalow Belt reptiles (DCCEEW, 2023) Spotlighting transects targeting water-inundated gilgais, wetlands, riparian habitats and surrounding environments and large logs between dusk and early morning hours, ideally on warm and humid evenings. Opportunistic road surveys while driving along roadways in the identified study area, especially following large rainfall events and on warm evenings. Microhabitat searches during the coolest parts of the day, including carefully turning woody debris, rocks and artificial debris, raking the soil surface or leaf litter beneath trees.	rocks, logs and debris. Assessments were undertaken across six surveys events in both the wet and dry seasons (October 2022, March, June and September/October 2023, June and September 2024). 6 hours of spotlighting over two nights in October 2022 (impacted by inclement weather). 12 hours of spotlighting over four nights in June 2023. 8 hours of spotlighting over two nights in September 2024.	

[1] NC Act status: EN = endangered; VU = vulnerable
[2] EPBC Act status: E = endangered; V = vulnerable; Mi = Migratory
[3] Satin flycatcher and rufous fantail were originally included in the referral information and assessed for potential impacts of the Proposed Action. Following recent changes to the EPBC Act Migratory Species list, these species no longer require assessment under the EPBC Act as MNES and are therefore not assessed as part of this PER.

4.8.6 HABITAT ASSESSMENT FOR MNES

In order to map habitat for listed threatened and/or migratory species and threatened communities known, likely or potentially occurring, the Study Area was divided into BHT. BHTs were identified based on vegetation community type and structure and ground-truthed during field surveys. These BHTs were used to map habitat for listed threatened and/or migratory species and threatened communities, based on the specific habitat requirements and preferences of the species/communities. For some species (e.g. yellow-bellied glider), regional ecosystem mapping was also used in conjunction with BHTs to delineate the extent of habitat. BHTs within the Study Area are outlined in Section 4.7.

4.8.6.1 MNES HABITAT MAPPING

The mapped habitat for threatened and/or migratory species and threatened communities listed under the EPBC Act has been categorised with consideration of the SIG 1.1 (DoE, 2013). Habitat definitions within the SIG 1.1 relevant to this assessment are:

- Habitat critical to the survival of a species (relevant to vulnerable, endangered and critically endangered flora, fauna and ecological communities); and
- Important Habitat (relevant to migratory species).

Individual species/ecological communities approved conservation advice or recovery plans were used to provide species-specific description of habitat critical to the survival of the species and important habitat where appropriate.

Each relevant MNES known, likely or potential to occur within the Study Area is assessed against the SIG 1.1 to determine if the Proposed Action will result in a significant impact to that MNES.

Habitat critical to the survival of a species

For all EPBC Act listed species and ecological communities, 'habitat critical to survival of the species' is referenced within the relevant Significant Impact Assessment (SIA) criteria. As defined in the SIG 1.1 (DoE, 2013), habitat critical to the survival of a species or ecological communities are areas that are necessary:

- *For activities such as foraging, breeding, roosting, or dispersal;*
- *For the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators);*
- *To maintain genetic diversity and long-term evolutionary development; and/or*
- *For the reintroduction of populations or recovery of the species or ecological community.*

Such habitat maybe, but is not limited to: habitat identified in a recovery plan for the species or ecological community as habitat critical for that species or ecological community; and/or habitat listed on the Register of Critical Habitat maintained by the minister under the EPBC Act.

Important Habitat

For migratory species, 'important habitat' is referenced within the relevant SIA criteria. As defined in the SIG 1.1 (DoE, 2013), important habitat is:

- Habitat utilised by a migratory species occasionally or periodically within a *region that supports an ecologically significant proportion of the population of the species; and/or*
- *Habitat that is of critical importance to the species at particular life-cycle stages; and/or*
- *Habitat utilised by a migratory species which is at the limit of the species range; and/or*
- *Habitat within an area where the species is declining.*

SECTION 4 REFERENCES

AusWEA. (2006). *Wind Farms and Birds: Interim Standards For Risk Assessment.* Brett Lane & Asspcoates PTY LTD.

Band, W. (2000). *Windfarms and Birds: calculating a throretical collision risk assuming no avoiding action.* Scottish Natural Heritage Guidance Note. Retrieved from http://www.snh.gov.uk/planningand-development/renewable-energy/onshore-wind/assessing-bird-collision-risks/

Band, W., Madders, M., & Whitfield, D.P. (2007). Developing field and analytical methods to assess avian collision risk at wind farms. *Birds and Wind Farms: Risk Assessment and Mitigation*, 259-275.

Bureau of Meterology . (2024). *Climate statistics for Thangoool Airport* . Retrieved from Bureau of Meterology : http://www.bom.gov.au/climate/averages/tables/cw_039089.shtml

DAWE. (2021). *Onshore Wind Farms – interim guidance on bird and bat management.* Department of Agriculture, Water and the Environment.

DCCEEW. (2023). *Draft Referral guidelines for the nationally listed Brigalow Belt reptiles v1.1.* Canberra: Department of Climate Change, Energy, the Environment and Water.

DCCEEW. (2024). *Onshore wind farm guidance - best practice approaches when seeking approval under Australia's national environment law.* Canberra: Department of Climate Change, Energy, the Environment and Water.

DES. (2018). *A Biodiversity Plannng Assessment for the Brigalow Belt Bioregion.* Retrieved from https://www.qld.gov.au/__data/assets/pdf_file/0028/68428/bb-bpa-expert-panel-report.pdf

DES. (2020). *Flora Survey Guidelines - Protected Plants.* Wildlife and Threatened Species Operations, Department of Environment and Science.

DES. (2020). *Method for mapping Matters of state environmental significance For the State Planning Policy 2017. Version 6.0.* Brisbane: Department of Environment and Science.

DES. (2022). *Terrestrial Vertebrate Fauna Survey Guidelines for Queensland (V 4.0).* Queensland Herbarium and Biodiversity Science, Department of Environment and Science.

DEWHA. (2010). *Survey guidelines for Australia's threatened bats.* Department of the Environment, Water, Heritage and the Arts.

DEWHA. (2017). *Survey guidelines for Australia's threatened birds: Guidelines for detecting birds listed as threatened under the Environment Protection and Biodiversity Conservation Act 1999.* Department of the Environment, Water, Heritage and the Arts. Retrieved from https://www.dcceew.gov.au/sites/default/files/documents/survey-guidelines-birds-april-2017.pdf

DoE. (2013). *Significant Impact Guidelines 1.1 - Matters of National Environmental Significance.* Department of the Environment.

DoE. (2014). *EPBC Act Referral Guidelines for the vulnerable koala (combined populations of Queensland, New South Wales and the Australian Capital Territory.* Department of the Environment, Commonwealth of Australia.

DoE. (2015). *Draft referral guidelines for 14 birds listed as migratory species under the EPBC Act.* Canberra: Department of the Environment.

DSDILGP. (2022). *Planning guidance - State code 23: Wind farm development.* Department of State Development, Infrastructure, Local Government and Planning.

DSEWPC. (2011). *Survey guidelines for Australia's threatened mammals.* Department of Sustainability, Environment, Water, Population and Communities. Retrieved from https://www.agriculture.gov.au/sites/default/files/documents/survey-guidelines-mammals.pdf

DSEWPC. (2011). *Survey guidelines for Australia's threatened reptiles.* Department of Sustainability, Environment, Water, Population and Communities.

Eyre, T. J. (2006). Regional habitat selection of large gliding possums at forest stand and landscape scales in southern Queensland, Australia I. Greater glider (Petauroides volans). *Forest Ecology and Management, 235*, 270-282.

Eyre, T. J., Smith, G. C., Venz, M. F., Mathieson, M. T., Hogan, L. D., Starr, C., . . . McDonald, K. (2022). *Guide to greater glider habitat in Queensland .* Canberra: Department of Agriculture, Water and the Environment.

Neldner, V. J., Wilson, B. A., Dillewaard, H. A., Ryan, T. S., Butler, D. W., McDonald, W. J., . . . Appelman, C. N. (2022). *Methodology for surveying and mapping regional ecosystems and vegetation communities in Queensland. Version 6.0. Updated April 2022.* Queensland Herbarium. Brisbane: Queensland Department of Environment and Science.

SNH. (2016). *Avoidance rates for the onshore SNH wind farm collision risk model*. Retrieved from http://www.snh.gov.uk/docs/A2126483.pdf

Youngentob, K. N., Marsh, K. F., & Skewes, J. (2021). *A review of koala habitat assessment criteria and methods.* Canberra: Department of Agriculture, Water and the Environment.

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Theodore Wind Farm

Public Environment Report – Matters of National Environmental Significance (Section 5)

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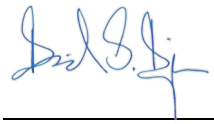
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ACRONYMS AND ABBREVIATIONS

Acronym	Description
ALA	Atlas of Living Australia
BACI	Before-After-Control-Impact
BHT	Broad Habitat Types
BUS	Bird Utilisation Survey
CRM	Collision Risk Model
DBH	Diameter at Breast Height
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DESI	Department of Environment, Science and Innovation
DEWHA	Department of Environment, Water, Heritage and the Arts
Disturbance Footprint	The area whereby the final layout and impacts have been considered and occupies an area of 1,590.1 ha.
E	Endangered
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
GBRMP	Great Barrier Reef Marine Park
MHQA	Modified Habitat Quality Assessment
Mi	Migratory
MNES	Matters of National Environmental Significance
NSW	New South Wales
PMST	Protected Matters Search Tool
Project Area	The corridor of land on which the Disturbance Footprint will be located, including a 100 metre buffer for micro-siting.
QLD	Queensland
REs	Regional Ecosystems
SATs	Spot Assessment Technique
SIG 1.1	Significant Impact Guidelines 1.1 – Matters of National Environmental Significance
SPRAT	Species Profile and Threats Database
State Code 23	Queensland State Code 23 – Wind farm developments
Study Area	The 9 land parcels, across 3 properties, and road reserve areas, 46,830 ha, in which the Proposed Action will be located.
TECs	Threatened Ecological Community
The Proponent	Theodore Energy Development Pty Ltd
V	Vulnerable
VCA	Vegetation Classification and Assessment
WTG	Wind Turbine Generator

5. MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

5.1 SUMMARY OF MNES OCCURRENCE

The Matters of National Environmental Significance (MNES) relevant to the Study Area are summarized in Table 5-1, with detailed descriptions provided in the Sections following.

Four *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) listed threatened fauna species were considered likely or known to occur in the Study Area. Two Threatened Ecological Communities (TEC) were determined known to occur.

Five listed threatened fauna species, six listed threatened flora species and two migratory species were determined to potentially occur within the Study Area. Although no recent records of these species occur within the Study Area or Locality, and no observations were made during field surveys, the potential future presence of these species cannot be ruled out due to an overlap of distribution and potential general habitat within the Study Area. The final likelihood of occurrence for known, likely and potential species is attached in Appendix C.

TABLE 5-1 MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE IN THE STUDY AREA

Matter	Relevance to the Study Area
World heritage properties	There are no world heritage properties within the Study Area.
National heritage properties	There are no national heritage properties within the Study Area.
Wetland of international importance	There are no wetlands of international importance associated with the Study Area.
Threatened species and ecological communities	The PMST identified five EPBC Act listed TECs with potential to occur within the Study Area. Based on in-situ ground-truthing via completion of quaternary vegetation assessments and BioCondition transects, as well as desktop assessment of aerial imagery, **two** TECs have been considered known to occur: • Poplar Box Grassy Woodland on Alluvial Plains; and • Brigalow (*Acacia harpophylla* dominant and co-dominant). Based on direct observations of species or species habitat during targeted field surveys, **four** EPBC Act listed threatened species have been concluded as known or likely to occur. • Squatter pigeon (southern) (*Geophaps scripta scripta*) - listed as Vulnerable under the EPBC Act (known); • Koala (*Phascolarctos cinereus*) - listed as Endangered under the EPBC Act (known); • Greater glider (southern and central) (*Petauroides volans*) - listed as Endangered under the EPBC Act (known); and • Large-eared pied bat (*Chalinolobus dwyeri*) – listed as Endangered under the EPBC Act (likely). **Five** additional EPBC Act listed fauna species are considered to have the potential to occur, due to the presence of general habitat for these species observed within the Study Area and recent records in the Locality, including: • Black-breasted buttonquail (*Turnix melanogaster*), listed as Vulnerable under the EPBC Act; • White-throated needletail (*Hirundapus caudacutus*), listed as Vulnerable under the EPBC Act;

Matter	Relevance to the Study Area
	• Australian painted snipe (*Rostratula australis*), listed as Endangered under the EPBC Act; • Diamond firetail (*Stagonopleura guttata*) listed as Vulnerable under the EPBC Act; and • Yellow-bellied glider (south-eastern) (*Petaurus australis australis*) listed as Vulnerable under the EPBC Act. No listed flora species have been assessed as known or likely to occur within the Study Area. Based on survey effort and habitat suitability, **six** listed threatened flora species have been assessed as having the potential to occur: • Ooline (*Cadellia pentastylis*), listed as Vulnerable under the EPBC Act; • Cossinia (*Cossinia australiana*), listed as Endangered under the EPBC Act; • Austral Cornflower (*Rhaponticum australe*), listed as Vulnerable under the EPBC Act; • *Solanum dissectum*, listed as Endangered under the EPBC Act; • *Solanum johnsonianum*, listed as Endangered under the EPBC Act; and • *Xerothamnella herbacea*, listed as Endangered under the EPBC Act.
Migratory species	There are **two**[1] listed migratory species under the EPBC Act regarded as having the potential to occur within the Study Area: • Fork-tailed swift (*Apus pacificus*); and • White-throated needletail (*Hirundapus caudacutus*).
Commonwealth marine area	There are no Commonwealth marine areas within the Study Area.
The Great Barrier Reef Marine Park	The Great Barrier Reef is not associated with the Study Area, however information relevant to assess the potential impacts of the Proposed Action on the Great Barrier Reef is provided in Section 5.5.
Nuclear actions	Not Applicable
Water resources	Not Applicable

[1]Satin flycatcher (*Myiagra cyanoleuca*) and rufous fantail (*Rhipidura rufifrons*) were originally included in the referral information and assessed for potential impacts of the Proposed Action. Following recent changes to the EPBC Act Migratory Species list, these de-listed species no longer require assessment under the EPBC Act as MNES and are therefore not assessed as part of this PER.

5.2 LISTED THREATENED ECOLOGICAL COMMUNITIES

The Protected Matters Seach Tool (PMST) results (Appendix B) indicated the possible occurrence of five EPBC Act listed TECs within the Study Area. Based on field surveys and a likelihood of occurrence assessment (Appendix C), two EPBC Act listed TECs were considered known to occur within the Study Area (Table 5-2). These TECs are further discussed in the following Sections.

A summary of the desktop review and field survey effort is discussed in Section 4.2 Ecological Investigations of the Theodore Wind Farm Public Environment Report (PER).

TABLE 5-2 LIKELIHOOD OF OCCURRENCE RESULTS (TECS)

Scientific Name	Common Name	EPBC Act Status	Likelihood of Occurrence
TEC			
Brigalow (*Acacia harpophylla* dominant and co-dominant)		E	Known
Poplar Box Grassy Woodland on Alluvial Plains		E	Known

EPBC Act listing status: E = Endangered.

5.2.1 BRIGALOW (*ACACIA HARPOPHYLLA* DOMINANT AND CO-DOMINANT)

Brigalow (*Acacia harpophylla* dominant and co-dominant) TEC (Brigalow TEC) is listed as Endangered under the EPBC Act and is considered known to occur within the Study Area.

5.2.1.1 TEC DESCRIPTION

Brigalow TEC coincides with 16 Regional Ecosystems (REs) in Queensland (QLD) (listed in the *Approved Conservation Advice or the Brigalow (Acacia harpophylla dominant and co-dominant) ecological community* (DoE, 2013), as well as any regrowth patch of a sufficient size dominated or co-dominated by Brigalow (*Acacia harpophylla)* which has not been comprehensively cleared in 15 years.

Key Diagnostic Characteristics and Condition Thresholds

Brigalow TEC is limited to patches that meet the following key diagnostic characteristics and condition thresholds (DoE, 2013).

Key Diagnostic Characteristics

A patch must include the following key diagnostic characteristics to be considered the Brigalow ecological community (DoE, 2013):

3. The presence of *Acacia harpophylla* as one of the most abundant tree species in the patch. *A. harpophylla* is either dominant in the tree layer, or co-dominant with other species (notably *Casuarina cristata*, other species of *Acacia*, or species of *Eucalyptus*). **AND**

4. Either:

a. In QLD - the patch is in one of the following QLD bioregions (including outliers) and it meets the description of one of 16 QLD REs determined at the time of the national listing of the Brigalow ecological community under the EPBC Act. The 16 REs are, as described by the Queensland Herbarium (2013):
    i. In the Qld Brigalow Belt Bioregion – REs 11.3.1, 11.4.3, 11.4.7, 11.4.8, 11.4.9, 11.4.10, 11.5.16, 11.9.1, 11.9.5, 11.9.6, 11.11.14 and 11.12.21;
    ii. In the Qld Southeast Queensland Bioregion – REs 12.8.23, 12.9-10.6 and 12.12.26; or,
    iii. In the QLD Mulga Lands Bioregion – RE 6.4.2. OR 2b). **OR**
b. In New South Wales (NSW) - the patch meets one of the following NSW Vegetation Classification and Assessment (VCA) community descriptions. The NSW VCA communities are: VCA IDs 29, 31 and 35; as described in Benson et al. (2006). **AND/OR**
c. The vegetation in the patch is brigalow regrowth with species composition and structural elements broadly typical of one of the identified QLD REs or NSW vegetation communities (although species density may be reduced). This can be assumed to be the case where it has been at least 15 years since it was last comprehensively cleared (not just thinned); unless direct evidence proves otherwise.

Condition Threshold

A patch must meet the following condition thresholds to be considered the Brigalow ecological community (DoE, 2013):

3. The patch is 0.5 ha or more in size; **AND**
4. Exotic perennial plants comprise less than 50% of the total vegetation cover of the patch, as assessed over a minimum sample area of 0.5 ha (100 m by 50 m), that is representative of the patch.

Additional Considerations

Additional considerations when applying key diagnostics and condition thresholds of Brigalow TEC are described in *Approved Conservation Advice or the Brigalow (Acacia harpophylla dominant and co-dominant) ecological community* (DoE, 2013). These additional considerations, including land use history, patch, buffer zone, revegetated areas and timing of surveys, have been reviewed and taken into consideration when assessing the presence of Brigalow TEC.

Areas critical to the survival of the ecological community

The areas considered critical to the survival of the Brigalow TEC includes (DoE, 2013):

> *All patches that meet the key diagnostic characteristics and condition thresholds for the ecological community; plus the buffer zones, particularly where these include native vegetation. Note that additional areas that do not meet the minimum condition thresholds may be critical to the survival of the ecological community depending on factors such as their size and shape, landscape linkages to other patches and landscape position; this is because they could retain some biodiversity, wildlife corridor, or habitat values.*

5.2.1.2 FIELD SURVEYS

Survey Methodology and Effort

One RE mapped as present within the Study Area (RE 11.12.21) coincides with Brigalow TEC. Survey effort for this TEC included 16 quaternary assessments in mapped vegetation patches of brigalow woodland (RE 11.12.21) as well as regrowth patches that were identified to have the required floristic composition. These surveys were completed across the October 2022, March 2023 and June 2023 survey periods.

Following these quaternary assessments, three BioCondition assessment transects have been completed to assess if the brigalow woodland patches (potential Brigalow TEC patches) identified from the initial quaternary assessments meet the key diagnostic criteria and conditions thresholds of the TEC (focusing particularly on the patches located within or near the Disturbance Footprint). These surveys were conducted across the September 2023, June 2024 and September 2024 survey periods.

For further detail on the ecological investigations completed within the Study Area, including desktop searches, survey timing and survey methodology, refer to Section 4.8.

Survey Results

More than 36 disjunct patches of potential Brigalow TEC have been mapped, with quaternary and/or BioCondition transects completed in 17 patches, mostly within or near the Disturbance Footprint, as shown in Figure 5-1. As a result of the initial vegetation assessments, a total of 8 patches of brigalow woodland (potential Brigalow TEC patches) were identified within the Disturbance Footprint. Of these patches, assessment concluded that:

- 3 patches met the key diagnostic criteria and condition thresholds and are considered ground-truthed Brigalow TEC patches; and
- 5 patches did not meet key diagnostic criteria or condition thresholds and are not considered Brigalow TEC.

Table 5-3 details how the key diagnostic criteria for the Brigalow TEC have been met based on data collected from field surveys and Table 5-4 details this assessment for each patch of potential Brigalow TEC within or near the Disturbance Footprint.

TABLE 5-3 KEY DIAGNOSTIC CRITERIA FOR BRIGALOW TEC AND RELEVANCE TO THE STUDY AREA

Key Diagnostic Criteria and Condition Threshold for TEC		Comment on Requirement met in Study Area
1	Presence of *Acacia harpophylla* as one of the most abundant tree species in the patch	A total of 10 potential Brigalow TEC patches were confirmed to have *Acacia harpophylla* as one of the most abundant tree species in the patch via quaternary or BioCondition transect. Patches that did not meet this diagnostic criterion were excluded from consideration.
2	Patch meets the description of one of 16 QLD REs that coincide with Brigalow TEC	A total of 23 patches of RE 11.12.21 were identified within the Study Area during the desk-top assessment. Ground-truthing via quaternary assessment or BioCondition transect occurred during field surveys which confirmed the presence of 11 patches of RE 11.12.21 within the Study Area. Potential Brigalow TEC patches that did not meet this diagnostic criteria were excluded from consideration.

Key Diagnostic Criteria and Condition Threshold for TEC		Comment on Requirement met in Study Area
3	The patch is ≥ 0.5 ha	A total of 16 potential Brigalow TEC patches are greater than 0.5 ha in size across the Study Area. Where patches smaller than this size occur, they have been excluded from consideration.
4	Exotic perennial plants comprise less than 50% of total vegetation cover of the patch.	All 17 patches of potential Brigalow TEC assessed within the Study were comprised of less than 50% exotic perennial plant cover.

TABLE 5-4 TEC ASSESSMENT OF POTENTIAL BRIGALOW TEC PATCHES WITHIN OR NEAR THE DISTURBANCE FOOTPRINT

Potential Brigalow TEC Patch within or near the Disturbance Footprint	Key Diagnostic Criteria		Condition Threshold		Conclusion
	1 Presence of *Acacia harpophylla* as one of the most abundant tree species in the patch	2 Patch meets the description of one of 16 QLD REs that coincide with Brigalow TEC	3 The patch is ≥ 0.5 ha	4 Exotic perennial plants comprise less than 50% of total vegetation cover of the patch.	
1	✓	✓	✓	✓	Ground-truthed Brigalow TEC
2	✗	✗	✓	✓	Brigalow TEC not present
3	✓	✓	✓	✓	Ground-truthed Brigalow TEC
4	✓	✓	✓	✓	Ground-truthed Brigalow TEC
5	✓	✓	✓	✓	Ground-truthed Brigalow TEC
6	✗	✗	✓	✓	Brigalow TEC not present
7	✓	✓	✓	✓	Ground-truthed Brigalow TEC
8	✓	✓	✓	✓	Ground-truthed Brigalow TEC
9	✓	✓	✓	✓	Ground-truthed Brigalow TEC
10	✗	✗	✓	✓	Brigalow TEC not present
11	✗	✗	✓	✓	Brigalow TEC not present
12	✓	✓	✓	✓	Ground-truthed Brigalow TEC
13	✗	✗	✓	✓	Brigalow TEC not present
14	✗	✗	✓	✓	Brigalow TEC not present
15	✓	✓	✓	✓	Ground-truthed Brigalow TEC

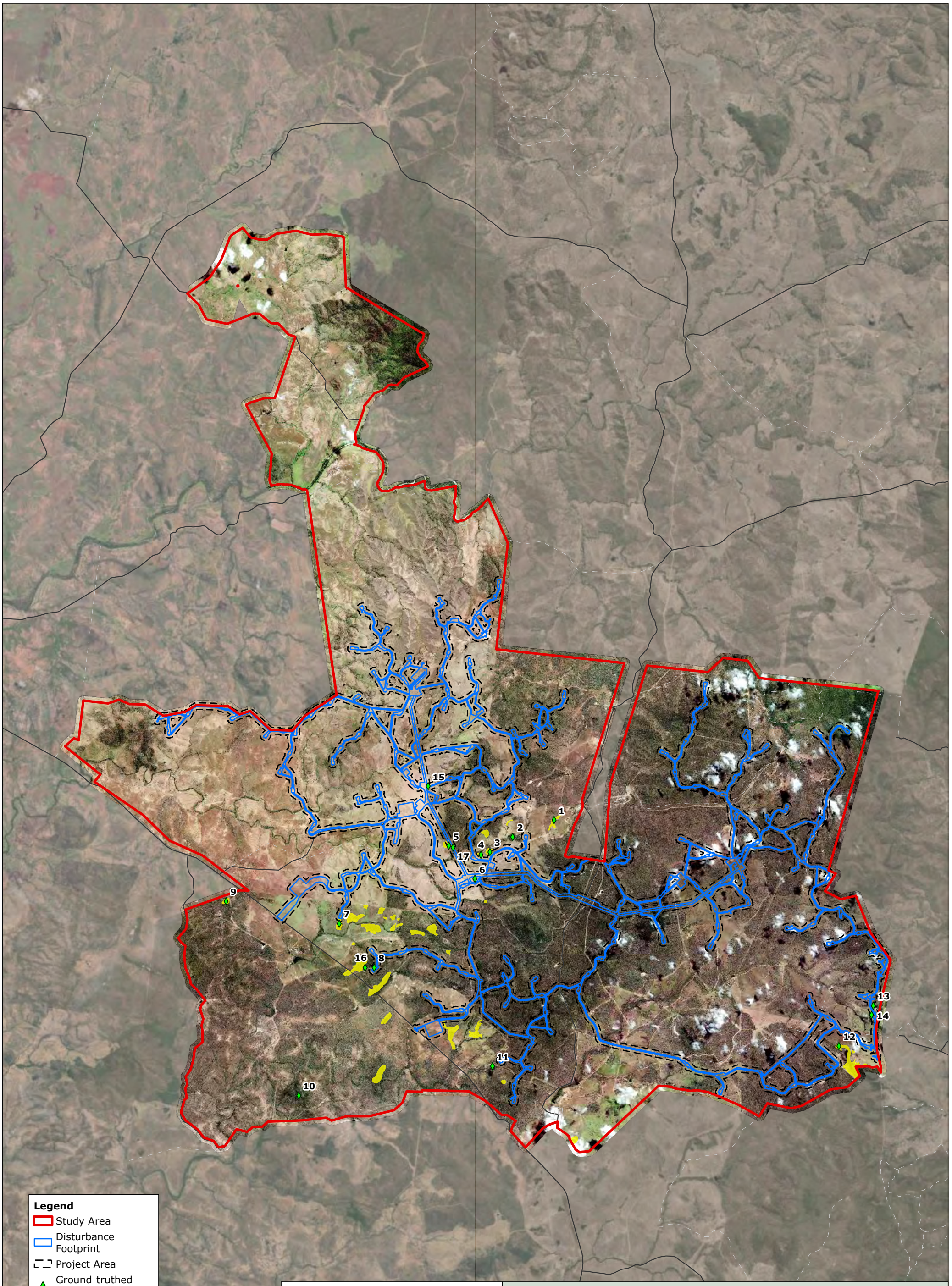
Potential Brigalow TEC Patch within or near the Disturbance Footprint	Key Diagnostic Criteria		Condition Threshold		Conclusion
	1 Presence of *Acacia harpophylla* as one of the most abundant tree species in the patch	2 Patch meets the description of one of 16 QLD REs that coincide with Brigalow TEC	3 The patch is ≥ 0.5 ha	4 Exotic perennial plants comprise less than 50% of total vegetation cover of the patch.	
16	✓	✓	✓	✓	Ground-truthed Brigalow TEC
17	✓	✓	×	✓	Brigalow TEC not present

✓ Key diagnostic criteria or condition threshold met
× Key diagnostic criteria or condition threshold not met
- BioCondition not completed within patch

5.2.1.3 HABITAT ASSESSMENT AND MAPPING

Brigalow TEC mapping was conducted through the onsite verification of vegetation mapped as brigalow woodland (RE 11.12.21) as well as regrowth patches that were identified to have the required floristic composition. Particular focus was on patches of potential TEC located within or near the Disturbance Footprint, in an effort to accurately map the TEC that would potentially be impacted by the Proposed Action. As a result, all of the potential Brigalow TEC within the Disturbance Footprint has been delineated as ground-truthed Brigalow TEC, or discounted as not meeting the requirements to constitute Brigalow TEC.

Where field verification has not been completed, desktop imagery analyses and assessment of representative sampling points has been undertaken to assist with mapping of Brigalow TEC where possible. Where access difficulties and time constraints have limited survey effort, patches have conservatively been considered potential Brigalow TEC. All the mapped potential Brigalow TEC occurs outside of the Disturbance Footprint. For the purpose of this report, including the Impact Assessment (Section 6), the combined total of all ground-truthed and potential Brigalow TEC within the Study Area (225.5 ha) is considered Brigalow TEC, as presented in Figure 5-1. It should be noted that any TEC that occurs within the Disturbance Footprint and is considered in the Impact Assessment is ground-truthed Brigalow TEC.



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5.2.2 POPLAR BOX GRASSY WOODLANDS ON ALLUVIAL PLAINS TEC

Poplar Box Grassy Woodlands on Alluvial Plains TEC (Poplar Box TEC) is listed as Endangered under the EPBC Act and is considered known to occur within the Study Area.

5.2.2.1 TEC DESCRIPTION

Poplar Box Grassy Woodlands on Alluvial Plains TEC (Poplar Box TEC) is typically a grassy woodland with a canopy dominated by *Eucalyptus populnea* and understorey mostly of grasses and other herbs. It occurs in Queensland RE Land Zone 3 (quaternary alluvium deposited from stream flow) and Land Zone 4 (quaternary clay plains originating in ancient alluvium deposits) (DoEE, 2019). The TEC is best represented by five REs in QLD, though can occur outside of these mapped REs, including as regrowth vegetation (DoEE, 2019).

Key Diagnostic Characteristics and Condition Thresholds

For EPBC Act referral, assessment and compliance purposes, the nominated ecological community is limited to patches that meet the following diagnostic characteristics and condition thresholds. The additional factors noted in Section 3.2.3 and critical areas noted in Section 3.3 of the *Conservation Advice (including listing advice) for the Poplar Box Grassy Woodland on Alluvial Plains* (DoEE, 2019) should also be taken into consideration.

Key Diagnostic Characteristics

The Poplar Box TEC that is protected under national environment law consists of areas of vegetation (and associated biota) that meet the following key diagnostic characteristics:

Location and physical environment:

3. Occurs in the Brigalow Belt North, Brigalow Belt South, Southeast QLD, Cobar Peneplains, Darling Riverine Plains, NSW South Western Slopes, Riverina and Murray Darling Depression IBRA bioregions.
4. Associated with ancient and recent depositional alluvial plains with clay, clay-loam, loam and sandy loam, typically duplex soils or sodosols. This includes areas that may not be part of currently defined floodplains.

Structure:

1. A grassy woodland to grassy open woodland with a tree crown cover of 10% or more at patch scale.
2. A tree canopy must be present that shows these features:

- Canopy tree species are capable of reaching 10 m or more in height;
- *Eucalyptus populnea* (poplar box) must be present in the canopy and is the dominant tree species;
- Where hybrids of poplar box with other *Eucalyptus* sp. are present, they should be counted as part of the *Eucalyptus populnea* component of the tree canopy when assessing the previous criterion.

3. Mid layer (1-10 m) crown cover of shrubs to small trees is low, about 30% or less.
4. A ground layer (<1 m) mostly dominated across a patch by native grasses, other herbs and occasionally chenopods (during extended dry periods), ranging from sparse to thick (in response to canopy development, soil moisture, disturbance and/or management history).

5. A list of diagnostic native plant species and some of the key native fauna that make up the ecological community is given at Appendix A of the *Conservation Advice (including listing advice) for the Poplar Box Grassy Woodland on Alluvial Plains* (DoEE, 2019), although particular species may be abundant or rare, or not necessarily present, at every location.

Condition Threshold

6. The Poplar Box TEC that is protected under national environment law comprises patches that meet the key diagnostic characteristics (above) and at least the minimum condition thresholds (Moderate and High condition categories A, B, or C) set out in Table 5-5 Poplar Box TEC Condition Threshold.

TABLE 5-5 POPLAR BOX TEC CONDITION THRESHOLD

Category and rationale	Native cover and diversity thresholds	Minimum patch size thresholds*
Class A Highest Quality		
Category A1 Little to no perennial weeds and diverse native understorey	The crown cover of canopy trees in the patch is ≥10% AND ≥ 90% of perennial vegetation cover in the ground layer is native AND ≥ 30 native plant species per patch in the ground layer	≥ 1 ha
Category A2 A large patch with low perennial weeds and diverse native understorey	The crown cover of canopy trees in the patch is ≥10% AND ≥70% of perennial vegetation cover in the ground layer is native AND ≥ 30 native plant species per patch in the ground layer	≥ 5 ha
Class B Good Quality		
Category B A large patch with good quality native understorey or with mature trees	The crown cover of canopy trees in the patch is ≥10% AND ≥ 50% of perennial vegetation cover in ground layer is native AND EITHER ≥ 20 perennial native plant species per patch in the ground layer OR ≥ 10 mature trees+ per ha with ≥ 30cm Diameter at Breast Height (DBH) (and/or hollows)	≥ 5 ha
Class C Moderate Quality		
Category C A large patch with low native cover but retains good native understorey diversity and habitat features of mature trees	The crown cover of canopy trees in the patch is ≥10% **AND** If < 50% of perennial vegetation cover in ground layer is native, then the patch must have: ≥ 20 native plant spp. per patch in the ground layer AND ≥ 10 mature trees per ha with ≥ 30cm DBH (and/or hollows) AND smaller trees, saplings or seedlings suggestive of periodic recruitment	≥ 5 ha

5.2.2.2 FIELD SURVEYS

Survey Methodology and Effort

Survey effort for this TEC included 18 quaternary assessments in accordance with Neldner et al, (2022) and five BioCondition transects in accordance with Eyre et al., (2015) in state-mapped vegetation patches of poplar box alluvial woodland. Surveys focused on the patches located within or near the Disturbance Footprint.

For further detail on the ecological investigations completed within the Study Area, including desktop searches, survey timing and survey methodology, refer to Section 4.8.

Survey Results

Three BioCondition transects and quaternary assessments confirmed the presence of the TEC due to meeting 'Class B Good Quality' key diagnostic condition criteria. Additionally, 10 quaternary assessments ground-truthed areas with suitable dominance in the canopy of *Eucalyptus populnea* (poplar box). The remaining quaternary assessments ruled out the TEC occurring due to inconsistent floristics. In total, assessments found:

- 5 patches of ground-truthed Class B Poplar Box TEC within the Study Area; and
- 13 patches of potential Poplar Box TEC within the Study Area.

Table 5-6 and Table 5-7 details how the Category B key diagnostic criteria and condition thresholds for the Poplar Box TEC were met based on data collected from field surveys.

TABLE 5-6 KEY DIAGNOSTIC CRITERIA FOR POPLAR BOX TEC AND RELEVANCE TO THE STUDY AREA

Key Diagnostic Criteria and Condition Threshold for TEC		Comment on Requirement met in Study Area
Key Diagnostics		
Location and Physical Environment		
1	Occurs in defined IBRA Bioregion	The entire Study Area is within the Brigalow Belt South IBRA Bioregion which meets key diagnostic criteria 1.
2	Associated with ancient and recent depositional alluvial plains with clay, clay-loam, loam and sandy loam, typically duplex soils or sodosols	All potential patches of Poplar Box TEC occur on QLD RE Land Zone 3 (quaternary alluvium deposited from stream flow).
Structure		
3	A grassy woodland to grassy open woodland with a tree crown cover of 10% or more at patch scale.	All potential patches of Poplar Box TEC within the Study Area were identified as having >10% crown cover, with *Eucalyptus populnea* accounting for dominant species in all canopies.
4	A tree canopy with defined features present.	

TABLE 5-7 KEY DIAGNOSTIC CRITERIA AND CONDITION THRESHOLD FOR POPLAR BOX TEC PATCHES WITHIN THE STUDY AREA

Potential Poplar Box TEC Patch within THE Study Area	Key Diagnostic Criteria			Condition Threshold (Class B Good Quality, Category B)			Minimum patch size thresholds	Conclusion
	5 Mid layer (1-10 m) crown cover low, ~ 30% or less	6 Ground layer (<1 m) mostly dominated by natives	7 Diagnostic native species present	The crown cover of canopy trees in the patch is ≥10% AND	Exotic perennial plants comprise less than 50% of total vegetation cover of the patch AND EITHER	≥ 20 perennial native species in ground layer OR ≥ 10 mature trees+ per ha with ≥ 30cm DBH	CLASS B ≥ 5 ha	
1	-	✓	✓	✓	-	-	✓	Potential Poplar Box TEC
2	✓	✓	✓	✓	✓	✓	✓	Ground-truthed Class B TEC
3	-	-	-	✓	-	-	✓	Potential Poplar Box TEC
4	-	✓	✓	✓	-	-	✓	Potential Poplar Box TEC
5	✓	✓	✓	✓	✓	✓	✓	Ground-truthed Class B TEC
6	-	✓	✓	✓	-	-	✓	Potential Poplar Box TEC
7	-	-	-	✓	-	-	✓	Potential Poplar Box TEC
8	-	-	-	✓	-	-	✓ [1]	Potential Poplar Box TEC
9	-	-	-	✓	-	-	✓	Potential Poplar Box TEC
10	-	-	-	✓	-	-	✓	Potential Poplar Box TEC
11	-	-	-	✓	-	-	✓	Potential Poplar Box TEC

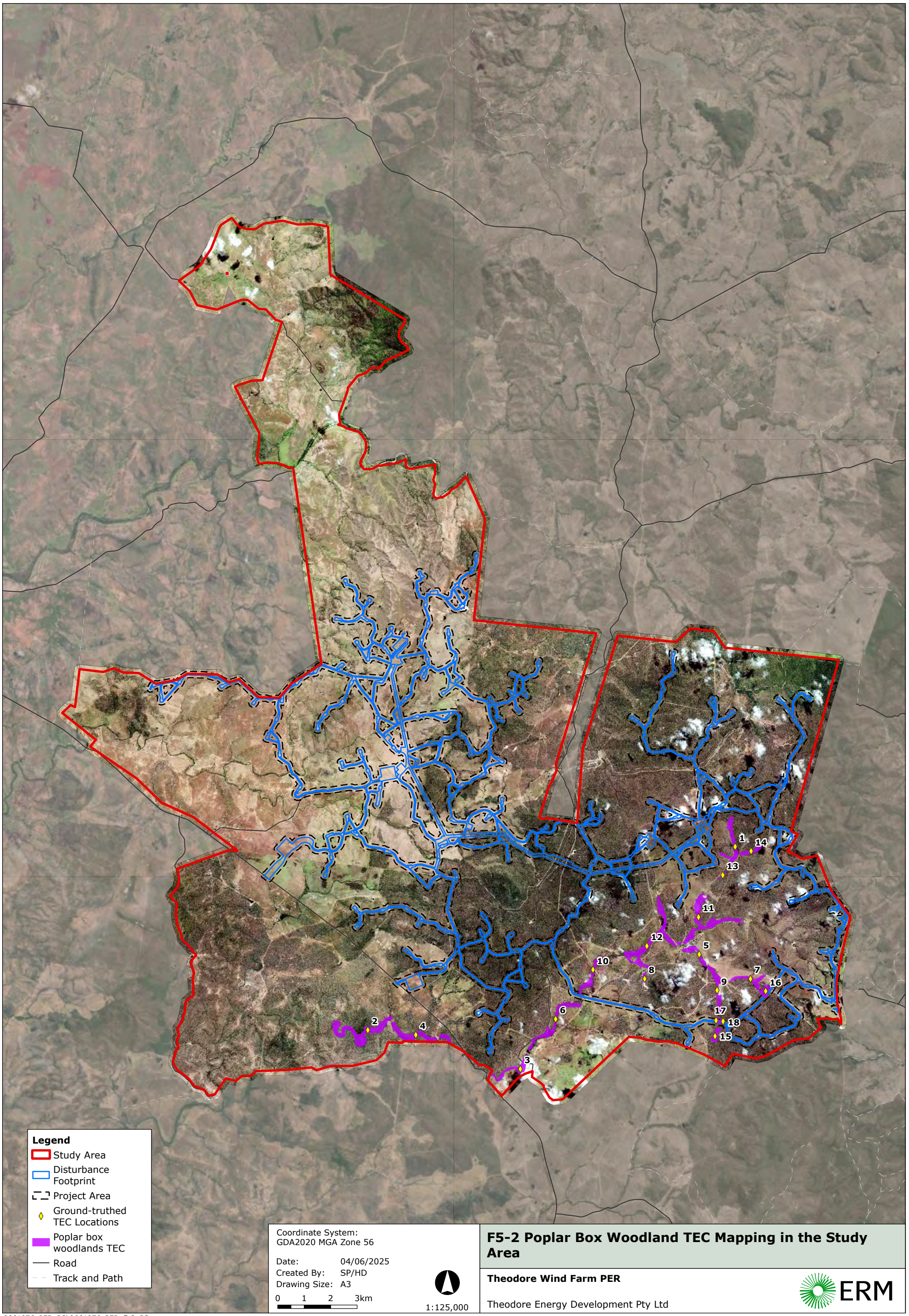
Potential Poplar Box TEC Patch within THE Study Area	Key Diagnostic Criteria			Condition Threshold (Class B Good Quality, Category B)			Minimum patch size thresholds	Conclusion
	5 Mid layer (1-10 m) crown cover low, ~ 30% or less	6 Ground layer (<1 m) mostly dominated by natives	7 Diagnostic native species present	The crown cover of canopy trees in the patch is ≥10% AND	Exotic perennial plants comprise less than 50% of total vegetation cover of the patch AND EITHER	≥ 20 perennial native species in ground layer OR ≥ 10 mature trees+ per ha with ≥ 30cm DBH	CLASS B ≥ 5 ha	
12	-	✓	✓	✓	-	-	✓	Potential Poplar Box TEC
13	-	-	-	✓	-	-	✓ [1]	Potential Poplar Box TEC
14	-	-	-	✓	-	-	✓	Potential Poplar Box TEC
15	-	-	-	✓	-	-	✓	Potential Poplar Box TEC
16	✓	✓	✓	✓	✓	✓	✓	Ground-truthed Class B TEC
17	✓	✓	✓	✓	✓	✓	✓ [2]	Ground-truthed Class B TEC
18	✓	✓	✓	✓	✓	✓	✓ [2]	Ground-truthed Class B TEC

✓ Key diagnostic criteria or condition threshold met
× Key diagnostic criteria or condition threshold not met
- BioCondition not completed within patch
1 Patches 8 and 13 are each below 5 ha (3.3 ha and 1.3 ha respectively) however were not able to be adequately surveyed to rule out meeting criteria for Class A Highest Quality, Category A1 Poplar Box TEC (minimum patch size thresholds ≥ 1 ha), and have therefore been included as potential Poplar Box TEC.
2 Patches 17 and 18 are below 5 ha individually (3.2 ha and 2.2 ha respectively) however are separated by non-TEC native vegetation and are close enough to ecologically function as a single patch, and have therefore been included as ground-truthed Class B Poplar Box TEC.

5.2.2.3 HABITAT ASSESSMENT AND MAPPING

Poplar Box TEC has been mapped to occur within the southeast of the Study Area in 18 relatively well-connected patches associated with RE 11.3.2 along Oxtrack Creek, as shown in Figure 5-2. Poplar Box TEC mapping was conducted through the onsite verification of state-mapped vegetation patches of poplar box alluvial woodland. Particular focus was on patches of potential TEC located within or near the Disturbance Footprint, in an effort to accurately map the TEC that would potentially be impacted by the Proposed Action. As a result, all of the mapped potential Poplar Box TEC within the Disturbance Footprint has been delineated as ground-truthed Poplar Box TEC, or discounted as not meeting the requirements to constitute Poplar Box TEC.

In patches of Poplar Box TEC where in-situ assessment has not been completed, satellite imagery analyses and assessment of representative sampling points has been undertaken to assist mapping of the TEC. Where access difficulties and time constraints have limited survey effort, patches have conservatively been considered potential Poplar Box TEC. All the mapped potential Poplar Box TEC occurs outside of the Disturbance Footprint. For the purpose of this report, including the Impact Assessment (Section 6), the combined total of all ground-truthed and potential Poplar Box TEC within the Study Area (478.4 ha) is considered Poplar Box TEC, as presented in Figure 5-2. It should be noted that any TEC that occurs within the Disturbance Footprint and is considered in the Impact Assessment is ground-truthed Poplar Box TEC.



F5-2 Poplar Box Woodland TEC Mapping in the Study Area

Theodore Wind Farm PER

Theodore Energy Development Pty Ltd

ERM

0661076_PER_R2\0661076_PER_5-2_R3

5.3 LISTED THREATENED SPECIES

The following Sections summarise the occurrence of and habitat for EPBC Act listed threatened species determined known, likely or potential to occur within the Study Area based on desktop assessments and field surveys. Species identified in the Theodore Wind Farm (EPBC 2024/09842) PER guidelines provided by Department of Climate Change, Energy, the Environment and Water (DCCEEW) and determined unlikely to occur are also discussed. The PMST results (Appendix B) indicated the possible occurrence of 38 EPBC Act listed threatened species within the Study Area. Based on field surveys and a likelihood of occurrence assessment (Appendix C), four EPBC Act listed threatened species were considered known or likely to occur within the Study Area (Table 5-8).

An additional 11 EPBC Act listed species have been assessed as having the potential to occur within the Study Area (Table 5-8). These species' distribution overlaps with the Study Area, with suitable habitat also occurring, which is supported by field assessments of habitat suitability and targeted species surveys conducted over 10 separate events. No observations of these species within the Study Area or Locality have been made to date, however their presence cannot be ruled out.

EPBC Act listed threatened species, determined known, likely or potential to occur within the Study Area are further discussed in the following Sections. A summary of the desktop review and field survey effort is discussed in Section 4.2 Ecological Investigations of the Theodore Wind Farm PER. Habitat assessment methodology, including the use of broad habitat types (BHTs) to delineate threatened species habitat within the Study Area, is discussed in Section 4.2.6 of the Theodore Wind Farm PER.

TABLE 5-8 LIKELIHOOD OF OCCURRENCE RESULTS (THREATENED SPECIES)

Scientific Name	Common Name	EPBC Act Status	Likelihood of Occurrence
Mammals			
Petauroides volans	Greater glider (southern and central)	E	Known
Petaurus australis australis	Yellow-bellied glider (south-eastern)	V	Potential
Phascolarctos cinereus	Koala	E	Known
Chalinolobus dwyeri	Large-eared pied-bat	E	Likely
Nyctophilus corbeni	South-eastern long-eared bat	V	Unlikely
Birds			
Geophaps scripta scripta	Squatter pigeon (southern)	V	Known
Hirundapus caudacutus	White-throated needletail	V and Mi	Potential
Turnix melanogaster	Black-breasted buttonquail	V	Potential
Rostratula australis	Australian painted snipe	E	Potential

Scientific Name	Common Name	EPBC Act Status	Likelihood of Occurrence
Stagonopleura guttata	Diamond firetail	V	Potential
Reptiles			
Denisonia maculata	Ornamental snake	V	Unlikely
Flora			
Cadellia pentastylis	Ooline	V	Potential
Rhaponticum australe	Austral cornflower	V	Potential
Cossinia australiana	Cossinia	E	Potential
Xerothamnella herbacea		E	Potential
Solanum johnsonianum		E	Potential
Solanum dissectum		E	Potential

EPBC Act listing status: E = Endangered, V = Vulnerable, Mi = Migratory

5.3.1 GREATER GLIDER (SOUTHERN AND CENTRAL)

The greater glider (southern and central) (*Petauroides volans)* (greater glider) was upgraded from a listing of Vulnerable to Endangered under the EPBC Act, on the 5th of July 2022. It is noted in the Conservation Advice that two separate taxa of subspecies likely co-exist in this area. However, until such ambiguity is resolved, the listed entity will be referred to as *Petauroides volans* (DCCEEW, 2022a). This species was concluded as known to occur within the Study Area as per the likelihood of occurrence assessment (Appendix C).

5.3.1.1 SPECIES DISTRIBUTION AND HISTORICAL RECORDS

The greater glider occurs in eastern Australia, where it has a broad distribution from around Proserpine in QLD, south through NSW and the ACT, to Wombat State Forest in central VIC, preferring an elevational range of 0−1200 m above sea level (DCCEEW, 2022a). The Study Area is within the 'species or species habitat likely to occur' modelled distribution of the species (DCCEEW, 2024a) (Figure 5-3). There is a total of four historical records of greater glider, one recent (within the past 20 years) Atlas of Living Australia (ALA) record (2020) (ALA, 2024), and three outdated (recorded more than 20 years ago) Wildnet records (2002), within the Locality.

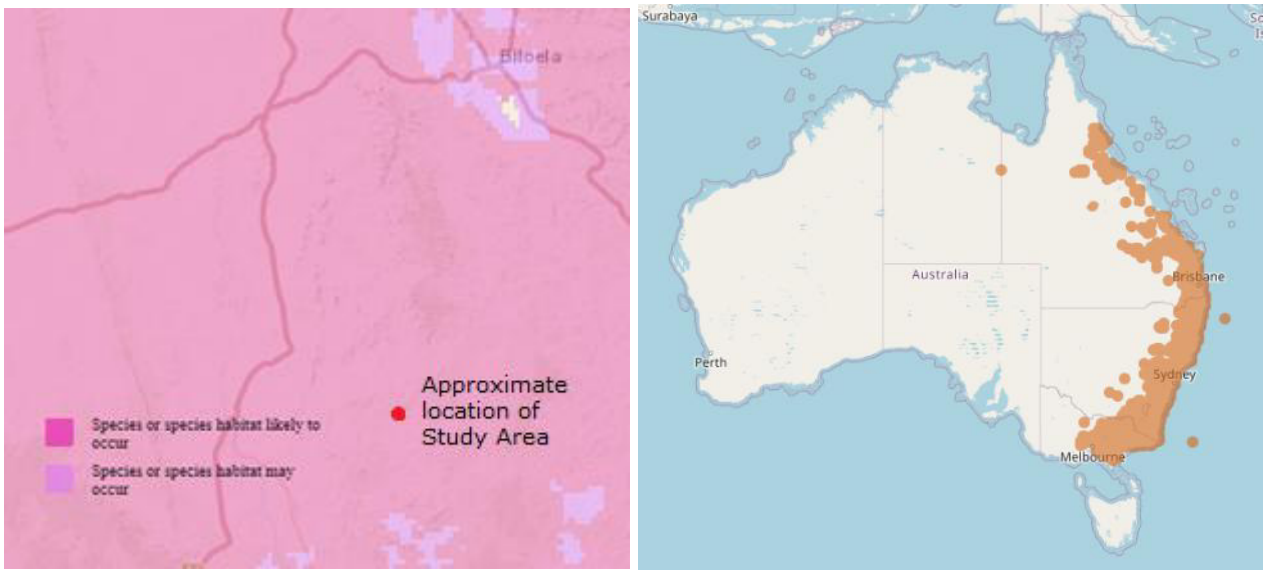


FIGURE 5-3 GREATER GLIDER MODELLED DISTRIBUTION (DCCEEW, 2024A) AND RECORDS (ALA, 2024)

5.3.1.2 HABITAT REQUIREMENTS

Greater glider habitat consists of tall, eucalypt forests with mature hollow-bearing trees (Eyre T. , 2004). The species has an affinity for habitats dominated or co-dominated by *Corymbia citriodora, E. moluccana, E. tereticornis, E. crebra, C. intermedia* and *E. portuensis* (Eyre, et al., 2022). Eyre (2002) notes, within southern Queensland, greater glider requires a density of at least 2-4 live den trees per ha of suitable forest habitat. The species also demonstrates a 'preference for large hollows (diameter >10cm) in large, old trees' (DCCEEW, 2022a), though it is noted that the species will utilise both living and dead trees. Most studies of the species have demonstrated that they generally have small home ranges (<3 ha) (Eyre, et al., 2022).

The *Guide to greater glider habitat in Queensland* (Eyre, et al., 2022) includes the following definitions of habitat for the species:

> *Habitat*
>
> - *Regional ecosystems with confirmed greater glider records.*
> - *Contains habitat attributes (but not necessarily all attributes), such as live and dead hollow-bearing trees for denning, feed trees, large trees, habitat connectivity across the landscape.*
>
> *Potential habitat*
>
> - *Regional ecosystems that do not have confirmed greater glider records but are identified by experts as potential greater glider habitat.*
> - *Contains habitat attributes (but not necessarily all attributes), such as live and dead hollow-bearing trees for denning, feed trees, large trees, habitat connectivity across the landscape.*
>
> *Not habitat*
>
> - *Regional ecosystems with no confirmed records of greater gliders, and identified by experts as non-habitat.*
> - *Does not contain habitat attributes such as live and dead hollow-bearing trees for denning, feed trees, large trees, habitat connectivity across the landscape.*

Specifically, in Central Queensland, greater glider preferred habitat includes the following characteristics:

- Remnant connected eucalypt woodlands and forests containing more than 2 hollow bearing trees per 2 ha, with hollow entrance diameters greater than 10 cm;
- Preferred foraging tree species:
  - Trees >30 cm in DBH;
  - Species including:
    - Red ironbark (*E. fibrosa*);
    - Gum-topped box (*E. moluccana*); and
    - Lemon-scented spotted gum (*C. citriodora*).
- Preferred denning trees include:
  - Trees >50 cm DBH, as trees greater than 50 cm DBH are more likely to contain suitable hollows for the species (Eyre, et al., 2022);
  - Species including:
    - Forest red gum (*E. tereticornis*);
    - Lemon-scented spotted gum (*C. citriodora*);
    - River red gum (*E. camaldulensis*).

Other suitable foraging and/or denning trees for the greater glider in Central Queensland include coolibah (*E. coolabah*), narrow-leaved ironbark (*E. crebra*), silver-top stringybark (*E. laevopinea*), mountain coolibah (*E. orgadophila*), poplar box (*E. populnea*), silver-leaved ironbark (*E. melanophloia*) and Moreton Bay ash (*C. tessellaris*).

Habitat Critical to the Survival of the Species

Habitat critical to survival for the greater glider has been defined in *Conservation Advice for Petauroides volans (Greater Glider (southern and central))* (DCCEEW, 2022a) as:

- *Large contiguous areas of eucalypt forest, which contain mature hollow-bearing trees and a diverse range of the species' preferred food species in a particular region; and*
- *Smaller or fragmented habitat patches connected to larger patches of habitat, that can facilitate dispersal of the species and/or that enable recolonization; and*
- *Cool microclimate forest/woodland areas (e.g., protected gullies, sheltered high elevation areas, coastal lowland areas, southern slopes); and*
- *Areas identified as refuges under future climate changes scenarios; and*
- *Short-term or long-term post-fire refuges (i.e., unburnt habitat within or adjacent to recently burnt landscapes) that allow the species to persist, recover and recolonise burnt areas.*

5.3.1.3 FIELD SURVEYS

Survey Methodology and Effort

In lieu of species-specific guidelines, a targeted survey approach was implemented to assess the presence of greater glider, and potential habitat, in line with *Survey guidelines for Australia's threatened mammals* (DSEWPC, 2011a), *Terrestrial Vertebrate Fauna Survey Guidelines for Queensland* (DES, 2022), and *Guide to greater glider habitat in Queensland* (Eyre, et al., 2022).

A total of 26 hours of two-person targeted spotlighting searches were conducted throughout the Study Area across three survey periods:

- October 2022 – six hours of spotlighting transects over two nights;
- June 2023 – 12 hours of spotlighting transects over four nights; and
- September 2024 – eight hours of spotlighting transects over two nights.

Additionally, 245 vegetation and habitat assessments were completed across the Study Area during the 10 survey periods.

For further detail on the ecological investigations completed within the Study Area, including desktop searches, survey timing and survey methodology, refer to Section 4.8.

Survey Results

Greater glider was recorded within the Study Area during targeted spotlighting surveys in the June 2023 survey period, with 14 individuals observed in the south-east and central north of the Study Area. An additional 10 individuals were also observed during the September 2024 survey period. Field survey observations and historical records are included in Figure 5-4.

Survey Adequacy

Considering relevant guidelines and recommendations, the field survey methodology and effort has been considered adequate for this species. Survey guideline advice for the greater glider and field survey effort and adequacy are outlined in Table 5-9.

TABLE 5-9 GREATER GLIDER FIELD SURVEY EFFORT

Survey Guidelines and Recommendations	Survey Effort Utilised and Timing	Comment on Field Survey Adequacy
Arboreal mammal survey methods adopted from the *Survey Guidelines for Australia's Threatened Mammals* (DSEWPC, 2011): • Diurnal searches for the presence of potentially suitable habitat resources for nest or den sites as well as signs of the species' presence, such as scratches on tree trunks and scats beneath trees. • Stag watching. • Spotlight surveys in suitable vegetation types. Bright moonlight aids in detecting greater gliders. Spotlighting should be at least two 200 m transects per 5 ha sites. It is also recommended there be 100 m between survey transects. As per the Terrestrial Vertebrate Fauna Survey Guidelines for Queensland (DES, 2018): • Spotlighting transects are the most effective method. • Where possible, survey effort should target habitat known to be suitable for listed species Spotlighting requires two-person 30-minute searches of 100 x 100 m survey site across multiple nights. This can include spotlighting up one side of the 100 x 100 m area and then spotlighting back the other side of the 100 x 100 m area. The *Guide to greater glider habitat in Queensland* (Eyre, et al., 2022) includes the following advice (further outlined above in Section 4: • Preferred foraging tree species include trees >30 cm DBH; and • Preferred denning trees include trees >50 cm DBH.	245 diurnal vegetation and habitat assessments determining the presence of suitable habitat features for the species, including any hollow-bearing trees within mature eucalypt forests. Assessments undertaken across surveys events in both the wet and dry seasons (October 2022, March, June and September/October 2023, June and September 2024). 6 hours of spotlighting over two nights in October 2022 (impacted by inclement weather). 12 hours of spotlighting over four nights in June 2023. 8 hours of spotlighting over two nights in September 2024. 4 x camera traps deployed for 4 trap nights in October 2022 within suitable habitat, totalling 16 trap nights.	Survey effort considered adequate. Diurnal searches were undertaken in areas of potential habitat for this species with the aim of identifying suitable microhabitat features, namely mature hollow-bearing trees with >20cm diameter hollows in areas of eucalypt forest. DBH measurements were taken within suitable eucalypt forests to delineate potential foraging and denning habitat. Suitable denning and foraging habitat were located. Spotlighting surveys were undertaken on foot and in slow moving vehicles within suitable habitats and vegetation communities, totalling 26 hours across 8 nights of survey effort. This species was observed on 14 occasions during June 2023 surveys, and on 10 occasions during the September 2024 surveys.

5.3.1.4 HABITAT ASSESSMENT AND MAPPING

Greater glider habitat within the Study Area can be considered to include large contiguous areas of eucalypt forest containing mature hollow-bearing trees and a diverse range of preferred food species, as well as smaller or fragmented habitat patches connected to larger patches of habitat. Suitable greater glider foraging and denning habitat has been identified within the Study Area based on ground-truthing of habitat attributes and confirmed records of the species during survey effort.

BHT mapping has been used to identify habitat suitable for denning and foraging for greater glider within the Study Area, as well as generally unsuitable habitat for the species.

In accordance with habitat guidance provided by Eyre, et al. (2022)), and the Theodore Wind Farm (EPBC 2024/09842) PER guidelines provided by DCCEEW, mapping was refined to areas with eucalypt forest or woodland containing the following parameters:

Likely/Current Denning Habitat

- Habitat contains a suitable density of appropriate mature, hollow-bearing canopy trees greater than the relevant RE threshold for large trees stated in the *Guide to greater glider habitat in Queensland* (Eyre, et al., 2022);
- Habitat contains a diverse range of the species' preferred food trees;
- Likely/Current Denning Habitat predominantly includes remnant vegetation.

Potential Denning Habitat

- Habitat contains some appropriate hollow-bearing canopy trees, less than a suitable density of relevant RE large trees though typically trees >30 cm DBH are present;
- Habitat contains a diverse range of the species' preferred food trees;
- Potential Denning Habitat predominantly includes remnant or advanced regrowth vegetation that has been subject to historical disturbance.

Foraging and Dispersal Habitat

- Any eucalypt forest or woodland containing appropriate tree species for greater glider;
- Habitat lacks appropriate hollow-bearing canopy trees;
- Trees and canopy dense enough to allow the species to glide from tree to tree, and to disperse between other patches of habitat;
- Foraging and Dispersal Habitat includes remnant and regrowth vegetation connected to denning habitat.

Ground-truthed surveys have identified 1,662.1 ha of greater glider Likely/Current Denning Habitat, 381.4 ha of Potential Denning Habitat, and 20,070.2 ha of Foraging and Dispersal Habitat within the Study Area, which meets the definition of habitat critical to the survival of the species. There is also 24,658.9 ha of generally unsuitable habitat within the Study Area. It should be noted that greater glider habitat has been identified based on the habitat requirements discussed within Section 5.3.1.2, and includes both remnant and non-remnant vegetation. In total, 233.8 ha of Likely/Current Denning Habitat and 147.2 ha of Potential Denning Habitat lies within non-remnant vegetation.

Greater glider habitat mapping is presented in Figure 5-4, with a summary of mapped habitat in the Study Area presented below in Table 5-10.

TABLE 5-10 GREATER GLIDER HABITAT SUMMARY IN THE STUDY AREA

	Likely/Current Denning Habitat	**Potential Denning Habitat**	**Foraging and Dispersal Habitat**	**Generally Unsuitable Habitat**
Description	Any eucalypt forest or woodland containing appropriate tree species and mature, hollow-bearing canopy trees greater than relevant RE large tree thresholds, plus a diverse range of the species' preferred food trees. This predominantly includes remnant vegetation.	Any eucalypt forest or woodland containing appropriate tree species and some mature, hollow-bearing canopy trees >30 cm DBH, plus a diverse range of the species' preferred food trees. This predominantly includes regrowth vegetation.	Any eucalypt forest or woodland containing a range of the species' preferred food trees and canopy dense enough to allow the species to glide from tree to tree. This includes remnant and regrowth vegetation.	Unsuitable habitat includes vegetation communities which do not provide sufficient foraging function (absence of eucalypt species) or which do not provide suitable denning function (absence of mature hollows).
Mapped habitat within the Study Area (by BHT)	Suitably large and connected communities of: • Riparian woodland and open forests dominated by *E. tereticornis* often associated with stream channels; • In areas with predominantly remnant vegetation; and • Contains a suitable density of appropriate mature, hollow-bearing canopy trees greater than the relevant RE threshold for large trees.	• Suitably large and connected communities of: • Riparian woodland and open forests dominated by *E. tereticornis* often associated with stream channels; • In areas with predominantly remnant or advanced regrowth vegetation that has been subject to historical disturbance; and • Contains some appropriate hollow-bearing canopy trees, less than a suitable density of relevant RE large trees though typically trees >30 cm DBH are present.	Suitably large and connected communities of: • Eucalypt woodland and open forest dominated by *E. crebra* with a grassy understorey.	• Vine forests/thickets and dry rainforest; • Waterbodies and drainage features (predominately farm dams); • Brigalow woodlands; and • Grasslands and cultivated agricultural land.

	Likely/Current Denning Habitat	Potential Denning Habitat	Foraging and Dispersal Habitat	Generally Unsuitable Habitat
Total in the Study Area (ha)	1,662.1	381.4	20,070.2	24,658.9
Total in the Project Area (ha)	94.8	7.7	2,889.9	3,672.6

Legend

- Study Area
- Disturbance Footprint
- Project Area
- Greater Glider – Field Observations
- Greater Glider Historical Record (Wildnet, 2002)

Greater Glider Habitat

- Foraging/dispersal habitat
- Likely/current denning habitat
- Potential/future denning habitat
- Road
- Track and Path

Coordinate System:
GDA2020 MGA Zone 56

Date: 27/05/2025
Created By: SP/HD
Drawing Size: A3

0 1 2 3km

1:125,000

F5-4 Greater Glider (Southern and Central) Habitat and Occurrence in the Study Area

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Theodore Energy Development Pty Ltd

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5.3.2 YELLOW-BELLIED GLIDER (SOUTH-EASTERN)

The yellow-bellied glider (south-eastern) (*Petaurus australis australis*) (yellow-bellied glider) is listed as Vulnerable under the EPBC Act, effective from 2 March 2022. It is noted in the Conservation Advice that two subspecies are recognised and accepted, which includes an isolated northern subspecies in the Wet Tropics, but have not yet been formally described (DAWE, 2022a). In this assessment, the listed entity referred to is *Petaurus australis australis*. This species is considered to have the potential to occur within the Study Area as per the likelihood of occurrence assessment (Appendix C).

5.3.2.1 SPECIES DISTRIBUTION AND HISTORICAL RECORDS

The yellow-bellied glider is found at altitudes ranging from sea level to 1400 m above sea level and has a widespread but patchy distribution from south-eastern QLD to far south-eastern SA, near the SA-VIC border. Most of the QLD distribution is coastal, extending southward from north of Mackay to the NSW-QLD border (DAWE, 2022a). The Study Area is within the 'species or species habitat may occur' modelled distribution of the species (DCCEEW, 2024a) (Figure 5-5). There are three historical records of yellow-bellied glider listed in the Wildnet search results and several in the Locality from 1998 (ALA, 2024), though these do not meet recency criteria (within 20 years) for the likelihood of occurrence assessment (outdated historical records). The majority of these records are from within the Camboon State Forest, which is located directly south-east of the Study Area and is connected through remnant vegetation.

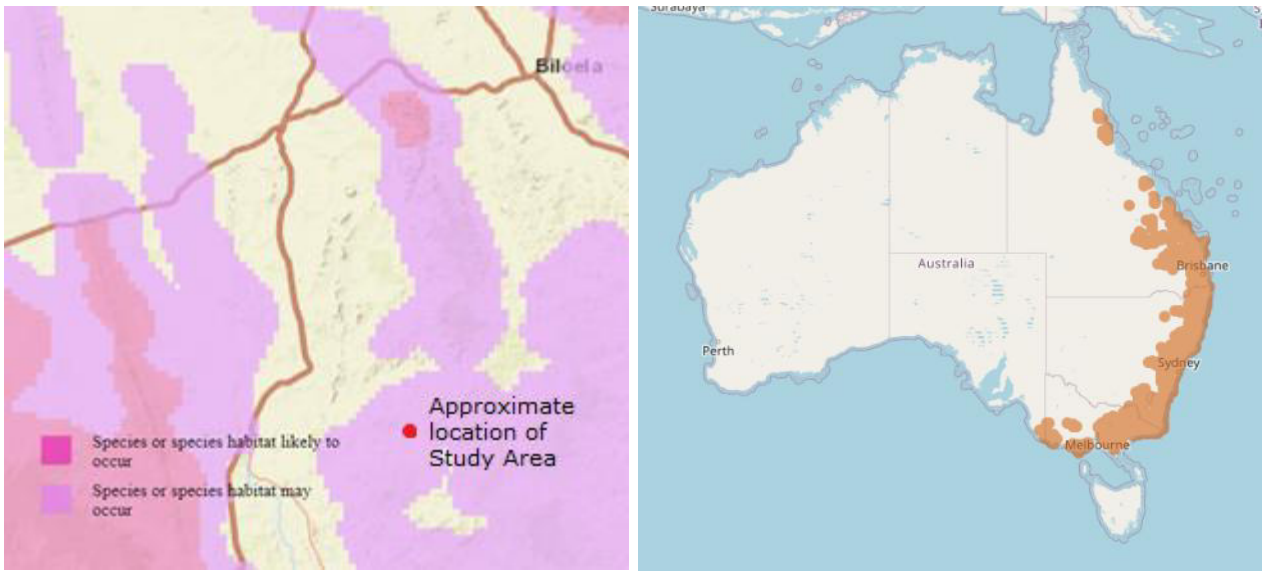


FIGURE 5-5 YELLOW-BELLIED GLIDER MODELLED DISTRIBUTION (DCCEEW, 2024A) AND RECORDS (ALA, 2024)

5.3.2.2 HABITAT REQUIREMENTS

Habitat for yellow-bellied glider broadly includes wet and dry eucalypt-dominated sclerophyll woodlands and forests. Forest age is a reliable determinant of abundance of the south-eastern sub-species, as they require mature old growth for foraging and shelter. Additionally, they show a preference for woodlands and forests that have a high proportion and diversity of winter-flowering and smooth-barked eucalypts, which help provide a variety of food sources year-round. The south-eastern sub-species also typically have a large home-range (50-65 ha) to further provide this food resource diversity. The diet of the yellow-bellied glider includes

insects sheltering in shed bark, manna, eucalypt nectar and pollen. Various *Eucalyptus* species are used for sap-feeding, a process whereby sap is drawn from the tree via V-shaped incisions and vertical furrows created by the species' large, lower incisor teeth. Sap feed trees are considered a critical habitat feature for the species (DAWE, 2022a).

Another critical microhabitat feature are hollows found in old, mature trees usually greater than one metre in diameter, which provide dens for shelter during the day. Hollow-bearing trees for this species are typically living, smooth-barked eucalypts (DAWE, 2022a).

Based on subject matter expert input, yellow-bellied gliders do not occur in poplar box (*Eucalyptus populnea*) habitat and due to their large home ranges and reliance on mature forest habitat, they are highly unlikely to inhabit non-remnant or fragmented habitats (Eyre, pers comm 2025).

Habitat Critical to the Survival of the Species

Under the *Conservation Advice for Petaurus australis australis (yellow-bellied glider (south-eastern))* (DAWE, 2022), habitat critical to the survival of the species is habitat that contains any one of the following attributes:

- *Large contiguous areas of floristically diverse eucalypt forest, which are dominated by winter-flowering and smooth-barked eucalypts, including mature living hollow-bearing trees and sap trees;*
- *Areas identified as refuges under future climate change scenarios;*
- *Short or long-term post-fire refuges that allow the species to persist, recover and recolonise burnt areas;*
- *Habitat corridors required to facilitate dispersal of the subspecies between fragmented habitat patches and/or that enable recolonization or movement away from threats. Yellow-bellied gliders (south-eastern) have a glide ratio (horizontal distance/height dropped) of around 2.0, and corridors spanning gaps larger than the distance gliders are likely to be able to travel should be considered critical to the survival. There is not enough evidence to define the canopy and width characteristics of appropriate corridors. In the absence of such information, a precautionary approach should be taken to maximise dispersal by considering all habitat corridors in the species' range to be habitat critical to the survival; and*
- *Areas in which some trees have evidence of use for sap extraction by yellow-bellied glider.*

5.3.2.3 FIELD SURVEYS

Survey Methodology and Effort

In lieu of species-specific guidelines, a targeted survey approach was implemented to assess the presence of yellow-bellied glider, and potential habitat, in line with *Survey guidelines for Australia's threatened mammals* (DSEWPC, 2011a) and *Terrestrial Vertebrate Fauna Survey Guidelines for Queensland* (DES, 2022).

A total of 26 hours of two-person targeted spotlighting searches were conducted throughout the Study Area across three survey periods:

- October 2022 – six hours of spotlighting transects over two nights;
- June 2023 – 12 hours of spotlighting transects over four nights; and
- September 2024 – eight hours of spotlighting transects over two nights, which included eight call playback sessions for yellow-bellied glider.

As shown in Figure 4-2b (Survey Effort and Locations in the Study Area – Targeted Surveys for Listed Fauna Species) and Figure 5-6 below, spotlighting surveys have been conducted in both yellow-bellied glider Potential Denning Habitat and Potential Foraging Habitat that has been mapped within the south-east section of the Study Area. Camera trapping was also conducted within mapped Potential Foraging Habitat. Additionally, 245 vegetation and habitat assessments were completed across the Study Area during the 10 survey periods, which includes multiple assessments within both mapped habitat types for yellow-bellied glider.

Targeted surveys were also conducted from 19 and 20 February 2026 by two ecologists, to undertake detailed potential habitat mapping. The targeted surveys focused on determining the presence of key attributes that define yellow-bellied glider habitat, as provided by Dr Teresa Eyre (see Section 5.3.2.4).

For further detail on the ecological investigations completed within the Study Area, including desktop searches, survey timing and survey methodology, refer to Section 4.8.

Survey Results

No yellow-bellied gliders, or signs of the species, were observed during field surveys. However, potential suitable denning and foraging habitat has been identified.

Survey Adequacy

Considering relevant guidelines and recommendations, the field survey methodology and effort has been considered adequate for this species. Survey guideline advice for yellow-bellied glider and field survey effort and adequacy are outlined in Table 5-11.

TABLE 5-11 YELLOW-BELLIED GLIDER FIELD SURVEY EFFORT

Survey Guidelines and Recommendations	Survey Effort Utilised and Timing	Comment on Field Survey Adequacy
Arboreal mammal survey methods adopted from the *Survey Guidelines for Australia's Threatened Mammals* (DSEWPC, 2011): • Diurnal searches for the presence of potentially suitable habitat resources for nest or den sites as well as signs of the species' presence, such as scratches or feeding marks on tree trunks. • Stag watching. • Spotlight surveys in suitable vegetation types. • Call detection surveys or call playback surveys are also suitable for the yellow-bellied glider.	245 diurnal vegetation and habitat assessments determining the presence of suitable habitat features for the species, including any hollow-bearing trees within mature eucalypt forests. Assessments undertaken across surveys events in both the wet and dry seasons (October 2022, March, June and September/October 2023, June and September 2024, and February 2026).	Survey effort considered adequate, although spotlighting in potential habitat was limited. Diurnal searches were undertaken in areas of potential habitat for this species with the aim of identifying suitable microhabitat features, namely living, smooth-barked eucalypts with large hollows in areas of sclerophyll forest. DBH measurements were taken within suitable sclerophyll forest to delineate potential foraging and denning habitat.

Survey Guidelines and Recommendations	Survey Effort Utilised and Timing	Comment on Field Survey Adequacy
As per the Terrestrial Vertebrate Fauna Survey Guidelines for Queensland (Eyre et al. 2022). Feeding mark searches on trees are an effective way to identify this species. This is because these gliders use their teeth to incise tree bark for feeding. A list of tree species the yellow-bellied glider prefers is found in the guidelines. Call playback is another method that can detect this species. This method involves conducting playback on two occasions over different nights in a survey area. This is then followed by a 5-minute listening period for un-elicited calls. These surveys should be done on numerous occasions given the species large home range and mobility. Recommended four spotlight/call playback surveys to a site (two in each survey event).	6 hours of spotlighting over two nights in October 2022 (impacted by inclement weather). 12 hours of spotlighting over four nights in June 2023. 8 hours of spotlighting over two nights in September 2024, which included 8 call playback sessions for yellow-bellied glider. 4 x camera traps deployed for 4 trap nights in October 2022 within suitable habitat, totaling 16 trap nights.	Suitable denning and foraging habitat was located, therefore the species is considered as potentially occurring. Spotlighting surveys were undertaken on foot and in slow moving vehicles within suitable habitats and vegetation communities, totaling 26 hours across 8 nights of survey effort. Nine call playback surveys were conducted in September 2024. No yellow-bellied gliders were observed from diurnal surveys, spotlighting surveys, or the presence of feeding marks located within the Study Area.

5.3.2.4 HABITAT ASSESSMENT AND MAPPING

There is potential denning and foraging habitat for the yellow-bellied glider in the form of old growth eucalypt forests present within the Study Area, where a suitable tree canopy species composition contains known foraging resources. Smooth-barked eucalypts are important due to the range of foraging substrates (and therefore food resources) they provide, as loose bark hanging in strips from these trees provides shelter for insect prey (DAWE, 2022a). Yellow-bellied glider, or signs of the species, were not observed in the Study Area during any of the field surveys. Wildnet records of yellow-bellied glider in the Locality include several from 1998 within the Camboon State Forest, located directly south-east of the Study Area. Yellow-bellied glider abundance is highly dependent on habitat suitability, which is determined by species composition and maturity of trees. The south-eastern subspecies also has very poor dispersal capabilities over open spaces greater than its gliding distance. with a glide ratio of around 2.0 (DAWE, 2022a). Yellow-bellied glider habitat requirements are based on the description in Section 5.3.2.2. It is noted that additional advice from subject matter expert, T. Eyre, concludes yellow-bellied gliders do not occur in poplar box (*Eucalyptus populnea*) habitat and due to their large home ranges and reliance on mature forest habitat, they are highly unlikely to inhabit non-remnant or fragmented habitats (Eyre, pers comm 2025). This advice has informed a more granular, accurate and refined habitat map for this species within the Study Area.

On the boundary between the Camboon State Forest and the south-eastern portion of the Project Area, is RE 11.12.17. This RE is a heterogeneous polygon, that contains poplar box, and likely to form a barrier to movement of the species from the Camboon State Forest to the Project Area. Despite this, the mapping of potential habitat for the species has considered that connectivity may be maintained in a drainage feature that contains taller (approx. 25m) smooth bark trees such as *C. citriodora* that connects the Project Area and the Camboon State

Forest in the most south-eastern portion of the Project Area . Therefore, the potential habitat mapped is conservative and has considered the precautionary principle.

When analysing data collected from the targeted field surveys associated with this drainage feature, *E. crebra* dominated open woodlands to the east and west of the riparian vegetation, were not considered potential habitat for the species due to the presence of poplar box and/or were being sparsely vegetated due to previous disturbance as well as being disconnected from other vegetated parts of the Project Area.

Overall, the areas that have been mapped in this south-eastern part of the Project Area containing potential habitat for yellow-bellied glider, are as follows:

- Potential Denning Habitat: mapped as the vegetation associated with the riparian area at the centre of the patch, that is connected to the Camboon State Forest. Some suitable tree species were identified as present for the species along the riparian area, but overall were present at low densities with smooth-bark largely absent. A total of 16.0 ha of Potential Denning Habitat has been mapped within the Study Area.
- Potential Foraging Habitat: mapped as vegetation adjacent to this Potential Denning Habitat that did not contain poplar box, and did not show evidence of recent disturbance or was sparsely distributed. A total of 110.2 ha of Potential Foraging Habitat has been mapped within the Study Area.

Yellow-bellied glider habitat mapping is presented in Figure 5-6, with a summary of mapped habitat in the Study Area presented below in Table 5-12.

It is noted that there is also a single (1997) record of a yellow-bellied glider within remnant vegetation to the west of the Study Area (approximately 2 km from the boundary), though this patch is limited in size and appears to be isolated from potential habitat within the Study Area by similarly unsuitable vegetation and fragmented landscapes. Vegetation and habitat assessments conducted in this south-western section determined this area unsuitable for yellow-bellied glider due to the sparse, open nature of the ironbark communities present, presence of poplar box communities creating barriers to movement due to their lack of suitability and the minimal occurrence of smooth-barked species. Riparian corridors closer to the historical record also lack suitably large denning eucalypts and are in a generally fragmented state.

TABLE 5-12 YELLOW-BELLIED GLIDER HABITAT SUMMARY IN THE STUDY AREA

	Potential Denning Habitat	**Potential Foraging Habitat**	**Generally Unsuitable Habitat**
Description	Sufficiently large and connected patches of sclerophyll forest in the south-eastern section of the Study Area containing mature, hollow-bearing canopy trees and supporting a diversity of smooth or half-bark eucalypts. This includes only remnant vegetation.	Sufficiently large and connected patches of sclerophyll forest in the south-eastern section of the Study Area, located on a range of soils where species diversity and presence of smooth or half-bark eucalypts is limited. This includes only remnant vegetation that has not been disturbed and/or is not sparsely distributed.	Unsuitable habitat includes vegetation communities which: • Do not provide sufficient foraging function (absence of suitable eucalypt species); • Which do not provide suitable denning function (absence of mature hollows); or

	Potential Denning Habitat	Potential Foraging Habitat	Generally Unsuitable Habitat
			• Contain poplar box and do not form large, connected patches.
Mapped habitat within the Study Area (by BHT)	Suitably large and connected communities of the following BHT (excluding areas co-dominated by *E. populnea)*: • Riparian woodland and open forests dominated by *E. tereticornis* often associated with stream channels.	Suitably large and connected communities of the following BHT with high floristic diversity of winter-flowering and smooth-barked eucalypts (excluding areas co-dominated by *E. populnea*): • Eucalypt woodland and open forest dominated by *E. crebra* with a grassy understorey adjacent to riparian vegetation. Generally, this *E. crebra* woodland does not contain a diversity of trees, or smooth-barked species, and where field data confirms areas undisturbed or sparsely distributed, has been conservatively mapped as potential foraging habitat for the species.	• Vine forests/thickets and dry rainforest; • Waterbodies and drainage features (predominately farm dams); • Brigalow woodlands; • Grasslands and cultivated agricultural land; and • All remaining areas of suitable BHTs which do not have suitable foraging function, suitable denning function, or suitable extent or connectivity.
Total in the Study Area (ha)	16.0	110.2	46,703.7
Total in the Project Area (ha)	1.3	28.5	6,645.2

Legend

- Study Area
- Disturbance Footprint
- Project Area
- Yellow-bellied Glider Historical Record (Wildnet, 1997)
- Road
- Track and Path

Yellow-bellied Glider Habitat

- Potential Denning Habitat
- Potential Foraging Habitat

Coordinate System:
GDA2020 MGA Zone 56

Date: 27/02/2026
Created By: SP/HD
Drawing Size: A3

0 1 2 3km

1:125,000

F5-6 Potential Yellow-bellied Glider (South-eastern) Habitat in the Study Area

Theodore Wind Farm PER

Theodore Energy Development Pty Ltd

ERM

0661076_PER_R3\0661076_PER_5-6_R1

5.3.3 KOALA

The koala (*Phascolarctos cinereus*) is listed as Endangered under the EPBC Act (as of the 12th of February 2022) and is considered known to occur within the Study Area.

5.3.3.1 SPECIES DISTRIBUTION AND HISTORICAL RECORDS

The koala typically occurs in eastern Australian forests and woodlands of predominantly *Eucalyptus* species. The koala's distribution is not continuous across this range, occurring in several subpopulations that are separated by cleared land or unsuitable habitat. Within Queensland, koalas occur as far north as the Einasleigh Uplands and Wet Tropics bioregions with records to the south and west in the Desert Uplands, Central Mackay Coast, Mitchell Grass Downs, Mulga Lands, Brigalow Belt North, Brigalow Belt South, and South Eastern Queensland (DAWE, 2022b). The Study Area is within the 'species or species habitat likely to occur' modelled distribution of the species (DCCEEW, 2024a) (Figure 5-7). No historical records occur within the Study Area however there is one undated ALA record (ALA, 2024) and Wildnet record within the Locality.

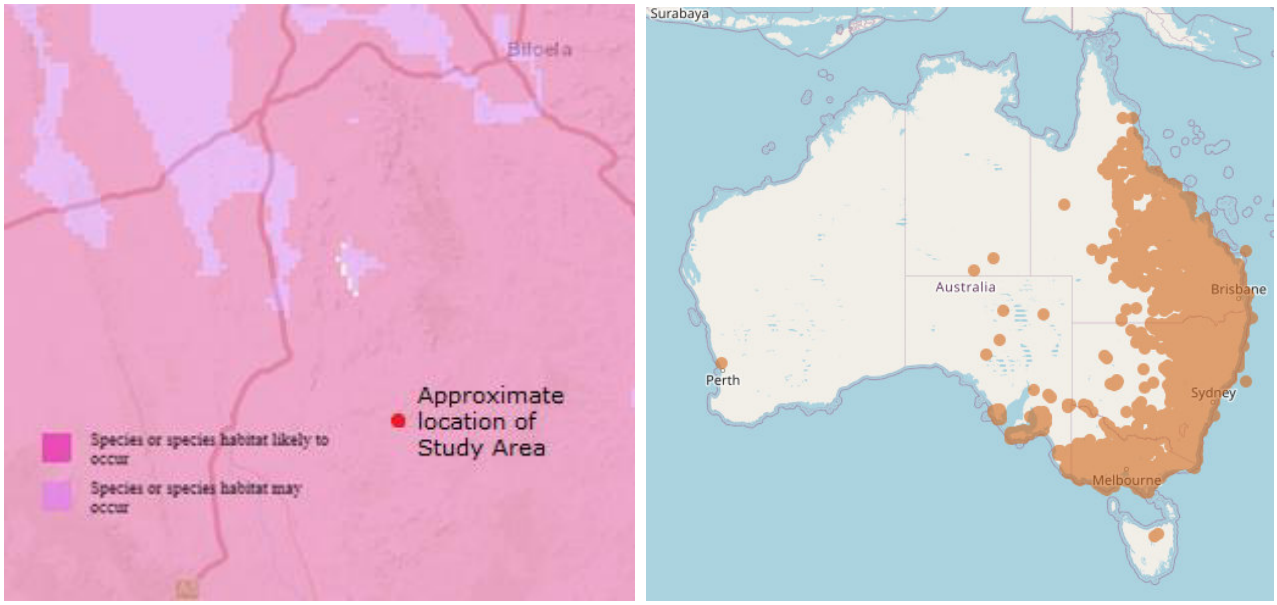


FIGURE 5-7 KOALA MODELLED DISTRIBUTION (DCCEEW, 2024A) AND RECORDS (ALA, 2024)

5.3.3.2 HABITAT REQUIREMENTS

Under the revised Conservation Advice for *Phascolarctos cinereus* (Koala) combined populations of Queensland, New South Wales and the Australian Capital Territory (DAWE, 2022b), released on 12 February 2022, habitat for the koala is described as follows:

> *Koala habitat includes both coastal and inland areas that are typically characterised by Eucalyptus forests and woodlands. Biophysical habitat attributes for the Koala include places that contain the resources necessary for individual foraging, survival (including predator avoidance), growth, reproduction and movement.*

In Central Queensland, koala habitat is described as preferred habitat and general habitat, with preferred habitat including:

- Contiguous remnant *Eucalyptus* open forest and woodlands on alluvial soils or with connection to seasonal aquifers where palatable food tree species occur frequently and are typically dominant. Preferred koala habitat is typically centralised around riparian forests and woodlands where forest red gum (*E. tereticornis*) and river red gum (*E. camaldulensis*) are the dominant or sub-dominant species; and
- Habitat trees greater than 10 cm in DBH (Youngentob, Marsh, & Skewes, 2021).

Preferred foraging and breeding trees within Central Queensland include: Brown's box (*Eucalyptus brownii*), river red gum (*E. camaldulensis*), coolibah (*Eucalyptus coolabah*), narrow-leaved ironbark (*E. crebra*), Queensland grey ironbark (*E. drepanophylla*), Queensland peppermint (*E. exserta*), broad-leaved ironbark (*E. fibrosa*), silver-top stringybark (*E. laevopinea*), black box (*E. largiflorens*), silver-leaved ironbark (*E. melanophloia*), coastal grey box (*E. moluccana*), mountain coolibah (*E. orgadophila*), poplar box (*E. populnea*), and forest red gum (*E. tereticornis*) (Youngentob, Marsh, & Skewes, 2021).

General habitat for the koala in Central Queensland includes all other remnant and regrowth *Eucalyptus* open forest and woodland on alluvial areas or with connection to seasonal aquifers and all other fragmented and sparsely distributed woodlands (including open woodlands), shrublands and forests where some food tree species occur, which are connected to areas of preferred habitat.

Koala ancillary habitat trees that are classified as species general habitat in Central Queensland include: brigalow (*Acacia harpophylla*), cooba (*A. salicina*), boree (*A. tephrina*), lemon-scented spotted gum (*Corymbia citriodora*), Dallachy's ghost gum (*C. dallachiana*), red bloodwood (*C. erythrophloia*), pink bloodwood (*C. intermedia*), Moreton Bay ash (*C. tessellaris*), white mahogany (*E. acmenoides*), Dawson River blackbutt (*E. cambageana*), white gum (*E. platyphylla*), Thozet's box (*E. thozetiana*) and black tea-tree (*Melaleuca bracteata*) (Youngentob, Marsh, & Skewes, 2021).

Habitat Critical to the Survival of the Species

Habitat critical to the survival of the species is defined as those that the species relies on to avoid or halt decline and promote the recovery of the species. Under the EPBC Act, the following factors are considered when identifying habitat that is critical to the survival of the species:

> *(a) Whether the habitat is used during periods of stress (examples: flood, drought or fire);*
>
> *(b) Whether the habitat is used to meet essential life cycle requirements (examples: foraging, breeding, nesting, roosting, social behaviour patterns or seed dispersal processes);*
>
> *(c) The extent to which the habitat is used by important populations;*
>
> *(d) Whether the habitat is necessary to maintain genetic diversity and long-term evolutionary development;*

(e) Whether the habitat is necessary for use as corridors to allow the species to move freely between sites used to meet essential life cycle requirements;

(f) Whether the habitat is necessary to ensure the long-term future of the species or ecological community through reintroduction or re-colonisation; and

(g) Any other way in which habitat may be critical to the survival of a listed threatened species or a listed threatened ecological community.

5.3.3.3 FIELD SURVEYS

Survey Methodology and Effort

No specific methodology or effort standards are prescribed for koala surveys. However, where there is a need to critically evaluate the potential impacts of major projects, multiple techniques should be used. A targeted survey approach was implemented to assess the presence of koala, and potential habitat, in line with *Survey guidelines for Australia's threatened mammals* (DSEWPC, 2011a), *Terrestrial Vertebrate Fauna Survey Guidelines for Queensland* (DES, 2022), and the *EPBC Act referral guidelines for the vulnerable koala* (DoE, 2014).

A total of 12 koala Spot Assessment Technique surveys (SATs) were conducted in suitable habitat within the Study Area to detect the species (diurnal searches). A total of 26 hours of two-person targeted spotlighting searches were conducted throughout the Study Area across three survey periods (nocturnal searches):

- October 2022 – six hours of spotlighting transects over two nights;
- June 2023 – 12 hours of spotlighting transects over four nights; and
- September 2024 – eight hours of spotlighting transects over two nights, which included eight call playback sessions for koala.

Additionally, 245 vegetation and habitat assessments were completed across the Study Area during the 10 survey periods and scat searches occurred at each site.

For further detail on the ecological investigations completed within the Study Area, including desktop searches, survey timing and survey methodology, refer to Section 4.8.

Survey Results

The presence of koala has been assessed as known due to positive identifications of faecal pellets (scats) for the species, recorded in the south-east corner and adjacent the western boundary of the Study Area during the September 2023, June and September 2024 field surveys. A koala was also heard bellowing within the Study Area at dusk during the September 2024 survey period prior to any call playback. Field survey observations and historical records are included in Figure 5-8. Given the number of field surveys undertaken across multiple years and seasons and the general paucity of evidence of the species, it is considered that the species occurs in a patchy distribution and at very low densities across the Study Area.

Survey Adequacy

Considering relevant guidelines and recommendations, the field survey methodology and effort has been considered adequate for this species. Survey guideline advice for the koala and field survey effort and adequacy are outlined in Table 5-13.

TABLE 5-13 KOALA FIELD SURVEY EFFORT

Survey Guidelines and Recommendations	Survey Effort Utilised and Timing	Comment on Field Survey Adequacy
Arboreal mammal survey methods adopted from the *Survey Guidelines for Australia's Threatened Mammals* (DSEWPC, 2011): • Diurnal searches for the presence of potentially suitable habitat resources for nest or den sites as well as signs of the species' presence, such as scratches on tree trunks and scats beneath trees. • Spotlight surveys in suitable vegetation types. As per the Terrestrial Vertebrate Fauna Survey Guidelines for Queensland (DES, 2018) Spotlighting requires two-person 30-minute searches of 100 x 100 m survey site across multiple nights. This can include spotlighting up one side of the 100 x 100 m area and then spotlighting back the other side of the 100 x 100 m area. Scat and sign search can coincide with the systematic diurnal active searches, within 50 x 50 m quadrates of the survey site. EPBC Act referral guidelines for the vulnerable koala (DoE, 2014) Strip transects which involve diurnal distance sampling and density searches. Nocturnal spotlighting for smaller sites to determine presence and density. Spot Assessment Technique (SAT) which involves looking at food trees for presence of koala scats.	245 diurnal vegetation and habitat assessments determining the presence of any suitable habitat features for the species, including any eucalypt forest and riparian vegetation. Assessments undertaken across six surveys events in both the wet and dry seasons (October 2022, March, June and September/October 2023, June and September 2024). 6 hours of spotlighting over two nights in October 2022 (impacted by inclement weather). 12 hours of spotlighting over four nights in June 2023. 8 hours of spotlighting over two nights in September 2024, which included 8 call playback sessions for koala. 4 x camera traps deployed for 4 trap nights in October 2022 within 12 koala SATs conducted in suitable habitat to detect the species (diurnal searches).	Survey effort considered adequate. Diurnal searches during habitat assessments were conducted to indicate presence. Spotlighting surveys were undertaken by foot and slow vehicle within suitable habitats and vegetation communities, totalling 18 hours and 6 nights of survey effort. This species was not directly observed, a single faecal pellet was recorded during field surveys. One koala was also heard bellowing within the Survey Area at dusk during the September 2024 survey period prior to any call playback.

5.3.3.4 HABITAT ASSESSMENT AND MAPPING

The majority of the Study Area contains general foraging and breeding habitat and dispersal habitat for koala associated with eucalypt dominated communities. It should be noted that in the centre and north of the Study Area, dieback of eucalypt species was widely observed, to the extent it was determined most vegetation patches in that region of the Study Area do not constitute koala habitat.

Survey results indicate that the species occurs in a patchy distribution and at very low densities across the Study Area (see Section 5.3.3.3). As outlined in Section 5.3.3.2, preferred koala habitat in Central Queensland includes contiguous remnant *Eucalyptus* open forest and woodlands in riparian areas where favoured food tree species occur in abundance (Youngentob, Marsh, & Skewes, 2021). General habitat includes all other remnant and regrowth *Eucalyptus*

open forest which is connected to preferred habitat, occurring within alluvial areas or with seasonal access to water, fragmented and more open woodlands, and shrublands and forests where some food tree species are available (Youngentob, Marsh, & Skewes, 2021).

Preferred Foraging and Breeding Habitat has therefore been mapped within riparian zones and adjoining alluvial areas where preferred foraging trees occur, and higher moisture content of leaves provides increased nutritional value. General Foraging and Breeding Habitat has been mapped within forest and woodland (including remnant and regrowth vegetation) connected to Preferred Foraging and Breeding Habitat, containing species that are known koala food trees, or shrubland with emergent food trees.

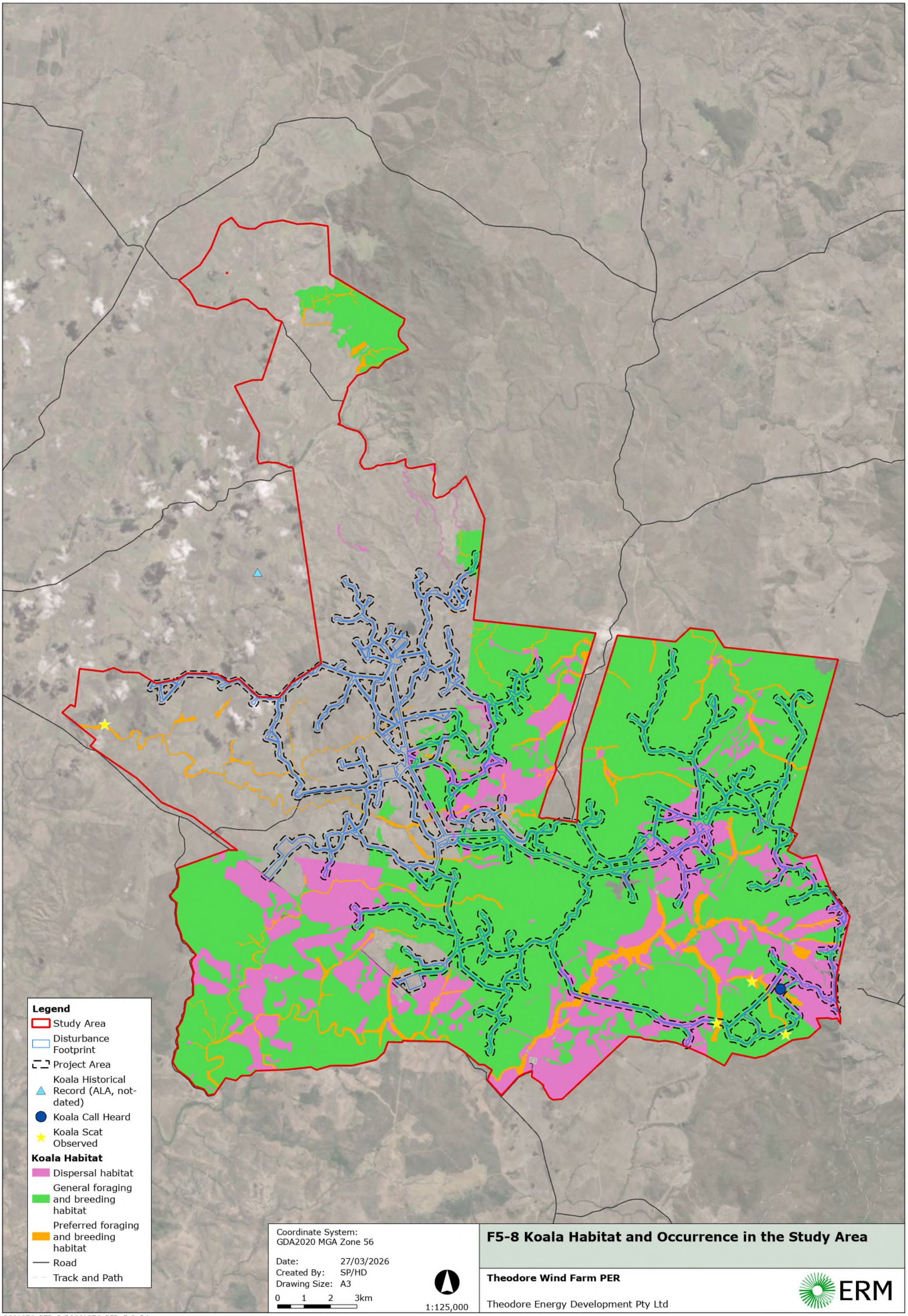
Open grassy areas and cleared agricultural land with occasional standalone koala food trees are also present within the Study Area, mostly in the centre and north. Due to the lack of connectivity and observed effects of dieback and drought within these areas, this habitat type in those areas is also deemed generally unsuitable for koala. Koala dispersal habitat has been identified where cleared areas contain occasional eucalypt paddock trees that are directly adjacent to eucalypt woodlands.

The BHTs that comprise each koala habitat are presented in Table 5-14. Ground-truthed surveys have identified 1,613.4 ha of Preferred Foraging and Breeding Habitat, 21,216.6 ha of General Foraging and Breeding Habitat and 6,950.5 ha of Dispersal Habitat within the Study Area, which meets the definition of habitat critical to the survival of the species. There is also 16,992.9 ha of generally unsuitable habitat for koala. These habitats are presented in Figure 5-8.

TABLE 5-14 KOALA HABITAT SUMMARY IN THE STUDY AREA

	Preferred Foraging and Breeding Habitat	**General Foraging and Breeding Habitat**	**Dispersal Habitat**	**Generally Unsuitable Habitat**
Description	Contiguous remnant Eucalyptus open forest and woodlands on alluvial soils or with connection to seasonal aquifers where palatable food tree species occur frequently and are typically dominant.	Any forest or woodland containing species that are known koala food trees, or shrubland with emergent food trees. This includes remnant and regrowth vegetation.	Part of the broader landscape that includes cleared areas. Contains isolated or scattered foraging or shelter trees. Contains vegetation generally not used frequently for foraging and breeding purposes by the species.	Not suitable habitat includes barriers (natural or artificial) that prevent the movement of koalas, such as mountain ranges, water bodies or treeless areas that are greater than 500 m wide.
Mapped habitat within the Study Area (by BHT)	• Riparian woodland and open forests dominated by *E. tereticornis* often associated with stream channels.	• Eucalypt woodland and open forest dominated by *E. crebra* with a grassy understorey.	• Brigalow woodlands; and • Cleared grasslands that contain occasional paddock trees.	• Vine forests/thickets and dry rainforest; • Grasslands and cultivated agricultural land; and • Waterbodies and drainage features (predominately farm dams).

	Preferred Foraging and Breeding Habitat	General Foraging and Breeding Habitat	Dispersal Habitat	Generally Unsuitable Habitat
Total in the Study Area (ha)	1,613.4	21,216.6	6,950.5	16,992.9
Total in the Project Area (ha)	45.4	3,035.4	942	2,652.2



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5.3.4 LARGE-EARED PIED BAT

The large-eared pied bat (*Chalinolobus dwyeri*) is listed as Endangered under the EPBC Act, as of 15th November 2023, and has been concluded as likely to occur within the Study Area.

5.3.4.1 SPECIES DISTRIBUTION AND HISTORICAL RECORDS

The large-eared pied bat is a medium-sized bat that is found mainly in areas with extensive cliffs and caves, from Rockhampton in Queensland down to Bungonia in the NSW Southern Highlands (DERM, 2011)). The Study Area sits outside the species modelled distribution, however Camboon State Forest (that borders the Study Area in the south) sits within the 'species or species habitat may occur' distribution of the species (DCCEEW, 2024a) (Figure 5-9). No historical records of the species occur within the Study Area or the Locality, with the closest record occurring within Presho State Forest, over 100 km to the west of the Study Area (ALA, 2024).



FIGURE 5-9 LARGE-EARED PIED BAT MODELLED DISTRIBUTION (DCCEEW, 2024A) AND RECORDS (ALA, 2024)

5.3.4.2 HABITAT REQUIREMENTS

Large-eared pied bat prefers a specific intersection of habitat traits which makes habitat for the species both uncommon and susceptible to clearing-related impacts. Per the Conservation Advice for the species (DCCEEW, 2023a)):

> *Large-eared pied-bat has close association with the presence of sandstone escarpment (for roosts) and fertile valleys (for foraging), particularly where the valleys support box gum woodland. This is a relatively restricted combination of habitat factors, and the extent of woodlands on fertile soils within its range has been greatly diminished by clearing (Pennay, 2008*).

The large-eared pied bat is dependent on the presence of diurnal roosts for shelter (DERM, 2011)). Escarpments provide roosting habitat for this species, with the availability of diurnal roost options an important indicator of habitat suitability. Large-eared pied bat prefers rhyolite cliffs and caves for roosting purposes, although geology is secondary to presence of suitably deep and high caves and overhangs which provide shelter from natural disturbances (DCCEEW, 2023a)).

Fertile valleys and vegetated areas provide foraging habitat for large-eared pied-bat, with riverine and riparian corridors being identified as favourable for the insectivorous species. The species has been recorded foraging in canopied vegetation communities of various descriptions including dry and wet sclerophyll forest, grassy woodland, *Callitris* dominated forest, tall open eucalypt forest with a rainforest sub-canopy, subtropical rainforest and small clearings adjacent to rainforest (DCCEEW, 2023a)). Wing morphology suggests that it is a relatively slow-flying manoeuvrable species. Studies on flight behaviour suggest the species may prefer open habitats in the mid to upper canopy and is less inclined to enter dense vegetation (Williams & Thomson, 2018). Almost all records are within several kilometres of cliff lines or rocky terrain. It is likely that critical foraging resources are also located in these areas (DERM, 2011)).

Habitat Critical to the Survival of the Species

Under the species approved Conservation Advice, any known roost site, or caves that could be roost sites, are considered habitat critical to the survival of the species. Further, the presence of foraging habitat within close proximity to roosting sites should be considered habitat critical to the survival of the large-eared pied bat (DCCEEW, 2023a).

Additionally, all populations are considered important due to their likely role in maintaining genetic diversity necessary for the ecological survival of the species (DCCEEW, 2023a). As the species is considered likely to occur within the Study Area, it is considered likely that the identified habitat within the Study Area constitutes habitat critical to the survival of the species.

5.3.4.3 FIELD SURVEYS

Survey Methodology and Effort

A targeted survey approach was implemented to assess the presence of large-eared pied bat, and potential habitat, in line with *Survey guidelines for Australia's threatened bats* (DEWHA, Survey guidelines for Australia's threatened bats, 2010a).

Acoustic bat detectors (Anabats) were deployed over three of the 10 surveys for a total of 40 trapping nights. This includes:

- Four devices deployed for four nights in October 2022 (16 trapping nights);
- Two devices deployed for four nights in February 2023 (8 trapping nights); and
- Four devices deployed for four nights in March 2023 (16 trapping nights).

Calls recorded on the Anabats were analysed by specialist analysts Green Tape Solutions.

Additionally, 245 vegetation and habitat assessments were completed across the Study Area during the 10 survey periods.

For further detail on the ecological investigations completed within the Study Area, including desktop searches, survey timing and survey methodology, refer to Section 4.8.

Survey Results

Calls were recorded on five occasions that were determined to be 'probable' large-eared pied bat calls by specialist analysts Green Tape Solutions. The full echolocation analyses for the Anabats deployed during the October 2022, February and March 2023 field investigations are presented in Appendix E. Additionally, the Study Area sits just outside the species modelled distribution ('species or species habitat may occur') (DCCEEW, 2024a) and contains habitat suitable for large-eared pied bat survival (as evidenced by species presence). The location of

Anabat devices that yielded 'probable' large-eared pied bat records are included in Figure 5-10.

There were no deep caves or overhangs observed within the Study Area during field surveys. One location within the north of the Study Area has been identified to potentially contain suitable roosting habitat for the species. Other than a few small, isolated hills within the south of the Study Area, the larger area in the north that extends to the east of the Study Area is the area that shows the highest slope gradient and seems to be the most prominent steep slope, high elevation feature within the landscape (as presented in Figure 5-16).

Survey Adequacy

In May 2024, the *Draft Onshore Wind Farm Guidance - best practice approaches when seeking approval under Australia's national environment law* was published and opened for consultation (DCCEEW, 2024d), which considers best practice to undertake at least 24 months of site utilisation surveys (for birds and bats) before assessment of a proposed wind farm can be completed and an approval decision made. Consultation was completed in July 2024, and the department advises it is currently reviewing all feedback received.

Considering the guidelines and recommendations available at the commencement of the Proposed Action's survey program, the field survey methodology and effort in potential habitat for the species is considered adequate to detect the presence of this species, and subsequently map the species habitat and conduct an accurate impact assessment. Survey guideline advice for the large-eared pied bat and field survey effort and adequacy are outlined in Table 5-15.

TABLE 5-15 LARGE-EARED PIED BAT FIELD SURVEY EFFORT

Survey Guidelines and Recommendations	Survey Effort Utilised and Timing	Comment on Field Survey Adequacy
As per the *Survey guidelines for Australia's threatened bats* (DEWHA, 2010a): A combination of survey efforts is recommended for this species. This includes unattended bat detectors for 16 detector nights for a minimum of four nights and attended bat detectors for six detector hours for a minimum of three nights. It also includes harp traps and/or mist nets for 16 trap or net nights for a minimum of four nights. Surveys are best undertaken from October through to March.	Anabats have been deployed across 10 locations within the Study Area (for up to four nights per survey event), for a total of 40 Anabat trapping nights across the October 2022, February and March 2023 survey periods (across two seasons in wormer months). 245 vegetation and habitat assessments were completed determining the presence of any suitable habitat features for the species, including any camps or roosting sites. Assessment of potential roosting sites was extended to areas adjacent the Study Area. Assessments undertaken across surveys events in both the wet and dry seasons (October 2022, March, June and September/October 2023, June and September 2024).	Survey effort targeted in potential is considered adequate to detect large-eared pied bat. Diurnal habitat assessments were conducted, which identified potentially suitable large-eared pied bat foraging habitat within the Study Area. Anabats were deployed in suitable habitat of well-vegetated areas such as eucalypt forest and in the appropriate seasons from October to March across two years. This species' call was recorded as 'probable' on Anabat devices deployed in the October 2022, February and March 2023 surveys.

5.3.4.4 HABITAT ASSESSMENT AND MAPPING

Roosting and breeding habitat was not directly observed during field surveys and sandstone is generally absent from the Study Area. As a result, only foraging habitat has been mapped for the species.

The National Recovery plan for the large-eared pied bat states that:

> *Almost all records are within several kilometres of cliff lines or rocky terrain and it is likely that critical foraging resources are also located in these areas* (DERM, 2011).

As specific roosting habitat has not been directly observed within or surrounding the Study Area despite surveys, determining a specific distance from roosting habitat to define potential foraging habitat cannot be undertaken. To be conservative, the preferred riverine and riparian corridor habitat of the species has been mapped across the entire Study Area as potential foraging habitat.

Additionally, as stated above in Section 5.3.4.3, one location within the north of the Study Area has been identified to potentially contain suitable roosting habitat for the species due to the potential for cliff lines and rocky terrain (as shown in Figure 5-16). It should be noted that although no suitable roosting habitat features were observed within the Study Area during field surveys, this identified higher slope area extends to the east and north of the Study Area where surveys did not occur and therefore the utilisation of this area as potential roosting habitat cannot be discounted. As such, the open eucalypt forest habitat within this identified area in the north that may contain potential roosting habitat has also been included within the species habitat mapping.

BHT mapping has been used to identify suitable foraging habitat for large-eared pied bat within the Study Area, as well as generally unsuitable habitat for the species. There is a total 2,856.1 ha of Foraging Habitat which meets the definition of habitat critical to the survival of the species. No roosting habitat for this species was identified within the Study Area, however there is potential for such habitat to occur in the north of the Study Area and in the Locality. Mapped foraging habitat for the large-eared pied bat is shown on Figure 5-10, with habitat types summarised below in Table 5-16.

TABLE 5-16 LARGE-EARED PIED BAT HABITAT SUMMARY IN THE STUDY AREA

	Foraging Habitat	**Generally Unsuitable Habitat**
Description	Fertile valleys and vegetated areas, riverine and riparian corridors, dry and wet sclerophyll forest and grassy woodland. Open, less densely vegetated habitats better suited to foraging.	Cleared areas are likely to constitute unsuitable habitat, with *Acacia* woodland also not suitable within the Study Area. Though the species has been recorded foraging in subtropical and dry rainforest, vegetation communities within the Study Area are of generally low quality and do not form suitable habitat.

	Foraging Habitat	Generally Unsuitable Habitat
Mapped habitat within the Study Area (by BHT)	• Riparian woodland and open forest dominated by *E. tereticornis* often associated with stream channels; and • Eucalypt woodland and open forest dominated by *E. crebra* with a grassy understorey on steep slope gradients within the north of the Study Area.	• Vine forest/ thickets and dry rainforest; • Waterbodies and drainage features; • Grasslands and cultivated agricultural land; • Brigalow woodlands dominated by *Acacia harpophylla*; • All other areas of Eucalypt woodland and open forest dominated by *E. crebra* with a grassy understorey.
Total in the Study Area (ha)	2,856.1	43,917.3
Total in the Project Area (ha)	99.1	6,575.8

Legend

- Study Area
- Disturbance Footprint
- Project Area
- Probable Large-eared pied-bat call detected

Large-eared pied-bat habitat

- Foraging Habitat
- Road
- Track and Path

Coordinate System:
GDA2020 MGA Zone 56

Date: 19/03/2026
Created By: SP/HD
Drawing Size: A3

0 1 2 3km

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F5-10 Large-eared Pied Bat Habitat and Occurrence in the Study Area

Theodore Wind Farm PER

Theodore Energy Development Pty Ltd

ERM

0661076_PER_R4\0661076_PER_5-10_R4

5.3.5 ORNAMENTAL SNAKE

The ornamental snake (*Denisonia maculata*) is listed as Vulnerable under the EPBC Act and is considered unlikely to occur within the Study Area.

5.3.5.1 SPECIES DISTRIBUTION AND HISTORICAL RECORDS

The ornamental snake is known only from within the drainage system of the Fitzroy and Dawson Rivers in Queensland (DoE, 2014). The Study Area is located at the southern extent of the species known range, within the 'species or species habitat may occur' modelled distribution (DCCEEW, 2024a) (Figure 5-11). No historical records are present within the Study Area, however one ALA record of a "preserved specimen", with an unknown date and unknown spatial accuracy, exists within the Locality (ALA, 2024).

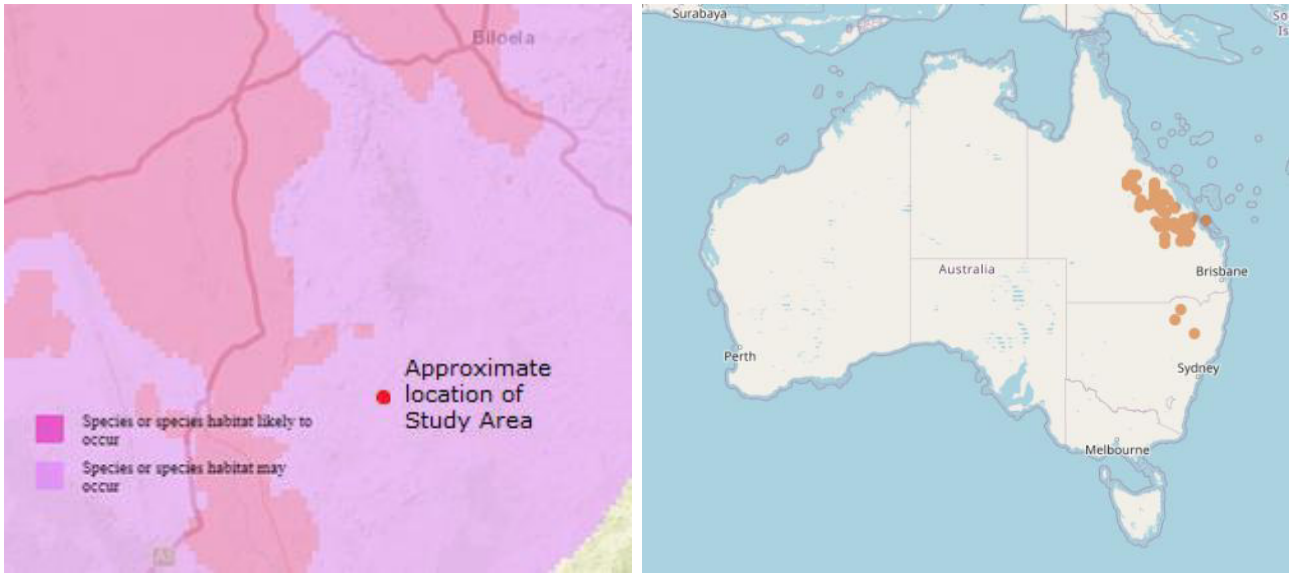


FIGURE 5-11 ORNAMENTAL SNAKE MODELLED DISTRIBUTION (DCCEEW, 2024A) AND RECORDS (ALA, 2024)

5.3.5.2 HABITAT REQUIREMENTS

Preferred ornamental snake habitat is within, or close to, habitat that is favoured by frogs, which make up most of the species' diet. Ornamental snake prefers woodlands and open forests in moist areas, particularly gilgai (melon-hole) mounds and undulations in Queensland RE Land Zone 4, but also around lakes and wetlands (DCCEEW, 2024c). Ornamental snake habitat is associated with brigalow (*Acacia harpophylla*), gidgee (*Acacia cambagei*), blackwood (*Acacia argyrodendron*) and coolibah (*Eucalyptus coolabah*)-dominated vegetation communities, or grasslands where gilgais are present (DCCEEW, 2024c). There is no delineation between breeding, dispersal and foraging habitat for this species.

According to the species' SPRAT profile (DCCEEW, 2024c), microhabitat features common within areas where ornamental snakes have been recorded in abundance include:

- Sites located within the lowest part of the catchment;
- A diversity of gilgai size and depth;
- Soils of high clay content and deep-cracking characteristics;
- Ground timber is usually relatively common (especially piles adjacent to or close by to gilgais);

- Where burrowing frogs (*Cyclorana species*) are abundant; and
- Habitat patches are typically greater than 10 ha in area and are within, or connected, to larger areas of remnant vegetation.

Ornamental snakes are vulnerable to lethal poisoning caused by predating upon cane toads (*Bufo marinus*), which are common within their range. The two species are often recorded at the same sites, however cane toads are never found where the ornamental snake is in high numbers. In contrast, a number of studies in seemingly optimal ornamental snake habitat have yielded no observations of the species where cane toads were in abundance (DCCEEW, 2024c).

Habitat Critical to the Survival of the Species

Habitat critical for survival has not been specifically described for the ornamental snake (DoE, 2014). Therefore, habitat critical to the survival of the species has been considered according to the following description (as provided in the *SIG 1.1* (DEWHA, 2013)).

> *Habitat critical to the survival of a species or ecological communities are areas that are necessary:*
>
> - *"For activities such as foraging, breeding, roosting, or dispersal;*
> - *For the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators);*
> - *To maintain genetic diversity and long-term evolutionary development; and/or*
> - *For the reintroduction of populations or recovery of the species or ecological community.*

5.3.5.3 FIELD SURVEYS

Survey Methodology and Effort

Targeted searches were undertaken for all for listed reptiles with potential habitat identified within the Study Area, though were primarily focused on identification of the ornamental snake. These searches were undertaken in accordance with the *Survey guidelines for Australia's threatened reptiles* (DSEWPC, 2011b) and the *EPBC Act - Draft Referral guidelines for the nationally listed Brigalow Belt reptiles* (DCCEEW, 2023b).

A total of 26 hours of two-person targeted spotlighting searches were conducted throughout the Study Area across three survey periods:

- October 2022 – six hours of spotlighting transects over two nights;
- June 2023 – 12 hours of spotlighting transects over four nights; and
- September 2024 – eight hours of spotlighting transects over two nights.

A total of 245 vegetation and habitat assessments were completed across the Study Area during the 10 survey periods. Searches for reptiles involved turning over potential sheltering sites such as rocks, logs and debris.

For further detail on the ecological investigations completed within the Study Area, including desktop searches, survey timing and survey methodology, refer to Section 4.8.

Survey Results

The species was not observed during any of the field surveys. The Study Area is located at the southern extent of the species known range, within the 'species or species habitat may occur' modelled distribution (DCCEEW, 2024a) and the closest confirmed record (from 2007) of a non-preserved specimen is located 50 km west of the Study (ALA, 2024). Brigalow vegetation communities (known to be associated with ornamental snake habitat) were identified within the Study Area, however lacked key microhabitat features (see Plate 5-1 below).

Brigalow communities within the Study Area distinctly lacked gilgais and the appropriate soil composition known to be associated with presence of ornamental snake. Most of the surveyed areas targeting ornamental snake also lacked coarse woody debris, leaf litter and other suitable sheltering resources. Soils encountered tended to be loamy, as opposed to the deep-cracking clay soils favoured by the species (DCCEEW, 2024c).

Additionally, Brigalow communities within the Study Area had suffered soil degradation resultant of historical land clearing and grazing pressure, reducing potential habitat quality for ornamental snake. Further, a notable abundance of cane toads was observed, particularly after rain during the September 2024 survey event, which is known to be associated with a lower likelihood of ornamental snake presence (DCCEEW, 2024c).

As a result, no suitable habitat for the ornamental snake was identified within the Study Area during field surveys. This species has been concluded as unlikely to occur within the Study Area as per the likelihood of occurrence (Appendix C).



PLATE 5-1: EXAMPLES OF BRIGALOW WOODLAND WITHIN THE STUDY AREA. NO CRACKING CLAYS PRESENT (LOAMY SOILS ONLY). SOME MINOR DEPRESSIONS PRESENT BUT DISTINCT ABSENCE OF GILGAIS. ONLY SPARSE LEAF-LITTER AND LARGER WOODY DEBRIS.

Survey Adequacy

Considering relevant guidelines and recommendations, the field survey methodology and effort has been considered adequate for this species. Survey guideline advice for the ornamental snake and field survey effort and adequacy are outlined in Table 5-17.

TABLE 5-17 ORNAMENTAL SNAKE FIELD SURVEY EFFORT

Survey Guidelines and Recommendations	Survey Effort Utilised and Timing	Comment on Field Survey Adequacy
As per the Survey guidelines for Australia's threatened reptiles (DSEWPC, 2011): • Searches of suitable gilgai habitat (small depressions and mounds in clay soils) while preferred prey species (frogs) are active. • Diurnal searches under sheltering sites such as rocks, logs or other large objects on the ground. As per the EPBC Act - Draft Referral guidelines for the nationally listed Brigalow Belt reptiles (DCCEEW, 2023): • Spotlighting transects targeting water-inundated gilgais, wetlands, riparian habitats and surrounding environments and large logs between dusk and early morning hours, ideally on warm and humid evenings. • Opportunistic road surveys while driving along roadways in the identified study area, especially following large rainfall events and on warm evenings. • Microhabitat searches during the coolest parts of the day, including carefully turning woody debris, rocks and artificial debris, raking the soil surface or leaf litter beneath trees.	245 diurnal vegetation and habitat assessments determining the presence of any suitable habitat features for the species, including any *Acacia*-dominated vegetation communities, areas with cracking clay soils or gilgais. Searches for reptiles involved turning over potential sheltering sites such as rocks, logs and debris. Assessments were undertaken across surveys events in both the wet and dry seasons (October 2022, March, June and September/October 2023, June and September 2024). 6 hours of spotlighting over two nights in October 2022 (impacted by inclement weather). 12 hours of spotlighting over four nights in June 2023. 8 hours of spotlighting over two nights in September 2024.	Survey effort considered adequate. No ornamental snakes were observed from diurnal searches. No suitable habitat was identified during field surveys due to the absence of microhabitat features and the abundance of cane toads observed.

5.3.5.4 HABITAT ASSESSMENT AND MAPPING

No suitable habitat for the ornamental snake was identified within the Study Area due to an absence of microhabitat features required for the species and the abundance of cane toads observed during field surveys. This species has therefore been concluded as unlikely to occur within the Study Area as per the likelihood of occurrence (Appendix C).

As a result, no habitat has been mapped within the Study Area and no significant impact assessment has been completed for the species.

5.3.6 SOUTH-EASTERN LONG-EARED BAT

The south-eastern long-eared bat (*Nyctophilus corbeni*) is listed as Vulnerable under the EPBC Act and is considered unlikely to occur within the Study Area.

5.3.6.1 SPECIES DISTRIBUTION AND HISTORICAL RECORDS

The south-eastern long-eared bat is found in southern central Queensland, central western New South Wales, north-western Victoria and eastern South Australia, with majority of its range within the Murray Darling Basin and most records recorded inland of the Great Dividing Range (TSSC, 2015b). The Study Area is within the 'species or species habitat may occur' modelled distribution of the species (DCCEEW, 2024a) (Figure 5-12). No historical records for the species exist within the Study Area or the Locality. The closest record is approx. 40 km south-west of the Study Area from 2000 (ALA, 2024) with the closest recent record 140 km from the Study Area.

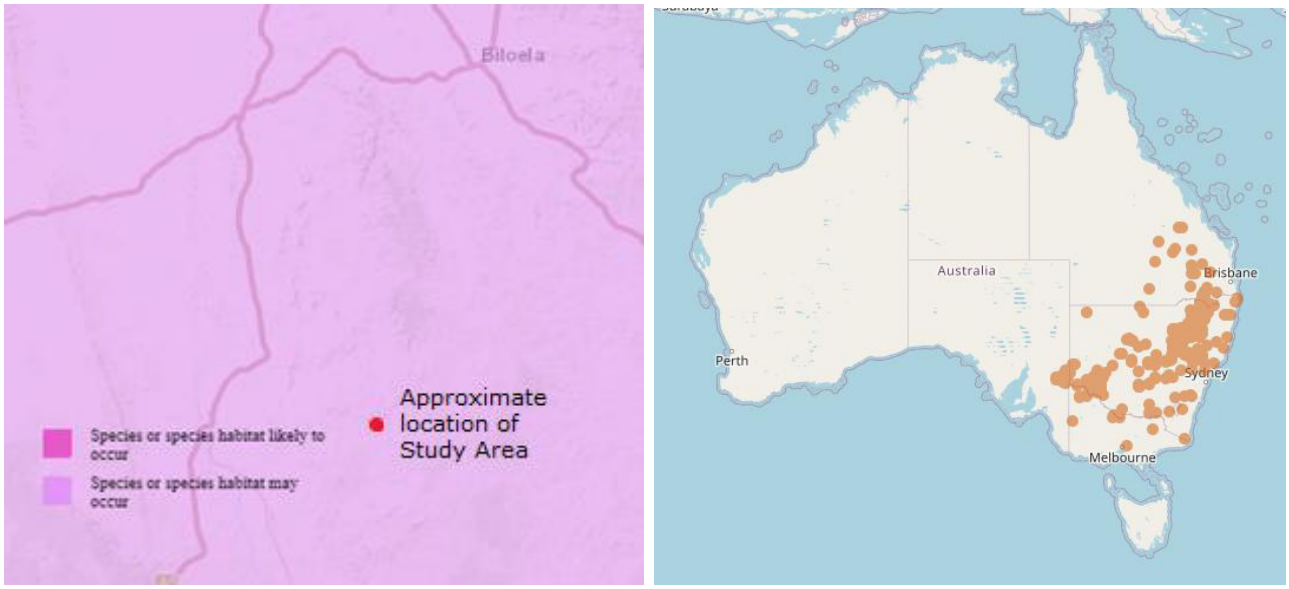


FIGURE 5-12 SOUTH-EASTERN LONG-EARED BAT MODELLED DISTRIBUTION (DCCEEW, 2024A) AND RECORDS (ALA, 2024)

5.3.6.2 HABITAT REQUIREMENTS

The south-eastern long-eared bat is found in a wide range of inland woodland vegetation types, including box / ironbark / cypress pine woodlands, Buloke woodlands, Brigalow woodland, Belah woodland, smooth-barked apple woodland, river red gum forest, black box woodland, and various types of tree mallee. In QLD, it is distinctly more common in box / ironbark / cypress-pine vegetation that occurs in a north-south belt along the western slopes and plains of southern QLD (TSSC, 2015b).

Studies have found that the south-eastern long-eared bat roosts solitarily, mainly in dead trees or dead spouts of live trees. A study in VIC found most bats roosting in mallee eucalypts, with some under bark or in fissures of dead Buloke (*Allocasuarina leuhmannii*) or Belah (*Casuarina cristata*) trees (Lumsden , Nelson, & Lindeman, 2008).

The species is more abundant in extensive stands of vegetation in comparison to smaller woodland patches, suggesting its home range is probably large, and has also been found to be

more abundant in habitats that have a distinct tree canopy and a dense, cluttered understorey layer (TSSC, 2015b).

Habitat Critical to the Survival of the Species

Habitat critical to the survival has not been specifically defined for this species (TSSC, 2015b). Therefore, habitat critical to the survival of the species has been considered according to the following description (as provided in the *SIG 1.1* (DEWHA, 2013)).

> *Habitat critical to the survival of a species or ecological communities are areas that are necessary:*
>
> - *"For activities such as foraging, breeding, roosting, or dispersal;*
> - *For the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators);*
> - *To maintain genetic diversity and long-term evolutionary development; and/or*
> - *For the reintroduction of populations or recovery of the species or ecological community.*

5.3.6.3 FIELD SURVEYS

Survey Methodology and Effort

A targeted survey approach was implemented to assess the presence of south-eastern long-eared bat and potential habitat for the species, in line with *Survey guidelines for Australia's threatened bats* (DEWHA, 2010a).

Acoustic bat detectors (Anabats) were deployed over three of the 10 surveys for a total of 40 trapping nights. This includes:

- Four devices deployed for four nights in October 2022 (16 trapping nights);
- Two devices deployed for four nights in February 2023 (8 trapping nights); and
- Four devices deployed for four nights in March 2023 (16 trapping nights).

Calls recorded on the Anabats were analysed by specialist analysts Green Tape Solutions.

Additionally, 245 vegetation and habitat assessments were completed across the Study Area during the 10 survey periods.

For further detail on the ecological investigations completed within the Study Area, including desktop searches, survey timing and survey methodology, refer to Section 4.8.

Survey Results

A 'Possible' *Nyctophilus* sp. call was recorded on seven Anabats devices deployed within the Study Area during field surveys, however this call was unable to be distinguished between the three *Nyctophilus* species that possibly occur within the Study Area. It has also been noted that the call is often confused with *Mytosis macropus*. The full echolocation analyses for the Anabats deployed during October 2022, February and March 2023 field investigations are presented in Appendix E.

Considering these results, a review of species distribution indicates that the Study Area location is more consistent with the distribution of two unlisted species of *Nyctophilus* (*N. geoffroyi* or *N. gouldii*), rather than the south-eastern long-eared bat. Although the Study Area overlaps with the 'may occur' modelled distribution of the species (Figure 5-12), the presence of recent records and the modelled 'likely to occur' distribution indicates that important habitat for the species begins just north of Roma (approximately 150 km south of the Study Area) and continues south throughout NSW and northern Victoria. The closest record of the species is located 40 km south-east of the Study Area (from 2000 and therefore out-dated), with the closest recent record of the species located approximately 140 km from the Study Area.

Additionally, the closest record of the species, occurring around Precipice National Park, is located in an area where Belah (*Cassuarina cristata*) open forest to woodland is mapped in relative abundance. This community type is recognised as providing habitat value for the south-eastern long-eared bat, particularly due to the roosting function that Belah provides. In contrast, although the Study Area contains ironbark and box woodlands, these communities lack the identified roosting tree species (as identified within Section 5.3.6.2), such as Belah and Buloke. As a result, it has been concluded that suitable habitat for the south-eastern long-eared bat is generally absent from the Study Area.

Considering the absence of suitable habitat and the conclusion that the 'Possible' call is most likely a different *Nyctophilus* sp., this species has been concluded as unlikely to occur within the Study Area.

Survey Adequacy

In May 2024, the Draft Onshore Wind Farm Guidance - best practice approaches when seeking approval under Australia's national environment law was published and opened for consultation (DCCEEW, 2024d), which considers best practice to undertake at least 24 months of site utilisation surveys (for birds and bats) before assessment of a proposed wind farm can be completed and an approval decision made. Consultation was completed in July 2024, and the department advises it is currently reviewing all feedback received.

Considering the guidelines and recommendations available at the commencement of the Proposed Action's survey program, the field survey methodology and effort has been considered adequate to assess the presence of this genus for this group of species, and is supported by data from the Anabat analysis. Harp trapping is typically required to positively identify south-eastern long-eared bat, however this was not performed as suitable habitat was generally absent as explained above, and that the species' northern distribution limit ('species or species habitat likely to occur') is approximately 150 km south of the Study Area, with the closest recent record is 140 km away. Survey guideline advice for the south-eastern long-eared bat and field survey effort and adequacy are outlined in Table 5-18.

TABLE 5-18 SOUTH-EASTERN LONG-EARED BAT FIELD SURVEY EFFORT

Survey Guidelines and Recommendations	Survey Effort Utilised and Timing	Comment on Field Survey Adequacy
As per the Survey guidelines for Australia's threatened bats (DEWHA, 2010): A combination of survey efforts is recommended for this species. This includes unattended bat detectors for 16 detector nights for a minimum of four nights and attended bat detectors for six detector hours for a minimum of three nights. It also includes harp traps and/or mist nets for 16 trap or net nights for a minimum of four nights. Surveys are best undertaken from October through to March.	Anabats have been deployed in 10 locations within the Study Area (all for 4 nights), for a total of 40 Anabat trapping nights across the October 2022, February and March 2023 survey periods. 245 vegetation and habitat assessments were completed determining the presence of any suitable habitat features for the species, including any camps or roosting sites. Assessment of potential roosting sites was extended to areas adjacent the Study Area. Assessments undertaken across surveys events in both the wet and dry seasons (October 2022, March, June and September/October 2023, June and September 2024).	Survey effort considered adequate to detect *Nyctophilus* sp. (that includes south-eastern long-eared bat). Diurnal habitat assessments were conducted, which identified the lack of suitable roosting habitat within the Study Area. Anabats were deployed in potential habitat of well-vegetated areas such as eucalypt forest and in the appropriate seasons of October to March. A *Nyctophilus* sp. call was recorded as 'possible' deployed across seven locations in the October 2022, February 2023 and March 2023 surveys, but likely to be the one or both of the unlisted species.

5.3.6.4 HABITAT ASSESSMENT AND MAPPING

Considering that suitable habitat for south-eastern long-eared bat is generally absent from the Study Area and the conclusion that the 'Possible' call is most likely a different *Nyctophilus* sp*.,* the species has been concluded as unlikely to occur within the Study Area.

As a result, no habitat has been mapped within the Study Area and no significant impact assessment has been completed for the species.

5.3.7 SQUATTER PIGEON (SOUTHERN)

The squatter pigeon (southern) (*Geophaps scripta scripta*) (squatter pigeon) is listed as Vulnerable, under the EPBC Act, as of 16th July 2000. This species is considered known to occur within the Study Area.

Squatter pigeon (southern) is a ground-dwelling pigeon and can be differentiated from the northern subspecies by its larger body, and the skin around the eyes being predominantly blue-grey compared with yellowy-orange to orange-red in the northern subspecies (DCCEEW, 2024b).

5.3.7.1 SPECIES DISTRIBUTION AND HISTORICAL RECORDS

The squatter pigeon occurs on the inland slopes of the Great Dividing Range. Its current distribution extends from the Burdekin-Lynd Divide in central Queensland, west to Longreach and Charleville, east to the coast between Port Curtis and Proserpine, and south to New South Wales (DCCEEW, 2024b). The Study Area occurs within the 'species or species habitat may occur' modelled distribution of the species (DCCEEW, 2024a) (Figure 5-13). No historical records occur within the Study Area or the Locality, with the closest recent historical record located 70 km to the south-east of the Study Area at Eidsvoid (ALA, 2024).

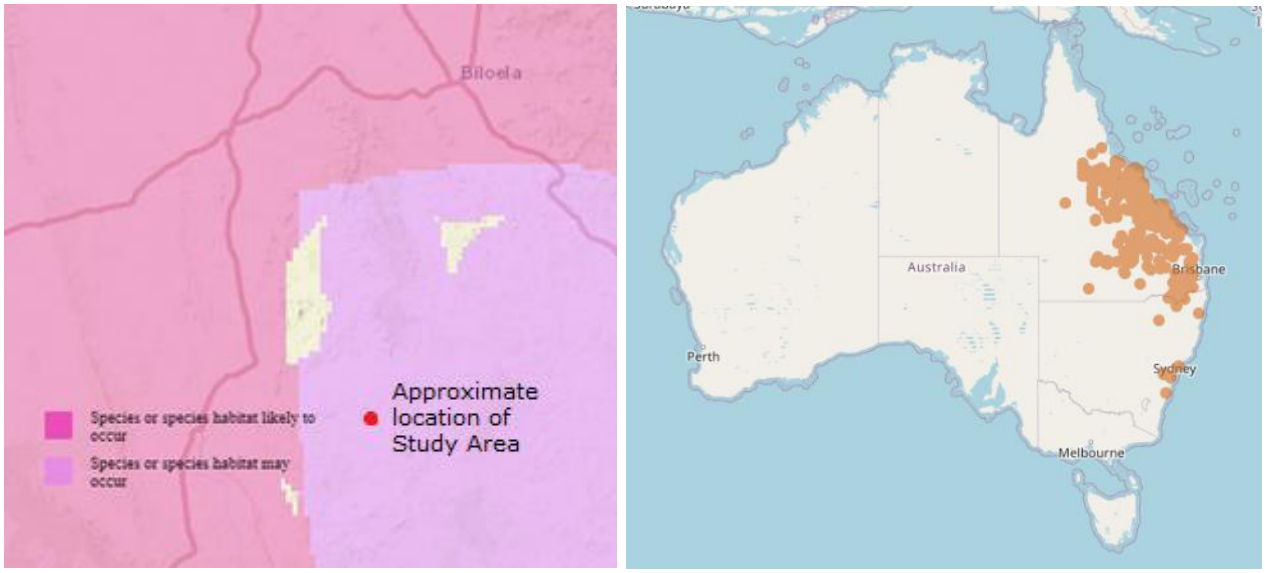


FIGURE 5-13 SQUATTER PIGEON MODELLED DISTRIBUTION (DCCEEW, 2024A) AND RECORDS (ALA, 2024)

5.3.7.2 HABITAT REQUIREMENTS

The squatter pigeon inhabits open forests to sparse, open woodlands and scrub mostly dominated in the overstorey by *Eucalyptus, Corymbia, Acacia* or *Callitris* species, on sandy or gravelly soils, within approximately 3 km of a suitable, permanent or seasonal waterbody. Retention of these woodland canopy species, which provide shelter from predatory birds, is an important habitat factor for the squatter pigeon and is a notable distinction between the habitat value of open woodland compared to cleared land (which does not constitute important or critical habitat for the species). Density of ground layer vegetation in foraging and breeding habitat is considerably patchy and rarely exceeds 33% (DCCEEW, 2024b).

Additional to presence of woodland canopy species, squatter pigeon conservation guidelines identify proximity to water as the most important determinant of habitat suitability, with open ground cover that permits ease of movement also crucial:

> *It is nearly always found near permanent water such as rivers, creeks and waterholes. Sandy areas dissected by gravel ridges, which have open and short grass cover allowing easier movement, are preferred* (TSSC, 2015a).

Specifically in Queensland, foraging and breeding habitat is known to occur on well-draining, sandy or loamy soils on low, gently sloping, flat to undulating plains and foothills, and lateritic (duplex) soils on low 'jump-ups' and escarpments within 1 km of watercourses. The squatter pigeon nests on the ground where it forages for seeds among ground layers where there is sparse and low-density grass cover. It roosts in low trees at night.

Habitat Critical to the Survival of the Species

Habitat critical to the survival has not been specifically defined for the squatter pigeon (DCCEEW, 2024b). Therefore, habitat critical to the survival of the species has been considered according to the following description (as provided in the *SIG 1.1* (DEWHA, 2013)).

Habitat critical to the survival of a species or ecological communities are areas that are necessary:

- *"For activities such as foraging, breeding, roosting, or dispersal;*
- *For the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators);*
- *To maintain genetic diversity and long-term evolutionary development; and/or*
- *For the reintroduction of populations or recovery of the species or ecological community.*

5.3.7.3 FIELD SURVEYS

Survey Methodology and Effort

A targeted survey approach was implemented to assess the presence of squatter pigeon, and potential habitat, in line with *Survey guidelines for Australia's threatened birds* (DEWHA, 2010b). A total of 171 20-minute BUS were completed across 38 locations within the Study Area during eight filed survey periods (four across each season):

Dry season

- October 2022 - 23 surveys, 12 morning and 11 afternoon;
- June 2023 - 24 surveys repeat visits to BUS points including 12 morning and 12 afternoon surveys;
- September/October 2023 - 26 surveys, repeat visits to BUS points including 12 morning and 14 afternoon surveys; and
- June 2024 -18 surveys, repeat visits to BUS points including 9 morning and 9 afternoon surveys.

Wet Season

- February 2023 - 32 surveys, repeat visits to BUS points including 16 morning and 16 afternoon surveys;
- March 2023-2 8 surveys, repeat visits to BUS points including 14 morning and 14 afternoon surveys;
- December 2023 - 40 surveys, repeat visits to BUS points including 20 morning and 20 afternoon surveys; and
- February 2024-27 surveys, repeat visits to BUS points including 13 morning and 14 afternoon surveys.

Additionally, 245 vegetation and habitat assessments were completed across the Study Area during the 10 survey periods.

For further detail on the ecological investigations completed within the Study Area, including desktop searches, survey timing and survey methodology, refer to Section 4.8.

Survey Results

This species was identified on three occasions during field surveys in October 2022, September/October 2023 and December 2023. All observations were made in the north to

north-west section of the Study Area outside the Disturbance Footprint. Field survey observations are presented in Figure 5-14.

Survey Adequacy

Considering relevant guidelines and recommendations, the field survey methodology and effort has been considered adequate for this species. Survey guideline advice for squatter pigeon and field survey effort and adequacy are outlined in Table 5-19.

TABLE 5-19 SQUATTER PIGEON FIELD SURVEY EFFORT

Survey Guidelines and Recommendations	Survey Effort Utilised and Timing	Comment on Field Survey Adequacy
As per the Survey guidelines for Australia's threatened birds (DEWHA, 2010): Area searches or transect surveys should be conducted in suitable habitat. Flushing surveys also likely to be useful. Recommended methods include 15 hours of flushing surveys over a 3-day survey period. 10 hours of area searches or transect surveys over a 3-day survey period in suitable habitat (short, grassy understory of eucalypt woodland, nearly always near permanent water).	171 dawn and dusk timed surveys (20 minutes), bird utilisation surveys across 38 locations in the Study Area. Bird surveys were conducted during eight of the 10 survey periods (October 2022, February, March, June, September/October and December 2023, February and June 2024). 3 area/transect searches were also conducted in appropriate habitat. These area/transect searches were completed by 2 ecologists for 1.5 hours each (9 total hours).	Survey effort considered adequate. 171 timed bird surveys across 38 locations. Surveys were conducted throughout the Study Area, in suitable patches of open eucalypt woodlands and areas close to permanent bodies like farm dams and waterways. Squatter pigeon was observed on one occasion during the October 2022 survey at a farm dam located in the northern section of the Study Area, on one occasion during the September/October 2023 survey in the north-western section of the Study Area, and on one occasion during December 2023 survey.

5.3.7.4 HABITAT ASSESSMENT AND MAPPING

BHT mapping has been used to identify suitable squatter pigeon breeding, foraging and dispersal habitat within the Study Area, as well as generally unsuitable habitat for the species. The BHTs considered suitable for squatter pigeon habitat include:

- Eucalypt woodland and open forest dominated by *E. crebra* with a grassy understorey;
- Brigalow woodlands; and
- Riparian woodland and open forests dominated by *E. tereticornis* often associated with stream channels.

The suitable squatter pigeon habitat within these BHTs has been narrowed down to areas within 1 km of permanent dams, watercourses and waterbodies as breeding habitat and areas within 3 km of permanent dams, watercourses and waterbodies as foraging and dispersal habitat.

Given that foraging and breeding habitat for the species is known to occur gently sloping, flat to undulating plains and foothills (DCCEEW, 2024b), squatter pigeon habitat has been further refined to only include grassy, open forest in areas with lower elevation and gradual slopes. This refinement has discounted much of the open forest habitats in the central and eastern sections of the Study Area, which tends to exhibit steep, hilly terrain (see Figure 5-16). These

central and eastern areas also contain more dense grassy eucalypt woodlands, with ground layer vegetation cover in excess of 33% and likely unsuitable for squatter pigeon. This is further evidenced by the fact that, despite 10 survey events across the survey period, no individuals were detected in the central, eastern and southern parts of the Study Area.

Based on the presence of woodland canopy species and the proximity to water, mapped squatter pigeon habitat within the Study Area (which is assumed to provide breeding and foraging function for the known species), is considered habitat critical to the survival of the species. It should be noted that suitable low grass cover for foraging will vary across the year in the Study Area, with cover reducing during dry the dry season.

There is a total of 9,575.4 ha Breeding Habitat and 2,333.5 ha of Foraging and Dispersal Habitat mapped in the Study Area. There is also 34,864.6 ha of generally unsuitable habitat within the Study Area. The habitat for the squatter pigeon is presented in Figure 5-14, with habitat types summarised below in Table 5-20.

TABLE 5-20 SQUATTER PIGEON (SOUTHERN) HABITAT SUMMARY IN THE STUDY AREA

	Breeding Habitat	**Foraging and Dispersal Habitat**	**Generally Unsuitable Habitat**
Description	Low, open eucalypt woodland on well-draining, gravelly, sandy or loamy soils and escarpments within 1 km of permanent dams, watercourses and waterbodies.	Low, open eucalypt woodland on well-draining, gravelly, sandy or loamy soils and escarpments within 3 km of dam, watercourses and waterbodies.	Not suitable habitat includes areas either bereft of suitable roosting and shelter sites, areas that are too dense for movement and areas which tend to exhibit steep, hilly terrain.
Mapped habitat within the Study Area (by BHT)	Grassy, open forest in areas with lower elevation and gradual slopes within 1 km of permanent waterbodies, including: • Eucalypt woodland and open forest dominated by *E. crebra* with a grassy understorey; • Brigalow woodlands; and • Riparian woodland and open forests dominated by *E. tereticornis* often associated with stream channels.	Grassy, open forest in areas with lower elevation and gradual slopes within 3 km of permanent and seasonal waterbodies, including: • Eucalypt woodland and open forest dominated by *E. crebra* with a grassy understorey; • Brigalow woodlands; and • Riparian woodland and open forests dominated by *E. tereticornis* often associated with stream channels.	• Vine forest/thickets and dry rainforest; • Waterbodies and drainage features; and • Grasslands and cultivated agricultural land.
Total in the Study Area (ha)	9,575.4	2,333.5	34,864.6
Total in the Project Area (ha)	625.5	255.3	5,794.1

Legend

- Study Area
- Disturbance Footprint
- Project Area
- Squatter Pigeon (Southern) Observation

Squatter Pigeon (Southern) Habitat

- Breeding
- Foraging and Dispersal Habitat
- Road
- Track and Path

Coordinate System:
GDA2020 MGA Zone 56

Date: 27/05/2025
Created By: SP/HD
Drawing Size: A3

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F5-14 - Squatter Pigeon (Southern) Habitat and Occurrence in the Study Area

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5.3.8 WHITE-THROATED NEEDLETAIL

White-throated needletail (*Hirundapus caudacutus*) is listed as Vulnerable under the EPBC Act as of 19th July 2019 and is considered as potentially occurring within the Study Area.

5.3.8.1 SPECIES DISTRIBUTION AND HISTORICAL RECORDS

The white-throated needletail is widespread in eastern and south-eastern Australia, with the species being recorded in all coastal regions of Queensland, extending inland to the western slopes of the Great Dividing Range and occasionally onto the adjacent inland plains (TSSC, 2019). The Study Area occurs within the 'species or species habitat may occur' modelled distribution of the species (DCCEEW, 2024a) (Figure 5-15). No recent historical record of the species occurs within the Study Area or the Locality, however one outdated historical record from 2002 occurs within the Locality (ALA, 2024). It should be noted that during surveys for the Kariboe Wind Farm (EPBC 2022/09428), approximately 45 km east of the Study Area, a flock of 100+ white-throated needletails were recorded overflying the Kariboe Wind Farm project area in October 2022, as reported in the *Kariboe Wind Farm Project MNES Assessment Report* (Attexo, 2022).

White-throated needletail breeds in the Northern Hemisphere and migrates to Australia during the species' non-breeding season, roughly October to April (TSSC, 2019).

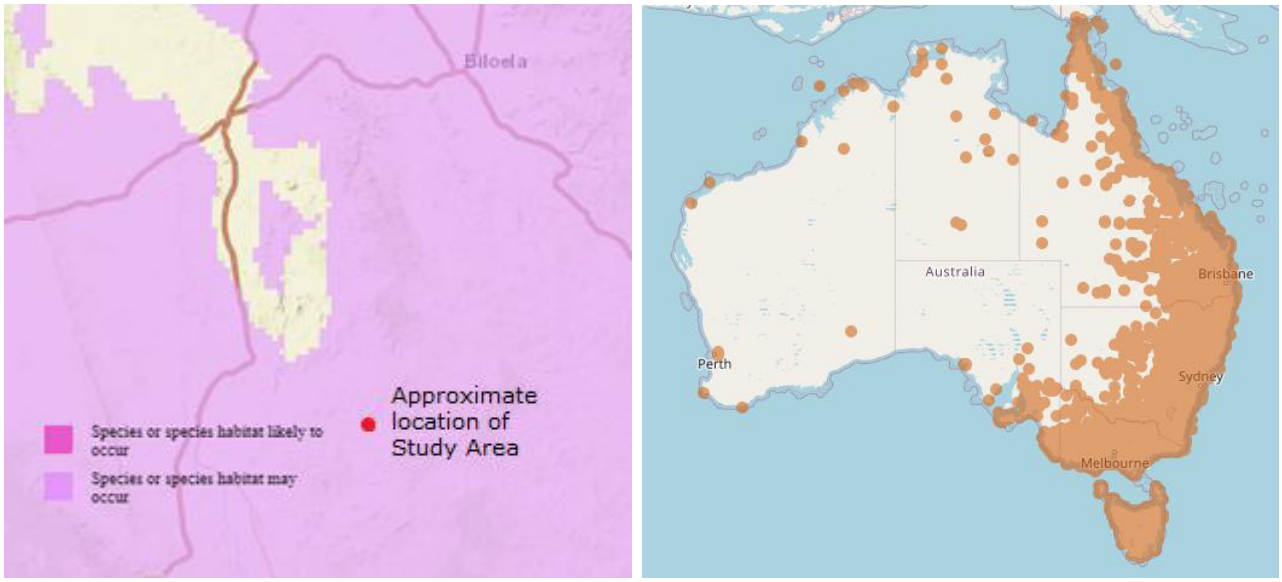


FIGURE 5-15 WHITE-THROATED NEEDLETAIL MODELLED DISTRIBUTION (DCCEEW, 2024A) AND RECORDS (ALA, 2024)

5.3.8.2 HABITAT REQUIREMENTS

During the time the white-throated needletail is within Australia, the species mostly remains aerial, foraging above a variety of habitats as it moves along the eastern coast of Australia, before returning to preferred breeding locations across Asia in autumn. They are more commonly recorded foraging above open wooded areas, though may also forage beneath the canopy between trees. Around farmland, white-throated needletail are often recorded above partly cleared fields or remnant vegetation at the edge of paddocks (TSSC, 2019)).

Conservation Advice for white-throated needletail (TSSC, 2019)) identifies this broad range of suitable foraging habitat as the following:

> *White-throated Needletail forages at heights up to 'cloud level', above a wide variety of habitats ranging from heavily treed forests to open habitats, such as farmland, heathland, mudflats […] or coastal saltworks. Large tracts of native vegetation, particularly forest, may be a key habitat requirement for species.*
>
> *Areas of updraughts, such as ridges, cliffs or sand-dunes […] or along the edges of low-pressure systems, which both lift their food sources and assist with their flight, are preferred for foraging purposes as well, with the species potentially following these systems across Australia.*
>
> *The species roosts in trees amongst dense foliage in the canopy or in hollows.*

The species has been observed to roost in trees amongst dense foliage in the canopy or in hollows (TSSC, 2019), although the degree to which the species roosts in trees is potentially over-emphasised and not well known. Roosting has been recorded rarely in Australia, for example Tarburton (2021) identified 10 published roosting records ranging from 1902 to 2001 and 20 in journals, newsletters and direct reports citing visual evidence of them landing in Australia. Twenty-four of these observations were of birds roosting/landing after sunset. A recent roosting observation of white-throated needletail was made in the Pilliga Forest in NSW (Vanderduys, Macdonald, & Pavey, 2024)), though this observation may be associated with a failed attempt at predation by a brown falcon (*Falco berigora*). Evidence suggests roosting is extremely rare in Australia and specific roosting habitat is not known.

Habitat Critical to the Survival of the Species

Habitat critical to the survival has not been specifically defined for the white-throated needletail in Australia (TSSC, 2019) and would be limited to foraging only. That is, prominent landscape features that have the potential to create updraughts and foraging opportunities may be important for the species. In this context, habitat critical to the survival of the species has been considered according to the following description (as provided in the *SIG 1.1* (DEWHA, 2013)).

> *Habitat critical to the survival of a species or ecological communities are areas that are necessary:*
>
> - *For activities such as foraging, breeding, roosting, or dispersal;*
> - *For the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators);*
> - *To maintain genetic diversity and long-term evolutionary development; and/or*
> - *For the reintroduction of populations or recovery of the species or ecological community.*

5.3.8.3 FIELD SURVEYS

Survey Methodology and Effort

A targeted survey approach was implemented to assess the presence of white-throated needletail, and potential habitat, in line with *Survey guidelines for Australia's threatened birds*

(DEWHA, 2010b). A total of 171 20-minute BUS were completed across 38 locations within the Study Area during eight field survey periods (four across each season):

Dry season

- October 2022 - 23 surveys, 12 morning and 11 afternoon;
- June 2023 - 24 surveys repeat visits to BUS points including 12 morning and 12 afternoon surveys;
- September/October 2023 - 26 surveys, repeat visits to BUS points including 12 morning and 14 afternoon surveys; and
- June 2024 -18 surveys, repeat visits to BUS points including 9 morning and 9 afternoon surveys.

Wet Season

- February 2023 - 32 surveys, repeat visits to BUS points including 16 morning and 16 afternoon surveys;
- March 2023-2 8 surveys, repeat visits to BUS points including 14 morning and 14 afternoon surveys;
- December 2023 - 40 surveys, repeat visits to BUS points including 20 morning and 20 afternoon surveys; and
- February 2024-27 surveys, repeat visits to BUS points including 13 morning and 14 afternoon surveys.

In addition to the 171 BUS, six targeted white-throated needletail surveys were also carried out during the September 2024 survey period in elevated sections of the Study Area in order to identify potential areas of roosting habitat (see Figure 5-16). Topographic data was reviewed prior to the September 2024 survey event and targeted survey points identified, which were visited by the field teams in order to confirm the presence of roosting and foraging habitat features, such as tall woodland and areas with prominent updraughts.

It is important to note that the white-throated needletail is a migratory species, and that the species is more likely to be observed utilising the Study Area in the warmer months (from October to April).

For further detail on the ecological investigations completed within the Study Area, including desktop searches, survey timing and survey methodology, refer to Section 4.8.

Survey Results

White-throated needletail was not observed during any of the field surveys. Suitable foraging habitat occurs above the Study Area, as the species forages almost exclusively aerially.

The Study Area contains eucalypt woodland atop elevations, however, these do not comprise the dense, tall forest typically associated with preferred habitat for the species. Most of the vegetation observed during targeted white-throated needletail surveys in elevated areas consisted of open, immature *Eucalyptus crebra* woodland (see Plate 5-2 – Plate 5-5 below) which lacked the dense foliage and hollows the species is reported to utilise for roosting.

Further, the elevated areas within the Study Area tend to consist of gentle, undulating hills (see Plate 5-2 – Plate 5-5 below) rather than steep ridges or cliffs that result in more pronounced updraughts. Due to the lack of elevated areas with dense canopy foliage and tall

hollow-bearing trees and the general undulating nature of the landscape, with limited large and distinct areas of elevational change, the habitat in the Study Area is not deemed suitable for the species for roosting.



PLATE 5-2: GENTLE, ROLLING HILLS IN THE CENTRAL SECTION OF THE STUDY AREA. PLATE 1.5 SHOWS THE VEGETATION ON THE NORTHERN FACE OF THIS ELEVATION. NO STEEP CLIFFS, RIDGES OR PROMINENT UPDRAUGHTS WERE OBSERVED.



PLATE 5-3: OPEN, IMMATURE E. CREBRA WOODLAND WITH AN ESTIMATED HEIGHT OF 8M IN THE CENTRE OF THE STUDY AREA, NOT LIKELY WHITE-THROATED NEEDLETAIL ROOSTING HABITAT.



PLATE 5-4: GENTLE, SLOPING HILLS WITH OPEN EUCALYPT WOODLAND CONSISTING OF TREES <20M TALL IN THE NORTH-WEST OF THE STUDY AREA.



PLATE 5-5: ELEVATED AREA IN THE NORTH-EAST OF THE STUDY AREA WITH OPEN WOODLAND RATHER THAN TALL FOREST. NEARBY FOREST OUTSIDE OF THE STUDY AREA APPEARS MORE SUITABLE FOR POTENTIAL ROOSTING HABITAT.

Survey Adequacy

Considering relevant guidelines and recommendations, the field survey methodology and effort has been considered adequate for this species. Survey guideline advice for white-throated needletail and field survey effort and adequacy are outlined in Table 5-21.

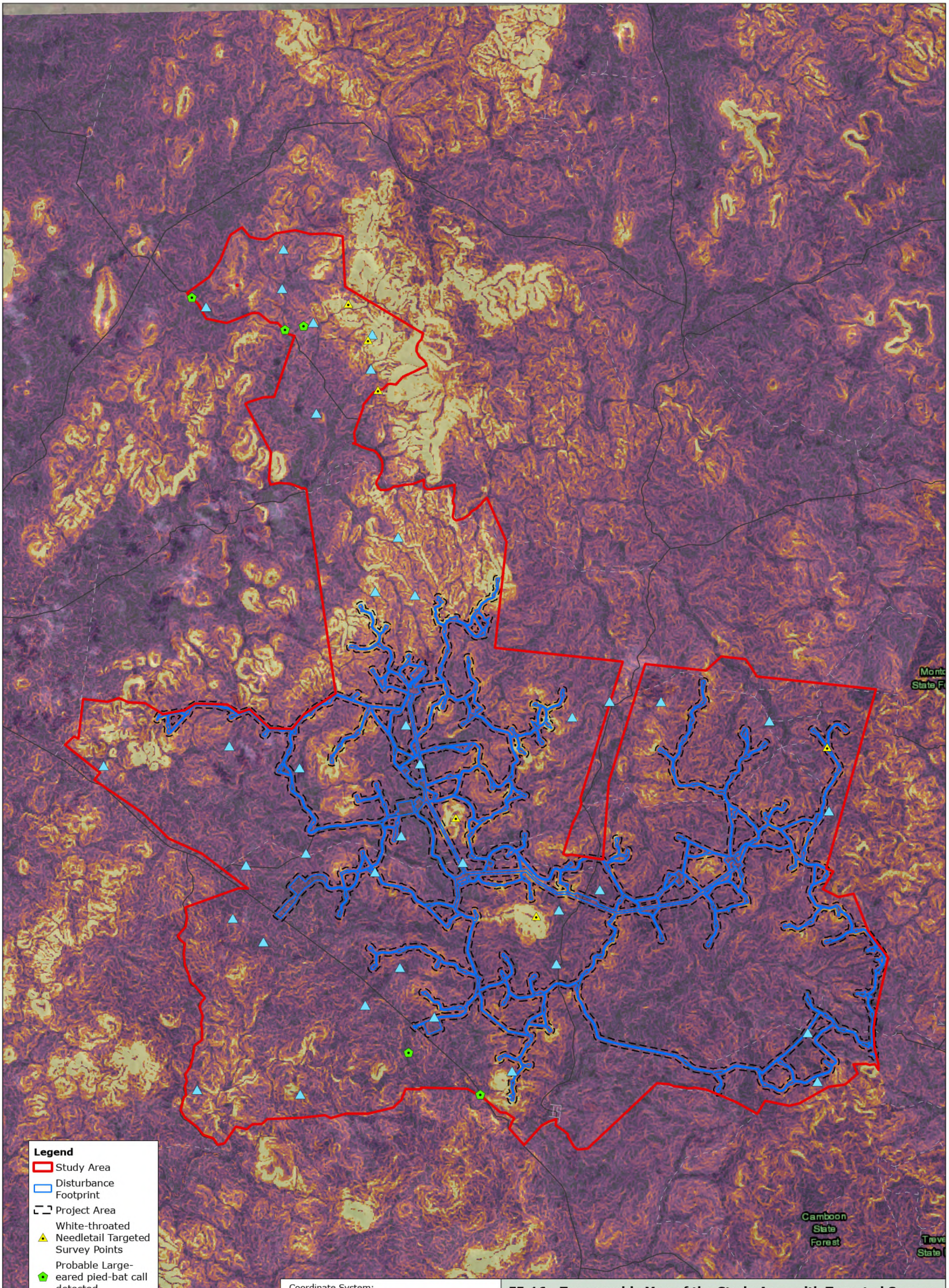
TABLE 5-21 WHITE-THROATED NEEDLETAIL FIELD SURVEY EFFORT

Survey Guidelines and Recommendations	Survey Effort Utilised and Timing	Comment on Field Survey Adequacy
As per the Draft referral guidelines for 14 birds listed as migratory species under the EPBC Act (DoE, 2015): No survey guidelines specific to white-throated needletail, however, recommended to focus survey efforts from high vantage points. Observations should be made as late as possible in the evening of birds coming in to roost. This species is almost exclusively aerial, from heights of less than 1 m up to more than 1000 m above the ground and have been recorded over most types of habitat.	171 dawn and dusk timed surveys (20 minutes), bird utilisation surveys across 38 locations in the Study Area. Bird surveys were conducted during eight of the 10 survey periods (October 2022, February, March, June, September/October and December 2023, February and June 2024). 6 targeted assessments atop ridgelines for potential white-throated needletail roosting habitat during the September 2024 surveys.	Survey effort considered adequate. Surveys were conducted from vantage points in the Study Area within the appropriate time frame to detect the species. The species was not detected in any of the surveys. The habitat in the Study Area was not deemed suitable for the species to roost in.

5.3.8.4 HABITAT ASSESSMENT AND MAPPING

Figure 5-16 demonstrates the topography of the Study Area and the surrounding landscape. As stated in Section 5.3.8.3, the gentle, undulating nature of the Study Area suggests that this area is generally unsuitable for roosting. This is further supported by the lack of observations of the species, despite surveys of 171 locations across multiple survey events conducted over a two-year period. This confirms the Study Area is unlikely to provide important roosting habitat for the species. As such, no habitat mapping has been completed for the white-throated needletail within the Study Area. An assessment of collision risk and management measures to minimise impacts is considered in the Bird and Bat Management Plan (BBMP), Appendix D.

The species is therefore considered to only utilise the aerial space across the Study Area for foraging if it were to occur. As demonstrated in Figure 5-16, landscape features within the north of the Study Area (extending to the north and east outside of the Study Area) contain higher slope gradients that may present a terrain that promotes the occurrence of suitable updraughts that might support foraging. The use of this landscape feature for potential foraging by the species cannot be ruled out, and as a result this area within the Study Area is considered to have the highest potential value for foraging for the species.



F5-16 - Topographic Map of the Study Area with Targeted Survey Locations for the White-Throated Needletail and BUS Locations

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5.3.9 BLACK-BREASTED BUTTONQUAIL

The black-breasted buttonquail (*Turnix melanogaster*) is listed as Vulnerable under the EPBC Act as of 16th July 2000 and is considered to have the potential to occur within the Study Area.

5.3.9.1 SPECIES DISTRIBUTION AND HISTORICAL RECORDS

Black-breasted buttonquail is a cryptic, mostly ground-dwelling bird endemic to coastal and near-coastal south-east Queensland and north-east New South Wales (TSSC, 2015c). The Study Area within the 'species or species habitat may occur' modelled distribution of the species, however the species distribution is patchy within this area (DCCEEW, 2024a) (Figure 5-17). Species movement is poorly understood. Though patches of suitable habitat within the distribution are often widely separated, due to naturally open landscapes or through clearing in agricultural areas, enough records of vagrants exist to suggest that dispersibility is maintained in a fragmented landscape and that a single population persists (Garnett & Baker, 2021).

Although there are no recent historical records of black-breasted buttonquail in the Locality, there is a record from 2021 located approximately 20 km to the east of the Study Area in Coominglah State Forest (ALA, 2024).

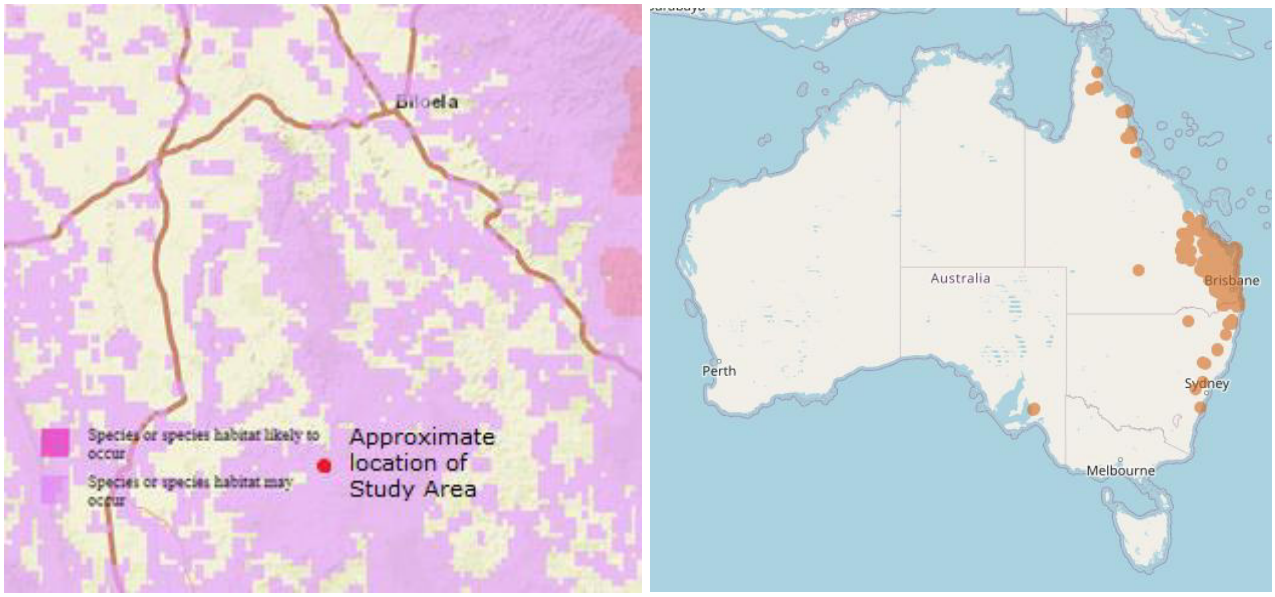


FIGURE 5-17 BLACK-BREASTED BUTTONQUAIL MODELLED DISTRIBUTION (DCCEEW, 2024A) AND RECORDS (ALA, 2024)

5.3.9.2 HABITAT REQUIREMENTS

The species inhabits rainforest and closed forest ecosystems, with a preference for low, dry rainforest communities such as semi-evergreen vine thickets and araucarian microphyll to notophyll vine forests (Smyth, Noble, & Wiley, 2001). These vegetation communities often have a dense understorey high in complex shrubs and coarse woody debris, which provide important shelter and breeding value for the species (Smyth, Noble, & Wiley, 2001). They may also be found in low, dense acacia thickets and, in littoral areas, in vegetation behind sand dunes. Nesting often occurs in areas where understorey plants including bracken (*Pteridium esculentum*), rasp fern (*Doodia aspera*) and lantana (*Lantana camara*) are common (TSSC, 2015c).

Black-breasted buttonquail forages along forest floors, preying on invertebrates sheltered amongst leaf litter. Presence of leaf litter is a crucial habitat determinant for black-breasted buttonquail, with a given community requiring extensive deposits of litter to provide suitable habitat (TSSC, 2015c). To this extent, habitat for the species is considered to occur on highly fertile soils which facilitate rapid foliage growth and provide a constant layer of fallen leaves (TSSC, 2015c).

Habitat Critical to the Survival of the Species

Habitat critical to the survival of the black-breasted buttonquail has been defined within the *National Recovery Plan for Black-breasted Button-quail* (*Turnix melanogaster*) (DCCEEW, 2022b) as:

- *Foraging and breeding habitat;*
- *Habitat for the long-term maintenance of the species;*
- *Areas with potential habitat; and*
- *Areas supporting recovery.*

5.3.9.3 FIELD SURVEYS

Survey Methodology and Effort

A targeted survey approach was implemented to assess the presence of black-breasted buttonquail, and potential habitat, in line with *Survey guidelines for Australia's threatened birds* (DEWHA, 2010b). A total of 171 20-minute BUS were completed across 38 locations within the Study Area during eight filed survey periods (four across each season):

Dry season

- October 2022 - 23 surveys, 12 morning and 11 afternoon;
- June 2023 - 24 surveys repeat visits to BUS points including 12 morning and 12 afternoon surveys;
- September/October 2023 - 26 surveys, repeat visits to BUS points including 12 morning and 14 afternoon surveys; and
- June 2024 -18 surveys, repeat visits to BUS points including 9 morning and 9 afternoon surveys.

Wet Season

- February 2023 - 32 surveys, repeat visits to BUS points including 16 morning and 16 afternoon surveys;
- March 2023-2 8 surveys, repeat visits to BUS points including 14 morning and 14 afternoon surveys;
- December 2023 - 40 surveys, repeat visits to BUS points including 20 morning and 20 afternoon surveys; and
- February 2024-27 surveys, repeat visits to BUS points including 13 morning and 14 afternoon surveys.

Additionally, 245 vegetation and habitat assessments were completed across the Study Area during the 10 survey periods.

For further detail on the ecological investigations completed within the Study Area, including desktop searches, survey timing and survey methodology, refer to Section 4.8.

Survey Results

No individuals of the species were observed within the Study Area during field surveys. No platelets or other indicators of the presence of black-breasted buttonquail were observed during field surveys. Suitable habitat for the species was identified in the Study Area within the Vine forest/thicket and dry rainforest BHT, however this habitat is considered fragmented and limited. Observed habitat lacks key requirements for the species, such as a dense, heterogeneously distributed shrub layer for shelter and nesting, and a deep leaf litter layer for foraging.

Survey Adequacy

Considering relevant guidelines and recommendations, the field survey methodology and effort has been considered adequate for this species. Survey guideline advice for black-breasted buttonquail and field survey effort and adequacy are outlined in Table 5-22.

TABLE 5-22 BLACK-BREASTED BUTTONQUAIL FIELD SURVEY EFFORT

Survey Guidelines and Recommendations	Survey Effort Utilised and Timing	Comment on Field Survey Adequacy
Survey guidelines for Australia's threatened birds: Guidelines for detecting birds listed as threatened under the EPBC Act (DEWHA, 2010b) Area searches of suitable habitat with detection of flushing birds or hearing of foraging scratching for 15 hours over 3 days.	171 dawn and dusk timed surveys (20 minutes), bird utilisation surveys across 38 locations in the Study Area. 245 vegetation and habitat assessments were completed across six survey periods determining the presence of any suitable habitat features for the species.	Survey effort considered adequate. Suitable habitat for the species was detected within the Study Area, with flushing surveys being conducted within this habitat during habitat assessments. The species was not observed in any surveys.

5.3.9.4 HABITAT ASSESSMENT AND MAPPING

BHT mapping has been used to identify suitable habitat within the Study Area where black-breasted buttonquail has the potential to occur. Though potentially suitable habitat within the Study Area is considered fragmented and limited in key requirements, a conservative approach to mapping this species' habitat has been implemented. Potential Foraging and Roosting Habitat for the black-breasted buttonquail within the Study Area includes the following BHT:

- Vine forest/thicket and dry rainforest.

As this habitat is considered potential habitat, it constitutes habitat critical to the survival of the species (defined in Section 5.3.9.2).

There is a total of 277.4 ha of Potential Foraging and Roosting Habitat for the species in the Study Area. Mapped habitat for the black-breasted buttonquail is shown on Figure 5-18, with habitat types summarised below in Table 5-23.

TABLE 5-23 BLACK-BREASTED BUTTONQUAIL HABITAT SUMMARY IN THE STUDY AREA

	Potential Foraging and Roosting Habitat	**Generally Unsuitable Habitat**
Description	Rainforest and closed forest ecosystems with presence of leaf litter.	Unsuitable habitat includes vegetation communities that are not considered rainforest or closed forest systems.
Mapped habitat within the Study Area (by BHT)	• Vine forest/ thickets and dry rainforest.	• Waterbodies and drainage features; • Grasslands and cultivated agricultural land; • Brigalow woodlands dominated by *Acacia harpophylla*; • Eucalypt woodland and open forest dominated by *E. crebra* with a grassy understorey; and • Riparian woodland and open forest dominated by *E. tereticornis* often associated with stream channels.
Total in the Study Area (ha)	277.4	46,496
Total in the Project Area (ha)	26.2	6,671.6

Legend

- Study Area
- Disturbance Footprint
- Project Area
- Potential Foraging and Roosting Habitat
- Road
- Track and Path

Coordinate System:
GDA2020 MGA Zone 56

Date: 27/05/2025
Created By: SP/HD
Drawing Size: A3

0 1 2 3km

1:125,000

F5-18 Potential Black-breasted Buttonquail Habitat in the Study Area

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5.3.10 AUSTRALIAN PAINTED SNIPE

The Australian painted snipe (*Rostratula australis*) is listed as Endangered under the EPBC Act, effective 15 May 2013, and was assessed as having the potential to occur in the Study Area.

5.3.10.1 SPECIES DISTRIBUTION AND HISTORICAL RECORDS

The Australian painted snipe occurs throughout Australia, being recorded at wetlands in all Australian states and territories, however, is the most localised in eastern Australia (DSEWPC, 2013). They are a highly mobile species, known to travel long distances between wetland habitats based on seasonal availability (Garnett & Baker, 2021). The Study Area within the 'species or species habitat likely to occur' modelled distribution of the species, however the species distribution is patchy within this area (DCCEEW, 2024a) (Figure 5-19). No historical records of the species exist within the Study Area or the Locality, with the closest record (outdated – 2000) approximately 17 km to the south-west of the Study Area (ALA, 2024).

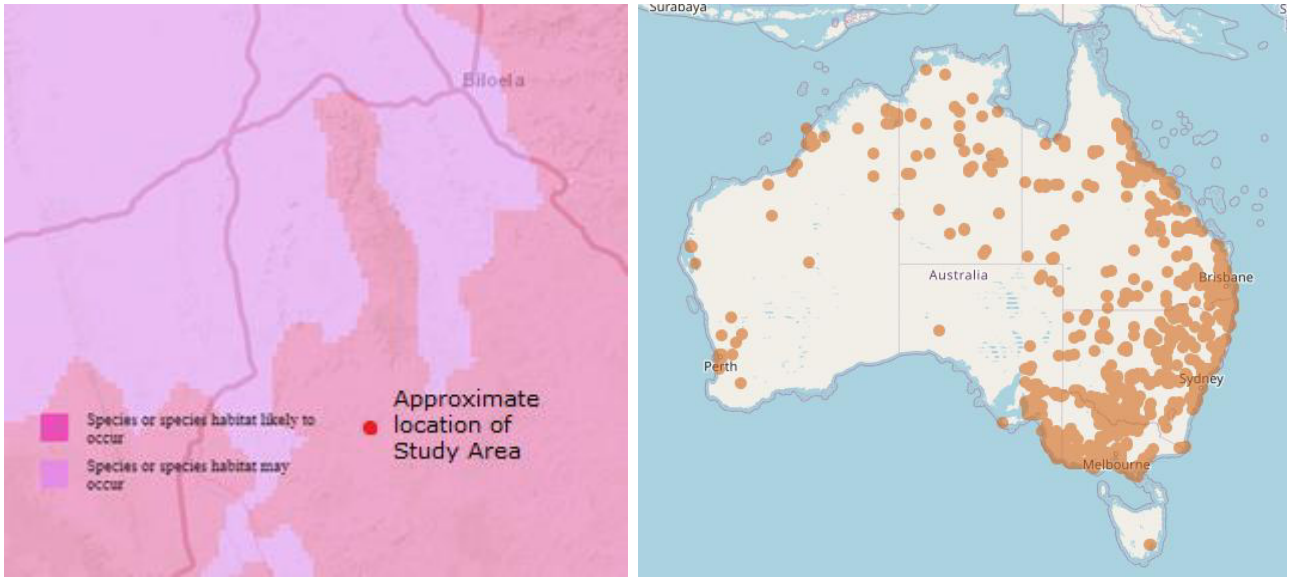


FIGURE 5-19 AUSTRALIAN PAINTED SNIPE MODELLED DISTRIBUTION (DCCEEW, 2024A) AND RECORDS (ALA, 2024)

5.3.10.2 HABITAT REQUIREMENTS

The Australian painted snipe occurs throughout Australia, being recorded at wetlands in all Australian states and territories, however, is the most localised in eastern Australia. The species inhabits shallow terrestrial freshwater wetlands, and occasionally brackish. Common habitats for the species include temporary and/or permanent lakes, swamps and claypans, inundated or waterlogged grassland, saltmarsh, farm dams and sewage farms, and bore drains (DSEWPC, 2013). In drought conditions, the Australian painted snipe requires suitable wetland conditions and may move to other suitable habitats if required (Marchant & Higgins, 1993), however migratory patterns are poorly known for the species (Pringle, 1987).

Breeding habitat for the species is known to be more specific, where the species requires shallow wetlands with areas of bare wet mud and upper and canopy cover within the immediate vicinity. All recorded nests have been located in or near small islands in freshwater wetlands (DCCEEW, 2024a).

Habitat Critical to the Survival of the Species

No habitat critical to the survival has been specifically described for this species (DSEWPC, 2013). Therefore, habitat critical to the survival of the species has been considered according to the following description (as provided in the *SIG 1.1* (DEWHA, 2013)).

> *Habitat critical to the survival of a species or ecological communities are areas that are necessary:*
>
> - *"For activities such as foraging, breeding, roosting, or dispersal;*
> - *For the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators);*
> - *To maintain genetic diversity and long-term evolutionary development; and/or*
> - *For the reintroduction of populations or recovery of the species or ecological community.*

5.3.10.3 FIELD SURVEYS

Survey Methodology and Effort

A targeted survey approach was implemented to assess the presence of squatter pigeon, and potential habitat, in line with *Survey guidelines for Australia's threatened birds* (DEWHA, 2010b). A total of 171 20-minute BUS were completed across 38 locations within the Study Area during eight filed survey periods (four across each season):

Dry season

- October 2022 - 23 surveys, 12 morning and 11 afternoon;
- June 2023 - 24 surveys repeat visits to BUS points including 12 morning and 12 afternoon surveys;
- September/October 2023 - 26 surveys, repeat visits to BUS points including 12 morning and 14 afternoon surveys; and
- June 2024 -18 surveys, repeat visits to BUS points including 9 morning and 9 afternoon surveys.

Wet Season

- February 2023 - 32 surveys, repeat visits to BUS points including 16 morning and 16 afternoon surveys;
- March 2023-2 8 surveys, repeat visits to BUS points including 14 morning and 14 afternoon surveys;
- December 2023 - 40 surveys, repeat visits to BUS points including 20 morning and 20 afternoon surveys; and
- February 2024-27 surveys, repeat visits to BUS points including 13 morning and 14 afternoon surveys.

Additionally, 245 vegetation and habitat assessments were completed across the Study Area during the 10 survey periods.

For further detail on the ecological investigations completed within the Study Area, including desktop searches, survey timing and survey methodology, refer to Section 4.8.

Survey Results

Australian painted snipe was not observed during any of the field surveys, however suitable foraging habitat was identified within the Study Area. Based on the likelihood of occurrence criteria, this species is considered potential to occur within the Study Area (Appendix C).

Survey Adequacy

Considering relevant guidelines and recommendations, the field survey methodology and effort has been considered adequate for this species. Survey guideline advice for Australian painted snipe and field survey effort and adequacy are outlined in Table 5-24.

TABLE 5-24 AUSTRALIAN PAINTED SNIPE FIELD SURVEY EFFORT

Survey Guidelines and Recommendations	Survey Effort Utilised and Timing	Comment on Field Survey Adequacy
Survey guidelines for Australia's threatened birds: Guidelines for detecting birds listed as threatened under the EPBC Act (DEWHA, 2010b) Area searches or transects through suitable wetlands; detection by sighting and flushing. Conducted for 10 hours over 3 days. Targeted stationary observations at dawn and dusk of suitable foraging locations within wetlands; detection by sighting. Conducted for 10 hours over 5 days. Also a brief spotlight search shortly after dusk may detect birds.	171 dawn and dusk timed surveys (20 minutes), bird utilisation surveys across 38 locations in the Study Area. 245 vegetation and habitat assessments were completed across 10 survey periods determining the presence of any suitable habitat features for the species. 6 hours of spotlighting over two nights in October 2022 (Impacted by inclement weather). 12 hours of spotlighting over four nights in June 2023. 8 hours of spotlighting over two nights in September 2024.	Survey effort considered adequate. Waterbodies were surveyed across the Study Area, with flushing being conducted. Habitat assessments and timed stationary surveys being conducted at dawn and dusk. Spotlighting was also conducted. The species was not observed in any surveys.

5.3.10.4 HABITAT ASSESSMENT AND MAPPING

Potential foraging habitat for this species in the Study Area includes the following BHT:

- Waterbodies and drainage features.

This habitat is considered potential foraging habitat only, with no breeding habitat identified within the Study Area.

As no individuals of the species have been observed utilising this habitat and the habitat is considered to be in poor condition due to the historical cattle grazing within the Study Area, this habitat has not been considered habitat critical to the survival of the species.

There is a total of 56.0 ha of Potential Foraging Habitat for the species in the Study Area. Mapped habitat for the Australian painted snipe is shown on Figure 5-20, with habitat types summarised below in Table 5-25.

TABLE 5-25 AUSTRALIAN PAINTED SNIPE HABITAT SUMMARY IN THE STUDY AREA

	Potential Foraging Habitat	**Generally Unsuitable Habitat**
Description	Shallow terrestrial freshwater wetlands.	Unsuitable habitat includes all habitat types that do not provide foraging value.
Mapped habitat within the Study Area (by BHT)	• Waterbodies and drainage features.	• Vine forest/ thickets and dry rainforest; • Grasslands and cultivated agricultural land; • Brigalow woodlands dominated by *Acacia harpophylla;* • Eucalypt woodland and open forest dominated by *E. crebra* with a grassy understorey; and • Riparian woodland and open forest dominated by *E. tereticornis* often associated with stream channels.
Total in the Study Area (ha)	56	46,717.4
Total in the Project Area (ha)	3.3	6,671.6

Legend

- Study Area
- Disturbance Footprint
- Project Area

Australian Painted Snipe Habitat

- Potential Foraging Habitat
- Road
- Track and Path

Coordinate System:
GDA2020 MGA Zone 56

Date: 27/05/2025
Created By: SP/HD
Drawing Size: A3

0 1 2 3km

1:125,000

F5-20 Potential Australian Painted Snipe Habitat within the Study Area

Theodore Wind Farm PER

Theodore Energy Development Pty Ltd

ERM

0661076_PER_R2\0661076_PER_5-20_R1

5.3.11 DIAMOND FIRETAIL

The diamond firetail (*Stagonopleura guttata*) is listed as Vulnerable under the EPBC Act and considered potential to occur within the Study Area.

5.3.11.1 SPECIES DISTRIBUTION AND HISTORICAL RECORDS

Diamond firetails occur on the south-east mainland of Australia from south-east Queensland to Eyre Peninsula, South Australia, and about 300 km inland from the sea (Higgins, Peter, & Cowling, 2007). The Study Area occurs within the 'species or species habitat may occur' modelled distribution of the species (DCCEEW, 2024a) (Figure 5-21). No historical record of the species exists within the Study Area or the Locality. The closest (undated) record is located approximately 30 km to the west of the Study Area (ALA, 2024).

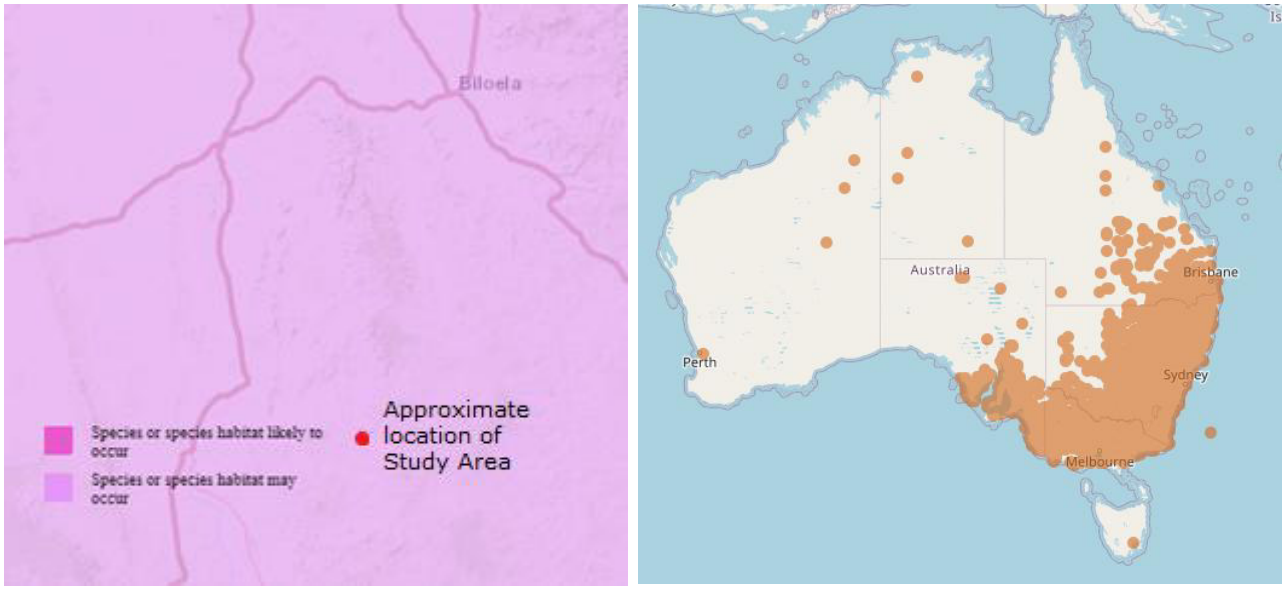


FIGURE 5-21 DIAMOND FIRETAIL MODELLED DISTRIBUTION (DCCEEW, 2024A) AND RECORDS (ALA, 2024)

5.3.11.2 HABITAT REQUIREMENTS

Diamond firetails occur in eucalypt, acacia or casuarina woodlands, open forests and other lightly timbered habitats, including farmland and grassland with scattered trees (Higgins, Peter, & Cowling, 2007). They prefer areas with relatively low tree density, few large logs, and little litter cover but high grass cover and roost in dense shrubs or in smaller nests built especially for roosting (DCCEEW, 2023b). Their flight is described as low and direct in long lines with slight undulations.

The diamond firetails build their nests in areas where the eggs are somewhat safeguarded including in the base of raptor bird nests or in foliage of prickly shrubs (DCCEEW, 2023b).

Habitat Critical to the Survival of the Species

Habitat critical to the survival of the diamond firetail has been described within the species Conservation Advice (DCCEEW, 2023b) and includes areas of:

- *Eucalypt, acacia or casuarina woodlands, open forests and other lightly timbered habitats;*

- *Low tree density, few large logs, and little litter cover but high grass cover for foraging, roosting and breeding;*
- *Drooping she-oak (Allocasuarina verticillata) within the Mt Lofty Ranges.*

Any known or likely habitat within the modelled distribution of the diamond firetail (Species of National Environmental Significance database) should be considered as habitat critical to the survival of the species (DCCEEW, 2023b). Additionally, areas that are not currently occupied by the species due to recent disturbance (e.g. fire, grazing or human activity), but should became suitable again in the future, should also be considered habitat critical to the survival of the species (DCCEEW, 2023b).

5.3.11.3 FIELD SURVEYS

Survey Methodology and Effort

A targeted survey approach was implemented to assess the presence of diamond firetail, and potential habitat, in line with *Survey guidelines for Australia's threatened birds* (DEWHA, 2010b). A total of 171 20-minute BUS were completed across 38 locations within the Study Area during eight filed survey periods (four across each season):

Dry season

- October 2022 - 23 surveys, 12 morning and 11 afternoon;
- June 2023 - 24 surveys repeat visits to BUS points including 12 morning and 12 afternoon surveys;
- September/October 2023 - 26 surveys, repeat visits to BUS points including 12 morning and 14 afternoon surveys;
- June 2024 -18 surveys, repeat visits to BUS points including 9 morning and 9 afternoon surveys; and
- September 2024 – 3 call playback sessions in suitable habitat.

Wet Season

- February 2023 - 32 surveys, repeat visits to BUS points including 16 morning and 16 afternoon surveys;
- March 2023-2 8 surveys, repeat visits to BUS points including 14 morning and 14 afternoon surveys;
- December 2023 - 40 surveys, repeat visits to BUS points including 20 morning and 20 afternoon surveys; and
- February 2024-27 surveys, repeat visits to BUS points including 13 morning and 14 afternoon surveys.

Call playback surveys were conducted in suitable habitat for diamond firetail during the September 2024 surveys. Six call playback sessions using downloaded diamond firetail calls broadcast through a speaker were conducted in open eucalypt forest with a grassy understory.

Additionally, 245 vegetation and habitat assessments were completed across the Study Area during the 10 survey periods.

For further detail on the ecological investigations completed within the Study Area, including desktop searches, survey timing and survey methodology, refer to Section 4.8.

Survey Results

Diamond firetail was not observed during any of the field surveys, however potential foraging and breeding habitat has been identified throughout the Study Area. Based on the likelihood of occurrence criteria, this species is considered potential to occur within the Study Area (Appendix C).

Survey Adequacy

Considering relevant guidelines and recommendations, the field survey methodology and effort has been considered adequate for this species. Survey guideline advice for diamond firetail and field survey effort and adequacy are outlined in Table 5-26.

TABLE 5-26 DIAMOND FIRETAIL FIELD SURVEY EFFORT

Survey Guidelines and Recommendations	Survey Effort Utilised and Timing	Comment on Field Survey Adequacy
Survey guidelines for Australia's threatened birds: Guidelines for detecting birds listed as threatened under the EPBC Act (DEWHA, 2010) There are no targeted survey guidelines for this species. Active searches or transects whilst recording any sightings and calls within suitable habitat is recommended. Suitable habitats include; grassy eucalypt, acacia, or casuarina woodlands, other suitable habitat include open forests, mallees or natural temperate grasslands. Active searches for microhabitat features include; globular structured nests within the shrubby understorey of woodland areas.	171 dawn and dusk timed surveys (20 minutes), bird utilisation surveys across 38 locations in the Study Area. 245 vegetation and habitat assessments were completed across 10 survey periods determining the presence of any suitable habitat features for the species. Six 5-minute call playback sessions, using a portable speaker to broadcast diamond firetail calls in suitable habitat.	Survey effort considered adequate. Survey effort was conducted in a range of habitats throughout the Study Area by suitably qualified ecologists, including suitable habitat of grassy eucalypt woodlands and grasslands. No observation of the species occurred during field surveys however suitable habitat for breeding, foraging and dispersal was detected within the Study Area.

5.3.11.4 HABITAT ASSESSMENT AND MAPPING

Considering the above discussion of the species habitat, the BHT in the Study Area which can be considered Potential Breeding and Foraging Habitat for the diamond firetail include:

- Eucalypt woodland and open forest dominated by *E. crebra* with a grassy understorey.

It should be noted that the Study Area is in the northern extent of the species distribution with no sighting of the species during field surveys despite surveys of 171 targeted sites over a two-year period. Because of this, it has been concluded that the potential for the species to occur within the Study Area is low. As such, only areas of this BHT with the most preferred habitat features of low tree density and high grass cover have been mapped as potential habitat for the species. Areas containing these habitat features within the Study Area seem to be concentrated to north facing hillsides in eucalypt woodland. In line with the description provided within the species Conservation Advice (DCCEEW, 2023b), this mapped potential habitat has been conservatively considered potential habitat critical to the survival of the species due to the presence of preferred lightly timbres eucalyptus habitat with low tree

density that may provide habitat for foraging, breeding, roosting and dispersal in the future if the species was to occur.

While acacia woodlands are typically considered suitable habitat for diamond firetail, the Brigalow woodland observed within the Study Area contained a distinct lack of grassy understory, and was considered unlikely to be utilised by the species which prefers high grass cover. The BHT Brigalow woodlands dominated by *Acacia harpophylla* has therefore not been mapped as diamond firetail habitat.

The BHTs not listed above have been excluded as habitat for the diamond firetail for the following reasons:

- Grasslands and cultivated agricultural – absence of trees;
- Riparian woodland and open forest – vegetation considered too dense for the species;
- Vine forest/ thickets and dry rainforest – preferred canopy species and microhabitat (few large logs, and little litter cover but high grass cover) not present;
- Permanent waterbodies – while the diamond firetail may drink from farm dams, they are not considered a foraging resource.

There is a total of 7,899.3 ha Potential Breeding and Foraging Habitat for the species in the Study Area. Mapped habitat for the diamond firetail is shown on Figure 5-22, with habitat types summarised below in Table 5-27.

TABLE 5-27 DIAMOND FIRETAIL HABITAT SUMMARY IN THE STUDY AREA

	Potential Breeding and Foraging Habitat	**Generally Unsuitable Habitat**
Description	Eucalypt, acacia or casuarina woodlands, open forests and other lightly timbered habitats.	Other habitat types, particularly those with high tree density, abundance of large logs, thick litter cover and/or low grass cover.
Mapped habitat within the Study Area (by BHT)	• Eucalypt woodland and open forest dominated by *E. crebra* with a grassy understorey – with low tree density and high grass cover (north facing areas).	• Eucalypt woodland and open forest dominated by *E. crebra* with a grassy understorey – with high tree density and low grass cover; • Grasslands and cultivated agricultural land; • Riparian woodland and open forest dominated by *E. tereticornis* often associated with stream channels; • Vine forest/ thickets and dry rainforest; • Brigalow woodlands dominated by *Acacia harpophylla;* and • Waterbodies and drainage features.
Total in the Study Area (ha)	7,899.3	38,874.1
Total in the Project Area (ha)	1,162.7	5,512.2

Legend

- Study Area
- Disturbance Footprint
- Project Area

Diamond Firetail Habitat

- Potential Foraging Habitat
- Road
- Track and Path

Coordinate System:
GDA2020 MGA Zone 56

Date: 27/05/2025
Created By: SP/HD
Drawing Size: A3

0 1 2 3km

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F5-22 Potential Diamond Firetail Habitat within the Study Area

Theodore Wind Farm PER

Theodore Energy Development Pty Ltd

ERM

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5.3.12 OOLINE

Ooline (*Cadellia pentastylis*) is listed as Vulnerable under the EPBC Act as of 16th July 2000, and is assessed as having the potential to occur within the Study Area.

5.3.12.1 SPECIES DISTRIBUTION AND HISTORICAL RECORDS

Ooline occurs in north-west New South Wales and southern and central Queensland (DEWHA, 2008a). The majority of the Study Area occurs within the 'species or species habitat may occur' modelled distribution of the species, with small portions of the Study Area within the 'species or species habitat likely to occur' modelled distribution (DCCEEW, 2024a) (Figure 5-23). No historical record of the species occurs within the Study Area or the Locality, however an out-dated record of the species occurs 50 km east of the Study Area near Coominglah State Forest (dated 2003) (ALA, 2024).

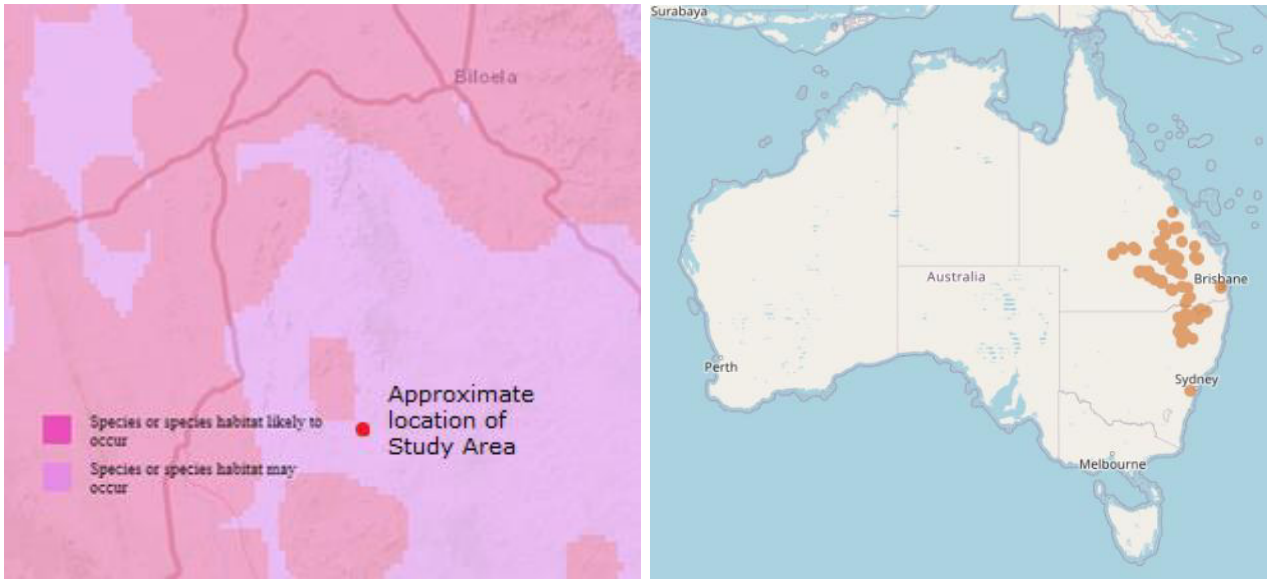


FIGURE 5-23 OOLINE MODELLED DISTRIBUTION (DCCEEW, 2024A) AND RECORDS (ALA, 2024)

5.3.12.2 HABITAT REQUIREMENTS

This species inhabits dry rainforest, vine thickets and some mixed sclerophyllous communities on mid-to-upper slopes of hills and ridges (300m to 600m above sea level) comprised of a varied clay and sandstone geology (DEWHA, 2008a). Ooline is a dominant or co-dominant canopy species often found in conjunction with white box and white cypress pine, with an open understorey and dense leaf litter. Understorey species commonly observed include native olive (*Notelaea microcarpa*), pinkwood (*Beyeria viscosa*), bitterbark (*Alstonia constricta*), wilga (*Geijera parviflora*), berry saltbush (*Einadia hastate*), *Stipa* and *Aristida* species (DCCEEW, 2024a).

Habitat Critical to the Survival of the Species

Habitat critical to the survival of the species has not been specifically described for ooline (DEWHA, 2008a). Therefore, habitat critical to the survival of the species has been considered according to the following description (as provided in the *SIG 1.1* (DEWHA, 2013)).

Habitat critical to the survival of a species or ecological communities are areas that are necessary:

- *"For activities such as foraging, breeding, roosting, or dispersal;*
- *For the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators);*
- *To maintain genetic diversity and long-term evolutionary development; and/or*
- *For the reintroduction of populations or recovery of the species or ecological community.*

5.3.12.3 FIELD SURVEYS

Survey Methodology and effort

A total of 245 vegetation and habitat assessments were completed across the Study Area during the 10 field surveys, including random meanders completed concurrently with these surveys in suitable habitat for the species across the Study Area.

This total includes 42 BioCondition assessments, including 35 conducted in eucalypt open woodland/riparian communities, three in patches of brigalow woodland, two in vine thicket/dry rainforest communities, and two in open grasslands/cleared environments.

A total of 17 targeted flora transects were also conducted during the September 2024 survey period.

For further detail on the ecological investigations completed within the Study Area, including desktop searches, survey timing and survey methodology, refer to Section 4.8.

Survey Results

This species was not observed during field surveys, despite suitable habitat being identified.

Survey Adequacy

Considering relevant guidelines and recommendations, the field survey methodology and effort has been considered adequate for this species. Survey guideline advice for ooline, field survey effort and adequacy is outlined in Table 5-28.

TABLE 5-28 OOLINE FIELD SURVEY EFFORT

Survey Guidelines and Recommendations	Survey Effort Utilised and Timing	Comment on Field Survey Adequacy
Flora Survey Guidelines – Protected Plants, Nature Conservation Act 1992 (DES, 2020) Random, non-selective traverses of all habitat types throughout the Study Area, whether identified as suitable or un-suitable habitat for threatened flora.	245 vegetation and habitat assessments were completed across 10 survey periods, including 42 BioCondition assessments. Meander searches were undertaken at the same time as vegetation and habitat assessments within the Study Area. 17 targeted flora transects conducted during the September 2024 survey period in impact areas ranging from 30 minutes to an hour.	Survey effort considered adequate. This species has not been observed during field surveys, despite suitable habitat being identified.

5.3.12.4 HABITAT ASSESSMENT AND MAPPING

Potential ooline habitat occurs within the Study Area in association with the following BHT:

- Vine forest / thickets and dry rainforest.

The BHT of Brigalow woodlands dominated by *Acacia harpophylla* was considered to potentially provide habitat for ooline. However considering the survey effort within Brigalow TEC, particularly within the Disturbance Footprint (see Section 5.2.1.2), and as ooline is such a distinctive and conspicuous species, it has been concluded that if ooline was present within this habitat, it would have been identified during field surveys. Therefore, Brigalow woodlands dominated by *Acacia harpophylla* was not mapped as potential habitat for the species.

In the absence of an official definition, potential species habitat defined above and mapped to occur within the Study Area has conservatively been considered habitat critical to the survival of ooline, though the Study area does not support an important population of the species.

This habitat has been mapped with a total of 277.4 ha occurring in the Study Area. Mapped habitat for ooline is shown on Figure 5-24, with habitat types summarised below in Table 5-27.

TABLE 5-29 OOLINE HABITAT SUMMARY IN THE STUDY AREA

	Potential Habitat	**Generally Unsuitable Habitat**
Description	Dry rainforest, vine thickets and some mixed sclerophyllous communities on mid-to-upper slopes of hills and ridges (300m to 600m above sea level) comprised of a varied clay and sandstone geology.	Habitats at lower altitudes and/or on soils not comprising of clay and sandstone and/or communities not containing components of dry rainforests or vine thickets.
Mapped habitat within the Study Area (by BHT)	• Vine forest/ thickets and dry rainforest.	• Grasslands and cultivated agricultural land; • Brigalow woodlands dominated by *Acacia harpophylla;* • Waterbodies and drainage features. • Eucalypt woodland and open forest dominated by *E. crebra* with a grassy understorey; and • Riparian woodland and open forest dominated by *E. tereticornis* often associated with stream channels.
Total in the Study Area (ha)	277.4	46,496
Total in the Project Area (ha)	26.2	6,648.7

Legend

- Study Area
- Disturbance Footprint
- Project Area

Ooline Habitat

- Potential Habitat
- Road
- Track and Path

Coordinate System:
GDA2020 MGA Zone 56

Date: 27/05/2025
Created By: SP/HD
Drawing Size: A3

0 1 2 3km

1:125,000

F5-24 Potential Ooline Habitat within the Study Area

Theodore Wind Farm PER

Theodore Energy Development Pty Ltd

ERM

0661076_PER_R2\0661076_PER_5-24_R1

5.3.13 COSSINIA

Cossinia (*Cossinia australiana*) is listed as Endangered under the EPBC Act as of 16th July 2000, and is assessed as having the potential to occur within the Study Area.

5.3.13.1 SPECIES DISTRIBUTION AND HISTORICAL RECORDS

Cossinia is endemic to central and southern Queensland where it occurs from 20 m to 520 m above sea level (DEWHA, 2008b). The majority of the Study Area occurs within the 'species or species habitat may occur' modelled distribution of the species, with small portions of the Study Area within the 'species or species habitat likely to occur' modelled distribution (DCCEEW, 2024a) (Figure 5-25). No recent historical record of the species occurs within the Study Area or the Locality, however one out-dated (2002) record of the species occurs 1 km east of the Study Area in Montour State Forest (ALA, 2024).

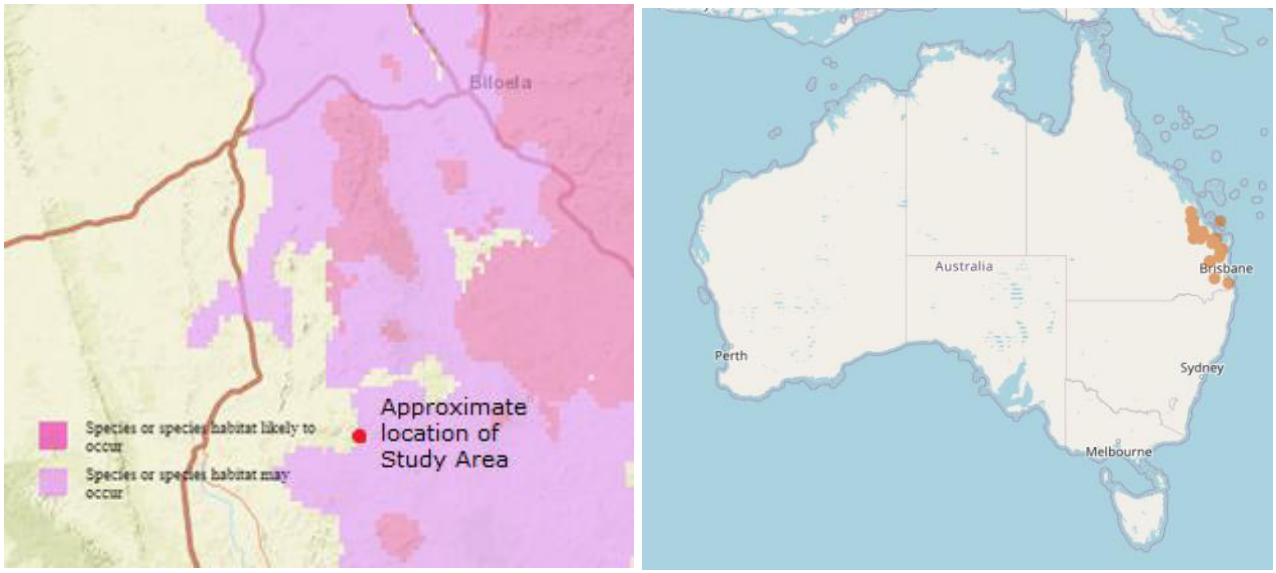


FIGURE 5-25 COSSINIA MODELLED DISTRIBUTION (DCCEEW, 2024A) AND RECORDS (ALA, 2024)

5.3.13.2 HABITAT REQUIREMENTS

Cossinia occurs in *Araucaria* vine forests and semi-evergreen thickets on varied geology of red volcanic soils and black clay loams. In addition to occurrences as a scattered or uncommon individual among closed forests, cossinia also inhabits ecotones between dry rainforest and sclerophyllous communities (DEWHA, 2008b).

Habitat Critical to the Survival of the Species

Habitat critical to the survival of the species has not been specifically described for cossinia (DEWHA, 2008b). Therefore, habitat critical to the survival of the species has been considered according to the following description (as provided in the *SIG 1.1* (DEWHA, 2013)).

> *Habitat critical to the survival of a species or ecological communities are areas that are necessary:*
>
> - *"For activities such as foraging, breeding, roosting, or dispersal;*

- *For the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators);*
- *To maintain genetic diversity and long-term evolutionary development; and/or*
- *For the reintroduction of populations or recovery of the species or ecological community.*

5.3.13.3 FIELD SURVEYS

Survey Methodology and effort

A total of 245 vegetation and habitat assessments were completed across the Study Area during the 10 field surveys, including random meanders completed concurrently with these surveys in suitable habitat for the species across the Study Area.

This total includes 42 BioCondition assessments, including 35 conducted in eucalypt open woodland/riparian communities, three in patches of brigalow woodland, two in vine thicket/dry rainforest communities, and two in open grasslands/cleared environments.

A total of 17 targeted flora transects were also conducted during the September 2024 survey period.

For further detail on the ecological investigations completed within the Study Area, including desktop searches, survey timing and survey methodology, refer to Section 4.8.

Survey Results

This species was not observed during field surveys, despite suitable habitat being identified.

Survey Adequacy

Considering relevant guidelines and recommendations, the field survey methodology and effort has been considered adequate for this species. Survey guideline advice for cossinia, field survey effort and adequacy is outlined in Table 5-30.

TABLE 5-30 COSSINIA FIELD SURVEY EFFORT

Survey Guidelines and Recommendations	Survey Effort Utilised and Timing	Comment on Field Survey Adequacy
Flora Survey Guidelines – Protected Plants, Nature Conservation Act 1992 (DES, 2020) Random, non-selective traverses of all habitat types throughout the Study Area, whether identified as suitable or un-suitable habitat for threatened flora.	245 vegetation and habitat assessments were completed across 10 survey periods, including 42 BioCondition assessments. Meander searches were undertaken at the same time as vegetation and habitat assessments within the Study Area. 17 targeted flora transects conducted during the September 2024 survey period in impact areas ranging from 30 minutes to an hour.	Survey effort considered adequate. This species has not been observed during field surveys, despite suitable habitat being identified.

5.3.13.4 HABITAT ASSESSMENT AND MAPPING

Potential cossinia habitat occurs within the Study Area in association with the following BHT:

- Vine forest / thickets and dry rainforest.

In the absence of an official definition, potential species habitat defined above and mapped to occur within the Study Area has been considered habitat critical to the survival of cossinia. This is largely due to the 2002 record 1 km east of the Study Area.

This habitat has been mapped with a total of 277.4 ha occurring in the Study Area. Mapped habitat for the cossinia is shown on Figure 5-26, with habitat types summarised below in Table 5-31.

TABLE 5-31 COSSINIA HABITAT SUMMARY IN THE STUDY AREA

	Potential Habitat	**Generally Unsuitable Habitat**
Description	Vine forests and semi-evergreen thickets and/or ecotones between dry rainforest and sclerophyllous communities.	Non dry-rainforest habitats.
Mapped habitat within the Study Area (by BHT)	• Vine forest / thickets and dry rainforest.	• Grasslands and cultivated agricultural land; • Brigalow woodlands dominated by *Acacia harpophylla;* • Waterbodies and drainage features. • Eucalypt woodland and open forest dominated by *E. crebra* with a grassy understorey; and • Riparian woodland and open forest dominated by *E. tereticornis* often associated with stream channels.
Total in the Study Area (ha)	277.4	46,496
Total in the Project Area (ha)	26.2	6,648.7

Legend

- Study Area
- Disturbance Footprint
- Project Area

Cossinia Habitat

- Potential Habitat
- Road
- Track and Path

Coordinate System:
GDA2020 MGA Zone 56

Date: 27/05/2025
Created By: SP/HD
Drawing Size: A3

0 1 2 3km

1:125,000

F5-26 Potential Cossinia habitat within the Study Area

Theodore Wind Farm PER

Theodore Energy Development Pty Ltd

ERM

0661076_PER_R2\0661076_PER_5-26_R1

5.3.14 AUSTRAL CORNFLOWER

Austral cornflower (*Leuzea australis*) is listed as Vulnerable under the EPBC Act, effective 16 July 2000, and was assessed as having the potential to occur in the Study Area.

5.3.14.1 SPECIES DISTRIBUTION AND HISTORICAL RECORDS

Austral cornflower's distribution occurs across 600 km, from Mt Moffat to Gatton. It is thought to be extinct in NSW and Victoria, but it historically occurred in these two states (DEWHA, 2008c). The majority of the Study Area occurs within the 'species or species habitat may occur' modelled distribution of the species (DCCEEW, 2024a) (Figure 5-27). No historical record of the species occurs within the Study Area or the Locality, however three out-dated records of the species occur 20 km east of the Study Area (ALA, 2024).

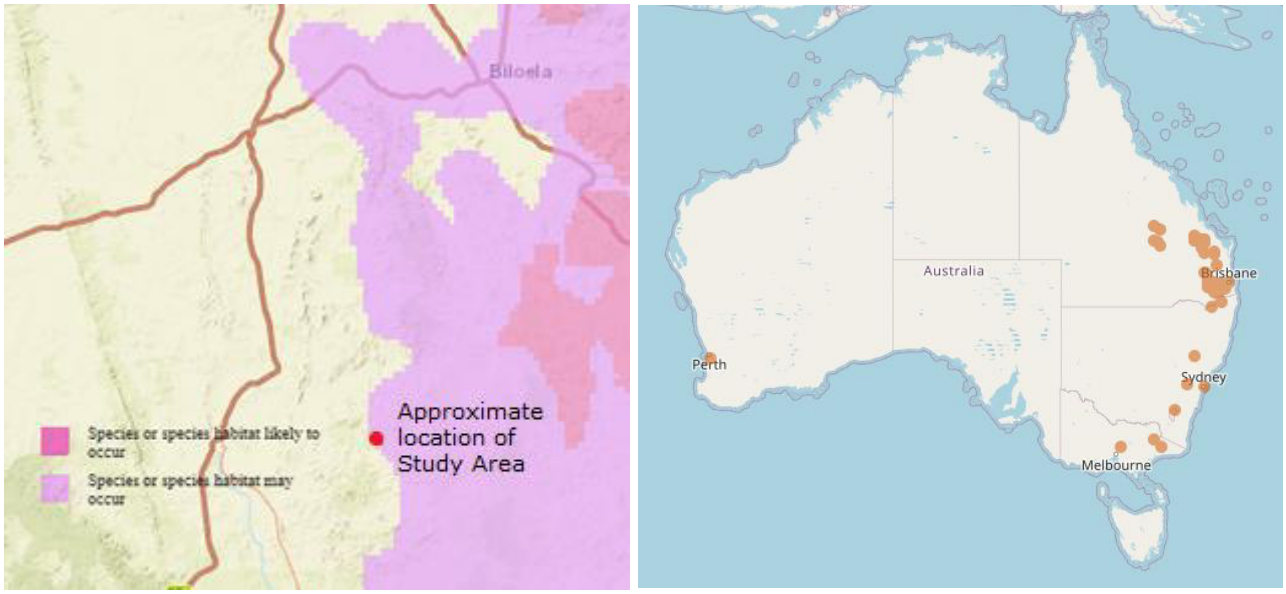


FIGURE 5-27 AUSTRAL CORNFLOWER MODELLED DISTRIBUTION (DCCEEW, 2024A) AND RECORDS (ALA, 2024)

5.3.14.2 HABITAT REQUIREMENTS

The species occurs in eucalypt open forests with a grassy understorey on heavy clay soils or clay loams derived from basalt. Typical associated canopy species include *Eucalyptus crebra, E. populnea, E. tereticornis,* and *E. melanophloia*. This species is noted to be a poor competitor and tends to favour habitat where grass competition has been reduced by fire or other forms of disturbance (DCCEEW, 2024a).

Habitat Critical to the Survival of the Species

Habitat critical to the survival of the species has not been specifically described for austral cornflower (DEWHA, 2008c). Therefore, habitat critical to the survival of the species has been considered according to the following description (as provided in the *SIG 1.1* (DEWHA, 2013)).

> *Habitat critical to the survival of a species or ecological communities are areas that are necessary:*
>
> - *"For activities such as foraging, breeding, roosting, or dispersal;*

- *For the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators);*
- *To maintain genetic diversity and long-term evolutionary development; and/or*
- *For the reintroduction of populations or recovery of the species or ecological community.*

5.3.14.3 FIELD SURVEYS

Survey Methodology and effort

A total of 245 vegetation and habitat assessments were completed across the Study Area during the 10 field surveys, including random meanders completed concurrently with these surveys in suitable habitat for the species across the Study Area.

This total includes 42 BioCondition assessments, including 35 conducted in eucalypt open woodland/riparian communities, three in patches of brigalow woodland, two in vine thicket/dry rainforest communities, and two in open grasslands/cleared environments.

A total of 17 targeted flora transects were also conducted during the September 2024 survey period.

For further detail on the ecological investigations completed within the Study Area, including desktop searches, survey timing and survey methodology, refer to Section 4.8.

Survey Results

This species was not observed during field surveys, despite suitable habitat being identified.

Survey Adequacy

Considering relevant guidelines and recommendations, the field survey methodology and effort has been considered adequate for this species. Survey guideline advice for austral cornflower, field survey effort and adequacy is outlined in Table 5-32.

TABLE 5-32 AUSTRAL CORNFLOWER FIELD SURVEY EFFORT

Survey Guidelines and Recommendations	Survey Effort Utilised and Timing	Comment on Field Survey Adequacy
Flora Survey Guidelines – Protected Plants, Nature Conservation Act 1992 (DES, 2020) Random, non-selective traverses of all habitat types throughout the Study Area, whether identified as suitable or un-suitable habitat for threatened flora.	245 vegetation and habitat assessments were completed across 10 survey periods, including 42 BioCondition assessments. Meander searches were undertaken at the same time as vegetation and habitat assessments within the Study Area. 17 targeted flora transects conducted during the September 2024 survey period in impact areas ranging from 30 minutes to an hour.	Survey effort considered adequate. This species has not been observed during field surveys, despite suitable habitat being identified.

5.3.14.4 HABITAT ASSESSMENT AND MAPPING

Some of the key threats to austral cornflower include vegetation clearing, invasion by weeds (including exotic grasses), and grazing pressure (DEWHA, 2008c). It should be noted that much of the habitat within the Study Area is subject to a high level of these threats, which is likely to affect the persistence of austral cornflower within the Study Area. However, in line with a conservative approach, potential austral cornflower habitat has been mapped within the Study Area in association with the following BHT:

- Eucalypt woodlands and open forests.

In the absence of an official definition, potential species habitat defined above and mapped to occur within the Study Area has been considered habitat critical to the survival of austral cornflower.

This habitat has been mapped, with a total of 21,768.5 ha of potential habitat occurring in the Study Area. Mapped habitat for austral cornflower is shown on Figure 5-28 with habitat types summarised below in Table 5-33.

TABLE 5-33 AUSTRAL CORNFLOWER HABITAT SUMMARY IN THE STUDY AREA

	Potential Habitat	**Generally Unsuitable Habitat**
Description	Eucalypt open forests with a grassy understorey on black clay soils.	Non-eucalypt communities, or eucalypt communities that lack grassy understory and black clay soils.
Mapped habitat within the Study Area (by BHT)	• Eucalypt woodland and open forest dominated by *E. crebra* with a grassy understorey.	• Grasslands and cultivated agricultural land; • Brigalow woodlands dominated by *Acacia harpophylla;* • Vine forest/ thickets and dry rainforest; • Waterbodies and drainage features; and • Riparian woodland and open forest dominated by *E. tereticornis* often associated with stream channels.
Total in the Study Area (ha)	21,768.5	25,004.9
Total in the Project Area (ha)	3,089.7	3,585.2

Legend

- Study Area
- Disturbance Footprint
- Project Area

Austral Cornflower Habitat

- Potential Habitat
- Road
- Track and Path

Coordinate System:
GDA2020 MGA Zone 56

Date: 27/05/2025
Created By: SP/HD
Drawing Size: A3

0 1 2 3km

1:125,000

F5-28 Potential Austral Cornflower Habitat within the Study Area

Theodore Wind Farm PER

Theodore Energy Development Pty Ltd

ERM

5.3.15 SOLANUM DISSECTUM

Solanum dissectum is listed as Endangered under the EPBC Act, effective 7 December 2016, and is assessed as having the potential to occur in the Study Area (see LoO in Appendix C).

5.3.15.1 SPECIES DISTRIBUTION AND HISTORICAL RECORDS

S. dissectum is distributed between Blackwater, Bauhinia, Thangool and Dululu, though is confined to localised areas where the species has been observed (TSSC, 2016a). The Study Area is located outside the species modelled habitat distribution, though parts of the Locality intersect the 'species or species habitat may occur' modelled distribution (DCCEEW, 2024a) (Figure 5-29). No historical record of the species occurs within the Study Area or the Locality, with the closest record of the species located 30 km north-west of the Study Area near Moura (dated 2017) (ALA, 2024).

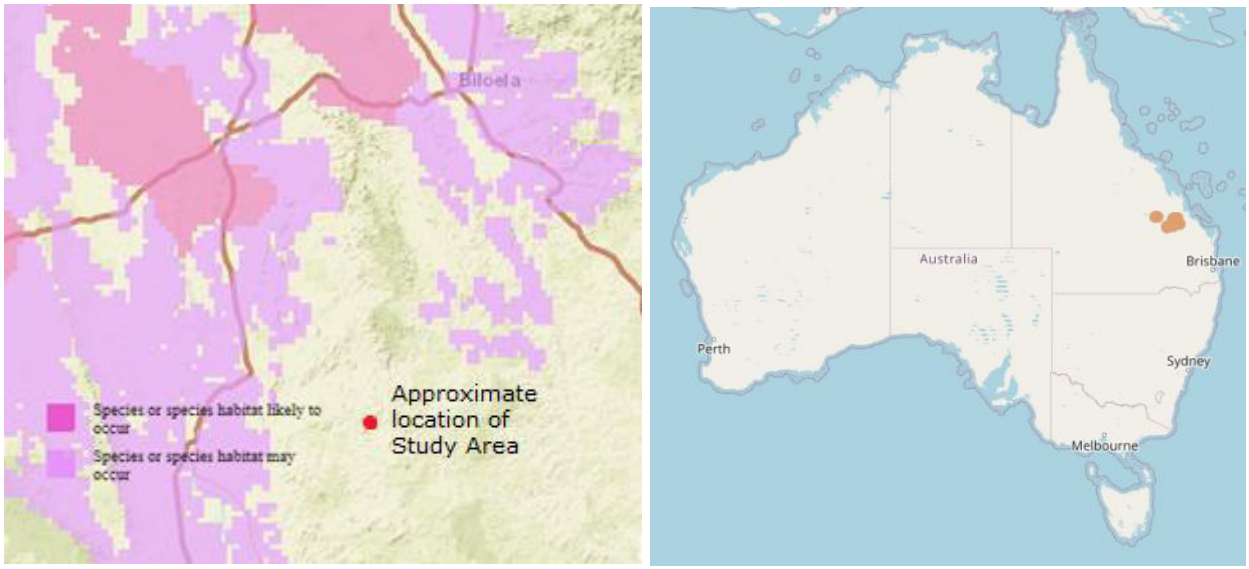


FIGURE 5-29 *SOLANUM DISSECTUM* MODELLED DISTRIBUTION (DCCEEW, 2024A) AND RECORDS (ALA, 2024)

5.3.15.2 HABITAT REQUIREMENTS

The species occurs in open forest and woodland habitats on solodic clay soils, characterised by brigalow (*Acacia harpophylla)* and/or lapunyah (*Eucalyptus thozetiana*). It is restricted to very small, localised patches within its distribution (TSSC, 2016a).

Habitat Critical to the Survival of the Species

Habitat critical to the survival of the species has not been specifically described for *S. dissectum* (TSSC, 2016a). Therefore, habitat critical to the survival of the species has been considered according to the following description (as provided in the *SIG 1.1* (DEWHA, 2013)).

> *Habitat critical to the survival of a species or ecological communities are areas that are necessary:*
>
> - *"For activities such as foraging, breeding, roosting, or dispersal;*
> - *For the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators);*

- *To maintain genetic diversity and long-term evolutionary development; and/or*
- *For the reintroduction of populations or recovery of the species or ecological community.*

5.3.15.3 FIELD SURVEYS

Survey Methodology and effort

A total of 245 vegetation and habitat assessments were completed across the Study Area during the 10 field surveys, including random meanders completed concurrently with these surveys in suitable habitat for the species across the Study Area.

This total includes 42 BioCondition assessments, including 35 conducted in eucalypt open woodland/riparian communities, three in patches of brigalow woodland, two in vine thicket/dry rainforest communities, and two in open grasslands/cleared environments.

A total of 17 targeted flora transects were also conducted during the September 2024 survey period.

For further detail on the ecological investigations completed within the Study Area, including desktop searches, survey timing and survey methodology, refer to Section 4.8.

Survey Results

This species was not observed during field surveys, despite suitable habitat being identified.

Survey Adequacy

Considering relevant guidelines and recommendations, the field survey methodology and effort has been considered adequate for this species. Survey guideline advice for *S. dissectum*, field survey effort and adequacy is outlined in Table 5-34.

TABLE 5-34 *S. DISSECTUM* FIELD SURVEY ADEQUACY

Survey Guidelines and Recommendations	Survey Effort Utilised and Timing	Comment on Field Survey Adequacy
Flora Survey Guidelines – Protected Plants, Nature Conservation Act 1992 (DES, 2020) Random, non-selective traverses of all habitat types throughout the Study Area, whether identified as suitable or un-suitable habitat for threatened flora.	245 vegetation and habitat assessments were completed across 10 survey periods, including 42 BioCondition assessments. Meander searches were undertaken at the same time as vegetation and habitat assessments within the Study Area. 17 targeted flora transects conducted during the September 2024 survey period in impact areas ranging from 30 minutes to an hour.	Survey effort considered adequate This species has not been observed during field surveys, despite suitable habitat being identified.

5.3.15.4 HABITAT ASSESSMENT AND MAPPING

Potential *S. dissectum* habitat occurs within the Study Area in association with the following BHT:

- Brigalow woodlands.

Based on the definition provided in Section 5.3.15.2, although the Study Area is located outside the species modelled distribution, to be conservative the habitat identified within the Study Area has been considered to have the potential to constitute habitat critical to the survival of the species due to the species highly restricted distribution and the presence of recent records within 50 km of the Study Area.

This habitat has been mapped, with a total of 260.6 ha of potential habitat occurring in the Study Area. Mapped habitat for *S. dissectum* is shown on Figure 5-30 with habitat types summarised below in Table 5-35.

TABLE 5-35 *S. DISSECTUM* HABITAT SUMMARY IN THE STUDY AREA

	Potential Habitat	**Generally Unsuitable Habitat**
Description	Open forest and woodland habitats on solodic clay soils, characterised by brigalow (*Acacia harpophylla*) and/or lapunyah (*Eucalyptus thozetiana*).	Habitats not characterised by brigalow (*Acacia harpophylla*) and/or lapunyah (*Eucalyptus thozetiana*).
Mapped habitat within the Study Area (by BHT)	• Brigalow woodlands dominated by *Acacia harpophylla.*	• Grasslands and cultivated agricultural land; • Eucalypt woodland and open forest dominated by *E. crebra* with a grassy understorey; • Vine forest/ thickets and dry rainforest; • Waterbodies and drainage features; and • Riparian woodland and open forest dominated by *E. tereticornis* often associated with stream channels.
Total in the Study Area (ha)	260.6	46,512.8
Total in the Project Area (ha)	10.4	6,664.5

Legend

- Study Area
- Disturbance Footprint
- Project Area

***Solanum dissectum* Habitat**

- Potential Habitat
- Road
- Track and Path

Coordinate System:
GDA2020 MGA Zone 56

Date: 27/05/2025
Created By: SP/HD
Drawing Size: A3

0 1 2 3km

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F5-30 Potential *Solanum dissectum* Habitat within the Study Area

Theodore Wind Farm PER

Theodore Energy Development Pty Ltd

ERM

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5.3.16 SOLANUM JOHNSONIANUM

Solanum johnsonianum is listed as Endangered under the EPBC Act, effective 7 December 2016, and was assessed as having the potential to occur in the Study Area as a conservative approach despite the Study Area being located outside the species modelled distribution (see Section 5.3.16.1 below and the LoO in Appendix C).

5.3.16.1 SPECIES DISTRIBUTION AND HISTORICAL RECORDS

S. johnsonianum is distributed between Rolleston, Theodore, Biloela and Dululu, though is confined to localised areas where the species has been observed (TSSC, 2016b). The Study Area is located just outside the species modelled habitat distribution, though parts of the Locality intersect the 'species or species habitat may occur' modelled distribution (DCCEEW, 2024a) (Figure 5-31). No historical record of the species occurs within the Study Area or the Locality, with the closest record of the species located 30 km north-west of the Study Area near Moura (dated 2018) (ALA, 2024) (Figure 5-31).

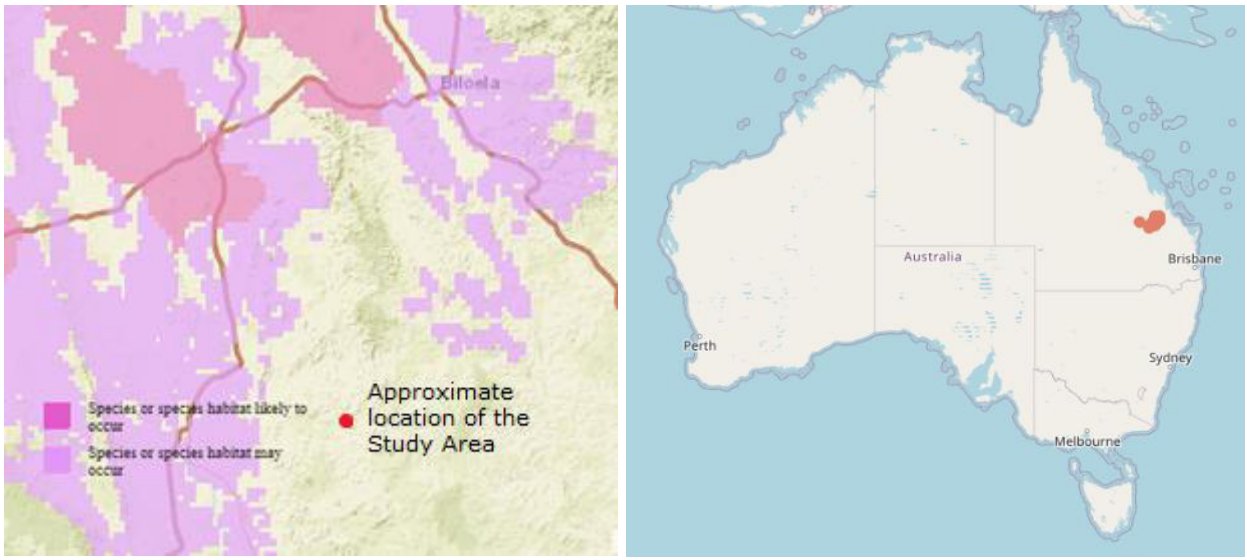


FIGURE 5-31 *SOLANUM JOHNSONIANUM* MODELED DISTRIBUTION (DCCEEW, 2024A) AND RECORDS (ALA, 2024)

5.3.16.2 HABITAT REQUIREMENTS

S. johnsonianum occurs in open forest and woodland habitats on heavy cracking clay soils dominated or co-dominated by brigalow (*A. harpophylla)*. Other species associated with *S. johnsonianum* include *Eucalyptus thozetiana* with an understory of wilga (*Geijera parviflora*). It is restricted to very small localised patches within it's distribution (TSSC, 2016b).

Habitat Critical to the Survival of the Species

Habitat critical to the survival of the species has not been specifically described for *S. johnsonianum* (TSSC, 2016b). Therefore, habitat critical to the survival of the species has been considered according to the following description (as provided in the *SIG 1.1* (DEWHA, 2013)).

> *Habitat critical to the survival of a species or ecological communities are areas that are necessary:*
>
> - *"For activities such as foraging, breeding, roosting, or dispersal;*

- *For the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators);*
- *To maintain genetic diversity and long-term evolutionary development; and/or*
- *For the reintroduction of populations or recovery of the species or ecological community.*

5.3.16.3 FIELD SURVEYS

Survey Methodology and effort

A total of 245 vegetation and habitat assessments were completed across the Study Area during the 10 field surveys, including random meanders completed concurrently with these surveys in suitable habitat for the species across the Study Area.

This total includes 42 BioCondition assessments, including 35 conducted in eucalypt open woodland/riparian communities, three in patches of brigalow woodland, two in vine thicket/dry rainforest communities, and two in open grasslands/cleared environments.

A total of 17 targeted flora transects were also conducted during the September 2024 survey period.

For further detail on the ecological investigations completed within the Study Area, including desktop searches, survey timing and survey methodology, refer to Section 4.8.

Survey Results

This species was not observed during field surveys, despite suitable habitat being identified.

Survey Adequacy

Considering relevant guidelines and recommendations, the field survey methodology and effort has been considered adequate for this species. Survey guideline advice for *S. johnsonianum*, field survey effort and adequacy is outlined in Table 5-36.

TABLE 5-36 *S. JOHNSONIANUM*, FIELD SURVEY ADEQUACY

Survey Guidelines and Recommendations	Survey Effort Utilised and Timing	Comment on Field Survey Adequacy
Flora Survey Guidelines – Protected Plants, Nature Conservation Act 1992 (DES, 2020) Random, non-selective traverses of all habitat types throughout the Study Area, whether identified as suitable or un-suitable habitat for threatened flora.	245 vegetation and habitat assessments were completed across 10 survey periods, including 42 BioCondition assessments. Meander searches were undertaken at the same time as vegetation and habitat assessments within the Study Area. 17 targeted flora transects conducted during the September 2024 survey period in impact areas ranging from 30 minutes to an hour.	Survey effort considered adequate. This species has not been observed during field surveys, despite suitable habitat being identified.

5.3.16.4 HABITAT ASSESSMENT AND MAPPING

Potential *S. johnsonianum* habitat occurs within the Study Area in association with the following BHT:

- Brigalow woodlands.

Based on the definition provided in Section 5.3.16.2, although the Study Area is located outside the species modelled distribution, to be conservative the habitat identified within the Study Area has been considered to have the potential to constitute habitat critical to the survival of the species due to the species highly restricted distribution and the presence of recent records within 50 km of the Study Area.

This habitat has been mapped, with a total of 260.6 ha of potential habitat occurring in the Study Area. Mapped habitat for *S. johnsonianum* is shown on Figure 5-32 with habitat types summarised below in Table 5-37.

TABLE 5-37 *S. JOHNSONIANUM* HABITAT SUMMARY IN THE STUDY AREA

	Potential Habitat	**Generally Unsuitable Habitat**
Description	Open forest and woodland habitats on heavy cracking clay soils dominated or co-dominated by brigalow (*A. harpophylla*).	Habitats not dominated by brigalow (*Acacia harpophylla*).
Mapped habitat within the Study Area (by BHT)	• Brigalow woodlands dominated by *Acacia harpophylla.*	• Grasslands and cultivated agricultural land; • Eucalypt woodland and open forest dominated by *E. crebra* with a grassy understorey; • Vine forest/ thickets and dry rainforest; • Waterbodies and drainage features; and • Riparian woodland and open forest dominated by *E. tereticornis* often associated with stream channels.
Total in the Study Area (ha)	260.6	46,512.8
Total in the Project Area (ha)	10.4	6,664.5

Legend

- Study Area
- Disturbance Footprint
- Project Area

***Solanum johnsonianum* Habitat**

- Potential Habitat
- Road
- Track and Path

Coordinate System:
GDA2020 MGA Zone 56

Date: 27/05/2025
Created By: SP?HD
Drawing Size: A3

0 1 2 3km

1:125,000

F5-32 Potential *Solanum johnsonianum* Habitat within the Study Area

Theodore Wind Farm PER

Theodore Energy Development Pty Ltd

ERM

0661076_PER_R2\0661076_PER_5-32_R1

5.3.17 XEROTHAMNELLA HERBACEA

Xerothamnella herbacea is listed as Endangered under the EPBC Act, effective 16 July 2000, and was assessed as having the potential to occur in the Study Area.

5.3.17.1 SPECIES DISTRIBUTION AND HISTORICAL RECORDS

X. herbacea is known only from a few official observations: two records north of Chinchilla, one record near Theodore, and a record near Goondoowindi. The Study Area is located within the 'species or species habitat may occur' modelled distribution of the species (DCCEEW, 2024a)(Figure 5-33). No historical record of the species occurs within the Study Area or the Locality, with the closest record of the species located 30 km north-west of the Study Area near Moura (dated 2018) (ALA, 2024) (Figure 5-33).

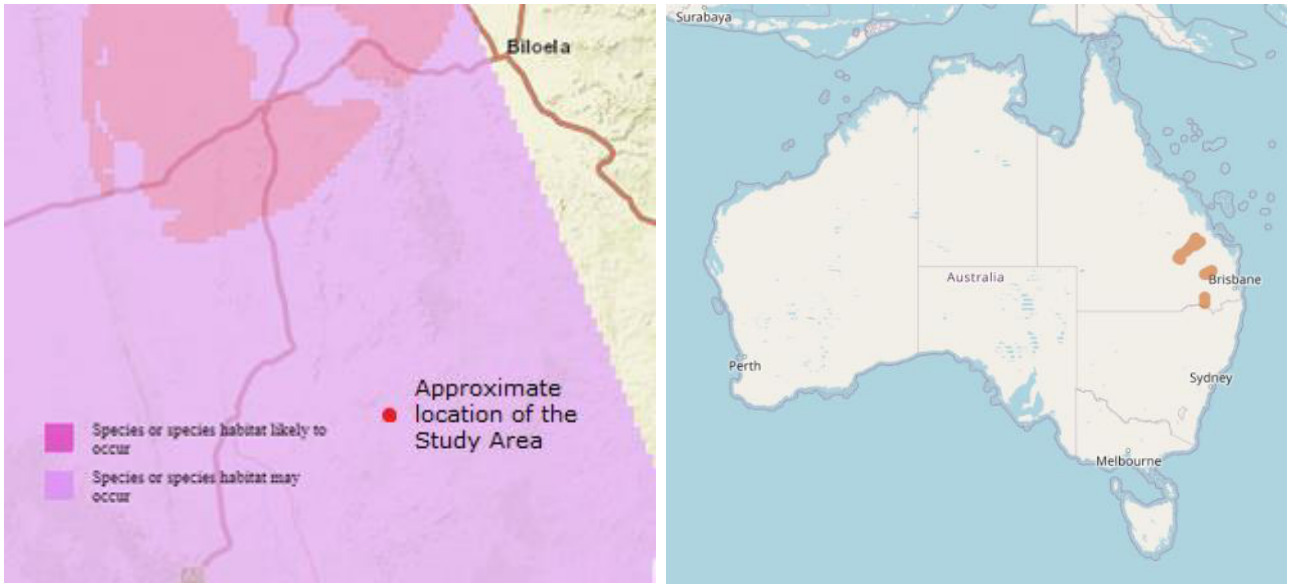


FIGURE 5-33 *XEROTHAMNELLA HERBACEA* MODELED DISTRIBUTION (DCCEEW, 2024A) AND RECORDS (ALA, 2024)

5.3.17.2 HABITAT REQUIREMENTS

The species occurs in well-shaded and gilgai-rich microhabitats in brigalow (*Acacia harpophylla*) dominated woodlands with heavy, grey to dark brown clay soils. The species is known to occur in cleared/non-remnant vegetation (DEWHA, 2008d). In Queensland, *X. herbacea* has been found in gidgee woodland with blunt-leaved cassia and *Senna artemisioides* subsp. *coriacea* on clay soils with a gravel surface, as well as on low slopes of dissected tablelands with clay soils and stony surface debris (DCCEEW, 2024a).

Habitat Critical to the Survival of the Species

Habitat critical to the survival of the species has not been specifically described for *X. herbacea* (DEWHA, 2008d). Therefore, habitat critical to the survival of the species has been considered according to the following description (as provided in the *SIG 1.1* (DEWHA, 2013)).

> *Habitat critical to the survival of a species or ecological communities are areas that are necessary:*
>
> - *"For activities such as foraging, breeding, roosting, or dispersal;*

- *For the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators);*
- *To maintain genetic diversity and long-term evolutionary development; and/or*
- *For the reintroduction of populations or recovery of the species or ecological community.*

5.3.17.3 FIELD SURVEYS

Survey Methodology and effort

A total of 245 vegetation and habitat assessments were completed across the Study Area during the 10 field surveys, including random meanders completed concurrently with these surveys in suitable habitat for the species across the Study Area.

This total includes 42 BioCondition assessments, including 35 conducted in eucalypt open woodland/riparian communities, three in patches of brigalow woodland, two in vine thicket/dry rainforest communities, and two in open grasslands/cleared environments.

A total of 17 targeted flora transects were also conducted during the September 2024 survey period.

For further detail on the ecological investigations completed within the Study Area, including desktop searches, survey timing and survey methodology, refer to Section 4.8.

Survey Results

This species was not observed during field surveys, despite suitable habitat being identified.

Survey Adequacy

Considering relevant guidelines and recommendations, the field survey methodology and effort has been considered adequate for this species. Survey guideline advice for *X. herbacea*, field survey effort and adequacy is outlined in Table 5-38.

TABLE 5-38 *XEROTHAMNELLA HERBACEA* FIELD SURVEY ADEQUACY

Survey Guidelines and Recommendations	Survey Effort Utilised and Timing	Comment on Field Survey Adequacy
Flora Survey Guidelines – Protected Plants, Nature Conservation Act 1992 (DES, 2020) Random, non-selective traverses of all habitat types throughout the Study Area, whether identified as suitable or un-suitable habitat for threatened flora.	245 vegetation and habitat assessments were completed across 10 survey periods, including 42 BioCondition assessments. Meander searches were undertaken at the same time as vegetation and habitat assessments within the Study Area. 17 targeted flora transects conducted during the September 2024 survey period in impact areas ranging from 30 minutes to an hour.	Survey effort considered adequate. This species has not been observed during field surveys, despite suitable habitat being identified.

5.3.17.4 HABITAT ASSESSMENT AND MAPPING

Potential *X. herbacea* habitat occurs within the Study Area in association with the following BHT:

- Brigalow woodlands.

Based on the definition provided in Section 5.3.17.2, the total area of potential *X. herbacea* habitat in the Study Area has conservatively been considered to constitute habitat critical to the survival of the species.

This habitat has been mapped, with a total of 260.6 ha of potential habitat occurring in the Study Area. Mapped habitat for *X. herbacea* is shown on Figure 5-34 with habitat types summarised below in Table 5-39.

TABLE 5-39 *XEROTHAMNELLA HERBACEA* HABITAT SUMMARY IN THE STUDY AREA

	Potential Habitat	**Generally Unsuitable Habitat**
Description	Brigalow *(Acacia harpophylla*) dominated woodlands.	Habitats not dominated by brigalow (*Acacia harpophylla*).
Mapped habitat within the Study Area (by BHT)	• Brigalow woodlands dominated by *Acacia harpophylla.*	• Grasslands and cultivated agricultural land; • Eucalypt woodland and open forest dominated by *E. crebra* with a grassy understorey; • Vine forest/ thickets and dry rainforest; • Waterbodies and drainage features; and • Riparian woodland and open forest dominated by *E. tereticornis* often associated with stream channels.
Total in the Study Area (ha)	260.6	46,512.8
Total in the Project Area (ha)	10.4	6,664.5

Legend

- Study Area
- Disturbance Footprint
- Project Area

***Xerothamnella herbacea* Habitat**

- Potential Habitat
- Road
- Track and Path

Coordinate System:
GDA2020 MGA Zone 56

Date: 27/05/2025
Created By: SP/HD
Drawing Size: A3

0 1 2 3km

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F5-34 Potential *Xerothamnella herbacea* Habitat within the Study Area

Theodore Wind Farm PER

Theodore Energy Development Pty Ltd

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5.4 LISTED MIGRATORY SPECIES

The PMST results (Appendix B) indicated the possible occurrence of 12 EPBC Act listed migratory species within the Study Area. Based on field surveys and a likelihood of occurrence assessment (Appendix C), two EPBC Act listed migratory species have been assessed as having the potential to occur within the Study Area (Table 5-40). No signs or observations of these species within the Study Area occurred during field surveys. However, species' presence within the Study Area cannot be ruled out due to overlapping distribution and suitable habitat occurring within the Study Area.

Satin flycatcher (*Myiagra cyanoleuca*) and rufous fantail (*Rhipidura rufifrons*) were originally included in the referral information and assessed for potential impacts of the Proposed Action. Following recent changes to the EPBC Act Migratory Species list (*List of Migratory Species Amendment (1) Instrument 2024*, dated 11/09/2024), these species no longer require assessment under the EPBC Act as MNES and are therefore not assessed as part of this PER.

TABLE 5-40 LIKELIHOOD OF OCCURRENCE RESULTS (MIGRATORY SPECIES)

Scientific Name	Common Name	EPBC Act Status	Likelihood of Occurrence
Birds			
Hirundapus caudacutus	White-throated needletail	V and Mi	Potential
Apus pacificus	Fork-tailed swift	Mi	Potential

EPBC Act listing status: Mi = Migratory

5.4.1 WHITE-THROATED NEEDLETAIL

White-throated needletail (EPBC Act migratory) is also listed under the EPBC Act as Vulnerable and has therefore been addressed within Section 5.3.8.

5.4.2 FORK-TAILED SWIFT

Fork-tailed swift is listed as migratory under the EPBC Act due to its inclusion in the *China-Australia Migratory Bird Agreement (CAMBA*), Ja*pan-Australia Migratory Bird Agreement (JAMBA*) and the *Republic of Korea-Australia Migratory Bird Agreement (ROKAMBA*). The species is considered as having the potential to occur in the Study Area.

5.4.2.1 SPECIES DISTRIBUTION AND HISTORICAL RECORDS

Fork-tailed swift migrates to Australia during the species' non-breeding season, roughly October to April (DCCEEW, 2024a). The Study Area occurs within the 'species or species habitat likely to occur' modelled distribution (DCCEEW, 2024a). One outdated historical record of the species exists within the Locality from 2002 (ALA, 2024).

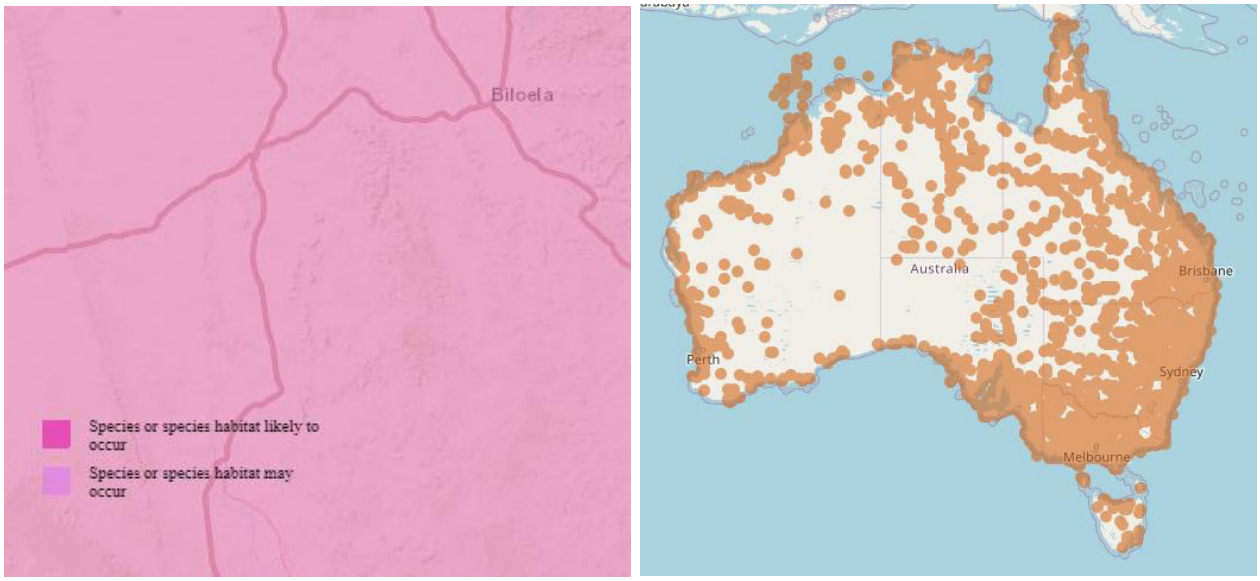


FIGURE 5-35 FORK-TAILED SWIFT MODELED DISTRIBUTION (DCCEEW, 2024A) AND RECORDS (ALA, 2024)

5.4.2.2 HABITAT REQUIREMENTS

During it's time in Australia, the species remains almost exclusively aerial, foraging above a variety of habitats across all states of Australia. The species is largely considered to roost aerially, with it being extremely rare for the species to roost terrestrially in Australia.

Important Habitat

The *Draft referral guideline for 14 birds listed as migratory species under the EPBC Act* (DoE, 2015) identifies that important habitat for the fork-tailed swift is '*a range of habitats, from inland open plains to wooded areas, where it is exclusively aerial'*.

5.4.2.3 FIELD SURVEYS

Survey Methodology and effort

A total of 171 20-minute BUS were completed over 38 locations across the Study Area, during eight field survey periods (four across each season):

Dry season

- October 2022 - 23 surveys, 12 morning and 11 afternoon;
- June 2023 - 24 surveys repeat visits to BUS points including 12 morning and 12 afternoon surveys;
- September/October 2023 - 26 surveys, repeat visits to BUS points including 12 morning and 14 afternoon surveys; and
- June 2024 -18 surveys, repeat visits to BUS points including 9 morning and 9 afternoon surveys.

Wet Season

- February 2023 - 32 surveys, repeat visits to BUS points including 16 morning and 16 afternoon surveys;

- March 2023-2 8 surveys, repeat visits to BUS points including 14 morning and 14 afternoon surveys;
- December 2023 - 40 surveys, repeat visits to BUS points including 20 morning and 20 afternoon surveys; and
- February 2024-27 surveys, repeat visits to BUS points including 13 morning and 14 afternoon surveys.

It is important to note that the fork-tailed swift is a migratory species, and that the species is more likely to be observed utilising the Study Area in the warmer months (roughly from October to April).

For further detail on the ecological investigations completed within the Study Area, including desktop searches, survey timing and survey methodology, refer to Section 4.8.

Survey Results

The species was not observed during field surveys.

Survey Adequacy

Considering relevant guidelines and recommendations, the field survey methodology and effort has been considered adequate for this species. Survey guideline advice for fork-tailed swift and field survey effort and adequacy are outlined in Table 5-41.

TABLE 5-41 FORK-TAILED SWIFT FIELD SURVEY ADEQUACY

Survey Guidelines and Recommendations	Survey Effort Utilised and Timing	Comment on Field Survey Adequacy
Draft referral guidelines for 14 birds listed as migratory species under the EPBC Act (DoE, 2015) No survey guidelines specific to the fork-tailed swift – however, recommended to focus survey efforts from high vantage points. This species is found across a range of habitats (non-breeding habitats only), from inland plains to wooded areas. It is exclusively aerial.	171 dawn and dusk timed surveys (20 minutes), bird utilisation surveys across 38 locations in the Study Area.	Survey effort considered adequate. Surveys were conducted from vantage points in the Study Area and done in the appropriate timing to detect the species. The species was not detected in any of the survey. The habitat in the Study Area, was not deemed suitable for the species to roost in.

5.4.2.4 HABITAT ASSESSMENT AND MAPPING

Considering the habitat requirements provided in Section 5.4.2.2, the entirety of the Study Area may be considered suitable foraging habitat for the fork-tailed swift. It must be noted however, that the species will only occur as a flyover visitor and is unlikely to roost within the Study Area. Habitat for the fork-tailed swift has therefore not been mapped within the Study Area as the entirely of the Study Area is considered potential arial foraging habitat.
Additionally, based on the 'important habitat' description also provided in Section 5.4.2.2, this potential foraging habitat may constitute important habitat for the species. An assessment of collision risk and management measures to minimise impacts is considered in the Bird and Bat Management Plan (BBMP), Appendix D.

As demonstrated in Figure 5-16, landscape features within the north of the Study Area (extending to the north and east outside of the Study Area) contain higher slope gradients that may present a terrain that promotes the occurrence of suitable updraughts that might support foraging for fork-tailed swift. The use of this landscape feature for potential foraging by the species cannot be ruled out, and as a result this area within the Study Area is considered to have the highest potential value for foraging for the species.

5.5 THE GREAT BARRIER REEF MARINE PARK, WORLD HERITAGE PROPERTY, AND NATIONAL HERITAGE PLACE (THE GREAT BARRIER REEF)

The following Sections summarise information relevant to assess the potential impacts of the Proposed Action on the Great Barrier Reef. These Sections provide historical information and relevant topographical and hydrological parameters for the Study Area, including numerical data where available.

5.5.1 LOCAL RAINFALL AND CLIMATIC CONDITIONS

The Study Area is located approximately 20km east of the rural township of Theodore in the Shire of Banana, Queensland. Theodore is characterised by a sub-tropical climate, with a distinct wet season (October to February) and dry season (March to September). The minimum mean monthly rainfall for the region is 26.7 mm in August, with a maximum mean monthly rainfall of 92.2 mm in February. The risk of erosion and sediment runoff induced by rainfall and stormwater runoff would be greatest during the wet season months. The mean annual rainfall at Theodore (1967 to 2024) is 659.4 mm, 7% higher than the long-term average (1900 to 2015) of 616 mm for the state of Queensland (BoM, 2021).

Rainfall data is presented Figure 5-36 and was sourced from the Bureau of Meteorology (BOM) Theodore weather station (station no. 039158) which is located approximately 20 km west of the Study Area. The dataset from Theodore Station represents monthly rainfall data collected from July 1967 to July 2024.

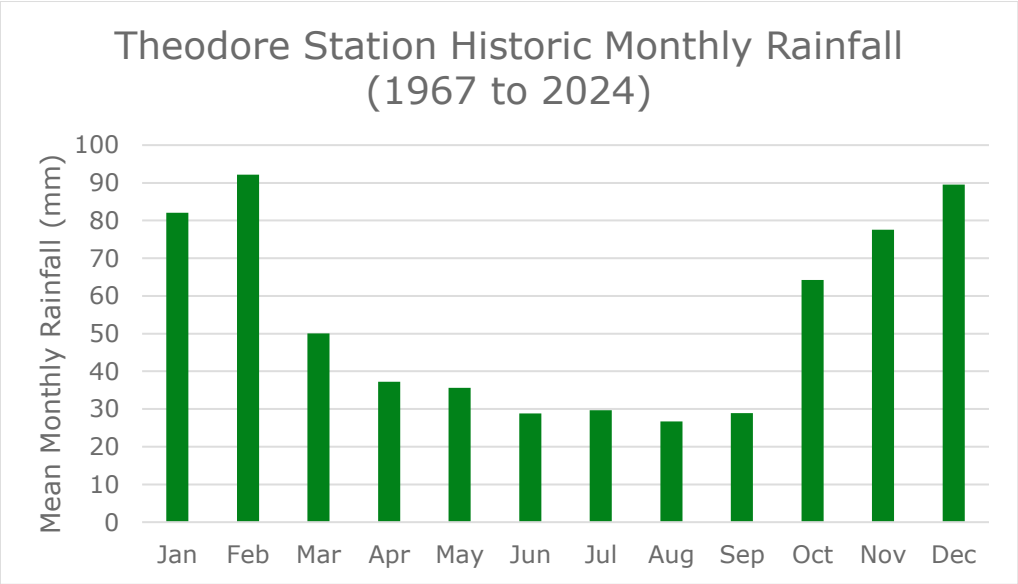


FIGURE 5-36 THEODORE STATION (039158) HISTORIC MONTHLY RAINFALL

5.5.2 HISTORICAL LAND USE

The Australian Land Use and Management Classification mapping (Department of Agriculture, 2016), the predominant land use of the Study Area is 'Grazing Native Vegetation. Under the ALUM classification system, grazing native vegetation includes "land uses based on grazing by domestic stock on native vegetation where there has been limited or no deliberate attempt at pasture modification." A grazing land use implies the ground will have been compacted in areas where stock have been present. Heavy stock traffic can lead to increased erosion and sediment loss. Smaller land use areas scattered throughout the Study Area include residential, utilities, reservoir/dam, cropping, and grazing modified pastures.

Existing land management practices will be largely unaffected by the Proposed Action as the host properties are able to continue to use the land for agricultural activities throughout the life of the project, including the shared use of access tracks and locations with landowners for the effective continuation of existing land use with potential for improved productivity.

Notable roads within the vicinity of the Proposed Action include Crowsdale Camboon Road in the east, Defence Road in the west and Hamilton's Road in the north-west. Smaller roads and tracks include Rockhampton Street and Park Street which adjoin the southern section of Crowsdale Camboon Road, and several Queensland Parks and Wildlife Service owned unnamed tracks in the east.

5.5.3 TOPOGRAPHY

The Study Area is located across a range of terrains from generally low hilly country with long moderate gentle slopes, to small alluvial plains, moderate high hills with rounded crests and straight often gentle side slopes with narrow valley plains. A small portion of the Study Area is located within areas described as steep, hilly mountainous country.

Contour mapping available on Queensland Globe and presented in Figure 5-37 indicates a maximum point of elevation of 540m AHD at the centre of the Study Area, with a minimum point of elevation of 220 m AHD recorded along Castle Creek in the north of the Study Area.

The Proposed Action does not present significant changes to the topographical landscape of the Study Area. Cut and fill earthworks are anticipated to support the development of hard standing infrastructure, such WTGs and their foundations.

Barfield Road
Sawells Walloon Road
Lonesome Creek
Scotts Road
Goades Road
Shawlands Road
Twenty Mile Creek
Dingly Dell Road
Castle Creek
Pump Creek
Rawbelle Road
Lyndale Road
Keen Creek
Crowsdale Camboon Road
Hamiltons Road
Defence Road
Huggins Road
Camboon State Forest
Mooccooroobah Road

Legend

- Study Area
- Major Watercourse
- Road
- Track and Path

Elevation Contours

- 200
- 250
- 300
- 350
- 400
- 450
- 500
- 550

Coordinate System:
GDA2020 MGA Zone 56

Date: 06/11/2024
Created By: SP
Drawing Size: A3

0 1 2 3km

1:125,000

F5-37 Site Elevation

Theodore Wind Farm

Theodore Energy Development Pty Ltd

ERM

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5.5.4 SOIL TYPE(S) AND ERODIBILITY

Australian Soil Classification mapping (accessed via Queensland Globe) was used to identify Sodosol and Chromosol as the dominant soil types throughout the Study Area. This is presented in Figure 5-38.

Sodosols are defined as texture-contrast soils, and are susceptible to high erodibility, particularly following the removal of vegetation (QLD Gov, 2013). Sodic soils are dispersive and highly susceptible to deep, narrow rilling on slopes and drains. Where water flows not managed appropriately, sodic soils are highly susceptible to tunnel erosion (IECA, 2008).

In contrast to sodosols, chromosols do not exhibit a sodic subsoil, although they may be susceptible to erosion due to characteristics such as soil structure decline and poor local drainage.

Legend

- Study Area
- Disturbance Footprint
- Project Area

Australian soil classification (ASC)

- Chromosol
- Dermosol
- Kurosol
- Rudosol
- Sodosol
- Tenosol
- Vertosol
- Road
- Track and Path

Coordinate System:
GDA2020 MGA Zone 56

Date: 27/05/2025
Created By: SP/HD
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F5-38 Soil Types

Theodore Wind Farm PER

Theodore Energy Development Pty Ltd

ERM

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5.5.5 KNOWN OR POTENTIAL CONTAMINANTS

There is currently limited information available regarding the presence and extent of potential contaminants within the Study Area. Given the existing land uses are predominantly grazing, anticipated potential contaminants associated would normally be elevated nutrients (nitrogen and/or phosphorus), and animal wastes.

Contaminants introduced to the Study Area as a result of the Proposed Action may include concrete (used in the footings of WTGs and other hardstanding infrastructure), hydrocarbons (associated with fuels for vehicles), and various oils and chemicals associated with the construction, operation and maintenance of infrastructure. Construction activities for the Proposed Action present the potential risk for an increase in erosion and sedimentation.

The Proposed Action will include a series of action plans outlining procedures in the event of identifying potential contamination within the clearing area or in the event of a spill. The project will be governed by Construction Environment Management Plan (CEMP) which will include an Erosion and Sediment Control Plan (ESCP). With effective implementation of the management plans and procedures, risks associated with contaminated land are expected to be minimal.

5.5.6 GROUNDCOVER

The condition of groundcover in the Study Area has largely been influenced by historical land clearing and cattle grazing, with large areas of cleared land featuring no remnant vegetation occurring throughout. This is most prominent in the centre and north of the Study Area, though some large swathes of cleared land also occur in the southeast of the Study Area. Almost half of the Study Area, (approximately 22,561 ha) has been cleared.

The Proposed Action has been designed to be responsive to environmental constraints on the land and minimises the amount of clearing required to facilitate the WTGs and associated infrastructure. Throughout the 1,590.1 ha Disturbance Footprint, it is anticipated that a maximum area of 818.12 ha of clearing of Regulated Vegetation will be required. Native vegetation will be cleared for the construction of the Proposed Action, however each turbine will be micro-sited before construction to ensure minimal clearing.

5.5.7 HYDROLOGICAL CONNECTION TO THE GREAT BARRIER REEF

The Study Area is located within the Dawson River catchment (Figure 5-40). The Dawson River is located approximately 15km to the west of the Study Area at its closest point, flowing from south to north. The Dawson River catchment is a sub catchment of the larger Fitzroy River catchment, which is one of the largest in Queensland, covering an area of >142,600 square kilometres. The Dawson River converges with the Mackenzie River to form the Fitzroy River approximately 140 km (as the crow flies) to the north of the Study Area near the rural township of Duaringa. From this point, the Fitzroy River generally flows east to west, flowing through Rockhampton before reaching the Great Barrier Reef Marine Park (GBRMP) at the coast north of Gladstone, approximately 480km upstream of the Study Area.

The Fitzroy River catchment is the largest of six catchments that comprise the Fitzroy region, a natural resource management region that drains into the Great Barrier Reef off coastal Queensland.

Flows within the Dawson River are influenced by seasonal rainfall, with higher flows typically observed during the wet season (December to February) and lower flows during the dry season (April to August). As such, erosion and sedimentation risk for the region is expected to be greatest during these wet season months.

Streamflow data for the Dawson River is presented Figure 5-39 and was sourced from the Queensland Government Water Monitoring Information Portal. Figure 5-39 displays data collected at the Dawson River at Woodleigh open gauging station (identifier no. 130317B) which is located approximately 30km west of the Study Area. The dataset from the Dawson River at Woodleigh open gauging station represents streamflow data collected from October 1985 to September 2024.

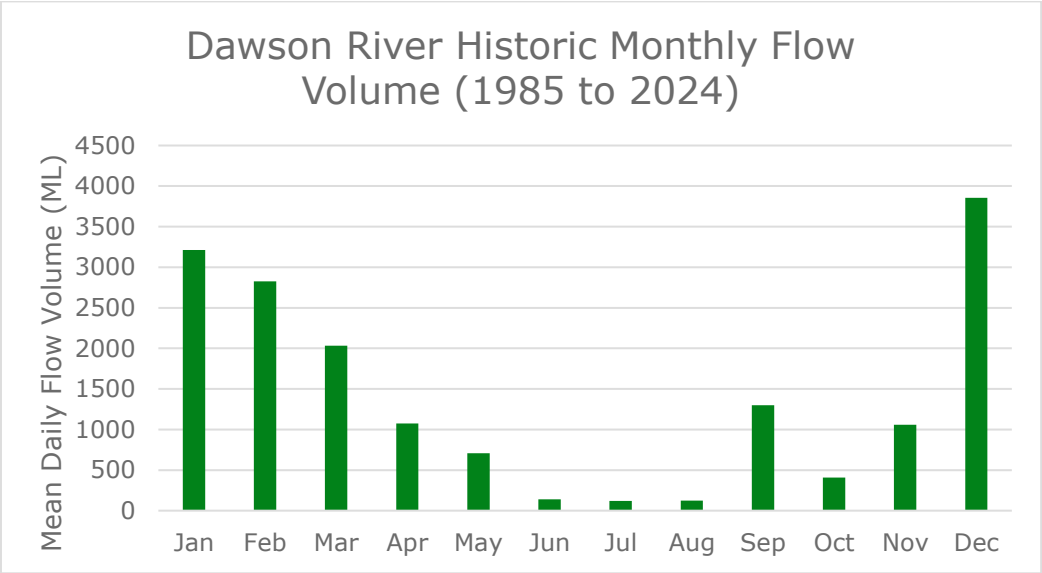


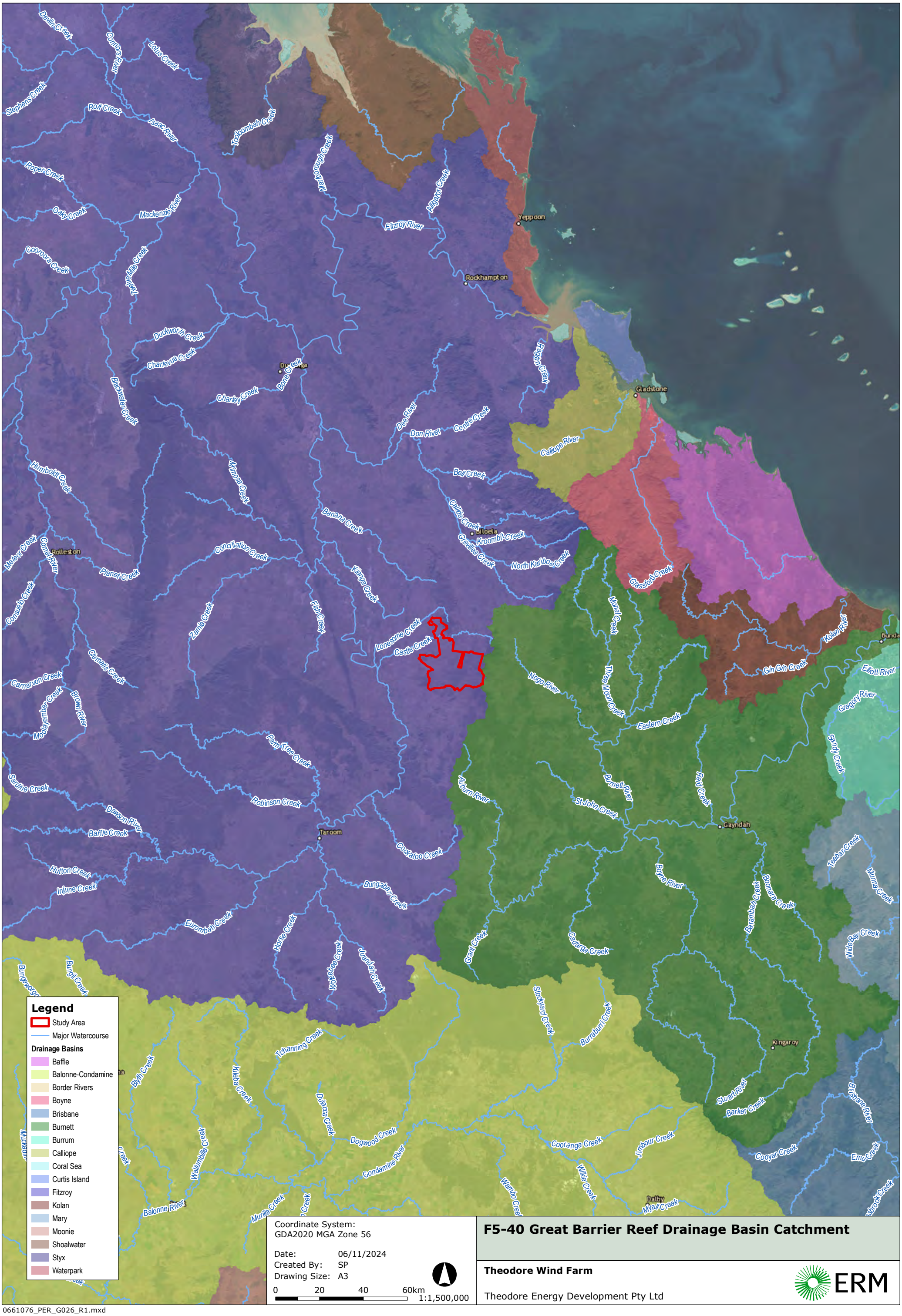
FIGURE 5-39 MEAN DAILY FLOW VOLUME AT STATION 130317B

Within the Study Area there are several tributaries of the Dawson River, the most notable of which is Castle Creek, classified as Stream Order 5 under the Strahler system of stream order. Castle Creek intersects the Study Area in the north however, it does not intersect the Disturbance Footprint. Several other tributaries of the Dawson River and Castle Creek the flow through the Study Area, as detailed in Figure 5-41.

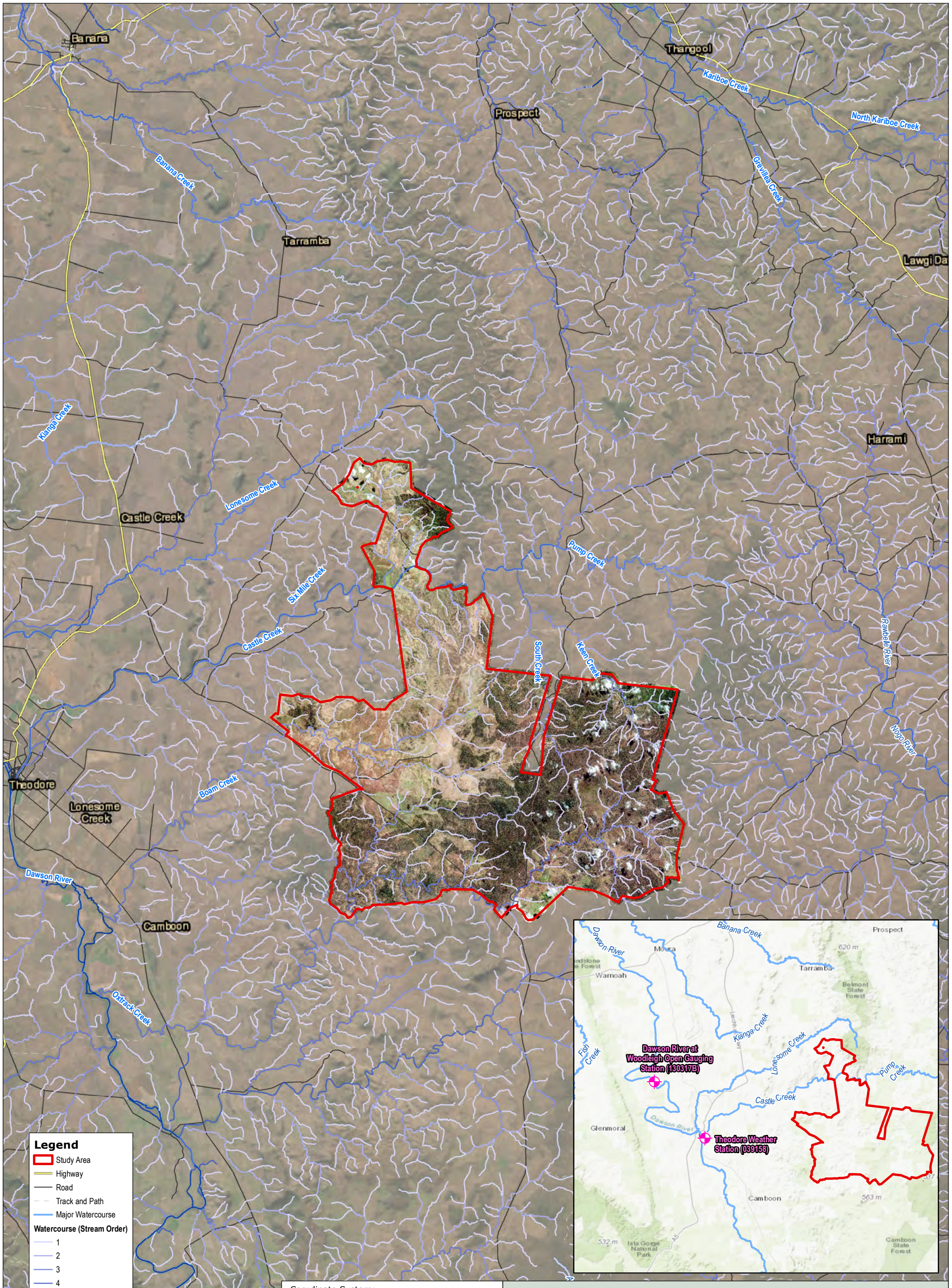
The Proposed Action will result in a negligible increase in impervious surfaces in the post-development landscape. The Disturbance Footprint shows limited amount of works near or within waterways (other than the construction of access tracks). It is noted, approval for waterway barrier works defined under the *Fisheries Act 1994* will be required prior to construction. The overall change in imperviousness across the catchment is considered to be negligible, with some small, temporary changes in flows during the construction phase. The Proposed Action is not expected to cause any impacts to the downstream waterways or nearby property owners.

Detailed design will refine the corridor of disturbance across the Disturbance Footprint, ensuring potential impacts to the natural drainage patterns of watercourses are minimised. Impacts to the watercourses associated with the Proposed Action do not result in a significant residual impact.

Development and implementation of a site specific ESCP will ensure the Proposed Action does not pose any unacceptable risks to surface water quality.



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Banana
Thangool
Kariboe Creek
North Kariboe Creek
Prospect
Banana Creek
Crevillea Creek
Tarramba
Lawgi Da
Harrami
Kianga Creek
Lonesome Creek
Castle Creek
Six Mile Creek
Pump Creek
Rawbelle River
South Creek
Keen Creek
Nogo River
Theodore
Lonesome Creek
Boam Creek
Dawson River
Camboon
Oxtrack Creek
Legend
Study Area
Highway
Road
Track and Path
Major Watercourse
Watercourse (Stream Order)
1
2
3
4
5
6
7
8
Dawson River
Banana Creek
Prospect
Moura
620 m
Tarramba
Warnoah
Belmont State Forest
Fish Creek
Kianga Creek
Lonesome Creek
Pump Creek
Dawson River at Woodleigh Open Gauging Station (130317B)
Castle Creek
Dawson River
Theodore Weather Station (039158)
Glenmoral
Camboon
563 m
532 m
Isla Gorge National Park
Camboon State Forest
Coordinate System:
GDA2020 MGA Zone 56
Date: 06/11/2024
Created By: SP
Drawing Size: A3
0 2.5 5 7.5km
1:250,000
F5-41 Watercourses
Theodore Wind Farm
Theodore Energy Development Pty Ltd
ERM
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SECTION 5 REFERENCES

ALA. (2024). *Atlas of Living Australia*. Retrieved from https://www.ala.org.au/

Attexo. (2022, 12 12). *Kariboe Wind Farm Project MNES Assessment Report.* Retrieved from EPBC Act Public Portal: https://epbcpublicportal.environment.gov.au/all-referrals/project-referral-summary/project-decision/?id=3627d092-79ad-ed11-83fe-00224818abd2

BayWa r.e. (n.d.). *Kariboe Wind Farm Project MNES Assessment Report .* Prepared by BayWa r.e.

BirdLife International. (2024, September 5). *East Asia/Australasia Flyway.* Retrieved from BirdLife International Data Zone: https://datazone.birdlife.org/userfiles/file/sowb/flyways/8_EastAsia_Australasia_NEW.pdf

DAWE. (2022a). *Conservation Advice for Petaurus australis australis (yellow-bellied glider (south-eastern)).* Department of Agriculture, Water and the Environment.

DAWE. (2022b). *Conservation Advice for Phascolarctos cinereus (Koala) combined populations of Queensland, New South Wales and the Australian Capital Territory.* Canberra: Department of Agriculture, Water and the Environment. Retrieved In effect under the EPBC Act from 12-Feb-2022., from http://www.environment.gov.au/biodiversity/threatened/species/pubs/85104-conservation-advice-12022022.pdf.

DCCEEW. (2022a). *Conservation Advice for Petauroides volans (greater glider (southern and central)).* Canberra: Department of Climate Change, Energy, the Environment and Water.

DCCEEW. (2022b). *National Recovery Plan for Black-breasted Button-quail (Turnix melanogaster).* Canberra: Department of Climate Change, Energy, the Environment and Water. Retrieved from http://www.dcceew.gov.au/environment/biodiversity/threatened/publications/recovery/black-breasted-button-quail

DCCEEW. (2023a). *Conservation Advice for Chalinolobus dwyeri (large-eared pied bat).* Canberra: Department of Climate Change, Energy, the Environment and Water.

DCCEEW. (2023b). *Conservation Advice for Stagonopleura guttata (diamond firetail).* Canberra: Department of Climate Change, Energy, the Environment and Water. Retrieved from http://www.environment.gov.au/biodiversity/threatened/species/pubs/59398-conservation-advice-31032023.pdf.

DCCEEW. (2024a). *Species Profile and Threats Database*. Retrieved from Department of the Environment, Canberra: https://www.environment.gov.au/sprat.

DCCEEW. (2024b, September 5). *Geophaps scripta scripta — Squatter Pigeon (southern)*. Retrieved from Species Profile and Threats Database: http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=64440

DCCEEW. (2024c, September 20). *Denisonia maculata — Ornamental Snake*. Retrieved from Species Profile and Threats Database: http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=1193

DCCEEW. (2024d). *Onshore Wind Farm Guidance - Best practice approaches when seeking approval under Australia's national environment law.* Canberra: Department of Climate Change, Energy, the Environment and Water.

DERM. (2011). *National recovery plan for the Large-eared Pied Bat Chalinolobus dwyeri.* Department of Environment and Resource Management.

DES. (2022). *Terrestrial Vertebrate Fauna Survey Guidelines for Queensland (V 4.0).* Queensland Herbarium and Biodiversity Science, Department of Environment and Science.

DEWHA. (2008a). *Approved Conservation Advice for Cadellia pentastylis (Ooline).* Canberra: Department of the Environment, Water, Heritage and the Arts. Retrieved from http://www.environment.gov.au/biodiversity/threatened/species/pubs/9828-conservation-advice.pdf.

DEWHA. (2008b). *Approved Conservation Advice for Cossinia australiana (Cossinia).* Canberra: Department of the Environment, Water, Heritage and the Arts. Retrieved from http://www.environment.gov.au/biodiversity/threatened/species/pubs/3066-conservation-advice.pdf.

DEWHA. (2008c). *Approved Conservation Advice for Stemmacantha australis (Austral Cornflower).* Canberra: Department of the Environment, Water, Heritage and the Arts. Retrieved from http://www.environment.gov.au/biodiversity/threatened/species/pubs/23949-conservation-advice.pdf

DEWHA. (2008d). *Approved Conservation Advice for Xerothamnella herbacea.* Canberra: Department of the Environment, Water, Heritage and the Arts. Retrieved from http://www.environment.gov.au/biodiversity/threatened/species/pubs/4146-conservation-advice.pdf.

DEWHA. (2010a). *Survey guidelines for Australia's threatened bats.* Department of the Environment, Water, Heritage and the Arts.

DEWHA. (2010b). *Survey guidelines for Australia's threatened birds.* Department of the Environment, Water, Heritage and the Arts. Retrieved from https://www.dcceew.gov.au/sites/default/files/documents/survey-guidelines-birds-april-2017.pdf

DEWHA. (2013). *Significant Impact Guidelines 1.1 - Matters of National Environmental Significance.* Department of the Environment, Water, Heritage and the Arts.

DoE. (2013). *Approved Conservation Advice for the Brigalow (Acacia harpophylla dominant and co-dominant) ecological community.* Canberra: Department of the Environment.

DoE. (2014). *Approved Conservation Advice for Denisonia maculata (Ornamental Snake).* Canberra: Department of the Environment. Retrieved from Department of the Environment (2014). Approved Conservation Advice for Denisonia maculata

(Ornamental Snake). Canberra: Department of the Environment. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/1193-conservation-ad

DoE. (2015). *Draft referral guidelines for 14 birds listed as migratory species under the EPBC Act.* Canberra: Department of the Environment.

DoEE. (2019). *Conservation Advice (including listing advice) for the Poplar Box Grassy Woodland on Alluvial Plains.* Canberra: Department of the Environment and Energy.

DSEWPC. (2011a). *Survey guidelines for Australia's threatened mammals.* Department of Sustainability, Environment, Water, Population and Communities. Retrieved from https://www.agriculture.gov.au/sites/default/files/documents/survey-guidelines-mammals.pdf

DSEWPC. (2011b). *Survey guidelines for Australia's threatened reptiles.* Department of Sustainability, Environment, Water, Population and Communities.

DSEWPC. (2013). *Approved Conservation Advice for Rostratula australis (Australian painted snipe).* Canberra: Department of Sustainability, Environment, Water, Population and Communities. Retrieved from http://www.environment.gov.au/biodiversity/threatened/species/pubs/77037-conservation-advice.pdf

Eyre, T. (2004). *Distribution and conservation status of the possums and gliders of southern Queensland.* In The Biology of Australian Possums and Gliders (eds R. L. Goldingay & S. M. Jackson), pp. 1-25. Surrey Beatty & Sons, Chipping Norton.

Eyre, T. J. (n.d.). Distribution and conservation status of the possums and gliders of southern. *In RL Goldingay &SM Jackson (eds) The Biology of Australian Possums and*, 1-25.

Eyre, T. J., Smith, G. C., Venz, M. F., Mathieson, M. T., Hogan, L. D., Starr, C., . . . McDonald, K. (2022). *Guide to greater glider habitat in Queensland .* Canberra: Department of Agriculture, Water and the Environment.

Garnett, S. T., & Baker, G. B. (2021). *The Action Plan for Australian Birds 2020.* Melbourne: CSIRO Publishing.

Higgins, P. J., Peter, J. M., & Cowling, S. J. (2006). *Handbook of Australian, New Zealand and Antarctic Birds. In: Part A. Boatbill to Larks.* (Vol. 7). Melbourne, Victoria: Oxford University Press.

Higgins, P. J., Peter, J. M., & Cowling, S. J. (2007). *Handbook of Australian, New Zealand and Antarctic Birds. Volume 7: Boatbill to Starlings.* Melbourne: Oxford University Press.

Lumsden , L., Nelson, J., & Lindeman, M. (2008). *Ecological research on the Eastern Long-eared Bat Nyctophilus timoriensis (south-eastern form). A report to the Mallee Catchment Management Authority.* Melbourne, Australia: Arthur Rylah Institute for Environmental Research, Department of Sustainability and Environment.

Marchant, S., & Higgins, P. J. (1993). *Handbook of Australian, New Zealand & Antarctic, Vol. 2: Raptors to Lapwings.* Melbourne: Oxford University Press.

Martin, R., & Handasyde, K. (1999). *The Koala: Natural History, Conservation and Management.* Keieger Pub Co.

Mathieson, M., & Smith, G. (2009). *National recovery plan for the black-breasted button-quail Turnix melanogaster.* Canberra: Report to the Department of the Environment, Water Heritage and the Arts.

Melzer, A., Carrick, F., Menkhorst, P., Lunney, D., & St John, B. (2000). *Overview, Critical Assessment, and Conservation Implications of Koala Distribution and Abundance.* Conservation Biology 14(3):619-628.

Pringle, J. D. (1987). *The Shorebirds of Australia.* Sydney, NSW: Angus & Robertson.

Smyth, A. K., Noble, D., & Wiley, C. (2001). Black-breasted Button-quail in open eucalypt forest in south-eastern Queensland. *Australian Bird Watcher, 19*, 45-47.

Tarburton, M. K. (2021). Recent increase in knowledge about numbers and flight behaviour in the White-throated Needletail 'Hirundapus caudacutus'. *Australian Field Ornithology, 38*, 124-130.

TSSC. (2015a). *Conservation Advice Geophaps scripta scripta squatter pigeon (southern).* Canberra: Threatened Species Scientific Committee, Department of the Environment. Retrieved In effect under the EPBC Act from 27-Oct-2015., from http://www.environment.gov.au/biodiversity/threatened/species/pubs/64440-conservation-advice-31102015.pdf.

TSSC. (2015b). *Conservation Advice Nyctophilus corbeni south-eastern long-eared bat.* Canberra: Department of the Environment. Retrieved from http://www.environment.gov.au/biodiversity/threatened/species/pubs/83395-conservation_advice-01102015.pdf.

TSSC. (2015c). *Conservation Advice Turnix melanogaster black-breasted button-quail.* Canberra: Department of the Environment. Retrieved from http://www.environment.gov.au/biodiversity/threatened/species/pubs/923-conservation-advice-31102015.pdf.

TSSC. (2016a). *Conservation Advice Solanum dissectum.* Canberra: Departement of Agriculture, Water and the Environement. Retrieved from https://www.environment.gov.au/biodiversity/threatened/species/pubs/75720-conservation-advice-07122016.pdf

TSSC. (2016b). *Conservation Advice Solanum johnsonianum.* Canberra: Department of the Environment and Energy. Retrieved from http://www.environment.gov.au/biodiversity/threatened/species/pubs/84820-conservation-advice-07122016.pdf.

TSSC. (2019). *Conservation Advice Hirundapus caudacutus White-throated Needletail.* Canberra: Department of the Environment and Energy. Retrieved from http://www.environment.gov.au/biodiversity/threatened/species/pubs/682

Vanderduys, E., Macdonald, S., & Pavey, C. (2024). Note and photographs of a roosting White-throated Needletail Hirundapus caudacutus from New South Wales. *Australian Field Ornithology, 41*.

Williams, E., & Thomson, B. (2018). Aspects of the foraging and roosting ecology of the large-earedpied bat (Chalinolobus dwyeri) in the western Blue Mountains, with implications for conservation. *Australian Mammalogy*.

Youngentob, K. N., Marsh, K. F., & Skewes, J. (2021). *A review of koala habitat assessment criteria and methods.* Canberra: Department of Agriculture, Water and the Environment.



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Theodore Wind Farm

Public Environment Report – Impact Assessment (Section 6)

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Public Environment Report – Impact Assessment (Section 6)

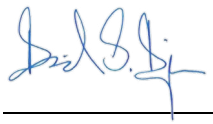
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ACRONYMS AND ABBREVIATIONS

Acronym	Description
AEP	Annual Exceedance Probability
ALA	Atlas of Living Australia
BACI	Before-After-Control-Impact
BBMP	Bird and Bat Management Plan
BHT	Broad Habitat Types
BPESC	Best Practice Erosion and Sediment Control
BUS	Bird Utilisation Survey
CEMP	Construction Environmental Management Plan
CRM	Collision Risk Model
DBH	Diameter at Breast Height
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DESI	Department of Environment, Science and Innovation
DEWHA	Department of Environment, Water, Heritage and the Arts
Disturbance Footprint	The area whereby the final layout and impacts have been considered and occupies an area of 1,590.1 ha.
E	Endangered
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
FMP	Fire Management Plan
GBR	Great Barrier Reef
IBA	Important Bird and Biodiversity Areas
IECA	International Erosion Control Association
MHQA	Modified Habitat Quality Assessment
Mi	Migratory
MNES	Matters of National Environmental Significance
MSDS	Material Safety Data Sheet
Type 1 natural regeneration	Natural regeneration restricted to low shrubbery and grass post-construction
Type 2 rehabilitation/ revegetation	Revegetation reinstated of equivalent pre-construction vegetation without height restrictions post-construction
NSW	New South Wales
PMST	Protected Matters Search Tool
Project Area	The corridor of land on which the Disturbance Footprint will be located, including a 100 metre buffer for micro-siting.
Proposed Action	Theodore Wind Farm

Acronym	Description
QLD	Queensland
QUDM	Queensland Urban Drainage Manual
REs	Regional Ecosystems
RSA	Rotor Swept Area
RULSE	Revised Universal Soil Loss Equation
SIA	Significant Impact Assessment
SRI	Significant Residual Impact
SATs	Spot Assessment Technique
SIG 1.1	Significant Impact Guidelines 1.1 – Matters of National Environmental Significance
SPRAT	Species Profile and Threats Database
State Code 23	Queensland State Code 23 – Wind farm developments
Study Area	The 9 land parcels, across 3 properties, and road reserve areas, 46,830 ha, in which the Proposed Action will be located.
TECs	Threatened Ecological Community
The Proponent	Theodore Energy Development Pty Ltd
V	Vulnerable
VCA	Vegetation Classification and Assessment
WONS	Weeds of National Significance
WTG	Wind Turbine Generators

6. IMPACT ASSESSMENT

6.1 OVERVIEW

The Proposed Action has the potential to impact on the ecological values in the Study Area during its construction, operation and decommissioning phases. This impact assessment includes the following information:

- Detailed assessment of the nature and extent of the likely short-term and long-term impacts;
- Statements on whether any impacts are likely to be unknown, unpredictable or irreversible;
- The component(s) and stage(s) of the Proposed Action that are of relevance to potential impacts on each protected matter;
- Analysis of the significance of impacts to protected matters; and
- Technical data and other information used or needed to make a detailed assessment of the relevant impacts.

This impact assessment has been undertaken with consideration for relevant departmental policies and guidelines. Table 6-1 summarises the legislation and policies considered in this Section of the report.

TABLE 6-1 KEY LEGISLATION AND POLICIES

Act/Policy	Administering Authority	Purpose
Commonwealth Legislation		
Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)	Department of Climate Change, Energy, the Environment and Water (DCCEEW)	The EPBC Act administers the protection of the environment within Australia – in particular Matters of National Environmental Significance (MNES), which include: • World heritage properties; • National heritage properties; • Wetlands of international importance; • Threatened species and ecological communities; • Migratory species; • Commonwealth marine areas; • The Great Barrier Reef Marine Park; • Nuclear Actions (include. uranium mines); and • Water Resources.
Significant Impact Guidelines 1.1 – Matters of National Environmental Significance (SIG 1.1) 2013	Department of the Environment, Water, Heritage and the Arts (DEWHA)	The significance of impacts to MNES are assessed against the SIG 1.1. For all EPBC Act listed species and ecological communities, impacts are assessed against relevant Significant Impact Assessment (SIA) criteria applicable to: 'Habitat critical to survival of the species'; and/or An 'important population' of the species; and/or 'Important habitat for a migratory species'.

Act/Policy	Administering Authority	Purpose
Species Profile and Threats Database (SPRAT)	DCCEEW	The SPRAT database provides information about species and ecological communities listed under the EPBC Act 1999. It provides information on species descriptions, population, distribution, habitat, ecology and threats. It also provides links to recovery plans and survey guidelines. Species information is compiled by summarising information from a range of sources.
EPBC Act Environmental Offsets Policy 2012	DCCEEW	This policy applies where a significant impact on an MNES is expected to occur as a result of the Proposed Action. The policy provides guidance on the role of offsets and when a proposed offset is considered suitable.

6.1.1 SIGNIFICANT IMPACT ASSESSMENT SUMMARY

Six MNES were identified as known or likely to occur in the Study Area, including four threatened species and two Threatened Ecological Communities (TECs). Additionally, 13 MNES, including threatened and migratory species, were identified as having the potential to occur within the Study Area.

Potential impacts from the Proposed Action to MNES have been assessed against the *Significant Impact Guidelines 1.1 – Matters of National Environmental Significance* (SIG 1.1) (DoE, 2013a). These significant impact assessments (SIA) have been completed assuming the proposed avoidance, minimisation, mitigation and management measures (as detailed within Section 7 of the Theodore Wind Farm PER) will be implemented. The results of the SIAs are summarised below in Table 6-2 and are provided in further detail in Section 6.6. It should be noted that the actual area of disturbance may be lower than that documented in this impact assessment as a result of further avoidance associated with detailed design, micro-siting and data obtained from pre-clearance surveys.

TABLE 6-2 MNES SIGNIFICANT IMPACT ASSESSMENT SUMMARY

MNES	EPBC Act Status	Likelihood of Occurrence	Habitat in Study Area (ha)	Direct Impact (ha)	Percentage of Habitat Impacted (%)	Potential Rehabilitation Area (ha)	Habitat Permanently Impacted (Subject to final revegetation)	SRI status
Brigalow TEC	E	Known	225.5 ha of Brigalow TEC	1.3 ha of Brigalow TEC	0.6% of Brigalow TEC	N/A	1.3 ha of Brigalow TEC	**Unlikely**
Poplar Box TEC	E	Known	478.4 ha of Poplar Box TEC	6.6 ha of Poplar Box TEC	1.4% of Poplar Box TEC	N/A	6.6 ha of Poplar Box TEC	**Likely**
Greater glider (southern and central)	E	Known	1,662.1 ha of Likely/Current Denning Habitat 381.4 ha of Potential Denning Habitat 20,070.2 ha of Foraging and Dispersal Habitat	19 ha of Likely/Current Denning Habitat 0.8 ha of Potential Denning Habitat 623.9 ha of Foraging and Dispersal Habitat	1.1% of Likely/Current Denning Habitat 0.2% of Potential Denning Habitat 3.1% of Foraging and Dispersal Habitat	N/A	19 ha of Likely/Current Denning Habitat 0.8 ha of Potential Denning Habitat 623.9 ha of Foraging and Dispersal Habitat	**Likely**
Yellow-bellied glider (south-eastern)	V	Potential	16.0 ha of Potential Denning Habitat 110.2 ha of Potential Foraging Habitat	0.3 ha of Potential Denning Habitat 5.4 ha of Potential Foraging Habitat	1.6% of Potential Denning Habitat 4.9% of Potential Foraging Habitat	N/A	0.3 ha of Potential Denning Habitat 5.4 ha of Potential Foraging Habitat	**Unlikely**
Koala	E	Known	1,613.4 ha of Preferred Foraging and Breeding Habitat 21,216.6 ha of General Foraging and Breeding Habitat 6,950.5 ha of Dispersal Habitat	6.2 ha of Preferred Foraging and Breeding Habitat 657.3 ha of General Foraging and Breeding Habitat 237.9 ha of Dispersal Habitat	0.4% of Preferred Foraging and Breeding Habitat 4% of General Foraging and Breeding Habitat 4.6% of Dispersal Habitat	237.9 ha of Dispersal Habitat	6.2 ha of Preferred Foraging and Breeding Habitat 657.3 ha of General Foraging and Breeding Habitat	**Likely**
Large-eared pied bat	E	Likely	2,856.1 ha of Foraging Habitat	16.5 ha of Foraging Habitat	0.6% of Foraging Habitat	N/A	16.5 ha of Foraging Habitat	**Unlikely**
Squatter pigeon (southern)	V	Known	9,575.4 ha of Breeding Habitat 2,333.5 ha of Foraging and Dispersal Habitat	128.3 ha of Breeding Habitat 57.6 ha of Foraging and Dispersal Habitat	0.8% of Breeding Habitat 0.7% of Foraging and Dispersal Habitat	33.4 ha of Foraging and Dispersal Habitat	128.3 ha of Breeding Habitat 24.2 ha of Foraging and Dispersal Habitat	**Likely**
White-throated needletail	V, Mi	Potential	46,773 ha of Potential Foraging Habitat[1]	N/A[1]	N/A[1]	N/A[1]	0 ha of Potential Foraging Habitat[1]	**Unlikely**
Black-breasted buttonquail	V	Potential	277.4 ha of Potential Foraging and Roosting Habitat	5 ha of Potential Foraging and Roosting Habitat	1.8% of Potential Foraging and Roosting Habitat	N/A	5 ha of Potential Foraging and Roosting Habitat	**Unlikely**
Australian painted snipe	E	Potential	56 ha of Potential Foraging Habitat	1.3 ha of Potential Foraging Habitat	2.4% of Potential Foraging Habitat	N/A	1.3 ha of Potential Foraging Habitat	**Unlikely**
Diamond firetail	V	Potential	7,899.3 ha of Potential Breeding and Foraging Habitat	263.6 ha of Potential Breeding and Foraging Habitat	3.3% of Potential Breeding and Foraging Habitat	167.8 ha of Potential Breeding and Foraging Habitat	95.8 ha of Potential Breeding and Foraging Habitat	**Potential**
Ooline	V	Potential	277.4 ha of Potential Habitat	5 ha of Potential Habitat	1.8% of Potential Habitat	N/A	5 ha of Potential Habitat	**Unlikely**
Cossinia	E	Potential	277.4 ha of Potential Habitat	5 ha of Potential Habitat	1.8% of Potential Habitat	N/A	5 ha of Potential Habitat	**Unlikely**
Austral cornflower	V	Potential	21,768.5 ha of Potential Habitat	662.5 ha of Potential Habitat	3.1% of Potential Habitat	434 ha of Potential Habitat	233.5 ha of Potential Habitat	**Unlikely**
Solanum dissectum	E	Potential	260.6 ha of Potential Habitat	2.2 ha of Potential Habitat	0.8% of Potential Habitat	1.8 ha of Potential Habitat	0.3 ha of Potential Habitat	**Unlikely**
Solanum johnsonianum	E	Potential	260.6 ha of Potential Habitat	2.2 ha of Potential Habitat	0.8% of Potential Habitat	1.8 ha of Potential Habitat	0.3 ha of Potential Habitat	**Unlikely**
Xerothamnella herbacea	E	Potential	260.6 ha of Potential Habitat	2.2 ha of Potential Habitat	0.8% of Potential Habitat	N/A	2.2 ha of Potential Habitat	**Unlikely**
Fork-tailed swift	Mi	Potential	46,773 ha of Potential Foraging Habitat[1]	N/A[1]	N/A[1]	N/A[1]	0 ha of Potential Foraging Habitat[1]	**Unlikely**

EPBC Act listing status: E = Endangered, V = Vulnerable, Mi = Migratory
1 White-throated needletail and fork-tailed swift (both potentially occurring) are aerial foraging species, and no roosting habitat has been identified. Both species are therefore considered to only utilise the arial space within the Study Area for foraging if they were to occur.

6.2 POTENTIAL IMPACTS FROM CONSTRUCTION

The key activities with the potential to impact ecological values during construction are:

- Vegetation clearing for new access tracks, temporary construction compounds and laydown areas, borrow pits, water storages, batching plants, turbine hardstands, trenches for reticulation and instrumentation cables, electrical substations and overhead powerlines and associated earthworks;
- Excavating trenches;
- Blasting for turbine foundations (if required); and
- Construction traffic movements and plant operation (rock crushing and batching plants).

Construction works are anticipated to have a duration of 36-60 months. The Disturbance Footprint of the Proposed Action (that is, the maximum area to be cleared) is 1,590.1 ha and includes a maximum impact of 613.0 ha to remnant vegetation associated with the clearing for infrastructure. The Disturbance Footprint is 3.4% of the total Study Area. It is anticipated that rehabilitation opportunities post-construction will occur to reduce the percentage of total disturbance required to facilitate construction.

6.2.1 HABITAT LOSS AND INDIVIDUAL MORTALITY FROM VEGETATION CLEARING

Construction activities will result in 1,590.1 ha of disturbance to broad habitat types (BHTs) across the Study Area throughout the duration of the construction phase. The following disturbance to BHTs and habitat within the Disturbance Footprint are anticipated to occur:

- 907.8 ha to Grasslands and cultivated agricultural land;
- 667.5 ha to Eucalypt woodland and open forest dominated by *E. crebra* with a grassy understorey;
- 6.3 ha to Riparian woodland and open forest dominated by *E. populnea, E. tereticornis* often associated with stream channels;
- 5 ha to Vine forest/thickets and dry rainforest;
- 1.3 ha to Waterbodies and drainage features; and
- 2.2 ha to Brigalow woodlands.

The loss of this vegetation is expected to negatively impact the native flora and fauna by reducing species composition and structural diversity of the area to be cleared. This impact will result in the permanent removal of these vegetation types, and the associated habitat values they provide for the native flora and fauna such as foraging, breeding, dispersal etc. for the duration of the Proposed Action. It is the permanent impact associated with habitat loss will be limited to approximately **559.7 ha**, or 1.2% of the available habitat in the Study Area, following the completion of post-construction rehabilitation, outlined in Section 8. The impacts of habitat loss from vegetation clearing are considered to constitute long-term and short-term impacts, dependent on the MNES-specific habitat requirements. This is further outlined in Section 6.6.

There is potential for direct mortality or injury to native fauna during the construction and operational activities. While many fauna groups are highly mobile (e.g. birds) and are likely to move when machinery and vehicles approach, other less mobile groups (e.g. reptiles and amphibians) may be more vulnerable to this impact. Similarly, there will be excavation (construction only) which may pose a trapping hazard for some fauna groups (e.g. amphibians, small reptiles, and small mammals).

6.2.2 HABITAT FRAGMENTATION AND PATCH ISOLATION

Habitat fragmentation is defined as a process during which "*a large expanse of habitat is transformed into a number of smaller patches of smaller total area, isolated from each other by a matrix of habitats unlike the original*" (Wilcove, McLellan, & Dobson, 1986).

Fragmentation has the potential to negatively impact ecological values and native species through habitat loss, habitat patch isolation (disrupting connectivity and reducing dispersal ability and gene flow), reducing patch size (small habitat patches may not be able to sustain local populations or individual territories) and edge effects (more edges increase the probability of individuals leaving the habitat patch, increasing mortality rates and reducing reproduction rates) (Fahrig, 2003). Specifically, creating more extensive edges through fragmentation increases the colonisation by exotic plant and animal species, and allows for more effective hunting by predator species. Additionally, certain native species such as noisy miners (*Manorina melanocephala*) and yellow-throated miners (*M. flavigula*) may also benefit from fragmentation and disrupt the ecological functioning within woodland habitat patches by outcompeting insect and nectar-feeding bird species (Neldner, et al., 2017).

The Proposed Action has the potential to contribute to fragmentation of native species habitat on a regional scale, due to the proximity of the Study Area to Belmont State Forest and Camboon State Forest and its position within a mapped regionally significant Biodiversity Corridor. Within the Study Area, more than half (60%) is mapped as non-remnant or sparse regrowth vegetation that has been impacted by clearing, cattle grazing and crop fields, with several existing cleared vehicle and cattle tracks. The remaining areas exist as relatively connected stands of remnant vegetation, however this vegetation and connectivity areas may suffer from further fragmentation if inappropriately managed. This potential impact would be considered a long-term impact.

The Disturbance Footprint intersects some areas mapped as remnant vegetation which could result in further fragmentation. However, this is limited based on the narrow linear nature of the proposed clearing with any clearing proposed to occur in small, localised strips or small patches, and as such, is unlikely to present an obstacle for most species. All clearing for access corridors will be limited to 40 m in width during the construction phase. As such, this loss of habitat is likely to have a greater impact on flora and fauna species with smaller home ranges and specific habitat requirements (e.g. small mammals, amphibians and reptiles) compared to species with larger home ranges and more general habitat preferences (e.g. larger mammals and generalist birds).

Vegetation clearing has the potential to restrict dispersal of arboreal mammals, including greater glider (known to occur within the Study Area) and yellow-bellied glider (potentially occurring). The nocturnal movements of greater glider are usually restricted to gliding between canopy trees. When dispersing, greater glider can reportedly cover distances up to 100 m (Kerle, 2001 as cited in NSW Scientific Committee, 2024), and oberservations have been made

of individuals gliding over distances of 75 m from a tree canopy 45 m high (R. Kavanagh pers. comm. as cited in Taylor & Goldingay, 2009). However, they typically glide no further than 30 m and tend to have a steeper glide trajectory compared to other gliding mammals (R. Kavanagh pers. comm. August 2013 as cited in NSW Scientific Committee, 2024). Studies on the effectiveness of road-crossing infrastructure found that a 55 m wide road can effectively restrict greater glider dispersal between two remnant forest patches (Taylor & Goldingay, 2009).

Artificial wildlife crossing structures (glide poles) have been utilised within glider habitat throughout eastern Australia to assist dispersal between areas fragmented by clearing, such as roads and highways (DCCEEW, 2022). However, only one example of greater gliders using these structures currently exists, at the Sugarloaf Pipeline project in Victoria. Annual monitoring from GHD found greater gliders were occasionally recorded on glide poles at this site, though it was not established whether they were using the structures to cross cleared areas or to move parallel to gaps (GHD 2017; Dalton 2018 as cited in DCCEEW, 2022a). Conservation advice and species-specific guidance suggest further research on greater glider dispersal ability and persistence in fragmented habitat is required (DCCEEW, 2022; DES, 2022).

Yellow-bellied gliders (south-eastern) tend not to traverse open spaces larger than their gliding distance. The species' maximum glide distance could be as high as 120 m–140 m (Kavanagh & Rohan-Jones 1982; Kambouris et al. 2013; Goldingay 2014 as cited in DAWE, 2022), though conservation advice suggests management should be informed by average gliding distance (DAWE, 2022a). Studies recording glide distances in low-canopy forest documented an average of 25.2 m and suggested a glide ratio (horizontal distance/height dropped) of 2.0 should be used to inform management decisions concerned with gliding capabilities (Goldingay, 2014). Habitat fragmentation may be effectively managed by installing glide poles, which yellow-bellied gliders (south-eastern) have been documented using (Goldingay et al. 2019; Taylor & Rohweder 2020 as cited in DAWE, 2022a).

Overhead cable systems (powerlines) have the potential to impact fauna. Birds and bats may become entangled in overhead cable infrastructure while traversing the Study Area. Depending on positioning and height, overhead cables may also attract birds to the vicinity of operating turbines by providing a potential perching resource. Overhead cable systems will be designed to allow for safe operations, using buffers between conductors and the ground, and conductors and adjacent vegetation. The transmission line has adopted a design which allows for reduced interference to canopy dwelling species due to minimising impacts to canopy vegetation.

6.2.3 INCREASED PREVALENCE OF INVASIVE PLANTS AND ANIMALS

Vegetation removal, increased vehicular activity and introduction of foreign material during the construction phase can lead to the introduction and/or spread of weeds and pest species throughout the Study Area. This introduction or spread of weeds and pests could be a result of on-foot movement, vehicular movement or the disturbance and clearing of vegetation.

Four Weeds of National Significance (WONS) and Category 3 restricted invasive plants were recorded throughout the Study Area including velvet prickly pear (*Opuntia tomentosa*), parthenium (*Parthenium hysterophorus)*, cats claw creeper (*Dolichandra unguis-cati*) and lantana (*Lantana camara)*. Additionally, six invasive fauna species were observed within the Study Area during field surveys including feral rabbit (*Oryctolagus cuniculus*), wild dog (*Canis*

lupus), feral pig (*Sus scrofa*), feral cat (*Felis catus*), house mouse (*Mus musculus*) and cane toad (*Rhinella marina*). Such weed and pest species have the potential to negatively impact native flora and fauna communities through competition for resources, habitat degradation and/or predation, parasitism or poisoning. This potential impact would be considered a long-term impact.

Presence of lantana has been observed to reduce species richness through outcompeting native flora species (particularly tree and shrub species) within Australian vegetation communities. Lantana infestation can result in altered species composition and structural diversity, and shifting tall open forests to low, dense, lantana-dominated shrubland, potentially decreasing habitat value for certain fauna (Gooden, French, Turner, & Downey, 2009).

Similarly, pest animal species are also known to negatively impact native flora and fauna. Native predators are known to be significantly impacted through poisoning by consumption of cane toads (DEWHA, 2010); specific microhabitat features, such as invertebrate diversity, leaf litter and fallen log cover, are known to be susceptible to degradation by rabbit and pigs (DoEE, 2016; DoEE, 2017); and broad range of native species are known to be vulnerable to predation from feral cats and dogs (DoE, 2015c; Centre for Invasive Species Solutions, 2024).

6.2.4 INCREASED VEHICLE IMPACTS ON FAUNA AND HABITAT

Impacts on fauna from vehicles and machinery operation have the potential to occur throughout the life of the Proposed Action, however peak traffic periods will be during the construction period. This potential impact would therefore be considered a short-term impact. Vehicle and machinery movements during the operational phase are likely to be minimal. It is well understood that collision with vehicles and machinery has the potential to kill or seriously injure fauna.

Vehicles and machinery can also damage vegetation and fauna habitat when traversing the Study Area. These impacts may be exacerbated if vehicles and machinery deviate from access roads or do not adhere to established on-site road rules and speed restrictions.

6.2.5 ALTERED FIRE REGIMES AND BUSHFIRE RISK

The Proposed Action has the potential to alter fire regimes and bushfire risk on a local scale, by increasing potential sources of ignition, and altering vegetation composition and fuel loads. Depending on the extent and severity of a fire, impacts to MNES within the Study Area may be short or long term. Risks of fire range from injury or loss of human life, loss or degradation of vegetation communities and habitat, fauna injury or mortality and impacts to water quality. Risk of a fire ignition within the Study Area is more likely to be associated with construction phase activities, for example, the use of machinery and vehicles or hot works.

Clearing of intact vegetation, increased activity and introduction of foreign material has the potential to facilitate the introduction and/or spread of weed plant species. This in turn could change the floristic composition within the Study Area, and lead to increase in fuel load in some areas. Increased fuel loads can lead to higher intensity and more damaging fire conditions. Higher intensity, more frequent wildfires are a key threatening process for a number of threatened native species (DoE, 2014; DAWE, 2022c).

6.2.6 ALTERED HYDROLOGY

6.2.6.1 STORMWATER QUANTITY

Impervious Areas

Changes in hydrology would typically be associated with a change in the imperviousness of the catchment, or as a result of substantial diversion of overland flows due to the Proposed Action. This could occur throughout all phases of the project lifecycle, from construction, during operation and through to the decommissioning phases.

On a sub-catchment scale, the 1,590.1 ha Disturbance Footprint represents a nominal 0.03% of the encompassing Dawson sub catchment (5,077,521 ha). The 1,590.1 ha Disturbance Footprint is inclusive of all disturbance and infrastructure areas, and the proportion of the footprint represented by impervious infrastructure will be notably smaller.

Whilst it is unlikely for the Proposed Action to have a measurable effect on sub-catchment hydrology, localised impacts pertaining to impervious infrastructure have the potential to arise. These may include the following:

- Localised flooding/ponding of stormwater due to reduced infiltration;
- Increase in peak flows rates and flow velocity;
- Decline in water quality due to a reduction in vegetation sediment trapping;
- Increased erosion due to an increase in concentrated flows.

Implementation and sizing of stormwater infrastructure will be in accordance with the methodology and principles described in the Queensland Urban Drainage Manual (QUDM) (IPWEA, 2024), as a means of maintaining flows to similar levels observed throughout the pre-development catchment.

Impacts to local hydrology and flow regimes may also arise due to the placement of infrastructure within identified flood risk zones, and watercourse crossings. These impacts are assessed below.

Given the localised nature of any potential impacts, any changes in stormwater quantity as a result of the Proposed Action are not anticipated to impact identified MNES.

Flooding

Based on a review of flood extent mapping (DoR, 2015) (Figure 6-1), none of the Disturbance Footprint is located within areas considered likely to be affected by a 1% annual exceedance probability (AEP) flood event of Castle Creek. The flood extent does not intersect any of the project infrastructure or clearing areas. The proposed turbines, access tracks, substations, Operation and Maintenance facility, alongside all other temporary infrastructure (such as the concrete batching plants and laydown areas) are all located outside of the 1% AEP flood area.

It is anticipated that any potential flooding impacts will be minor, confined to the ponding of water, or small-scale localised flooding during a large-scale flood event (i.e. 1% AEP).

It should be noted that the initial flood risk assessment represents a high-level assessment only, with data derived from publicly accessible desktop resources. Detailed flood modelling will be undertaken at the detailed design phase to determine the full extent of the flood risk.

Lonesome Creek
Prospect Creek
Scoria Creek
Oaky Creek
Twenty Mile Creek
Scrubby Creek
Nine Mile Creek
Purgatory Creek
Amy Creek
Seven Mile Creek
Castle Creek
South Creek
Pump Creek
Boam Creek
Marvel Creek
Keen Creek
Milton Creek
Oxtrack Creek
Nine Mile Gully
Montour Creek
Oxtrack Creek
Kable Creek
Nailcan Creek
Reardon Creek
Garvey Creek
Delusion Creek

Legend

- Study Area
- Disturbance Footprint
- Project Area
- Turbines
- AEP 1% Flood Overlay
- Laydown
- OM Compund
- Site Compound
- Substation
- Switching Station
- Optional Access Tracks
- Proposed Access Tracks
- Hardstands

Watercourse (Stream Order)

- 1
- 2
- 3
- 4
- 5
- 6
- Road
- Track and Path

Coordinate System:
GDA2020 MGA Zone 56

Date: 27/05/2025
Created By: SP/HD
Drawing Size: A3

0 1 2 3km

1:125,000

F6-1 Flood Extent

Theodore Wind Farm PER

Theodore Energy Development Pty Ltd

ERM

0661076_PER_R2\0661076_PER_6-1_R2

Watercourse Crossings

An evaluation of the Disturbance Footprint determined there are 59 potential watercourse crossings associated with the Disturbance Footprint. Each crossing attributed a nominal 40 m^2 of disturbance during construction, with widening only in specific areas. Cumulatively, the 59 watercourse crossings represent a disturbance area of 0.24 ha.

As per Figure 6-1, a majority (55) of the 59 potential watercourse crossings occur at points where the access track network intersects predominantly ephemeral waterways that are defined as Stream Order 1 or 2 under the Strahler system of stream order (DoR, 2024).

The potential impacts that may arise from disturbance associated with watercourse crossings includes the following:

- Increased sediment and nutrient loads due to altered roadside drainage arrangements;
- Disturbance and/or removal of riparian and in-stream vegetation;
- Prevention of fish passage through the crossing structure; and
- Alteration of the stream's natural flow pattern, both in-channel and floodplain flows.

The Disturbance Footprint has been designed to minimise impacts to mapped watercourses for all non-linear infrastructure. Where linear infrastructure is proposed to impact mapped watercourses, detailed design will further refine the corridor of disturbance to ensure potential impacts to the natural drainage patterns of watercourses are minimised. Where waterway crossings are considered, the design and development will comply with the accepted development requirements for waterway barrier works. By implementing controls consistent with the requirements for waterway barrier works, impacts to downstream areas are likely to be managed to acceptable levels. While some localised short-term impacts may occur, long-term impacts downstream are not expected.

6.2.6.2 STORMWATER QUALITY

Pollution from Increased Sediment and Erosion Run-Off

To quantify the extent of erosion and sedimentation from the Study Area, an erosion risk assessment was undertaken using the Revised Universal Soil Loss Equation (RUSLE). The RUSLE is an empirical equation used predict soil loss based on key data inputs (rainfall data, soil properties, digital elevation, and land use), classifying erosion risk into seven (7) categories, ranging from very low to extremely high risk. A visualisation of the erosion risk (based on the outcomes of the RUSLE) across the Disturbance Footprint is presented in Figure 6-2.

The Proposed Action has the potential to increase erosion and sedimentation beyond the pre-disturbance baseline through the following actions:

- Construction activities and land clearing works, particularly on steep slopes;
- Excessive soil disturbance and duration of exposure;
- Site traffic, particularly on unsealed roads, and along steep slopes;
- Inappropriate site practices resulting in features such as stockpiles, tracks and excavations washed away by rainfall or other surface water features;
- High velocity and concentrated flow from stormwater runoff occurring across impervious surfaces such as hardstand areas and access roads;

- Instream works for the construction of watercourse crossings;
- Works areas not stabilised and rehabilitated effectively; and
- Improper maintenance of erosion and sediment control structures.

The likelihood and scale of impact as a result of these activities is expected to be amplified when undertaken in regions of the Study Area with a high to extreme erosion risk classification (refer Figure 6-2), and during periods of the year characterised by high rainfall and streamflow (refer to Section 5.5.1 of the Theodore Wind Farm PER). Accordingly, risk will be lower when undertaken in regions where erosion risk is low, and when rainfall and streamflow are minimal.

The RUSLE assessment undertaken for the Proposed Action presents a conservative and high-level estimate of erosion risk, utilising publicly available information from sources such as Queensland Globe and the Queensland Government's QSpatial Catalogue.

The key findings of the RUSLE assessment are as follows;

- 70.92% of the Disturbance Footprint is classified as very low to low erosion risk;
- There is 0.25% of extremely high erosion risk within the Disturbance Footprint;
- High to very high erosion risk occurs in 6.16% of the Disturbance Footprint, driven by the hilly terrain of the region.

Erosion and sedimentation in areas of low to moderate erosion risk will typically be manageable with basic or industry standard controls. Where there is disturbance to areas of high or extremely high erosion risk, high-level erosion and sediment controls will be implemented. These controls are to be aligned with the methodology set out in the International Erosion Control Association (IECA) Best Practice Erosion and Sediment Control (BPESC) Book 1 (2008) and detailed in Section 7.2.2 of the Theodore Wind Farm PER. Areas of high to extreme erosion risk tend to be located in areas with steep and long slopes. The turbine locations are typically away from steep slopes and therefore avoid extremely high erosion risk areas. The IECA recommends the avoidance of areas with an extreme erosion risk wherever possible. This recommendation is reflected in the layout of the Disturbance Footprint, of which 0.25% is classified as having an extremely high erosion risk.

Legend

- Study Area
- Project Area

RUSLE

- Very Low (<150)
- Low (151-225)
- Low - Moderate (226-350)
- Moderate (351-500)
- High (501-750)
- Very High (751-1,500)
- Extremely High (>1,500)
- Road
- Track and Path

Coordinate System:
GDA2020 MGA Zone 56

Date: 27/05/2025
Created By: SP/HD
Drawing Size: A3

0 1 2 3km

1:125,000

F6-2 Revised Universal Soil Loss Equation (RUSLE)

Theodore Wind Farm PER

Theodore Energy Development Pty Ltd

ERM

Pollution from Spills

The Proposed Action does not anticipate any direct releases to receiving waters, although the following activities present a potential risk to water quality throughout all stages of the Proposed Action lifecycle:

- Leakage or accidental spillage of oil, fuel or other liquids associated with Project infrastructure, with potential to migrate off site if not captured and managed;
- Chemical leaks from batteries during the construction stages, such as accidental damage during installation has the potential to migrate off site if not captured and managed;
- The use and storage of fuel for vehicles presents a potential for hydrocarbon spills which can contaminate surface water and result in off-site migration if not captured and managed; and
- Use of water for dust suppression (and other earthworks), dependent on the type of water used. If the water used is of a poorer quality compared with the background surface water quality, this can cause an impact to surface water quality.
    - Noting that it is anticipated that water for dust suppression and earthworks will be sourced from groundwater (to include artesian and sub-artesian), rainwater (sourced from dams or collection ranks), and offsite (via trucks).

Pollution from Concrete

The potential for release of concrete based pollutants may lead to an increase in the pH of receiving surface waters. There are 5 proposed locations for concrete batching plants across the Study Area, which will support the production of concrete for the WTGs foundations and other infrastructure footings. Activities and processes that may result in the release of concrete based pollutants from the Study Area include the following:

- Concrete batching, cutting, and disposal;
- Spills of wet concrete;
- Dampening of freshly laid concrete;
- Cleaning of concrete polluted equipment (e.g. machinery, vehicles, tools) without appropriate controls for the capture of contaminated cleaning water;
- Concrete dust released into waterways; and
- Erosion of exposed concrete surfaces resulting in concrete pollution of downstream waterways.

6.2.7 ENVIRONMENTAL POLLUTION AND HAZARDOUS MATERIALS

Construction traffic movement, on-site activities and plant operation may introduce light and noise pollution, vibration and dust generation, and hazardous materials that have the potential to negatively impact adjacent vegetation communities and disturb native fauna. Impacts on MNES from environmental pollution and hazardous materials have the potential to occur throughout the life of the Proposed Action, however peak work periods will be during the construction period. This potential impact would therefore be considered a short-term impact.

Light and noise pollution have the potential to affect the physiology, behaviour and reproduction of a range of animal taxa, with these effects including reduction in animal fitness, increased risk of predation, reduced success or alternations of acoustic communication,

increase vigilance and reduced reproductive success (Newport, Shorthouse, & Manning, 2014). In Australia, it has been found that some species, such as squirrel gliders, are negatively affected by noise and light pollution and show a decrease in activity levels as light and noise pollution increase (Francis, Spooner, & Matthews, 2015). Studies suggest that the consistency of noise is more important than volume, with irregular and unpredictable noise being emitted during construction and decommissioning likely to be more disruptive to wildlife (Jones, Pejchar, & Kiesecker, 2015). For native fauna communities in general, individuals may relocate to adjacent areas during times of noise disturbance.

Blasting will result in disturbance to wildlife through vibration, noise and possibly injury from flying rock. Blasting will occur infrequently but has the potential effect of displacing nearby wildlife from retained foraging and breeding habitat.

Dust generated by vehicle and machinery movements has the potential to smother vegetation directly adjacent to the works and inhibit plant growth and palatability for native fauna. However, these effects would be localised and management measures are available to limit dust generation and dispersion.

Erosion from construction activities can alter the physical condition of an environment through the removal of topsoil and potential run off into nearby waterways. This runoff can indirectly cause impacts to aquatic habitats through changing the physical and/or chemical condition of waterways within the Study Area and within downstream environments. Additionally, there is the potential for the Proposed Action to result in pollution of waterways and aquatic habitats within and downstream of the Study Area and through improper vegetation management (inappropriate handling and use of herbicides and pesticides etc.) or potential fuel, chemical or hazardous material spills.

Hazardous materials also pose potential impacts to flora and fauna species within the Study Area. Hazardous materials likely to be used throughout the Proposed Action may include overhead cabling, barbed wire, fuel, herbicides, pesticides, oils, chemicals and other waste forms. These materials can cause direct mortality or injury to fauna species and harm flora species that may come in contact. The physical condition of environmental habitat can also be impacted by hazardous materials.

6.3 POTENTIAL IMPACTS FROM OPERATION

Operational activities and their potential impacts during the operation phase include:

- Operation of the Wind Turbine Generators (WTGs) for an estimated period of 30-35 years, resulting in potential bird and bat collision and barotrauma risks;
- Routine maintenance and servicing of WTGs, access tracks, electrical installations, and infrastructure as required, resulting in potential impacts of vehicle mortality and incidents, habitat disturbance (albeit, on a considerably smaller scale than construction phase activities), disturbance and potential hazardous materials exposure; and
- Operation of the wind farm causing changes in fauna behaviour, including avoiding previously utilised breeding or foraging resources or deviating around the areas where turbines are located (site alienation).

Operational phase activities, though longer in duration than those of construction phase activities, are anticipated to result in impacts that are of a more indirect nature, of lower frequency and smaller in intensity. Potential construction phase impacts listed above, such as

introduction/spread of invasive species, vehicle collision with fauna, altered fire regimes and hydrology, and environmental (light, noise and dust) pollution, are still relevant in the operational phase but are expected to be far less prevalent, and impacts to MNES are likely to be minimal.

6.3.1 INDIVIDUAL MORTALITY AND INJURY FROM TURBINE COLLISION AND BAROTRAUMA

One of the primary environmental concerns arising from wind farm developments in Australia and overseas is the potential impact to bird and bat species from collision with operating turbines. Wind farms are known to cause injury or mortality to birds and bats through collision with turbine blades. The potential impacts from wind farm turbine operation are generally considered to constitute long-term impacts.

In addition to mortality caused by direct collision with turbines, studies have also found that barotrauma (tissue damage caused by changes in barometric (air) pressure) caused by rapid air-pressure fluctuation near moving turbine blades accounts for a significant number of bat fatalities recorded at wind energy facilities (Baerwald, D'Amours, Klug, & Barclay, 2008).

Any incidental mortality is linked closely to the wind turbine generator Rotor Swept Area (RSA) height. RSA refers to the physical area swept by the rotating blades of a turbine during operation. The RSA height to be adopted for the Proposed Action is 87-250 m. RSA is important to note as it typically dictates the risk of impacts to certain species of birds and bats. Those species found to be flying at or above the RSA are typically more at risk from barotrauma and rotor collision than those that fly below the RSA.

Given the small area of habitat occupied by the WTGs relative to the entire Study Area, and that the bat species recorded at the Study Area (see Appendix E) tend to forage within the woodland canopy, the risk of bat injury or mortality is regarded as low. However, EPBC Act listed large-eared pied bat was recorded as ‘probable’ to occur at numerous survey locations throughout the Study Area. Impacts to this species are discussed below in Section 6.6.6.

The majority of birds recorded in the Study Area are woodland-dwelling, low-flying species. These species require woodland dominated by *Eucalyptus*, *Callitris* and *Acacia* sp., often with hollows for nesting and roosting habitat. Most woodland species were observed flying to a maximum height of 15 m or below, typically remaining beneath the height of the woodland canopy.

While few studies have been conducted to investigate the significant impacts of RSA on collision incidence, it is considered that passerine (perching birds) species, due to their fast flight patterns and high flight, and migratory species, may be more at risk than other species (Erickson, et al., 2001). The field surveys identified no EPBC Act listed passerine species that would be at greater risk of collision.

Overall, collision rates are considered to be very low for the majority of Australian bird species (Smales & Muir, 2005), including those recorded at the Study Area and surrounds. Empirical evidence shows that birds have a very high rate (99%), of wind turbine avoidance (Smales & Muir, 2005; Madders & Whitfield, 2006).

Impacts associated with turbine strike and site utilisation specific to the Proposed Action, including implementation of a Bird and Bat Management Plan (BBMP) is discussed further in Section 6.6 and Section 6.11. The BBMP is attached as Appendix D.

6.3.2 SITE ALIENATION

The construction and operation of the turbines and associated infrastructure may result in barriers to movement for species accessing and dispersing within the Study Area. The operation of the wind farm may also cause certain species to avoid the area altogether, abandoning potential key habitat resources previously used. Site alienation may affect a range of fauna in their regular traverses for breeding and foraging sites.

Birds and bats may change their flight paths to avoid collisions with turbines, potentially leading to an increase in energy expenditure and impacting on their breeding and foraging success. Migratory birds may be forced to alter their migratory flyways (Drewitt & Langston, 2006). It should be noted that only two EPBC Act listed migratory species, white-throated needletail and fork-tailed swift, have been considered to potentially occur within the Study Area.

Barriers may be created through the clearing and fragmentation of habitat and/or short-term construction activities and machinery during construction. Roads usually have a more open canopy, lack ground cover and have different thermal characteristics than the surrounding habitat, often creating a microhabitat where predation risk is higher and potentially resulting in behaviour changes and avoidance of these areas by certain species (Shepard, Kuhns, Dreslik, & Phillips, 2008).

It is expected that creating barriers to movement and dispersal may impact native species through changing dispersal behaviours, reducing access to resources (water, food, breeding (hollows, mate selection etc.)) and, depending on the strength of the barrier, disrupt ecosystem function and gene flow throughout the Study Area and broader region (Shepard, Kuhns, Dreslik, & Phillips, 2008). This potential impact would therefore be considered to constitute a long-term impact. It is likely that this impact will have a greater effect on native species that are more vulnerable to predation and are unable to disperse through non-remnant habitat, compared to those that have a lower predation threat and have greater dispersal ability (particularly within cleared, non-remnant habitat).

6.4 POTENTIAL IMPACTS FROM MAINTENANCE AND DECOMMISSIONING

Some of the potential impacts resulting from the construction and operation phases are considered likely to be repeated during the maintenance and decommissioning phases. Decommissioning phase impacts are similar to those that might occur during the construction phase (Section 6.2) but likely to be of much lower magnitude. At the end of decommissioning, the site would be rehabilitated to the extent agreed upon with the landholder. Potential impacts from maintenance and decommissioning include:

- Construction/operation traffic movements and plant operations;
- Vegetation clearing for new access tracks, temporary construction compounds and laydown areas, borrow pits, water storages and associated earthworks;
- Excavating trenches.

If a decision was taken to decommission the Proposed Action, this would involve:

- Dismantling and removal of WTGs;
- Removal of electrical reticulation where not part of permanent network infrastructure;

- Responsible disposal/recycling/reuse of infrastructure removed from site according to the waste hierarchy; and
- Areas not required for ongoing operational disturbance to be rehabilitated and or regenerated in accordance with rehabilitation management practices established in Section 8 of the PER and where not required for ongoing grazing or agricultural practices.

Considerable quantities of waste material will be generated during decommissioning of wind turbines and other infrastructure (overhead cabling, met masts) at the end of the Proposed Action's operational life. The Proponent will find sustainable and best practice waste management options during the decommissioning process, including implementing the waste reduction hierarchy and prioritising reuse and recycling options over disposal.

Underground cabling would be left *in situ*. Hardstand pads will be left in situ where rehabilitation to the prior state is not possible and deep ripped where rehabilitation to prior state is achievable, as identified in Section 8 of the PER. Turbine foundations may be left up to 500 mm below rehabilitated ground level as they do not present a risk to people or livestock. Excavations would be backfilled and rehabilitated. Access tracks could be retained on site for the continued benefit of the landholder, or they could be rehabilitated.

6.5 ASSESSMENT OF UNKNOWN, UNPREDICTED OR IRREVERSIBLE IMPACTS

The potential impacts described in Section 6.2, 6.3, and 6.4 will be monitored and managed through the use of mitigation, rehabilitation and management measures provided in Section 7. Potential impacts have been assessed based on the understanding of the local environment and the activities associated with the Proposed Action. The assessment of the Proposed Action has taken a conservative approach for understanding potential impacts. The assessment, in determining potential for impact occurrence and knowledge of the potential impacts adequately speaks to and outlines the known unknowns (impacts that we know cannot be predicted) and known knowns (impacts we are certain of). Known unknowns are dealt with by implementing research standards to decrease the amount of uncertainty and the capture the assumptions and create contingency of the potential impact.

Where unexpected, unpredicted or irreversible impacts may occur, these are likely to be in the form of unknown unknowns (knowledge of the impact and its occurrence are not known) and mitigation of unknown unknowns comes in the form of occurrence and learnings, and in this form the knowledge of the risk becomes a known unknown. Mitigating unknown unknowns is not highly successful, however can be mitigated with implementation of adaptive management practices. Adaptive management is implemented when an impact occurs which changes the management approach of that category of risk. Adaptive management has been built into all management plans that are to be finalised upon post-approval. Principles of adaptive management are also to be built into more general, broad management plans, such as the Construction Environmental Management Plan (CEMP) and Vegetation and Fauna Management Plan (VFMP).

6.6 MNES IMPACT ASSESSMENT

6.6.1 BRIGALOW (*ACACIA HARPOPHYLLA* DOMINANT AND CO-DOMINANT)

6.6.1.1 DIRECT IMPACTS

Direct impacts to Brigalow TEC associated with the Proposed Action are considered to be limited to habitat loss from vegetation clearing. The current layout of the Proposed Action has almost entirely avoided all Brigalow TEC within the Study Area as presented in Figure 5-1. It is noted that rehabilitation to affected areas will not restore this habitat to its former state, therefore any direct impact due to clearing at the construction phase is considered permanent.

Clearing within the Disturbance Footprint will result in several smaller patches of mapped Brigalow TEC (see Figure 5-1, Ground-truthed TEC Locations 8 and 15) being reduced in size to an extent that they no longer meet the minimum patch size criteria (> 0.5 ha). Therefore, the total amount (area in hectares) of Brigalow TEC in these patches has been added to the direct impact calculation.

A summary of the direct impacts on Brigalow TEC as a result of the Proposed Action is shown in Table 6-3. A total of 1.1 ha of Brigalow TEC is within the Disturbance Footprint of the Proposed Action. Due to fragmentation, 0.2 ha of Brigalow habitat will be unable to meet the key diagnostic criteria of Brigalow TEC due to a reduction in patch size, and therefore this area has been added to the permanent impact to the TEC.

TABLE 6-3 DIRECT IMPACTS TO BRIGALOW TEC

	Brigalow TEC
Study Area (ha)	225.5
Disturbance Footprint (ha)	1.1
Patches disturbed to an extent that they no longer meet the criteria for TEC (ha)	0.2
Percent of TEC within the Study Area to be impacted	0.6% of Brigalow TEC within the Study Area
Permanent impact (ha)	**1.3**

6.6.1.2 INDIRECT IMPACTS

The indirect impacts to Brigalow TEC as a result of the Proposed Action are summarised in Table 6-4, along with how these impacts will be managed and any residual impact that will affect the MNES. Avoidance, mitigation and management measures are discussed in detail in Section 7.

TABLE 6-4 INDIRECT IMPACTS TO BRIGALOW TEC

Indirect Impact	**Management of Indirect Impact**	**Residual Impact**
Habitat Fragmentation and Patch Isolation	• Areas identified as TEC will be avoided at the design and micro-siting stages. • Location of infrastructure will prioritise avoiding or minimising edge effects or dissecting tracts of native vegetation.	The Brigalow TEC observed within the Study Area is in a highly fragmented state at present. The management of potential indirect fragmentation and patch isolation will ensure

Indirect Impact	Management of Indirect Impact	Residual Impact
	• Turbine placement will maximise the use of areas that are less vegetated to avoid and minimise clearing of TEC. • Clear delineation of areas to be cleared, ensuring that the Disturbance Footprint does not extend further than planned to create unnecessary fragmentation or disturbance.	that remaining Brigalow TEC is still largely intact throughout the Study Area. Additionally, the Proposed Action will not remove or isolate TEC patches altogether, only clearing in the areas necessary for infrastructure and will not impact the TEC beyond the permanent impacts to 1.3 ha from clearing. Site works will be managed (from actions within the VFMP and CEMP) to ensure that existing TEC condition is retained. Therefore, this indirect impact will be minimised so as not to cause a residual impact to the TEC.
Increased Prevalence of Invasive Plants and Animals	• A Biosecurity Management Plan will be implemented for the site which includes requirements for vehicle washdowns and protocols to ensure activities are planned to minimise movement of vehicles, equipment and machinery outside of designated access corridors. • Staff and contractors will be given information on the location and consequences of biosecurity threats in the Study Area. • Access to a landholder's property will not occur unless authorised under a land use agreement. • Weed management and control methods will depend on the location, the identified weed species, the degree of infestation, provisions in relevant landholder agreements or conduct and compensation agreements, and local, state, and national regulatory requirements. • Imported material able to transport weed seed will be assessed to ensure they are free of contamination, disease and invasive weeds.	Management measures will limit the introduction or spread of invasive plant and animal species through relevant biosecurity measures, including weed washdowns and monitoring procedures to identify and remove weed species. This ensures that indirect impacts are minimised, preventing residual impacts on the TEC.
Increased Vehicle Impacts on Fauna and Habitat	• No driving will occur in unauthorised areas, routes and access tracks will be clearly communicated to all site visitors. All driving will be carried out at safe speeds designated for the site. • Staff and contractors will be made aware through general site induction and training of the potential to impact habitat, reporting requirements and mitigation and management measures that are to be implemented during on-site works.	Implementation of management measures will ensure residual impact to this TEC caused by operating vehicles during the construction, operation and decommissioning phases will not occur beyond the current Proposed Disturbance Footprint.
Altered Fire Regimes and Bushfire Risk	• A Bushfire Management Plan will be developed and implemented during construction and operation to mitigate the potential impact of fires to MNES habitat. • Maintenance of an asset protection zone within the Operations Footprint is required to reduce the risk of reduction of habitat due to fire.	Management measures implemented in line with the site-specific Bushfire Management Plan will greatly reduce the potential for residual impact to this TEC caused by planned or unplanned fires. These measures will ensure that

Indirect Impact	Management of Indirect Impact	Residual Impact
	• Use of industry best practice hazard reduction measures to minimise bushfire risk and environmental impacts of on-site burning of cleared vegetation. • Ensuring a 30 m bushfire setback from vegetation around electrical infrastructure. Maintaining safe distances between vegetation and potential fire-starting hazards will increase safety and reduce fire risk. • Weed management and control methods (in line with the requirements of *Biosecurity Act 2014 (Qld)*) will reduce the potential of invasive plants changing species composition on-site and increasing fire risk. • Reduce on-site fuel load and maintain firebreaks and trails.	the indirect impact is minimised to not cause an indirect residual impact to the TEC.
Altered Hydrology	• The Proposed Action will adopt best practice erosion and sediment control measures, which will implement all relevant State Codes and Guidelines. • Watercourse crossings shall be stabilised to mitigate erosion of pavement and embankment materials during rainfall events up to and including the 10% AEP storm event. • Staff and contractors will be made aware through general site induction and training of the potential to generate runoff and mitigation and management measures that should be implemented. • Construction activities must not interfere or block natural drainage e.g. disturbing channel contours.	Impacts to on-site hydrology will be managed in accordance with the CEMP. Impacts to watercourses will be addressed by stabilising to prevent erosion, and only occur in discrete work areas, such that no increase in sedimentation is overserved affecting the TEC. These measures will ensure that the indirect impact is minimised to not cause an indirect residual impact to the TEC.
Environmental Pollution and Hazardous Materials	• All hazardous materials bought on-site will be accompanied by a Material Safety Data Sheet (MSDS), all relevant personnel will be trained in their proper use. • Only registered herbicides will be used for weed management by a suitably qualified bush regeneration contractor. • Imported materials that can transport hazardous substances will be assessed to ensure they are free of contamination, disease and invasive species. • Ensuring appropriate waste management (lidded bins), to reduce potential for spread of hazardous materials on-site. • Vehicles, plant and machinery will comply with site-specific speed limits to minimise dust generation. • Dust will be minimised through engineering controls on machinery and other available dust suppression controls, such as sprinklers. • Staff and contractors will be made aware through general site induction and training of the potential to generate dust and management measures that should be implemented. • Auditing of CEMP during construction.	The management measures proposed will result in the reduction of the indirect impacts of environmental pollution and hazardous materials. Hazardous materials brought onto the site will be tightly regulated. Dust generation will be minimised such that it is unlikely to damage species that comprise the TEC. These measures will ensure that the indirect impact is minimised to not cause an indirect residual impact to the TEC.

6.6.1.3 SIGNIFICANT IMPACT ASSESSMENT

A total of 225.5 ha of Brigalow TEC has been identified within the Study Area with 1.3 ha or 0.6% of this TEC occurring within the Disturbance Footprint.

A significant impact assessment based on the guidance provided in the SIG 1.1 is presented in Table 6-5. It has been concluded that the Proposed Action is **unlikely** to have a significant impact on Brigalow TEC. Avoidance, mitigation and management measures considered within this SIA are discussed in detail in Section 7.

TABLE 6-5 SIGNIFICANT IMPACT ASSESSMENT FOR BRIGALOW TEC

Criteria	Description	Criteria Triggered?
An action is likely to have a significant impact on a critically endangered or endangered ecological community if there is a real chance or possibility that it will:		
Reduce the extent of an ecological community;	225.5 ha of Brigalow TEC occurs within the Study Area, 1.3 ha of which will be impacted by the Disturbance Footprint. Permanent impact to this 1.3 ha will result in a reduction of 0.6% of Brigalow TEC within the Study Area. Clearing of Brigalow is listed as a key threatening process under the Approved Conservation Advice for the TEC. However, the patches of Brigalow TEC impacted by the Proposed Action are small and in a highly fragmented state at present. The majority of the 225.5 ha of Brigalow TEC present within the Study Area will be retained. It is therefore unlikely the removal of 1.3 ha will reduce the overall extent of the ecological community.	Unlikely
Fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines;	225.5 ha of Brigalow TEC occurs within the Study Area, with 1.3 ha (0.6%) of this TEC occurring impacted by Disturbance Footprint. The Brigalow TEC observed within the Study Area is in a highly fragmented state at present. Management of habitat fragmentation and patch isolation will ensure that Brigalow TEC is retained as much as possible throughout the Study Area, and impacts from the Proposed Action avoid further fragmentation of TEC patches. The Proposed Action is therefore unlikely to further fragment the Brigalow TEC within the Study Area.	Unlikely
Adversely affect habitat critical to the survival of an ecological community;	*Approved Conservation Advice for the Brigalow (Acacia harpophylla dominant and co-dominant) ecological community* (DoE, 2013b) states that habitat critical to the survival of the TEC areas 'includes all patches that meet the key diagnostic characteristics and condition thresholds for the ecological community; plus the buffer zones, particularly where these include native vegetation.' It is noted that the size threshold for a patch of Brigalow to be defined a TEC is 0.5 ha. Therefore, all patches are considered habitat critical for the survival of Brigalow TEC. However, the patches of Brigalow TEC impacted by the Proposed Action are small and in a highly fragmented state at	Unlikely

Criteria	Description	Criteria Triggered?
	present. Therefore, the impact to 1.3 ha, resulting from the Proposed Action is unlikely to adversely affect habitat critical to the survival of Brigalow TEC.	
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;	The Proposed Action layout has largely avoided impact of the Brigalow TEC, with 1.3 ha of total permanent impact. Brigalow TEC is often found in cracking clay soils, often not associated with alluvium landscapes that rely on floodwaters for deposition of minerals and soils (DoE, 2013b). The 1.3 ha of impact to Brigalow TEC is unlikely to significantly modify abiotic factors in the vicinity, to a greater extent than already impacted by historic land clearing and present land use (cattle grazing). The Proposed Action is therefore unlikely to significantly affect abiotic factors necessary for Brigalow TEC to survive.	Unlikely
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;	Key canopy species for the brigalow TEC are *Acacia harpophylla* (Brigalow) potentially with *Casuarina cristata* or *Eucalyptus sp.* (DoE, 2013b). It is unlikely that a permanent impact to 1.3 ha of Brigalow TEC as a proportion of the much larger 225.5 ha available within the Study Area will substantially modify the structural or floral composition of the areas of retained TEC within the Study Area. Further, the Proponent will, as part of mitigation measures, engage in the abatement of threats in the form of management plans, and create exclusion areas as part of construction to prevent indirect impacts to Brigalow TEC outside of the Disturbance Footprint (see Section 7).	Unlikely
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; and/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	Threats to the Brigalow TEC include (DoE, 2013b): • Clearing; • Fire; • Weeds; • Pest animals; • Inappropriate grazing regimes; and • Climate change. Of these, several pose a threat to the quality or integrity of the TEC. Specifically, clearing, weeds, pest animals and inappropriate grazing regimes. Not all listed threats will be exacerbated by the Proposed Action due to previous historic and present agricultural use and the observed presence of feral flora and fauna species. Mitigation measures are proposed to avoid the further introduction and incursion of invasive species into the Study Area and specifically in ecologically sensitive areas such as areas of Brigalow TEC (see Section 7). The Proposed Action layout has avoided majority of the Brigalow TEC found within the Study Area. Impact to 1.3 ha (0.6%) of Brigalow TEC as a proportion of 225.5 ha available within the Study Area will not cause a substantial reduction in the quality or integrity of the ecological community. The Proponent will utilise measures to reduce the spread	Unlikely

Criteria	Description	Criteria Triggered?
	of weeds and seeds through appropriate biosecurity procedures (see Section 7). The Study Area is presently utilised for agricultural and grazing purposes, the Proposed Action will not be furthering agricultural practices such as herbicide and pesticide usage such that it would impact the TEC.	
Interfere with the recovery of an ecological community.	*Approved Conservation Advice for the Brigalow (Acacia harpophylla dominant and co-dominant) ecological community* (DoE, 2013b) lists priority actions to support conservation of the species and guide recovery as: • Research and monitoring to improve our understanding of the ecological community and the best methods to aid its management and recover; • Protect the ecological community to prevent further losses; • Restore the ecological community by active abatement of threats, appropriate management, restoration and other conservation initiatives; and • Communicate, engage with and support people to increase understanding of the value and function of the ecological community and encourage their efforts in its protection and recovery. Particularly landowners utilising land for agricultural practices. As the Proposed Action layout has largely avoided clearing of Brigalow TEC and the calculated impacts of 1.3 ha (0.6%) as a proportion of the observed occurrence of Brigalow TEC within the Study area it is unlikely that this would interfere with the recovery of the TEC. The Proponent will, as part of mitigation measures, engage in the abatement of threats in the form of management plans, and create exclusion areas as part of construction to prevent indirect impacts Brigalow TEC outside of the Proposed Action (see Section 7).	Unlikely
Significant Impact: Unlikely		

6.6.2 POPLAR BOX GRASSY WOODLANDS ON ALLUVIAL PLAINS TEC

6.6.2.1 DIRECT IMPACTS

Direct impacts to Poplar Box Grassy Woodlands on Alluvial Plains TEC (Poplar Box TEC) associated with the Proposed Action are considered to be limited to habitat loss from vegetation clearing. The current layout of the Proposed Action has endeavoured to avoid Poplar Box TEC within the Study Area as presented in Figure 5-2. It is noted that rehabilitation or revegetation to affected areas will not restore this habitat to its former state, therefore any direct impact due to clearing at the construction phase is considered permanent.

Clearing within the Disturbance Footprint will result in several smaller patches of mapped Poplar Box TEC (see Figure 5-2, Ground-truthed TEC Locations 17 and 18) being reduced in size to an extent that they no longer meet the minimum patch size criteria (> 5 ha). Therefore, the total amount of Poplar Box TEC in these patches has been added to the direct impact calculation.

A summary of the direct impacts to Poplar Box TEC as a result of the Proposed Action is shown in Table 6-6. A total of 1.2 ha of Poplar Box TEC is within the Disturbance Footprint of the Proposed Action. Due to fragmentation, 5.4 ha of additional area of Poplar Box habitat will be unable to meet the key diagnostic criteria of Poplar Box TEC due to a reduction in patch size, and therefore this area has been added to the permanent impact to the TEC.

TABLE 6-6 DIRECT IMPACTS TO POPLAR BOX TEC

	Poplar Box TEC
Study Area (ha)	478.4
Disturbance Footprint (ha)	1.2
Areas disturbed to an extent that they no longer meet the criteria for TEC (ha)	5.4
Percent of habitat within the Study Area to be impacted	1.4% of Poplar Box TEC within the Study Area
Permanent impact (ha)	**6.6**

6.6.2.2 INDIRECT IMPACTS

The indirect impacts to Poplar Box TEC as a result of the Proposed Action are detailed in Table 6-7, along with how these impacts will be managed and any residual impact that will affect the MNES. Avoidance, mitigation and management measures are discussed in detail in Section 7.

TABLE 6-7 INDIRECT IMPACTS TO POPLAR BOX TEC

Indirect Impact	**Management of Indirect Impact**	**Residual Impact**
Habitat Fragmentation and Patch Isolation	• Areas identified as TEC will be avoided at the design and micro-siting stages. • Location of infrastructure will prioritise avoiding or minimising edge effects or dissecting tracts of native vegetation. • Turbine placement will maximise the use of areas that are less vegetated to avoid and minimise clearing of TEC. • Clear delineation of areas to be cleared, ensuring that the Disturbance Footprint does not extend further than planned to create unnecessary fragmentation or disturbance.	The management of habitat fragmentation and patch isolation will ensure that Poplar Box TEC is retained as much as possible throughout the Study Area, avoiding any whole destruction to an area of TEC and ensuring that any natural expansion of the TEC through natural ecological function is retained. Additionally, the Proposed Action will not remove or isolate TEC patches altogether, only clearing in the areas necessary for infrastructure and will not impact the TEC beyond the permanent impacts to 1.2 ha from clearing. Site works will be managed (from actions within the VFMP and CEMP) to ensure that existing TEC condition is retained. Therefore, this indirect impact will be minimised so as not to cause a residual impact toon the TEC.
Increased Prevalence of Invasive	• A Biosecurity Management Plan will be implemented for the site which includes requirements for vehicle washdowns and	Management measures will limit the possibility of the introduction or spread of invasive plant and

Indirect Impact	Management of Indirect Impact	Residual Impact
Plants and Animals	protocols to ensure activities are planned to minimise movement of vehicles, equipment and machinery outside of designated access corridors. • Access to a landholder's property will not occur unless authorised under a land use agreement. • Weed management and control methods will depend upon the location, weed species identified, the degree of the infestation, relevant landholder agreement or conduct and compensation agreements provisions, and local, state and national regulatory requirements. • Imported material able to transport weed seed will be assessed to ensure they are free of contamination, disease and invasive weeds.	animal species through relevant Biosecurity measures including weed washdowns, and monitoring procedures to identify and remove weed species. This is such that the indirect impact will be minimised so as not to cause an indirect residual impact to the TEC.
Increased Vehicle Impacts on Fauna and Habitat	• No driving will occur in unauthorised areas, routes and access tracks will be clearly communicated to all site visitors. All driving will be carried out at safe speeds designated for the site. • Staff and contractors will be made aware through general site induction and training of the potential to impact habitat, reporting requirements and mitigation and management measures that are to be implemented during on-site works.	Implementation of management measures will ensure residual impact to this TEC caused by operating vehicles during the construction, operation and decommissioning phases will not occur beyond the current Proposed Disturbance Footprint.
Altered Fire Regimes and Bushfire Risk	• An Bushfire Management Plan will be developed and implemented during construction and operation to mitigate the potential impact of fires to MNES habitat. • Maintenance of an asset protection zone within the Operations Footprint is required to reduce the risk of reduction of habitat due to fire. • Use of industry best practice hazard reduction measures to minimise bushfire risk and environmental impacts of on-site burning of cleared vegetation. • Ensuring a 30 m bushfire setback from vegetation around electrical infrastructure. Maintaining safe distances between vegetation and potential fire-starting hazards will increase safety and reduce fire risk. • Weed management and control methods (in line with the requirements of *Biosecurity Act 2014 (Qld)*) will reduce the potential of invasive plants changing species composition on-site and increasing fire risk. • Reduce on-site fuel load and maintain firebreaks and trails.	Management measures implemented in line with the site-specific Bushfire Management Plan will greatly reduce the potential for residual impact to this TEC caused by planned or unplanned fires. These measures will ensure that the indirect impact is minimised so as to not cause an indirect residual impact to the TEC.
Altered Hydrology	• The Proposed Action will adopt best practice erosion and sediment control measures, which will implement all relevant State Codes and Guidelines.	Impacts to on-site hydrology will be managed in accordance with the CEMP. Impacts to watercourses will be addressed

Indirect Impact	Management of Indirect Impact	Residual Impact
	• Watercourse crossings shall be stabilised to mitigate erosion of pavement and embankment materials during rainfall events up to and including the 10% AEP storm event. • Staff and contractors will be made aware through general site induction and training of the potential to generate runoff and mitigation and management measures that should be implemented. • Construction activities must not interfere or block natural drainage e.g. disturbing channel contours.	by stabilising work areas to prevent erosion, and will only occur in discrete work areas, such that no increase in sedimentation affects the TEC. These measures will ensure that the indirect impact is minimised so as to not cause an indirect residual impact to the TEC.
Environmental Pollution and Hazardous Materials	• All hazardous materials bought on-site will be accompanied by an MSDS, all relevant personnel will be trained in their proper use. • Only registered herbicides will be used for weed management by a suitably qualified bush regeneration contractor. • Imported materials that are able to transport hazardous substances will be assessed to ensure they are free of contamination, disease and invasive species. • Ensuring appropriate waste management (e.g. lidded bins), to reduce potential for spread of hazardous materials on-site. • Vehicles, plant and machinery will comply with site-specific speed limits to minimise dust generation. • Dust will be minimised through engineering controls on machinery and other available dust suppression controls, such as sprinklers. • Staff and contractors will be made aware through general site induction and training of the potential to generate dust and management measures that should be implemented. • Auditing of CEMP during construction.	The management measures proposed will result in the reduction of the indirect impacts of environmental pollution and hazardous materials. Hazardous materials brought onto the site will be regulated. Dust generation will be minimised such that it is unlikely to damage species that comprise the TEC. These measures will ensure that the indirect impact is minimised to not cause an indirect residual impact to the TEC.

6.6.2.3 SIGNIFICANT IMPACT ASSESSMENT

For the purpose of the SIA, the combined total of all Confirmed and Potential Poplar Box TEC within the Study Area (478.4 ha) is considered Poplar Box TEC. The impacts to 6.6 ha therefore equate to 1.4% of the total Poplar Box TEC mapped within the Study Area.

A significant impact assessment based on the guidance provided in the SIG 1.1 is presented in Table 6-8. It has been concluded that the Proposed Action is **likely** to have a significant impact on Poplar Box TEC. Avoidance, mitigation and management measures considered within this SIA are discussed in detail in Section 7.

TABLE 6-8 SIGNIFICANT IMPACT ASSESSMENT FOR POPLAR BOX TEC

Criteria	Description	Criteria Triggered?
An action is likely to have a significant impact on a critically endangered or endangered ecological community if there is a real chance or possibility that it will:		
Reduce the extent of an ecological community;	A total of 478.4 ha of Poplar Box TEC is determined to occur within the Study Area, 6.4 ha of which will be impacted by the Disturbance Footprint. The permanent impact to this 6.6 ha will result in a reduction of approximately 1.4% of the TEC within the Study Area. Although this is a relatively low percent, an impact to 6.4 ha is considered likely to constitute a reduction in the extent of an ecological community.	Likely
Fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines;	Poplar Box TEC is known to occur within the Study Area, with 6.6 ha of the TEC impacted by the Disturbance Footprint. The Poplar Box TEC observed within the Study Area is in a relatively well-connected state at present. The current layout of the Proposed Action has endeavored to avoid Poplar Box TEC within the Study Area as much as possible. The management of habitat fragmentation and patch isolation will ensure that Poplar Box TEC is retained as much as possible throughout the Study Area, avoiding any whole destruction to an area of TEC and ensuring that any natural expansion of the TEC through natural ecological function is retained. The Proposed Action is therefore unlikely to further fragment the Poplar Box TEC within the Study Area.	Unlikely
Adversely affect habitat critical to the survival of an ecological community;	The *Conservation Advice (including listing advice) for the Poplar Box Grassy Woodland on Alluvial Plains* (DoEE, 2019) defines areas critical to the survival of this ecological community as the 'best quality, most intact patches of the ecological community'. Areas most critical to the survival of the TEC are areas of Class A Poplar Box TEC as designated by the condition and diagnostic criteria. Class B areas connected to Class A within the Study Area should also be counted as an area critical to the survival of the TEC. As the Proposed Action will result in the clearing of some Condition Class B TEC, this impact has the potential to adversely affect areas critical to the survival of the TEC within the Study Area.	Potential

Criteria	Description	Criteria Triggered?
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;	478.4 ha of this TEC occurs within the Study Area, 6.6 ha (1.4%) of which is expected to be impacted by the Proposed Action. Poplar Box TEC is a grassy woodland that occurs on alluvial soils found within the Study Area. Abiotic factors will vary due to a wide range of factors and ecological conditions including microclimates, fire regimes and drought. The 1.2 ha of impact to Poplar Box TEC is unlikely to significantly modify abiotic factors in the vicinity, to a greater extent than already impacted by historic land clearing and present land use (cattle grazing). The Proposed Action is therefore unlikely to significantly affect abiotic factors necessary for Poplar Box TEC to survive.	Unlikely
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;	The *Conservation Advice (including listing advice) for the Poplar Box Grassy Woodland on Alluvial Plains* (DoEE, 2019) lists poplar box (*Eucalyptus populnea*) as the defining species for this ecological community. Additionally, there is a distinctly sparse or absent shrub layer in this TEC. For the Proposed Action, 6.6 ha of Poplar Box TEC lies within the Disturbance Footprint. It is not anticipated that clearing of 6.6 ha as a proportion of 478.4 ha (01.4%) of the TEC within the Study area would lead to a substantial change in the species composition in patches of the ecological community such that it would be significant and deleterious to the TEC broadly. Further, The Proponent will, as part of mitigation measures, engage in the abatement of threats in the form of management plans, and create exclusion areas as part of construction to prevent indirect impacts to Poplar Box TEC outside of the Disturbance Footprint (see Section 7).	Unlikely
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; and/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	A total of 478.4 ha of this TEC occurs within the Study Area, 1.2 ha of which is within the Disturbance Footprint. As listed in the *Conservation Advice (including listing advice) for the Poplar Box Grassy Woodland on Alluvial Plains* (DoEE, 2019), threats to the TEC under the EPBC Act include: • Over-abundance of noisy miners excluding other birds; • Loss of climatic habitat; • Land-clearing; • Competition and land degradation by rabbits and goats; • Invasive species and their impact on biodiversity (including cane toads, feral cats and foxes, plants etc.); and • Beak and feather disease affecting endangered psittacines. Of these, land clearing and invasive species are applicable to the Proposed Action. To minimise the impact of clearing, Poplar Box TEC has been avoided as much as possible at the design phase. Micro-siting is likely to further reduce impacts to Poplar Box TEC where present within the Disturbance Footprint.	Unlikely

Criteria	Description	Criteria Triggered?
	Weeds of National Significance and restricted biosecurity matters are known to occur within the Study Area. The Proponent will utilise measures to reduce the spread of weeds and seeds through appropriate biosecurity procedures (see Section 7). The Study Area is presently utilised for agricultural and grazing purposes, the Proposed Action will not be furthering agricultural practices such as herbicide and pesticide usage such that it would impact the TEC. Ultimately, the Proposed Action is unlikely to cause a substantial reduction in the quality or integrity of Poplar Box TEC in the Study Area outside of the Disturbance Footprint.	
Interfere with the recovery of an ecological community.	The *Conservation Advice (including listing advice) for the Poplar Box Grassy Woodland on Alluvial Plains* (DoEE, 2019), lists key recovery actions to conserving PBGW as: • Protect the ecological community to prevent further loss of extent and condition; • Restore the ecological community within its current and potential range by active abatement of threats, revegetation and other conservation initiatives; • Communicate - engage with and support people to increase understanding of the value and function of the ecological community and encourage their efforts in its protection and recovery; and • Research and monitoring to improve our understanding of the ecological community and methods for restoration and protection over the long-term. The removal of 6.6 ha of Poplar Box TEC (or 1.4% of the available TEC within the Study Area), is unlikely to interfere with the recovery of this TEC.	Unlikely
Significant Impact: Likely		

6.6.3 GREATER GLIDER (SOUTHERN AND CENTRAL)

6.6.3.1 DIRECT IMPACTS

Direct impacts to greater glider associated with the Proposed Action are considered to be limited to habitat loss from vegetation clearing. These impacts are quantified below and include impacts to:

- 19 ha of Likely/Current Denning Habitat;
- 0.8 ha of Potential Denning Habitat; and
- 623.9 ha of Foraging and Dispersal Habitat.

It is expected that some impacted areas of greater glider habitat will be revegetated after the construction phase. However, this revegetation will not restore this habitat to a required functional state for greater glider (in particular those areas identified as denning or future denning habitat). Therefore, the direct impact to greater glider associated with construction-phase clearing is considered permanent.

A summary of the direct impacts to greater glider habitat as a result of the Proposed Action is shown in TABLE 6-9. A total of 643.8 ha of greater glider habitat will be permanently impacted by the Proposed Action, which equates to 2.9% of the total available habitat identified within the Study Area.

TABLE 6-9 DIRECT IMPACTS TO GREATER GLIDER

	Likely/Current Denning Habitat	Potential Denning Habitat	Foraging and Dispersal Habitat
Study Area (ha)	1,662.1	381.4	20,070.2
Disturbance Footprint (ha)	19	0.8	623.9
Percent of habitat within the Study Area to be impacted	1.1% of Likely/Current Denning Habitat within the Study Area	0.2% of Potential Denning Habitat within the Study Area	3.1% of Foraging and Dispersal Habitat within the Study Area
Permanent impact (Operations Footprint) (ha)	**19.0**	**0.8**	**623.9**

6.6.3.2 INDIRECT IMPACTS

The indirect impacts to greater glider as a result of the Proposed Action are detailed in Table 6-10, along with how these impacts will be managed and any residual impact that will affect the MNES. Avoidance, mitigation and management measures are discussed in detail in Section 7.

TABLE 6-10 INDIRECT IMPACTS TO GREATER GLIDER

Indirect Impact	Management of Indirect Impact	Residual Impact
Habitat Loss and Individual Mortality from Vegetation Clearing	The impact of habitat loss is considered a direct impact and has been addressed in the above Section. The following points refer to the potential indirect impact of individual mortality during vegetation clearing associated with the Proposed Action. • Areas identified as MNES habitat will be avoided as much as possible at the design and micro-siting stages. • Clear delineation of areas to be cleared, ensuring that the Disturbance Footprint does not extend further than planned to create unnecessary fragmentation or disturbance. • Pre-clearance surveys and fauna spotter catchers will be utilised. Microhabitat features (e.g. hollow bearing trees) will be avoided where sufficient flexibility is enabled by State and Federal approvals. • Staff and contractors will be made aware through general site induction and training of the potential to impact native fauna, reporting requirements and mitigation and management	The management measures to mitigate direct fatality or injury during construction and operation will result in the successful avoidance of impact to the species. This is such that any greater gliders found within the Disturbance Footprint in pre-clearance surveys will be avoided through micro-siting or translocated to safer habitat such that no indirect impact will result.

Indirect Impact	Management of Indirect Impact	Residual Impact
	measures that are to be implemented during on-site works. • Vehicles, plant and machinery will comply with site-specific speed limits to minimise the likelihood of collision with fauna. • Where trenching and excavations are created which may entrap fauna, suitable escape measures will be put in place, and excavations checked for fauna before backfilling. • Weekly site inspections to review flora and fauna control measures during construction. Sightings and incidents reported in daily pre-starts during construction. All near misses and incidents will be investigated to establish root cause. Where necessary corrective actions will be developed to improve existing processes.	
Habitat Fragmentation and Patch Isolation	• Areas identified as MNES habitat will be avoided as much as possible at the design and micro-siting stages. • Micro-siting of infrastructure will utilise existing clearance areas and avoid habitat fragmentation and patch isolation, with consideration of whether avoidance areas would still be connected to habitat in the broader landscape. • Prior to construction and detailed design, the incorporation of road pinch points to maximise connectivity will be considered to maintain habitat connectivity. While pinch points have a benefit for habitat, they present a technical and logistical barrier to safe and effective construction. Pre-clearance surveys will determine appropriate locations for road pinch points. • Location of infrastructure will prioritise avoiding or minimising edge effects or dissecting tracts of native vegetation. • Where possible, the Proposed Action will implement the use of innovative turbine blade transportation, including methods to minimise necessary clearance widths (e.g. 'Blade Manipulator' trucks). • Turbine placement will maximise the use of areas that are less vegetated to avoid and minimise clearing of key habitat. • No linear clearing will exceed the dispersal ability of the species, such that all habitat within the Study Area remaining after the construction phase will still be accessible and usable for the species. All clearing for access corridors will be limited to 40 m in width during the construction phase. • Clear delineation of areas to be cleared, ensuring that the Disturbance Footprint does not extend further than planned to create unnecessary fragmentation or disturbance. Toolbox talks will relay site-specific clearing information to all field staff and contractors. • Rehabilitation of access corridors will occur once construction has been completed. Such	Habitat fragmentation and patch isolation will be managed to ensure that greater gliders are able to move and disperse throughout the entirety of identified habitat, maintaining connectivity with the landscape within and surrounding the Study Area. All clearing for access corridors will be limited to 40 m, and glide poles will be implemented to ensure greater glider dispersal across the identified habitat within the Study Area. Additionally, the Proposed Action will not remove or isolate habitat patches altogether, only clearing in the areas necessary for infrastructure. Therefore, this indirect impact will be minimised so as not to cause an indirect residual impact.

Indirect Impact	Management of Indirect Impact	Residual Impact
	rehabilitation will involve planting/natural regeneration of native species that are habitat for MNES.	
Increased Prevalence of Invasive Plants and Animals	• A Biosecurity Management Plan will be implemented for the site which includes requirements for vehicle washdowns and protocols to ensure activities are planned to minimise movement of vehicles, equipment and machinery outside of designated access corridors. • Staff and contractors will be given information on the location and consequences of biosecurity threats in the Study Area. • Access to a landholder's property will not occur unless authorised under a land use agreement. • WONS and Restrictive Invasive Species will be identified and monitored in the Study Area. Appropriate weed monitoring will occur to ensure new weed species are identified, recorded and controlled. • Weed management and control methods will depend upon the location, weed species identified, the degree of the infestation, relevant landholder agreement or conduct and compensation agreements provisions, and local, state and national regulatory requirements. • Weed loads will be minimised in high-traffic areas such as roads, easements and yards through regular monitoring and site personnel reporting protocols, with an investigation to be managed to prevent spread of weeds in accordance with the *Biosecurity Act 2014* (Qld). • Imported material able to transport weed seed will be assessed to ensure they are free of contamination, disease and invasive weeds.	Management measures will limit the possibility of the introduction or spread of invasive plant and animal species through relevant biosecurity measures incorporated into the Biosecurity Management Plan. This is such that the indirect impact will be minimised so as not to cause an indirect residual impact to the species.
Increased Vehicle Impacts on Fauna and Habitat	• No driving will occur in unauthorised areas, routes and access tracks will be clearly communicated to all site visitors. All driving will be carried out at safe speeds designated for the site. Night-time safe driving controls will also be applied, including additional speed restrictions, providing additional protection to nocturnal animals. • Site entry and exit points will be clearly marked to ensure vehicle movements are contained within the approved areas. • Staff and contractors will be made aware through general site induction and training of the potential to impact native fauna, reporting requirements and mitigation and management measures that are to be implemented during on-site works. • Injured, sick or dead fauna will be recorded and reported, during and after the construction and operation phases. This can be carried out by a fauna spotter-catcher	Implementation of management measures will ensure operating vehicles on-site during the construction, operation and decommissioning phases will not result in residual impacts to greater glider.

Indirect Impact	Management of Indirect Impact	Residual Impact
	during periods where disturbance is expected to occur (primarily construction activities). Where injured or sick fauna is detected, individuals will be taken to the nearest wildlife carer or veterinarian if practical.	
Altered Fire Regimes and Bushfire Risk	• An Bushfire Management Plan will be developed and implemented during construction and operation to mitigate the potential impact of fires to MNES habitat. • Maintenance of an asset protection zone within the Operations Footprint is required to reduce the risk of reduction of habitat due to fire. • Use of industry best practice hazard reduction measures to minimise bushfire risk and environmental impacts, such as on-site controlled burning of cleared vegetation. • Ensuring a 30 m bushfire setback from vegetation around electrical infrastructure. Maintaining safe distances between vegetation and potential fire-starting hazards will increase safety and reduce fire risk. • Weed management and control methods (in line with the requirements of the *Biosecurity Act 2014* (Qld)) will reduce the potential of invasive plants changing species composition on-site and increasing fire risk. • Reduce on-site fuel loads and maintain firebreaks and trails.	Management measures implemented in line with the site-specific Bushfire Management Plans will greatly reduce the potential risk for this species caused by planned or unplanned fires. Therefore, there is no anticipated indirect residual impact.
Altered Hydrology	• The Proposed Action will adopt best practice erosion and sediment control measures, which will implement all relevant State Codes and Guidelines. • Watercourse crossings shall be stabilised to mitigate erosion of pavement and embankment materials during rainfall events up to and including the 10% AEP storm event. • Staff and contractors will be made aware through general site induction and training of the potential to generate runoff and mitigation and management measures that should be implemented. • Construction activities must not interfere or block natural drainage e.g. disturbing channel contours. • Water barrier works will be designed to minimise impact on fish habitats, stock or movements through compliance with relevant design codes. During the detailed design phase, fish passage elements will be considered in all mapped waterways for fish passage, including compliance with the accepted development requirements for waterway barrier works or an operational works permit under the Planning Act.	Impacts to on-site hydrology will be managed in accordance with the CEMP. Impacts to watercourses will be addressed by stabilising to prevent erosion , and only occur in discrete work areas, such that no increase in sedimentation is overserved affecting habitat. Therefore, there is no anticipated indirect residual impact.
Environmental Pollution and Hazardous Materials	• All hazardous materials bought on-site will be accompanied by an MSDS, all relevant personnel will be trained in their proper use.	The management measures proposed will result in the reduction of the indirect impacts of environmental pollution and

Indirect Impact	Management of Indirect Impact	Residual Impact
	• Only registered herbicides will be used for weed management by a suitably qualified bush regeneration contractor. • Imported materials that are able to transport hazardous substances will be assessed to ensure they are free of contamination, disease and invasive species. • Ensuring appropriate waste management (lidded bins), to reduce potential for spread of hazardous materials on-site. • Vehicles, plant and machinery will comply with site-specific speed limits to minimise noise and dust generation. • Staff and contractors will be made aware through general site induction and training of the potential to generate dust, light and noise pollution and management measures that should be implemented. • Auditing of the CEMP will occur during construction. • Dust will be minimised through engineering controls on machinery and other available dust suppression controls, such as sprinklers. • Light pollution will be minimised through engineering controls on infrastructure and machinery, such as colour selection and timing controls. • Noise will be minimised through engineering controls on infrastructure and machinery, such as noise barriers and timing controls. • Disturbance form blasting will be minimised through engineering controls and other available blasting suppression, such as barrier walls. • Electricity infrastructure designed to allow for safe operations, using buffers between conductors and the ground, and conductors and adjacent vegetation. The transmission line has adopted a design which allows for reduced interference to canopy dwelling species due to minimising impacts to canopy vegetation.	hazardous materials. Hazardous materials brought onto the site will be tightly regulated. Dust, light and noise generation will be minimised such that is it unlikely to adversely affect species or damage species habitat. These measures will ensure that the indirect impact is minimised so as to not cause an indirect residual impact to greater glider.
Site Alienation	• Locating turbines and access corridors away from key habitats where feasible (including remnant vegetation, waterways and drainage lines) reducing disturbance during all phases of the Proposed Action. • Mitigating habitat fragmentation and maintaining connectivity through the measures outlined above. • Using turbines with an RSA >40 m above ground level to provide a collision-free foraging zone within the canopy and 20 m above the canopy, reducing operational disturbance to terrestrial species. • Development and implementation of management plans (VFMP, CEMP) outlined above to reduce the potential impact of construction and operation phase activities including introducing invasive species, fire and altered hydrology.	The potential risk of site alienation will be managed to ensure that species are able to move, disperse and utilise habitat throughout the Study Area for the life of the Proposed Action. Avoidance, mitigation and management measures outlined in this PER will ensure that the potential for site alienation is minimised so as to not cause an indirect residual impact to greater glider.

Indirect Impact	Management of Indirect Impact	Residual Impact
	• Implementing engineering controls on infrastructure and machinery outlined above, such that dust, light and noise pollution and blasting does not adversely affect species or species habitat.	

Indirect impacts from the Proposed Action will be mitigated and managed appropriately, such that there is no residual impact on greater glider. Some indirect impacts have been considered as part of the significant impact assessment for this species but are concluded unlikely to contribute to a significant impact.

6.6.3.3 SIGNIFICANT IMPACT ASSESSMENT

Ground-truthed surveys have identified 1,662.1 ha of Likely/Current Denning Habitat, 381.4 ha of Potential Denning Habitat, and 20,070.2 ha of Foraging and Dispersal Habitat within the Study Area. A total of 643.8 ha of greater glider habitat is expected to be permanently impacted as a result of the Proposed Action, which includes:

- 19.0 ha of Likely/Current Denning Habitat (1.1% of this habitat type within the Study Area);
- 0.8 ha of Potential Denning Habitat (0.2% of this habitat type within the Study Area); and
- 623.9 ha of Foraging and Dispersal Habitat (3.4% of this habitat type within the Study Area).

A significant impact assessment based on the guidance provided in the SIG 1.1 is presented in Table 6-11. It has been concluded that the Proposed Action is **likely** to have a significant impact on the greater glider. Avoidance, mitigation and management measures considered within the assessment are discussed in detail in Section 7.

TABLE 6-11 SIGNIFICANT IMPACT ASSESSMENT FOR THE GREATER GLIDER

Criteria	Description	Criteria Triggered?
An action is likely to have a significant impact on an endangered species if there is a real chance or possibility that it will:		
Lead to a long-term decrease in the size of a population;	A known population of greater gliders utilise the Study Area with 24 individuals identified within the Study Area during field surveys. A total of 19 ha (1.1%) of greater glider Likely/Current Denning Habitat, 0.8 ha (0.2%) of Potential Denning Habitat and 623.9 ha (3.1%) of Foraging and Dispersal Habitat are projected to be cleared during the construction phase of the Proposed Action. Mitigation measures such as pre-clearance surveys and micro-siting at areas of planned infrastructure will ensure that impacts to essential microhabitat features (hollow-bearing trees) are further avoided where possible. Disturbance associated with linear infrastructure will also ensure that movement and gliding ability for the species is not affected.	Unlikely

Criteria	Description	Criteria Triggered?
	Considering the avoidance of hollow bearing trees through micro-sighting, the extent of species habitat throughout the Study Area (22,113.6 ha or 47.28% of the Study Area), and the relatively low impact to high-value denning habitat, it has been concluded that the Proposed Action is unlikely to result in the long-term decrease in the size of a population of greater glider.	
Reduce the area of occupancy of the species;	Greater glider conservation advice identifies an area of occupancy for the species at approximately 15,316 km^2 (DCCEEW, 2022). 22,113.6 ha of habitat suitable for greater glider has been mapped to occur throughout the Study Area (roughly 47% of the Study Area), with projected impacts to 19 ha of greater glider Likely/Current Denning Habitat (1.1% of this habitat within the Study Area), 0.8 ha of Potential Denning Habitat (0.2%) and 623.9 ha of Foraging and Dispersal Habitat (3.1%). The Proposed Action allows for a large degree of avoidance for high-value denning habitat, and the linear nature of predicted disturbances allows for retention of important habitat patches with connectivity to these patches retained. Impacts to 623.9 ha of Foraging and Dispersal Habitat (the habitat type mostly affected by the Proposed Action) is unlikely to reduce the area of occupancy for the species in the Study Area.	Unlikely
Fragment an existing population into two or more populations;	The home range for the greater glider varies across their natural extent, however it is accepted the species generally has a small home range due to low reproductive rate, sensitivity to disturbance and inability to traverse non-native forest (DCCEEW, 2022a). In Queensland sub-populations where the species' range is generally broader on account of less-productive forests (fewer hollows and poorer leaf nutrition), greater glider has outlier dispersal range of up to 19 ha (DES, 2022). However, with this broader home range, it is expected viability of greater glider habitat is more sensitive to disturbance of important den trees (Eyre, 2006). Habitat fragmentation will be managed to ensure that greater gliders are able to move and disperse throughout the entirety of identified habitat, maintaining connectivity with the landscape within and surrounding the Study Area. All clearing for access corridors will be limited to 40 m (greater glider can cover distances up to 100 m). Additionally, the Proposed Action will not remove or isolate habitat patches altogether, only clearing in the areas necessary for infrastructure. Avoidance of denning trees will be prioritised during construction phase, via pre-clearance surveys and micro-siting of infrastructure where sufficient flexibility is enabled by State and Federal approvals.	Unlikely

Criteria	Description	Criteria Triggered?
	This, in addition to a relatively small disturbance to 19.0 ha of greater glider Likely/Current Denning Habitat (1.1% of this habitat within the Study Area), 0.8 ha of Potential Denning Habitat (0.2%) and larger disturbance of 623.9 ha to the less ecologically significant Foraging and Dispersal Habitat (3.1%) makes it unlikely the Proposed Action will fragment the existing population or populations of greater glider that occur within the Study Area.	
Adversely affect habitat critical to the survival of a species;	Greater glider was observed utilising the Study Area at length, with 26 individuals observed in the south-east and central north of the Study Area over two survey periods. It is likely all greater glider habitat mapped within the Study Area constitutes habitat critical to the survival of the species. This habitat is accepted as habitat which contains any of the following (DCCEEW, 2022a): • Large contiguous eucalypt forest with mature hollow-bearing trees and diverse food tree species; • Habitat patches that can facilitate dispersal of the species; • Cool microclimate areas; and/or • Refuges from climate change or fire. • Given the projected impact of 19 ha of greater glider Likely/Current Denning Habitat (1.1% of this habitat within the Study Area), 0.8 ha of Potential Denning Habitat (0.2%) and 623.9 ha of Foraging and Dispersal Habitat (3.1%), all of which constitutes habitat critical to the survival of the species, it is likely the Proposed Action will adversely affect habitat critical to the survival of the species, even with mitigation measures such as micro-siting at areas of proposed infrastructure.	Likely
Disrupt the breeding cycle of a population;	Greater gliders utilise the shelter provided by denning habitat for breeding (DES, 2022). Disturbances associated with the Proposed Action will impact 19 ha of Likely/Current Denning Habitat (1.1% of this habitat within the Study Area) and 0.8 ha of Potential Denning Habitat (0.2% of this habitat within the Study Area). In addition to relatively low impacts to greater glider denning habitat, pre-clearance surveys and micro-siting at areas of proposed infrastructure will be implemented to avoid impacting identified denning and breeding trees. Given this, it is unlikely the Proposed Action will impact or disrupt the breeding cycle of greater glider.	Unlikely
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline;	The Proposed Action will result in the disturbance of 19 ha of greater glider Likely/Current Denning Habitat (1.1% of this habitat within the Study Area), 0.8 ha of Potential Denning Habitat (0.2%) and 623.9 ha of Foraging and Dispersal Habitat (3.1%).	Unlikely

Criteria	Description	Criteria Triggered?
	While there is potential the Proposed Action will lead a negative impact on greater glider, given the confirmed population(s) utilising the Study Area, it is unlikely that associated disturbance will decrease the quality or availability of habitat such that it would result in the species' decline.	
Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat;	Invasive species such as feral cats (*Felis catus*), European red fox (*Vulpes vulpes*) and wild dogs (*Canis lupus*) are ubiquitous in Queensland. All of these invasive species are known to occur in the Study Area. The Proposed Action will adopt and follow a Biosecurity Plan, as outline in Section 7. The activities related to the Proposed Action, both during construction and operation, will implement and follow biosecurity measures to reduce the risk of introducing new invasive species and to prevent the further spread of existing invasive species.	Unlikely
Introduce disease that may cause the species to decline; or	There is currently limited evidence of diseases causing detrimental effects on greater glider populations in Queensland. The Proposed Action is unlikely introduce a disease that would cause decline in this species.	Unlikely
Interfere with the recovery of the species.	There is no formally adopted Recovery Plan for this species. However, given the projected impact to habitat critical to the survival of the species, the Proposed Action has potential to interfere with the recovery of the species. Mitigation measures such as pre-clearance surveys and micro-siting of infrastructure where important habitat is identified will likely reduce interference with the recovery of this species. However, this cannot be quantified at present.	Potential
Significant impact: Likely		

6.6.4 YELLOW-BELLIED GLIDER (SOUTH-EASTERN)

6.6.4.1 DIRECT IMPACTS

Direct impacts to yellow-bellied glider associated with the Proposed Action are considered to be limited to habitat loss from vegetation clearing. These impacts are quantified below and include impacts to:

- 0.3 ha of Potential Denning Habitat; and
- 5.4 ha of Potential Foraging Habitat.

It is expected that some impacted areas of yellow-bellied glider habitat will be revegetated after the construction phase. However, no rehabilitation or revegetation in these areas is expected to restore any functionality for this species post-construction. Therefore, the direct impact to yellow-bellied glider associated with construction-phase clearing is considered permanent.

A summary of the direct impacts to yellow-bellied glider habitat as a result of the Proposed Action is shown in Table 6-12. A total of 5.6 ha of yellow-bellied glider habitat will be permanently impacted by the Proposed Action, which equates to 4.5% of the total available habitat identified within the Study Area.

TABLE 6-12 DIRECT IMPACTS TO YELLOW-BELLIED GLIDER

	Potential Denning Habitat	Potential Foraging Habitat
Study Area (ha)	16.0	110.2
Disturbance Footprint (ha)	0.3	5.4
Percent of habitat within the Study Area to be impacted	1.6% of Potential Denning Habitat within the Study Area	4.9% of Potential Foraging Habitat within the Study Area
Permanent impact (Operations Footprint) (ha)	**0.3**	**5.4**

6.6.4.2 INDIRECT IMPACTS

The indirect impacts to yellow-bellied glider as a result of the Proposed Action are detailed in Table 6-13, along with how these impacts will be managed and any residual impact that will affect the MNES. Avoidance, mitigation and management measures are discussed in detail in Section 7.

TABLE 6-13 INDIRECT IMPACTS TO YELLOW-BELLIED GLIDER

Indirect Impact	Management of Indirect Impact	Residual Impact
Habitat Loss and Individual Mortality from Vegetation Clearing	The impact of habitat loss is considered a direct impact and has been addressed in the above Section. The following points refer to the potential indirect impact of individual mortality during vegetation clearing associated with the Proposed Action. • Areas identified as MNES habitat will be avoided as much as possible at the design and micro-siting stages. • Clear delineation of areas to be cleared, ensuring that the Disturbance Footprint does not extend further than planned to create unnecessary fragmentation or disturbance. • Pre-clearance surveys and fauna spotter catchers will be utilised. Microhabitat features (e.g. hollow bearing trees) will be avoided where sufficient flexibility is enabled by State and Federal approvals. • Staff and contractors will be made aware through general site induction and training of the potential to impact native fauna, reporting requirements and mitigation and management measures that are to be implemented during on-site works. • Vehicles, plant and machinery will comply with site-specific speed limits to minimise the likelihood of collision with fauna.	The management measures to mitigate direct fatality or injury during construction and operation will result in the successful avoidance of impact to the species. This is such that any yellow-bellied glider habitat features found within the Disturbance Footprint in pre-clearance surveys will be avoided through micro-siting .

Indirect Impact	Management of Indirect Impact	Residual Impact
	• Where trenching and excavations are created which may entrap fauna, suitable escape measures will be put in place, and excavations checked for fauna before backfilling. • Weekly site inspections to review flora and fauna control measures during construction. Sightings and incidents reported in daily pre-starts during construction. All near misses and incidents will be investigated to establish root cause. Where necessary corrective actions will be developed to improve existing processes.	
Habitat Fragmentation and Patch Isolation	• Areas identified as MNES habitat will be avoided as much as possible at the design and micro-siting stages. • Micro-siting of infrastructure will utilise existing clearance areas and avoid habitat fragmentation and patch isolation, with consideration of whether avoidance areas would still be connected to habitat in the broader landscape. • Prior to construction and detailed design, the incorporation of road pinch points to maximise connectivity will be considered to maintain habitat connectivity. While pinch points have a benefit for habitat they present a technical and logistical barrier to safe and effective construction. Pre-clearance surveys will determine appropriate locations for road pinch points. • Location of infrastructure will prioritise avoiding or minimising edge effects or dissecting tracts of native vegetation. • Where possible, the Proposed Action will implement the use of innovative turbine blade transportation, including methods to minimise necessary clearance widths (e.g. 'Blade Manipulator' trucks). • Turbine placement will maximise the use of areas that are less vegetated to avoid and minimise clearing of key habitat. • No linear clearing will exceed the dispersal ability of the species, such that all habitat within the Study Area remaining after the construction phase will still be accessible and usable for the species. All clearing for access corridors will be limited to 40 m in width during the construction phase. • Clear delineation of areas to be cleared, ensuring that the Disturbance Footprint does not extend further than planned to create unnecessary fragmentation or disturbance. Toolbox talks will relay site-specific clearing information to all field staff and contractors. • Rehabilitation of access corridors will occur once construction has been completed. Such rehabilitation will involve planting/natural regeneration of native species that are habitat for MNES.	Yellow-bellied gliders have not been observed within the Study Area. Habitat fragmentation and patch isolation will be managed to ensure that any potentially present yellow-bellied gliders are able to move and disperse throughout the entirety of identified habitat, maintaining connectivity with the landscape within and surrounding the Study Area. All clearing for access corridors will be limited to 40 m (the maximum glide distance of yellow-bellied glider is thought to be as high as 120 m–140 m). Additionally, the Proposed Action will not remove or isolate habitat patches altogether, only clearing in the areas necessary for infrastructure. Therefore, this indirect impact will be minimised so as not to cause an indirect residual impact.

Indirect Impact	Management of Indirect Impact	Residual Impact
Increased Prevalence of Invasive Plants and Animals	• A Biosecurity Management Plan will be implemented for the site which includes requirements for vehicle washdowns and protocols to ensure activities are planned to minimise movement of vehicles, equipment and machinery outside of designated access corridors. • Staff and contractors will be given information on the location and consequences of biosecurity threats in the Study Area. • Access to a landholder's property will not occur unless authorised under a land use agreement. • WONS and Restrictive Invasive Species will be identified and monitored in the Study Area. Appropriate weed monitoring will occur to ensure new weed species are identified, recorded and controlled. • Weed management and control methods will depend upon the location, weed species identified, the degree of the infestation, relevant landholder agreement or conduct and compensation agreements provisions, and local, state and national regulatory requirements. • Weed loads will be minimised in high-traffic areas such as roads, easements and yards through regular monitoring and site personnel reporting protocols, with an investigation to be managed to prevent spread of weeds in accordance with the *Biosecurity Act 2014* (QLD). • Imported material able to transport weed seed will be assessed to ensure they are free of contamination, disease and invasive weeds.	Management measures will limit the possibility of the introduction or spread of invasive plant and animal species through relevant biosecurity measures incorporated into the Biosecurity Management Plan. This is such that the indirect impact will be minimised so as not to cause an indirect residual impact to the species.
Increased Vehicle Impacts on Fauna and Habitat	• No driving will occur in unauthorised areas, routes and access tracks will be clearly communicated to all site visitors. All driving will be carried out at safe speeds designated for the site. Night-time safe driving controls will also be applied, including additional speed restrictions, providing additional protection to nocturnal animals. • Site entry and exit points will be clearly marked to ensure vehicle movements are contained within the approved areas. • Staff and contractors will be made aware through general site induction and training of the potential to impact native fauna, reporting requirements and mitigation and management measures that are to be implemented during on-site works. • Injured, sick or dead fauna will be recorded and reported, during and after the construction and operation phases. This can be carried out by a fauna spotter-catcher during periods where disturbance is expected to occur (primarily construction activities). Where injured or sick fauna is detected,	Implementation of management measures will ensure operating vehicles on-site during the construction, operation and decommissioning phases will not result in residual impacts to yellow-bellied glider.

Indirect Impact	Management of Indirect Impact	Residual Impact
	individuals will be taken to the nearest wildlife carer or veterinarian if practical.	
Altered Fire Regimes and Bushfire Risk	• A Bushfire Management Plan will be developed and implemented during construction and operation to mitigate the potential impact of fires to MNES habitat. • Maintenance of an asset protection zone within the Operations Footprint is required to reduce the risk of reduction of habitat due to fire. • Use of industry best practice hazard reduction measures to minimise bushfire risk and environmental impacts, such as on-site controlled burning of cleared vegetation. • Ensuring a 30 m bushfire setback from vegetation around electrical infrastructure. Maintaining safe distances between vegetation and potential fire-starting hazards will increase safety and reduce fire risk. • Weed management and control methods (in line with the requirements of the *Biosecurity Act 2014 (Qld))* will reduce the potential of invasive plants changing species composition on-site and increasing fire risk. • Reduce on-site fuel loads and maintain firebreaks and trails.	Management measures implemented in line with the site-specific Bushfire Management Plan will greatly reduce the potential risk for this species caused by planned or unplanned fires. Therefore, there is no anticipated indirect residual impact.
Altered Hydrology	• The Proposed Action will adopt best practice erosion and sediment control measures, which will implement all relevant State Codes and Guidelines. • Watercourse crossings will be stabilised to mitigate erosion of pavement and embankment materials during rainfall events up to and including the 10% AEP storm event. • Staff and contractors will be made aware through general site induction and training of the potential to generate runoff and mitigation and management measures that should be implemented. • Construction activities must not interfere or block natural drainage e.g. disturbing channel contours. • Water barrier works will be designed to minimise impact on fish habitats, stock or movements through compliance with relevant design codes. During the detailed design phase, fish passage elements will be considered in all mapped waterways for fish passage, including compliance with the accepted development requirements for waterway barrier works or an operational works permit under the Planning Act.	Impacts to on-site hydrology will be managed in accordance with the CEMP. Impacts to watercourses will be addressed by stabilising to prevent erosion, and only occur in discrete work areas, such that no increase in sedimentation is overserved affecting habitat. Therefore, there is no anticipated indirect residual impact.
Environmental Pollution and Hazardous Materials	• All hazardous materials bought on-site will be accompanied by an MSDS, all relevant personnel will be trained in their proper use. • Only registered herbicides will be used for weed management by a suitably qualified bush regeneration contractor.	The management measures proposed will result in the reduction of the indirect impacts of environmental pollution and hazardous materials. Hazardous materials brought onto the site will be tightly regulated. Dust,

Indirect Impact	Management of Indirect Impact	Residual Impact
	• Imported materials that are able to transport hazardous substances will be assessed to ensure they are free of contamination, disease and invasive species. • Ensuring appropriate waste management (lidded bins), to reduce potential for spread of hazardous materials on-site. • Vehicles, plant and machinery will comply with site-specific speed limits to minimise noise and dust generation. • Staff and contractors will be made aware through general site induction and training of the potential to generate dust, light and noise pollution and management measures that should be implemented. • Auditing of the CEMP will occur during construction. • Dust will be minimised through engineering controls on machinery and other available dust suppression controls, such as sprinklers. • Light pollution will be minimised through engineering controls on infrastructure and machinery, such as colour selection and timing controls. • Noise will be minimised through engineering controls on infrastructure and machinery, such as noise barriers and timing controls. • Disturbance form blasting will be minimised through engineering controls and other available blasting suppression, such as barrier walls. • Electricity infrastructure designed to allow for safe operations, using buffers between conductors and the ground, and conductors and adjacent vegetation. The transmission line has adopted a design which allows for reduced interference to canopy dwelling species due to minimising impacts to canopy vegetation.	light and noise generation will be minimised such that is it unlikely to adversely affect species or damage species habitat. These measures will ensure that the indirect impact is minimised so as to not cause an indirect residual impact to yellow-bellied glider.
Site Alienation	• Locating turbines and access corridors away from key habitats where feasible (including remnant vegetation, waterways and drainage lines) reducing disturbance during all phases of the Proposed Action. • Mitigating habitat fragmentation and maintaining connectivity through the measures outlined above. • Using turbines with an RSA >40 m above ground level to provide a collision-free foraging zone within the canopy and 20 m above the canopy, reducing operational disturbance to terrestrial species. • Development and implementation of management plans (VFMP, CEMP) outlined above to reduce the potential impact of construction and operation phase activities including introducing invasive species, fire and altered hydrology. • Implementing engineering controls on infrastructure and machinery outlined above, such that dust, light and noise pollution and	The potential risk of site alienation will be managed to ensure that species are able to move, disperse and utilise habitat throughout the Study Area for the life of the Proposed Action. Avoidance, mitigation and management measures outlined in this PER will ensure that the potential for site alienation is minimised so as to not cause an indirect residual impact to yellow-bellied glider.

Indirect Impact	Management of Indirect Impact	Residual Impact
	blasting does not adversely affect species or species habitat.	

Indirect impacts from the Proposed Action will be mitigated and managed appropriately, such that there is no residual impact on yellow-bellied glider. Some indirect impacts have been considered as part of the significant impact assessment for this species but are concluded unlikely to contribute to a significant impact.

6.6.4.3 SIGNIFICANT IMPACT ASSESSMENT

Ground-truthed surveys have identified 16.0 ha of yellow-bellied glider Potential Denning Habitat and 110.2 ha of Potential Foraging Habitat within the Study Area. A total 5.6 ha of yellow-bellied glider habitat is expected to be permanently impacted as a result of the Proposed Action, which includes:

- 0.3 ha of Potential Denning Habitat (1.6% of this habitat type within the Study Area); and
- 5.4 ha of Potential Foraging Habitat (4.9% of this habitat type within the Study Area).

A significant impact assessment based on the guidance provided in the SIG 1.1 is presented in Table 6-14. It has been concluded that the Proposed Action is **unlikely** to have a significant impact on the yellow-bellied glider. Avoidance, mitigation and management measures considered within the assessment are discussed in detail in Section 7.

TABLE 6-14 SIGNIFICANT IMPACT ASSESSMENT FOR YELLOW-BELLIED GLIDER

Criteria	Description	Criteria Triggered?
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:		
Lead to a long-term decrease in the size of an important population of a species;	Yellow-bellied glider is considered as having the potential to occur within the Study Area with no individuals observed during targeted field surveys. There is unlikely to be an important population within the Study Area. The amount of yellow-bellied glider habitat within the Study Area to be cleared is up to 0.3 ha of Potential Denning Habitat and 5.4 ha of Potential Foraging Habitat. Mitigation measures such as pre-clearance surveys and micro-siting at areas of planned infrastructure will ensure that impacts to essential microhabitat features (hollow-bearing trees) are further avoided where possible. Disturbance associated with linear infrastructure will also ensure that movement and dispersal ability for the species is not affected. Identified habitat within the Study Area will remain connected to adjacent, larger remnant forests, such as the Camboon State Forest. Therefore, the Proposed Action is unlikely to lead to a long-term decrease in the size of an important population.	Unlikely

Criteria	Description	Criteria Triggered?
Reduce the area of occupancy of an important population;	This species is predicted to have an area of occupancy of 12,724 km^2 (DAWE, 2022a). The clearing of 5.6 ha of potential yellow-bellied glider habitat within the Study Area equates to only <0.005% of the species area of occupancy. The nature of clearing involved within the Proposed Action, being small areas of linear infrastructure across the landscape, is unlikely to reduce the species area of occupancy.	Unlikely
Fragment an existing important population into two or more populations;	The yellow-bellied glider is considered as having the potential to occur within the Study Area, with no evidence of the species or populations inhabiting the Study Area to date. Habitat fragmentation will be managed so that any potentially present yellow-bellied gliders are able to move and disperse throughout the entirety of identified habitat, maintaining connectivity with the landscape within and surrounding the Study Area. Additionally, the Proposed Action will not remove or isolate habitat patches altogether, only clearing in the areas necessary for infrastructure. Avoidance of denning trees will be prioritised during construction phase, via pre-clearance surveys and micro-siting of infrastructure where sufficient flexibility is enabled by State and Federal approvals. When considering mitigation measures and the limited area of proposed potential yellow-bellied glider habitat to be cleared (5.6 ha), it has been concluded that the Proposed Action is unlikely to fragment an existing important population.	Unlikely
Adversely affect habitat critical to the survival of a species;	Under the *Conservation Advice for Petaurus australis australis (yellow-bellied glider (south-eastern))* (DAWE, 2022a), habitat critical to the survival of the species is habitat that contains any one of the following attributes: 1. Large contiguous areas of floristically diverse eucalypt forest, which are dominated by winter-flowering and smooth-barked eucalypts, including mature living hollow-bearing trees and sap trees; 2. Areas identified as refuges under future climate change scenarios; 3. Short or long-term post-fire refuges that allow the species to persist, recover and recolonise burnt areas; 4. Habitat corridors required to facilitate dispersal between fragmented habitat patches and/or that enable recolonization or movement away from threats (further detail provided in the Conservation Advice document); and 5. Areas in which some trees have evidence of use for sap extraction by yellow-bellied glider.	Unlikely

Criteria	Description	Criteria Triggered?
	Each of the above numbered Conservation Advice items, have been addressed accordingly in the numbered responses. 1. The area of updated habitat is considered a large, continuous area, with winter-flowering and smooth-bark eucalypt canopy species. However, habitat is not considered floristically diverse with canopy species identified during field surveys limited. The smooth-bark eucalyptus species present within denning habitat are generally absent from the identified foraging and dispersal habitat that is dominated by *E. crebra* (on Land Zone 12 that does not correlate with species observations in Land Zone 3/5/7). The absence of smooth bark species and dominance of a single species to the west of the mapped foraging and dispersal habitat, together with observed disturbance limits the potential for the *E. crebra* dominated vegetation to be considered habitat and therefore has been excluded. 2. Updated habitat is not considered refuge under future climate change scenarios. The Study Area is located in the northern portion of the species distribution and contains lower quality habitat compared to surrounding areas (e.g. Camboon State Forest). 3. No recently burnt landscapes are present in the surrounding connecting habitat of the Study Area, and therefore the habitat is not currently considered a short or long-term post-fire refuge. 4. Yellow-bellied glider habitat within the Study Area is not considered a habitat corridor for the species, with no connected habitat identified to the north, east or west of the identified habitat. 5. Further, no evidence of sap extraction by yellow-bellied glider has been recorded within the Study Area. Overall, the potential impacts to yellow-bellied glider habitat will be limited to 0.3 ha of Potential Denning Habitat (1.6% of this habitat type within the Study Area) and 5.4 ha of Potential Foraging Habitat (4.9% of this habitat type within the Study Area). Further, retention of connectivity in potential habitat, means yellow-bellied glider will still be able to utilise all remaining mapped potential habitat for both denning, foraging and dispersal purposes should the species occur in the future. Based on the above assessment, it is considered unlikely that the limited impacts to mapped potential habitat within the Study Area constitutes	

Criteria	Description	Criteria Triggered?
	adversely affecting habitat critical to the survival of the species.	
Disrupt the breeding cycle of an important population;	No recent evidence of the species was identified in the Study Area or immediate surrounds based on desktop analysis and field surveys. Yellow-bellied gliders have a plausible home range of 25-85 ha (Craig, 1985; Goldingay & Quin, 2004 as cited in DAWE, 2022a). The Proposed Action will result in the clearing of up to 0.3 ha of Potential Denning Habitat (1.6%) and 5.4 ha of Potential Foraging Habitat (4.9%) within the Study Area. The design phase as well as micro-siting will avoid hollow-bearing trees that are necessary for the successful breeding cycle of the species. Therefore, the Proposed Action is unlikely to disrupt the breeding cycle of a population, should a population be identified within or near the Study Area.	Unlikely
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline;	The Proposed Action will result in the removal of 5.6 ha or 4.5% of the total available potential yellow-bellied glider habitat within the Study Area. However, the habitat within the Study Area will remain connected to larger remnant patches outside of the Study Area. Additionally, no population is currently known to utilise this habitat, with the species considered only potentially occurring. Therefore, the small amount of clearing in the larger context of the landscape is unlikely to remove, isolate or decrease the quality of habitat that would result in species decline.	Unlikely
Result in invasive species that are harmful to a Vulnerable species becoming established in the endangered species' habitat;	Invasive species such as feral cats (*Felis catus*) and cane toads (*Rhinella marina*) are common pests encountered in Queensland and are particularly harmful to native, threatened mammals. Both of these invasive species are known to occur in the Study Area. The Proposed Action will adopt and follow a Biosecurity Plan, as outline in Section 7 of the Theodore Wind Farm PER. The activities related to the Proposed Action, both during construction and operation, will implement and follow biosecurity measures to reduce the risk of introducing new invasive species and to prevent the further spread of existing invasive species.	Unlikely
Introduce disease that may cause the species to decline; or	There is currently limited evidence of diseases noted in the Conservation Advice or literature causing detrimental effects on yellow-bellied glider populations in Queensland. There is also no evidence to suggest the Proposed Action will introduce a disease that would cause the species to decline. Additionally, precautions will be taken to ensure that the spread of disease does not occur, this includes following proposed biosecurity measures (see Section 7 of the Theodore Wind Farm PER).	Unlikely

Criteria	Description	Criteria Triggered?
Interfere with the recovery of the species.	There is no adopted or made Recovery Plan for this species. Clearing will largely occur within small, isolated turbine locations, or narrow linear areas within the Study Area. Additionally, the Study Area will remain connected to adjacent State Forests. The design phase, micro siting, and other mitigation methods will ensure that interference with the recovery of the species is unlikely.	Unlikely
Significant Impact: Unlikely		

6.6.5 KOALA

6.6.5.1 DIRECT IMPACTS

Direct impacts to koala associated with the Proposed Action are considered to be limited to habitat loss from vegetation clearing. These impacts are quantified below and include impacts to:

- 6.2 ha of Preferred Breeding and Foraging Habitat;
- 657.3 ha of General Breeding and Foraging Habitat; and
- 237.9 ha of Dispersal Habitat.

It is expected that some impacted areas of koala habitat will be rehabilitated post-construction. However, rehabilitation is not expected to restore most of the mapped breeding and foraging habitat to a useful state for koala for at least 6-8 years and will likely be re-cleared during decommissioning.

Koalas typically travel on the ground to traverse between patches of habitat, as such the ground itself forms an essential component of koala habitat. Connectivity between patches of habitat does not require complete continuity of vegetation, and scattered trees in a fragmented landscape can in fact extend the area of a habitat available to the species (Youngentob, Marsh, & Skewes, 2021). Koalas readily disperse on the ground covering distances of 1-3 km, and occasionally over 10 km when dispersing (Melzer 1995; White 1999; Dique et al. 2003; Matthews et al. 2016 as cited in Youngentob, Marsh, & Skewes, 2021).

The following statement in Youngentob et al. (2021) refers to how koalas move through the landscape and therefore, needs to be considered in determining impacts to ancillary dispersal habitat:

> *Walking on the ground is how koalas typically travel between trees, so the ground itself forms an essential component of koala habitat, without which movement between trees would be hindered or impossible.*

This statement highlights two essential components of ancillary koala dispersal habitat:

- The ground where koalas walk between trees inferred not to contain barriers; and
- The trees that koalas may use for shelter, and potentially foraging, while dispersing.

While both of these components together comprise dispersal habitat (and have been mapped as such), the presence of trees (as shelter or potential fodder) are an integral part of dispersal habitat, without which "the ground" on its own would not be considered dispersal habitat.

Disturbance to koala dispersal habitat is limited to 237.9 ha associated with short-term construction activities. This disturbance primarily occurs to cultivated agricultural land and is unlikely to result in the removal of koala habitat trees or isolated scattered paddock trees, especially following preclearance surveys.

Considering the species' dispersal ability in agricultural environments with scattered paddock trees, koalas will maintain movement and dispersal post-construction within the 237.9 ha of Dispersal Habitat that will be initially disturbed. The short-term nature of the disturbance of this habitat type within the Study Area is therefore not considered permanent and will not contribute to a significant residual impact to the species. However, the loss of Preferred and

General Breeding and Foraging Habitat associated with construction-phase clearing is considered permanent.

The rehabilitation of 237.9 ha of koala Dispersal Habitat includes 56.5 ha of Type 1 natural regeneration and 92.9 ha of Type 2 rehabilitation, as shown in Figure 6-3. Further discussion on rehabilitation types, estimated timing to return habitat to its previous functionality, as well as the management measures, completion criteria, interim targets and corrective actions for rehabilitation is provided in Section 8.

A summary of the direct impacts to koala habitat as a result of the Proposed Action is shown in Table 6-15. A total of 663.5 ha of koala habitat will be permanently impacted by the Proposed Action, which equates to 2.9% of the total available habitat identified within the Study Area.

TABLE 6-15 DIRECT IMPACTS TO KOALA HABITAT

	Preferred Breeding and Foraging Habitat	**General Breeding and Foraging Habitat**	**Dispersal Habitat**
Study Area (ha)	1,613.4	21,216.6	6,950.5
Disturbance Footprint (ha)	6.2	657.3	237.9
Percent of habitat within the Study Area to be impacted	1% of Preferred Breeding and Foraging Habitat within the Study Area	4% of General Breeding and Foraging Habitat within the Study Area	4.6% of Dispersal Habitat within the Study Area
Available **Revegetation areas** within the Disturbance Footprint (ha)	N/A	N/A	237.9
Permanent impact* (Operations Footprint) (ha)	**6.2**	**657.3**	**0**

**Permanent impact (Operations Footprint) is provided where revegetation and/or rehabilitation can return habitat for the species to function or utilise post-construction (i.e., for recolonisation, dispersal, foraging or breeding).*

Legend

- Study Area
- Operation Footprint
- Koala Dispersal Habitat
- Koala Dispersal Habitat - Type 1 Natural Regeneration
- Koala Dispersal Habitat - Type 2 Revegetation/ Rehabilitation
- Road
- Track and Path

Coordinate System:
GDA2020 MGA Zone 56

Date: 05/06/2025
Created By: HD
Drawing Size: A3

0 1 2 3km

1:125,000

F6-3 Rehabilitation of Koala Dispersal Habitat

Theodore Wind Farm PER

Theodore Energy Development Pty Ltd

ERM

0661076_PER_R2\0661076_PER_6-3_R2

6.6.5.2 INDIRECT IMPACTS

The indirect impacts to koala as a result of the Proposed Action are detailed in Table 6-16, along with how these impacts will be managed and any residual impact that will affect the MNES. Avoidance, mitigation and management measures are discussed in detail in Section 7.

TABLE 6-16 INDIRECT IMPACTS TO KOALA

Indirect Impact	Management of Indirect Impact	Residual Impact
Habitat Loss and Individual Mortality from Vegetation Clearing	The impact of habitat loss is considered a direct impact and has been addressed in the above Section. The following points refer to the potential indirect impact of individual mortality during vegetation clearing associated with the Proposed Action. • Areas identified as MNES habitat will be avoided as much as possible at the design and micro-siting stages. • Clear delineation of areas to be cleared, ensuring that the Disturbance Footprint does not extend further than planned to create unnecessary fragmentation or disturbance. • Pre-clearance surveys and fauna spotter catchers will be utilised. Microhabitat features (e.g. hollow bearing trees) will be avoided where sufficient flexibility is enabled by State and Federal approvals. • Staff and contractors will be made aware through general site induction and training of the potential to impact native fauna, reporting requirements and mitigation and management measures that are to be implemented during on-site works. • Vehicles, plant and machinery will comply with site-specific speed limits to minimise the likelihood of collision with fauna. • Where trenching and excavations are created which may entrap fauna, suitable escape measures will be put in place, and excavations checked for fauna before backfilling. • Weekly site inspections to review flora and fauna control measures during construction. Sightings and incidents reported in daily pre-starts during construction. All near misses and incidents will be investigated to establish root cause. Where necessary corrective actions will be developed to improve existing processes.	The management measures to mitigate direct fatality or injury during construction and operation will result in the successful avoidance of impact to the species. This is such that any koalas found within the Disturbance Footprint in pre-clearance surveys will be avoided through micro-siting or translocated to safer habitat such that no indirect impact will result.
Habitat Fragmentation and Patch Isolation	• Areas identified as MNES habitat will be avoided as much as possible at the design and micro-siting stages. • Micro-siting of infrastructure will utilise existing clearance areas and avoid habitat fragmentation and patch isolation, with consideration of whether avoidance areas would still be connected to habitat in the broader landscape. • Prior to construction and detailed design, the incorporation of road pinch points to maximise connectivity will be considered to maintain	Habitat fragmentation and patch isolation will be managed to ensure that koalas are able to move and disperse throughout the entirety of identified habitat, maintaining connectivity with the landscape within and surrounding the Study Area. All clearing for access corridors will be limited to 40 m. Additionally, the Proposed Action will not remove or isolate habitat patches altogether, only

Indirect Impact	Management of Indirect Impact	Residual Impact
	habitat connectivity. While pinch points have a benefit for habitat they present a technical and logistical barrier to safe and effective construction. Pre-clearance surveys will determine appropriate locations for road pinch points. • Location of infrastructure will prioritise avoiding or minimising edge effects or dissecting tracts of native vegetation. • Where possible, the Proposed Action will implement the use of innovative turbine blade transportation, including methods to minimise necessary clearance widths (e.g. 'Blade Manipulator' trucks). • Turbine placement will maximise the use of areas that are less vegetated to avoid and minimise clearing of key habitat. • All clearing for access corridors will be limited to 40 m in width during the construction phase. • Clear delineation of areas to be cleared, ensuring that the Disturbance Footprint does not extend further than planned to create unnecessary fragmentation or disturbance. Toolbox talks will relay site-specific clearing information to all field staff and contractors. • Rehabilitation of access corridors will occur once construction has been completed. Such rehabilitation will involve planting/natural regeneration of native species that are habitat for MNES.	clearing in the areas necessary for infrastructure. Therefore, this indirect impact will be minimised so as not to cause an indirect residual impact.
Increased Prevalence of Invasive Plants and Animals	• A Biosecurity Management Plan will be implemented for the site which includes requirements for vehicle washdowns and protocols to ensure activities are planned to minimise movement of vehicles, equipment and machinery outside of designated access corridors. • Staff and contractors will be given information on the location and consequences of biosecurity threats in the Study Area. • Access to a landholder's property will not occur unless authorised under a land use agreement. • WONS and Restrictive Invasive Species will be identified and monitored in the Study Area. Appropriate weed monitoring will occur to ensure new weed species are identified, recorded and controlled. • Weed management and control methods will depend upon the location, weed species identified, the degree of the infestation, relevant landholder agreement or conduct and compensation agreements provisions, and local, state and national regulatory requirements. • Weed loads will be minimised in high-traffic areas such as roads, easements and yards through regular monitoring and site personnel reporting protocols, with an investigation to be	Management measures will limit the possibility of the introduction or spread of invasive plant and animal species through relevant biosecurity measures incorporated into the Biosecurity Management Plan. This is such that the indirect impact will be minimised so as not to cause an indirect residual impact to the species.

Indirect Impact	Management of Indirect Impact	Residual Impact
	managed to prevent spread of weeds in accordance with the *Biosecurity Act 2014* (Qld). • Imported material able to transport weed seed will be assessed to ensure they are free of contamination, disease and invasive weeds.	
Increased Vehicle Impacts on Fauna and Habitat	• No driving will occur in unauthorised areas, routes and access tracks will be clearly communicated to all site visitors. All driving will be carried out at safe speeds designated for the site. Night-time safe driving controls will also be applied, including additional speed restrictions, providing additional protection to nocturnal animals. • Site entry and exit points will be clearly marked to ensure vehicle movements are contained within the approved areas. • Staff and contractors will be made aware through general site induction and training of the potential to impact native fauna, reporting requirements and mitigation and management measures that are to be implemented during on-site works. • Injured, sick or dead fauna will be recorded and reported, during and after the construction and operation phases. This can be carried out by a fauna spotter-catcher during periods where disturbance is expected to occur (primarily construction activities). Where injured or sick fauna is detected, individuals will be taken to the nearest wildlife carer or veterinarian if practical.	Implementation of management measures will ensure operating vehicles on-site during the construction, operation and decommissioning phases will reduce the risk of residual impacts to koala through vehicle collision.
Altered Fire Regimes and Bushfire Risk	• A Bushfire Management Plan will be developed and implemented during construction and operation to mitigate the potential impact of fires to MNES habitat. • Maintenance of an asset protection zone within the Operations Footprint is required to reduce the risk of reduction of habitat due to fire. • Use of industry best practice hazard reduction measures to minimise bushfire risk and environmental impacts, such as on-site controlled burning of cleared vegetation. • Ensuring a 30 m bushfire setback from vegetation around electrical infrastructure. Maintaining safe distances between vegetation and potential fire-starting hazards will increase safety and reduce fire risk. • Weed management and control methods (in line with the requirements of the *Biosecurity Act 2014* (Qld)) will reduce the potential of invasive plants changing species composition on-site and increasing fire risk. • Reduce on-site fuel loads and maintain firebreaks and trails.	Management measures implemented in line with the site-specific Bushfire Management Plan will greatly reduce the potential risk for this species caused by planned or unplanned fires. Therefore, there is no anticipated indirect residual impact.

Indirect Impact	Management of Indirect Impact	Residual Impact
Altered Hydrology	• The Proposed Action will adopt best practice erosion and sediment control measures, which will implement all relevant State Codes and Guidelines. • Watercourse crossings shall be stabilised to mitigate erosion of pavement and embankment materials during rainfall events up to and including the 10% AEP storm event. • Staff and contractors will be made aware through general site induction and training of the potential to generate runoff and mitigation and management measures that should be implemented. • Construction activities must not interfere or block natural drainage e.g. disturbing channel contours. • Water barrier works will be designed to minimise impact on fish habitats, stock or movements through compliance with relevant design codes. During the detailed design phase, fish passage elements will be considered in all mapped waterways for fish passage, including compliance with the accepted development requirements for waterway barrier works or an operational works permit under the Planning Act.	Impacts to on-site hydrology will be managed in accordance with the CEMP. Impacts to watercourses will be addressed by stabilising to prevent erosion, and only occur in discrete work areas, such that no increase in sedimentation is overserved affecting habitat. Therefore, there is no anticipated indirect residual impact.
Environmental Pollution and Hazardous Materials	• All hazardous materials bought on-site will be accompanied by an MSDS, all relevant personnel will be trained in their proper use. • Only registered herbicides will be used for weed management by a suitably qualified bush regeneration contractor. • Imported materials that are able to transport hazardous substances will be assessed to ensure they are free of contamination, disease and invasive species. • Ensuring appropriate waste management (lidded bins), to reduce potential for spread of hazardous materials on-site. • Vehicles, plant and machinery will comply with site-specific speed limits to minimise noise and dust generation. • Staff and contractors will be made aware through general site induction and training of the potential to generate dust, light and noise pollution and management measures that should be implemented. • Auditing of the CEMP will occur during construction. • Dust will be minimised through engineering controls on machinery and other available dust suppression controls, such as sprinklers. • Light pollution will be minimised through engineering controls on infrastructure and machinery, such as colour selection and timing controls. • Noise will be minimised through engineering controls on infrastructure and machinery, such as noise barriers and timing controls.	The management measures proposed will result in the reduction of the indirect impacts of environmental pollution and hazardous materials. Hazardous materials brought onto the site will be regulated. Where permanent fencing is required for linear infrastructure (road corridors or transmission lines) within mapped koala foraging and breeding habitat, fencing will be designed and installed in accordance with the koala-sensitive design guideline (DES, 2022). Dust, light and noise generation will be minimised such that is it unlikely to adversely affect species or damage species habitat. These measures will ensure that the indirect impact is minimised so as to not cause an indirect residual impact to koala.

Indirect Impact	Management of Indirect Impact	Residual Impact
	• Disturbance form blasting will be minimised through engineering controls and other available blasting suppression, such as barrier walls. • Where new fencing is required within mapped koala foraging and breeding habitat, barbed wire fencing will not be used. • Electricity infrastructure designed to allow for safe operations, using buffers between conductors and the ground, and conductors and adjacent vegetation. The transmission line has adopted a design which allows for reduced interference to canopy dwelling species due to minimising impacts to canopy vegetation.	
Site Alienation	• Locating turbines and access corridors away from key habitats where feasible (including remnant vegetation, waterways and drainage lines) reducing disturbance during all phases of the Proposed Action. • Mitigating habitat fragmentation and maintaining connectivity through the measures outlined above. • Using turbines with an RSA >40 m above ground level to provide a collision-free foraging zone within the canopy and 20 m above the canopy, reducing operational disturbance to terrestrial species. • Development and implementation of management plans (VFMP, CEMP) outlined above to reduce the potential impact of construction and operation phase activities including introducing invasive species, fire and altered hydrology. • Implementing engineering controls on infrastructure and machinery outlined above, such that dust, light and noise pollution and blasting does not adversely affect species or species habitat.	The potential risk of site alienation will be managed to ensure that species are able to move, disperse and utilise habitat throughout the Study Area for the life of the Proposed Action. Avoidance, mitigation and management measures outlined in this PER will ensure that the potential for site alienation is minimised so as to not cause an indirect residual impact to koala.

Indirect impacts from the Proposed Action will be mitigated and managed appropriately, such that there is no residual impact on koala. Some indirect impacts have been considered as part of the significant impact assessment for this species but are concluded unlikely to contribute to a significant impact.

6.6.5.3 SIGNIFICANT IMPACT ASSESSMENT

Ground-truthed surveys have identified 29,780.5 ha of koala habitat, including 1,613.4 ha of Preferred Breeding and Foraging Habitat, 21,216.6 ha of General Breeding and Foraging Habitat, and 6,950.5 ha of Dispersal Habitat within the Study Area. A total 663.5 ha of habitat is expected to be permanently impacted as a result of the Proposed Action, which includes:

- 6.2 ha of Preferred Breeding and Foraging Habitat (0.4% of this habitat type within the Study Area); and
- 657.3 ha of General Breeding and Foraging Habitat (3.1% of this habitat type within the Study Area);

A significant impact assessment based on the guidance provided in the SIG 1.1 is presented in Table 6-17. It has been concluded that the Proposed Action is **likely** to cause a significant impact to the koala. Avoidance, mitigation and management measures considered within the assessment are discussed in detail in Section 7.

TABLE 6-17 SIGNIFICANT IMPACT ASSESSMENT FOR THE KOALA

Criteria	Description	Criteria Triggered?
An action is likely to have a significant impact on an endangered species if there is a real chance or possibility that it will:		
Lead to a long-term decrease in the size of a population;	A total of 6.2 ha of Preferred Breeding and Foraging Habitat, 657.3 ha of General Breeding and Foraging Habitat, and 237.9 ha of Dispersal Habitat will be impacted within the Study Area as a result of the Proposed Action. The impact will involve clearing of small amounts of remnant vegetation and linear corridors for the construction of the Proposed Action's infrastructure. Mitigation measures such as pre-clearance surveys will ensure that impacts are further avoided to the species. All 237.9 ha of Dispersal Habitat will be returned to functionality post-construction. With these mitigation measures enacted, the extent of total species habitat throughout the Study Area (29,780.5 ha or 63.7% of the Study Area) and relatively low impacts to higher-value Preferred and General Breeding and Foraging Habitat, (6.2 ha or 0.4% of available habitat within the Study Area) it is unlikely the Proposed Action will result in the long-term decrease in the size of a population of koala.	Unlikely
Reduce the area of occupancy of the species;	Koala has a widespread distribution across the east coast of Australia that ranges more than 1,660,000 km^2. The species has a smaller and more fragmented area of occupancy estimated at 19,428 km^2 (DAWE, 2022b). A total of 29,780.5 ha of species habitat has been mapped to occur throughout the Study Area (63.7% of the Study Area), with projected impacts to 663.5 ha or 2.9% of this available habitat. This impact equates to <0.04% of the species area of occupancy. Additionally, disturbance to dispersal habitat will not permanently remove the function of this habitat or create a barrier to movement, allowing for retention of important habitat patches and maintained connectivity between these patches. It is therefore considered unlikely that the Proposed Action will reduce the area of occupancy of the species.	Unlikely

Criteria	Description	Criteria Triggered?
Fragment an existing population into two or more populations;	The home range for the koala is highly variable, with the species known to disperse between 3 to 500 ha across various habitats (DAWE, 2022b). It is not expected an impact to 6.2 ha of Preferred Breeding and Foraging Habitat (0.4% of this habitat type within the Study Area), 657.3 ha of General Breeding and Foraging Habitat (3.1%) will fragment existing koala populations. Impacts associated with the Proposed Action will only remove habitat in small linear patches. Due to the linear nature of clearing it is expected koala will still be able to disperse across tracks and small cleared areas within the Study Area. It is therefore unlikely the Proposed Action will fragment an existing koala population into two or more populations.	Unlikely
Adversely affect habitat critical to the survival of a species;	Koala habitat within the Study Area has been concluded to be habitat critical to the survival of the species as it provides foraging, breeding and dispersal functions. The short-term disturbance to Dispersal Habitat is not considered to be significant, as the linear design of the Proposed Action will still allow for koala dispersal across the landscape (thus retaining its function). The proposed access tracks, overhead transmission lines and turbines will not reduce the ability for koalas to disperse through the landscape. Additionally, higher-value Preferred and General Breeding and Foraging Habitat is mostly avoided in the design phase, with 663.5 ha of a total 22,830.0 ha within the Study Area (approximately 2.9%) projected to be impacted by the Proposed Action. However, despite the implementation of mitigation measures including pre-clearance surveys and micro-siting of planned infrastructure, avoidance of high-value habitat and retention of movement and dispersal function through linear WTG design, it is considered likely that the Proposed Action will adversely affect habitat critical to the survival of the species due to the Preferred and General Breeding and Foraging Habitat to be impacted within the Study Area.	Likely
Disrupt the breeding cycle of a population;	Projected impacts are expected to occur across 6.2 ha (0.4%) of Preferred Breeding and Foraging Habitat and 657.3 ha (3.1%) of General Breeding and Foraging Habitat. Mitigation measures such as pre-clearance surveys and micro-siting of proposed infrastructure areas in both Preferred and General Breeding and Foraging Habitat will ensure connectivity values are retained (allowing for individuals to safely traverse between suitable habitat patches) and locally important or higher quality trees are preserved where possible. Given these mitigation measures, and that the	Unlikely

Criteria	Description	Criteria Triggered?
	Proposed Action is largely avoiding Preferred Breeding and Foraging Habitat, it is not expected the Proposed Action will disrupt the breeding cycle of a koala population within the Study Area.	
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline;	Preferred Breeding and Foraging Habitat has largely been avoided, with only 0.4% of this habitat type within the Study Area projected to be disturbed. While a larger portion of General Breeding and Foraging Habitat is expected to be disturbed (3.1%), this still constitutes a very small percentage of habitat in relation to the larger context of the Study Area. It is unlikely the Proposed Action will decrease the availability or quality of koala habitat to the extent that the species will decline. Disturbance to Dispersal Habitat has not been considered for this criteria as the impacts to this habitat type will not permanently prevent koala from utilising these areas for dispersal purposes.	Unlikely
Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat;	Invasive species such as feral cats (*Felis catus*) and wild dogs (*Canis lupus*) are common pests encountered Queensland and are particularly harmful to native, threatened mammals. Both of these invasive species are known to occur in the Study Area. The Proposed Action will adopt and follow a Biosecurity Plan, as outline in Section 7. The activities related to the Proposed Action, both during construction and operation, will implement and follow biosecurity measures to reduce the risk of introducing new invasive species and to prevent the further spread of existing invasive species.	Unlikely
Introduce disease that may cause the species to decline; or	Koala populations are known to be impacted by diseases, specifically koala retrovirus (KoRV) and chlamydia (*Chlamydia pecorum*). There is no evidence to suggest the construction and/or operational activities of the Proposed Action would introduce a disease, such as chlamydia, that would cause the species to be at risk of illness and subsequent population decline. Additionally, precautions will be taken to ensure that the spread of disease does not occur, as detailed in a Biosecurity Plan. This includes following biosecurity measures and ensuring proper personal protection equipment is worn by construction workers and vehicle washdowns before entering any sites near koala habitat.	Unlikely

Criteria	Description	Criteria Triggered?
Interfere with the recovery of the species.	The interim recovery objectives for the koala are: • Protect and conserve the quality and extent of habitat refuges for the persistence of the species during droughts and periods of extreme heat, especially in riparian environments and other areas with reliable soil moisture and fertility; and • Maintain the quality, extent and connectivity of large areas of koala habitat surrounding habitat refuges. The Proposed Action will only impact a relatively small portion of koala habitat within the Study Area (663.5 ha or 2.9%), with an even smaller portion of Preferred Breeding and Foraging habitat comprised of riparian woodland suitable for drought and extreme heat refuge to be affected (6.2 ha or 0.4%). Further, impacts associated with the Proposed Action will only remove habitat in small linear patches, with connectivity values retained and mitigation measures including pre-clearance surveys and micro-siting employed to further preserve important habitat traits. Therefore, the Proposed Action is unlikely to interfere with the above recovery objectives.	Unlikely
Significant impact: Likely		

6.6.6 LARGE-EARED PIED BAT

6.6.6.1 DIRECT IMPACTS

Direct impacts to large-eared pied bat associated with the Proposed Action are considered to be limited to habitat loss from vegetation clearing and individual mortality and injury from turbine collision. These impacts are quantified below and include impacts to:

- 16.5 ha of Foraging Habitat.

It is expected that some impacted areas of large-eared pied bat habitat will be revegetated after the construction phase. However, no rehabilitation or revegetation in these areas is expected to restore any functionality for this species post-construction. Therefore, the direct impact to large-eared pied bat associated with construction-phase clearing is considered permanent.

A quantitative risk assessment of direct impact to large-eared pied bat associated with the operational-phase collision risk with wind turbines is presented in the BBMP (Appendix D). In summary:

- The species is listed as endangered under the EPBC Act;
- Several 'probable' recordings of the species were detected within the Study Area through Anabat recordings;
- No records exist within the broader locality in the last 20 years (100 km radius of the Study Area);
- The species is a canopy and above canopy forager; and
- Potential foraging habitat is present within the Study Area.

Based on the collision risk assessment (CRA) methodology and risk matrix detailed within the BBMP (Appendix D), the large-eared pied bat has a 'moderately likely' likelihood of WTG collision, and as an endangered EPBC Act listed species, the consequence of an impact event is considered to be 'major'. Therefore, the species has been considered to be at a 'moderate' risk of being impacted by the Proposed Action through collision with WTGs. Further detail on the CRA is provided in Section 6.11 and within the BBMP (Appendix D).

The BBMP establishes species-specific impact thresholds and associated triggers for turbine-related mortality, along with the decision-making framework and adaptive management responses required when thresholds are reached. These thresholds include an Annual Threshold and a Significant Impact Threshold, the latter comprising an intermediate trigger (Trigger 1) and a significant impact trigger (Trigger 2). Based on an Australian population estimate of 20,000 individuals, the Trigger 2 for large-eared pied bat is 20 mortalities (0.1% of population) over a 10-year period (based on generational time). Adaptive management measures and corrective actions will be implemented proactively to avoid progression toward a Trigger 2 (a significant impact), including actions triggered by exceeding the Annual Threshold and/or Significant Impact Threshold Trigger 1. However, if a significant impact (Trigger 2) is reached for any bird or bat species, the Proponent must cease operation of the WTGs identified as contributing to the MNES mortality during ecologically relevant periods. WTGs must not recommence operation until approval is given from DCCEEW.

A summary of the direct impacts to large-eared pied bat habitat as a result of the Proposed Action is shown in Table 6-18. A total of 16.5 ha of large-eared pied bat habitat will be permanently impacted by the Proposed Action, which equates to 0.6% of the total available habitat identified within the Study Area.

TABLE 6-18 DIRECT IMPACTS TO LARGE-EARED PIED BAT

	Foraging Habitat
Study Area (ha)	2,856.1
Disturbance Footprint (ha)	16.5
Percent of habitat within the Study Area to be impacted	0.6% of Foraging Habitat within the Study Area
Permanent impact (Operations Footprint) (ha)	16.5

6.6.6.2 INDIRECT IMPACTS

The indirect impacts to large-eared pied bat as a result of the Proposed Action are detailed in Table 6-19, along with how these impacts will be managed and any residual impact that will affect the MNES. Avoidance, mitigation and management measures are discussed in detail in Section 7.

TABLE 6-19 INDIRECT IMPACTS TO LARGE-EARED PIED BAT

Indirect Impact	Management of Indirect Impact	Residual Impact
Habitat Loss and Individual Mortality from Vegetation Clearing	The impact of habitat loss is considered a direct impact and has been addressed in the above Section. The following points refer to the potential indirect impact of individual mortality during vegetation clearing associated with the Proposed Action. • Areas identified as MNES habitat will be avoided as much as possible at the design and micro-siting stages. • Clear delineation of areas to be cleared, ensuring that the Disturbance Footprint does not extend further than planned to create unnecessary fragmentation or disturbance. • Pre-clearance surveys and fauna spotter catchers will be utilised. Microhabitat features (e.g. hollow bearing trees) will be avoided where sufficient flexibility is enabled by State and Federal approvals. • Staff and contractors will be made aware through general site induction and training of the potential to impact native fauna, reporting requirements and mitigation and management measures that are to be implemented during on-site works. • Vehicles, plant and machinery will comply with site-specific speed limits to minimise the likelihood of collision with fauna. • Where trenching and excavations are created which may entrap fauna, suitable escape measures will be put in place, and excavations checked for fauna before backfilling. • Weekly site inspections to review flora and fauna control measures during construction. Sightings and incidents reported in daily pre-starts during construction. All near misses and incidents will be investigated to establish root cause. Where necessary corrective actions will be developed to improve existing processes.	The management measures to mitigate direct fatality or injury during construction and operation will result in the successful avoidance of impact to the species. This is such that any roosting bats found within the Disturbance Footprint in pre-clearance surveys will be avoided through micro-siting or translocated to safer habitat such that no indirect impact will result.
Habitat Fragmentation and Patch Isolation	• Areas identified as MNES habitat will be avoided as much as possible at the design and micro-siting stages. • Micro-siting of infrastructure will utilise existing clearance areas and avoid habitat fragmentation and patch isolation, with consideration of whether avoidance areas would still be connected to habitat in the broader landscape. • Prior to construction and detailed design, the incorporation of road pinch points to maximise connectivity will be considered to maintain habitat connectivity. While pinch points have a benefit for habitat they present a technical and logistical barrier to safe and effective construction. Pre-clearance surveys will determine appropriate locations for road pinch points.	Habitat fragmentation and patch isolation will be managed to ensure that large-eared pied bats are able to move and disperse throughout the entirety of identified habitat, maintaining connectivity with the landscape within and surrounding the Study Area. All clearing for access corridors will be limited to 40 m. Additionally, the Proposed Action will not remove or isolate habitat patches altogether, only clearing in the areas necessary for infrastructure. Therefore, this indirect impact will be minimised so as not to cause an indirect residual impact.

Indirect Impact	Management of Indirect Impact	Residual Impact
	• Location of infrastructure will prioritise avoiding or minimising edge effects or dissecting tracts of native vegetation. • Where possible, the Proposed Action will implement the use of innovative turbine blade transportation, including methods to minimise necessary clearance widths (e.g. 'Blade Manipulator' trucks). • Turbine placement will maximise the use of areas that are less vegetated to avoid and minimise clearing of key habitat. • All clearing for access corridors will be limited to 40 m in width during the construction phase. • Clear delineation of areas to be cleared, ensuring that the Disturbance Footprint does not extend further than planned to create unnecessary fragmentation or disturbance. Toolbox talks will relay site-specific clearing information to all field staff and contractors. • Rehabilitation of access corridors will occur once construction has been completed. Such rehabilitation will involve planting/natural regeneration of native species that are habitat for MNES.	
Increased Prevalence of Invasive Plants and Animals	• A Biosecurity Management Plan will be implemented for the site which includes requirements for vehicle washdowns and protocols to ensure activities are planned to minimise movement of vehicles, equipment and machinery outside of designated access corridors. • Staff and contractors will be given information on the location and consequences of biosecurity threats in the Study Area. • Access to a landholder's property will not occur unless authorised under a land use agreement. • WONS and Restrictive Invasive Species will be identified and monitored in the Study Area. Appropriate weed monitoring will occur to ensure new weed species are identified, recorded and controlled. • Weed management and control methods will depend upon the location, weed species identified, the degree of the infestation, relevant landholder agreement or conduct and compensation agreements provisions, and local, state and national regulatory requirements. • Weed loads will be minimised in high-traffic areas such as roads, easements and yards through regular monitoring and site personnel reporting protocols, with an investigation to be managed to prevent spread of weeds in accordance with the *Biosecurity Act 2014* (Qld). • Imported material able to transport weed seed will be assessed to ensure they are free of contamination, disease and invasive weeds.	Management measures will limit the possibility of the introduction or spread of invasive plant and animal species through relevant biosecurity measures incorporated into the Biosecurity Management Plan. This is such that the indirect impact will be minimised so as not to cause an indirect residual impact to the species.

Indirect Impact	Management of Indirect Impact	Residual Impact
Increased Vehicle Impacts on Fauna and Habitat	• No driving will occur in unauthorised areas, routes and access tracks will be clearly communicated to all site visitors. All driving will be carried out at safe speeds designated for the site. Night-time safe driving controls will also be applied, including additional speed restrictions, providing additional protection to nocturnal animals. • Site entry and exit points will be clearly marked to ensure vehicle movements are contained within the approved areas. • Staff and contractors will be made aware through general site induction and training of the potential to impact native fauna, reporting requirements and mitigation and management measures that are to be implemented during on-site works. • Injured, sick or dead fauna will be recorded and reported, during and after the construction and operation phases. This can be carried out by a fauna spotter-catcher during periods where disturbance is expected to occur (primarily construction activities). Where injured or sick fauna is detected, individuals will be taken to the nearest wildlife carer or veterinarian if practical.	Implementation of management measures will ensure operating vehicles on-site during the construction, operation and decommissioning phases will not result in residual impacts to large-eared pied bat.
Altered Fire Regimes and Bushfire Risk	• A Bushfire Management Plan will be developed and implemented during construction and operation to mitigate the potential impact of fires to MNES habitat. • Maintenance of an asset protection zone within the Operations Footprint is required to reduce the risk of reduction of habitat due to fire. • Use of industry best practice hazard reduction measures to minimise bushfire risk and environmental impacts, such as on-site controlled burning of cleared vegetation. • Ensuring a 30 m bushfire setback from vegetation around electrical infrastructure. Maintaining safe distances between vegetation and potential fire-starting hazards will increase safety and reduce fire risk. • Weed management and control methods (in line with the requirements of the *Biosecurity Act 2014* (Qld).) will reduce the potential of invasive plants changing species composition on-site and increasing fire risk. • Reduce on-site fuel loads and maintain firebreaks and trails.	Management measures implemented in line with the site-specific Bushfire Management Plan will greatly reduce the potential risk for this species caused by planned or unplanned fires. Therefore, there is no anticipated indirect residual impact.

Indirect Impact	Management of Indirect Impact	Residual Impact
Altered Hydrology	• The Proposed Action will adopt best practice erosion and sediment control measures, which will implement all relevant State Codes and Guidelines. • Watercourse crossings shall be stabilised to mitigate erosion of pavement and embankment materials during rainfall events up to and including the 10% AEP storm event. • Staff and contractors will be made aware through general site induction and training of the potential to generate runoff and mitigation and management measures that should be implemented. • Construction activities must not interfere or block natural drainage e.g. disturbing channel contours. • Water barrier works will be designed to minimise impact on fish habitats, stock or movements through compliance with relevant design codes. During the detailed design phase, fish passage elements will be considered in all mapped waterways for fish passage, including compliance with the accepted development requirements for waterway barrier works or an operational works permit under the Planning Act.	Impacts to on-site hydrology will be managed in accordance with the CEMP. Impacts to watercourses will be addressed by stabilising to prevent erosion, and only occur in discrete work areas, such that no increase in sedimentation is overserved affecting habitat. Therefore, there is no anticipated indirect residual impact.
Environmental Pollution and Hazardous Materials	• All hazardous materials bought on-site will be accompanied by an MSDS, all relevant personnel will be trained in their proper use. • Only registered herbicides will be used for weed management by a suitably qualified bush regeneration contractor. • Imported materials that are able to transport hazardous substances will be assessed to ensure they are free of contamination, disease and invasive species. • Ensuring appropriate waste management (lidded bins), to reduce potential for spread of hazardous materials on-site. • Vehicles, plant and machinery will comply with site-specific speed limits to minimise noise and dust generation. • Staff and contractors will be made aware through general site induction and training of the potential to generate dust, light and noise pollution and management measures that should be implemented. • Auditing of the CEMP will occur during construction. • Dust will be minimised through engineering controls on machinery and other available dust suppression controls, such as sprinklers. • Light pollution will be minimised through engineering controls on infrastructure and machinery, such as colour selection and timing controls. • Noise will be minimised through engineering controls on infrastructure and machinery, such as noise barriers and timing controls.	The management measures proposed will result in the reduction of the indirect impacts of environmental pollution and hazardous materials. Hazardous materials brought onto the site will be tightly regulated. Dust, light and noise generation will be minimised such that is it unlikely to adversely affect species or damage species habitat. These measures will ensure that the indirect impact is minimised so as to not cause an indirect residual impact to large-eared pied bat.

Indirect Impact	Management of Indirect Impact	Residual Impact
	• Disturbance form blasting will be minimised through engineering controls and other available blasting suppression, such as barrier walls. • Electricity infrastructure designed to allow for safe operations, using buffers between conductors and the ground, and conductors and adjacent vegetation. The transmission line has adopted a design which allows for reduced interference to canopy dwelling species due to minimising impacts to canopy vegetation.	
Individual Mortality and Injury from Turbine Collision and Barotrauma	• WTGs will be located away from key bird and bat habitats (such as waterways and drainage lines). • Powerlines will be located so as to avoid fauna obstruction/entanglement and minimise potential perching resources within 200 m of high-risk turbines (identified within the BBMP (Appendix D)). • Turbine selection will incorporate innovative blade design features to minimise potential collision rates. WTG design will include acoustic and visual deterrents (e.g. ultrasound acoustic devices) and detection systems (e.g. IdentiFlight®, Robin Radar Systems) for high-risk turbines (identified within the BBMP (Appendix D)). • Development and implementation of a BBMP that considers the impacts that may occur to birds and mitigation measures to address potential impacts to migratory species considered 'potential' to occur within the Study Area. • Sightings and incidents reported in daily pre-starts during construction. • Carry out scientifically robust monitoring program for the detection/quantification of impacts on protected matters, including as a result of turbine strike and barotrauma. The monitoring program must be able to accurately and in a timely manner detect when impact triggers are reached. • All near misses and incidents will be investigated to establish root cause. Where necessary corrective actions will be developed to improve existing processes. • Injured, sick or dead fauna will be recorded and reported, during and after the construction and operation phases.	Mitigation and management measures outlined for the Proposed Action's WTGs will ensure that the potential impacts are minimised so as to not cause an indirect residual impact to large-eared pied bat. It is noted that the results of future bat surveys and any evidence of threatened or migratory species in the Study Area, will be incorporated into future risk assessments and CRM within the BBMP. Therefore, the principle of adaptive management will be applied to ensure that any future risks identified are adequately reported, analysed and subsequently managed as per the framework in the BBMP. The amount and magnitude of direct impact to large-eared pied bat associated with the operational-phase collision risk with wind turbines is further discussed in Section 6.11.

Indirect Impact	Management of Indirect Impact	Residual Impact
Site Alienation	• Locating turbines and access corridors away from key habitats where feasible (including remnant vegetation, waterways and drainage lines) reducing disturbance during all phases of the Proposed Action. • Mitigating habitat fragmentation and maintaining connectivity through the measures outlined above. • Using turbines with an RSA >40 m above ground level to provide a collision-free foraging zone within the canopy and 20 m above the canopy, reducing operational disturbance to terrestrial species. • Development and implementation of management plans (VFMP, CEMP) outlined above to reduce the potential impact of construction and operation phase activities including introducing invasive species, fire and altered hydrology. • Implementing engineering controls on infrastructure and machinery outlined above, such that dust, light and noise pollution and blasting does not adversely affect species or species habitat.	The potential risk of site alienation will be managed to ensure that species are able to move, disperse and utilise habitat throughout the Study Area for the life of the Proposed Action. Avoidance, mitigation and management measures outlined in this PER will ensure that the potential for site alienation is minimised so as to not cause an indirect residual impact to large-eared pied bat.

Indirect impacts from the Proposed Action will be mitigated and managed appropriately, such that there is no residual impact on large-eared pied bat. Some indirect impacts have been considered as part of the significant impact assessment for this species but are concluded unlikely to contribute to a significant impact.

6.6.6.3 SIGNIFICANT IMPACT ASSESSMENT

There is a total of 2,856.1 ha large-eared pied bat Foraging Habitat within the Study Area. A total of 16.5 ha of large-eared pied bat habitat is expected to be permanently impacted as a result of the Proposed Action. No roosting habitat was identified, however due to the proximity of Belmont State Forest and Mount Tam to the northern boundary of the Study Area, there is potential that areas of steep terrain may support roosting bats in this location that utilise the Study Area for foraging. No record of the species occurs within the Study Area or the Locality, with the closest record occurring within Presho State Forest, over 100 km to the west of the Study Area (ALA, 2024).

A significant impact assessment based on the guidance provided in the SIG 1.1 is presented in Table 6-20. It has been concluded that the Proposed Action is **unlikely** to have a significant impact on the large-eared pied bat. Avoidance, mitigation and management measures considered within this assessment are discussed in detail in Section 7.

TABLE 6-20 SIGNIFICANT IMPACT ASSESSMENT FOR LARGE-EARED PIED BAT

Criteria	Description	Criteria Triggered?
An action is likely to have a significant impact on an endangered species if there is a real chance or possibility that it will:		
Lead to a long-term decrease in the size of a population;	The Study Area likely provides foraging resources to support large-eared pied bat, however there is an absence of suitable caves for roosting. The species is considered likely to occur within the Study area due to the detection of 'probable' recordings of the species by Anabat recording devices deployed across the Study Area during multiple field surveys. A total of 2,856.1 ha of Foraging Habitat for large-eared pied bat (6.1% of the Study Area) has been identified and mapped within the Study Area, with a total of 16.5 ha of Foraging Habitat (0.6% of all Foraging Habitat within the Study Area) projected to be impacted as a result of the Proposed Action. Given the 'probable' recording locations of the species within the Study Area, there is potential for large-eared pied bat to occur within the Locality, with roost sites outside the Study Area. As no roosts sites were identified within the Study Area, impacts as a result of the Proposed Action are limited to loss of foraging habitat only. As no known roosts are likely to be impacted, and the large availability of foraging habitat retained in the Study Area, impacts to habitat associated with the Proposed Action are considered unlikely to lead to a long-term decrease in the size of the population. The total population size for large-eared pied bat likely ranges between 10,000 and 20,000 individuals (DCCEEW, 2023a). The Indicative Significant Impact Threshold (0.1% of population) for large-eared pied bat adopted for the Proposed Action is 20 mortalities over a five-year period. If this threshold is reached, adaptive management outlined in the BBMP will be implemented to determine the contribution factors and mitigate risk to large-eared pied bat associated with the operation of the Proposed Action's WTGs. It is therefore considered unlikely that the operational phase of Proposed Action will lead to a long-term decrease in the size of the population.	Unlikely

Criteria	Description	Criteria Triggered?
Reduce the area of occupancy of the species;	The estimated area of occupancy of large-eared pied bat is 1,500 km^2 (150,000 ha), of which the Study Area occurs at the northern-most extent (DCCEEW, Conservation Advice for Chalinolobus dwyeri (large-eared pied bat), 2023a). Area of occupancy for the species is determined by total area of know maternity roost sites, which provide an essential roosting, sheltering and breeding function for the species (DCCEEW, 2023). No roosting habitat is mapped to occur within the Study Area, however likely recordings of the species across multiple locations and multiple survey events indicate the possibility for large-eared pied bat roosting habitat within the Locality. Vegetation clearance in the proximity of roosts is identified as a key threat to large-eared pied bat in the species' conservation advice (DCCEEW, 2023). The Proposed Action is projected to impact a total of 16.5 ha of Foraging Habitat (0.6% of all Foraging Habitat within the Study Area). The retention of approximately 99% of large-eared pied bat Foraging Habitat within the Study Area means the Proposed Action is unlikely to reduce the area of occupancy of the species.	Unlikely
Fragment an existing population into two or more populations;	The Proposed Action is expected to impact a total of 16.5 ha of Foraging Habitat (0.6% of all Foraging Habitat within the Study Area). This impact will only remove small, linear patches of habitat and as the large-eared pied bat is a highly mobile species, it is considered unlikely that the Proposed Action will fragment an existing important population into two or more populations.	Unlikely
Adversely affect habitat critical to the survival of a species;	Large-eared pied bat conservation advice identifies that, due to loss, degradation and fragmentation of habitat, especially foraging habitat, all suitable habitat for the species likely constitutes habitat critical to the survival. Specifically, the presence of foraging habitat within close proximity to roosting sites should be considered habitat critical to the survival of the large-eared pied bat (DCCEEW, 2023). A total of 16.5 ha of large-eared pied bat Foraging Habitat (0.6% of all Foraging Habitat within the Study Area) is projected to be impacted as a result of the Proposed Action. Multiple 'probable' large-eared pied acoustic records were made within the Study Area across multiple survey events, indicating the potential for suitable roosting sites within the Locality. However, no roosting habitat, which is essential for the species, has been identified during field surveys and therefore, no roosting habitat has been mapped to occur within the Study Area. Given that no roosting habitat has been identified within the Study Area and the Proposed Action will result in <1% of the available habitat within the Study Area being directly impacted, it is considered unlikely that the Proposed Action will adversely affect habitat critical to the survival of the species.	Unlikely

Criteria	Description	Criteria Triggered?
Disrupt the breeding cycle of a population;	Large-eared pied bats utilise roosting habitat for breeding function. This includes cliffs, escarpments, overhangs, cracks or rocky ledges (DCCEEW, 2023). The Proposed Action is estimated to impact 16.5 ha of Foraging Habitat (0.6% of all Foraging Habitat within the Study Area), however no roosting habitat has been identified within the Study Area. Therefore, it is unlikely the Proposed Action will disrupt the breeding cycle of an important population of large-eared pied bat.	Unlikely
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline;	A total of 2,856.1 ha of large-eared pied bat Foraging Habitat has been identified and mapped within the Study Area, with 16.5 ha (0.6% of all Foraging Habitat within the Study Area) of this habitat projected to be impacted by the Proposed Action. The species displays fidelity to established foraging habitat (DCCEEW, 2023). Foraging resources in proximity of established diurnal roosts are of high ecological value for large-eared pied bat, however no essential roosting habitat in the Study Area has been identified, and while there is potential for roosting habitat in the Locality, that cannot be confirmed. Given this, it is considered unlikely that impacts associated with the Proposed Action will modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	Unlikely
Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat	Predation by introduced predators (such as feral cats (*Felis catus*), European red foxes (*Vulpes vulpes*) and rats (*Rattus sp*.)) has been suggested as a potential threat to cave roosting microbats in Australia. Additionally, roosting habitat disturbance by feral goats (*Capra hircus)* is considered a major risk to the species (DCCEEW, 2023). No feral goats were observed within the Study Area. The Proposed Action will adopt and follow a Biosecurity Plan, as outline in Section 7. The activities related to the Proposed Action, both during construction and operation, will implement and follow biosecurity measures to reduce the risk of introducing new invasive species and to prevent the further spread of existing invasive species.	Unlikely
Introduce disease that may cause the species to decline; or	The impact of diseases, including but not limited to, white-nose syndrome is a potential threat to the species. White-nose syndrome is caused by the fungus *Pseudogymnoascus destructans* and leads to death through an infection of the muzzle and other parts of the body. The disease has not yet been detected in Australia but is a threat to cave-dwelling bats in other parts of the world and could have a significant impact on this species if it is introduced (DCCEEW, 2023).	Unlikely

Criteria	Description	Criteria Triggered?
	Precautions will be taken to ensure that the spread of disease does not occur, as will be detailed in the Biosecurity Plan (see Section 7). This includes following biosecurity measures and ensuring proper personal protection equipment is worn by construction workers and vehicle washdowns before entering identified habitats.	
Interfere with the recovery of the species.	There is currently no adopted Recovery Plan for the species. The priority conservation objective stated within the species Conservation Advice is: *The distribution and the abundance of the species' subpopulations are maintained, and no known maternity roosts are lost. Foraging habitat within the vicinity of known roosts is maintained and is not cleared* (DCCEEW, 2023a). It is noted that the population structure of this species within QLD is poorly known (DCCEEW, 2023) and there are likely roosting sites located within the locality of the Study Area. However, as no roosting habitat was identified within the Study Area, it is considered unlikely that an impact to 16.5 ha of Foraging Habitat (0.6% of all Foraging Habitat within the Study Area) will interfere with the recovery of the species.	Unlikely
Significant Impact: Unlikely		

6.6.7 SQUATTER PIGEON (SOUTHERN)

6.6.7.1 DIRECT IMPACTS

Direct impacts to squatter pigeon associated with the Proposed Action are considered to be limited to habitat loss from vegetation clearing. Impacts due to individual mortality and injury from turbine collision are not anticipated for squatter pigeon as this species is typically low-flying and forages on the ground, well below the RSA.

Direct impacts to squatter pigeon habitat are quantified below and include impacts to:

- 128.3 ha of Breeding Habitat; and
- 57.6 ha of Foraging and Dispersal Habitat;

Squatter pigeons are commonly observed foraging on roadsides and dirt tracks (DCCEEW, 2024b). It is expected that 33.4 ha of Foraging and Dispersal Habitat will be revegetated after the construction phase. Revegetation is expected to return the functionality required for the squatter pigeon in Foraging and Dispersal Habitat and therefore, this impact is considered temporary. However, revegetation is not expected to return Breeding Habitat to a fully functional state, as this habitat requires a more complex structure. As a result, the entire 123.3 hectares of impact to Breeding Habitat is considered permanent.

The rehabilitation of 33.4 ha of squatter pigeon Foraging and Dispersal Habitat includes 13.3 ha of Type 1 natural regeneration and 20.1 ha of Type 2 rehabilitation, as shown in Figure 6-4. Further discussion on rehabilitation types, estimated timing to return habitat to its previous functionality, as well as the management measures, completion criteria, interim targets and corrective actions for rehabilitation is provided in Section 8.

A summary of the direct impacts to squatter pigeon habitat as a result of the Proposed Action is shown in Table 6-21. A total of 152.5 ha of squatter pigeon habitat will be permanently impacted by the Proposed Action, which equates to 0.6% of the total available habitat identified within the Study Area.

TABLE 6-21 DIRECT IMPACTS TO SQUATTER PIGEON HABITAT

	Breeding Habitat	**Foraging and Dispersal Habitat**
Study Area (ha)	9,575.4	2,333.5
Disturbance Footprint (ha)	128.3	57.6
Percent of habitat within the Study Area to be impacted	0.8% of Breeding Habitat within the Study Area	0.7% of Foraging and Dispersal Habitat within the Study Area
Available **Revegetation areas** within the Disturbance Footprint (ha)	N/A	33.4
Permanent impact* (Operations Footprint) (ha)	128.3	24.2 (or 0.3%)

**Permanent impact (Operations Footprint) is provided where revegetation and/or rehabilitation can return habitat for the species to function or utilise post-construction (i.e., for recolonisation, dispersal, foraging or breeding).*

Legend

- Study Area
- Operation Footprint
- Squatter pigeon Foraging and Dispersal Habitat
- Squatter pigeon Foraging and Dispersal - Type 1 natural regeneration
- Squatter pigeon Foraging and Dispersal - Type 2 revegetation/ rehabilitation
- Highway
- Road
- Track and Path

Coordinate System:
GDA2020 MGA Zone 56

Date: 05/06/2025
Created By: HD
Drawing Size: A3

0 1 2 3km

1:125,000

F6-4 Rehabilitation of Squatter pigeon Foraging and Dispersal Habitat

Theodore Wind Farm PER

Theodore Energy Development Pty Ltd

ERM

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6.6.7.2 INDIRECT IMPACTS

The indirect impacts to squatter pigeon as a result of the Proposed Action are detailed in Table 6-22, along with how these impacts will be managed and any residual impact that will affect the MNES. Avoidance, mitigation and management measures are discussed in detail in Section 7.

TABLE 6-22 INDIRECT IMPACTS TO SQUATTER PIGEON

Indirect Impact	Management of Indirect Impact	Residual Impact
Habitat Loss and Individual Mortality from Vegetation Clearing	The impact of habitat loss is considered a direct impact and has been addressed in the above Section. The following points refer to the potential indirect impact of individual mortality during vegetation clearing associated with the Proposed Action. • Areas identified as MNES habitat will be avoided as much as possible at the design and micro-siting stages. • Clear delineation of areas to be cleared, ensuring that the Disturbance Footprint does not extend further than planned to create unnecessary fragmentation or disturbance. • Pre-clearance surveys and fauna spotter catchers will be utilised. Microhabitat features (e.g. hollow bearing trees) will be avoided where sufficient flexibility is enabled by State and Federal approvals. • Staff and contractors will be made aware through general site induction and training of the potential to impact native fauna, reporting requirements and mitigation and management measures that are to be implemented during on-site works. • Vehicles, plant and machinery will comply with site-specific speed limits to minimise the likelihood of collision with fauna. • Where trenching and excavations are created which may entrap fauna, suitable escape measures will be put in place, and excavations checked for fauna before backfilling. • Weekly site inspections to review flora and fauna control measures during construction. Sightings and incidents reported in daily pre-starts during construction. All near misses and incidents will be investigated to establish root cause. Where necessary corrective actions will be developed to improve existing processes.	The management measures to mitigate direct fatality or injury during construction and operation will result in the successful avoidance of impact to the species. This is such that any squatter pigeon found within the Disturbance Footprint in pre-clearance surveys will be closely monitored, allowed to self-disperse, and worst-case scenario translocated to safer habitat such that no indirect residual impact will result.
Habitat Fragmentation and Patch Isolation	• Areas identified as MNES habitat will be avoided as much as possible at the design and micro-siting stages. • Micro-siting of infrastructure will utilise existing clearance areas and avoid habitat fragmentation and patch isolation, with consideration of whether avoidance areas would still be connected to habitat in the broader landscape. • Prior to construction and detailed design, the incorporation of road pinch points to maximise	Habitat fragmentation and patch isolation will be managed to ensure that squatter pigeons are able to move and disperse throughout the entirety of identified habitat, maintaining connectivity with the landscape within and surrounding the Study Area. All clearing for access corridors will be limited to 40 m. Additionally, the Proposed Action

Indirect Impact	Management of Indirect Impact	Residual Impact
	connectivity will be considered to maintain habitat connectivity. While pinch points have a benefit for habitat they present a technical and logistical barrier to safe and effective construction. Pre-clearance surveys will determine appropriate locations for road pinch points. • Location of infrastructure will prioritise avoiding or minimising edge effects or dissecting tracts of native vegetation. • Where possible, the Proposed Action will implement the use of innovative turbine blade transportation, including methods to minimise necessary clearance widths (e.g. 'Blade Manipulator' trucks). • Turbine placement will maximise the use of areas that are less vegetated to avoid and minimise clearing of key habitat. • All clearing for access corridors will be limited to 40 m in width during the construction phase. • Clear delineation of areas to be cleared, ensuring that the Disturbance Footprint does not extend further than planned to create unnecessary fragmentation or disturbance. Toolbox talks will relay site-specific clearing information to all field staff and contractors. • Rehabilitation of access corridors will occur once construction has been completed. Such rehabilitation will involve planting/natural regeneration of native species that are habitat for MNES.	will not remove or isolate habitat patches altogether, only clearing in the areas necessary for infrastructure. Therefore, this indirect impact will be minimised so as not to cause an indirect residual impact.
Increased Prevalence of Invasive Plants and Animals	• A Biosecurity Management Plan will be implemented for the site which includes requirements for vehicle washdowns and protocols to ensure activities are planned to minimise movement of vehicles, equipment and machinery outside of designated access corridors. • Staff and contractors will be given information on the location and consequences of biosecurity threats in the Study Area. • Access to a landholder's property will not occur unless authorised under a land use agreement. • WONS and Restrictive Invasive Species will be identified and monitored in the Study Area. Appropriate weed monitoring will occur to ensure new weed species are identified, recorded and controlled. • Weed management and control methods will depend upon the location, weed species identified, the degree of the infestation, relevant landholder agreement or conduct and compensation agreements provisions, and local, state and national regulatory requirements. • Weed loads will be minimised in high-traffic areas such as roads, easements and yards through regular monitoring and site personnel	Management measures will limit the possibility of the introduction or spread of invasive plant and animal species through relevant biosecurity measures incorporated into the Biosecurity Management Plan. This is such that the indirect impact will be minimised so as not to cause an indirect residual impact to the species.

Indirect Impact	Management of Indirect Impact	Residual Impact
	reporting protocols, with an investigation to be managed to prevent spread of weeds in accordance with the *Biosecurity Act 2014* (Qld). • Imported material able to transport weed seed will be assessed to ensure they are free of contamination, disease and invasive weeds.	
Increased Vehicle Impacts on Fauna and Habitat	• No driving will occur in unauthorised areas, routes and access tracks will be clearly communicated to all site visitors. All driving will be carried out at safe speeds designated for the site. • Site entry and exit points will be clearly marked to ensure vehicle movements are contained within the approved areas. • Staff and contractors will be made aware through general site induction and training of the potential to impact native fauna, reporting requirements and mitigation and management measures that are to be implemented during on-site works. • Injured, sick or dead fauna will be recorded and reported, during and after the construction and operation phases. This can be carried out by a fauna spotter-catcher during periods where disturbance is expected to occur (primarily construction activities). Where injured or sick fauna is detected, individuals will be taken to the nearest wildlife carer or veterinarian if practical.	Implementation of management measures will ensure operating vehicles on-site during the construction, operation and decommissioning phases will not result in residual impacts to squatter pigeon.
Altered Fire Regimes and Bushfire Risk	• A Bushfire Management Plan will be developed and implemented during construction and operation to mitigate the potential impact of fires to MNES habitat. • Maintenance of an asset protection zone within the Operations Footprint is required to reduce the risk of reduction of habitat due to fire. • Use of industry best practice hazard reduction measures to minimise bushfire risk and environmental impacts, such as on-site controlled burning of cleared vegetation. • Ensuring a 30 m bushfire setback from vegetation around electrical infrastructure. Maintaining safe distances between vegetation and potential fire-starting hazards will increase safety and reduce fire risk. • Weed management and control methods (in line with the requirements of the *Biosecurity Act 2014* (Qld)) will reduce the potential of invasive plants changing species composition on-site and increasing fire risk. • Reduce on-site fuel loads and maintain firebreaks and trails.	Management measures implemented in line with the site-specific Bushfire Management Plan will greatly reduce the potential risk for this species caused by planned or unplanned fires. Therefore, there is no anticipated indirect residual impact.

Indirect Impact	Management of Indirect Impact	Residual Impact
Altered Hydrology	• The Proposed Action will adopt best practice erosion and sediment control measures, which will implement all relevant State Codes and Guidelines. • Watercourse crossings shall be stabilised to mitigate erosion of pavement and embankment materials during rainfall events up to and including the 10% AEP storm event. • Staff and contractors will be made aware through general site induction and training of the potential to generate runoff and mitigation and management measures that should be implemented. • Construction activities must not interfere or block natural drainage e.g. disturbing channel contours. • Water barrier works will be designed to minimise impact on fish habitats, stock or movements through compliance with relevant design codes. During the detailed design phase, fish passage elements will be considered in all mapped waterways for fish passage, including compliance with the accepted development requirements for waterway barrier works or an operational works permit under the Planning Act.	Impacts to on-site hydrology will be managed in accordance with the CEMP. Impacts to watercourses will be addressed by stabilising to prevent erosion, and only occur in discrete work areas, such that no increase in sedimentation is overserved affecting habitat. Therefore, there is no anticipated indirect residual impact.
Environmental Pollution and Hazardous Materials	• All hazardous materials bought on-site will be accompanied by an MSDS, all relevant personnel will be trained in their proper use. • Only registered herbicides will be used for weed management by a suitably qualified bush regeneration contractor. • Imported materials that are able to transport hazardous substances will be assessed to ensure they are free of contamination, disease and invasive species. • Ensuring appropriate waste management (lidded bins), to reduce potential for spread of hazardous materials on-site. • Vehicles, plant and machinery will comply with site-specific speed limits to minimise noise and dust generation. • Staff and contractors will be made aware through general site induction and training of the potential to generate dust, light and noise pollution and management measures that should be implemented. • Auditing of the CEMP will occur during construction. • Dust will be minimised through engineering controls on machinery and other available dust suppression controls, such as sprinklers. • Light pollution will be minimised through engineering controls on infrastructure and machinery, such as colour selection and timing controls. • Noise will be minimised through engineering controls on infrastructure and machinery, such as noise barriers and timing controls.	The management measures proposed will result in the reduction of the indirect impacts of environmental pollution and hazardous materials. Hazardous materials brought onto the site will be tightly regulated. Dust, light and noise generation will be minimised such that is it unlikely to adversely affect species or damage species habitat. These measures will ensure that the indirect impact is minimised so as to not cause an indirect residual impact to squatter pigeon.

Indirect Impact	Management of Indirect Impact	Residual Impact
	• Disturbance form blasting will be minimised through engineering controls and other available blasting suppression, such as barrier walls. • Electricity infrastructure designed to allow for safe operations, using buffers between conductors and the ground, and conductors and adjacent vegetation. The transmission line has adopted a design which allows for reduced interference to canopy dwelling species due to minimising impacts to canopy vegetation.	
Site Alienation	• Locating turbines and access corridors away from key habitats where feasible (including remnant vegetation, waterways and drainage lines) reducing disturbance during all phases of the Proposed Action. • Mitigating habitat fragmentation and maintaining connectivity through the measures outlined above. • Using turbines with an RSA >40 m above ground level to provide a collision-free foraging zone within the canopy and 20 m above the canopy, reducing operational disturbance to terrestrial species. • Development and implementation of management plans (VFMP, CEMP) outlined above to reduce the potential impact of construction and operation phase activities including introducing invasive species, fire and altered hydrology. • Implementing engineering controls on infrastructure and machinery outlined above, such that dust, light and noise pollution and blasting does not adversely affect species or species habitat.	The potential risk of site alienation will be managed to ensure that species are able to move, disperse and utilise habitat throughout the Study Area for the life of the Proposed Action. Avoidance, mitigation and management measures outlined in this PER will ensure that the potential for site alienation is minimised so as to not cause an indirect residual impact to squatter pigeon.

Indirect impacts from the Proposed Action will be mitigated and managed appropriately, such that there is no residual impact on squatter pigeon. Some indirect impacts have been considered as part of the significant impact assessment for this species but are concluded unlikely to contribute to a significant impact.

6.6.7.3 SIGNIFICANT IMPACT ASSESSMENT

A total of 11,908.9 ha of squatter pigeon habitat has been mapped to occur within the Study Area, including 9,575.4 ha of Breeding Habitat and 2,333.5 ha of Foraging and Dispersal Habitat. A total 152.5 ha of habitat is expected to be permanently impacted as a result of the Proposed Action, which includes:

- 128.3 ha of Breeding Habitat; and
- 24.2 ha of Foraging and Dispersal Habitat.

A significant impact assessment based on the guidance provided in the SIG 1.1 is presented in Table 6-23. It has been concluded that the Proposed Action is **likely** to have a significant impact on the squatter pigeon. Avoidance, mitigation and management measures considered within this assessment are discussed in detail in Section 7.

TABLE 6-23 SIGNIFICANT IMPACT ASSESSMENT FOR THE SQUATTER PIGEON

Criteria	Description	Criteria Triggered?
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:		
Lead to a long-term decrease in the size of an important population of a species;	Squatter pigeon (southern) is known to occur within the Study Area. The species' SPRAT profile (DCCEEW, 2024b) outlines that all sub-populations occurring south of the Carnarvon Ranges in Central QLD are considered important sub-populations of the subspecies. This includes, but is not limited to: • Populations occurring in the Condamine River catchment and Darling Downs of southern Queensland; • Populations known to occur in the Warwick-Inglewood-Texas region of southern Queensland; and • Any populations potentially occurring in northern NSW. The Study Area is situated in relatively close proximity to the Carnarvon Ranges and the conservation-significant southern extent of the subspecies occurrence. Based on a conservative approach, the population utilising habitat within the Study Area is considered an important population. A total of 128.3 ha (0.8%) of squatter pigeon Breeding Habitat and 57.6 ha (0.7%) of Foraging and Dispersal Habitat is expected to be disturbed during construction. After post-construction rehabilitation, which is expected to return the functionality required for the squatter pigeon foraging and dispersal, the Proposed Action is expected to impact only 0.3% of all available Foraging and Dispersal Habitat within the Study Area. Further to this, squatter pigeon has an observed tendency to inhabit disturbed and partially disturbed areas. Therefore, the Proposed Action is unlikely to lead to a long-term decrease in the size of an important population.	Unlikely
Reduce the area of occupancy of an important population;	Squatter pigeon (southern) has an area of occupancy that is roughly estimated at 10,000 km^2, with a presumed low reliability in this figure (Garnett & Crowley, 2000). All sub-populations occurring south of the Carnarvon Ranges in Central QLD are considered important sub-populations of the subspecies, which includes populations occurring in the Condamine River catchment, Darling Downs region, Warwick-Inglewood-Texas region, and northern NSW (DCCEEW, 2024b). The Proposed Action will lead to a permanent impact to 0.8% of all available Breeding Habitat and 0.3% of all available Foraging and Dispersal Habitat within the Study Area, resulting in the disturbance to <0.01% of the sub-species total area of occupancy.	Unlikely

Criteria	Description	Criteria Triggered?
	Three individual observations of the species have been made across the Study Area. Additionally, based on a conservative approach, the Study Area falls within the conservation-significant southern extent of the species occurrence south of the Carnarvon Ranges, making the impacted population an 'important sub-population.' The linear nature of the Proposed Action and the retention of the majority of the squatter pigeon habitat in the Study Area will allow the persistence of the species. Therefore, it is likely with implemented mitigation measures such as pre-clearance surveys and micro-siting (see Section 7), impacts associated with the Proposed Action are unlikely to reduce area of occupancy for an important population of this species.	
Fragment an existing important population into two or more populations;	Clearing associated with the Proposed Action will largely occur within small, isolated turbine locations, or narrow linear areas within the Disturbance Footprint. The nature of the proposed clearing will ensure that southern squatter pigeon remains connected, both within and outside of the Study Area. Permanent disturbance to 0.8% of all available Breeding Habitat and 0.3% of all available Foraging and Dispersal Habitat within the Study Area are unlikely to fragment populations of this species due to southern squatter pigeon's comfort dispersing through disturbed areas.	Unlikely
Adversely affect habitat critical to the survival of a species;	A total of 11,908.9 ha of squatter pigeon habitat has been mapped to occur within the Study Area. Based on a conservative approach, the Study Area falls within the conservation-significant southern extent of the species occurrence south of the Carnarvon Ranges, making the impacted population an 'important sub-population.' Additionally, this habitat provides foraging and breeding function to the species. Due to the identified foraging and breeding habitat, and that the population of squatter pigeon within the Study Area potentially constitutes an 'important sub-population,' it has been considered likely the Study Area supports habitat critical to the survival of the species. Therefore, the projected permanent impact to 128.3 ha (or 0.8%) of all available Breeding Habitat and 24.2 ha (or 0.3%) of all available Foraging and Dispersal Habitat is considered likely to adversely affect habitat critical to the survival of the species.	Likely

Criteria	Description	Criteria Triggered?
Disrupt the breeding cycle of an important population;	A total of 128.3 ha (or 0.8%) of all available squatter pigeon Breeding Habitat is expected to be impacted within the Study Area during construction. Considering the retention of connectivity values, the species' ability to breed throughout the year (DCCEEW, 2024b), and the implementation of micro-siting at planned infrastructure sites, it is unlikely that the breeding cycle of southern squatter pigeon will be disrupted by the Proposed Action.	Unlikely
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline;	A total of 128.3 ha (or 0.8%) of southern squatter pigeon Breeding Habitat and 57.6 ha (or 0.7%) of Foraging and Dispersal Habitat is expected to be disturbed during construction. After post-construction rehabilitation, which is expected to return the functionality required for the squatter pigeon foraging and dispersal, the Proposed Action is expected to impact only 0.3% of all available Foraging and Dispersal Habitat within the Study Area. It is expected that the small areas of disturbance in the larger context of the landscape will not remove, isolate or decrease the quality of habitat to an extent that would result in species decline.	Unlikely
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat;	Invasive species such as feral cats (*Felis catus*) and European red foxes (*Vulpes vulpes*) are common pests encountered in Queensland and are particularly harmful to native threatened birds. These invasive species are known to occur in the Study Area. The Proposed Action will adopt and follow a Biosecurity Plan, as outline in Section 7. The activities related to the Proposed Action, both during construction and operation, will implement and follow biosecurity measures to reduce the risk of introducing new invasive species and to prevent the further spread of existing invasive species.	Unlikely
Introduce disease that may cause the species to decline; or	There is currently limited evidence of diseases causing detrimental effects on southern squatter pigeon populations in Queensland. There is also no evidence to suggest the proposed disturbance would introduce a disease that would cause the species to decline. Additionally, precautions will be taken to ensure that the spread of disease does not occur. This includes following biosecurity measures as part of a Biosecurity Plan (see Section 7).	Unlikely
Interfere substantially with the recovery of the species.	The Proposed Action is expected to result in permanent impacts to 128.3 ha (0.8%) of Breeding Habitat and 24.2 ha (0.3%) of Foraging and Dispersal Habitat within the Study Area. There are no formally adopted recovery plans for this species. However, it is considered that the mostly linear nature of disturbance of habitat	Unlikely

Criteria	Description	Criteria Triggered?
	within the Study Area will not affect the recovery of this species. Clearing will not adversely affect retained areas of suitable habitat, and mitigation measures such as micro-siting and pre-clearance surveys will be utilised. This will enable the species to continually traverse the landscape, ensuring genetic viability of the population. The Proposed Action is also unlikely to restrict access or limit the availability of current breeding habitat adjacent to known waterbodies such as farm dams and watercourses. While there is potential the population within the Study Area constitutes an 'important sub-population' of squatter pigeon, with the above avoidance and mitigation measures enacted, it is unlikely the Proposed Action will interfere substantially with the recovery of the species.	
Significant Impact: Likely		

6.6.8 WHITE-THROATED NEEDLETAIL

6.6.8.1 DIRECT IMPACTS

The entire Study Area has been considered Potential Foraging Habitat for the white-throated needletail, as this species forages aerially. Initial construction-phase clearing of vegetation within the Study Area is only likely to represent a short-term disturbance to the species.

Direct impacts to white-throated needletail associated with the Proposed Action are therefore considered to be limited to individual mortality and injury from turbine collision. A quantitative risk assessment of direct impact to white-throated needletail associated with the operational-phase collision risk with wind turbines is presented in the BBMP (Appendix D). In summary:

- The species is listed as vulnerable and migratory under the EPBC Act;
- No records of the species exist within the Study Area and locality;
- Low-moderate abundance of records exist within the broader locality in the last 20 years (100 km radius of the Study Area);
- Species population is estimated at above 10,000 individuals (TSSC, 2019);
- Flight height generally occurs within the RSA (known to fly 1-300m above ground);
- The species is known to form large flocks of 1000s of individuals; and
- The species is considered to be exclusively aerial, with no roosting habitat mapped within the Study Area (it is assumed that the species could utilise the entire Study Area aerially).

Based on the CRA methodology and risk matrix detailed within the BBMP (Appendix D), the white-throated needletail has a 'moderately likely' likelihood of WTG collision due to its flight height and flock flying behaviour, and, as a vulnerable and migratory species, the consequence of an impact event is considered to be 'moderate'. Therefore, the species has been considered to be at a 'low' risk of being impacted by the Proposed Action Through collision with WTGs. Further detail on the CRA is provided in Section 6.11 and within the BBMP (Appendix D).

The BBMP establishes species-specific impact thresholds and associated triggers for turbine-related mortality, along with the decision-making framework and adaptive management responses required when thresholds are reached. These thresholds include an Annual Threshold and a Significant Impact Threshold, the latter comprising an intermediate trigger (Trigger 1) and a significant impact trigger (Trigger 2). Based on an Australian population estimate of 40,000 individuals (Garnett & Crowley, 2000), the Trigger 2 for white-throated needletail is 40 mortalities (0.1% of population) over a 5-year period (based on generational time). Adaptive management measures and corrective actions will be implemented proactively to avoid progression toward a Trigger 2 (a significant impact), including actions triggered by exceeding the Annual Threshold and/or Significant Impact Threshold Trigger 1. However, if a significant impact (Trigger 2) is reached for any bird or bat species, the Proponent must cease operation of the WTGs identified as contributing to the MNES mortality during ecologically relevant periods. WTGs must not recommence operation until approval is given from DCCEEW.

6.6.8.2 INDIRECT IMPACTS

The indirect impacts to white-throated needletail as a result of the Proposed Action are detailed in Table 6-24, along with how these impacts will be managed and any residual impact that will affect the MNES. Avoidance, mitigation and management measures are discussed in detail in Section 7.

TABLE 6-24 INDIRECT IMPACTS TO WHITE-THROATED NEEDLETAIL

Indirect Impact	Management of Indirect Impact	Residual Impact
Habitat Loss and Individual Mortality from Vegetation Clearing	Initial construction-phase clearing of vegetation within the Study Area is only likely to represent a short-term disturbance to the species, therefore there is no anticipated overall habitat loss. The following points refer to the potential indirect impact of individual mortality during vegetation clearing associated with the Proposed Action. • Areas identified as MNES habitat will be avoided as much as possible at the design and micro-siting stages. • Clear delineation of areas to be cleared, ensuring that the Disturbance Footprint does not extend further than planned to create unnecessary fragmentation or disturbance. • Pre-clearance surveys and fauna spotter catchers will be utilised. Microhabitat features (e.g. hollow bearing trees) will be avoided where sufficient flexibility is enabled by State and Federal approvals. • Staff and contractors will be made aware through general site induction and training of the potential to impact native fauna, reporting requirements and mitigation and management measures that are to be implemented during on-site works. • Vehicles, plant and machinery will comply with site-specific speed limits to minimise the likelihood of collision with fauna. • Where trenching and excavations are created which may entrap fauna, suitable escape	The management measures to mitigate direct fatality or injury during construction and operation will result in the successful avoidance of impact to the species. White-throated needletail are anticipated as a flyover visitor only, as no roosting habitat was identified and this species forages aerially.

Indirect Impact	Management of Indirect Impact	Residual Impact
	measures will be put in place, and excavations checked for fauna before backfilling. • Weekly site inspections to review flora and fauna control measures during construction. Sightings and incidents reported in daily pre-starts during construction. All near misses and incidents will be investigated to establish root cause. Where necessary corrective actions will be developed to improve existing processes.	
Habitat Fragmentation and Patch Isolation	• Areas identified as MNES habitat will be avoided as much as possible at the design and micro-siting stages. • Micro-siting of infrastructure will utilise existing clearance areas and avoid habitat fragmentation and patch isolation, with consideration of whether avoidance areas would still be connected to habitat in the broader landscape. • Prior to construction and detailed design, the incorporation of road pinch points to maximise connectivity will be considered to maintain habitat connectivity. While pinch points have a benefit for habitat, they present a technical and logistical barrier to safe and effective construction. Pre-clearance surveys will determine appropriate locations for road pinch points. • Location of infrastructure will prioritise avoiding or minimising edge effects or dissecting tracts of native vegetation. • Where possible, the Proposed Action will implement the use of innovative turbine blade transportation, including methods to minimise necessary clearance widths (e.g. 'Blade Manipulator' trucks). • Turbine placement will maximise the use of areas that are less vegetated to avoid and minimise clearing of key habitat. • All clearing for access corridors will be limited to 40 m in width during the construction phase. • Clear delineation of areas to be cleared, ensuring that the Disturbance Footprint does not extend further than planned to create unnecessary fragmentation or disturbance. Toolbox talks will relay site-specific clearing information to all field staff and contractors. • Rehabilitation of access corridors will occur once construction has been completed. Such rehabilitation will involve planting/natural regeneration of native species that are habitat for MNES.	Habitat fragmentation and patch isolation will be managed to ensure that white-throated needletail are able to move and disperse throughout the entirety of identified habitat, maintaining connectivity with the landscape within and surrounding the Study Area. White-throated needletail are anticipated as a flyover visitor only, as no roosting habitat was identified and this species forages aerially. The entire Study Area has been considered Potential Foraging Habitat for the white-throated needletail. Therefore, this indirect impact will be minimised so as not to cause an indirect residual impact.

Indirect Impact	Management of Indirect Impact	Residual Impact
Increased Prevalence of Invasive Plants and Animals	• A Biosecurity Management Plan will be implemented for the site which includes requirements for vehicle washdowns and protocols to ensure activities are planned to minimise movement of vehicles, equipment and machinery outside of designated access corridors. • Staff and contractors will be given information on the location and consequences of biosecurity threats in the Study Area. • Access to a landholder's property will not occur unless authorised under a land use agreement. • WONS and Restrictive Invasive Species will be identified and monitored in the Study Area. Appropriate weed monitoring will occur to ensure new weed species are identified, recorded and controlled. • Weed management and control methods will depend upon the location, weed species identified, the degree of the infestation, relevant landholder agreement or conduct and compensation agreements provisions, and local, state and national regulatory requirements. • Weed loads will be mimimised in high-traffic areas such as roads, easements and yards through regular monitoring and site personnel reporting protocols, with an investigation to be managed to prevent spread of weeds in accordance with the *Biosecurity Act 2014* (Qld). • Imported material able to transport weed seed will be assessed to ensure they are free of contamination, disease and invasive weeds.	Management measures will limit the possibility of the introduction or spread of invasive plant and animal species through relevant biosecurity measures incorporated into the Biosecurity Management Plan. This is such that the indirect impact will be minimised so as not to cause an indirect residual impact to the species.
Increased Vehicle Impacts on Fauna and Habitat	• No driving will occur in unauthorised areas, routes and access tracks will be clearly communicated to all site visitors. All driving will be carried out at safe speeds designated for the site. • Site entry and exit points will be clearly marked to ensure vehicle movements are contained within the approved areas. • Staff and contractors will be made aware through general site induction and training of the potential to impact native fauna, reporting requirements and mitigation and management measures that are to be implemented during on-site works. • Injured, sick or dead fauna will be recorded and reported, during and after the construction and operation phases. This can be carried out by a fauna spotter-catcher during periods where disturbance is expected to occur (primarily construction activities). Where injured or sick fauna is detected, individuals will be taken to the nearest wildlife carer or veterinarian if practical.	White-throated needletail are anticipated as a flyover visitor only, as no roosting habitat was identified and this species forages aerially. Therefore, this indirect impact is not expected to lead to an indirect residual impact.

Indirect Impact	Management of Indirect Impact	Residual Impact
Altered Fire Regimes and Bushfire Risk	• A Bushfire Management Plan will be developed and implemented during construction and operation to mitigate the potential impact of fires to MNES habitat. • Maintenance of an asset protection zone within the Operations Footprint is required to reduce the risk of reduction of habitat due to fire. • Use of industry best practice hazard reduction measures to minimise bushfire risk and environmental impacts, such as on-site controlled burning of cleared vegetation. • Ensuring a 30 m bushfire setback from vegetation around electrical infrastructure. Maintaining safe distances between vegetation and potential fire-starting hazards will increase safety and reduce fire risk. • Weed management and control methods (in line with the requirements of the *Biosecurity Act 2014* (Qld)) will reduce the potential of invasive plants changing species composition on-site and increasing fire risk. • Reduce on-site fuel loads and maintain firebreaks and trails.	White-throated needletail are anticipated as a flyover visitor only, as no roosting habitat was identified and this species forages aerially. Therefore, this indirect impact is not expected to lead to an indirect residual impact.
Altered Hydrology	• The Proposed Action will adopt best practice erosion and sediment control measures, which will implement all relevant State Codes and Guidelines. • Watercourse crossings shall be stabilised to mitigate erosion of pavement and embankment materials during rainfall events up to and including the 10% AEP storm event. • Staff and contractors will be made aware through general site induction and training of the potential to generate runoff and mitigation and management measures that should be implemented. • Construction activities must not interfere or block natural drainage e.g. disturbing channel contours. • Water barrier works will be designed to minimise impact on fish habitats, stock or movements through compliance with relevant design codes. During the detailed design phase, fish passage elements will be considered in all mapped waterways for fish passage, including compliance with the accepted development requirements for waterway barrier works or an operational works permit under the Planning Act.	White-throated needletail are anticipated as a flyover visitor only, as no roosting habitat was identified and this species forages aerially. Therefore, this indirect impact is not expected to lead to an indirect residual impact.

Indirect Impact	Management of Indirect Impact	Residual Impact
Environmental Pollution and Hazardous Materials	• All hazardous materials bought on-site will be accompanied by an MSDS, all relevant personnel will be trained in their proper use. • Only registered herbicides will be used for weed management by a suitably qualified bush regeneration contractor. • Imported materials that are able to transport hazardous substances will be assessed to ensure they are free of contamination, disease and invasive species. • Ensuring appropriate waste management (lidded bins), to reduce potential for spread of hazardous materials on-site. • Vehicles, plant and machinery will comply with site-specific speed limits to minimise noise and dust generation. • Staff and contractors will be made aware through general site induction and training of the potential to generate dust, light and noise pollution and management measures that should be implemented. • Auditing of the CEMP will occur during construction. • Dust will be minimised through engineering controls on machinery and other available dust suppression controls, such as sprinklers. • Light pollution will be minimised through engineering controls on infrastructure and machinery, such as colour selection and timing controls. • Noise will be minimised through engineering controls on infrastructure and machinery, such as noise barriers and timing controls. • Disturbance form blasting will be minimised through engineering controls and other available blasting suppression, such as barrier walls. • Electricity infrastructure designed to allow for safe operations, using buffers between conductors and the ground, and conductors and adjacent vegetation. The transmission line has adopted a design which allows for reduced interference to canopy dwelling species due to minimising impacts to canopy vegetation.	The management measures proposed will result in the reduction of the indirect impacts of environmental pollution and hazardous materials. Hazardous materials brought onto the site will be tightly regulated. Dust, light and noise generation will be minimised such that is it unlikely to adversely affect species or damage species habitat. These measures will ensure that the indirect impact is minimised to not cause an indirect residual impact to white-throated needletail.
Individual Mortality and Injury from Turbine Collision and Barotrauma	• WTGs will be located away from key bird and bat habitats (such as waterways and drainage lines). • Powerlines will be located so as to avoid fauna obstruction/entanglement and minimise potential perching resources within 200 m of high-risk turbines (identified within the BBMP (Appendix D)). • Turbine selection will incorporate innovative blade design features to minimise potential collision rates. WTG design will include acoustic and visual deterrents (e.g. ultrasound acoustic devices) and detection systems (e.g. IdentiFlight®, Robin Radar Systems) for high-risk turbines (identified within the BBMP (Appendix D)).	Mitigation and management measures outlined for the Proposed Action's WTGs will ensure that the potential impacts are minimised so as to not cause an indirect residual impact to white-throated needletail. White-throated needletail has not been observed within the Study Area, and no suitable roosting habitat has been identified. It is noted that the results of future bird surveys and any evidence of threatened or migratory species in the Study Area, will be incorporated into future risk

Indirect Impact	Management of Indirect Impact	Residual Impact
	• Development and implementation of a BBMP that considers the impacts that may occur to birds and mitigation measures to address potential impacts to migratory species considered 'potential' to occur within the Study Area. • Sightings and incidents reported in daily pre-starts during construction. • Carry out scientifically robust monitoring program for the detection/quantification of impacts on protected matters, including as a result of turbine strike and barotrauma. The monitoring program must be able to accurately and in a timely manner detect when impact triggers are reached. • All near misses and incidents will be investigated to establish root cause. Where necessary corrective actions will be developed to improve existing processes. • Injured, sick or dead fauna will be recorded and reported, during and after the construction and operation phases.	assessments and CRM within the BBMP. Therefore, the principle of adaptive management will be applied to ensure that any future risks identified are adequately reported, analysed and subsequently managed per the framework in the BBMP. The amount of direct impact to white-throated needletail associated with the operational-phase collision risk with wind turbines is further discussed in Section 6.11.
Site Alienation	• Locating turbines and access corridors away from key habitats where feasible (including remnant vegetation, waterways and drainage lines) reducing disturbance during all phases of the Proposed Action. • Mitigating habitat fragmentation and maintaining connectivity through the measures outlined above. • Development and implementation of a Bird and Bat Management Plan (BBMP) that considers the impacts that may occur to birds and mitigation measures to address potential impacts to migratory species considered 'potential' to occur within the Study Area. • Development and implementation of management plans (VFMP, CEMP) outlined above to reduce the potential impact of construction and operation phase activities including introducing invasive species, fire and altered hydrology. • Implementing engineering controls on infrastructure and machinery outlined above, such that dust, light and noise pollution and blasting does not adversely affect species or species habitat.	The potential risk of site alienation will be managed to ensure that species are able to move, disperse and utilise habitat throughout the Study Area for the life of the Proposed Action. Avoidance, mitigation and management measures outlined in this PER and the BBMP will ensure that the potential for site alienation is minimised to not cause an indirect residual impact to white-throated needletail.

Indirect impacts from the Proposed Action will be mitigated and managed appropriately, such that there is no residual impact on white-throated needletail. Some indirect impacts have been considered as part of the significant impact assessment for this species but are concluded unlikely to contribute to a significant impact.

6.6.8.3 SIGNIFICANT IMPACT ASSESSMENT

A significant impact assessment based on the guidance provided in the SIG 1.1 is presented in in Table 6-25. It has been concluded that the Proposed Action is **unlikely** to have a significant impact on the white-throated needletail.

Considering the species nature as an aerial species in Australia, and proclivity to fly at RSA heights and above, there is a risk of turbine collision as a result of the Proposed Action (further discussed in Section 6.11). Therefore, should the species be observed in the Study Area, adaptive management measures will be undertaken to further prevent any impact to this species. Avoidance, mitigation and management measures considered within this assessment are discussed in detail in Section 7.

TABLE 6-25 SIGNIFICANT IMPACT ASSESSMENT FOR THE WHITE-THROATED NEEDLETAIL

Criteria	Description	Criteria Triggered?
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:		
Lead to a long-term decrease in the size of an important population of a species;	White-throated needletail is almost exclusively aerial in nature while in Australia, with the entire Study Area (46,830 ha) considered aerial foraging habitat for the species. It is unlikely that development for the Proposed Action will interfere with this species ability to forage and disperse. The white-throated needletail is considered potential to occur within the Study Area, with no individuals recorded during field surveys. The minimum threshold for an ecologically significant impact to a population for white-throated needletail is 40 individuals (Garnett & Crowley, 2000). As the species was not identified within the Study Area and no impacts to this species ability to forage aerially overhead will occur, it is considered unlikely that the Proposed Action will lead to a long-term decrease in the size of an important population of the species.	Unlikely
Reduce the area of occupancy of an important population;	White-throated needletail's area of occupancy while migrating through coastal Eastern Australia is estimated at approximately 126,000 km^2 (TSSC, 2019). As discussed, white-throated needletail, is almost exclusively aerial whilst migrating across Australia. Therefore, disturbance of vegetation associated with the Proposed Action is unlikely to reduce this area of occupancy. Additionally, no important population has been identified utilising the Study Area.	Unlikely
Fragment an existing important population into two or more populations;	White-throated needletail is a highly mobile species that migrates southwards over large areas of coastal Eastern Australia in the spring, summer, and autumn seasons (TSSC, 2019). It is not expected that the Project will fragment a population of this species given its dispersive and aerial nature.	Unlikely

Criteria	Description	Criteria Triggered?
Adversely affect habitat critical to the survival of a species;	The Study Area has been considered as habitat critical to the survival of the species conservatively, based on its potential utility for foraging behaviour. However, the Proposed Actions potential impacts will not adversely affect this habitat for white-throated needletail, as its foraging value is highly unlikely to be altered. Therefore, it is unlikely that the Proposed Action will adversely affect habitat critical to the survival of this species.	Unlikely
Disrupt the breeding cycle of an important population;	White-throated needletail does not breed during its migration to Australia. While a loss of old growth forest and mature hollow bearing trees in the northern hemisphere is suspected to be impacting the species' breeding success, it is not projected the Proposed Action will disrupt or have any impact on white-throated needletail's ability to breed.	Unlikely
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline;	A loss of potential roosting sites in Australia is potentially contributing to the decline of the species, as well as the loss of suitably wooded habitat that invertebrate prey species require (TSSC, 2019). However, since no roosting habitat has been identified and all foraging habitat is aerial in nature, it is unlikely that the Proposed Action will modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	Unlikely
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat;	No invasive species have been identified as a threat to the white-throated needletail. The Proposed Action will adopt and follow a Biosecurity Plan, as outline in Section 7. The activities related to the Proposed Action, both during construction and operation, will implement and follow biosecurity measures to reduce the risk of introducing new invasive species and to prevent the further spread of existing invasive species.	Unlikely
Introduce disease that may cause the species to decline; or	While not necessarily a disease, the use of insecticides, particularly organochlorines, has been linked with the decline of white-throated needletail through indirect impacts. These indirect impacts include secondary poisoning through bioaccumulation of insecticides in prey species, and the decrease in the availability of preferred invertebrate prey species (Tarburton, 2014). There is no evidence to suggest that the Proposed Action will increase the risk of these impacts. However, precautions will be taken as detailed in a Biosecurity Plan, to ensure that insecticides are not improperly applicated within the Study Area (see Section 7).	Unlikely

Criteria	Description	Criteria Triggered?
Interfere substantially with the recovery of the species.	There are no threat abatement or recovery actions proposed or underway for this species. Due to no individuals being observed during field surveys, and the habitat within the Study Area being exclusively aerial foraging habitat, it is considered unlikely that the Proposed Action will interfere with the recovery of the species.	Unlikely
An action is likely to have a significant impact on a migratory species if there is a real chance or possibility that it will:		
Substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species;	The loss of potential roosting sites as well as wooded habitat suitable for prey species in Australia, may potentially be contributing to the decline of the species (TSSC, 2019). However, since no roosting habitat has been identified and all foraging habitat is aerial in nature it is unlikely that the Proposed Action will substantially modify, destroy or isolate an area of important habitat for the migratory species.	Unlikely
Result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species; or	No invasive species have been identified as a threat to the white-throated needletail. Additionally, biosecurity risks associated with the Proposed Action will be managed with a Biosecurity Plan, as outlined in Section 7. Ensuring that this plan is adequately followed, it is considered unlikely that the Proposed Action will result in invasive species that are potentially harmful to the white-throated needletail becoming established in the Study Area.	Unlikely
Seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species.	The minimum threshold for an ecologically significant impact to a population for white-throated needletail is 40 individuals (Garnett & Crowley, 2000). The white-throated needletail is considered only potential to occur within the Study Area, with no individuals recorded during field surveys. As the white-throated needletail does not breed during its migration to Australia, it is not projected the Proposed Action will disrupt or have any impact on white-throated needletail's ability to breed. White-throated needletail is almost exclusively aerial in nature while in Australia, with the entire Study Area considered aerial foraging habitat for the species. No roosting habitat has been identified within the Study Area. It is therefore unlikely that development for the Proposed Action will interfere with this species ability to roost, forage and migrate.	Unlikely
Significant Impact: Unlikely		

6.6.9 BLACK-BREASTED BUTTONQUAIL

6.6.9.1 DIRECT IMPACTS

Direct impacts to black-breasted buttonquail associated with the Proposed Action are considered to be limited to habitat loss from vegetation clearing. Impacts due to individual mortality and injury from turbine collision are not anticipated for black-breasted button quail as this species is typically low-flying and forages on the ground, well below the RSA. The direct impacts to black-breasted buttonquail habitat are quantified below and include impacts to:

- 5 ha of Potential Foraging and Roosting Habitat.

It is expected that some impacted areas of black-breasted buttonquail habitat will be rehabilitated post-construction. However, no rehabilitation or revegetation in these areas is expected to restore any functionality for this species post-construction. Therefore, the direct impact to black-breasted button quail associated with construction-phase clearing is considered permanent.

A summary of the direct impacts to black-breasted buttonquail habitat as a result of the Proposed Action is shown in Table 6-26. A total of 5 ha of black-breasted buttonquail habitat will be permanently impacted by the Proposed Action, which equates to 1.8% of the total available habitat identified within the Study Area.

TABLE 6-26 DIRECT IMPACTS TO BLACK-BREASTED BUTTON QUAIL HABITAT

	Potential Foraging and Roosting Habitat
Study Area (ha)	277.4
Disturbance Footprint (ha)	5
Percent of habitat within the Study Area to be impacted	1.8% of Potential Foraging and Roosting Habitat within the Study Area
Permanent impact (Operations Footprint) (ha)	**5**

6.6.9.2 INDIRECT IMPACTS

The indirect impacts to black-breasted button quail as a result of the Proposed Action are detailed in Table 6-27, along with how these impacts will be managed and any residual impact that will affect the MNES. Avoidance, mitigation and management measures are discussed in detail in Section 7.

TABLE 6-27 INDIRECT IMPACTS TO BLACK-BREASTED BUTTON QUAIL

Indirect Impact	**Management of Indirect Impact**	**Residual Impact**
Habitat Loss and Individual Mortality from Vegetation Clearing	The impact of habitat loss is considered a direct impact and has been addressed in the above Section. The following points refer to the potential indirect impact of individual mortality during vegetation clearing associated with the Proposed Action. • Areas identified as MNES habitat will be avoided as much as possible at the design and micro-siting stages.	The management measures to mitigate direct fatality or injury during construction and operation will result in the successful avoidance of impact to the species. This is such that any black-breasted button quail found within the Disturbance Footprint in pre-clearance surveys will be closely

Indirect Impact	Management of Indirect Impact	Residual Impact
	• Clear delineation of areas to be cleared, ensuring that the Disturbance Footprint does not extend further than planned to create unnecessary fragmentation or disturbance. • Pre-clearance surveys and fauna spotter catchers will be utilised. Microhabitat features (e.g. hollow bearing trees) will be avoided where sufficient flexibility is enabled by State and Federal approvals. • Staff and contractors will be made aware through general site induction and training of the potential to impact native fauna, reporting requirements and mitigation and management measures that are to be implemented during on-site works. • Vehicles, plant and machinery will comply with site-specific speed limits to minimise the likelihood of collision with fauna. • Where trenching and excavations are created which may entrap fauna, suitable escape measures will be put in place, and excavations checked for fauna before backfilling. • Weekly site inspections to review flora and fauna control measures during construction. Sightings and incidents reported in daily pre-starts during construction. All near misses and incidents will be investigated to establish root cause. Where necessary corrective actions will be developed to improve existing processes.	monitored, allowed to self-disperse, and worst-case scenario translocated to safer habitat such that no indirect residual impact will result.
Habitat Fragmentation and Patch Isolation	• Areas identified as MNES habitat will be avoided as much as possible at the design and micro-siting stages. • Micro-siting of infrastructure will utilise existing clearance areas and avoid habitat fragmentation and patch isolation, with consideration of whether avoidance areas would still be connected to habitat in the broader landscape. • Prior to construction and detailed design, the incorporation of road pinch points to maximise connectivity will be considered to maintain habitat connectivity. While pinch points have a benefit for habitat they present a technical and logistical barrier to safe and effective construction. Pre-clearance surveys will determine appropriate locations for road pinch points. • Location of infrastructure will prioritise avoiding or minimising edge effects or dissecting tracts of native vegetation. • Where possible, the Proposed Action will implement the use of innovative turbine blade transportation, including methods to minimise necessary clearance widths (e.g. 'Blade Manipulator' trucks). • Turbine placement will maximise the use of areas that are less vegetated to avoid and minimise clearing of key habitat.	Habitat fragmentation and patch isolation will be managed to ensure that black-breasted button quail are able to move and disperse throughout the entirety of identified habitat, maintaining connectivity with the landscape within and surrounding the Study Area. All clearing for access corridors will be limited to 40 m. Additionally, the Proposed Action will not remove or isolate habitat patches altogether, only clearing in the areas necessary for infrastructure. Therefore, this indirect impact will be minimised so as not to cause an indirect residual impact.

Indirect Impact	Management of Indirect Impact	Residual Impact
	• All clearing for access corridors will be limited to 40 m in width during the construction phase. • Clear delineation of areas to be cleared, ensuring that the Disturbance Footprint does not extend further than planned to create unnecessary fragmentation or disturbance. Toolbox talks will relay site-specific clearing information to all field staff and contractors. • Rehabilitation of access corridors will occur once construction has been completed. Such rehabilitation will involve planting/natural regeneration of native species that are habitat for MNES.	
Increased Prevalence of Invasive Plants and Animals	• A Biosecurity Management Plan will be implemented for the site which includes requirements for vehicle washdowns and protocols to ensure activities are planned to minimise movement of vehicles, equipment and machinery outside of designated access corridors. • Staff and contractors will be given information on the location and consequences of biosecurity threats in the Study Area. • Access to a landholder's property will not occur unless authorised under a land use agreement. • WONS and Restrictive Invasive Species will be identified and monitored in the Study Area. Appropriate weed monitoring will occur to ensure new weed species are identified, recorded and controlled. • Weed management and control methods will depend upon the location, weed species identified, the degree of the infestation, relevant landholder agreement or conduct and compensation agreements provisions, and local, state and national regulatory requirements. • Weed loads will be mimimised in high-traffic areas such as roads, easements and yards through regular monitoring and site personnel reporting protocols, with an investigation to be managed to prevent spread of weeds in accordance with the *Biosecurity Act 2014* (Qld). • Imported material able to transport weed seed will be assessed to ensure they are free of contamination, disease and invasive weeds.	Management measures will limit the possibility of the introduction or spread of invasive plant and animal species through relevant biosecurity measures incorporated into the Biosecurity Management. This is such that the indirect impact will be minimised so as not to cause an indirect residual impact to the species.
Increased Vehicle Impacts on Fauna and Habitat	• No driving will occur in unauthorised areas, routes and access tracks will be clearly communicated to all site visitors. All driving will be carried out at safe speeds designated for the site. • Site entry and exit points will be clearly marked to ensure vehicle movements are contained within the approved areas. • Staff and contractors will be made aware through general site induction and training of	Implementation of management measures will ensure operating vehicles on-site during the construction, operation and decommissioning phases will not result in residual impacts to black-breasted button quail.

Indirect Impact	Management of Indirect Impact	Residual Impact
	the potential to impact native fauna, reporting requirements and mitigation and management measures that are to be implemented during on-site works. • Injured, sick or dead fauna will be recorded and reported, during and after the construction and operation phases. This can be carried out by a fauna spotter-catcher during periods where disturbance is expected to occur (primarily construction activities). Where injured or sick fauna is detected, individuals will be taken to the nearest wildlife carer or veterinarian if practical.	
Altered Fire Regimes and Bushfire Risk	• A Bushfire Management Plan will be developed and implemented during construction and operation to mitigate the potential impact of fires to MNES habitat. • Maintenance of an asset protection zone within the Operations Footprint is required to reduce the risk of reduction of habitat due to fire. • Use of industry best practice hazard reduction measures to minimise bushfire risk and environmental impacts, such as on-site controlled burning of cleared vegetation. • Ensuring a 30 m bushfire setback from vegetation around electrical infrastructure. Maintaining safe distances between vegetation and potential fire-starting hazards will increase safety and reduce fire risk. • Weed management and control methods (in line with the requirements of the *Biosecurity Act 2014* (Qld)) will reduce the potential of invasive plants changing species composition on-site and increasing fire risk. • Reduce on-site fuel loads and maintain firebreaks and trails.	Management measures implemented in line with the site-specific Bushfire Management Plan will greatly reduce the potential risk for this species caused by planned or unplanned fires. Therefore, there is no anticipated indirect residual impact.
Altered Hydrology	• The Proposed Action will adopt best practice erosion and sediment control measures, which will implement all relevant State Codes and Guidelines. • Watercourse crossings shall be stabilised to mitigate erosion of pavement and embankment materials during rainfall events up to and including the 10% AEP storm event. • Staff and contractors will be made aware through general site induction and training of the potential to generate runoff and mitigation and management measures that should be implemented. • Construction activities must not interfere or block natural drainage e.g. disturbing channel contours. • Water barrier works will be designed to minimise impact on fish habitats, stock or movements through compliance with relevant design codes. During the detailed design phase, fish passage elements will be considered in all mapped waterways for fish passage, including compliance with the accepted development requirements for waterway barrier works or an operational works permit under the Planning Act.	Impacts to on-site hydrology will be managed in accordance with the CEMP. Impacts to watercourses will be addressed by stabilising to prevent erosion, and only occur in discrete work areas, such that no increase in sedimentation is overserved affecting habitat. Therefore, there is no anticipated indirect residual impact.

Indirect Impact	Management of Indirect Impact	Residual Impact
Environmental Pollution and Hazardous Materials	• All hazardous materials bought on-site will be accompanied by an MSDS, all relevant personnel will be trained in their proper use. • Only registered herbicides will be used for weed management by a suitably qualified bush regeneration contractor. • Imported materials that are able to transport hazardous substances will be assessed to ensure they are free of contamination, disease and invasive species. • Ensuring appropriate waste management (lidded bins), to reduce potential for spread of hazardous materials on-site. • Vehicles, plant and machinery will comply with site-specific speed limits to minimise noise and dust generation. • Staff and contractors will be made aware through general site induction and training of the potential to generate dust, light and noise pollution and management measures that should be implemented. • Auditing of the CEMP will occur during construction. • Dust will be minimised through engineering controls on machinery and other available dust suppression controls, such as sprinklers. • Light pollution will be minimised through engineering controls on infrastructure and machinery, such as colour selection and timing controls. • Noise will be minimised through engineering controls on infrastructure and machinery, such as noise barriers and timing controls. • Disturbance form blasting will be minimised through engineering controls and other available blasting suppression, such as barrier walls. • Electricity infrastructure designed to allow for safe operations, using buffers between conductors and the ground, and conductors and adjacent vegetation. The transmission line has adopted a design which allows for reduced interference to canopy dwelling species due to minimising impacts to canopy vegetation.	The management measures proposed will result in the reduction of the indirect impacts of environmental pollution and hazardous materials. Hazardous materials brought onto the site will be tightly regulated. Dust, light and noise generation will be minimised such that is it unlikely to adversely affect species or damage species habitat. These measures will ensure that the indirect impact is minimised so as to not cause an indirect residual impact to black-breasted button quail.
Site Alienation	• Locating turbines and access corridors away from key habitats where feasible (including remnant vegetation, waterways and drainage lines) reducing disturbance during all phases of the Proposed Action. • Mitigating habitat fragmentation and maintaining connectivity through the measures outlined above. • Using turbines with an RSA >40 m above ground level to provide a collision-free foraging zone within the canopy and 20 m above the canopy, reducing operational disturbance to terrestrial species. • Development and implementation of management plans (VFMP, CEMP) outlined above to reduce the potential impact of	The potential risk of site alienation will be managed to ensure that species are able to move, disperse and utilise habitat throughout the Study Area for the life of the Proposed Action. Avoidance, mitigation and management measures outlined in this PER will ensure that the potential for site alienation is minimised so as to not cause an indirect residual impact to black-breasted button quail.

Indirect Impact	Management of Indirect Impact	Residual Impact
	construction and operation phase activities including introducing invasive species, fire and altered hydrology. • Implementing engineering controls on infrastructure and machinery outlined above, such that dust, light and noise pollution and blasting does not adversely affect species or species habitat.	

Indirect impacts from the Proposed Action will be mitigated and managed appropriately, such that there is no residual impact on black-breasted button quail. Some indirect impacts have been considered as part of the significant impact assessment for this species but are concluded unlikely to contribute to a significant impact

6.6.9.3 SIGNIFICANT IMPACT ASSESSMENT

There is a total of 277.4 ha of Potential Foraging and Roosting Habitat for the species within the Study Area, 5.0 ha of which is expected to be permanently impacted as a result of the Proposed Action.

A significant impact assessment based on the guidance provided in the SIG 1.1 is presented in Table 6-28. It has been concluded that the Proposed Action is **unlikely** to have a significant impact on the black-breasted button quail. Avoidance, mitigation and management measures considered within this assessment are discussed in detail in Section 7.

TABLE 6-28 SIGNIFICANT IMPACT ASSESSMENT FOR THE BLACK-BREASTED BUTTONQUAIL

Criteria	Description	Criteria Triggered?
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:		
Lead to a long-term decrease in the size of an important population of a species;	Black-breasted buttonquail is considered potential to occur within the Study Area. A total of 277.4 ha of Potential Foraging and Roosting Habitat for this species has been identified within the Study Area, however no individuals have been recorded within the Study Area or Locality within the last 20 years. As there is no known population of black-breasted buttonquail within the Study Area, it is unlikely that any potential population would be an 'important population'. It is therefore unlikely that the Proposed Action will lead to a long-term decrease in the size of an important population of the species.	Unlikely

Criteria	Description	Criteria Triggered?
Reduce the area of occupancy of an important population;	The species is estimated to have an area of occupancy of 75,000 ha (Garnett & Crowley, 2000) and given the broad-scale loss of vine thicket vegetation and other black-breasted button-quail habitat (up to 90%, as suggested in Hamley et al., 1997), it is highly likely that the remaining distribution is severely fragmented (DoE, 2015a). Black-breasted buttonquail is considered potential to occur within the Study Area. A total of 277.4 ha of Potential Foraging and Roosting Habitat for this species has been identified within the Study Area, however no individuals have been recorded within the Study Area or Locality within the last 20 years. As there is no known population of black-breasted buttonquail within the Study Area, it is unlikely that any potential population would be an 'important population'. It is therefore unlikely that the Proposed Action will reduce the area of occupancy of an important population.	Unlikely
Fragment an existing important population into two or more populations;	Black-breasted buttonquail is considered potential to occur within the Study Area. A total of 277.4 ha of Potential Foraging and Roosting Habitat for this species has been identified within the Study Area, however no individuals have been recorded within the Study Area or Locality within the last 20 years. As there is no known population of black-breasted buttonquail within the Study Area, it is unlikely that any potential population would be an 'important population'. It is therefore unlikely that the Proposed Action will fragment an existing important population into two or more populations.	Unlikely
Adversely affect habitat critical to the survival of a species;	Black-breasted buttonquail is considered as having the potential to occur within the Study Area. A total 277.4 ha of Potential Foraging and Roosting Habitat for this species has been identified within the Study Area. Habitat critical to the survival of the black-breasted buttonquail has been defined within the National Recovery Plan for Black-breasted Button-quail (*Turnix melanogaster*) (Mathieson & Smith, 2009): • Foraging and breeding habitat; • Habitat for the long-term maintenance of the species; • Areas with potential habitat; and • Areas supporting recovery. Based on this definition, the potential habitat within the Study Area constitutes habitat critical to the survival of the species. A total of 5 ha of Potential Foraging and Roosting Habitat will be subject to disturbance by the Proposed Action. Impact to this 5 ha of habitat critical to the survival	Unlikely

Criteria	Description	Criteria Triggered?
	of the species is not considered to be 'adverse' given the very limited area impacted (1.8% of available habitat in the Study Area). Therefore, the Proposed Action is unlikely to adversely affect habitat critical to the survival of the species.	
Disrupt the breeding cycle of an important population;	Black-breasted buttonquail is considered potential to occur within the Study Area. A total of 277.4 ha of Potential Foraging and Roosting Habitat for this species has been identified within the Study Area, however no individuals have been recorded within the Study Area or Locality within the last 20 years. There is not expected to be any important population of the black-breasted buttonquail in the Study Area, due to the lack of records of the species in the Locality, and the fragmented existence of potential habitat. Therefore, impact to 5 ha of Potential Foraging and Roosting Habitat (1.8% of available habitat in the Study Area) is unlikely to disrupt the breeding cycle of an important population.	Unlikely
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline;	Black-breasted buttonquail is considered potential to occur within the Study Area. A total of 277.4 ha of Potential Foraging and Roosting Habitat for this species has been identified within the Study Area, however no individuals have been recorded within the Study Area or Locality within the last 20 years. Due to the absence of any records of the species, and the fragmented existence of potential habitat, it is unlikely that impact to 5 ha of Potential Foraging and Roosting Habitat (1.8% of available habitat in the Study Area) would modify this species habitat to the extent that the species would decline.	Unlikely
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat;	Based on the species conservation advice (DoE, 2015a), both invasive flora and fauna species have been identified as a threat to the black-breasted buttonquail. These include: • Habitat degradation as a result of domestic livestock and feral pigs (*Sus scrofa*); and • Predation by feral animals such as feral cats (*Felis catus*) and foxes (*Vulpes vulpes*). Biosecurity risks associated with the Proposed Action will be managed with a Biosecurity Plan, as outlined in Section 7. By ensuring that this plan is adequately followed, it is considered unlikely that the Proposed Action will result in increasing the risk of any of the above invasive species becoming established in this species habitat.	Unlikely

Criteria	Description	Criteria Triggered?
Introduce disease that may cause the species to decline; and	No specific disease has been identified within the approved conservation advice as a threat to this species (DoE, 2015a). Biosecurity risks associated with the Proposed Action will be managed with a Biosecurity Plan, as outlined in Section 7. By ensuring that this plan is adequately followed, it is considered unlikely that the Project will introduce a disease that may cause the species to decline.	Unlikely
Interfere substantially with the recovery of the species.	The main recovery plan objectives for this species, outlined in National Recovery Plan for Black-breasted Button-quail (*Turnix melanogaster*) (Mathieson & Smith, 2009), include: • By 2032, maintain and improve the extent, condition and connectivity of habitat of the Black-breasted Button-quail; • By 2032, demonstrably reduce the severity of identified anthropogenic threats across the extent of the species' range; • By 2032, achieve, measure and sustain a stable or positive trend in area of occupancy and population size (assessed by new baseline counts) in the number of mature individuals of the Black-breasted Button-quail; and • This will be achieved by implementing the actions set out in this recovery plan that minimise threats while protecting and enhancing the species' habitat throughout its range, adequately monitoring the species, generating new knowledge to guide recovery actions and increasing public awareness. Although the Proposed Action will result in the disturbance of 5 ha of Potential Foraging and Roosting Habitat, as this habitat is only potential (no population has been identified within the Study Area) it is considered unlikely that this impact will interfere with the recovery of the species.	Unlikely
Significant Impact: Unlikely		

6.6.10 AUSTRALIAN PAINTED SNIPE

6.6.10.1 DIRECT IMPACTS

Direct impacts to Australian painted snipe associated with the Proposed Action are considered to be limited to habitat loss from vegetation clearing. These impacts are quantified below and include impacts to:

- 1.3 ha of Potential Foraging Habitat.

It is expected that some impacted areas of Australian painted snipe habitat will be revegetated after the construction phase. However, no rehabilitation or revegetation in these areas is expected to restore any functionality for this species post-construction. Therefore, the direct impact to Australian painted snipe associated with construction-phase clearing is considered permanent.

A quantitative risk assessment of direct impact to Australian painted snipe associated with the operational-phase collision risk with wind turbines is presented in the BBMP (Appendix D). In summary:

- The species is listed as endangered under the EPBC Act;
- No records exist for the species within the Study Area or Locality;
- No recent records (last 20 years) exist within the broader locality (several undated or outdated records exist);
- Population size is estimated to be at 2,500 individuals (DSEWPC, 2013);
- Flight height is usually below RSA (low level flight in wetlands) or greater than the RSA (migrating); and
- Potential foraging and roosting habitat in the form of farm dams present.

Based on the CRA methodology and risk matrix detailed within the BBMP (Appendix D), the Australian painted snipe has a 'moderately likely' likelihood of WTG collision, and as an endangered EPBC Act listed species, the consequence of an impact event is considered to be 'moderate'. Therefore, the species has been considered to be at a 'low' risk of being impacted by the Proposed Action through collision with WTGs. Further detail on the CRA is provided in Section 6.11 and within the BBMP (Appendix D).

The BBMP establishes species-specific impact thresholds and associated triggers for turbine-related mortality, along with the decision-making framework and adaptive management responses required when thresholds are reached. These thresholds include an Annual Threshold and a Significant Impact Threshold, the latter comprising an intermediate trigger (Trigger 1) and a significant impact trigger (Trigger 2). Based on an Australian population estimate of 2,500 individuals, the Trigger 2 for Australian painted snipe is 2 mortalities (0.1% of population) over a 10-year period (based on generational time). Adaptive management measures and corrective actions will be implemented proactively to avoid progression toward a Trigger 2 (a significant impact), including actions triggered by exceeding the Annual Threshold and/or Significant Impact Threshold Trigger 1. However, if a significant impact (Trigger 2) is reached for any bird or bat species, the Proponent must cease operation of the WTGs identified as contributing to the MNES mortality during ecologically relevant periods. WTGs must not recommence operation until approval is given from DCCEEW.

A summary of the direct impacts to Australian painted snipe habitat as a result of the Proposed Action is shown in Table 6-29. A total of 1.3 ha of Australian painted snipe habitat will be permanently impacted by the Proposed Action, which equates to 2.4% of the total available habitat identified within the Study Area.

TABLE 6-29 DIRECT IMPACTS TO AUSTRALIAN PAINTED SNIPE HABITAT

	Potential Foraging Habitat
Study Area (ha)	56
Disturbance Footprint (ha)	1.3
Percent of habitat within the Study Area to be impacted	2.4% of Potential Foraging Habitat within the Study Area
Permanent impact (Operations Footprint) (ha)	**1.3**

6.6.10.2 INDIRECT IMPACTS

The indirect impacts to Australian painted snipe as a result of the Proposed Action are detailed in Table 6-30, along with how these impacts will be managed and any residual impact that will affect the MNES. Avoidance, mitigation and management measures are discussed in detail in Section 7.

TABLE 6-30 INDIRECT IMPACTS TO AUSTRALIAN PAINTED SNIPE

Indirect Impact	Management of Indirect Impact	Residual Impact
Habitat Loss and Individual Mortality from Vegetation Clearing	The impact of habitat loss is considered a direct impact and has been addressed in the above Section. The following points refer to the potential indirect impact of individual mortality during vegetation clearing associated with the Proposed Action. • Areas identified as MNES habitat will be avoided as much as possible at the design and micro-siting stages. • Clear delineation of areas to be cleared, ensuring that the Disturbance Footprint does not extend further than planned to create unnecessary fragmentation or disturbance. • Pre-clearance surveys and fauna spotter catchers will be utilised. Microhabitat features (e.g. hollow bearing trees) will be avoided where sufficient flexibility is enabled by State and Federal approvals. • Staff and contractors will be made aware through general site induction and training of the potential to impact native fauna, reporting requirements and mitigation and management measures that are to be implemented during on-site works. • Vehicles, plant and machinery will comply with site-specific speed limits to minimise the likelihood of collision with fauna. • Where trenching and excavations are created which may entrap fauna, suitable escape measures will be put in place, and excavations checked for fauna before backfilling. • Weekly site inspections to review flora and fauna control measures during construction. Sightings and incidents reported in daily pre-starts during construction. All near misses and incidents will be investigated to establish root cause. Where necessary corrective actions will be developed to improve existing processes.	The management measures to mitigate direct fatality or injury during construction and operation will result in the successful avoidance of impact to the species. This is such that any Australian painted snipe found within the Disturbance Footprint in pre-clearance surveys will be closely monitored, allowed to self-disperse, and worst-case scenario translocated to safer habitat such that no indirect residual impact will result.
Habitat Fragmentation and Patch Isolation	• Areas identified as MNES habitat will be avoided as much as possible at the design and micro-siting stages. • Micro-siting of infrastructure will utilise existing clearance areas and avoid habitat fragmentation and patch isolation, with consideration of whether avoidance areas would still be connected to habitat in the broader landscape. • Prior to construction and detailed design, the incorporation of road pinch points to maximise	Habitat fragmentation and patch isolation will be managed to ensure that Australian painted snipe are able to move and disperse throughout the entirety of identified habitat, maintaining connectivity with the landscape within and surrounding the Study Area. All clearing for access corridors will be limited to 40 m. Additionally, the Proposed Action

Indirect Impact	Management of Indirect Impact	Residual Impact
	connectivity will be considered to maintain habitat connectivity. While pinch points have a benefit for habitat they present a technical and logistical barrier to safe and effective construction. Pre-clearance surveys will determine appropriate locations for road pinch points. • Location of infrastructure will prioritise avoiding or minimising edge effects or dissecting tracts of native vegetation. • Where possible, the Proposed Action will implement the use of innovative turbine blade transportation, including methods to minimise necessary clearance widths (e.g. 'Blade Manipulator' trucks). • Turbine placement will maximise the use of areas that are less vegetated to avoid and minimise clearing of key habitat. • All clearing for access corridors will be limited to 40 m in width during the construction phase. • Clear delineation of areas to be cleared, ensuring that the Disturbance Footprint does not extend further than planned to create unnecessary fragmentation or disturbance. Toolbox talks will relay site-specific clearing information to all field staff and contractors. • Rehabilitation of access corridors will occur once construction has been completed. Such rehabilitation will involve planting/natural regeneration of native species that are habitat for MNES.	will not remove or isolate habitat patches altogether, only clearing in the areas necessary for infrastructure. Therefore, this indirect impact will be minimised so as not to cause an indirect residual impact.
Increased Prevalence of Invasive Plants and Animals	• A Biosecurity Management Plan will be implemented for the site which includes requirements for vehicle washdowns and protocols to ensure activities are planned to minimise movement of vehicles, equipment and machinery outside of designated access corridors. • Staff and contractors will be given information on the location and consequences of biosecurity threats in the Study Area. • Access to a landholder's property will not occur unless authorised under a land use agreement. • WONS and Restrictive Invasive Species will be identified and monitored in the Study Area. Appropriate weed monitoring will occur to ensure new weed species are identified, recorded and controlled. • Weed management and control methods will depend upon the location, weed species identified, the degree of the infestation, relevant landholder agreement or conduct and compensation agreements provisions, and local, state and national regulatory requirements. • Weed loads will be mimimised in high-traffic areas such as roads, easements and yards through regular monitoring and site personnel	Management measures will limit the possibility of the introduction or spread of invasive plant and animal species through relevant biosecurity measures incorporated into the Biosecurity Management Plan. This is such that the indirect impact will be minimised so as not to cause an indirect residual impact to the species.

Indirect Impact	Management of Indirect Impact	Residual Impact
	reporting protocols, with an investigation to be managed to prevent spread of weeds in accordance with the *Biosecurity Act 2014* (Qld). • Imported material able to transport weed seed will be assessed to ensure they are free of contamination, disease and invasive weeds.	
Increased Vehicle Impacts on Fauna and Habitat	• No driving will occur in unauthorised areas, routes and access tracks will be clearly communicated to all site visitors. All driving will be carried out at safe speeds designated for the site. Night-time safe driving controls will also be applied, including additional speed restrictions, providing additional protection to nocturnal animals. • Site entry and exit points will be clearly marked to ensure vehicle movements are contained within the approved areas. • Staff and contractors will be made aware through general site induction and training of the potential to impact native fauna, reporting requirements and mitigation and management measures that are to be implemented during on-site works. • Injured, sick or dead fauna will be recorded and reported, during and after the construction and operation phases. This can be carried out by a fauna spotter-catcher during periods where disturbance is expected to occur (primarily construction activities). Where injured or sick fauna is detected, individuals will be taken to the nearest wildlife carer or veterinarian if practical.	Implementation of management measures will ensure operating vehicles on-site during the construction, operation and decommissioning phases will not result in residual impacts to Australian painted snipe.
Altered Fire Regimes and Bushfire Risk	• A Bushfire Management Plan will be developed and implemented during construction and operation to mitigate the potential impact of fires to MNES habitat. • Maintenance of an asset protection zone within the Operations Footprint is required to reduce the risk of reduction of habitat due to fire. • Use of industry best practice hazard reduction measures to minimise bushfire risk and environmental impacts, such as on-site controlled burning of cleared vegetation. • Ensuring a 30 m bushfire setback from vegetation around electrical infrastructure. Maintaining safe distances between vegetation and potential fire-starting hazards will increase safety and reduce fire risk. • Weed management and control methods (in line with the requirements of the *Biosecurity Act 2014* (Qld)) will reduce the potential of invasive plants changing species composition on-site and increasing fire risk. • Reduce on-site fuel loads and maintain firebreaks and trails.	Management measures implemented in line with the site-specific Bushfire Management Plan will greatly reduce the potential risk for this species caused by planned or unplanned fires. Therefore, there is no anticipated indirect residual impact.

Indirect Impact	Management of Indirect Impact	Residual Impact
Altered Hydrology	• The Proposed Action will adopt best practice erosion and sediment control measures, which will implement all relevant State Codes and Guidelines. • Watercourse crossings shall be stabilised to mitigate erosion of pavement and embankment materials during rainfall events up to and including the 10% AEP storm event. • Staff and contractors will be made aware through general site induction and training of the potential to generate runoff and mitigation and management measures that should be implemented. • Construction activities must not interfere or block natural drainage e.g. disturbing channel contours. • Water barrier works will be designed to minimise impact on fish habitats, stock or movements through compliance with relevant design codes. During the detailed design phase, fish passage elements will be considered in all mapped waterways for fish passage, including compliance with the accepted development requirements for waterway barrier works or an operational works permit under the Planning Act.	Impacts to on-site hydrology will be managed in accordance with the CEMP. Impacts to watercourses will be addressed by stabilising to prevent erosion, and only occur in discrete work areas, such that no increase in sedimentation is overserved affecting habitat. Therefore, there is no anticipated indirect residual impact.
Environmental Pollution and Hazardous Materials	• All hazardous materials bought on-site will be accompanied by an MSDS, all relevant personnel will be trained in their proper use. • Only registered herbicides will be used for weed management by a suitably qualified bush regeneration contractor. • Imported materials that are able to transport hazardous substances will be assessed to ensure they are free of contamination, disease and invasive species. • Ensuring appropriate waste management (lidded bins), to reduce potential for spread of hazardous materials on-site. • Vehicles, plant and machinery will comply with site-specific speed limits to minimise noise and dust generation. • Staff and contractors will be made aware through general site induction and training of the potential to generate dust, light and noise pollution and management measures that should be implemented. • Auditing of the CEMP will occur during construction. • Dust will be minimised through engineering controls on machinery and other available dust suppression controls, such as sprinklers. • Light pollution will be minimised through engineering controls on infrastructure and machinery, such as colour selection and timing controls. • Noise will be minimised through engineering controls on infrastructure and machinery, such as noise barriers and timing controls.	The management measures proposed will result in the reduction of the indirect impacts of environmental pollution and hazardous materials. Hazardous materials brought onto the site will be tightly regulated. Dust, light and noise generation will be minimised such that is it unlikely to adversely affect species or damage species habitat. These measures will ensure that the indirect impact is minimised so as to not cause an indirect residual impact to Australian painted snipe.

Indirect Impact	Management of Indirect Impact	Residual Impact
	• Disturbance form blasting will be minimised through engineering controls and other available blasting suppression, such as barrier walls. • Electricity infrastructure designed to allow for safe operations, using buffers between conductors and the ground, and conductors and adjacent vegetation. The transmission line has adopted a design which allows for reduced interference to canopy dwelling species due to minimising impacts to canopy vegetation.	
Site Alienation	• Locating turbines and access corridors away from key habitats where feasible (including remnant vegetation, waterways and drainage lines) reducing disturbance during all phases of the Proposed Action. • Mitigating habitat fragmentation and maintaining connectivity through the measures outlined above. • Using turbines with an RSA >40 m above ground level to provide a collision-free foraging zone within the canopy and 20 m above the canopy, reducing operational disturbance to terrestrial species. • Development and implementation of management plans (VFMP, CEMP) outlined above to reduce the potential impact of construction and operation phase activities including introducing invasive species, fire and altered hydrology. • Implementing engineering controls on infrastructure and machinery outlined above, such that dust, light and noise pollution and blasting does not adversely affect species or species habitat.	The potential risk of site alienation will be managed to ensure that species are able to move, disperse and utilise habitat throughout the Study Area for the life of the Proposed Action. Avoidance, mitigation and management measures outlined in this PER will ensure that the potential for site alienation is minimised so as to not cause an indirect residual impact to Australian painted snipe.

Indirect impacts from the Proposed Action will be mitigated and managed appropriately, such that there is no residual impact on Australian painted snipe. Some indirect impacts have been considered as part of the significant impact assessment for this species but are concluded unlikely to contribute to a significant impact

6.6.10.3 SIGNIFICANT IMPACT ASSESSMENT

There is a total of 56.0 ha of Potential Foraging Habitat for the species within the Study Area, 1.3 ha of which is expected to be permanently impacted as a result of the Proposed Action.

A significant impact assessment based on the guidance provided in the SIG 1.1 is presented in Table 6-31. It has been concluded that the Proposed Action is **unlikely** to have a significant impact on the Australian painted snipe. Avoidance, mitigation and management measures considered within this assessment are discussed in detail in Section 7.

TABLE 6-31 SIGNIFICANT IMPACT ASSESSMENT FOR THE AUSTRALIAN PAINTED SNIPE

Criteria	Description	Criteria Triggered?
An action is likely to have a significant impact on an endangered species if there is a real chance or possibility that it will:		
Lead to a long-term decrease in the size of a population,	The Australian painted snipe is considered potential to occur within the Study Area with no known population observed during field surveys. It is expected that 1.3 ha (or 2.4%) of Australian painted snipe Potential Foraging Habitat will be impacted as a result of the Proposed Action. The Proposed Action's activities are unlikely to cause a local population to experience decline as there is no current evidence to suggest a local population utilises this habitat. Additionally, the impacts that will occur are small in size (2.4% of total habitat available), are mostly linear in nature, and are unlikely to impact any potentially occurring populations.	Unlikely
Reduce the area of occupancy of the species,	The current extent of occurrence for the species is extensive, at 4,500,000 km² ha, though the area of occupancy is estimated (with low reliability) to be 1,000 km² (Garnett & Crowley, 2000). Impact to 1.3 ha of potential habitat is considered unlikely to reduce this area of occupancy.	Unlikely
Fragment an existing population into two or more populations,	The Australian painted snipe is considered potential to occur within the Study Area with no known population observed during field surveys. It is expected that 1.3 ha (or 2.4%) of Australian painted snipe Potential Foraging Habitat will be impacted as a result of the Proposed Action. However, due to the high mobility of the species, the small area of impact to habitat, and the lack of evidence of a population utilising habitat within the Study Area, it is considered unlikely that an impact to 1.3 ha of Potential Foraging Habitat will fragment an existing population into two or more populations.	Unlikely
Adversely affect habitat critical to the survival of a species,	While Potential Foraging Habitat for this species has been mapped, this habitat is not considered to constitute habitat critical to the survival of the species due to its degraded nature. Habitat is in poor condition due to the historical cattle grazing within the Study Area. Therefore, the Proposed Action's impact to 1.3 ha of Potential Foraging Habitat is unlikely to adversely affect habitat critical to the survival of this species.	Unlikely
Disrupt the breeding cycle of a population,	No breeding habitat was identified within the Study Area, as the species requires shallow freshwater wetlands with interspersed small islands and nearby canopy cover. As there is no such habitat in the Study Area, it is unlikely that breeding cycles will be directly impacted.	Unlikely

Criteria	Description	Criteria Triggered?
	A species breeding cycle can be disrupted due to substantial changes in foraging behaviour, however the limited impact to 1.3 ha of Potential Foraging Habitat is unlikely to lead to a substantial impact. Ultimately, considering the lack of breeding habitat within the Study Area, and the limited value of foraging habitat, it is unlikely that the Proposed Action's impacts would disrupt the species breeding cycle.	
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline,	The Proposed Action will result in the disturbance of 1.3 ha (or 2.4%) of Australian painted snipe Potential Foraging Habitat. This accounts for only a small area of habitat to be removed in relation to the larger context of the Study Area, which supports 56.0 ha of Potential Foraging Habitat for Australian painted snipe in total. It is expected that the limited amount of disturbance in the larger context of the landscape will not remove, isolate or decrease the quality of habitat such that it would result in species to decline.	Unlikely
Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat	The following invasive species are expected to be detrimental to the Australian painted snipe (DSEWPC, 2013): • Livestock via grazing and trampling of wetland vegetation and nests; • Feral foxes and cats via predation; and • Weeds that replace native wetland vegetation. The Proposed Action activities during construction and operation will adopt and follow biosecurity measures to prevent introduction of new invasive species or the spread of those known to the Study Area (see Section 7). The Study Area has been historically used for cattle grazing, and therefore no new impacts will arise as a result of the Proposed Action with regards to livestock.	Unlikely
Introduce disease that may cause the species to decline, or	The conservation advice for Australian painted snipe does not list any diseases as harmful to the species (DSEWPC, 2013). There is also no evidence to suggest the proposed disturbance would introduce a disease that would cause the species to decline. Additionally, precautions will be taken to ensure that the spread of disease does not occur. This includes following biosecurity measures as part of a Biosecurity Plan (see Section 7).	Unlikely
Interfere with the recovery of the species.	There are no formally adopted recovery plans for this species, but the conservation advice lists regional priority recovery actions that involve abatement/research of the following threats (DSEWPC, 2013): • Habitat loss, disturbance and modification; • Invasive weeds; • Trampling, browsing and grazing; • Animal predation or competition; and • Fire.	Unlikely

Criteria	Description	Criteria Triggered?
	Impacts to Potential Foraging Habitat for Australian painted snipe are limited to 1.3 ha of (2.4% of total habitat available). Other potential threats will be mitigated through implementation of the site-specific CEMP (see Section 7), through fire management, construction management, and biosecurity measures. Considering the potential impacts of the Proposed Action, along with proposed mitigation measures, the Proposed Action is unlikely to result in or exacerbate any of the threats outlined above.	
Significant Impact: Unlikely		

6.6.11 DIAMOND FIRETAIL

6.6.11.1 DIRECT IMPACTS

Direct impacts to diamond firetail associated with the Proposed Action are considered to be limited to habitat loss from vegetation clearing. Impacts due to individual mortality and injury from turbine collision are not anticipated for diamond firetail as this species is typically low-flying and forages close to the ground, well below the RSA. The direct impacts to diamond firetail habitat are quantified below and include impacts to:

- 263.6 ha of Potential Breeding and Foraging Habitat.

It is expected that 167.8 ha of impacted Potential Breeding and Foraging Habitat will be revegetated after the construction phase. Diamond firetail occurs in lightly timbered habitats, including farmland and grassland with scattered trees. They show preference for areas with relatively low tree density, few large logs, and little litter cover but high grass cover (DCCEEW, 2023b). The initial clearing of habitat for diamond firetail is only likely to represent a short-term disturbance to the species, and revegetation is expected to return the functionality required for the diamond firetail in some areas.

The rehabilitation of 167.8 ha of diamond firetail Potential Breeding and Foraging Habitat includes 67.6 ha of Type 1 natural regeneration and 100.2 ha of Type 2 rehabilitation, as shown in Figure 6-5. Further discussion on rehabilitation types, estimated timing to return habitat to its previous functionality, as well as the management measures, completion criteria, interim targets and corrective actions for rehabilitation is provided in Section 8.

A summary of the direct impacts to diamond firetail habitat as a result of the Proposed Action is shown in Table 6-32. A total of 95.8 ha of diamond firetail habitat will be permanently impacted by the Proposed Action, which equates to 1.2% of the total available habitat identified within the Study Area.

TABLE 6-32 DIRECT IMPACTS TO DIAMOND FIRETAIL HABITAT

	Potential Breeding and Foraging Habitat
Study Area (ha)	7,899.3
Disturbance Footprint (ha)	263.6
Percent of habitat within the Study Area to be impacted	3.3% of Potential Breeding and Foraging Habitat within the Study Area
Available **Revegetation areas** within the Disturbance Footprint (ha)	167.8
Permanent impact* (Operations Footprint) (ha)	95.8 (or 1.2%)

**Permanent impact (Operations Footprint) is provided where revegetation and/or rehabilitation can return habitat for the species to function or utilise post-construction (i.e., for recolonisation, dispersal, foraging or breeding).*

Legend

- Study Area
- Operation Footprint
- Diamond firetail Potential Breeding and Foraging Habitat
- Diamond firetail Potential Breeding and Foraging Habitat - Type 2 revegetation/ rehabilitation
- Diamond firetail Potential Breeding and Foraging Habitat - Type 1 natural regeneration
- Highway
- Road
- Track and Path

Coordinate System:
GDA2020 MGA Zone 56

Date: 05/06/2025
Created By: HD
Drawing Size: A3

0 1 2 3km

1:125,000

F6-5 Rehabilitation of Diamond firetail Potential Breeding and Foraging Habitat

Theodore Wind Farm PER

Theodore Energy Development Pty Ltd

ERM

0661076_PER_R2\0661076_PER_6-5_R1

6.6.11.2 INDIRECT IMPACTS

The indirect impacts to diamond firetail as a result of the Proposed Action are detailed in Table 6-33, along with how these impacts will be managed and any residual impact that will affect the MNES. Avoidance, mitigation and management measures are discussed in detail in Section 7.

TABLE 6-33 INDIRECT IMPACTS TO DIAMOND FIRETAIL

Indirect Impact	Management of Indirect Impact	Residual Impact
Habitat Loss and Individual Mortality from Vegetation Clearing	The impact of habitat loss is considered a direct impact and has been addressed in the above Section. The following points refer to the potential indirect impact of individual mortality during vegetation clearing associated with the Proposed Action. • Areas identified as MNES habitat will be avoided as much as possible at the design and micro-siting stages. • Clear delineation of areas to be cleared, ensuring that the Disturbance Footprint does not extend further than planned to create unnecessary fragmentation or disturbance. • Pre-clearance surveys and fauna spotter catchers will be utilised. Microhabitat features (e.g. hollow bearing trees) will be avoided where sufficient flexibility is enabled by State and Federal approvals. • Staff and contractors will be made aware through general site induction and training of the potential to impact native fauna, reporting requirements and mitigation and management measures that are to be implemented during on-site works. • Vehicles, plant and machinery will comply with site-specific speed limits to minimise the likelihood of collision with fauna. • Where trenching and excavations are created which may entrap fauna, suitable escape measures will be put in place, and excavations checked for fauna before backfilling. • Weekly site inspections to review flora and fauna control measures during construction. Sightings and incidents reported in daily pre-starts during construction. All near misses and incidents will be investigated to establish root cause. Where necessary corrective actions will be developed to improve existing processes.	The management measures to mitigate direct fatality or injury during construction and operation will result in the successful avoidance of impact to the species. This is such that any diamond firetail found within the Disturbance Footprint in pre-clearance surveys will be closely monitored, allowed to self-disperse, and worst-case scenario translocated to safer habitat such that no indirect residual impact will result.
Habitat Fragmentation and Patch Isolation	• Areas identified as MNES habitat will be avoided as much as possible at the design and micro-siting stages. • Micro-siting of infrastructure will utilise existing clearance areas and avoid habitat fragmentation and patch isolation, with consideration of whether avoidance areas would still be connected to habitat in the broader landscape. • Prior to construction and detailed design, the incorporation of road pinch points to maximise	Habitat fragmentation and patch isolation will be managed to ensure that diamond firetail are able to move and disperse throughout the entirety of identified habitat, maintaining connectivity with the landscape within and surrounding the Study Area. All clearing for access corridors will be limited to 40 m. Additionally, the Proposed Action

Indirect Impact	Management of Indirect Impact	Residual Impact
	connectivity will be considered to maintain habitat connectivity. While pinch points have a benefit for habitat they present a technical and logistical barrier to safe and effective construction. Pre-clearance surveys will determine appropriate locations for road pinch points. • Location of infrastructure will prioritise avoiding or minimising edge effects or dissecting tracts of native vegetation. • Where possible, the Proposed Action will implement the use of innovative turbine blade transportation, including methods to minimise necessary clearance widths (e.g. 'Blade Manipulator' trucks). • Turbine placement will maximise the use of areas that are less vegetated to avoid and minimise clearing of key habitat. • All clearing for access corridors will be limited to 40 m in width during the construction phase. • Clear delineation of areas to be cleared, ensuring that the Disturbance Footprint does not extend further than planned to create unnecessary fragmentation or disturbance. Toolbox talks will relay site-specific clearing information to all field staff and contractors. • Rehabilitation of access corridors will occur once construction has been completed. Such rehabilitation will involve planting/natural regeneration of native species that are habitat for MNES.	will not remove or isolate habitat patches altogether, only clearing in the areas necessary for infrastructure. Therefore, this indirect impact will be minimised so as not to cause an indirect residual impact.
Increased Prevalence of Invasive Plants and Animals	• A Biosecurity Management Plan will be implemented for the site which includes requirements for vehicle washdowns and protocols to ensure activities are planned to minimise movement of vehicles, equipment and machinery outside of designated access corridors. • Staff and contractors will be given information on the location and consequences of biosecurity threats in the Study Area. • Access to a landholder's property will not occur unless authorised under a land use agreement. • WONS and Restrictive Invasive Species will be identified and monitored in the Study Area. Appropriate weed monitoring will occur to ensure new weed species are identified, recorded and controlled. • Weed management and control methods will depend upon the location, weed species identified, the degree of the infestation, relevant landholder agreement or conduct and compensation agreements provisions, and local, state and national regulatory requirements. • Weed loads will be mimimised in high-traffic areas such as roads, easements and yards through regular monitoring and site personnel	Management measures will limit the possibility of the introduction or spread of invasive plant and animal species through relevant biosecurity measures incorporated into the Biosecurity Management Plan. This is such that the indirect impact will be minimised so as not to cause an indirect residual impact to the species.

Indirect Impact	Management of Indirect Impact	Residual Impact
	reporting protocols, with an investigation to be managed to prevent spread of weeds in accordance with the *Biosecurity Act 2014* (Qld). • Imported material able to transport weed seed will be assessed to ensure they are free of contamination, disease and invasive weeds.	
Increased Vehicle Impacts on Fauna and Habitat	• No driving will occur in unauthorised areas, routes and access tracks will be clearly communicated to all site visitors. All driving will be carried out at safe speeds designated for the site. • Site entry and exit points will be clearly marked to ensure vehicle movements are contained within the approved areas. • Staff and contractors will be made aware through general site induction and training of the potential to impact native fauna, reporting requirements and mitigation and management measures that are to be implemented during on-site works. • Injured, sick or dead fauna will be recorded and reported, during and after the construction and operation phases. This can be carried out by a fauna spotter-catcher during periods where disturbance is expected to occur (primarily construction activities). Where injured or sick fauna is detected, individuals will be taken to the nearest wildlife carer or veterinarian if practical.	Implementation of management measures will ensure operating vehicles on-site during the construction, operation and decommissioning phases will not result in residual impacts to diamond firetail.
Altered Fire Regimes and Bushfire Risk	• A Bushfire Management Plan will be developed and implemented during construction and operation to mitigate the potential impact of fires to MNES habitat. • Maintenance of an asset protection zone within the Operations Footprint is required to reduce the risk of reduction of habitat due to fire. • Use of industry best practice hazard reduction measures to minimise bushfire risk and environmental impacts, such as on-site controlled burning of cleared vegetation. • Ensuring a 30 m bushfire setback from vegetation around electrical infrastructure. Maintaining safe distances between vegetation and potential fire-starting hazards will increase safety and reduce fire risk. • Weed management and control methods (in line with the requirements of the *Biosecurity Act 2014* (Qld).) will reduce the potential of invasive plants changing species composition on-site and increasing fire risk. • Reduce on-site fuel loads and maintain firebreaks and trails.	Management measures implemented in line with the site-specific Bushfire Management Plan will greatly reduce the potential risk for this species caused by planned or unplanned fires. Therefore, there is no anticipated indirect residual impact.

Indirect Impact	Management of Indirect Impact	Residual Impact
Altered Hydrology	• The Proposed Action will adopt best practice erosion and sediment control measures, which will implement all relevant State Codes and Guidelines. • Watercourse crossings shall be stabilised to mitigate erosion of pavement and embankment materials during rainfall events up to and including the 10% AEP storm event. • Staff and contractors will be made aware through general site induction and training of the potential to generate runoff and mitigation and management measures that should be implemented. • Construction activities must not interfere or block natural drainage e.g. disturbing channel contours. • Water barrier works will be designed to minimise impact on fish habitats, stock or movements through compliance with relevant design codes. During the detailed design phase, fish passage elements will be considered in all mapped waterways for fish passage, including compliance with the accepted development requirements for waterway barrier works or an operational works permit under the Planning Act.	Impacts to on-site hydrology will be managed in accordance with the CEMP. Impacts to watercourses will be addressed by stabilising to prevent erosion, and only occur in discrete work areas, such that no increase in sedimentation is overserved affecting habitat. Therefore, there is no anticipated indirect residual impact.
Environmental Pollution and Hazardous Materials	• All hazardous materials bought on-site will be accompanied by an MSDS, all relevant personnel will be trained in their proper use. • Only registered herbicides will be used for weed management by a suitably qualified bush regeneration contractor. • Imported materials that are able to transport hazardous substances will be assessed to ensure they are free of contamination, disease and invasive species. • Ensuring appropriate waste management (lidded bins), to reduce potential for spread of hazardous materials on-site. • Vehicles, plant and machinery will comply with site-specific speed limits to minimise noise and dust generation. • Staff and contractors will be made aware through general site induction and training of the potential to generate dust, light and noise pollution and management measures that should be implemented. • Auditing of the CEMP will occur during construction. • Dust will be minimised through engineering controls on machinery and other available dust suppression controls, such as sprinklers. • Light pollution will be minimised through engineering controls on infrastructure and machinery, such as colour selection and timing controls. • Noise will be minimised through engineering controls on infrastructure and machinery, such as noise barriers and timing controls.	The management measures proposed will result in the reduction of the indirect impacts of environmental pollution and hazardous materials. Hazardous materials brought onto the site will be tightly regulated. Dust, light and noise generation will be minimised such that is it unlikely to adversely affect species or damage species habitat. These measures will ensure that the indirect impact is minimised so as to not cause an indirect residual impact to diamond firetail.

Indirect Impact	Management of Indirect Impact	Residual Impact
	• Disturbance form blasting will be minimised through engineering controls and other available blasting suppression, such as barrier walls. • Electricity infrastructure designed to allow for safe operations, using buffers between conductors and the ground, and conductors and adjacent vegetation. The transmission line has adopted a design which allows for reduced interference to canopy dwelling species due to minimising impacts to canopy vegetation.	
Site Alienation	• Locating turbines and access corridors away from key habitats where feasible (including remnant vegetation, waterways and drainage lines) reducing disturbance during all phases of the Proposed Action. • Mitigating habitat fragmentation and maintaining connectivity through the measures outlined above. • Using turbines with an RSA >40 m above ground level to provide a collision-free foraging zone within the canopy and 20 m above the canopy, reducing operational disturbance to terrestrial species. • Development and implementation of management plans (VFMP, CEMP) outlined above to reduce the potential impact of construction and operation phase activities including introducing invasive species, fire and altered hydrology. • Implementing engineering controls on infrastructure and machinery outlined above, such that dust, light and noise pollution and blasting does not adversely affect species or species habitat.	The potential risk of site alienation will be managed to ensure that species are able to move, disperse and utilise habitat throughout the Study Area for the life of the Proposed Action. Avoidance, mitigation and management measures outlined in this PER will ensure that the potential for site alienation is minimised so as to not cause an indirect residual impact to diamond firetail.

Indirect impacts from the Proposed Action will be mitigated and managed appropriately, such that there is no residual impact on diamond firetail. Some indirect impacts have been considered as part of the significant impact assessment for this species but are concluded unlikely to contribute to a significant impact.

6.6.11.3 SIGNIFICANT IMPACT ASSESSMENT

A total of 7,899.3 ha of diamond firetail Potential Breeding and Foraging Habitat has been mapped to occur within the Study Area. After post-construction revegetation, 95.8 ha of Potential Breeding and Foraging Habitat (1.2% of habitat available within the Study Area) is expected to be permanently impacted as a result of the Proposed Action.

A significant impact assessment based on the guidance provided in the SIG 1.1 is presented in Table 6-34. It has been concluded that the Proposed Action has the **potential** to have a significant impact on the diamond firetail. Avoidance, mitigation and management measures are discussed in detail in Section 7.

TABLE 6-34 SIGNIFICANT IMPACT ASSESSMENT FOR DIAMOND FIRETAIL

Criteria	Description	Criteria Triggered?
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:		
Lead to a long-term decrease in the size of an important population of a species;	Despite a large survey effort, the diamond firetail has not been observed within the Study Area. However, the species is considered as having the potential to occur due to suitable habitat being identified during field surveys. The total amount of habitat to be permanently impacted as a result of the Proposed Action is 95.8 ha (or 1.2%) of Potential Breeding and Foraging. Impacts will mostly involve clearing of small patches of remnant vegetation for turbines as well as clearing for linear infrastructure. Given the high mobility of this species, habitat within the Study Area will remain largely connected in the landscape, and to higher quality habitat associated with adjacent state forests. Therefore, the Proposed Action is unlikely to lead to a long-term decrease in the size of any potentially occurring populations of diamond firetail.	Unlikely
Reduce the area of occupancy of an important population;	This species' area of occupancy is roughly estimated at 25,000 km^2 (DCCEEW, 2023b). The Proposed Action will lead to an impact to 95.8 ha, or 1.2% of the total available diamond firetail habitat within the Study Area which equates to 0.004% of the species area of occupancy. The broad habitat requirements of this species suggest that this species is likely to have high availability of habitat within the wider region. Although 95.8 ha of habitat will be impacted within the Study Area, the area of retained habitat within the Study Area is likely to continue to support any potentially occurring local populations. Therefore, the Proposed Action is unlikely to reduce the area of occupancy of any potentially occurring populations of diamond firetail.	Unlikely
Fragment an existing important population into two or more populations;	Impacts will mostly involve clearing of small patches of remnant vegetation for turbines as well as clearing for linear infrastructure. Given the high mobility of this species, habitat within the Study Area will remain largely connected in the landscape, and to higher quality habitat associated with adjacent state forests. It is therefore unlikely that the impact to 95.8 ha, or 1.2% of the total available diamond firetail habitat within the Study Area, will result in a barrier to movement for this species, or fragment any existing populations into two or more populations.	Unlikely

Criteria	Description	Criteria Triggered?
Adversely affect habitat critical to the survival of a species;	Habitat critical to the survival of the diamond firetail has been described within the species Conservation Advice (DCCEEW, 2023b) and includes areas with: • Eucalypt, acacia or casuarina woodlands, open forests and other lightly timbered habitats; • Low tree density, few large logs, and little litter cover but high grass cover for foraging, roosting and breeding; • Drooping she-oak (*Allocasuarina verticillata*) within the Mt Lofty Ranges. According to the species conservation advice: • Habitat critical to the survival of diamond firetail should not be cleared, fragmented or degraded; • Any known or likely habitat (identified within the modelled distribution of the species and presented within the species conservation advice (DCCEEW, 2023b)), should be considered as habitat critical to the survival of the species; • Areas that are not currently occupied by the species due to recent disturbance (e.g. fire, grazing or human activity), but should became suitable again in the future, should also be considered habitat critical to the survival of the species (DCCEEW, 2023b). Despite a large survey effort, the diamond firetail has not been observed within the Study Area. Suitable habitat has been identified, though this Potential Habitat is at the northern extent of the species range within the 'may occur' modelled distribution of the species, therefore outside the 'known and likely habitat' identified within the species conservation advice (TSSC, 2015). Based on the information provided above, habitat within the Study Area is considered potential habitat critical to the survival of the diamond firetail. However, the initial construction-phase clearing of diamond firetail habitat is likely to only represent a short-term disturbance to the species. Revegetation is expected to return the functionality of impacted habitat outside of the Operations Footprint, reducing the overall permanent impact to the species. As the species has the potential to occur in the Study Area, it is considered that impacted 95.8 ha (1.2%) of Potential Breeding and Foraging habitat constitutes habitat critical to the survival of the species, and as such the Proposed Action has the potential to adversely affect habitat critical to the survival of the species.	Potential

Criteria	Description	Criteria Triggered?
Disrupt the breeding cycle of an important population;	Despite a large survey effort, the diamond firetail has not been observed within the Study Area. The species is considered as having the potential to occur within the Study Area, with potentially suitable breeding habitat determined to be present. Permanent impacts of the Proposed Action will be limited to 95.8 ha of Potential Breeding and Foraging (1.2% of habitat available within the Study Area). Clearing that occurs during the construction stage will be staged and pre-clearance surveys will identify any potential nests within suitable habitat. Disturbance to any active nests will be avoided/mitigated through micro-siting or, in a worst-case scenario, translocated to safer habitat. Therefore, the Proposed Action is unlikely to disrupt the breeding cycle of an important population.	Unlikely
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline;	A total of 263.6 ha of diamond firetail Potential Breeding and Foraging Habitat is expected to be disturbed during construction. After post-construction rehabilitation, which is expected to return the functionality required for the species, the Proposed Action is expected to only impact 95.8 ha, or 1.2% of all available Potential Breeding and Foraging within the Study Area. It is expected that the small area of disturbance in the larger context of the landscape is unlikely to remove/isolate or decrease the quality of habitat that would result in species decline.	Unlikely
Result in invasive species that are harmful to a Vulnerable species becoming established in the endangered species' habitat;	Invasive species such as feral cats (*Felis catus*) and European red foxes (*Vulpes vulpes*) are common pests encountered in Queensland and are particularly harmful to native threatened birds. These invasive species are known to occur in the Study Area. The Proposed Action will adopt and follow a Biosecurity Plan, as outline in Section 7. The activities related to the Proposed Action, both during construction and operation, will implement and follow biosecurity measures to reduce the risk of introducing new invasive species and to prevent the further spread of existing invasive species.	Unlikely
Introduce disease that may cause the species to decline; or	There is currently limited evidence of diseases causing detrimental effects to diamond firetail populations in Queensland. There is also no evidence to suggest the Proposed Action would introduce a disease that may cause the species to decline. Additionally, precautions will be taken to ensure that the spread of disease does not occur. This includes following biosecurity measures that are outlined in Section 7.	Unlikely

Criteria	Description	Criteria Triggered?
Interfere with the recovery of the species.	The Proposed Action is expected to result in permanent impacts to 95.8 ha of Breeding and Foraging Habitat (1.2% of habitat available within the Study Area). Despite a large survey effort, diamond firetail has not been observed within the Study Area. There are no formally adopted recovery plans for this species. However, the limited impact to potential habitat within the Study Area and the mostly linear nature of clearing associated with the Proposed Action is unlikely to affect the recovery of this species. Clearing is unlikely to adversely affect retained areas of suitable habitat, and mitigation measures such as micro-siting and pre-clearance surveys will be utilised. This will enable the species to continually traverse the landscape and utilise retained habitat, ensuring genetic viability of any potentially occurring local population. It is therefore unlikely the Proposed Action will interfere substantially with the recovery of the species.	Unlikely
Significant Impact: Potential		

6.6.12 OOLINE

6.6.12.1 DIRECT IMPACTS

Direct impacts to ooline associated with the Proposed Action are considered to be limited to habitat loss from vegetation clearing. These impacts are quantified below and include impacts to:

- 5 ha of Potential Habitat.

It is expected that some impacted areas of ooline habitat will be revegetated after the construction phase. However, no rehabilitation or revegetation in these areas is expected to restore any functionality for this species post-construction. Therefore, the direct impact to ooline associated with construction-phase clearing is considered permanent.

A summary of the direct impacts to ooline habitat as a result of the Proposed Action is shown in Table 6-35. A total of 5 ha of ooline habitat will be permanently impacted by the Proposed Action, which equates to 1.8% of the total available habitat identified within the Study Area.

TABLE 6-35 DIRECT IMPACTS TO OOLINE HABITAT

	Potential Habitat
Study Area (ha)	277.4
Disturbance Footprint (ha)	5
Percent of habitat within the Study Area to be impacted	1.8% of Potential Habitat within the Study Area
Permanent impact (Operations Footprint) (ha)	**5**

6.6.12.2 INDIRECT IMPACTS

The indirect impacts to ooline as a result of the Proposed Action are detailed in Table 6-36, along with how these impacts will be managed and any residual impact that will affect the MNES. Avoidance, mitigation and management measures are discussed in detail in Section 7.

TABLE 6-36 INDIRECT IMPACTS TO OOLINE

Indirect Impact	Management of Indirect Impact	Residual Impact
Habitat Fragmentation and Patch Isolation	• Areas identified as MNES habitat will be avoided as much as possible at the design and micro-siting stages. • Micro-siting of infrastructure will utilise existing clearance areas and avoid habitat fragmentation and patch isolation, with consideration of whether avoidance areas would still be connected to habitat in the broader landscape. • Prior to construction and detailed design, the incorporation of road pinch points to maximise connectivity will be considered to maintain habitat connectivity. While pinch points have a benefit for habitat they present a technical and logistical barrier to safe and effective construction. Pre-clearance surveys will determine appropriate locations for road pinch points. • Location of infrastructure will prioritise avoiding or minimising edge effects or dissecting tracts of native vegetation. • Where possible, the Proposed Action will implement the use of innovative turbine blade transportation, including methods to minimise necessary clearance widths (e.g. 'Blade Manipulator' trucks). • Turbine placement will maximise the use of areas that are less vegetated to avoid and minimise clearing of key habitat. • All clearing for access corridors will be limited to 40 m in width during the construction phase. • Clear delineation of areas to be cleared, ensuring that the Disturbance Footprint does not extend further than planned to create unnecessary fragmentation or disturbance. Toolbox talks will relay site-specific clearing information to all field staff and contractors. • Rehabilitation of access corridors will occur once construction has been completed. Such rehabilitation will involve planting/natural regeneration of native species that are habitat for MNES.	Habitat fragmentation and patch isolation will be managed to ensure that ooline habitat maintains connectivity with the landscape within and surrounding the Study Area. All clearing for access corridors will be limited to 40 m. Additionally, the Proposed Action will not remove or isolate habitat patches altogether, only clearing in the areas necessary for infrastructure. Therefore, this indirect impact will be minimised so as not to cause an indirect residual impact.

Indirect Impact	Management of Indirect Impact	Residual Impact
Increased Prevalence of Invasive Plants and Animals	• A Biosecurity Management Plan will be implemented for the site which includes requirements for vehicle washdowns and protocols to ensure activities are planned to minimise movement of vehicles, equipment and machinery outside of designated access corridors. • Staff and contractors will be given information on the location and consequences of biosecurity threats in the Study Area. • Access to a landholder's property will not occur unless authorised under a land use agreement. • WONS and Restrictive Invasive Species will be identified and monitored in the Study Area. Appropriate weed monitoring will occur to ensure new weed species are identified, recorded and controlled. • Weed management and control methods will depend upon the location, weed species identified, the degree of the infestation, relevant landholder agreement or conduct and compensation agreements provisions, and local, state and national regulatory requirements. • Weed loads will be mimimised in high-traffic areas such as roads, easements and yards through regular monitoring and site personnel reporting protocols, with an investigation to be managed to prevent spread of weeds in accordance with the *Biosecurity Act 2014* (Qld). • Imported material able to transport weed seed will be assessed to ensure they are free of contamination, disease and invasive weeds.	Management measures will limit the possibility of the introduction or spread of invasive plant and animal species through relevant biosecurity measures incorporated into the Biosecurity Management Plan. This is such that the indirect impact will be minimised so as not to cause an indirect residual impact to the species.
Increased Vehicle Impacts on Fauna and Habitat	• No driving will occur in unauthorised areas, routes and access tracks will be clearly communicated to all site visitors. All driving will be carried out at safe speeds designated for the site. • Site entry and exit points will be clearly marked to ensure vehicle movements are contained within the approved areas. • Staff and contractors will be made aware through general site induction and training of the potential to impact native flora habitat, reporting requirements and mitigation and management measures that are to be implemented during on-site works. • Weekly site inspections to review flora and fauna control measures during construction. Sightings and incidents reported in daily pre-starts during construction. All near misses and incidents will be investigated to establish root cause. Where necessary corrective actions will be developed to improve existing processes.	Implementation of management measures will ensure operating vehicles on-site during the construction, operation and decommissioning phases will not result in residual impacts to ooline.

Indirect Impact	Management of Indirect Impact	Residual Impact
Altered Fire Regimes and Bushfire Risk	• A Bushfire Management Plan will be developed and implemented during construction and operation to mitigate the potential impact of fires to MNES habitat. • Maintenance of an asset protection zone within the Operations Footprint is required to reduce the risk of reduction of habitat due to fire. • Use of industry best practice hazard reduction measures to minimise bushfire risk and environmental impacts, such as on-site controlled burning of cleared vegetation. • Ensuring a 30 m bushfire setback from vegetation around electrical infrastructure. Maintaining safe distances between vegetation and potential fire-starting hazards will increase safety and reduce fire risk. • Weed management and control methods (in line with the requirements of the *Biosecurity Act 2014* (Qld)) will reduce the potential of invasive plants changing species composition on-site and increasing fire risk. • Reduce on-site fuel loads and maintain firebreaks and trails.	Management measures implemented in line with the site-specific Bushfire Management Plan will greatly reduce the potential risk for this species caused by planned or unplanned fires. Therefore, there is no anticipated indirect residual impact.
Altered Hydrology	• The Proposed Action will adopt best practice erosion and sediment control measures, which will implement all relevant State Codes and Guidelines. • Watercourse crossings shall be stabilised to mitigate erosion of pavement and embankment materials during rainfall events up to and including the 10% AEP storm event. • Staff and contractors will be made aware through general site induction and training of the potential to generate runoff and mitigation and management measures that should be implemented. • Construction activities must not interfere or block natural drainage e.g. disturbing channel contours.	Impacts to on-site hydrology will be managed in accordance with the CEMP. Impacts to watercourses will be addressed by stabilising to prevent erosion, and only occur in discrete work areas, such that no increase in sedimentation is overserved affecting habitat. Therefore, there is no anticipated indirect residual impact.
Environmental Pollution and Hazardous Materials	• All hazardous materials bought on-site will be accompanied by an MSDS, all relevant personnel will be trained in their proper use. • Only registered herbicides will be used for weed management by a suitably qualified bush regeneration contractor. • Imported materials that are able to transport hazardous substances will be assessed to ensure they are free of contamination, disease and invasive species. • Ensuring appropriate waste management (lidded bins), to reduce potential for spread of hazardous materials on-site. • Vehicles, plant and machinery will comply with site-specific speed limits to minimise dust generation. • Staff and contractors will be made aware through general site induction and training of the potential to generate dust, light and noise	The management measures proposed will result in the reduction of the indirect impacts of environmental pollution and hazardous materials. Hazardous materials brought onto the site will be tightly regulated. Dust generation will be minimised such that is it unlikely to damage species habitat. These measures will ensure that the indirect impact is minimised so as to not cause an indirect residual impact to ooline.

Indirect Impact	Management of Indirect Impact	Residual Impact
	pollution and management measures that should be implemented. • Auditing of the CEMP will occur during construction. • Dust will be minimised through engineering controls on machinery and other available dust suppression controls, such as sprinklers. • Disturbance form blasting will be minimised through engineering controls and other available blasting suppression, such as barrier walls.	

Indirect impacts from the Proposed Action will be mitigated and managed appropriately, such that there is no residual impact on ooline. Some indirect impacts have been considered as part of the significant impact assessment for this species but are concluded unlikely to contribute to a significant impact

6.6.12.3 SIGNIFICANT IMPACT ASSESSMENT

Potential Habitat identified as suitable for ooline occurs within the Study Area in association with the BHT of *Vine forest / thickets and dry rainforest*. A total of 277.4 ha of Potential Habitat occurs within the Study Area, with 5 ha of this habitat expected to be permanently impacted as a result of the Proposed Action.

In the absence of an official description, Potential Habitat described above and mapped to occur within the Study Area has conservatively been considered habitat critical to the survival of ooline, though the Study Area does not support an important population of the species.

A significant impact assessment based on the guidance provided in the SIG 1.1 is presented in Table 6-37. It has been concluded that the Proposed Action is **unlikely** to have a significant impact on ooline. Avoidance, mitigation and management measures considered within this assessment are discussed in detail in Section 7.

TABLE 6-37 SIGNIFICANT IMPACT ASSESSMENT FOR OOLINE

Criteria	Description	Criteria Triggered?
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:		
Lead to a long-term decrease in the size of an important population of a species;	A total of 277.4 ha of Potential Habitat for ooline occurs within the Study Area (0.6% of the total Study Area), with 5 ha (or 1.8%) of this habitat expected to be disturbed as a result of the Proposed Action. No observations of the species have been made across the Study Area, with only one database record of the species from 2003 (ALA, 2024) occurring approximately 50 kms east of the Study Area. It is therefore considered unlikely an important population of ooline occurs within the Study Area and as such, an impact to approximately 1.8% of total available Potential	Unlikely

Criteria	Description	Criteria Triggered?
	Habitat within the Study Area is unlikely to lead to a long-term decrease in the size of any local populations of the species. Additionally, mitigation measures such as pre-clearance surveys and micro-siting at areas of planned infrastructure will ensure disturbance to the species are further avoided where possible.	
Reduce the area of occupancy of an important population;	Ooline occurs in central and southern Queensland and north-west New South Wales. Its area of occupancy in this range is unknown, though roughly 40 disjunct populations are known across its natural distribution (approximately 25 populations in Queensland and 15 in New South Wales) (DEWHA, 2008a). No observations of the species have been made across the Study Area, with only one database record of the species from 2003 (ALA, 2024) occurring approximately 50 kms east of the Study Area. It is therefore considered unlikely an important population of ooline occurs within the Study Area and as such, an impact to 5 ha (or 1.8%) of Potential Habitat within the Study Area is unlikely to reduce the area of occupancy of an important population of ooline.	Unlikely
Fragment an existing important population into two or more populations;	The Proposed Action will lead to the disturbance of 5.0 ha (or 1.8%) of ooline Potential Habitat within the Study Area. No observations of the species have been made across the Study Area, with only one database record of the species from 2003 (ALA, 2024) occurring approximately 50 kms east of the Study Area. It is therefore considered unlikely an important population of ooline occurs within the Study Area. Disturbances associated with the Proposed Action will largely occur at small, isolated turbine locations, or narrow, linear areas of projected access tracks within the Study Area. This will ensure that effects of fragmentation are minimised at all opportunities. With the addition of mitigation measures such as pre-clearance surveys and micro-siting at areas of planned infrastructure, it is unlikely that impacts to approximately 1.8% of total available Potential Habitat within the Study Area will fragment an existing important population of ooline into two or more populations.	Unlikely

Criteria	Description	Criteria Triggered?
Adversely affect habitat critical to the survival of a species;	Habitat critical to the survival of ooline has not been specifically described for this species. However, habitat for the species has been described within the species SPRAT profile as (DCCEEW, 2024a): *"semi-evergreen vine thickets and sclerophyll vegetation on undulating terrain of various geology […] associated with upper and mid-slopes in the landscape. The altitude is generally 300-460 m above sea level, with some stands known to occur at 600 m above sea level (Benson, 1993)."* A total of 277.4 ha of Potential Habitat has been mapped to occur within the Study Area. Though no observations of the species have been made across the Study Area and only database records of the species occur within approximately 50 kms of the Study Area, if a population was observed in future surveys, the surrounding habitat may be considered habitat critical to the survival of the species. The Proposed Action will lead to the disturbance of 5 ha (or 1.8%) of Potential Habitat within the Study Area. With the implementation of mitigation measures, such as pre-clearance surveys and micro-siting at areas of planned infrastructure, and noting the small area of impact in comparison to the broader Study Area, it is unlikely that the Proposed Action will adversely affect habitat critical to the survival of ooline.	Unlikely
Disrupt the breeding cycle of an important population;	The SPRAT profile for ooline identifies avifauna dispersal and passive fall as probable methods of reproduction for the species, with low rates of seed viability as one of the key threatening processes for ooline (DCCEEW, 2024a). Additionally, with no observations of the species across the Study Area and just one database record of the species approximately 50 kms east of the Study Area (ALA, 2024), it is unlikely an important population of ooline occurs within the Study Area. Considering the implementation of mitigation measures such as pre-clearance surveys and micro-siting at areas of planned infrastructure, it is unlikely that an impact to 5 ha (or 1.8%) of the Potential Habitat within the Study Area will disrupt the breeding cycle of an important population of ooline.	Unlikely

Criteria	Description	Criteria Triggered?
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline;	The Proposed Action will result in the disturbance of 5 ha of ooline Potential Habitat (1.8% of total habitat available). This accounts for a small area of habitat to be disturbed in relation to the larger context of the Study Area, which supports 277.4 ha of Potential Habitat. It is expected that small scale disturbance in the larger context of the landscape will not remove, isolate or decrease the quality of habitat that would result in species decline.	Unlikely
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat;	Invasive fauna such as feral goats (*Capra hircus*) and wild pigs (*Sus scrofa*) as well as invasive flora including tiger pear (*Opunita aurantiaca*) are identified as threats to ooline (DEWHA, 2008a). Wild pig and *Opuntioid* cactii are known to occur in the Study Area, though no wild goats have been observed. The Proposed Action will adopt and follow a Biosecurity Plan, as outline in Section 7. The activities related to the Proposed Action, both during construction and operation, will implement and follow biosecurity measures to reduce the risk of introducing new invasive species and to prevent the further spread of existing invasive species.	Unlikely
Introduce disease that may cause the species to decline; or	There is currently limited evidence of diseases causing detrimental effects on ooline populations in Queensland. There is also no evidence to suggest the proposed disturbance would introduce a disease that would cause the species to decline. Additionally, precautions will be taken to ensure that the spread of disease does not occur. This includes following biosecurity measures as part of a biosecurity plan (see Section 7).	Unlikely
Interfere substantially with the recovery of the species.	There are no formally adopted recovery plans for this species. However, there are *Regional* and *Local Priority Actions* identified by the *Approved Conservation Advice for Cadellia pentastylis* (DEWHA, 2008a), which determine key management issues of: • Habitat loss, disturbance and modification • Conservation information • Fire • Invasive weeds • Trampling, browsing or grazing • Recovery of additional sites and/or populations The Proposed Action will result in 5 ha of disturbance to Potential Habitat (1.8% of all habitat within the Study Area). It is unlikely this impact will lead to habitat loss, disturbance or modification of ooline habitat to the extent that recovery of the species is substantially interfered with. Additional priority actions will be managed so as not to interfere substantially with the recovery of	Unlikely

Criteria	Description	Criteria Triggered?
	the species, including control of invasive weeds through a biosecurity plan and mitigation measures such as pre-clearance surveys and micro-siting at areas of planned infrastructure to retain connectivity values and reduce impacts where possible. It is not expected the Proposed Action will lead to an increased fire risk. While the Study Area is used for agricultural purposes, it is not expected the Proposed Action will contribute to further impacts of trampling and grazing, especially regarding high-threat species such as feral goats. It is therefore considered unlikely the Proposed Action will substantially interfere with the recovery of ooline.	
Significant Impact: Unlikely		

6.6.13 COSSINIA

6.6.13.1 DIRECT IMPACTS

Direct impacts to cossinia associated with the Proposed Action are considered to be limited to habitat loss from vegetation clearing. These impacts are quantified below and include impacts to:

- 5 ha of Potential Habitat.

It is expected that some impacted areas of cossinia habitat will be revegetated after the construction phase. However, no rehabilitation or revegetation in these areas is expected to restore any functionality for this species post-construction. Therefore, the direct impact to cossinia associated with construction-phase clearing is considered permanent.

A summary of the direct impacts to cossinia habitat as a result of the Proposed Action is shown in Table 6-38. A total of 5 ha of cossinia habitat will be permanently impacted by the Proposed Action, which equates to 1.8% of the total available habitat identified within the Study Area.

TABLE 6-38 DIRECT IMPACTS TO COSSINIA HABITAT

	Potential Habitat
Study Area (ha)	277.4
Disturbance Footprint (ha)	5
Percent of habitat within the Study Area to be impacted	1.8% of Potential Habitat within the Study Area
Permanent impact (Operations Footprint) (ha)	**5**

6.6.13.2 INDIRECT IMPACTS

The indirect impacts to cossinia as a result of the Proposed Action are detailed in Table 6-39, along with how these impacts will be managed and any residual impact that will affect the MNES. Avoidance, mitigation and management measures are discussed in detail in Section 7.

TABLE 6-39 INDIRECT IMPACTS TO COSSINIA

Indirect Impact	Management of Indirect Impact	Residual Impact
Habitat Fragmentation and Patch Isolation	• Areas identified as MNES habitat will be avoided as much as possible at the design and micro-siting stages. • Micro-siting of infrastructure will utilise existing clearance areas and avoid habitat fragmentation and patch isolation, with consideration of whether avoidance areas would still be connected to habitat in the broader landscape. • Prior to construction and detailed design, the incorporation of road pinch points to maximise connectivity will be considered to maintain habitat connectivity. While pinch points have a benefit for habitat they present a technical and logistical barrier to safe and effective construction. Pre-clearance surveys will determine appropriate locations for road pinch points. • Location of infrastructure will prioritise avoiding or minimising edge effects or dissecting tracts of native vegetation. • Where possible, the Proposed Action will implement the use of innovative turbine blade transportation, including methods to minimise necessary clearance widths (e.g. 'Blade Manipulator' trucks). • Turbine placement will maximise the use of areas that are less vegetated to avoid and minimise clearing of key habitat. • All clearing for access corridors will be limited to 40 m in width during the construction phase. • Clear delineation of areas to be cleared, ensuring that the Disturbance Footprint does not extend further than planned to create unnecessary fragmentation or disturbance. Toolbox talks will relay site-specific clearing information to all field staff and contractors. • Rehabilitation of access corridors will occur once construction has been completed. Such rehabilitation will involve planting/natural regeneration of native species that are habitat for MNES.	Habitat fragmentation and patch isolation will be managed to ensure that cossinia habitat maintains connectivity with the landscape within and surrounding the Study Area. All clearing for access corridors will be limited to 40 m. Additionally, the Proposed Action will not remove or isolate habitat patches altogether, only clearing in the areas necessary for infrastructure. Therefore, this indirect impact will be minimised so as not to cause an indirect residual impact.
Increased Prevalence of Invasive Plants and Animals	• A Biosecurity Management Plan will be implemented for the site which includes requirements for vehicle washdowns and protocols to ensure activities are planned to minimise movement of vehicles, equipment and machinery outside of designated access corridors. • Staff and contractors will be given information on the location and consequences of biosecurity threats in the Study Area. • Access to a landholder's property will not occur unless authorised under a land use agreement. • WONS and Restrictive Invasive Species will be identified and monitored in the Study Area.	Management measures will limit the possibility of the introduction or spread of invasive plant and animal species through relevant biosecurity measures incorporated into the Biosecurity Management Plan. This is such that the indirect impact will be minimised so as not to cause an indirect residual impact to the species.

Indirect Impact	Management of Indirect Impact	Residual Impact
	Appropriate weed monitoring will occur to ensure new weed species are identified, recorded and controlled. • Weed management and control methods will depend upon the location, weed species identified, the degree of the infestation, relevant landholder agreement or conduct and compensation agreements provisions, and local, state and national regulatory requirements. • Weed loads will be mimimised in high-traffic areas such as roads, easements and yards through regular monitoring and site personnel reporting protocols, with an investigation to be managed to prevent spread of weeds in accordance with the *Biosecurity Act 2014* (Qld). • Imported material able to transport weed seed will be assessed to ensure they are free of contamination, disease and invasive weeds.	
Increased Vehicle Impacts on Fauna and Habitat	• No driving will occur in unauthorised areas, routes and access tracks will be clearly communicated to all site visitors. All driving will be carried out at safe speeds designated for the site. • Site entry and exit points will be clearly marked to ensure vehicle movements are contained within the approved areas. • Staff and contractors will be made aware through general site induction and training of the potential to impact native flora habitat, reporting requirements and mitigation and management measures that are to be implemented during on-site works. • Weekly site inspections to review flora and fauna control measures during construction. Sightings and incidents reported in daily pre-starts during construction. All near misses and incidents will be investigated to establish root cause. Where necessary corrective actions will be developed to improve existing processes.	Implementation of management measures will ensure operating vehicles on-site during the construction, operation and decommissioning phases will not result in residual impacts to cossinia.
Altered Fire Regimes and Bushfire Risk	• A Bushfire Management Plan will be developed and implemented during construction and operation to mitigate the potential impact of fires to MNES habitat. • Maintenance of an asset protection zone within the Operations Footprint is required to reduce the risk of reduction of habitat due to fire. • Use of industry best practice hazard reduction measures to minimise bushfire risk and environmental impacts, such as on-site controlled burning of cleared vegetation. • Ensuring a 30 m bushfire setback from vegetation around electrical infrastructure. Maintaining safe distances between vegetation and potential fire-starting hazards will increase safety and reduce fire risk.	Management measures implemented in line with the site-specific Bushfire Management Plan will greatly reduce the potential risk for this species caused by planned or unplanned fires. Therefore, there is no anticipated indirect residual impact.

Indirect Impact	Management of Indirect Impact	Residual Impact
	• Weed management and control methods (in line with the requirements of the *Biosecurity Act 2014* (Qld)) will reduce the potential of invasive plants changing species composition on-site and increasing fire risk. • Reduce on-site fuel loads and maintain firebreaks and trails.	
Altered Hydrology	• The Proposed Action will adopt best practice erosion and sediment control measures, which will implement all relevant State Codes and Guidelines. • Watercourse crossings shall be stabilised to mitigate erosion of pavement and embankment materials during rainfall events up to and including the 10% AEP storm event. • Staff and contractors will be made aware through general site induction and training of the potential to generate runoff and mitigation and management measures that should be implemented. • Construction activities must not interfere or block natural drainage e.g. disturbing channel contours.	Impacts to on-site hydrology will be managed in accordance with the CEMP. Impacts to watercourses will be addressed by stabilising to prevent erosion, and only occur in discrete work areas, such that no increase in sedimentation is overserved affecting habitat. Therefore, there is no anticipated indirect residual impact.
Environmental Pollution and Hazardous Materials	• All hazardous materials bought on-site will be accompanied by an MSDS, all relevant personnel will be trained in their proper use. • Only registered herbicides will be used for weed management by a suitably qualified bush regeneration contractor. • Imported materials that are able to transport hazardous substances will be assessed to ensure they are free of contamination, disease and invasive species. • Ensuring appropriate waste management (lidded bins), to reduce potential for spread of hazardous materials on-site. • Vehicles, plant and machinery will comply with site-specific speed limits to minimise dust generation. • Staff and contractors will be made aware through general site induction and training of the potential to generate dust, light and noise pollution and management measures that should be implemented. • Auditing of the CEMP will occur during construction. • Dust will be minimised through engineering controls on machinery and other available dust suppression controls, such as sprinklers. • Disturbance form blasting will be minimised through engineering controls and other available blasting suppression, such as barrier walls.	The management measures proposed will result in the reduction of the indirect impacts of environmental pollution and hazardous materials. Hazardous materials brought onto the site will be tightly regulated. Dust generation will be minimised such that is it unlikely to damage species habitat. These measures will ensure that the indirect impact is minimised so as to not cause an indirect residual impact to cossinia.

Indirect impacts from the Proposed Action will be mitigated and managed appropriately, such that there is no residual impact on cossinia. Some indirect impacts have been considered as part of the significant impact assessment for this species but are concluded unlikely to contribute to a significant impact.

6.6.13.3 SIGNIFICANT IMPACT ASSESSMENT

Potential Habitat identified as suitable for cossinia occurs within the Study Area in association with the broad habitat type *Vine forest / thickets and dry rainforest*. A total of 277.4 ha of Potential Habitat occurs within the Study Area, with 5 ha of this habitat expected to be permanently impacted as a result of the Proposed Action.

In the absence of an official description, Potential Habitat described above and mapped to occur within the Study Area has conservatively been considered habitat critical to the survival of cossinia, though the Study Area does not support an important population of the species.

A significant impact assessment based on the guidance provided in the SIG 1.1 is presented in Table 6-40. It has been concluded that the Proposed Action is **unlikely** to have a significant impact on cossinia. Avoidance, mitigation and management measures considered within this assessment are discussed in detail in Section 7.

TABLE 6-40 SIGNIFICANT IMPACT ASSESSMENT FOR COSSINIA

Criteria	Description	Criteria Triggered?
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:		
Lead to a long-term decrease in the size of a population;	A total of 277.4 ha (or 0.6%) of Potential Habitat suitable for cossinia occurs within the Study Area, with 5 ha (or 1.8%) of this Potential Habitat expected to be disturbed as a result of the Proposed Action. No observations of the species have been made across the Study Area. One out-of-date database record of the species from 2002 (ALA, 2024), occurs approximately 1 km east of the Study Area in Montour State Forest. An impact to approximately 1.8% of total available Potential Habitat within the Study Area is unlikely to impact any local populations of the species. Additionally, mitigation measures such as pre-clearance surveys and micro-siting at areas of planned infrastructure will ensure disturbance to the species is further avoided where possible. Therefore, the Proposed Action is unlikely to lead to a long-term decrease in the size of a population of cossinia.	Unlikely
Reduce the area of occupancy of the species;	Cossinia is endemic to central and southern Queensland. Its area of occupancy in this range is unknown, though occurs in a roughly 300 km range between Rockhampton and Kingaroy in scattered habitat patches as an uncommon or isolated individual (DEWHA, 2008b). The Proposed Action will lead to the disturbance of 5 ha of Potential Habitat for cossinia, or 1.8% of all habitat within the Study Area. No observations of the species have been made across the Study Area. One out-of-date database record of the species	Unlikely

Criteria	Description	Criteria Triggered?
	from 2002 (ALA) occurs approximately 1 km east of the Study Area in Montour State Forest. With the addition of mitigation measures such as pre-clearance surveys and micro-siting at areas of planned infrastructure, it is unlikely that impacts to approximately 5 ha of Potential Habitat or 1.8% of total available Potential Habitat within the Study Area will reduce the area of occupancy of cossinia.	
Fragment an existing population into two or more populations;	The Proposed Action will lead to disturbance of 5 ha of Potential Habitat suitable for cossinia, or 1.8% of all habitat within the Study Area. No observations of the species have been made across the Study Area. Disturbances associated with the Proposed Action will largely occur at small, isolated turbine locations, or narrow, linear areas of projected access tracks within the Study Area. This will ensure that effects of fragmentation are minimised at all opportunities. With the addition of mitigation measures such as pre-clearance surveys and micro-siting at areas of planned infrastructure, it is unlikely that an impact to approximately 1.8% of the total available Potential Habitat within the Study Area will fragment an existing population of cossinia into two or more populations.	Unlikely
Adversely affect habitat critical to the survival of a species;	Habitat critical to the survival of cossinia has not been specifically described. In lieu of an official description, cossinia habitat described within the species' conservation advice has been used: *"fragmented relict patches of* Araucarian *vine forests or vine thickets on fertile soils in central and southern Queensland* (DEWHA, 2008b)*."* A total of 277.4 ha of Potential Habitat has been mapped to occur within the Study Area in areas of semi-evergreen vine thickets. Though no observations of the species have been made across the Study Area and only out-of-date database records of the species occur 1 km east of the Study Area, if a population is observed in future surveys, the surrounding habitat may be considered habitat critical to the survival of the species. The Proposed Action will lead to the disturbance of 5 ha of Potential Habitat, or 1.8% of all habitat within the Study Area. It is expected that this small scale disturbance in the larger context of the landscape is unlikely to adversely affect habitat critical to the survival of the species.	Unlikely

Criteria	Description	Criteria Triggered?
Disrupt the breeding cycle of a population;	Disturbance to 5 ha (or 1.8%) of Potential Habitat suitable for Cossinia within the Study Area, is unlikely to disrupt the species' ability to reproduce within the Study Area. Additionally, with no observations of the species across the Study Area and just one out-of-date database record of the species approximately 1 km east of the Study Area (ALA, 2024), it is unlikely a population of cossinia occurs within the Study Area. Considering the implementation of mitigation measures such as pre-clearance surveys and micro-siting at areas of planned infrastructure, it is unlikely that the breeding cycle of a population of cossinia will be disrupted by the Proposed Action.	Unlikely
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline;	The Proposed Action will result in the disturbance of 5 ha (or 1.8%) of cossinia Potential Habitat. This accounts for a small area of Potential Habitat to be removed in relation to the larger context of the Study Area, which supports 277.4 ha of Potential Habitat. It is expected that small scale disturbance in the larger context of the landscape will not remove, isolate or decrease the quality of habitat to the extent that the species is likely to decline.	Unlikely
Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat	Cossinia often occurs in ecotonal habitat at the edge of dry rainforest ecosystems and is susceptible to edge effects and competition by introduced weeds (DEWHA, 2008b). Invasive flora is therefore considered one of the largest threatening processes to cossinia. Lantana (*Lantana camara*), Dutchman's Pipe (*Aristolochia elegans*), Madeira Vine (*Anredera cordifolia*), Cat's Claw Creeper (*Macfadyena unguis-cati*) and Climbing Asparagus (*Asparagus plumosus*) are the primary weeds which threaten cossinia (DEWHA, 2008b). Lantana and cat's claw creeper have been confirmed to occur within the Study Area. The Proposed Action will result in the disturbance of 5 ha (or 1.8%) of Potential Habitat within the Study Area, with associated impacts likely to introduce edge effects and invasive flora to this habitat without suitable mitigation measures. However, the Proposed Action will adopt and follow a Biosecurity Plan, as outline in Section 7. The activities related to the Proposed Action, both during construction and operation, will implement and follow biosecurity measures to reduce the risk of introducing new invasive species and to prevent the further spread of existing invasive species. Therefore, it is considered unlikely that the Proposed Action will increase the impact of invasive flora species on cossinia or cossinia Potential Habitat within he Study Area.	Unlikely

Criteria	Description	Criteria Triggered?
Introduce disease that may cause the species to decline; or	There is currently limited evidence of diseases causing detrimental effects on cossinia populations in Queensland. There is also no evidence to suggest the proposed disturbance would introduce a disease that would cause the species to decline. Additionally, precautions will be taken to ensure that the spread of disease does not occur. This includes following biosecurity measures as part of a biosecurity plan (see Section 7).	Unlikely
Interfere with the recovery of the species.	There are no formally adopted recovery plans for this species. However, there are *Regional* and *Local Priority Actions* identified by the *Approved Conservation Advice for Cossinia australiana* (DEWHA, 2008b) which, listed below, determine key management issues: • Habitat loss, disturbance and modification • Invasive weeds • Conservation information • Recovery of additional sites and/or populations The Proposed Action will result in 5 ha (or 1.8%) of disturbance to Cossinia Potential Habitat within the Study Area. It is unlikely this impact will lead to habitat loss, disturbance or modification to the extent that recovery of the species is interfered with. Additional priority actions will be managed so as not to interfere with the recovery of the species, including control of invasive weeds through a biosecurity plan and mitigation measures such as pre-clearance surveys and micro-siting at areas of planned infrastructure to retain connectivity values and reduce impacts where possible. It is therefore considered unlikely the Proposed Action will substantially interfere with the recovery of cossinia.	Unlikely
Significant Impact: Unlikely		

6.6.14 AUSTRAL CORNFLOWER

6.6.14.1 DIRECT IMPACTS

Direct impacts to austral cornflower associated with the Proposed Action are considered to be limited to habitat loss from vegetation clearing. These impacts are quantified below and include impacts to:

- 667.5 ha of Potential Habitat.

Of these areas cleared during construction, it is expected that there will be a reduction in impact through rehabilitation during the operations phase. Austral cornflower is a poor competitor and tends to prefer habitat where competition from grasses has been reduced by disturbance, and post-disturbance invasion of exotic grasses is suppressed (DEWHA, 2008c). Post-construction rehabilitation is expected to restore 434 ha of Potential Habitat to pre-disturbance composition and function. This will result in a permanent impact to only 233.5 ha of Potential Habitat for austral cornflower.

A summary of the direct impacts to austral cornflower habitat as a result of the Proposed Action is shown in Table 6-41. A total of 233.5 ha of austral cornflower habitat will be permanently impacted by the Proposed Action, which equates to 1.1% of the total available habitat identified within the Study Area.

TABLE 6-41 DIRECT IMPACTS TO AUSTRAL CORNFLOWER HABITAT

	Potential Habitat
Study Area (ha)	21,768.5
Disturbance Footprint (ha)	667.5
Percent of habitat within the Study Area to be impacted	3.1% of Potential Habitat within the Study Area
Available **Revegetation areas** within the Disturbance Footprint (ha)	434
Permanent impact* (Operations Footprint) (ha)	233.5 (1.1%)

**Permanent impact (Operations Footprint) is provided where revegetation and/or rehabilitation can return habitat for the species to function or utilise post-construction (i.e., for recolonisation, dispersal, foraging or breeding).*

6.6.14.2 INDIRECT IMPACTS

The indirect impacts to austral cornflower as a result of the Proposed Action are detailed in Table 6-42, along with how these impacts will be managed and any residual impact that will affect the MNES. Avoidance, mitigation and management measures are discussed in detail in Section 7.

TABLE 6-42 INDIRECT IMPACTS TO AUSTRAL CORNFLOWER

Indirect Impact	**Management of Indirect Impact**	**Residual Impact**
Habitat Fragmentation and Patch Isolation	• Areas identified as MNES habitat will be avoided as much as possible at the design and micro-siting stages. • Micro-siting of infrastructure will utilise existing clearance areas and avoid habitat fragmentation and patch isolation, with consideration of whether avoidance areas would still be connected to habitat in the broader landscape. • Prior to construction and detailed design, the incorporation of road pinch points to maximise connectivity will be considered to maintain habitat connectivity. While pinch points have a benefit for habitat they present a technical and logistical barrier to safe and effective construction. Pre-clearance surveys will determine appropriate locations for road pinch points. • Location of infrastructure will prioritise avoiding or minimising edge effects or dissecting tracts of native vegetation. • Where possible, the Proposed Action will implement the use of innovative turbine blade transportation, including methods to minimise	Habitat fragmentation and patch isolation will be managed to ensure that austral cornflower habitat maintains connectivity with the landscape within and surrounding the Study Area. All clearing for access corridors will be limited to 40 m. Additionally, the Proposed Action will not remove or isolate habitat patches altogether, only clearing in the areas necessary for infrastructure. Therefore, this indirect impact will be minimised so as not to cause an indirect residual impact.

Indirect Impact	Management of Indirect Impact	Residual Impact
	necessary clearance widths (e.g. 'Blade Manipulator' trucks). • Turbine placement will maximise the use of areas that are less vegetated to avoid and minimise clearing of key habitat. • All clearing for access corridors will be limited to 40 m in width during the construction phase. • Clear delineation of areas to be cleared, ensuring that the Disturbance Footprint does not extend further than planned to create unnecessary fragmentation or disturbance. Toolbox talks will relay site-specific clearing information to all field staff and contractors. • Rehabilitation of access corridors will occur once construction has been completed. Such rehabilitation will involve planting/natural regeneration of native species that are habitat for MNES.	
Increased Prevalence of Invasive Plants and Animals	• A Biosecurity Management Plan will be implemented for the site which includes requirements for vehicle washdowns and protocols to ensure activities are planned to minimise movement of vehicles, equipment and machinery outside of designated access corridors. • Staff and contractors will be given information on the location and consequences of biosecurity threats in the Study Area. • Access to a landholder's property will not occur unless authorised under a land use agreement. • WONS and Restrictive Invasive Species will be identified and monitored in the Study Area. Appropriate weed monitoring will occur to ensure new weed species are identified, recorded and controlled. • Weed management and control methods will depend upon the location, weed species identified, the degree of the infestation, relevant landholder agreement or conduct and compensation agreements provisions, and local, state and national regulatory requirements. • Weed loads will be mimimised in high-traffic areas such as roads, easements and yards through regular monitoring and site personnel reporting protocols, with an investigation to be managed to prevent spread of weeds in accordance with the *Biosecurity Act 2014* (Qld). • Imported material able to transport weed seed will be assessed to ensure they are free of contamination, disease and invasive weeds.	Management measures will limit the possibility of the introduction or spread of invasive plant and animal species through relevant biosecurity measures incorporated into the Biosecurity Management Plan. This is such that the indirect impact will be minimised so as not to cause an indirect residual impact to the species.

Indirect Impact	Management of Indirect Impact	Residual Impact
Increased Vehicle Impacts on Fauna and Habitat	• No driving will occur in unauthorised areas, routes and access tracks will be clearly communicated to all site visitors. All driving will be carried out at safe speeds designated for the site. • Site entry and exit points will be clearly marked to ensure vehicle movements are contained within the approved areas. • Staff and contractors will be made aware through general site induction and training of the potential to impact native flora habitat, reporting requirements and mitigation and management measures that are to be implemented during on-site works. • Weekly site inspections to review flora and fauna control measures during construction. Sightings and incidents reported in daily pre-starts during construction. All near misses and incidents will be investigated to establish root cause. Where necessary corrective actions will be developed to improve existing processes.	Implementation of management measures will ensure operating vehicles on-site during the construction, operation and decommissioning phases will not result in residual impacts to austral cornflower.
Altered Fire Regimes and Bushfire Risk	• A Bushfire Management Plan will be developed and implemented during construction and operation to mitigate the potential impact of fires to MNES habitat. • Maintenance of an asset protection zone within the Operations Footprint is required to reduce the risk of reduction of habitat due to fire. • Use of industry best practice hazard reduction measures to minimise bushfire risk and environmental impacts, such as on-site controlled burning of cleared vegetation. • Ensuring a 30 m bushfire setback from vegetation around electrical infrastructure. Maintaining safe distances between vegetation and potential fire-starting hazards will increase safety and reduce fire risk. • Weed management and control methods (in line with the requirements of the *Biosecurity Act 2014* (Qld)) will reduce the potential of invasive plants changing species composition on-site and increasing fire risk. • Reduce on-site fuel loads and maintain firebreaks and trails.	Management measures implemented in line with the site-specific Bushfire Management Plan will greatly reduce the potential risk for this species caused by planned or unplanned fires. Therefore, there is no anticipated indirect residual impact.
Altered Hydrology	• The Proposed Action will adopt best practice erosion and sediment control measures, which will implement all relevant State Codes and Guidelines. • Watercourse crossings shall be stabilised to mitigate erosion of pavement and embankment materials during rainfall events up to and including the 10% AEP storm event. • Staff and contractors will be made aware through general site induction and training of the potential to generate runoff and mitigation and management measures that should be implemented. • Construction activities must not interfere or block natural drainage e.g. disturbing channel contours.	Impacts to on-site hydrology will be managed in accordance with the CEMP. Impacts to watercourses will be addressed by stabilising to prevent erosion, and only occur in discrete work areas, such that no increase in sedimentation is overserved affecting habitat. Therefore, there is no anticipated indirect residual impact.

Indirect Impact	Management of Indirect Impact	Residual Impact
Environmental Pollution and Hazardous Materials	• All hazardous materials bought on-site will be accompanied by an MSDS, all relevant personnel will be trained in their proper use. • Only registered herbicides will be used for weed management by a suitably qualified bush regeneration contractor. • Imported materials that are able to transport hazardous substances will be assessed to ensure they are free of contamination, disease and invasive species. • Ensuring appropriate waste management (lidded bins), to reduce potential for spread of hazardous materials on-site. • Vehicles, plant and machinery will comply with site-specific speed limits to minimise dust generation. • Staff and contractors will be made aware through general site induction and training of the potential to generate dust, light and noise pollution and management measures that should be implemented. • Auditing of the CEMP will occur during construction. • Dust will be minimised through engineering controls on machinery and other available dust suppression controls, such as sprinklers. • Disturbance form blasting will be minimised through engineering controls and other available blasting suppression, such as barrier walls.	The management measures proposed will result in the reduction of the indirect impacts of environmental pollution and hazardous materials. Hazardous materials brought onto the site will be tightly regulated. Dust generation will be minimised such that is it unlikely to damage species habitat. These measures will ensure that the indirect impact is minimised so as to not cause an indirect residual impact to austral cornflower.

Indirect impacts from the Proposed Action will be mitigated and managed appropriately, such that there is no residual impact on austral cornflower. Some indirect impacts have been considered as part of the significant impact assessment for this species but are concluded unlikely to contribute to a significant impact.

6.6.14.3 SIGNIFICANT IMPACT ASSESSMENT

Potential Habitat identified as suitable for austral cornflower occurs within the Study Area in association with the BHT of *Eucalypt woodland and open forest dominated by E. crebra with a grassy understorey*. A total of 21,768.5 ha of Potential Habitat occurs within the Study Area, with 233.5 ha of this habitat expected to be permanently impacted as a result of the Proposed Action.

In the absence of an official description, Potential Habitat described above and mapped to occur within the Study Area has conservatively been considered habitat critical to the survival of austral cornflower, though the Study Area does not support an important population of the species.

A significant impact assessment based on the guidance provided in the SIG 1.1 is presented in Table 6-43. It has been concluded that the Proposed Action is **unlikely** to have a significant impact on austral cornflower. Avoidance, mitigation and management measures considered within this assessment are discussed in detail in Section 7.

TABLE 6-43 SIGNIFICANT IMPACT ASSESSMENT FOR AUSTRAL CORNFLOWER

Criteria	Description	Criteria Triggered?
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:		
Lead to a long-term decrease in the size of an important population of a species;	Due to the lack of observation of the species, it is unlikely an important population of Austral cornflower occurs within the Study Area. Additionally, mitigation measures such as pre-clearance surveys and micro-siting at areas of planned infrastructure will ensure disturbance to Potential Habitat is further avoided where possible, and any individuals of the species are also avoided should they be identified. Therefore, it is unlikely that an impact to approximately 1.1% of the total available Potential Habitat within the Study Area will lead to a long-term decrease in the size of an important population of Austral cornflower.	Unlikely
Reduce the area of occupancy of an important population;	Austral cornflower occurs in central and southern Queensland and its total area of occupancy is unknown but has contracted significantly compared to its historical range which extended to NSW and Victoria (DCCEEW, 2024a). Due to the lack of observation of the species, it is unlikely an important population of Austral cornflower occurs within the Study Area. Therefore, it is unlikely that an impact to approximately 1.1% of the total available Potential Habitat within the Study Area will reduce the area of occupancy of the species.	Unlikely
Fragment an existing important population into two or more populations;	Due to the lack of observation of the species, it is unlikely an important population of Austral cornflower occurs within the Study Area. Additionally, disturbances associated with the Proposed Action will largely occur at small, isolated turbine locations, or narrow, linear areas of projected access tracks within the Study Area. This will ensure that effects of fragmentation are minimised at all opportunities. Therefore, it is unlikely that an impact to approximately 1.1% of the total available Potential Habitat within the Study Area will fragment an existing important population into two or more populations.	Unlikely
Adversely affect habitat critical to the survival of a species;	Although the species was not identified during survey events, if a population is observed in future surveys, the surrounding habitat may be considered habitat critical to the survival of the species. However, this habitat is under pressure from historical and existing threats including historical logging and current grazing pressure, therefore reducing the habitat value of these areas for the species. Therefore, considering the historic and current pressures on this Potential Habitat, and the area of proposed impact (233.5 ha or 1.1% of the available habitat within the Study Area), it is considered unlikely that the Proposed Action will adversely affect habitat critical to the survival of this species.	Unlikely

Criteria	Description	Criteria Triggered?
Disrupt the breeding cycle of an important population;	Austral cornflower has been observed flowering in spring, late summer and autumn, but beyond this little information is available about the species reproductive cycle (DCCEEW, 2024a). A permanent disturbance to 233.5 ha (or 1.1%) of Potential Habitat within the Study Area is unlikely to disrupt the species' ability to reproduce. Additionally, no observations of the species have been made to date across the Study Area. Due to the lack of observation of the species, it is unlikely an important population of austral cornflower occurs within the Study Area. Therefore, it is unlikely that the Proposed Action would disrupt the breeding cycle of an important population of this species.	Unlikely
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline;	The Proposed Action will result in the permanent disturbance of 233.5 ha of Potential Habitat (1.1% of total habitat available). This is a relatively small area in the context of the Study Area, which supports 21,768.5 ha of austral cornflower Potential Habitat. Additionally, the species is not known to occur in the Study Area. Mitigation measures such as pre-clearance surveys and micro-siting at areas of planned infrastructure will be completed prior to any disturbance of habitat or potentially occurring individuals of the species. The Proposed Action is therefore unlikely to cause the species to decline.	Unlikely
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat;	Invasive flora are listed as a threat to the species, as are grazing fauna species (DEWHA, 2008c). The Proposed Action will adopt and follow a Biosecurity Plan, as outline in Section 7. The activities related to the Proposed Action, both during construction and operation, will implement and follow biosecurity measures to reduce the risk of introducing new invasive species and to prevent the further spread of existing invasive species.	Unlikely
Introduce disease that may cause the species to decline; or	Austral cornflower conservation advice does not list any diseases as a threat to the species (DEWHA, 2008c). There is no evidence to suggest the Proposed Action will introduce a disease that may cause the species to decline. Additionally, precautions will be taken to ensure that the spread of disease does not occur. This includes following biosecurity measures as part of a biosecurity plan (see Section 7).	Unlikely
Interfere substantially with the recovery of the species.	There are no formally adopted recovery plans for this species. However, there are *Regional* and *Local Priority Actions* identified in the *Approved Conservation Advice for Stemmacantha australis (Austral Cornflower)* (DEWHA, 2008c) which determine the following key management issues: • Habitat loss, disturbance and modification; • Conservation information; • Invasive weeds; • Trampling, browsing or grazing; and • Recovery of additional sites and/or populations.	Unlikely

Criteria	Description	Criteria Triggered?
	The Proposed Action will result in 233.5 ha (or 1.1%) of permanent disturbance to austral cornflower Potential Habitat within the Study Area. It is unlikely this impact will lead to habitat loss, disturbance or modification of austral cornflower habitat to the extent that recovery of the species is substantially interfered with. Additional priority actions will be managed so as not to interfere substantially with the recovery of the species, including control of invasive weeds through a biosecurity plan and mitigation measures such as pre-clearance surveys and micro-siting at areas of planned infrastructure to retain connectivity values and reduce impacts where possible. While the Study Area is used for agricultural purposes, it is not expected the Proposed Action will contribute to further impacts of trampling and grazing. It is therefore considered unlikely the Proposed Action will substantially interfere with the recovery of austral cornflower.	
Significant Impact: Unlikely		

6.6.15 SOLANUM DISSECTUM

6.6.15.1 DIRECT IMPACTS

Direct impacts to *Solanum dissectum* associated with the Proposed Action are considered to be limited to habitat loss from vegetation clearing. These impacts are quantified below and include impacts to:

- 2.2 ha of Potential Habitat.

It is expected that some impacted areas of *S. dissectum* habitat will be revegetated after the construction phase. Based on the species conservation advice, *S. dissectum* is likely to be a resprouting disturbance specialist, with bird dispersal a likely vector given that fruit are bright red in colour and fleshy (TSSC, 2016a). Additionally, brigalow has the ability to produce shoots from horizontal roots (suckering) in response to disturbance, resulting in there likely to be brigalow regrowth in areas not required for operation (Queensland Government, 2024). Because of this, post-construction rehabilitation is expected to restore 1.8 ha of Potential Habitat to pre-disturbance composition and function. This will result in a permanent impact to 0.3 ha of Potential Habitat for *S. dissectum*.

A summary of the direct impacts to *S. dissectum* habitat as a result of the Proposed Action is shown in Table 6-44. A total of 0.3 ha of *S. dissectum* habitat will be permanently impacted by the Proposed Action, which equates to 0.1% of the total available habitat identified within the Study Area.

TABLE 6-44 DIRECT IMPACTS TO *S. DISSECTUM* HABITAT

	Potential Habitat
Study Area (ha)	260.6
Disturbance Footprint (ha)	2.2
Percent of habitat within the Study Area to be impacted	0.8% of Potential Habitat within the Study Area
Available **Revegetation areas** within the Disturbance Footprint (ha)	1.8
Permanent impact* (Operations Footprint) (ha)	0.3 (or 0.1%)

**Permanent impact (Operations Footprint) is provided where revegetation and/or rehabilitation can return habitat for the species to function or utilise post-construction (i.e., for recolonisation, dispersal, foraging or breeding).*

6.6.15.2 INDIRECT IMPACTS

The indirect impacts to *S. dissectum* as a result of the Proposed Action are detailed in Table 6-45, along with how these impacts will be managed and any residual impact that will affect the MNES. Avoidance, mitigation and management measures are discussed in detail in Section 7.

TABLE 6-45 INDIRECT IMPACTS TO *S. DISSECTUM*

Indirect Impact	**Management of Indirect Impact**	**Residual Impact**
Habitat Fragmentation and Patch Isolation	• Areas identified as MNES habitat will be avoided as much as possible at the design and micro-siting stages. • Micro-siting of infrastructure will utilise existing clearance areas and avoid habitat fragmentation and patch isolation, with consideration of whether avoidance areas would still be connected to habitat in the broader landscape. • Prior to construction and detailed design, the incorporation of road pinch points to maximise connectivity will be considered to maintain habitat connectivity. While pinch points have a benefit for habitat they present a technical and logistical barrier to safe and effective construction. Pre-clearance surveys will determine appropriate locations for road pinch points. • Location of infrastructure will prioritise avoiding or minimising edge effects or dissecting tracts of native vegetation. • Where possible, the Proposed Action will implement the use of innovative turbine blade transportation, including methods to minimise necessary clearance widths (e.g. 'Blade Manipulator' trucks).	Habitat fragmentation and patch isolation will be managed to ensure that *S. dissectum* habitat maintains connectivity with the landscape within and surrounding the Study Area. All clearing for access corridors will be limited to 40 m. Additionally, the Proposed Action will not remove or isolate habitat patches altogether, only clearing in the areas necessary for infrastructure. Therefore, this indirect impact will be minimised so as not to cause an indirect residual impact.

Indirect Impact	Management of Indirect Impact	Residual Impact
	• Turbine placement will maximise the use of areas that are less vegetated to avoid and minimise clearing of key habitat. • All clearing for access corridors will be limited to 40 m in width during the construction phase. • Clear delineation of areas to be cleared, ensuring that the Disturbance Footprint does not extend further than planned to create unnecessary fragmentation or disturbance. Toolbox talks will relay site-specific clearing information to all field staff and contractors. • Rehabilitation of access corridors will occur once construction has been completed. Such rehabilitation will involve planting/natural regeneration of native species that are habitat for MNES.	
Increased Prevalence of Invasive Plants and Animals	• A Biosecurity Management Plan will be implemented for the site which includes requirements for vehicle washdowns and protocols to ensure activities are planned to minimise movement of vehicles, equipment and machinery outside of designated access corridors. • Staff and contractors will be given information on the location and consequences of biosecurity threats in the Study Area. • Access to a landholder's property will not occur unless authorised under a land use agreement. • WONS and Restrictive Invasive Species will be identified and monitored in the Study Area. Appropriate weed monitoring will occur to ensure new weed species are identified, recorded and controlled. • Weed management and control methods will depend upon the location, weed species identified, the degree of the infestation, relevant landholder agreement or conduct and compensation agreements provisions, and local, state and national regulatory requirements. • Weed loads will be mimimised in high-traffic areas such as roads, easements and yards through regular monitoring and site personnel reporting protocols, with an investigation to be managed to prevent spread of weeds in accordance with the *Biosecurity Act 2014* (Qld). • Imported material able to transport weed seed will be assessed to ensure they are free of contamination, disease and invasive weeds.	Management measures will limit the possibility of the introduction or spread of invasive plant and animal species through relevant biosecurity measures incorporated into the Biosecurity Management Plan. This is such that the indirect impact will be minimised so as not to cause an indirect residual impact to the species.

Indirect Impact	Management of Indirect Impact	Residual Impact
Increased Vehicle Impacts on Fauna and Habitat	• No driving will occur in unauthorised areas, routes and access tracks will be clearly communicated to all site visitors. All driving will be carried out at safe speeds designated for the site. • Site entry and exit points will be clearly marked to ensure vehicle movements are contained within the approved areas. • Staff and contractors will be made aware through general site induction and training of the potential to impact native flora habitat, reporting requirements and mitigation and management measures that are to be implemented during on-site works. • Weekly site inspections to review flora and fauna control measures during construction. Sightings and incidents reported in daily pre-starts during construction. All near misses and incidents will be investigated to establish root cause. Where necessary corrective actions will be developed to improve existing processes.	Implementation of management measures will ensure operating vehicles on-site during the construction, operation and decommissioning phases will not result in residual impacts to *S. dissectum*.
Altered Fire Regimes and Bushfire Risk	• A Bushfire Management Plan will be developed and implemented during construction and operation to mitigate the potential impact of fires to MNES habitat. • Maintenance of an asset protection zone within the Operations Footprint is required to reduce the risk of reduction of habitat due to fire. • Use of industry best practice hazard reduction measures to minimise bushfire risk and environmental impacts, such as on-site controlled burning of cleared vegetation. • Ensuring a 30 m bushfire setback from vegetation around electrical infrastructure. Maintaining safe distances between vegetation and potential fire-starting hazards will increase safety and reduce fire risk. • Weed management and control methods (in line with the requirements of the *Biosecurity Act 2014* (Qld)) will reduce the potential of invasive plants changing species composition on-site and increasing fire risk. • Reduce on-site fuel loads and maintain firebreaks and trails.	Management measures implemented in line with the site-specific Bushfire Management Plan will greatly reduce the potential risk for this species caused by planned or unplanned fires. Therefore, there is no anticipated indirect residual impact.
Altered Hydrology	• The Proposed Action will adopt best practice erosion and sediment control measures, which will implement all relevant State Codes and Guidelines. • Watercourse crossings shall be stabilised to mitigate erosion of pavement and embankment materials during rainfall events up to and including the 10% AEP storm event. • Staff and contractors will be made aware through general site induction and training of the potential to generate runoff and mitigation and management measures that should be implemented. • Construction activities must not interfere or block natural drainage e.g. disturbing channel contours.	Impacts to on-site hydrology will be managed in accordance with the CEMP. Impacts to watercourses will be addressed by stabilising to prevent erosion, and only occur in discrete work areas, such that no increase in sedimentation is overserved affecting habitat. Therefore, there is no anticipated indirect residual impact.

Indirect Impact	Management of Indirect Impact	Residual Impact
Environmental Pollution and Hazardous Materials	• All hazardous materials bought on-site will be accompanied by an MSDS, all relevant personnel will be trained in their proper use. • Only registered herbicides will be used for weed management by a suitably qualified bush regeneration contractor. • Imported materials that are able to transport hazardous substances will be assessed to ensure they are free of contamination, disease and invasive species. • Ensuring appropriate waste management (lidded bins), to reduce potential for spread of hazardous materials on-site. • Vehicles, plant and machinery will comply with site-specific speed limits to minimise dust generation. • Staff and contractors will be made aware through general site induction and training of the potential to generate dust, light and noise pollution and management measures that should be implemented. • Auditing of the CEMP will occur during construction. • Dust will be minimised through engineering controls on machinery and other available dust suppression controls, such as sprinklers. • Disturbance form blasting will be minimised through engineering controls and other available blasting suppression, such as barrier walls.	The management measures proposed will result in the reduction of the indirect impacts of environmental pollution and hazardous materials. Hazardous materials brought onto the site will be tightly regulated. Dust generation will be minimised such that is it unlikely to damage species habitat. These measures will ensure that the indirect impact is minimised so as to not cause an indirect residual impact to *S. dissectum*.

Indirect impacts from the Proposed Action will be mitigated and managed appropriately, such that there is no residual impact on *S. dissectum*. Some indirect impacts have been considered as part of the significant impact assessment for this species but are concluded unlikely to contribute to a significant impact.

6.6.15.3 SIGNIFICANT IMPACT ASSESSMENT

Potential Habitat identified as suitable for *S. dissectum* occurs within the Study Area in association with the BHT of *Brigalow woodlands*. A total of 260.6 ha of Potential Habitat occurs within the Study Area, with 0.3 ha of this habitat expected to be permanently impacted as a result of the Proposed Action.

In the absence of an official description, Potential Habitat described above and mapped to occur within the Study Area has conservatively been considered habitat critical to the survival of *S. dissectum*, though the Study area does not support an important population of the species.

A significant impact assessment based on the guidance provided in the SIG 1.1 is presented in Table 6-46. It has been concluded that the Proposed Action is **unlikely** to have a significant impact on *S. dissectum.* Avoidance, mitigation and management measures considered within this assessment are discussed in detail in Section 7.

TABLE 6-46 SIGNIFICANT IMPACT ASSESSMENT FOR *SOLANUM DISSECTUM*

Criteria	Description	Criteria Triggered?
An action is likely to have a significant impact on an endangered species if there is a real chance or possibility that it will:		
Lead to a long-term decrease in the size of a population,	The Proposed Action is expected to permanently impact 0.3 ha (or 0.1%) of *S. dissectum* Potential Habitat within the Study Area, though no known population of the species occurs in the Study Area or Locality. Impacts to 0.3 ha of Potential Habitat is not expected to constitute a substantial impact to the species, as this is a small area of habitat to be removed in relation to the larger context of the Study Area, which supports 260.6 ha of potential *S. dissectum* habitat. Therefore, the Proposed Action is unlikely to lead to a long-term decrease int eh size of a population.	Unlikely
Reduce the area of occupancy of the species,	The area of occupancy of the species is poorly understood due to the limited known occurrences of the species. Therefore, substantial impacts to species habitat have the potential to reduce the area of occupancy or fragment a population. However, impacts to 0.3 ha of potential habitat is not expected to constitute a substantial impact to the species, as this is a small area of habitat to be removed in relation to the larger context of the Study Area, which supports 260.6 ha of potential *S. dissectum* habitat. Therefore, the Proposed Action is unlikely to reduce the area of occupancy of the species.	Unlikely
Fragment an existing population into two or more populations,	The Proposed Action is expected to disturb 0.3 ha (or 0.1%) of *S. dissectum* Potential Habitat within the Study Area, though no known population of the species occurs in the Study Area or Locality. Additionally, disturbances associated with the Proposed Action will largely occur at small, isolated turbine locations, or narrow, linear areas of projected access tracks within the Study Area. This will ensure that effects of fragmentation are minimised at all opportunities. Therefore, the Proposed Action is unlikely to fragment an existing population into two or more populations.	Unlikely
Adversely affect habitat critical to the survival of a species,	Though the species was not identified during survey events and the closest recent record occurs approximately 30 km from the Study Area, if a population is observed in future surveys, the surrounding habitat may be considered habitat critical to the survival of the species. The Proposed Action's potential impact to 0.3 ha of Potential Habitat (only 0.1% of Potential Habitat within the Study Area) is unlikely to adversely affect habitat critical to the survival of this species.	Unlikely

Criteria	Description	Criteria Triggered?
Disrupt the breeding cycle of a population,	*S. dissectum* reproductive output (number of flowers, fruit and seeds) is thought to be somewhat low, with fewer than 100 seeds produced per stem during the species' fruiting period (between March and July each year) (TSSC, 2016a). However, the species is acknowledged to resprout successfully from disturbance and avifauna dispersal is a likely vector for reproduction. Considering the limited direct impact on the species' Potential Habitat (0.3 ha) and limited indirect impacts from operation, it is unlikely that the Proposed Action will disrupt the breeding cycle of *S. dissectum.* Further, mitigation measures such as a biosecurity plan (see Section 7), pre-clearance surveys and micro-siting at areas of planned infrastructure will be implemented to ensure the breeding cycle of a population is not disrupted.	Unlikely
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline,	The Proposed Action will result in the removal of 0.3 ha of Potential Habitat (0.1% of total habitat available). This accounts for a small area of habitat to be removed in relation to the larger context of the Study Area, which supports 260.6 ha of Potential Habitat. It is expected that small scale disturbance in the larger context of the landscape will not remove, isolate or decrease the quality of habitat that would result in species decline.	Unlikely
Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat	Invasive weeds such as green panic (*Megathyrsus maximus pubiglumis*) and buffel grass (*Cenchrus ciliaris*) are identified as threats to *S. dissectum* as they can outcompete the species in its preferred microhabitat. The Proposed Action activities during construction and operation will adopt and follow biosecurity measures to prevent the introduction of new invasive species or the spread of those known to the Study Area (see Section 7).	Unlikely
Introduce disease that may cause the species to decline, or	*S. dissectum* conservation advice does not list any diseases as a threat to the species (TSSC, 2016a). There is no evidence to suggest the Proposed Action will introduce a disease that may cause the species to decline. Additionally, precautions will be taken to ensure that the spread of disease does not occur. This includes following biosecurity measures as part of a biosecurity plan (see Section 7).	Unlikely
Interfere with the recovery of the species.	There are no formally adopted recovery plans for this species. However, there are *Primary Conservation Actions* and *Conservation and Management Actions* identified in the *Conservation Advice for Solanum dissectum* (TSSC, 2016a) which aim to; • Maintain and protect existing populations, and protect and enhance habitat to provide potential for reproduction of plants within existing populations • Consult with private landowners with *Solanum dissectum* on their properties and develop site-	Unlikely

Criteria	Description	Criteria Triggered?
	specific management actions and the implementation of conservation agreements; and • Manage sites to identify, control and reduce the spread of invasive species such as introduced grasses, especially buffel grass. The Proposed Action will aim to control invasive grasses through a biosecurity plan. Mitigation measures such as pre-clearance surveys and micro-siting at areas of planned infrastructure will aim to retain connectivity values and reduce impacts where possible (as well as identify and protect any specimens that may occur). It is therefore considered unlikely the Proposed Action will interfere with the recovery of the species.	
Significant Impact: Unlikely		

6.6.16 SOLANUM JOHNSONIANUM

6.6.16.1 DIRECT IMPACTS

Direct impacts to *Solanum johnsonianum* associated with the Proposed Action are considered to be limited to habitat loss from vegetation clearing. These impacts are quantified below and include impacts to:

- 2.2 ha of Potential Habitat.

It is expected that some impacted areas of *S. johnsonianum* habitat will be revegetated after the construction phase. Based on the species conservation advice, *S. johnsonianum* is thought to respond positively to some disturbance, such as wildfire and shallow mechanical disturbance, which is believed to promote growth and flowering (TSSC, 2016b). Additionally, brigalow has the ability to produce shoots from horizontal roots (suckering) in response to disturbance, resulting in there likely to be brigalow regrowth in areas not required for operation (Queensland Government, 2024). Because of this, post-construction rehabilitation is expected to restore 1.8 ha of Potential Habitat to pre-disturbance composition and function. This will result in a permanent impact to only 0.3 ha of Potential Habitat for *S. johnsonianum*.

A summary of the direct impacts to *S. johnsonianum* habitat as a result of the Proposed Action is shown in Table 6-47. A total of 0.3 ha of *S. johnsonianum* habitat will be permanently impacted by the Proposed Action, which equates to 0.1% of the total available habitat identified within the Study Area.

TABLE 6-47 DIRECT IMPACTS TO *S. JOHNSONIANUM* HABITAT

	Potential Habitat
Study Area (ha)	260.6
Disturbance Footprint (ha)	2.2
Percent of habitat within the Study Area to be impacted	0.8% of Potential Habitat within the Study Area
Available **Revegetation areas** within the Disturbance Footprint (ha)	1.8
Permanent impact* (Operations Footprint) (ha)	0.3 (or 0.1%)

**Permanent impact (Operations Footprint) is provided where revegetation and/or rehabilitation can return habitat for the species to function or utilise post-construction (i.e., for recolonisation, dispersal, foraging or breeding).*

6.6.16.2 INDIRECT IMPACTS

The indirect impacts to *S. johnsonianum* as a result of the Proposed Action are detailed in Table 6-48, along with how these impacts will be managed and any residual impact that will affect the MNES. Avoidance, mitigation and management measures are discussed in detail in Section 7.

TABLE 6-48 INDIRECT IMPACTS TO *S. JOHNSONIANUM*

Indirect Impact	**Management of Indirect Impact**	**Residual Impact**
Habitat Fragmentation and Patch Isolation	• Areas identified as MNES habitat will be avoided as much as possible at the design and micro-siting stages. • Micro-siting of infrastructure will utilise existing clearance areas and avoid habitat fragmentation and patch isolation, with consideration of whether avoidance areas would still be connected to habitat in the broader landscape. • Prior to construction and detailed design, the incorporation of road pinch points to maximise connectivity will be considered to maintain habitat connectivity. While pinch points have a benefit for habitat they present a technical and logistical barrier to safe and effective construction. Pre-clearance surveys will determine appropriate locations for road pinch points. • Location of infrastructure will prioritise avoiding or minimising edge effects or dissecting tracts of native vegetation. • Where possible, the Proposed Action will implement the use of innovative turbine blade transportation, including methods to minimise necessary clearance widths (e.g. 'Blade Manipulator' trucks). • Turbine placement will maximise the use of areas that are less vegetated to avoid and minimise clearing of key habitat. • All clearing for access corridors will be limited to 40 m in width during the construction phase.	Habitat fragmentation and patch isolation will be managed to ensure that *S. johnsonianum* habitat maintains connectivity with the landscape within and surrounding the Study Area. All clearing for access corridors will be limited to 40 m. Additionally, the Proposed Action will not remove or isolate habitat patches altogether, only clearing in the areas necessary for infrastructure. Therefore, this indirect impact will be minimised so as not to cause an indirect residual impact.

Indirect Impact	Management of Indirect Impact	Residual Impact
	• Clear delineation of areas to be cleared, ensuring that the Disturbance Footprint does not extend further than planned to create unnecessary fragmentation or disturbance. Toolbox talks will relay site-specific clearing information to all field staff and contractors. • Rehabilitation of access corridors will occur once construction has been completed. Such rehabilitation will involve planting/natural regeneration of native species that are habitat for MNES.	
Increased Prevalence of Invasive Plants and Animals	• A Biosecurity Management Plan will be implemented for the site which includes requirements for vehicle washdowns and protocols to ensure activities are planned to minimise movement of vehicles, equipment and machinery outside of designated access corridors. • Staff and contractors will be given information on the location and consequences of biosecurity threats in the Study Area. • Access to a landholder's property will not occur unless authorised under a land use agreement. • WONS and Restrictive Invasive Species will be identified and monitored in the Study Area. Appropriate weed monitoring will occur to ensure new weed species are identified, recorded and controlled. • Weed management and control methods will depend upon the location, weed species identified, the degree of the infestation, relevant landholder agreement or conduct and compensation agreements provisions, and local, state and national regulatory requirements. • Weed loads will be mimimised in high-traffic areas such as roads, easements and yards through regular monitoring and site personnel reporting protocols, with an investigation to be managed to prevent spread of weeds in accordance with the *Biosecurity Act 2014* (Qld). • Imported material able to transport weed seed will be assessed to ensure they are free of contamination, disease and invasive weeds.	Management measures will limit the possibility of the introduction or spread of invasive plant and animal species through relevant biosecurity measures incorporated into the Biosecurity Management Plan. This is such that the indirect impact will be minimised so as not to cause an indirect residual impact to the species.
Increased Vehicle Impacts on Fauna and Habitat	• No driving will occur in unauthorised areas, routes and access tracks will be clearly communicated to all site visitors. All driving will be carried out at safe speeds designated for the site. • Site entry and exit points will be clearly marked to ensure vehicle movements are contained within the approved areas. • Staff and contractors will be made aware through general site induction and training of the potential to impact native flora habitat, reporting requirements and mitigation and	Implementation of management measures will ensure operating vehicles on-site during the construction, operation and decommissioning phases will not result in residual impacts to *S. johnsonianum*.

Indirect Impact	Management of Indirect Impact	Residual Impact
	management measures that are to be implemented during on-site works. • Weekly site inspections to review flora and fauna control measures during construction. Sightings and incidents reported in daily pre-starts during construction. All near misses and incidents will be investigated to establish root cause. Where necessary corrective actions will be developed to improve existing processes.	
Altered Fire Regimes and Bushfire Risk	• A Bushfire Management Plan will be developed and implemented during construction and operation to mitigate the potential impact of fires to MNES habitat. • Maintenance of an asset protection zone within the Operations Footprint is required to reduce the risk of reduction of habitat due to fire. • Use of industry best practice hazard reduction measures to minimise bushfire risk and environmental impacts, such as on-site controlled burning of cleared vegetation. • Ensuring a 30 m bushfire setback from vegetation around electrical infrastructure. Maintaining safe distances between vegetation and potential fire-starting hazards will increase safety and reduce fire risk. • Weed management and control methods (in line with the requirements of the *Biosecurity Act 2014* (Qld)) will reduce the potential of invasive plants changing species composition on-site and increasing fire risk. • Reduce on-site fuel loads and maintain firebreaks and trails.	Management measures implemented in line with the site-specific Bushfire Management Plan will greatly reduce the potential risk for this species caused by planned or unplanned fires. Therefore, there is no anticipated indirect residual impact.
Altered Hydrology	• The Proposed Action will adopt best practice erosion and sediment control measures, which will implement all relevant State Codes and Guidelines. • Watercourse crossings shall be stabilised to mitigate erosion of pavement and embankment materials during rainfall events up to and including the 10% AEP storm event. • Staff and contractors will be made aware through general site induction and training of the potential to generate runoff and mitigation and management measures that should be implemented. • Construction activities must not interfere or block natural drainage e.g. disturbing channel contours.	Impacts to on-site hydrology will be managed in accordance with the CEMP. Impacts to watercourses will be addressed by stabilising to prevent erosion, and only occur in discrete work areas, such that no increase in sedimentation is overserved affecting habitat. Therefore, there is no anticipated indirect residual impact.
Environmental Pollution and Hazardous Materials	• All hazardous materials bought on-site will be accompanied by an MSDS, all relevant personnel will be trained in their proper use. • Only registered herbicides will be used for weed management by a suitably qualified bush regeneration contractor. • Imported materials that are able to transport hazardous substances will be assessed to ensure they are free of contamination, disease and invasive species.	The management measures proposed will result in the reduction of the indirect impacts of environmental pollution and hazardous materials. Hazardous materials brought onto the site will be tightly regulated. Dust generation will be minimised such that is it unlikely to damage species habitat. These measures

Indirect Impact	Management of Indirect Impact	Residual Impact
	• Ensuring appropriate waste management (lidded bins), to reduce potential for spread of hazardous materials on-site. • Vehicles, plant and machinery will comply with site-specific speed limits to minimise dust generation. • Staff and contractors will be made aware through general site induction and training of the potential to generate dust, light and noise pollution and management measures that should be implemented. • Auditing of the CEMP will occur during construction. • Dust will be minimised through engineering controls on machinery and other available dust suppression controls, such as sprinklers. • Disturbance form blasting will be minimised through engineering controls and other available blasting suppression, such as barrier walls.	will ensure that the indirect impact is minimised so as to not cause an indirect residual impact to *S. johnsonianum*.

Indirect impacts from the Proposed Action will be mitigated and managed appropriately, such that there is no residual impact on *S. johnsonianum*. Some indirect impacts have been considered as part of the significant impact assessment for this species but are concluded unlikely to contribute to a significant impact.

6.6.16.3 SIGNIFICANT IMPACT ASSESSMENT

Potential Habitat identified as suitable for *S. johnsonianum* occurs within the Study Area in association with the BHT of *Brigalow woodlands*. A total of 260.6 ha of Potential Habitat occurs within the Study Area, with 0.3 ha of this habitat expected to be permanently impacted as a result of the Proposed Action.

In the absence of an official description, Potential Habitat described above and mapped to occur within the Study Area has conservatively been considered habitat critical to the survival of *S. johnsonianum*, though the Study area does not support an important population of the species.

A significant impact assessment based on the guidance provided in the SIG 1.1 is presented in Table 6-49. It has been concluded that the Proposed Action is **unlikely** to have a significant impact on *S. johnsonianum.* Avoidance, mitigation and management measures considered within the assessment are discussed in detail in Section 7.

TABLE 6-49 SIGNIFICANT IMPACT ASSESSMENT FOR *SOLANUM JOHNSONIANUM*

Criteria	Description	Criteria Triggered?
An action is likely to have a significant impact on an endangered species if there is a real chance or possibility that it will:		
Lead to a long-term decrease in the size of a population,	The Proposed Action is expected to disturb 0.3 ha of Potential Habitat for *S. johnsonianum* (0.1% of total habitat available) within the Study Area, though no known population of the species occurs in the Study Area or Locality. Impacts to 0.3 ha of Potential Habitat is not expected to constitute a substantial impact to the species, as this is a small area of habitat to be removed in relation to the larger context of the Study Area, which supports 260.6 ha of Potential Habitat. Therefore, the Proposed Action is unlikely to lead to a long-term decrease in the size of a population.	Unlikely
Reduce the area of occupancy of the species,	The area of occupancy of the species is poorly understood due to the limited known occurrences of the species. Therefore, substantial impacts to species habitat have the potential to reduce the area of occupancy of the species. However, impacts to 0.3 ha of Potential Habitat is not expected to constitute a substantial impact to the species, as this is a small area of habitat to be removed in relation to the larger context of the Study Area, which supports 260.6 ha of Potential Habitat. Therefore, the Proposed Action is unlikely to reduce the area of occupancy of the species.	Unlikely
Fragment an existing population into two or more populations,	Impacts to 0.3 ha of Potential Habitat is not expected to constitute a substantial impact to the species, as this is a small area of habitat to be removed in relation to the larger context of the Study Area, which supports 260.6 ha of Potential Habitat. Additionally, disturbances associated with the Proposed Action will largely occur at small, isolated turbine locations, or narrow, linear areas of projected access tracks within the Study Area. This will ensure that effects of fragmentation are minimised at all opportunities. Therefore, the Proposed Action is unlikely to reduce the area of occupancy of the species.	Unlikely

Criteria	Description	Criteria Triggered?
Adversely affect habitat critical to the survival of a species,	Although the species was not identified during survey events and the closest recent record is approximately 30 km from the Study Area, if a population is observed in future surveys, the surrounding habitat may be considered habitat critical to the survival of the species. The Proposed Action's potential impact to 0.3 ha (or 0.1%) of Potential Habitat within the Study Area is unlikely to adversely affect habitat critical to the survival of this species.	Unlikely
Disrupt the breeding cycle of a population,	*S. johnsonianum* reproductive output (number of flowers, fruit and seeds) is thought to be somewhat low, with fewer than 100 seeds produced per stem during the species' fruiting period (between April to May each year) (TSSC, 2016b). Considering the limited direct impact to the species' Potential Habitat (0.3 ha) and limited indirect impacts from operation, it is unlikely that the Proposed Action will disrupt the breeding cycle of *S. johnsonianum.* Furthermore, mitigation measures such as a biosecurity plan (see Section 7), pre-clearance surveys and micro-siting at areas of planned infrastructure will be implemented to ensure the breeding cycle of a population is not disrupted.	Unlikely
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline,	The Proposed Action will result in the removal of 0.3 ha of potential *S. johnsonianum* habitat (0.1% of total habitat available). This accounts for a small area of habitat to be removed in relation to the larger context of the Study Area, which supports 260.6 ha of Potential Habitat. It is expected that small scale disturbance in the larger context of the landscape will not remove, isolate or decrease the quality of habitat that would result in species decline.	Unlikely
Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat	Invasive weeds such as green panic (*Megathyrsus maximus pubiglumis*) and buffel grass (*Cenchrus ciliaris*) are identified as threats to *S. johnsonianum* as they can outcompete the species in its preferred microhabitat. The Proposed Action activities during construction and operation will adopt and follow biosecurity measures to prevent introduction of new invasive species or the spread of those known to the Study Area (see Section 7).	Unlikely
Introduce disease that may cause the species to decline, or	*S. johnsonianum* conservation advice does not list any diseases as a threat to the species (TSSC, 2016b). There is no evidence to suggest the Proposed Action will introduce a disease that may cause the species to decline. Additionally, precautions will be taken to ensure that the spread of disease does not occur. This includes following biosecurity measures as part of a biosecurity plan (see Section 7).	Unlikely

Criteria	Description	Criteria Triggered?
Interfere with the recovery of the species.	There are no formally adopted recovery plans for this species. However, there are *Primary Conservation Actions* and *Conservation and Management Actions* identified in the *Conservation Advice for Solanum johnsonianum* (TSSC, 2016b) which aim to; • Maintain and protect existing populations, and protect and enhance habitat to provide potential for reproduction of plants within existing populations • Consult with private landowners with *Solanum johnsonianum* on their properties and develop site-specific management actions and the implementation of conservation agreements; and • Manage sites to identify, control and reduce the spread of invasive species such as introduced grasses. The Proposed Action will aim to control invasive grasses through a biosecurity plan. Mitigation measures such as pre-clearance surveys and micro-siting at areas of planned infrastructure will aim to retain connectivity values and reduce impacts where possible (as well as identify and protect any specimens that may occur). It is therefore considered unlikely the Proposed Action will interfere with the recovery of the species.	Unlikely
Significant Impact: Unlikely		

6.6.17 XEROTHAMNELLA HERBACEA

6.6.17.1 DIRECT IMPACTS

Direct impacts to *Xerothamnella herbacea* associated with the Proposed Action are considered to be limited to habitat loss from vegetation clearing. These impacts are quantified below and include impacts to:

- 2.2 ha of Potential Habitat.

It is expected that some impacted areas of *X. herbacea* habitat will be revegetated after the construction phase. However, no rehabilitation or revegetation in these areas is expected to restore any functionality for this species post-construction. Therefore, the direct impact to *X. herbacea* associated with construction-phase clearing is considered permanent.

A summary of the direct impacts on *X. herbacea* habitat as a result of the Proposed Action is shown in Table 6-50. A total of 2.2 ha of *X. herbacea* habitat will be permanently impacted by the Proposed Action, which equates to 0.8% of the total available habitat identified within the Study Area.

TABLE 6-50 DIRECT IMPACTS TO *X. HERBACEA* HABITAT

	Potential Habitat
Study Area (ha)	260.6
Disturbance Footprint (ha)	2.2
Percent of habitat within the Study Area to be impacted	0.8% of Potential Habitat within the Study Area
Permanent impact (Operations Footprint) (ha)	**2.2**

6.6.17.2 INDIRECT IMPACTS

The indirect impacts to *X. herbacea* as a result of the Proposed Action are detailed in Table 6-51, along with how these impacts will be managed and any residual impact that will affect the MNES. Avoidance, mitigation and management measures are discussed in detail in Section 7.

TABLE 6-51 INDIRECT IMPACTS TO *X. HERBACEA*

Indirect Impact	**Management of Indirect Impact**	**Residual Impact**
Habitat Fragmentation and Patch Isolation	• Areas identified as MNES habitat will be avoided as much as possible at the design and micro-siting stages. • Micro-siting of infrastructure will utilise existing clearance areas and avoid habitat fragmentation and patch isolation, with consideration of whether avoidance areas would still be connected to habitat in the broader landscape. • Prior to construction and detailed design, the incorporation of road pinch points to maximise connectivity will be considered to maintain habitat connectivity. While pinch points have a benefit for habitat they present a technical and logistical barrier to safe and effective construction. Pre-clearance surveys will determine appropriate locations for road pinch points. • Location of infrastructure will prioritise avoiding or minimising edge effects or dissecting tracts of native vegetation. • Where possible, the Proposed Action will implement the use of innovative turbine blade transportation, including methods to minimise necessary clearance widths (e.g. 'Blade Manipulator' trucks). • Turbine placement will maximise the use of areas that are less vegetated to avoid and minimise clearing of key habitat. • All clearing for access corridors will be limited to 40 m in width during the construction phase. • Clear delineation of areas to be cleared, ensuring that the Disturbance Footprint does not extend further than planned to create unnecessary fragmentation or disturbance.	Habitat fragmentation and patch isolation will be managed to ensure that *X. herbacea* habitat maintains connectivity with the landscape within and surrounding the Study Area. All clearing for access corridors will be limited to 40 m. Additionally, the Proposed Action will not remove or isolate habitat patches altogether, only clearing in the areas necessary for infrastructure. Therefore, this indirect impact will be minimised so as not to cause an indirect residual impact.

Indirect Impact	Management of Indirect Impact	Residual Impact
	Toolbox talks will relay site-specific clearing information to all field staff and contractors. • Rehabilitation of access corridors will occur once construction has been completed. Such rehabilitation will involve planting/natural regeneration of native species that are habitat for MNES.	
Increased Prevalence of Invasive Plants and Animals	• A Biosecurity Management Plan will be implemented for the site which includes requirements for vehicle washdowns and protocols to ensure activities are planned to minimise movement of vehicles, equipment and machinery outside of designated access corridors. • Staff and contractors will be given information on the location and consequences of biosecurity threats in the Study Area. • Access to a landholder's property will not occur unless authorised under a land use agreement. • WONS and Restrictive Invasive Species will be identified and monitored in the Study Area. Appropriate weed monitoring will occur to ensure new weed species are identified, recorded and controlled. • Weed management and control methods will depend upon the location, weed species identified, the degree of the infestation, relevant landholder agreement or conduct and compensation agreements provisions, and local, state and national regulatory requirements. • Weed loads will be mimimised in high-traffic areas such as roads, easements and yards through regular monitoring and site personnel reporting protocols, with an investigation to be managed to prevent spread of weeds in accordance with the *Biosecurity Act 2014* (Qld). • Imported material able to transport weed seed will be assessed to ensure they are free of contamination, disease and invasive weeds.	Management measures will limit the possibility of the introduction or spread of invasive plant and animal species through relevant biosecurity measures incorporated into the Biosecurity Management Plan. This is such that the indirect impact will be minimised so as not to cause an indirect residual impact to the species.
Increased Vehicle Impacts on Fauna and Habitat	• No driving will occur in unauthorised areas, routes and access tracks will be clearly communicated to all site visitors. All driving will be carried out at safe speeds designated for the site. • Site entry and exit points will be clearly marked to ensure vehicle movements are contained within the approved areas. • Staff and contractors will be made aware through general site induction and training of the potential to impact native flora habitat, reporting requirements and mitigation and management measures that are to be implemented during on-site works. • Weekly site inspections to review flora and fauna control measures during construction. Sightings and incidents reported in daily pre-	Implementation of management measures will ensure operating vehicles on-site during the construction, operation and decommissioning phases will not result in residual impacts to *X. herbacea*.

Indirect Impact	Management of Indirect Impact	Residual Impact
	starts during construction. All near misses and incidents will be investigated to establish root cause. Where necessary corrective actions will be developed to improve existing processes.	
Altered Fire Regimes and Bushfire Risk	• A Bushfire Management Plan will be developed and implemented during construction and operation to mitigate the potential impact of fires to MNES habitat. • Maintenance of an asset protection zone within the Operations Footprint is required to reduce the risk of reduction of habitat due to fire. • Use of industry best practice hazard reduction measures to minimise bushfire risk and environmental impacts, such as on-site controlled burning of cleared vegetation. • Ensuring a 30 m bushfire setback from vegetation around electrical infrastructure. Maintaining safe distances between vegetation and potential fire-starting hazards will increase safety and reduce fire risk. • Weed management and control methods (in line with the requirements of the *Biosecurity Act 2014* (Qld)) will reduce the potential of invasive plants changing species composition on-site and increasing fire risk. • Reduce on-site fuel loads and maintain firebreaks and trails.	Management measures implemented in line with the site-specific Bushfire Management Plan will greatly reduce the potential risk for this species caused by planned or unplanned fires. Therefore, there is no anticipated indirect residual impact.
Altered Hydrology	• The Proposed Action will adopt best practice erosion and sediment control measures, which will implement all relevant State Codes and Guidelines. • Watercourse crossings shall be stabilised to mitigate erosion of pavement and embankment materials during rainfall events up to and including the 10% AEP storm event. • Staff and contractors will be made aware through general site induction and training of the potential to generate runoff and mitigation and management measures that should be implemented. • Construction activities must not interfere or block natural drainage e.g. disturbing channel contours.	Impacts to on-site hydrology will be managed in accordance with the CEMP. Impacts to watercourses will be addressed by stabilising to prevent erosion, and only occur in discrete work areas, such that no increase in sedimentation is overserved affecting habitat. Therefore, there is no anticipated indirect residual impact.
Environmental Pollution and Hazardous Materials	• All hazardous materials bought on-site will be accompanied by an MSDS, all relevant personnel will be trained in their proper use. • Only registered herbicides will be used for weed management by a suitably qualified bush regeneration contractor. • Imported materials that are able to transport hazardous substances will be assessed to ensure they are free of contamination, disease and invasive species. • Ensuring appropriate waste management (lidded bins), to reduce potential for spread of hazardous materials on-site.	The management measures proposed will result in the reduction of the indirect impacts of environmental pollution and hazardous materials. Hazardous materials brought onto the site will be tightly regulated. Dust generation will be minimised such that is it unlikely to damage species habitat. These measures will ensure that the indirect impact is minimised so as to not cause an indirect residual impact to *X. herbacea*.

Indirect Impact	Management of Indirect Impact	Residual Impact
	• Vehicles, plant and machinery will comply with site-specific speed limits to minimise dust generation. • Staff and contractors will be made aware through general site induction and training of the potential to generate dust, light and noise pollution and management measures that should be implemented. • Auditing of the CEMP will occur during construction. • Dust will be minimised through engineering controls on machinery and other available dust suppression controls, such as sprinklers. • Disturbance form blasting will be minimised through engineering controls and other available blasting suppression, such as barrier walls.	

Indirect impacts from the Proposed Action will be mitigated and managed appropriately, such that there is no residual impact on *X. herbacea*. Some indirect impacts have been considered as part of the significant impact assessment for this species but are concluded unlikely to contribute to a significant impact.

6.6.17.3 SIGNIFICANT IMPACT ASSESSMENT

Potential Habitat identified as suitable for *X. herbacea* occurs within the Study Area in association with the BHT of *Brigalow woodlands*. A total of 260.6 ha of Potential Habitat occurs within the Study Area, with 2.2 ha of this habitat expected to be permanently impacted as a result of the Proposed Action.

In the absence of an official description, Potential Habitat described above and mapped to occur within the Study Area has conservatively been considered habitat critical to the survival of *X. herbacea*, though the Study area does not support an important population of the species.

A significant impact assessment based on the guidance provided in the SIG 1.1 is presented in Table 6-52. It has been concluded that the Proposed Action is **unlikely** to have a significant impact on *X. herbacea*. Avoidance, mitigation and management measures are discussed in detail in Section 7.

TABLE 6-52 SIGNIFICANT IMPACT ASSESSMENT FOR THE *XEROTHAMNELLA HERBACEA*

Criteria	Description	Criteria Triggered?
An action is likely to have a significant impact on an endangered species if there is a real chance or possibility that it will:		
Lead to a long-term decrease in the size of a population,	The Proposed Action is expected to disturb 2.2 ha of Potential Habitat for *X. herbacea* (0.8% of total habitat available) within the Study Area, though no known population of the species occurs in the Study Area or Locality.	Unlikely

Criteria	Description	Criteria Triggered?
	Impacts to 2.2 ha of Potential Habitat is not expected to constitute a substantial impact to the species, as this is a small area of habitat to be removed in relation to the larger context of the Study Area, which supports 260.6 ha of Potential Habitat. Therefore, the Proposed Action is unlikely to lead to a long-term decrease in the size of a population.	
Reduce the area of occupancy of the species,	The area of occupancy of the species is poorly understood due to the limited known occurrences of the species. Therefore, substantial impacts to species habitat have the potential to reduce the area of occupancy or fragment a population. However, impacts to 2.2 ha of Potential Habitat is not expected to constitute a substantial impact to the species, as this is a small area of habitat to be removed in relation to the larger context of the Study Area, which supports 260.6 ha of Potential Habitat. Therefore, the Proposed Action is unlikely to reduce the area of occupancy.	Unlikely
Fragment an existing population into two or more populations,	The Proposed Action is expected to disturb 2.2 ha of Potential Habitat for *X. herbacea* (0.8% of total habitat available) within the Study Area, though no known population of the species occurs in the Study Area or Locality. Additionally, disturbances associated with the Proposed Action will largely occur at small, isolated turbine locations, or narrow, linear areas of projected access tracks within the Study Area. This will ensure that effects of fragmentation are minimised at all opportunities. Therefore, the Proposed Action is unlikely to reduce the area of occupancy of the species.	Unlikely
Adversely affect habitat critical to the survival of a species,	Although the species was not identified during survey events and the closest recent record is approximately 30 km from the Study Area, if a population is observed in future surveys, the surrounding habitat may be considered habitat critical to the survival of the species. The Proposed Action's potential impact to 2.2 ha (0.8%) of Potential Habitat within the Study Area is unlikely to adversely affect habitat critical to the survival of this species, as an extensive 257.9 ha of Potential Habitat will remain.	Unlikely

Criteria	Description	Criteria Triggered?
Disrupt the breeding cycle of a population,	Little is known about the breeding cycle of *X. herbacea*. Considering the limited direct impacts to the species' Potential Habitat (2.2 ha) and limited indirect impacts from operation activities, it is unlikely the Proposed Action will disrupt the breeding cycle of *X. herbacea.* Furthermore, mitigation measures such as a biosecurity plan (see Section 7), pre-clearance surveys and micro-siting at areas of planned infrastructure will be implemented to ensure the breeding cycle of a population is not disrupted.	Unlikely
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline,	The Proposed Action will result in the removal of 2.2 ha of potential *X. herbacea* habitat (0.8% of total habitat available). This accounts for a small area of habitat to be removed in relation to the larger context of the Study Area, which supports 260.6 ha of Potential Habitat. It is expected that small scale disturbance in the larger context of the landscape will not remove/isolate or decrease the quality of habitat that would result in species decline.	Unlikely
Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat	Invasive flora such as green panic (*Megathyrsus maximus pubiglumis*) and buffel grass (*Cenchrus ciliaris*) are identified as threats to *X. herbacea* as they can outcompete the species in its microhabitat. Cattle and native macropods are also a threat to the species via trampling and grazing (DEWHA, 2008d). The Proposed Action activities during construction and operation will adopt and follow biosecurity measures to prevent introduction of new invasive species or the spread of those known to the Study Area (see Section 7).	Unlikely
Introduce disease that may cause the species to decline, or	The *X. herbacea* conservation advice does not list any diseases as a threat to the species. There is also no evidence to suggest the proposed disturbance would introduce a disease that would cause the species to decline. Additionally, precautions will be taken to ensure that the spread of disease does not occur. This includes following biosecurity measures as part of a biosecurity plan (see Section 7).	Unlikely
Interfere with the recovery of the species.	There are no formally adopted recovery plans for this species. However, there are *Regional* and *Local Priority Actions* identified by the *Approved Conservation Advice for Xerothamnella herbacea* (DEWHA, 2008d), which determine key management issues of: • Habitat loss, disturbance and modification • Conservation information • Fire • Invasive weeds • Trampling, browsing or grazing • Recovery of additional sites and/or populations The Proposed Action will result in 2.2 ha of disturbance to potential *X. herbacea* habitat (0.8%	Unlikely

Criteria	Description	Criteria Triggered?
	of all habitat within the Study Area). It is unlikely this impact will lead to habitat loss, disturbance or modification of *X. herbacea* habitat to the extent that recovery of the species is interfered with. Additional priority actions will be managed so as not to interfere substantially with the recovery of the species, including control of invasive weeds through a biosecurity plan and mitigation measures such as pre-clearance surveys and micro-siting at areas of planned infrastructure to retain connectivity values and reduce impacts where possible. It is not expected the Proposed Action will lead to an increased fire risk. While the Study Area is used for agricultural purposes, it is not expected the Proposed Action will contribute to further impacts of trampling and grazing. It is therefore considered unlikely the Proposed Action will substantially interfere with the recovery of the species.	
Significant Impact: Unlikely		

6.6.18 FORK-TAILED SWIFT

6.6.18.1 DIRECT IMPACTS

The entire Study Area has been considered Potential Foraging Habitat for the fork-tailed swift, as this species forages aerially. Initial construction-phase clearing of vegetation within the Study Area is only likely to represent a short-term disturbance to the species.

Direct impacts to fork-tailed swift associated with the Proposed Action are therefore considered to be limited to individual mortality and injury from turbine collision. A quantitative risk assessment of direct impact to fork-tailed swift associated with the operational-phase collision risk with wind turbines is presented in the BBMP (Appendix D). In summary:

- The species is listed as migratory under the EPBC Act;
- No records of the species exist within the Study Area or Locality;
- Low abundance of records exist within the broader locality in the last 20 years;
- Large global population estimate of 100,000 (DoE, 2015b);
- The species is known to form large flocks of 1,000s of individuals;
- The species is known to fly within the RSA; and
- Potential aerial foraging habitat over dry open habitats is present within the Study Area.

Based on the CRA methodology and risk matrix detailed within the BBMP (Appendix D), the fork-tailed swift has a 'moderately likely' likelihood of WTG collision due to its flight height and flock flying behaviour, and, as a migratory species, the consequence of an impact event is considered to be 'moderate'. Therefore, the species has been considered to be at a 'low' risk of being impacted by the Proposed Action Through collision with WTGs. Further detail on the CRA is provided in Section 6.11 and within the BBMP (Appendix D).

The BBMP establishes species-specific impact thresholds and associated triggers for turbine-related mortality, along with the decision-making framework and adaptive management responses required when thresholds are reached. These thresholds include an Annual Threshold and a Significant Impact Threshold, the latter comprising an intermediate trigger (Trigger 1) and a significant impact trigger (Trigger 2). Based on an Australian population estimate of 100,000 individuals (DoE, 2015b), the Trigger 2 for fork-tailed swift is 100 mortalities (0.1% of population) over a 5-year period (based on generational time). Adaptive management measures and corrective actions will be implemented proactively to avoid progression toward a Trigger 2 (a significant impact), including actions triggered by exceeding the Annual Threshold and/or Significant Impact Threshold Trigger 1. However, if a significant impact (Trigger 2) is reached for any bird or bat species, the Proponent must cease operation of the WTGs identified as contributing to the MNES mortality during ecologically relevant periods. WTGs must not recommence operation until approval is given from DCCEEW.

6.6.18.2 INDIRECT IMPACTS

The indirect impacts to fork-tailed swift as a result of the Proposed Action are detailed in Table 6-53, along with how these impacts will be managed and any residual impact that will affect the MNES. Avoidance, mitigation and management measures are discussed in detail in Section 7.

TABLE 6-53 INDIRECT IMPACTS TO FORK-TAILED SWIFT

Indirect Impact	Management of Indirect Impact	Residual Impact
Habitat Loss and Individual Mortality from Vegetation Clearing	Initial construction-phase clearing of vegetation within the Study Area is only likely to represent a short-term disturbance to the species, therefore there is no anticipated overall habitat loss. The following points refer to the potential indirect impact of individual mortality during vegetation clearing associated with the Proposed Action. • Areas identified as MNES habitat will be avoided as much as possible at the design and micro-siting stages. • Clear delineation of areas to be cleared, ensuring that the Disturbance Footprint does not extend further than planned to create unnecessary fragmentation or disturbance. • Pre-clearance surveys and fauna spotter catchers will be utilised. Microhabitat features (e.g. hollow bearing trees) will be avoided where sufficient flexibility is enabled by State and Federal approvals. • Staff and contractors will be made aware through general site induction and training of the potential to impact native fauna, reporting requirements and mitigation and management measures that are to be implemented during on-site works. • Vehicles, plant and machinery will comply with site-specific speed limits to minimise the likelihood of collision with fauna. • Where trenching and excavations are created which may entrap fauna, suitable escape	The management measures to mitigate direct fatality or injury during construction and operation will result in the successful avoidance of impact to the species. Fork-tailed swift are anticipated as a flyover visitor only, as no roosting habitat was identified and this species forages aerially.

Indirect Impact	Management of Indirect Impact	Residual Impact
	measures will be put in place, and excavations checked for fauna before backfilling. • Weekly site inspections to review flora and fauna control measures during construction. Sightings and incidents reported in daily pre-starts during construction. All near misses and incidents will be investigated to establish root cause. Where necessary corrective actions will be developed to improve existing processes.	
Habitat Fragmentation and Patch Isolation	• Areas identified as MNES habitat will be avoided as much as possible at the design and micro-siting stages. • Micro-siting of infrastructure will utilise existing clearance areas and avoid habitat fragmentation and patch isolation, with consideration of whether avoidance areas would still be connected to habitat in the broader landscape. • Prior to construction and detailed design, the incorporation of road pinch points to maximise connectivity will be considered to maintain habitat connectivity. While pinch points have a benefit for habitat, they present a technical and logistical barrier to safe and effective construction. Pre-clearance surveys will determine appropriate locations for road pinch points. • Location of infrastructure will prioritise avoiding or minimising edge effects or dissecting tracts of native vegetation. • Where possible, the Proposed Action will implement the use of innovative turbine blade transportation, including methods to minimise necessary clearance widths (e.g. 'Blade Manipulator' trucks). • Turbine placement will maximise the use of areas that are less vegetated to avoid and minimise clearing of key habitat. • All clearing for access corridors will be limited to 40 m in width during the construction phase. • Clear delineation of areas to be cleared, ensuring that the Disturbance Footprint does not extend further than planned to create unnecessary fragmentation or disturbance. Toolbox talks will relay site-specific clearing information to all field staff and contractors. • Rehabilitation of access corridors will occur once construction has been completed. Such rehabilitation will involve planting/natural regeneration of native species that are habitat for MNES.	Habitat fragmentation and patch isolation will be managed to ensure that fork-tailed swift are able to move and disperse throughout the entirety of identified habitat, maintaining connectivity with the landscape within and surrounding the Study Area. Fork-tailed swift are anticipated as a flyover visitor only, as no roosting habitat was identified and this species forages aerially. The entire Study Area has been considered Potential Foraging Habitat for the fork-tailed swift. Therefore, this indirect impact will be minimised so as not to cause an indirect residual impact.

Indirect Impact	Management of Indirect Impact	Residual Impact
Increased Prevalence of Invasive Plants and Animals	• A Biosecurity Management Plan will be implemented for the site which includes requirements for vehicle washdowns and protocols to ensure activities are planned to minimise movement of vehicles, equipment and machinery outside of designated access corridors. • Staff and contractors will be given information on the location and consequences of biosecurity threats in the Study Area. • Access to a landholder's property will not occur unless authorised under a land use agreement. • WONS and Restrictive Invasive Species will be identified and monitored in the Study Area. Appropriate weed monitoring will occur to ensure new weed species are identified, recorded and controlled. • Weed management and control methods will depend upon the location, weed species identified, the degree of the infestation, relevant landholder agreement or conduct and compensation agreements provisions, and local, state and national regulatory requirements. • Weed loads will be mimimised in high-traffic areas such as roads, easements and yards through regular monitoring and site personnel reporting protocols, with an investigation to be managed to prevent spread of weeds in accordance with the *Biosecurity Act 2014* (Qld). • Imported material able to transport weed seed will be assessed to ensure they are free of contamination, disease and invasive weeds.	Management measures will limit the possibility of the introduction or spread of invasive plant and animal species through relevant biosecurity measures incorporated into the Biosecurity Management Plan. This is such that the indirect impact will be minimised so as not to cause an indirect residual impact to the species.
Increased Vehicle Impacts on Fauna and Habitat	• No driving will occur in unauthorised areas, routes and access tracks will be clearly communicated to all site visitors. All driving will be carried out at safe speeds designated for the site. • Site entry and exit points will be clearly marked to ensure vehicle movements are contained within the approved areas. • Staff and contractors will be made aware through general site induction and training of the potential to impact native fauna, reporting requirements and mitigation and management measures that are to be implemented during on-site works. • Injured, sick or dead fauna will be recorded and reported, during and after the construction and operation phases. This can be carried out by a fauna spotter-catcher during periods where disturbance is expected to occur (primarily construction activities). Where injured or sick fauna is detected, individuals will be taken to the nearest wildlife carer or veterinarian if practical.	Fork-tailed swift are anticipated as a flyover visitor only, as no roosting habitat was identified and this species forages aerially. Therefore, this indirect impact is not expected to lead to an indirect residual impact.

Indirect Impact	Management of Indirect Impact	Residual Impact
Altered Fire Regimes and Bushfire Risk	• A Bushfire Management Plan will be developed and implemented during construction and operation to mitigate the potential impact of fires to MNES habitat. • Maintenance of an asset protection zone within the Operations Footprint is required to reduce the risk of reduction of habitat due to fire. • Use of industry best practice hazard reduction measures to minimise bushfire risk and environmental impacts, such as on-site controlled burning of cleared vegetation. • Ensuring a 30 m bushfire setback from vegetation around electrical infrastructure. Maintaining safe distances between vegetation and potential fire-starting hazards will increase safety and reduce fire risk. • Weed management and control methods (in line with the requirements of the *Biosecurity Act 2014* (Qld)) will reduce the potential of invasive plants changing species composition on-site and increasing fire risk. • Reduce on-site fuel loads and maintain firebreaks and trails.	Fork-tailed swift are anticipated as a flyover visitor only, as no roosting habitat was identified and this species forages aerially. Therefore, this indirect impact is not expected to lead to an indirect residual impact.
Altered Hydrology	• The Proposed Action will adopt best practice erosion and sediment control measures, which will implement all relevant State Codes and Guidelines. • Watercourse crossings shall be stabilised to mitigate erosion of pavement and embankment materials during rainfall events up to and including the 10% AEP storm event. • Staff and contractors will be made aware through general site induction and training of the potential to generate runoff and mitigation and management measures that should be implemented. • Construction activities must not interfere or block natural drainage e.g. disturbing channel contours. • Water barrier works will be designed to minimise impact on fish habitats, stock or movements through compliance with relevant design codes. During the detailed design phase, fish passage elements will be considered in all mapped waterways for fish passage, including compliance with the accepted development requirements for waterway barrier works or an operational works permit under the Planning Act.	Fork-tailed swift are anticipated as a flyover visitor only, as no roosting habitat was identified and this species forages aerially. Therefore, this indirect impact is not expected to lead to an indirect residual impact.

Indirect Impact	Management of Indirect Impact	Residual Impact
Environmental Pollution and Hazardous Materials	• All hazardous materials bought on-site will be accompanied by an MSDS, all relevant personnel will be trained in their proper use. • Only registered herbicides will be used for weed management by a suitably qualified bush regeneration contractor. • Imported materials that are able to transport hazardous substances will be assessed to ensure they are free of contamination, disease and invasive species. • Ensuring appropriate waste management (lidded bins), to reduce potential for spread of hazardous materials on-site. • Vehicles, plant and machinery will comply with site-specific speed limits to minimise noise and dust generation. • Staff and contractors will be made aware through general site induction and training of the potential to generate dust, light and noise pollution and management measures that should be implemented. • Auditing of the CEMP will occur during construction. • Dust will be minimised through engineering controls on machinery and other available dust suppression controls, such as sprinklers. • Light pollution will be minimised through engineering controls on infrastructure and machinery, such as colour selection and timing controls. • Noise will be minimised through engineering controls on infrastructure and machinery, such as noise barriers and timing controls. • Disturbance form blasting will be minimised through engineering controls and other available blasting suppression, such as barrier walls. • Electricity infrastructure designed to allow for safe operations, using buffers between conductors and the ground, and conductors and adjacent vegetation. The transmission line has adopted a design which allows for reduced interference to canopy dwelling species due to minimising impacts to canopy vegetation.	The management measures proposed will result in the reduction of the indirect impacts of environmental pollution and hazardous materials. Hazardous materials brought onto the site will be tightly regulated. Dust, light and noise generation will be minimised such that is it unlikely to adversely affect species or damage species habitat. These measures will ensure that the indirect impact is minimised to not cause an indirect residual impact to fork-tailed swift.
Individual Mortality and Injury from Turbine Collision and Barotrauma	• WTGs will be located away from key bird and bat habitats (such as waterways and drainage lines). • Powerlines will be located so as to avoid fauna obstruction/entanglement and minimise potential perching resources within 200 m of high-risk turbines (identified within the BBMP (Appendix D)). • Turbine selection will incorporate innovative blade design features to minimise potential collision rates. WTG design will include acoustic and visual deterrents (e.g. ultrasound acoustic devices) and detection systems (e.g. IdentiFlight®, Robin Radar Systems) for high-risk turbines (identified within the BBMP (Appendix D)).	Mitigation and management measures outlined for the Proposed Action's WTGs will ensure that the potential impacts are minimised so as to not cause an indirect residual impact to fork-tailed swift. Fork-tailed swift has not been observed within the Study Area, and no suitable roosting habitat has been identified. It is noted that the results of future bird surveys and any evidence of threatened or migratory species in the Study Area, will be incorporated into future risk assessments and CRM

Indirect Impact	Management of Indirect Impact	Residual Impact
	• Development and implementation of a BBMP that considers the impacts that may occur to birds and mitigation measures to address potential impacts to migratory species considered 'potential' to occur within the Study Area. • Sightings and incidents reported in daily pre-starts during construction. • Carry out scientifically robust monitoring program for the detection/quantification of impacts on protected matters, including as a result of turbine strike and barotrauma. The monitoring program must be able to accurately and in a timely manner detect when impact triggers are reached. • All near misses and incidents will be investigated to establish root cause. Where necessary corrective actions will be developed to improve existing processes. • Injured, sick or dead fauna will be recorded and reported, during and after the construction and operation phases.	within the BBMP. Therefore, the principle of adaptive management will be applied to ensure that any future risks identified are adequately reported, analysed and subsequently managed per the framework in the BBMP. The amount of direct impact to fork-tailed swift associated with the operational-phase collision risk with wind turbines is further discussed in Section 6.11.
Site Alienation	• Locating turbines and access corridors away from key habitats where feasible (including remnant vegetation, waterways and drainage lines) reducing disturbance during all phases of the Proposed Action. • Mitigating habitat fragmentation and maintaining connectivity through the measures outlined above. • Development and implementation of a (BBMP that considers the impacts that may occur to birds and mitigation measures to address potential impacts to migratory species considered 'potential' to occur within the Study Area. • Development and implementation of management plans (VFMP, CEMP) outlined above to reduce the potential impact of construction and operation phase activities including introducing invasive species, fire and altered hydrology. • Implementing engineering controls on infrastructure and machinery outlined above, such that dust, light and noise pollution and blasting does not adversely affect species or species habitat.	The potential risk of site alienation will be managed to ensure that species are able to move, disperse and utilise habitat throughout the Study Area for the life of the Proposed Action. Avoidance, mitigation and management measures outlined in this PER and the BBMP will ensure that the potential for site alienation is minimised to not cause an indirect residual impact to fork-tailed swift.

Indirect impacts from the Proposed Action will be mitigated and managed appropriately, such that there is no residual impact on fork-tailed swift. Some indirect impacts have been considered as part of the significant impact assessment for this species but are concluded unlikely to contribute to a significant impact.

6.6.18.3 SIGNIFICANT IMPACT ASSESSMENT

A significant impact assessment based on the guidance provided in the SIG 1.1 is presented in in Table 6-54. It has been concluded that the Proposed Action is **unlikely** to have a significant impact on the fork-tailed swift. Considering the species nature as an aerial species in Australia,

and proclivity to fly at RSA heights and above, there is a risk of turbine collision as a result of the Proposed Action. Therefore, should the species be observed in the Study Area, adaptive management measures will be undertaken to further prevent any impact on this species. Avoidance, mitigation and management measures considered within this assessment are discussed in detail in Section 7.

TABLE 6-54 SIGNIFICANT IMPACT ASSESSMENT FOR THE FORK-TAILED SWIFT

Criteria	Description	Criteria Triggered?
An action is likely to have a significant impact on a migratory species if there is a real chance or possibility that it will:		
Substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species;	The whole Study Area is considered important habitat for this species but impacts to this habitat will not change its utility for the fork-tailed swift. This is because the species is an aerial forager, and its prey, insects, will not be dissuaded from the Project Area due to the Proposed Actions activities. Additionally, there is no significant impact threshold set out in DoE (2015b) for impacts to important habitat for this species, due to its aerial nature.	Unlikely
Result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species; or	DoE (2015b) does not identify any invasive species as harmful to the Fork-tailed swift. This said, a biosecurity plan will be implemented for the Proposed Action, as well as other biosecurity measures (see Section 7). With such measures, it is unlikely that harmful invasive species become established in the Study Area.	Unlikely
Seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species.	The fork-tailed swift does not breed in Australia, nor is it considered to roost. Therefore, any occurrence of the species in the Study Area is likely to be a strict, flyover, aerial visitor which would not be impacted by the Proposed Action, apart from potential collision risks which will be adaptively managed as outlined in the BBMP. An ecologically significant proportion of fork-tailed swift is 100 individuals (for nationally significant) or 1,000 (for internationally significant) (DoE, 2015b). Considering the lack of observation, and the strict aerial nature of this species, the Study Area is unlikely to be a host to an ecologically significant proportion of this species. The Proposed Action is therefore unlikely to seriously disrupt the lifecycle of an ecologically significant proportion of the fork-tailed swift population.	Unlikely
Significant Impact: Unlikely		

6.7 CUMULATIVE IMPACTS

The above Sections have largely focused on impacts resulting solely from the Proposed Action. The potential impacts of the Proposed Action, when assessed in conjunction with other similar developments in the same region, may contribute to cumulative impacts.

As outlined by an article on the renewable energy transition published by the CSIRO:

> *Cumulative impacts occur when multiple activities are conducted simultaneously, or consecutively, within the same region resulting in a greater level of potential impact to the environment than what would occur from the individual activity alone* (Miller, 2023).

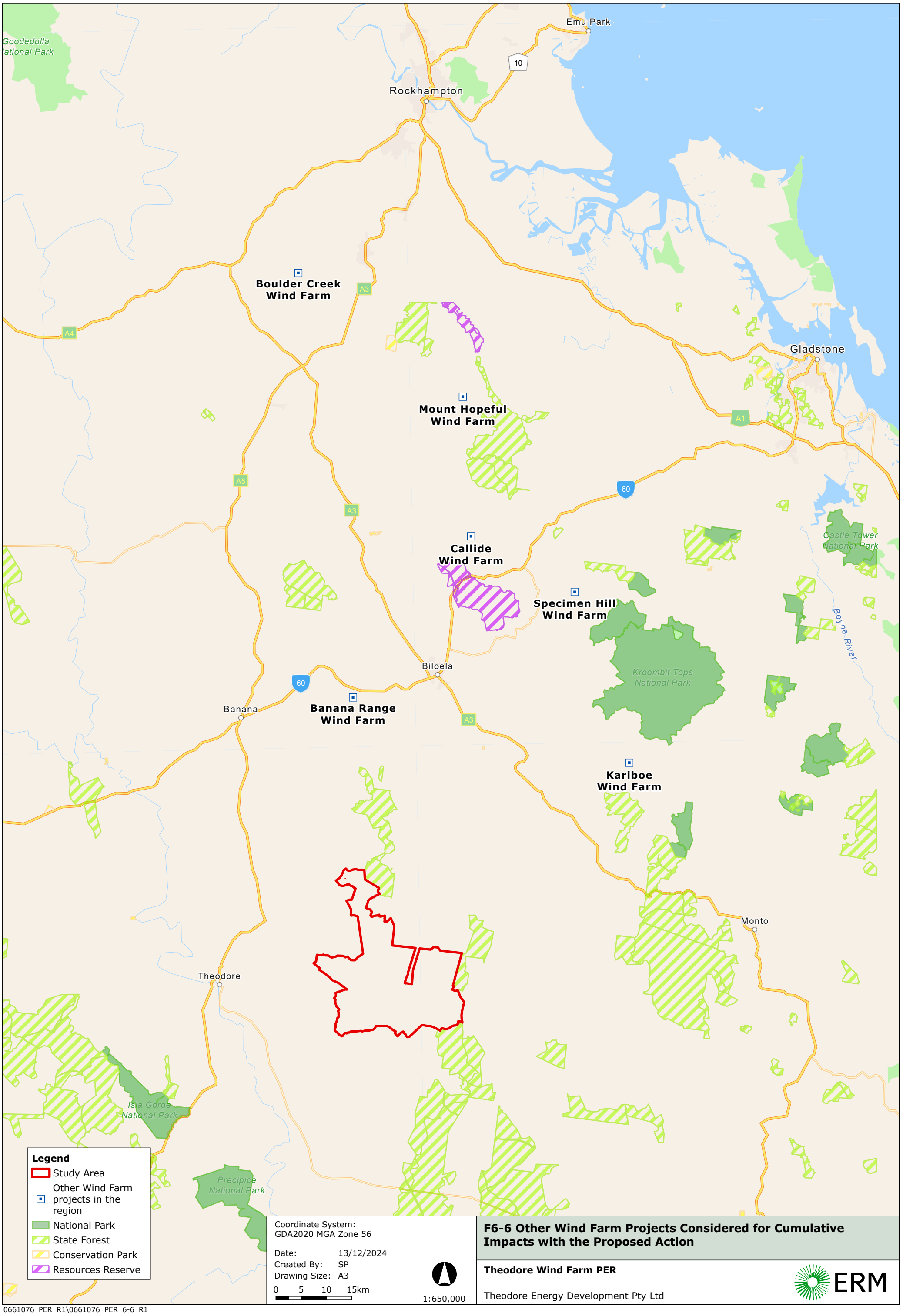
This Section aims to identify the potential cumulative impacts on MNES as a result of the Proposed Action in combination with other similar referred projects and developments (either approved or currently under assessment) in the immediate vicinity and broader region.

6.7.1 OTHER ACTIVITIES IN THE REGION

Table 6-55 summarises other wind farm projects in the vicinity of the Proposed Action that were referred to DCCEEW for assessment. The MNES assessed for these projects (that were also assessed in this PER), including the potential project impacts and mitigation measures proposed in referral information or imposed by the department, are discussed in Table 6-56. The location of these projects, in relation to the Proposed Action, is shown in Figure 6-6.

TABLE 6-55 OTHER PROJECTS AND DEVELOPMENTS IN THE REGION

EPBC Number	Project (Proponent)	Description / Location	Project Status
2019/8503	Banana Range Wind Farm	• Approved renewable energy project with up to 51 wind turbines and associated infrastructure generating 230 MW roughly 20 km west of Biloela.	Approved - not a controlled action
2022/09428	Kariboe Wind Farm Project (Kariboe Wind Farm Pty Ltd/BayWa r.e)	• Proposed wind farm site roughly 40 km southeast of Biloela. • Up to 170 turbines with a generating capacity of up to 1 GW. • Total Project Area 19,423.23 ha • Disturbance Footprint 1,254 ha (6% of Project Area).	Under Assessment - Public Environment Report (Attexo, 2022)
2020/8772	Boulder Creek Wind Farm (Boulder Creek Wind farm Pty Ltd/Ark Energy)	• Wind farm site in Westwood, Queensland (40 km south-west of Rockhampton). • 38 turbines with a nameplate capacity of 228 MW.	Approved with conditions
2021/9137	Mount Hopeful Wind Farm (Neoen Australia Pty Ltd)	• Located near the towns of Mount Morgan and Bajool, roughly 50km south of Rockhampton. • Final project capacity expected to be around 350 MW (around 60 wind turbines).	Approved with conditions
2021/9057	Callide Wind Farm (DP Green Energy Pty Limited)	• Proposed wind farm located in the Calliope Range approximately 75 km west south-west of Gladstone. • Up to 70 wind turbines with a generating capacity of up to 430MW.	Under Assessment - Preliminary Documentation (NGH, 2024)
2020/8864	Specimen Hill Wind Farm (Specimen Hill Wind Farm Pty Ltd/Ark Energy)	• Wind farm site in Dumgree, between Kroombit Tops and the Dawson Highway, roughly 25km north-east of Biloela. • 56 wind turbines with an output of approx. 336 MW.	Approved with conditions



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TABLE 6-56 IMPACTS OF PROJECTS INCLUDED IN CUMULATIVE IMPACT ASSESSMENT

EPBC Number	Project	MNES assessed for impacts (shared with the Proposed Action)	Potential impacts of the project	Significant residual impacts and MNES management measures
2022/09428	Kariboe Wind Farm Project	• Greater glider (southern and central) • Yellow-bellied glider (south-eastern) • Koala • Squatter pigeon (southern) • Black-breasted buttonquail • White-throated needletail • Fork-tailed swift	Potential impacts from the Kariboe Wind Farm Project outlined in the MNES assessment report (Attexo, 2022) include: • Clearing of up to 257.9 ha of potential greater glider habitat • Clearing of up to 2.04 ha of potential critical habitat for the yellow-bellied glider • Clearing of up to 259.6 ha of potential koala habitat • Clearing of up to 261.2 ha of potential dispersal habitat for the squatter pigeon • Removal of up to 1.9 ha of habitat critical to the survival of black-breasted buttonquail • Clearing of up to 1.9 ha of potential roosting habitat for the white-throated needletail • Low turbine collision risk for white-throated needletail and fork-tailed swift, triggers for adaptive management to be implemented.	MNES assessment report states significant residual impacts may occur to the greater glider as a result of the Project. Therefore, offsets will be proposed for this species. MNES assessment report states "*a certified BBMP will be prepared prior to the operation of the wind turbines. The BBMP will outline a monitoring program, identify if any threatened species are significantly impacted and define a strategy that manages and mitigates any significant impacts on these species*" (Attexo, 2022).

2020/8772	Boulder Creek Wind Farm	• Koala
		• Greater glider
		• White-throated needletail
			From the project conditions of approval, dated 30 June 2022:
			• The approval holder must not clear more than 541.9 ha within the project area, including no more than:
			  ◦ 530.8 ha of koala habitat
			  ◦ 54.7 ha of greater glider habitat
			• The approval conditions also include provision of a BBMP with specific triggers relating to impacts from turbine collision on white-throated needletail that, if reached or exceeded, prompt management measures including ceasing operation of all contributing turbines.
				The approval holder must submit an Offset Strategy, which must identify suitable offset sites for the impacts on koala habitat. To manage impacts on MNES species and their habitat, the approval holder must submit a MNES Management Plan.
				
				The approval holder must also submit a BBMP. The outcome of implementing the BBMP must be to avoid causing a significant impact from turbine collision and barotrauma on EPBC Act listed bird and bat species, including white-throated needletail.

EPBC Number	Project	MNES assessed for impacts (shared with the Proposed Action)	Potential impacts of the project	Significant residual impacts and MNES management measures

2021/9137	Mount Hopeful Wind Farm	• Greater glider
		• Yellow-bellied glider
		• Koala
		• White-throated needletail
			From the project conditions of approval, dated 19 April 2022:
			• the approval holder must not clear more than:
			  ◦ 244.7 ha of greater glider current denning habitat
			  ◦ 175.8 ha of greater glider potential denning habitat
			  ◦ 207.4 ha of greater glider foraging habitat
			  ◦ 163.3 ha of yellow-bellied glider denning habitat
			  ◦ 158.7 ha of yellow-bellied glider foraging habitat
			  ◦ 641.6 ha of koala dispersal habitat
			  ◦ 5.3 ha of koala climate change refugia habitat
			• The approval conditions also include provision of a BBMP with specific triggers relating to impacts from turbine collision on white-throated needletail that, if reached or exceeded, prompt management measures including ceasing operation of all contributing turbines.
				The approval holder must submit to the department an Offset Area Management Plan (OAMP), proposing environmental offsets for impacts to greater glider current/potential denning habitat and foraging habitat, yellow-bellied glider denning and foraging habitat, and koala dispersal and refugia habitat.
				
				The approval holder must also submit a BBMP. The BBMP must demonstrate how implementation of the BBMP will avoid and mitigate harm to EPBC Act listed bird and bat species during commissioning and operation, including white-throated needletail.

2021/9057	Callide Wind Farm	• Brigalow TEC • Greater glider (southern and central) • Yellow-bellied glider (south-eastern) • Koala • Squatter pigeon (southern)	Potential MNES impacts of the Callide Wind Farm outlined in the Preliminary Documentation (NGH, 2024) include impacts to: • 899.5 ha of potential koala habitat • 400.3 ha of greater glider current (likely) denning, future (potential) denning, and foraging and dispersal, with a further 95.3 ha potentially indirectly impacted through fragmentation	Preliminary Documentation concluded that there is likely to be significant residual impacts to koala, greater glider, and squatter pigeon which will be compensated for through a land-based offset. A Collision Risk Assessment (developed to address an RFI from the department) determined a high risk of collision with operating turbines for white-throated needletail, and a low risk for fork-tailed swift. Risk of indirect

EPBC Number	Project	MNES assessed for impacts (shared with the Proposed Action)	Potential impacts of the project	Significant residual impacts and MNES management measures
		• Australian painted snipe • Cossinia • White-throated needletail • Fork-tailed swift	• 21.06 ha of potential squatter pigeon breeding habitat and 21.8 ha of potential foraging habitat • High risk of impact risk due to potential turbine collision for white-throated needletail • Low risk of impact risk due to potential turbine collision for fork-tailed swift	disturbance including barrier effects was determined to be very low for both species. A Draft BBMP was submitted to DCCEEW with the PD to support assessment of the project by Preliminary Documentation. Environmental outcomes of the BBMP include to "*minimise the impacts from the Callide Wind Farm on threatened and migratory bird and bat species listed under the Commonwealth EPBC Act*" (NGH, 2024).

2020/8864	Specimen Hill Wind Farm	• Greater glider
		• Koala
		• Squatter pigeon
		• White-throated needletail
			From the project conditions of approval, dated 19 April 2022:
			• The approval holder must not clear more than 844.35 ha within the project footprint, including no more than:
			  ◦ 796.76 ha of koala habitat
			  ◦ 339.78 ha of greater glider habitat (208.41 ha greater glider denning habitat and 131.37 ha greater glider foraging habitat)
			  ◦ 101.28 ha squatter pigeon habitat (89.45 ha of squatter pigeon breeding habitat and 11.83 ha of squatter pigeon foraging habitat.
			• The approval conditions also include provision of a BBMP with specific triggers relating to impacts from turbine collision on white-throated needletail that, if reached or exceeded, prompt management measures including ceasing operation of all contributing turbines.
				The approval holder must submit to the department an Offset Area Management Plan, proposing environmental offsets for impacts to greater glider habitat, koala habitat, and squatter pigeon breeding habitat to the satisfaction of the Minister. To manage impacts on MNES species and their habitat, the approval holder must submit a MNES Management Plan.
				
				The approval holder must also submit a BBMP prior to commencement of the action. The environmental outcome of implementing the BBMP must be to minimise the impacts from construction and operation of the action on EPBC Act listed bird and bat species, including white-throated needletail.

6.7.2 ASSESSMENT OF POTENTIAL CUMULATIVE IMPACTS

Table 6-57 presents an assessment of the potential cumulative impacts of the Proposed Action and other wind farm projects in the region discussed above, specifically referencing impacts outlined in the Theodore Wind Farm (EPBC 2024/09842) PER guidelines provided by DCCEEW.

TABLE 6-57 POTENTIAL CUMULATIVE IMPACTS

Impact	Cumulative impacts of the Proposed Action and projects/developments in the region/vicinity	Mitigation measures to be implemented by the Proposed Action
Habitat loss	Based on information presented in referral documents and approval conditions for the above projects, the MNES relevant to the Proposed Action that are likely to be affected by accumulated impacts through habitat loss are: • Greater glider (southern and central) • Yellow-bellied glider (south-eastern) • Koala • Squatter pigeon (southern) • Black-breasted buttonquail The total amount of habitat predicted/allowed to be impacted is outlined above in Table 6-56 for each project. It should be noted that in each of the projects outlined above, mitigation measures proposed/imposed include compensating for impacted MNES habitat through managed offsets.	Various mitigation measures will be implemented for the Proposed Action to manage the potential impacts of habitat loss. This will begin at the design phase, where key habitat areas will be avoided when locating infrastructure wherever possible. During construction phase clearing, mitigation measures such as pre-clearance surveys and micro-siting at areas of planned infrastructure will ensure that impacts to essential microhabitat features (e.g., hollow-bearing trees) are further avoided wherever possible. All residual loss of MNES habitat considered to be significantly impacted by the Proposed Action will be compensated through suitable offsets (subject to approval by the department), as outlined in Section 9 of the PER. These offsets will be managed for the life of the Proposed Action through the Offset Management Plan (OMP, see Appendix F).
Habitat fragmentation	The majority of impacted habitat discussed in Table 6-56 refers to habitat cleared for infrastructure, with the exception of the Callide Wind Farm which indicates 95.3 ha will be potentially indirectly impacted through fragmentation. The linear nature of wind farm development typically means large patches of habitat are not entirely removed, instead clearing occurs in small, isolated patches that do not significantly impact the dispersal ability of most species. These impacts are usually further reduced through revegetation and rehabilitation of the Disturbance Footprint post-construction. Where potential residual impacts of fragmentation are identified, mitigation measures are	Management of potential fragmentation caused by the Proposed Action will ensure that areas of TEC largely remain intact throughout the Study Area. Brigalow TEC observed within the Study Area is in a highly fragmented state at present, and the Proposed Action is not anticipated to exacerbate this. Poplar Box TEC will be retained as much as possible throughout the Study Area, avoiding any whole destruction to an area of TEC and ensuring that any natural expansion of the TEC through natural ecological function is retained. The Proposed Action's potential indirect impact of habitat fragmentation will be minimised so as not to cause a residual impact to any MNES species. Habitat fragmentation will be managed to ensure that all MNES species are able

Impact	Cumulative impacts of the Proposed Action and projects/developments in the region/vicinity	Mitigation measures to be implemented by the Proposed Action
	suggested or imposed to reduce the impact on MNES. For example, the fragmentation of glider habitat has been addressed in the above projects by either narrowing the Disturbance Footprint in certain areas and retaining trees on either side of a clearing (as in the Callide Wind Farm Preliminary Documentation), or provision of glide poles where clearing exceeds a pre-determined distance (as in the Kariboe Wind Farm Project MNES assessment report and approval conditions for the Boulder Creek Wind Farm and Specimen Hill Wind Farm). Measures such as these ensure habitat within the project areas remains connected, and by extension species are still able to disperse throughout the broader landscape.	to move and disperse throughout the entirety of identified habitat, maintaining connectivity with the landscape within and surrounding the Study Area.
Bird and bat turbine strike, including the potential barrier effect of multiple wind farms	Bennun, et al., 2021 indicates migratory bird species and those with extensive foraging ranges may be more at risk of the cumulative impacts of wind farm projects, as they are more likely to encounter a higher number of turbines during their movements. Barrier effects of wind farm projects are also predicted to be more prevalent when considering the cumulative effects of multiple adjacent wind farm sites. Based on information presented in referral documents and approval conditions for the above projects, the MNES relevant to the Proposed Action that are more likely to be affected by the accumulated impacts of multiple wind farm operations are: • White-throated needletail • Fork-tailed swift These species have not been observed within the Study Area, and no suitable roosting habitat has been identified, however both are considered as having the potential to occur. The location of the Theodore Wind Farm site is more isolated in nature compared to other similar projects in the region. It is considered likely that the potential barrier effect of multiple wind farms created between the Proposed Action and other projects in the region is diminished due to this spatial separation.	Various mitigation measures will be implemented for the Proposed Action to manage the potential direct and indirect impacts of turbine operation. These include locating infrastructure to avoid key habitat areas and minimise perching resources close to high risk turbines, innovative turbine design for high risk turbines, including acoustic and visual deterrents, and activity scheduling to avoid ecologically sensitive periods. High-risk turbines have been identified within the BBMP (Appendix D). These measures will ensure that the potential impacts of WTG operation are minimised so as to not cause any indirect residual impact to white-throated needletail and forked-tailed swift. The BBMP submitted with this PER outlines continued monitoring of site utilisation, carcass searches to determine the actual impact of the Proposed Action on birds and bats, and Adaptive Management framework that will have the ability to be adjusted as the Proposed Action progresses to better manage and monitor species that may be impacted.

Impact	Cumulative impacts of the Proposed Action and projects/developments in the region/vicinity	Mitigation measures to be implemented by the Proposed Action
Sedimentation and run-off downstream, including (where relevant) to the Great Barrier Reef	A cumulative increase in erosion as a result of the ongoing wind farm developments within the region has the potential to result in an increase in sediment deposited to the Great Barrier Reef (GBR). The Kariobe, Boulder Creek, Mt Hopeful, Callide, and Specimen Hill Wind Farms are all located downstream of the Proposed Action within the Fitzroy Basin. The Fitzroy Basin has been designated as high management priority for fine sediment loads under the Reef 2050 Water Quality Improvement Plan (WQIP), and achievement of the end-of-catchment targets outlined in the WQIP is dependent on the implementation of appropriate erosion and sedimentation mitigation measures across all projects in the region.	Various mitigation measures will be implemented to manage the potential downstream erosion and sedimentation impacts that may arise as a result of the Proposed Action. Where the avoidance of high-risk areas is not feasible, focus will be placed on the capture of sediment at the source to avoid discharge to the receiving environment. Other general principles to mitigate downstream impacts including the scheduling of potentially high erosion risk activities (such as construction or earthworks) in periods of the year where rainfall and streamflow are at a minimum. Mitigation measures for erosion and sedimentation are detailed in full in Section 7 of the Theodore Wind Farm PER.

6.8 CLIMATE CHANGE

This Section considers predicted future climatic conditions in the region and impacts on MNES, and how changes in climate and the frequency and severity of weather events may interact with, exacerbate or reduce the impacts of the Proposed Action over time.

6.8.1 LOSS, FRAGMENTATION, OR DRYING OF POTENTIAL CLIMATE REFUGIA

Climate change and extreme weather events are well documented as direct drivers of changes to biodiversity in Australian ecosystems (DCCEEW, 2021). Often the impacts of climate change are compounded by other pressures such as land clearing and invasive species, though in some cases changes to biodiversity can be directly attributed to climate change alone (Hughes, Dean, Steffen, & Rice, 2019). Climate change is listed as a key threatening process for many MNES included in this PER Impact Assessment (DCCEEW, 2024a).

For example, increases in temperature, seasonality and intensity of rainfall may affect the resilience of certain plants and animals, which in turn could change the composition of species that make up Poplar Box TEC (DoEE, 2019). The highly specific diet of greater gliders also makes the species vulnerable to changes in temperature and water availability. Reduced water availability can affect growth patterns in eucalypt forests, resulting in a reduction of young, more palatable foliage. A reduction in foraging resources, combined with higher temperatures and extreme heat events, has the potential to lead to heat stress and mortality (DCCEEW, 2022).

Conservation advice states a key threat to koalas is the loss of climatically suitable habitat (DAWE, 2022b). Areas that are currently climatically suitable for koalas are diminishing, and climate change outlooks predict drier, hotter conditions across much of the koala's range.

These changes are predicted to lead to altered dispersal patterns, decreased reproductive rates, and an increase in heat-stress related mortality. Koala populations at the western extent of Queensland and New South Wales distributions are characterised by low densities and a higher level of isolation, and are known as western edge populations. These subpopulations have been identified as a priority for immediate climate-related risk management and conservation efforts, due to them potentially containing genetics that better adapt to environmental stressors (DAWE, 2022b).

The potential impacts of climate change highlight the importance of protecting key habitat elements including retention of larger remnant patches and corridors for dispersal, as well as riparian zones and patches of vegetation that are more resilient to drying conditions due to favourable access to water. Management measures implemented in line with the site-specific CEMP (see Section 7) will ensure key areas and habitat features are retained as much as possible, and the quality of all remaining MNES habitat throughout the Study Area is maintained or improved. This includes avoiding areas identified as MNES habitat as much as possible at the design and micro-siting stages, restoration of a significant portion of habitat cleared during the construction phase, and management of weeds and invasive species through a site-specific Biosecurity Plan to maintain habitat quality.

6.8.2 INCREASED RISK OF FIRE UNDER DRIER CONDITIONS AND PERIODS OF EXTREME HEAT

Studies on the influence of climate change globally have found that the length of fire seasons (when most fires are likely to occur) has increased significantly in many regions since the 1980s. Further, the number of days with extreme fire weather (high temperatures, low recent rainfall, low humidity and high winds) have become 54% more frequent on a global scale (Jones, et al., 2022). Unfavourable fire regimes, including more frequent fires and/or higher-intensity wildfires, are recognized as a key threatening process in the conservation advice or national recovery plans, as outlined in the Species Profile and Threats Database for several species addressed within this PER (DCCEEW, 2024a).

For example, the low density of herbs and ground cover species observed in most brigalow vegetation communities suggests that fire has been a historically rare occurrence. In general, fire-exclusion is the most appropriate regime for remnant patches of brigalow. If climate change leads to higher temperatures and lower rainfall, it is likely that the threat of more frequent, higher-intensity wildfires on Brigalow TEC will increase throughout the Brigalow Belt (DoE, 2013b).

Inappropriate fire regimes are also a key threat to greater glider. Direct mortality can occur during high-severity bushfires as a result of lethal temperatures or suffocation from smoke, or indirectly due to the loss of key habitat features. High fire frequency can change the floristic composition in greater glider habitat, potentially reducing availability of foraging resources (DCCEEW, 2022). Studies in sclerophyll forests in north-eastern New South Wales found just one fire in a ten-year period could reduce greater glider (southern and central) abundance by more than half, when compared to unburnt habitat (McLean, Kavanagh, Penman, & Bradstock, 2018).

Increased intensity/frequency of bushfire is a key threat to koalas listed in the species Conservation Advice (DAWE, 2022b). The wildfires experienced across Queensland, New South Wales and the Australian Capital Territory during the summer of 2019-2020 led to a loss of

over 3.5 million ha of koala habitat. Estimates suggest the koala population experienced a 10% decline one year after the fire events, of which 7.1% was directly attributed to the fires. As the region experiences more intense fire-weather patterns with the onset of climate change, a range of fire-related threats to koala are expected to increase. These include a reduction in availably and diversity of foraging resources, shifts in biological interactions including reproduction and fire-predator relationships, and habitat fragmentation which can be exacerbated by land clearing (DAWE, 2022b).

Management measures implemented in line with the site-specific FMP (see Section 7) will greatly reduce the potential risk for MNES within the Study Area caused by fires. This includes use of industry best practice hazard reduction measures to minimise bushfire risk, weed management and control methods (in line with the Bushfire Management Plan, Biosecurity Management Plan and CEMP) to reduce the potential of invasive plants changing species composition and reducing on-site fuel loads and maintaining firebreaks and trails.

6.8.3 INCREASED EROSION AND RUN-OFF ASSOCIATED WITH PREDICTED INCREASES IN HIGH RAINFALL EVENTS

Increases in the frequency and intensity of rainfall and other extreme weather events would be expected to increase the potential susceptibility of soils to erosion and consequently increase the volume of sediment potentially lost from site through an intensification of the following processes (Queensland Government , 2013);

- Raindrop erosion on bare or exposed soil surfaces;
- Sheet and hill erosion on hillslopes;
- Gully erosion due to an increase in the volume and energy of concentrated flows; and
- Streambank erosion due to high volume and energy streamflows following high intensity rainfall events.

Amplified rates of rainfall induced erosion, and sedimentation may also increase pressure on the erosion and sediment control devices implemented within the Study Area. If devices are not sized or maintained to manage the corresponding increase in intensity and frequency of weather events, increased stresses on the capacity of mitigation devices may cause the failure of these devices thus further amplifying the impact on downstream environments during and following extreme weather events.

Measures to mitigate the impacts induced by intensifying weather events include the rehabilitation and stabilisation of areas disturbed by construction, erosion protection along slopes, drainage controls to capture and dissipate the increased energy of concentrated flows, and implementation of effective stream stabilisation controls at watercourse crossings.

Given that an intensification of extreme weather events is likely to be observed over a gradual timeframe, the greatest impacts would most likely be observed during the late operation through to decommissioning phases of the Proposed Action. Management Plans developed for the decommissioning phase of the Proposed Action will consider changes in the intensity and frequency of weather events relative to the pre-development climate and implement measures to that will sufficiently manage the increased impacts brought about by potentially intensified extreme weather events.

Hydrological modelling will consider potential increases in intensity and frequency of extreme weather events to understand the extent of risk associated with changes in climatic conditions.

The 1% AEP flood modelling completed for the site identified a small region around Castle Creek to be at risk of inundation. Whilst the intensification of future weather events may increase the extent of the 1% AEP flood, it would be considered unlikely for this to impact the Proposed Action, given the distance of the flood zone in the north from the Disturbance Footprint.

6.9 CONSISTENCY WITH AUSTRALIA'S CONSERVATION OBLIGATIONS

MNES considered known, likely or with potential to occur, were considered for the PER impact assessments, as outlined in Section 6.6. Details on the distribution, habitat requirements (including habitat critical to the survival of the species) survey adequacy, and habitat assessment and mapping are outlined within Section 5 of this PER. All summaries and assessments in Section 5 and Section 6, as well as avoidance, mitigation and management measures detailed in Section 7, have taken into careful account all relevant approved conservation advice. This includes, but is not limited to:

- Approved Species Conservation Advice;
- Threat Abatement Plans; and
- Species Recovery Plans.

Reference to these resources can be found throughout Sections 5, 6 and 7. Conservation advice, threats, relevant avoidance, mitigation and management measures and specific and measurable environmental outcomes for all MNES relevant to this PER are presented in detail in Table 7-2.

There are several Conservation Conventions that Australia is committed to and must fulfil its obligations under, particularly regarding impacts on threatened species and protection of biodiversity. Table 6-58 has summarised Australia's commitments under these Conventions relevant to the Proposed Action, and discussed how the Proposed Action will not be inconsistent with such obligations.

TABLE 6-58 COMPLIANCE WITH BIODIVERSITY CONVENTION, APIA CONVENTION, AND CITES

Convention	Relevant Obligations	Proposed Action Compliance
UN Biodiversity Convention	**National Target 4:** By 2015, achieve a national increase of 600,000 km^2 of native habitat managed primarily for biodiversity conservation across terrestrial, aquatic and marine environments. **National Target 5:** By 2015, 1,000 km^2 of fragmented landscapes and aquatic systems are being restored to improve ecological connectivity. **National Target 6:** By 2015, four collaborative continental-scale linkages are established and managed to improve ecological connectivity. **National Target 7:** By 2015, reduce by at least 10 per cent the impacts of invasive species on threatened species and ecological communities in terrestrial, aquatic and marine environments. **National Target 8:** By 2015, nationally agreed science and knowledge priorities for biodiversity conservation are guiding research activities.	The Proposed Action will not result in the complete fragmentation of terrestrial and aquatic landscapes. Vegetation clearing will occur at a local scale, and will mostly include linear, narrow clearing for access and infrastructure. This clearing may temporarily affect some species dispersal ability during construction, however considering revegetation effort and the high mobility of MNES species identified, the Proposed Action is not expected to result in permanent fragmentation of habitat for any MNES within the Study Area or broader landscape. Invasive species will be managed as part of the Proposed Action, and biosecurity measures will be implemented to ensure the impact of invasive species on listed MNES are mitigated.
The Convention on Conservation of Nature in the South Pacific (Apia Convention)	**Article 2:** Undertake to create protected areas to safeguard representative samples of natural ecosystems, superlative scenery, striking geological formations and regions and objects of aesthetic, historic, cultural or scientific value. **Article 3:** Commit to not alter national parks so as to reduce their area except after the fullest investigation; their resources are not to be subject to commercial exploitation; hunting and collection of species are to be prohibited and provision is to be made for visitors.	The Study Area is not a protected area, therefore no direct alteration of any protected areas will occur. MNES within the Study Area will be protected, and impacts to threatened species and communities will be first avoided, and otherwise minimised as much as possible. Any adverse impacts will occur at a small, local scale and will not impact populations in the broader landscape or adjacent protected areas.
Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)	**Article VIII:** The Parties shall take appropriate measures to enforce the provisions of the present Convention and to prohibit trade in specimens in violation thereof. These shall include measures: (a) to penalize trade in, or possession of, such specimens, or both; and (b) to provide for the confiscation or return to the State of export of such specimens.	The Proposed Action will take appropriate measures (such as employment of certified and accredited ecologists and environmental specialist contractors) to reduce any likelihood of listed threatened fauna being at risk of international or domestic trade. All personnel working on-site will be made aware of their obligations to avoid impacts on or interaction with protected species.

6.10 IMPACTS TO LISTED MIGRATORY SPECIES

The operation of the WTGs has the potential to cause direct mortality or injury to avian fauna such as migratory birds. Risks to birds from wind farm developments are highest in areas where large numbers of birds congregate, such as Tarifa in Spain or Altamont Pass in the USA. At these locations, millions of birds migrate annually and must pass through large wind farm areas. Wind farm development in areas of lower importance to birds and bats record substantially lower impacts (EPHC, 2010). As discussed in Section 6.10.1, the Study Area occurs outside of the flyways of migratory bird species that have the potential, or are likely, to occur. It is anticipated that the risk to birds and bats in the Study Area will be low compared to wind farm developments in other areas where intersection of migratory flight paths occurs.

6.10.1 MIGRATORY FLYWAYS

The East Asia/Australasia Flyway is the most common and frequented flyway travelled by migratory shorebirds *en route* to, and within, Australia (BirdLife International, 2024). This flyway occurs over a total of 84,765,020 km^2 and occurs through 37 countries, including Australia. This flyway extends from Arctic Russia and North America to the southern extents of Australia and New Zealand. This flyway predominantly traverses the coastal extents of Australia, occasionally travelling inward through parts of South Australia and Western Australia (BirdLife International, 2024). When examining the records of the listed migratory shorebirds species from desktop searches, the vast majority of incidental records are consistent with the coastal routes of the East Asia/Australasia Flyway. Additionally, when examining the records of non-shorebird migratory birds, these species also generally traverse coastal areas.

Migratory flyways are known to correspond with the vast majority of Important Bird and Biodiversity Areas (IBAs). Such IBAs are globally known for their importance in bird conservation, particularly due to the number of migratory and/or threatened species that are found there. The East Asia/Australasia Flyway triggers a total of 1,184 migratory IBAs (BirdLife International, 2024), none of which occur within, or in close proximity to, the Study Area. Therefore, it is concluded that the Study Area does not fall within an important flyway or IBA for migratory birds.

6.10.2 CONSISTENCY WITH AUSTRALIA'S OBLIGATIONS UNDER MIGRATORY BIRD CONVENTIONS AND AGREEMENTS

There are several migratory bird Conventions and Agreements, approved under subsection 209 of the EPBC Act, that Australia is committed to and must fulfil its obligations under, particularly regarding impacts on threatened species of migratory birds. Table 6-59 has summarised Australia's commitments under these Agreements relevant to the Proposed Action, and discussed how the Proposed Action will not be inconsistent with such obligations.

TABLE 6-59 COMPLIANCE OF THE PROPOSED ACTION WITH MIGRATORY BIRD CONVENTIONS AND AGREEMENTS

Convention	Relevant Obligations	Proposed Action Compliance
Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention)	• Pay special attention to migratory species, the conservation status of which is unfavourable, and taking individually or in co-operation appropriate and necessary steps to conserve such species and their habitat. • Article II, 3b) provides immediate protection for migratory species included in Appendix I. • Article II, 3c) conclude agreements covering the conservation and management of migratory species included in Appendix II. • Maintain favourable conservation status.	• White-throated needletail and fork-tailed swift are not listed under the Bonn Convention. • Neither of these species have been observed within the Study area, however there is suitable foraging habitat present. The Proposed Action will not result in an upgrade of the conservation status of either of these species to unfavourable. This is because there is expected to be very limited impact on habitat, and a negligible risk of turbine collision.

China-Australia Migratory Bird Agreement (CAMBA)	• Each Contracting Party shall encourage the conservation of migratory birds, especially those species in danger of extinction.
	• Endeavour to take appropriate measures to preserve and enhance the environment of migratory birds. In particular:
	  ◦ Seek means to prevent damage to migratory birds and their environment; and
	  ◦ Endeavour to take such measures as may be necessary to restrict or prevent the importation and introduction of animals and plants which are hazardous to the preservation of migratory birds and their environment.
		• White-throated needletail and fork-tailed swift are listed in Annex for this Agreement.
		• The Proposed Action is not likely to significantly impact the conservation of these threatened migratory species.
		• Areas of potential habitat used for foraging purposes will not be significantly impacted by the Proposed Action.
		• A Biosecurity Management Plan will be developed and implemented for the Proposed Action, which will prevent the introduction of hazardous species that may impair migratory bird habitat.

Convention	Relevant Obligations	Proposed Action Compliance
Japan-Australia Migratory Bird Agreement (JAMBA)	• Encourage the conservation of migratory birds and birds in danger of extinction. • Take special protective measures, as appropriate, for the preservation of species or subspecies of birds which are in danger of extinction. • Take appropriate measures to preserve and enhance the environment of birds protected under the provisions of this Agreement. • Seek means to prevent damage to such birds and their environment. • Take such measures as may be necessary to control the importation of animals and plants which determines to be hazardous to the preservation of such birds. • Take such measures as may be necessary to control the introduction of animals and plants which could disturb the ecosystems of unique island environments.	• White-throated needletail and fork-tailed swift are listed in Annex for this Agreement. • The Proposed Action is not likely to significantly impact the conservation of these threatened migratory species. • Areas of potential habitat used for foraging purposes will not be significantly impacted by the Proposed Action. • A Biosecurity Management Plan will be developed and implemented for the Proposed Action, which will prevent the introduction of hazardous species that may impair migratory bird habitat.

International Agreement – Republic of Korea-Australia Migratory Bird Agreement (ROKAMBA)	• Each Party should encourage the conservation of migratory birds.
	• Endeavour to manage and conserve the habitat of migratory birds through activities such as the designation of conservation areas in their territory.
	• Each Party shall endeavour to take the appropriate measures to conserve and improve the environment of birds protected under Article 1 of this Agreement. In particular, it shall:
	  ° Seek means to prevent damage to such birds and their environment.
	  ° Endeavour to take measures to control the impact of invasive animals and plants on the conservation of such birds and their environment.
		• White-throated needletail and fork-tailed swift are listed in Annex for this Agreement.
		• The Proposed Action is not likely to significantly impact the conservation of these threatened migratory species.
		• Areas of potential habitat used for foraging purposes will not be significantly impacted by the Proposed Action.
		• A Biosecurity Management Plan will be developed and implemented for the Proposed Action, which will prevent the introduction of hazardous species that may impair migratory bird habitat.

6.11 IMPACTS ASSOCIATED WITH TURBINE STRIKE AND SITE UTILISATION

A Bird and Bat Management Plan (BBMP) has been developed and will be implemented for the Proposed Action. The BBMP aims to provide a monitoring and adaptive management framework for potential operating impacts on listed bird and bat species known, likely or with potential to occur within the Study Area, including impacts associated with turbine strike and site utilisation. The BBMP has been prepared in accordance with the Queensland *Planning guidance State code 23: Wind farm development* (updated September 2024) (DHLGPPW, 2024) and the DCCEEW *Onshore wind farm guidance - best practice approaches when seeking approval under Australia's national environment law* (DCCEEW, 2024c). The BBMP is attached as Appendix D.

6.11.1 DESKTOP ASSESSMENT

To inform preliminary site characterisation and predict potential site utilisation for at-risk threatened and migratory species, a review of desktop sources was undertaken to identify the ecological values of the Study Area. This review included Commonwealth, State and public information sources, and focused on site characteristics (e.g., landscape features, topography, prevailing wind and weather patterns, location of potential nesting, roosting and foraging resources) and species characteristics (e.g., flight behaviour, likely site use, species presence in the region [permanent, transitory/migratory], migratory flight paths).

The desktop analysis further guided the development of the field survey techniques and effort best suited to the ecological matters identified within the Study Area. Desktop information was utilised to assess and document the likelihood of occurrence (LoO) for at-risk threatened and migratory bird and bat species within the Study Area.

6.11.2 SITE-SPECIFIC ASSESSMENT

Development of the BBMP included a site-specific assessment of how listed threatened and migratory bird and bat species are using, or are likely to use, the Study Area and surrounding landscape. This assessment was informed by site-specific and species-specific site utilisation surveys, which were undertaken by suitably qualified ecologists.

Site utilisation data was obtained over a two-year period to provide sufficient baseline data on relevant species' potential to use the Study Area and surrounds, taking into account the Proposed Action's potential WTG layout. This involved:

- Field surveys to identify potential habitat for birds, as well as bird utilisation surveys (BUS) completed in October 2022, February 2023, March 2023, June 2023, September 2023, October 2023, December 2023, February 2024 and June 2024;
- Field surveys to identify potential habitat for bats, as well as bat surveys (using Anabat recording devices) completed in October 2022 and during the February and March 2023 survey periods.

6.11.3 LONG-TERM IMPACT RISK ASSESSMENT

The BBMP demonstrates how the potential impacts to each relevant species, including their risk of impact and site utilisation, have been analysed as part of the bird and bat CRA. All listed bird and bat species considered known, likely or having the potential to occur within the

Study Area, based on the LoO assessment, have been included within the CRA. Additionally, although assessed as unlikely to occur (see LoO, Appendix C) and no observations were made during seasonal BUS to date, grey falcon (*Falco hypoleucos*) and red goshawk (*Erythrotriorchis radiatus*) are known to have extensive ranges, and the Study Area is within their known distribution. Due to both the species' EPBC Act status and low population size, a collision event would constitute an impact to an ecologically significant proportion of the population, and so conservatively these species have also been assessed. The CRA results for each EPBC Act listed species are summarised in Table 6-60. A total of nine EPBC Act listed species were included within the assessment, with six species considered to be at low or moderate risk of collision. The full CRA, including the assessment of relevant non-listed species is provided within the BBMP.

The DCCEEW *Onshore wind farm guidance* details how Collision Risk Modelling (CRM) needs to be undertaken for listed threatened species (MNES) where risks from the Proposed Action, particularly collision risks, have been identified. Only one listed bird or bat species, squatter pigeon (southern), was recorded within the Study Area, with large-eared pied bat considered likely due to a 'probable' occurrence in the Study Area via Anabat detection equipment. Neither of these species were recorded within the assessed RSA (87 – 250 m) for the Proposed Action and therefore were not included within the CRM. Based on field data restrictions, only non-listed species were run within the CRM, with the full CRM methodology and results detailed within the BBMP.

TABLE 6-60 BIRD AND BAT COLLISION RISK ASSESSMENT RESULTS

Species	Threatened Species Status (EPBC Act)	Likelihood of Event	Consequence of Event	Risk Rating
Threatened or Migratory Bird and Bat Species				
Grey falcon (*Falco hypoleucos*)	V	Less likely	Major	**Low**
Red goshawk (*Erythrotriorchis radiatus*)	E	Less likely	Major	**Low**
Large-eared pied bat (*Chalinolobus dwyeri*)	E	Moderately likely	Major	**Moderate**
Southern squatter pigeon (*Geophaps scripta scripta*)	V	Less likely	Minor	**Negligible**
White-throated needletail (*Hirundapus caudacutus*)	V and Mi	Moderately likely	Moderate	**Low**
Black-breasted buttonquail (*Turnix melanogaster*)	V	Less likely	Moderate	**Negligible**
Australian painted snipe (*Rostratula australis*)	E	Moderately likely	Moderate	**Low**

Species	Threatened Species Status (EPBC Act)	Likelihood of Event	Consequence of Event	Risk Rating
Diamond firetail (*Stagonopleura guttata*)	V	Less likely	Minor	**Negligible**
Fork-tailed swift (*Apus pacificus*)	Mi	Moderately likely	Moderate	**Low**

Status listing per EPBC Act: E = Endangered; V = Vulnerable; Mi = Migratory.

The BBMP also outlines a monitoring program, to be undertaken during construction and operation of the Proposed Action, to track and manage species that are directly impacted by the Proposed Action. The monitoring program will be informed by the following procedures:

- Baseline (pre-construction), construction and operational phase bird (BUS) and bat (using Anabat devices) surveys;
- Carcass searches for species impacted by the WTGs;
- Measures to check for survey adequacy and to account for bias through scavenger and detectability trials;
- Statistical analysis of the results from such targeted field surveys and carcass searches to determine the mortality rates throughout the Study Area; and
- Subsequent reporting and consultations with the department.

Species-specific thresholds and triggers for listed species with a risk rating of 'low' or above (provided within Table 6-61) will ensure that appropriate adaptive management measures will be implemented before a significant impact is reached.

Monitoring reports will be produced in the first, eighth and last year of operation for submission to the department. Monthly summaries of data from carcass searches and detectability trials will also be provided as attachments to the monitoring reports.

This BBMP is an Adaptive Management framework that will have the ability to be adjusted as the Proposed Action progresses to better manage and monitor species that may be impacted by the WTGs, should it be required.

TABLE 6-61 SIGNIFICANT IMPACT THRESHOLD FOR AT-RISK LISTED SPECIES

At-risk Species	Australian Population Estimate	Annual Threshold	Significant Impact Threshold	
		Evidence of progression towards Trigger 1	Trigger 1	Trigger 2
Cumulative Assessment over 4 years				
Fork-tailed swift	100,000[1]	13 individuals	50 individuals	100 individuals

At-risk Species	Australian Population Estimate	Annual Threshold	Significant Impact Threshold	
		Evidence of progression towards Trigger 1	Trigger 1	Trigger 2
Grey falcon	<1,000[3]	Detected within the Locality*	2 individuals	5 individuals
White-throated needletail	40,000[4]	5 individuals	20 individuals	40 individuals
Australian painted snipe	2,500[6]	Detected within the Locality*	2 individuals	5 individuals
Cumulative Assessment over 6 years				
Large-eared pied bat	20,000[5]	2 individuals	10 individuals	20 individuals
Cumulative Assessment over 8 years				
Red Goshawk	<1,000[2]	Detected within the Locality*	2 individuals	5 individuals

***Records within the Locality will be monitored following the methodology provided within Appendix G (Bird and Bat Monitoring for the Life of the Proposed Action).*

[1] (DoE, 2015)

2 (DCCEEW, 2023c)

3 (TSSC, 2020

4 (Garnett & Crowley, 2000)

5 (DCCEEW, 2023a)

6 (DSEWPC, 2013)

6.12 IMPACTS TO THE GREAT BARRIER REEF

6.12.1 GUIDELINES

6.12.1.1 REEF 2050 LONG-TERM SUSTAINABILITY PLAN

The Reef 2050 Long-Term Sustainability Plan (Reef 2050 Plan) is a joint commitment of the Australian and Queensland Governments and is Australia's long-term strategy for protecting and managing the Reef to support its health and resilience. The plan is supported by the Reef 2050 Objectives and Goals document, which sets out the indicators that form the basis of measuring progress against the objectives and goals that are set out in the Reef 2050 Plan. The full scope of objectives (and indicators for their assessment) are detailed within Table 1 of The Reef 2050 Objectives and Goals document.

6.12.1.2 REEF 2050 WATER QUALITY IMPROVEMENT PLAN

The Reef 2050 Water Quality Improvement Plan 2017-22 (WQIP) is the planning and reporting framework that has been prepared for water quality under the overarching Reef 2050 Plan. The WQIP addresses all land-based sources of water pollution entering the reef, and outlines nutrients, fine sediments, and pesticides as the greatest water quality risks to the GBR. The WQIP seeks to increase the quality of water flowing to the GBR through outlining how the outcomes of the Reef 2050 Plan will be achieved. Under the WQIP, the Fitzroy River catchment has been listed under high management priority for fine sediment loads. The full suite of Water Quality Objectives (WQOs) specified for the Fitzroy River catchment under the WQIP are listed in Table 2 of the WQIP, and reproduced below in Table 6-62.

TABLE 6-62 END OF CATCHMENT ANTHROPOGENIC WATER QUALITY TARGETS FOR THE FITZROY RIVER CATCHMENT (WQIP)

	Required Reduction	
	Load (as tonnes (t) or kilotonnes (kt))	Percentage (%)
Dissolved Inorganic Nitrogen (DIN)[1]	Maintain current load	Maintain current load
Fine sediment (FS)[2]	390 kt	30
Particulate phosphorus (PP)[2]	380 t	30
Particulate nitrogen (PN)[2]	640 t	30

6.12.1.3 WATER PLAN (FITZROY BASIN) 2011

The outcomes for sustainable management of water are detailed in Chapter 3 of the Water Plan (Fitzroy Basin) 2011, which outlines both general and specific outcomes for surface and groundwater, as well as ecological outcomes for waters within the Fitzroy Basin. Section 14(1)(c) of the Water Plan specifies GBR related outcomes for the basin as follows:

"*14(1) Each of the following is a general ecological outcome for the water in the plan area –*

- *(c) to provide a flow regime that –*
    - *(i) maintains delivery of fresh water to the estuaries of watercourses and the Great Barrier Reef Lagoon; and*
    - *(ii) supports productivity in the receiving waters of the Great Barrier Reef and inshore reefs;"*

Adherence to the GBR related outcomes specified in the Water Plan (Fitzroy Basin) 2011 is expected to be achieved through adherence to the objectives outlined the Reef 2050 Plan and WQIP.

[1] "Low" management priority
[2] "High" management priority

6.12.2 POTENTIAL IMPACTS

As the Proposed Action comprises of a windfarm, with no operational water releases, there are no anticipated direct impacts to water quality by wastewater releases. However, the potential for negative contribution to the GBR water quality targets outlined in the Reef 2050 Plan and WQIP may arise from sediment and erosion related to the Proposed Action leading to increases in loading of DIN, FS, PP and PN.

In the case of the Proposed Action, the areas of greatest erosion risk are those characterised by steep slopes and abrupt scarps. The IECA recommends the avoidance of areas with an extreme erosion risk wherever possible. This recommendation is reflected in the layout of the disturbance footprint, of which 0.25% is classified as having an extremely high erosion risk.

Erosion and sedimentation risks to the GBR as detailed in Section 6.2.6 are expected to be most prevalent during the construction and decommissioning phases of the Proposed Action. The potential risk of sediment deposition will be greatest for the duration of works involving the disturbance and exposure of soil as a result of land clearing to support construction. Whilst the complete avoidance of sediment generation will not be feasible, measures will be implemented as per Section 7.2.2 of the Theodore Wind Farm PER to minimise the extent of disturbance (and thus volume of sediment generated) and to capture excess sediment at the source, prior to potential discharge to downstream waterways.

Whilst the designation of certain areas as high to extremely high risk is not diminished once construction reaches completion, activities involved with the operational phase of the Proposed Action are anticipated to present a more manageable level of risk. This will predominantly be achieved through progressive revegetation and stabilisation. Activities with the potential to generate a high volume of sediment (such as cut and fill earthworks for construction) will not be ongoing during the operational phase, and the extent of disturbed or exposed areas in the operational phase will be greatly diminished following the completion of the post construction rehabilitation activities detailed in Section 8 of the Theodore Wind Farm PER.

Specific soil analysis has not been completed for the Proposed Action, however, typical contaminants associated with increased sedimentation can include Dissolved Inorganic Nitrogen (DIN), Fine Sediment (FS) (which can affect Suspended Sediment), and nutrients such as Nitrogen and Phosphorus. The percentages of DIN, FS, PN, and PP within soils will be variable across the Study Area, and is typically dependent on soil types and land uses. The potential increase in the discharge of the above contaminants is anticipated to be proportional to the total amount of sediment lost from the Study Area. The Proposed Action includes the development of erosion and sediment control plans to manage loads of sediment discharge from the site and manage the potential impacts against the specific WQOs detailed in Reef Plan 2050 and WQIP. Reducing soil loss from the Study Area is a leading measure in meeting the targets of the Reef WQIP and the overarching Reef 2050 Plan. As such, the outcomes of the RUSLE assessment can inform the general extent of potential high-risk areas the Proposed Action poses to the GBR. Other potential impacts to GBR water quality values (refer to "Factors that influence the state of objectives" within the Reef 2050 Objectives and Goals document), such as those associated with the discharge of contaminants and concrete pollution are primarily expected to only occur on an incident basis. Measures will be employed, as detailed in Section 7.2.2 of the Theodore Wind Farm PER, to reduce the likelihood of incidents occurring, and to capture potential contaminants in the event of an incident. With the implementation of appropriate erosion and sediment controls, it is anticipated that the

Proposed Action will not negatively affect the contribution to the achievement of the targets outlined for the Fitzroy Basin in the WQIP, and subsequently the Reef 2050 Plan and Water Plan (Fitzroy Basin) 2011. The majority low to moderate erosion risk throughout the Disturbance Footprint presents a manageable level of risk that will be mitigated through implementation of the measures that are detailed in Section 7.2.2 of the Theodore Wind Farm PER. These measures will ensure that discharges of sediment from the Study Area are not elevated about the pre-development baseline.

The implementation of a downstream water quality monitoring program will allow for potential impacts and performance against the GBR WQOs specified in the Reef 2050 Plan and WQIP to be assessed in real time. This will allow for remedial actions to be implemented to ensure adherence to the WQOs and ensure measurable impacts on GBR values as a result of the Proposed Action are not observed.

Through the implementation of avoidance, mitigation, and monitoring strategies, the Proposed Action will not result in an increase of pollutants to GBR catchment waters in line with the objectives specified in the Reef 2050 Plan, WQIP, and Water Plan (Fitzroy Basin) 2011.

SECTION 6 REFERENCES

Attexo. (2022, 12 12). *Kariboe Wind Farm Project MNES Assessment Report.* Retrieved from EPBC Act Public Portal: https://epbcpublicportal.environment.gov.au/all-referrals/project-referral-summary/project-decision/?id=3627d092-79ad-ed11-83fe-00224818abd2

Baerwald, E. F., D'Amours, G. H., Klug, B. J., & Barclay, R. M. (2008). *Barotrauma is a significant cause of bat fatalities at wind turbines.* Current Biology, Volume 18, Issue 16.

BirdLife International. (2024, September 5). *East Asia/Australasia Flyway.* Retrieved from BirdLife International Data Zone: https://datazone.birdlife.org/userfiles/file/sowb/flyways/8_EastAsia_Australasia_NEW.pdf

Centre for Invasive Species Solutions. (2024, 09 11). *PestSmart website.* Retrieved from Wild dog risks to threatened wildlife. FactSheet.: https://pestsmart.org.au/toolkit-resource/wild-dog-risks-to-threatened-wildlife

DAWE. (2022a). *Conservation Advice for Petaurus australis australis (yellow-bellied glider (south-eastern)).* Department of Agriculture, Water and the Environment.

DAWE. (2022b). *Conservation Advice for Phascolarctos cinereus (Koala) combined populations of Queensland, New South Wales and the Australian Capital Territory.* Canberra: Department of Agriculture, Water and the Environment. Retrieved In effect under the EPBC Act from 12-Feb-2022., from http://www.environment.gov.au/biodiversity/threatened/species/pubs/85104-conservation-advice-12022022.pdf.

DAWE. (2022c). *Fire regimes that cause declines in biodiversity as a key threatening process.* Canberra: Department of Agriculture, Water and the Environment.

DCCEEW. (2021). *2021 State of the Environment Report.* Canberra: Department of Climate Change, Energy, the Environment and Water.

DCCEEW. (2022). *Conservation Advice for Petauroides volans (greater glider (southern and central)).* Canberra: Department of Climate Change, Energy, the Environment and Water.

DCCEEW. (2023a). *Conservation Advice for Chalinolobus dwyeri (large-eared pied bat).* Canberra: Department of Climate Change, Energy, the Environment and Water.

DCCEEW. (2023b). *Conservation Advice for Stagonopleura guttata (diamond firetail).* Canberra: Department of Climate Change, Energy, the Environment and Water.

DCCEEW. (2023c). *Conservation Advice for Erythrotriorchis radiatus (red goshawk).* Canberra: Department of Climate Change, Energy, the Environment and Water. Retrieved from http://www.environment.gov.au/biodiversity/threatened/species/pubs/942-conservation-advice-31032023.pdf.

DCCEEW. (2024a). *Species Profile and Threats Database*. Retrieved from Department of the Environment, Canberra: https://www.environment.gov.au/sprat.

DCCEEW. (2024b, September 5). *Geophaps scripta scripta — Squatter Pigeon (southern)*. Retrieved from Species Profile and Threats Database: http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=64440

DCCEEW. (2024c). *Onshore Wind Farm Guidance - Best practice approaches when seeking approval under Australia's national environment law.* Canberra: Department of Climate Change, Energy, the Environment and Water.

DERM. (2011). *National recovery plan for the large-eared pied bat Chalinolobus dwyeri.* Canberra: Report to the Department of Sustainability, Environment, Water, Population and Communities by the Department of Environment and Resource Management. Retrieved from http://www.environment.gov.au/biodiversity/threatened/recovery-plans/national-recovery-plan-large-eared-pied-bat-chalinolobus-dwyeri.

DES. (2022). *Guide to greater glider habitat in Queensland.* Brisbane: Department of Envuironment and Science.

DEWHA. (2008a). *Approved Conservation Advice for Cadellia pentastylis (Ooline).* Canberra: Department of the Environment, Water, Heritage and the Arts.

DEWHA. (2008b). *Approved Conservation Advice for Cossinia australiana (Cossinia).* Canberra: Department of the Environment, Water, Heritage and the Arts.

DEWHA. (2008c). *Approved Conservation Advice for Stemmacantha australis (Austral Cornflower).* Canberra: Department of the Environment, Water, Heritage and the Arts.

DEWHA. (2008d). *Approved Conservation Advice for Xerothamnella herbacea.* Canberra: Department of the Environment, Water, Heritage and the Arts.

DEWHA. (2010). *The cane toad (Bufo marinus) - fact sheet.* Canberra: Department of the Environment, Water, Heritage and the Arts.

DHLGPPW. (2024). *Planning guideline - State code 23: Wind farm development.* Department of Housing, Local Government, Planning and Public Works,.

DoE. (2013a). *Significant Impact Guidelines 1.1 - Matters of National Environmental Significance.* Department of the Environment.

DoE. (2013b). *Approved Conservation Advice for the Brigalow (Acacia harpophylla dominant and co-dominant) ecological community.* Canberra: Department of the Environment.

DoE. (2014). *EPBC Act Referral Guidelines for the vulnerable koala (combined populations of Queensland, New South Wales and the Australian Capital Territory.* Department of the Environment, Commonwealth of Australia.

DoE. (2015a). *Conservation Advice Turnix melanogaster black-breasted button-quail.* Canberra: Department of the Environment.

DoE. (2015b). *Draft referral guidelines for 14 birds listed as migratory species under the EPBC Act.* Canberra: Department of the Environment.

DoE. (2015c). *Threat abatement plan for predation by feral cats.* Department of the Environment.

DoEE. (2016). *Threat abatement plan for competition and land degradation by rabbits.* Department of the Environment and Energy.

DoEE. (2017). *Threat abatement plan for predation, habitat degradation, competition and disease transmission by feral pigs (Sus scrofa) (2017).* Department of the Environment and Energy.

DoEE. (2019). *Conservation Advice (including listing advice) for the Poplar Box Grassy Woodland on Alluvial Plains.* Canberra: Department of the Environment and Energy.

Drewitt, A., & Langston, R. (2006). Assessing the impacts of wind farms on birds. *Ibis, 148*, 29-42.

DSEWPC. (2013). *Approved Conservation Advice for Rostratula australis (Australian painted snipe).* Canberra: Department of Sustainability, Environment, Water, Population and Communities.

EPHC. (2010). *National Wind Farm Development Guidelines - Draft.* Environment Protection and Heritage Council .

Erickson, W., Johnson, G., Young, D., Strickland, D., Good, D., Bourassa, M., . . . Sernka, K. (2001, September 18). *Synthesis and Comparison of Baseline Avian and Bat Use, Raptor Nesting and Mortality Information from proposed and Existing Wind Developments.* Portland, Oregon: Report Prepared for Bonneville Power Administration .

Eyre, T. J. (2006). Regional habitat selection of large gliding possums at forest stand and landscape scales in southern Queensland, Australia I. Greater glider (Petauroides volans). *Forest Ecology and Management, 235*, 270-282.

Fahrig, L. (2003). *Effects of habitat fragmentation on biodiversity.* Annual review of ecology, evolution, and systematics, 34(1).

Francis, M., Spooner, P., & Matthews, A. (2015). *The influence of urban encroachment on squirrel gliders (Petaurus norfolcensis): effects of road density, light and noise pollution.* Wildlife Research, 42(4).

Garnett, S. T., & Crowley, G. M. (2000). *The Action Plan for Australian Birds 2000.* Canberra: Environment Australia.

Goldingay, R. L. (2014). *Gliding performance in the yellow-bellied glider in low-canopy forest.* Australian Mammalogy 36(2).

Gooden, B., French, K., Turner, P., & Downey, P. (2009). *Impact threshold for an alien plant invader, Lantana camara, on native plant communities.* Biological conservation 142(11).

Hughes, L., Dean, A., Steffen, W., & Rice, M. (2019). *This is what climate change looks like.* Sydney: Climate Council of Australia.

IPWEA. (2024). *Queensland Urban Drainage Manual (QUDM).* Institude of Public Works Engineering Australasia. Retrieved from https://www.ipwea-qnt.com/products-resources/qudm

Jones, M., Abatzoglou, J., Veraverbeke, S., Andela, N., Lasslop, G., Forkel, M., . . . Le Quere, C. (2022). *Global and Regional Trends and Drivers of Fire Under Climate Change.* Reviews of Geophysics, 60.

Jones, N., Pejchar, L., & Kiesecker, J. (2015). *The Energy Footprint: How Oil, Natural Gas, and Wind Energy Affect Land for Biodiversity and the Flow of Ecosystem Services.* BioScience 65, 290-301 (3).

Madders, M., & Whitfield, D. (2006). Upland raptors and the assessment of wind farm impacts. *Ibis*, 43-56.

Mathieson, M., & Smith, G. (2009). *National recovery plan for the black-breasted button-quail Turnix melanogaster.* Canberra: Report to the Department of the Environment, Water Heritage and the Arts.

McLean, C., Kavanagh, R., Penman, T., & Bradstock, R. (2018). *The threatened status of the hollow dependent arboreal marsupial, the Greater Glider (Petauroides volans), can be explained by impacts from wildfire and selective logging.* Forest Ecology and Management, 415–416.

Miller, A. (2023). Cumulative impact assessments – its relevance for Australia's energy transition. *CSIRO Publishing*.

Neldner, V., Laidlaw, M., McDonald, K., Mathieson, M., Melzer, R., McDonald, W., . . . Seaton, R. (2017). *Scientific review of the impacts of land clearing on threatened species in Queensland.* Brisbane: Department of Science, Information Technology and Innovation.

Newport, J., Shorthouse, D., & Manning, A. (2014). *The effects of light and noise from urban development on biodiversity: Implications for protected areas in Australia.* Ecological Management & Restoration, 15(3).

NGH. (2024, 08 13). *Callide Wind Farm Preliminary Documentation FV3.0.* Retrieved from DP Energy - Callide Wind Farm: https://callidewindfarm.com.au/resources-2/

NSW Scientific Committee. (2024, 09 12). *Greater Glider population in the Seven Mile Beach National Park area.* Retrieved from Scientific Committee Determinations: https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Animals-and-plants/Scientific-Committee/Determinations/2016/greater-glider-population-seven-mile-beach-national-park-nsw-scientific-committee-final-dtermination.pdf?la=en&hash=0B0DEBB

Queensland Government . (2013). *Types of erosion.* Retrieved from Queensland Government : https://www.qld.gov.au/environment/land/management/soil/erosion/types%23:~:text=Water%2520erosion,water%2520from%2520infiltrating%2520the%2520soil.

Queensland Government. (2024). *Brigalow management guide*. Retrieved from https://www.qld.gov.au/environment/plants-animals/habitats/regrowth/regrowth-guides/brigalow/brigalow-ecology#:~:text=A%20characteristic%20of%20brigalow%20is,and%20soil%20moisture%20is%20low

Shepard, B., Kuhns, A., Dreslik, M., & Phillips, C. (2008). *Roads as barriers to animal movement in fragmented landscapes.* Animal Conservation, 11(4).

Smales, L., & Muir, S. (2005). *Modelled cumulative impacts on the Tasmanian Wedge-tailed Eagle of wind farms across the species' range.* Report by Biosis Research Pty. Ltd. For Australian Department of Environment and Heritage. Project, (4857).

Tarburton, M. K. (2014). *Status of the white-throated Needletail Hirundapus caudacutus in Australia: Evidence for a marked decline.* Australian Field Ornithology 31(3).

Taylor, B. D., & Goldingay, R. L. (2009). Can road-crossing structures improve population viability of an urban gliding mammal? *Ecology and Society 14(2): 13*.

TSSC. (2015). *Conservation Advice Geophaps scripta scripta squatter pigeon (southern).* Canberra: Threatened Species Scientific Committee, Department of the Environment. Retrieved In effect under the EPBC Act from 27-Oct-2015., from http://www.environment.gov.au/biodiversity/threatened/species/pubs/64440-conservation-advice-31102015.pdf.

TSSC. (2016a). *Conservation Advice Solanum dissectum.* Canberra: Threatened Species Scientific Committee.

TSSC. (2016b). *Conservation Advice Solanum johnsonianum.* Canberra: Threatened Species Scientific Committee.

TSSC. (2019). *Conservation Advice Hirundapus caudacutus White-throated Needletail.* Canberra: Department of the Environment and Energy. Retrieved from http://www.environment.gov.au/biodiversity/threatened/species/pubs/682

TSSC. (2020). *Conservation Advice Falco hypoleucos Grey Falcon.* Department of Agriculture, Water and the Environment, Threatened Species Scientific Committee. Retrieved from http://www.environment.gov.au/biodiversity/threatened/species/pubs/929-conservation-advice-09072020.pdf.

Wilcove, D., McLellan, C., & Dobson, A. (1986). *Habitat fragmentation in the temperate zone.* Conservation Biology, ed. ME Soulé 237–56.

Youngentob, K. N., Marsh, K. F., & Skewes, J. (2021). *A review of koala habitat assessment criteria and methods.* Canberra: Department of Agriculture, Water and the Environment.

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Theodore Wind Farm

Public Environment Report – Avoidance and Mitigation

PREPARED FOR

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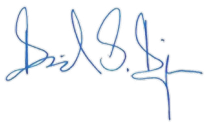
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ACRONYMS AND ABBREVIATIONS

Acronym	Description
BBMP	Bird and Bat Management Plan
BFM	Bonded Fibre Matrix
CEMP	Construction Environmental Management Plan
DCCEEW	Department of Climate Change, Energy, the Environment and Water
Disturbance Footprint	The area whereby the final layout and impacts have been considered and occupies an area of 1,590.1 ha.
ESC	Erosion and Sediment Control
ESCPC	Erosion and Sediment Control Plan for Construction
FSC	Fauna Spotter-Catcher
IECA	International Erosions Control Association
MNES	Matters of National Environmental Significance
MSDS	Material Safety Data Sheet
OMP	Offset Management Plan
PER	Public Environment Report
Proposed Action	Theodore Wind Farm
Proponent	Theodore Energy Development Pty Ltd
Project Area	The corridor of land on which the Disturbance Footprint will be located, including a 100 metre buffer for micro-siting.
SARA	State Assessment and Referral Agency
SRI	Significant Residual Impact
Study Area	The 9 land parcels, across 3 properties, and road reserve areas, 46,830 ha, in which the Proposed Action will be located.
TEC	Threatened Ecological Community
VFMP	Vegetation and Fauna Management Plan
WoNS	Weeds of National Significance
WTGs	Wind Turbine Generator

7. PROPOSED AVOIDANCE, MITIGATION AND MANAGEMENT MEASURES

7.1 OVERVIEW

This Section summarises the proposed avoidance, mitigation and management measures based on potential impacts of the Proposed Action outlined in Section 6 of the Theodore Wind Farm PER.

The mitigation hierarchy is a tool that is used to limit the amount of damage an action, such as a development, will have on the environment. The three tiers of the hierarchy, which must be followed preferentially from first to last and explored in full before moving on to the next (DCCEEW, 2024b), are:

1. Avoid
2. Mitigate
3. Offset

The Proponent has endeavored to follow the mitigation hierarchy, and has proposed avoidance and mitigation measures relevant to each phase of the Proposed Action. Broadly, these measures can be grouped as design and construction phase measures, operational phase measures, and maintenance and decommissioning phase measures.

Specific Management Plans have been developed with the aim to manage and mitigate impacts to Matters of National Environmental Significance (MNES). These management plans are attached to this PER and include:

- Bird and Bat Management Plan (BBMP) (Appendix D);
- Preliminary Vegetation and Fauna Management Plan (VFMP) (Appendix G); and
- Preliminary Construction Environmental Management Plan (CEMP) (Appendix H).

More general management plans that will be developed for the Proposed Action and are likely to include relevant measures outlined in species-specific management plans include:

- Construction Environmental Management Plan (CEMP); and
- Operational Environmental Management Plan (OEMP).

Conditions of Approval associated with the Development Permit (2409-41961 SDA), received from the Queensland State Assessment and Referral Agency (SARA), include the development of the following management plans:

- Vegetation and Fauna Management Plan (Condition 3);
- Cleared Vegetation Management Plan (Condition 4);
- Rehabilitation Management Plan (Condition 5);
- Bird and Bat Management Plan (Condition 8);
- Construction Environmental Management Plan (Condition 12);
- Bushfire Management Plan (Condition 13);
- Stormwater Management Plan (Condition 9);
- Site Stabilisation Plan (Condition 11);

- Erosion and Sediment Control (ESC) Plan for Construction (ESCPC) (Condition 10);
- End of Construction Decommissioning Management Plan (Condition 32); and
- End of Operation Decommissioning Management Plan (Condition 33).

7.1.1 SUMMARY OF PROPOSED AVOIDANCE, MITIGATION AND MANAGEMENT MEASURES

Table 7-1 below summarises the proposed avoidance, mitigation and management measures to be employed, responsible parties and their timing. Detailed discussion and evidence to support the efficacy of mitigating potential impacts of the Proposed Action are discussed in the following Sections.

TABLE 7-1 AVOIDANCE, MITIGATION AND MANAGEMENT MEASURES FOR THE PROPOSED ACTION

Measure	Responsibility	Phase(s)
Avoidance Measures		
Avoid disturbing MNES habitat	Proponent	Design, Construction, Operation, Maintenance and Decommissioning
Pre-clearance surveys and micro-siting	Proponent, Lead Construction Contractor, Specialist Environmental Contractors	Construction, Operation, Maintenance and Decommissioning
Avoid locating turbines in key MNES habitat	Proponent	Design and Construction
Mitigation Measures		
Designing layout to reduce habitat fragmentation impacts to MNES	Proponent	Design
Installing fauna crossing infrastructure	Proponent, Specialist Environmental Contractors	Construction and Operation
Fauna spotter-catchers	Proponent, Specialist FSC Contractor	Construction, Operation and Maintenance
Manage invasive plants and animals	Proponent, Specialist Environmental Contractors	Construction, Operation and Maintenance
Manage fire regimes and bushfire risk	Proponent, Specialist Environmental Contractors	Construction, Operation and Maintenance
Manage impacts from altered hydrology	Proponent, Lead Construction Contractor	Construction, Operation and Maintenance
Reduce environmental pollution	Proponent, Lead Construction Contractor	Construction, Operation and Maintenance

Measure	Responsibility	Phase(s)
Site inductions and training	Proponent, Lead Construction Contractor	Construction, Operation and Maintenance
Revegetation and rehabilitation (Type 1 and 2)	Proponent, Specialist Environmental Contractors	Operation and Maintenance
Reduce likelihood of turbine collision and barotrauma impacts	Proponent	Operation
Revegetation and rehabilitation (Type 3)	Proponent, Specialist Environmental Contractors	Decommissioning
Management Measures		
Specific Management Plans have developed to manage and mitigate impacts to listed threatened species known or likely to occur within the Study Area. These management plans include a BBMP and CEMP.	Proponent, Lead Construction Contractor, Specialist Environmental Contractors	Construction, Operation, Maintenance and Decommissioning

7.1.2 DEVELOPMENT TO MEET 'S.M.A.R.T' PRINCIPLE

The measures outlined in Table 7-1, and described in detail in the following Sections, have been developed in order to meet the 'S.M.A.R.T' goal principle as follows:

- **Specific** – this details the specific mitigation measure for the Proposed Action in terms of how it will mitigate the relevant potential impact;
- **Measurable** – this details how the mitigation measure for the Proposed Action will be achieved, through the collection of data during field surveys, or a specific number unit goal for the measure;
- **Achievable** – this details the way in which the measure will be achieved in relation to the timeframe, people involved in achieving the measure and the money or resources required;
- **Relevant** – this details any information for listed species that are relevant to, or addressed by, the specific mitigation measure, for example, how a Biosecurity Management Plan would help to address and adhere to the threat abatement plans for pest reduction for listed threatened species; and
- **Time bound** – this details the specific time frame in which the measure should be implemented for or achieved by.

7.2 DESIGN AND CONSTRUCTION PHASE MEASURES

The following measures are most relevant to the design and construction phases of the Proposed Action. Some measures (e.g., **Avoid locating turbines in key MNES habitat**, outlined under the operational phase) are also relevant to these phases.

7.2.1 AVOIDANCE MEASURES

Avoid disturbing MNES habitat

Mapping and protecting habitat for MNES and avoiding impacts as much as practicable within the Study Area is a key element to impact avoidance. Habitat loss is globally recognised as the greatest threat to threatened species, and land clearing is a primary contributor to this (Neldner, et al., 2017).

The Proponent has evaluated the Study Area and has continued to design a Disturbance Footprint that was feasible from an engineering perspective and minimised the disturbance to MNES wherever possible. Design principles that were adopted included locating infrastructure in already cleared paddocks, and reducing the size and extent of infrastructure. Access tracks, hardstands, laydown areas and other infrastructure have been designed to have the least impact on MNES as technically possible. By limiting the area of habitat to be cleared for the Proposed Action to the minimum required, impacts to threatened species will be avoided as much as practicable.

Since the conception of the Proposed Action, the design of the Disturbance Footprint has evolved with consideration of technical, environmental, social, and commercial constraints. Initial reviews determined that the Study Area has the maximum capacity to host up to 260 WTGs. A Draft Disturbance Footprint was designed to host up to 260 WTGs and associated infrastructure. The design of the Disturbance Footprint was refined to be up to 170 WTGs to minimise impacts to sensitive ecological areas, minimize potential visual impacts to surrounding dwellings and maximise commercial output.

Areas mapped to be impacted by the Proposed Action have been clearly delineated and communicated, ensuring that the Disturbance Footprint does not extend further than planned to create unnecessary fragmentation or disturbance.

Pre-clearance surveys and micro-siting

A two-stage design process involving initial mapping of ecological constraints completed and pre-clearance micro-siting surveys will be undertaken. Pre-clearance surveys will be undertaken at the 30% and 80% Disturbance Footprint design to search for listed flora species known, likely or with potential to occur and listed fauna species habitat, to define locations of populations and guide micro-siting and additional avoidance measures, such as species translocation, seed collection and propagation. Pre-clearance surveys will be conducted by suitably qualified ecologists as follows:

- Investigation of all habitat strata and fauna habitat types to be directly impacted (e.g. arboreal, terrestrial, leaf litter), inclusive of a 100 m buffer around infrastructure locations;
- The Disturbance Footprint will be traversed on foot to verify the presence of any Threatened Ecological Communities (TEC) or listed fauna or flora species, and identify areas in which suitable habitat for MNES fauna species may be present;
- If listed flora species are identified, the Disturbance Footprint will be refined to avoid these individuals. If they are unavoidably impacted, they will be translocated in line with Guidelines for the Translocation of Threatened Plants in Australia (3rd Edition) (Commander, et al., 2018);

- Habitat features such as hollow-bearing trees, large woody debris, bird nests and water bodies will be flagged with high-visibility tape and their position recorded using GPS or similar. Sightings of MNES fauna and flora will be recorded and these locations will be avoided where micro-siting allows (up to 100 m for wind turbine generators (WTGs));
- The habitat features and their GPS data will be recorded by licensed and suitably qualified fauna spotter catcher team to guide avoidance measures imposed during clearing; and
- A full list of fauna species detected during the pre-clearance inspection, as well as the marking and identification of significant habitat features will be outlined in a pre-clearance report.

This methodology will help in avoiding and mitigating impact to MNES. Ongoing monitoring will help manage impacts and will inform an adaptive management process.

7.2.2 MITIGATION MEASURES

Designing layout to reduce habitat fragmentation impacts to MNES

Prior to final design and construction, the Disturbance Footprint will incorporate design features to further minimise habitat fragmentation and patch isolation.

The incorporation of road pinch points to maximise dispersal between patches of vegetation will be considered to maintain habitat connectivity. While pinch points have a benefit for habitat, they present a technical and logistical barrier to safe and effective construction. Pre-clearance surveys, undertaken at the 30% and 80% Disturbance Footprint design, will determine appropriate locations for road pinch points. The Proponent will consider the use of innovative turbine blade transportation, including methods to minimise necessary clearance widths.

Electricity infrastructure will be designed to allow for safe operations, using buffers between conductors and the ground, and conductors and adjacent vegetation. A significant portion of the 33 kv overhead power has been removed during the most current Proposed Action layout design which will reduce impacts to MNES.

All linear clearing within mapped threatened flora and fauna species habitat will be conducted so as not to exceed the dispersal ability of that species, such that all habitat within the Study Area remaining after the construction phase will still be accessible for the species. All clearing for access corridors will be limited to 40 m in width during the construction phase. Where disturbance to mapped habitat occurs such that any MNES species dispersal ability is likely to be exceeded, adaptive management will be employed to overcome this impact and retain species dispersal ability throughout the entirety of the Study Area and the broader landscape. MNES-specific avoidance, mitigation and management measures, including discussion on retaining species dispersal ability, is outlined in Table 7-2.

Installing fauna crossing infrastructure and glider hollow boxes

Artificial wildlife crossing structures (e.g., glider poles) have been utlised within glider habitat throughout eastern Australia to assist dispersal between areas fragmented by clearing, such as roads and highways (DCCEEW, 2022a). However, only one example of greater gliders using these structures currently exists, at the Sugarloaf Pipeline project in Victoria. Annual monitoring from GHD found greater gliders were occasionally recorded on glider poles at this site, though it was not established whether they were using the structures to cross cleared

areas or to move parallel to gaps (GHD 2017; Dalton 2018 as cited in DCCEEW, 2022). Conservation advice and species-specific guidance suggests further research on greater glider dispersal ability and persistence in fragmented habitat is required (DCCEEW, 2022a; DES, 2022).

Where suitable trees cannot be retained, and linear disturbance within greater glider habitat results in any patch of Likely/Current Denning Habitat and/or Potential/Future Denning Habitat being isolated by a distance greater than the species dispersal ability, glider poles will be installed to re-connect fragmented habitat patches. After an analysis of tree height and greater glider gliding ability, a total of 14 locations has been identified to maintain habitat connectivity throughout the Study Area, requiring approximately 64 poles at 26 m lengths. Locations have been selected by prioritising areas where the footprint intersects denning habitat or creates large, isolated patches, as well as locations with confirmed greater glider records. The design and location selected for this mitigation measure has been guided by requirements outlined within the *Fauna Sensitive Transport Infrastructure Delivery, Chapter 6: Mitigation* (DTMR, 2024). This measure will also include a commitment to undertake monitoring of the glider poles, using non-invasive techniques such as camera traps, to monitor species presence and infrastructure use. This monitoring effort will contribute to the ongoing effort to establish if the species will use fauna-crossing infrastructure, and if glider poles are an effective measure to restore greater glider dispersal in fragmented habitat, particularly in Central Queensland where such information is currently lacking.

Greater gliders have been recorded utilising nest boxes at several projects between Victoria, NSW and Queensland (DCCEEW, 2022a; Wildlife Preservation Society of Queensland, 2025). A NSW study involving artificial denning infrastructure intended to mitigate the loss of tree hollows also made one record of a yellow-bellied glider using a nest box (Goldingay, Rohweder, & Taylor, 2020). If the Disturbance Footprint cannot be refined to avoid hollow bearing trees identified as potential glider denning resources, a fauna spotter-catcher (see below Section) will assess the best course of action. Field-verified hollow bearing trees with suitable greater glider hollows required for removal within the Disturbance Footprint will be replaced with fauna denning infrastructure (e.g., translocated tree hollows or artificial glider nesting boxes), at a 1:1 ratio. Based on an analysis of field survey data, it is estimated that greater glider denning habitat has an average of approximately 12 suitable hollow bearing trees/ha. It is therefore estimated that approximately 238 suitable hollow bearing trees occur within the Disturbance Footprint. Pre-clearance surveys will confirm the actual number of suitable hollow bearing trees to be impacted after micro-sighting. This measure will also include a commitment to undertake monitoring of the hollow boxes, using non-invasive techniques such as camera traps, to monitor species presence and infrastructure use. This monitoring effort will contribute to the ongoing effort to establish if gliders will use nesting boxes as a replacement for lost tree hollows.

Specific guidance on the use of glider poles and glider hollow boxes for the Proposed Action, including evaluating when infrastructure is required, expert consultation, species-specific features and dimensions for optimal utilisation, installation procedures and monitoring will be addressed within the CEMP.

Fauna sensitive fence design

Where fencing is required for linear infrastructure (road corridors or transmission lines) fencing will be designed and installed in accordance with *Koala-sensitive Design Guideline* (DES, 2022).

If additional fencing is required, fencing design will, at a minimum, include the following features:

- No barbed-wire to be used on any level of fencing to avoid entanglement of greater gliders, yellow-bellied gliders, large-eared pied bats and koalas; and
- A minimum gap of 300 mm between the ground and the lowest rail to allow koalas to move underneath the fence.

Fauna spotter-catchers

The Proponent will engage a licensed and suitably qualified fauna spotter-catcher (FSC) to search each infrastructure location for fauna within 48 hours prior to any vegetation clearing. This FSC role will include the detection, capture and removal of wildlife from the Disturbance Footprint. The FSC will have specialised skills and experience sufficient to service this role. Additionally, the FSC will have an understanding of basic ecological principles and knowledge of appropriate local release sites for wildlife. Guidance for FSC work for the Proposed Action will be addressed within the CEMP.

The FSC will visually inspect the vegetation and previously flagged habitat features to locate any fauna. Specific methodology and effort will be employed to detect MNES that are:

- Known or likely to occur;
- Potentially occurring; and
- General roosts or nest sites.

A FSC must be present during vegetation clearing or disturbance to any structures that may serve as wildlife habitat. A clear view of vegetation or habitat features being cleared is important for rapid detection of wildlife that is disturbed or uncovered by the operations. The FSC must remain on site during all vegetation clearing works to minimise direct impacts to MNES.

Where risks are identified from pre-clearance assessments, a qualified FCS will undergo searches immediately prior to clearing of any vegetation for presence of any fauna species. If fauna species or nesting sites are detected, the qualified fauna spotter catcher will assess and conduct the most appropriate method at the time to avoid or minimise impacts from clearing. If relocation is a viable option, considering the impacted species condition, habitat requirements and home range, captured individuals may be released into the Offset Area. Injured, sick or dead fauna will be recorded and reported, for the duration of construction and operation phases. A qualified fauna spotter catcher will carry out impacted fauna reporting during the construction phase. Where injured or sick fauna are detected, individuals will be taken to the nearest wildlife carer or veterinarian if practical.

Where essential microhabitat features are observed within the Disturbance Footprint (e.g. nests, logs, tree hollows), the microhabitat features will be inspected by the FSC for the presence of fauna, eggs or young. Where an absence of fauna, eggs or young can be confirmed, the microhabitat feature will be relocated, if possible, to nearby habitat that will not be disturbed. If the feature cannot be relocated, clearing will occur when no fauna is in the

vicinity of the feature. Where fauna, eggs or young are located within the microhabitat feature, the Disturbance Footprint will be refined accordingly.

Where an ecologist conducting the pre-clearance survey and/or a fauna spotter-catcher identifies a tree hollow that is within mapped glider denning habitat and likely to be suitable as a glider denning resource, the Disturbance Footprint will be refined to avoid these habitat features where possible. If the Disturbance Footprint cannot be refined to avoid hollow bearing trees identified as potential glider denning resources, the fauna spotter-catcher will assess the best course of action. Field-verified hollow bearing trees required for removal within the Disturbance Footprint will be replaced with fauna denning infrastructure (e.g., translocated tree hollows or artificial glider nesting boxes). This will be guided by the FSC's on-site assessment and provisions outlined in the CEMP. For placement of fauna denning infrastructure consideration needs to be given to the preferred habitat of the displaced MNES (Goldingay, Quin, & Thomas, 2024). Nest box usage is species dependent but whether a nest box is successful can be enhanced by location as well as a design that has a high thermal buffer, with these considerations colonization of nest boxes can be 100% (Gracanin, et al., 2025).

Immediately after capture, and prior to release, all animals will be identified to species level and examined for signs of injury or illness. A licenced wildlife carer and/or veterinarian will be contactable to take any wildlife requiring further examination or treatment. Where a veterinarian or licenced wildlife carer is not available and the animal is experiencing unnecessary and unjustified suffering, humane euthanasia will be undertaken in appropriate circumstances by an FSC who is suitably experienced, informed and licensed.

Manage invasive plants and animals

Invasive plant and animal management is identified as measures for conservation effort generally for all identified MNES. The management of predatory and invasive species will be addressed within the Biosecurity Management Plan, which will include site-specific biosecurity measures. This Biosecurity Management will be implemented during the construction, operation and decommissioning phases of the Proposed Action.

The Biosecurity Management will include measures such as vehicle wash downs, weed certification (the Biosecurity Management will also include a bio-hygiene declaration that will need to be completed upon entry into the Study Area as required by landowners), and obligations to remain on access tracks throughout the Study Area, particularly within the Disturbance Footprint. Activities will be planned so that movement of vehicles, plant, machinery and equipment avoid moving between properties as much as practicable. Access to a land holder's property will not occur unless authorised under a land use agreement.

Weeds of National Significance (WoNS) listed under the EPBC Act as well as Restrictive and Prohibited Invasive flora and fauna (restricted matters), listed under the Queensland *Biosecurity Act 2014* (Qld), will be identified, monitored and controlled within the Study Area. Weed management and control methods will depend upon the location, weed species identified, the degree of the infestation, relevant landholder agreement or conduct and compensation agreement provisions, and local, state and national regulatory requirements. Weed control will be conducted by a suitably qualified bush regeneration contractor.

Staff and contractors will be given information on the location and consequences of biosecurity threats in the Study Area. Access roads, easements and yards will be kept weed free.

Imported materials able to transport weed seeds will be assessed to ensure they are free of contamination, disease and invasive weeds.

Manage fire regimes and bushfire risk

A Bushfire Management Plan will be developed and implemented during construction and operation phase to mitigate the potential impact of fires to MNES habitat. The Bushfire Management Plan is discussed further in Section 7.8.3.

Manage impacts from altered hydrology

The following best-practice measures are to be implemented to manage and mitigate the potential impacts from altered hydrology, in particular risks to the Great Barrier Reef, caused by increased erosion and sedimentation as a result of the Proposed Action:

- The ESCPC explains the adoption of preventative measures to reduce erosion and sediment entering waterways. Rainfall data for the region (refer to Section 5.6.1) indicates a wet season from October to February, with a dry period from April to September;
- Construction to be completed in phases so that the extent/number of disturbance areas at any given time is limited;
- A stabilised entry/exit point (rumble pad) to be established and maintained for each area of the Study Area with all-weather access to a sealed road. The stabilised entry and exit points will include a vehicle cleaning area to mitigate the transportation of dust and dirt;
- Disturbed areas to be temporarily stabilised during periods of inactivity, and permanently stabilised at the conclusion of the disturbance works;
- Vegetation Clearing Plan to be developed, with staging set to occur immediately prior to soil disturbance to minimise soil exposure extent and duration;
- In areas where the slope exceeds 1 in 10 (steeper than a ratio of 1 vertical unit for every 10 horizontal units), hydraulically applied blankets such as bonded fibre matrix (BFM) or compost blankets to be implemented to promote the establishment of a vegetative cover. BFM will also assist in reducing the effect of raindrop impact erosion;
- Access tracks will be constructed in accordance with *Erosion control on property roads and tracks - managing runoff* (Queensland Government, 2018);
- Scour protection to be installed along drainage features to disperse and dissipate the energy of surface water flows. Protection may include features such as rock, concrete, or geo-fabric linings, or the establishment of vegetation and/or jute-matting;
- Flow diversion banks, diversion channels, catch drains, table drains, chutes and clean water diversions to be installed along the high side of each disturbance area to ensure that during and after storm events, clean water upstream flows entering the Study Area are not contaminated with construction material and/or particulates that might enter the downstream system;
- Sediment fences to be placed along the low side of work areas as a means of slowing flows, reducing scour, and capturing some sediment runoff;
- Channel clearing and stabilisation requirements for the work to be established in line with the best practice channel clearing and stabilisation requirements identified in International Erosion Control Association (IECA) (2008) Table I11, as a minimum, for all watercourse crossings identified;
- Channel crossing works to be compliant with the acceptable development outcomes for waterway barrier works (regulated by Queensland Government);

- In-stream works to be undertaken during periods when flows are minimal, if not absent; and
- Regular inspection and maintenance of ESC structures. Following rainfall events sufficient to produce runoff, inspection of erosion control measures and removal of collected material will be undertaken. Replacement of any damaged structures should be performed immediately.

All ESC structures are to be implemented in accordance with the IECA BPESC Book 1 (2008) with sizing of drainage controls undertaken in accordance with the methodology and principles described in the Queensland Urban Drainage Manual.

Other potential water quality related impacts may that arise as a result of the Proposed Action (such as spills and concrete pollution) will be addressed through the following measures:

- Areas for plant and construction material storage are to be designated along with associated diversion drains and spillage holding ponds. The BESS and any chemical storage facilities (such as the O&M Facility) are to be bunded to contain any leaks or spills;
- Site personnel to be made aware of the correct spill response and management procedures that are to be implemented within the Study Area, with spill response kits to be made available on site and in each vehicle;
- Water for earthworks and dust suppression is likely to be locally sourced from groundwater (artesian and sub-artesian), rainwater (sourced from dams or collection ranks), or offsite;
- On-site cement/concrete mixing carried out behind earth bunds (or other such measures) to capture and contain concrete-laden waste and spills;
- All concrete batching and pouring equipment will be rinsed in the designated on-site wash-down areas. Equipment wash-down water will not be diverted into the stormwater system, rather contained on site prior to treatment or disposal; and
- The site manager is to ensure that all sediment controls are in place prior any concrete pouring occurs.

The CEMP and a site-specific ESCPC will be developed to detail the required control measures, engineering drawings, and ongoing maintenance measures and schedules. The persons responsible for the controls and procedures adopted to mitigate surface water impacts should also be identified in these plans. At the operational phase, the CEMP will be transitioned into an OEMP.

A baseline surface water quality monitoring program will be implemented prior to the commencement of construction activities, with the aim to ensure water quality objectives are met and that potential impacts to water quality during can be monitored and mitigated as required.

Recommended sampling locations include upstream and downstream along:

- Dawson River;
- Castle Creek;
- Oxtrack Creek;
- Boam Creek;
- South Creek;
- Keen Creek; and
- Six Mile Creek.

The water quality monitoring program should seek to monitor for the following parameters:

- pH;
- Conductivity;
- Dissolved Oxygen;
- Turbidity;
- Total Suspended Sediment (TSS);
- Ammonia;
- Total nitrogen (TN); and
- Total Kjeldahl Nitrogen (TKN).

Reduce environmental pollution

Risk of environmental pollutants affecting MNES will be managed through the site-specific CEMP. Auditing of the CEMP, led by the Proponent or lead construction contractor, will occur monthly during construction. Staff and contractors will be made aware through general site induction and training of the potential to generate pollution (including through improper handling of hazardous materials and generation of dust, light and noise) and management measures that must be implemented.

All hazardous materials bought on-site will be accompanied by a Material Safety Data Sheet (MSDS), and all relevant personnel will be trained in their proper use. Only registered herbicides will be used for weed management, and only used by a suitably qualified bush regeneration contractor. Imported materials that are able to transport hazardous substances will be assessed by the Proponent or lead construction contractor to ensure they are free of contamination, disease and invasive species. All waste generated on-site will be managed in accordance with the legislation relevant to its classification, with general waste managed under the Waste Reduction and Recycling Act 2011 (QLD) and regulated waste managed under the Environmental Protection Act 1994 (QLD).

Dust will be minimised through engineering controls on machinery and other available dust suppression controls (water carts, sprinklers and covering stockpiles etc). Additionally, vehicles will adhere to speed limits within the Study Area to reduce dust generation. Disturbance from blasting will be minimised through engineering controls and other available blasting suppression, such as barrier walls, to avoid unnecessary ground vibrations, flying rocks, and dust generation that could cause disturbance to fauna and cause damage to vegetation.

Lighting will only be installed where it is necessary (e.g., as a safety or accessibility measure) to reduce light pollution impacts. Light pollution will also be minimised through engineering controls on infrastructure and machinery, such as colour selection to minimise attracting invertebrates, and timing controls to avoid periods of high fauna activity.

Noise protocols in regard to social impacts will be provided in the CEMP. Mitigation measures for ecological impacts from noise may include:

- Utilising hardware that produces the least amount of noise (while maintaining job suitability and performance);
- Idling of machinery, plant and vehicles will occur only when performing tasks necessary for the machinery, plant and vehicles to be idle;
- Sensitive periods and locations where fauna are reliant on vocal behaviour (e.g., dusk for koala during breeding season) will be identified and avoided (e.g., scheduling work during

the day, and consideration to take into account placement of machinery, plant and vehicles nearby sensitive receptors (such as water sources)).

Site inductions and training

Site inductions, training, pre-start meetings and inspections will be undertaken according to the site-specific CEMP. All staff and contractors visiting or working on site will be made aware, through general site induction and training and review of management plans, of the potential to impact MNES. All staff and contractors will be aware of their obligations to adhere to mitigation and management measures relevant to their works on site, and reporting requirements for any incidents or near-misses related to MNES.

All staff and contractors operating vehicles, plant and machinery will comply with site-specific road rules and speed limits to minimise the likelihood of impacts to MNES, including collisions with fauna and damage to vegetation. Site entry and exit points and access tracks will be clearly mapped, signed and communicated to ensure vehicle movements are contained within the approved areas. Night-time safe driving controls will also be applied, including additional speed restrictions, providing additional protection for nocturnal animals.

Trenching and excavations have the potential to entrap fauna. Where excavations are required to be left open and unattended, suitable fauna escape measures, such as battered sides or escape ramps, will be installed. Staff and contractors conducting earthworks will check excavations for fauna before backfilling occurs.

All staff and contractors will be aware of their obligations to report any injured, sick or dead fauna. All incidents of fauna mortality will be recorded and reported, during and after the construction and operation phases. This can be carried out by an FSC during periods where disturbance is expected to occur (primarily construction activities). Where injured or sick fauna is detected, individuals will be taken to the nearest wildlife carer or veterinarian if practical. This will be conducted by the FSC.

Daily pre-start meetings or 'toolbox talks', led by the Proponent or lead construction contractor, will be conducted to relay any site-specific clearing information to all staff and contractors. Sightings, incidents and near-misses will be discussed in daily pre-starts during the construction phase. Where reasonable and practicable, all near misses and incidents will be investigated to establish root cause. Where necessary, corrective actions will be developed to improve existing processes.

Site inspections will be undertaken monthly at a minimum to review the efficacy of MNES control measures during construction. This inspection will be led by the Proponent or lead construction contractor with guidance from a suitably qualified ecologist (where necessary). Where necessary, corrective actions will be developed to improve existing processes.

Revegetation and rehabilitation (Type 1 and 2)

Rehabilitation of disturbed areas will be undertaken for the Proposed Action post-construction as well at the end-of-life decommissioning phase. In both cases, the intention is to progressively stabilise areas of disturbance, making them resilient to erosion and weed infestation, and to re-establish appropriate vegetation cover. Following the completion of construction, areas not required for ongoing operational disturbance will be rehabilitated and or regenerated in accordance with the Post-Construction Rehabilitation Plan established in Section 8 of the PER and where not required for ongoing grazing or agricultural practices.

Construction laydown areas and widened access tracks not required for operation will be rehabilitated in accordance with good practice at the time and where not required for ongoing grazing or agricultural practices.

Post-construction rehabilitation will aim to improve 383.8 ha of Type 1 rehabilitation/ revegetation areas, which includes low shrubbery and grass. These areas are identified as not being required during the operational phase of the Proposed Action, but full rehabilitation and planting of tree species cannot occur due to the likelihood of re-disturbance during any maintenance requirements and decommissioning of infrastructure. Therefore, the key objective of Type 1 areas is to restore natural ground cover providing stabilisation and the ability for ground-dwelling species to forage.

Post-construction rehabilitation will also aim to improve 647.2 ha of Type 2 rehabilitation/ revegetation areas, which includes rehabilitation of vegetation without height restrictions.

Details on revegetation and rehabilitation, including objectives, timing and area-specific rehabilitation effort to be employed, are presented in Section 8 of the Theodore Wind Farm PER.

7.3 OPERATIONAL PHASE MEASURES

The following measures are most relevant to the operational phase of the Proposed Action. As outlined in Table 7-1, some measures outlined under the design and construction phases (e.g., **Reduce environmental pollution** (including light and noise), **Manage fire regimes and bushfire risk, Manage impacts from altered hydrology, Site inductions and training**, **Manage invasive plants and animals and Revegetation and rehabilitation (Type 1 and 2)**), are also relevant to this phase.

7.3.1 AVOIDANCE MEASURES

Avoid locating turbines in key MNES habitat

WTG locations have been thoroughly considered during the design phase, with turbines and access corridors located away from key habitats where feasible. This includes avoiding remnant vegetation, waterways and drainage lines and areas likely to provide thermals and updrafts, reducing potential impacts to MNES during the operational phase of the Proposed Action.

Prominent thermals and updrafts are more likely to be present in the north of the Study Area, where landscape features (extending to the north and east outside of the Study Area) contain higher slope gradients that may present a terrain which promotes the occurrence of suitable air currents to support foraging (see Figure 5-16). The Disturbance Footprint avoids the majority of this northern section, reducing the risk of collision of species that use updrafts to enable energy-efficient soaring (i.e. white-throated needletail, fork-tailed swift and raptor species).

Further, the Proposed Action uses turbines with a Rotor Swept Area >40 m above ground level, to provide a collision-free foraging zone within the canopy and 20 m above the canopy, reducing operational disturbance to terrestrial species.

7.3.2 MITIGATION MEASURES

Reduce likelihood of turbine collision and barotrauma impacts

The measures to mitigate bird and bat collision risk with WTGs are detailed in the BBMP (Appendix D). May et al. (2015) notes that species may be discouraged from using WTG occupied areas by making this area less attractive or by making the area outside of that occupied by the WTG more attractive. Some of the mitigation and management measures included in the BBMP for the Proposed Action use this ideology, such as reducing resources in WTG areas to make these regions less attractive to birds and bats. These measures include:

- Reducing WTG lighting (to reduce invertebrate density) where other factors (e.g., aeronautical safety obligations) are not compromised, and considering the use of red or yellow light (generally less attractive to invertebrates than white light); and
- Reducing food, water and perching resources for birds around WTGs.

The Proponent will incorporate the use of innovative blade design features at the "higher risk" turbines outlined in Section 3.3, reducing the risk to soaring bird species. To minimise potential collision rates, innovative blade design may include:

- Acoustic and visual deterrents (e.g., ultrasound acoustic devices, painted blades); and
- Detection systems (e.g., IdentiFlight®, Robin Radar Systems).

The Proposed Action may also implement measures, such as curtailment and acoustic and visual deterrents outlined above, as a corrective action in response to the Significant Residual Impact (SRI) trigger process (see Section 7.8.2 below). Implementation will involve appropriate research and consultation before adopting these measures.

7.4 MAINTENANCE AND DECOMMISSIONING PHASE MEASURES

The following measures are most relevant to the maintenance and decommissioning phases of the Proposed Action.

Maintenance phase impacts are likely to relate to construction/operation traffic movements and plant operation, vegetation clearing within existing access tracks and work areas, and management of invasive species, fire, hydrology and pollution. In general, potential impacts as a result of the decommissioning phase relate to habitat loss and disturbance. Decommissioning phase impacts are therefore similar to those that might occur during the construction phase but likely to be of lower magnitude. Therefore, all measures outlined under the design and construction phases are also relevant to the maintenance and decommissioning phases.

7.4.1 MITIGATION MEASURES

Revegetation and rehabilitation (Type 3)

At the end of the Proposed Action's expected operational timeline, and in the absence of a repowering or extension of asset life agreement being established, the Proposed Action and all associated infrastructure will reach an end-of-life stage.

End-of-life rehabilitation will include 506.4 ha of Type 3 rehabilitation/revegetation areas, which includes returning areas to a pre-development state based on broad habitat types within the nominated footprint. It is noted, access tracks have not been included due to the potential continued use of landholders for rural purposes, however, the Proponent is committed to analysing any potential areas of roads to be rehabilitated.

Type 3 refers to the rehabilitation/ revegetation efforts that will be undertaken after the decommissioning and end-of-life of the Proposed Action, including all areas of disturbance with the exception of those areas to be used for on-going rural activities such as formed access tracks under agreement by the landowner

Details on revegetation and rehabilitation, including objectives, timing and area-specific rehabilitation effort to be employed, are presented in Section 8 of the Theodore Wind Farm PER.

7.5 ENVIRONMENTAL OFFSETS

The Proposed Action has endeavored to avoid and reduce impacts to MNES as much as practicable. As a result of the Impact Assessment (Section 6 of the Theodore Wind Farm PER), it was determined that the Proposed Action is likely to have a SRI on the following MNES:

- Poplar Box Grassy Woodland on Alluvial Plains Threatened Ecological Community (TEC);
- Greater glider (southern and central) (*Petauroides volans*);
- Koala (*Phascolarctos cinereus*); and
- Southern squatter pigeon (*Geophaps scripta scripta*).

Additionally, is was concluded that the Proposed Action has the potential to significantly impact diamond firetail.

As such, the Proponent is required to offset the removal of habitat for the above species. An Offset Management Plan (OMP) has been developed, outlining proposed offsets for impacts to MNES, developed in accordance with the EPBC Act Environmental Offsets Policy (DSEWPC, 2012) and the Proposed Action-specific requirements outlined in the Theodore Wind Farm (EPBC 2024/09842) PER guidelines provided by Department of Climate Change, Environment, Energy and Water (DCCEEW). Environmental offsets for the Proposed Action are further discussed in Section 9 of the Theodore Wind Farm PER. The OMP is attached as Appendix F.

7.6 MNES-SPECIFIC AVOIDANCE, MITIGATION AND MANAGEMENT MEASURES

Conservation advice, threats, relevant measures and specific and measurable environmental outcomes for listed TECs, threatened and migratory species that have been identified as known, likely or potentially occurring within the Study Area are detailed in Table 7-2.

The Proposed Action will result in some disturbance to habitat for those MNES assessed as known, likely or having potential to occur, but will not exceed the maximum disturbance limits listed below. It should be noted that portions of these cleared areas will be subject to rehabilitation, which lowers the permanent impact to some MNES (depending on specific habitat requirements).

The dispersal ability of each MNES, potential high risk areas for habitat fragmentation and the adaptive management that will be employed if dispersal limits are exceeded is further discussed within Table 7-2.

TABLE 7-2 MNES SPECIFIC AVOIDANCE, MITIGATION AND MANAGEMENT MEASURES

MNES	Relevant Conservation Advice and Policy Objectives	Threats	Avoidance, Mitigation and Management Measures	Corrective Action	Environmental Outcome

Brigalow (*Acacia harpophylla* dominant and co-dominant) TEC (Endangered under the EPBC Act)	*Approved Conservation Advice for the Brigalow (Acacia harpophylla dominant and co-dominant) ecological community* (DoE, Approved Conservation Advice for the Brigalow (Acacia harpophylla dominant and co-dominant) ecological community, 2013)
	
	Objectives (with specific actions to be taken that are relevant to the Proposed Action):
	• Protect and conserve remnant and regrowth areas of the ecological community. Prevent clearance of this endangered ecological community and of nearby native vegetation including buffer zones and connecting corridors.
	• Where further clearance is unavoidable:
	  ◦ mitigate the severity of impacts (e.g. avoid higher quality areas, avoid dissection of patches, act to minimise hydrological disruption and the spread of weeds); and,
	  ◦ offsetting should consider the location and emulate qualities of affected patches.
	• Manage areas of the Brigalow ecological community to reduce threats, including through:
	  ◦ fire management that considers Brigalow conservation, protection, and ecological heterogeneity; and
	  ◦ targeted weed and feral animal control with a particular focus on high biomass exotic grasses (buffel grass, Rhodes grass, green panic grass) and feral pigs.
	• Manage all weeds appropriately within and
		Key threats include (DoE, Approved Conservation Advice for the Brigalow (Acacia harpophylla dominant and co-dominant) ecological community, 2013):
		• Clearing
		• Fire
		• Invasive Species:
		  ◦ Weeds
		  ◦ Pest animals
		• Inappropriate grazing regimes
		• Climate change
			• TECs have been mapped and the Proponent has continued to design a Disturbance Footprint that minimises disturbance to TEC wherever possible, with particular focus on avoided areas of higher quality TEC.
			• Areas mapped to be impacted by the Proposed Action will be clearly delineated and communicated, ensuring that the Disturbance Footprint does not extend further than planned to create unnecessary fragmentation or disturbance.
			• Pre-clearance surveys will be undertaken at the 30% and 80% Disturbance Footprint design to search for MNES, to define locations of populations, and guide micro-siting and additional avoidance measures.
			• Prior to final design and construction, the Proposed Action layout will incorporate design features to further minimise habitat fragmentation and patch isolation, such as road pinch points.
			• Invasive plant and animals will be managed in accordance with a Biosecurity Management Plan in accordance with the *Biosecurity Act 2014 (Qld).*
			• This Biosecurity Management Plan will be implemented for the site which includes requirements for vehicle washdowns and protocols to ensure activities are planned to minimise movement of vehicles, equipment and machinery outside of designated access corridors.
			• A Bushfire Management Plan will be developed and implemented during construction and operation to mitigate the potential impact of fires to MNES and their habitat.
			• Best-practice measures will be implemented to manage and mitigate the potential impacts from altered hydrology, such as habitat degradation, caused by increased erosion and sedimentation as a result of the Proposed Action.
			• Environmental pollutants affecting MNES will be managed through the site-specific CEMP. Staff and contractors will be made aware through general site induction and training of the potential to generate pollution (including through improper handling of hazardous materials and generation of dust, light and noise) and management measures that must be implemented.
			• Site inductions, training, pre-start meetings and inspections will be undertaken according to the CEMP. All staff and contractors visiting or working on site will be made aware of the potential to impact MNES and measures to be followed, such as safe driving speeds, and their obligations to report any damaged vegetation.
				Where reasonable and practicable, all near misses and incidents will be investigated to establish root cause.
				
				Where necessary, corrective actions will be developed to improve existing processes.
					No more than 1.1 ha (or 0.5%) of the TEC will be subject to long-term disturbance as a result of the Proposed Action.
					
					The functional value of all remaining TEC within the Study Area will be maintained.

MNES	Relevant Conservation Advice and Policy Objectives	Threats	Avoidance, Mitigation and Management Measures	Corrective Action	Environmental Outcome
	close to the Brigalow ecological community; e.g.: ◦ spot application of herbicides, rather than aerial spraying; ◦ avoid fertiliser application; • Minimise tree thinning and soil disturbance. • Manage foxes and cats (as well as feral pigs) using a coordinated approach, preferably among groups of neighbours and across regions. • Help woodland birds to avoid aggression from noisy miners by: encouraging and protecting shrubby understorey; managing grazing pressure so that it does not degrade native vegetation; and retaining dense stands of trees and regrowth.				
Poplar Box Grassy Woodlands on Alluvial Plains TEC (Endangered under the EPBC Act)	*Conservation Advice (including listing advice) for the Poplar Box Grassy Woodland on Alluvial Plains* (DoEE, 2019) Objectives (with specific actions to be taken that are relevant to the Proposed Action): • Prevent further clearance, fragmentation or detrimental modification of remnants of the ecological community and of surrounding native vegetation. • Recognise the landscape position of remnants of the ecological community and ensure that planning supports increased resilience within the landscape. • Prevent impacts to native vegetation, native fauna, hydrology or soil structure from any developments and activities adjacent to or near patches of the ecological community by planning for and appropriately avoiding or mitigating off-site effects. • Protect mature trees, particularly with hollows,	Key threats include (DoEE, 2019): • Clearance and fragmentation • Weed invasion • Inappropriate fire and grazing regimes • Dieback • Chemical impact and spray drift • Hydrological changes • Salinization • Nutrient enrichment • Invasive fauna • Climate change	• TECs have been mapped and the Proponent has continued to design a Disturbance Footprint that minimises disturbance to TEC wherever possible, with particular focus on avoided areas of higher quality TEC. • Areas mapped to be impacted by the Proposed Action will be clearly delineated and communicated, ensuring that the Disturbance Footprint does not extend further than planned to create unnecessary fragmentation or disturbance. • Pre-clearance surveys will be undertaken at the 30% and 80% Disturbance Footprint design to search for MNES, to define locations of populations, and guide micro-siting and additional avoidance measures. • Prior to final design and construction, the Proposed Action layout will incorporate design features to further minimise habitat fragmentation and patch isolation, such as road pinch points. • Invasive plant and animals will be managed in accordance with a Biosecurity Management Plan in accordance with the *Biosecurity Act 2014 (Qld).* • This Biosecurity Management Plan will be implemented for the Study Area which includes requirements for vehicle washdowns and protocols to ensure activities are planned to minimise movement of vehicles, equipment and machinery outside of designated access corridors. • A Bushfire Management Plan will be developed and implemented during construction and operation to mitigate the potential impact of fires to MNES and their habitat. • Best-practice measures will be implemented to manage and mitigate the potential impacts from altered hydrology, such as habitat degradation, caused by increased erosion and sedimentation as a result of the Proposed Action. • Environmental pollutants affecting MNES will be managed through the site-specific CEMP. Staff and contractors will be made aware through general site induction and training of the potential to generate pollution (including through improper handling of hazardous materials and generation of dust, light and noise) and management measures that must be implemented.	Where reasonable and practicable, all near misses and incidents will be investigated to establish root cause. Where necessary, corrective actions will be developed to improve existing processes.	No more than 1.2 ha (or 0.3%) of the TEC will be subject to long-term disturbance as a result of the Proposed Action. The functional value of all remaining TEC within the Study Area will be maintained.

MNES	Relevant Conservation Advice and Policy Objectives	Threats	Avoidance, Mitigation and Management Measures	Corrective Action	Environmental Outcome
	even if they are dead. Large and old trees may have numerous fissures that provide shelter. • Avoid significant changes to water table levels and /or run-off, salinity, pollution and water flow patterns arising from developments. • Manage access to remnants to prevent, for example, disturbance and spread of weeds and plant pathogens. • Protect the native soil seed bank by minimising soil disturbance and removal. • Retain habitat features for fauna, noting species requirements (e.g. fallen timber) or particular vegetation structure. • Prior to removal of any trees, or use of heavy machinery that may also damage the understorey, ensure comprehensive flora and fauna surveys have identified threatened species on site and their potential shelter and nesting sites. • Following disturbances, implement a weed control program that responds to weed establishment, particularly in the following 1–2 years after disturbance. • Implement effective control and management techniques for invasive grasses, such as *Cenchus ciliaris* (buffel grass). • Monitor for signs of new disease such as myrtle rust or incursions by new weeds (for example, African boxthorn or blackberry), or pest animals, (for example goats, rabbits and deer) and manage early for local eradication. • Use appropriate hygiene to minimise the introduction or spread of weeds and diseases at susceptible sites. For example, keep vehicles and machinery to dedicated roads and out of remnants wherever possible. If		• Site inductions, training, pre-start meetings and inspections will be undertaken according to the CEMP. All staff and contractors visiting or working on site will be made aware of the potential to impact MNES and measures to be followed, such as safe driving speeds, and their obligations to report any damaged vegetation. • As a result of the Impact Assessment (see Section 6 of the Theodore Wind Farm PER), it was determined that the Proposed Action is likely to have a SRI on Poplar Box Grassy Woodlands on Alluvial Plains TEC. As such, the Proponent is required to offset the removal of TEC, which will be managed in line with the OMP (see Section 9 of the Theodore Wind Farm PER).		

MNES	Relevant Conservation Advice and Policy Objectives	Threats	Avoidance, Mitigation and Management Measures	Corrective Action	Environmental Outcome
	vehicles must be taken into remnants ensure vehicles are washed first to remove soil, potential fungal pathogens and weed seeds. • Implement appropriate fire management regimes for the ecological community that take into account results from research. • Enhance the resilience of the ecological community to the impacts of climate change by relieving other pressures, in particular by implementing actions in this advice regarding vegetation clearance, invasive species and fire.				
Greater glider (southern and central) (Endangered under the EPBC Act)	*Conservation Advice for Petauroides volans (Greater Glider (southern and central)* (DCCEEW, 2022a) Conservation and management priorities (that are relevant to the Proposed Action) include: • Implement and enforce measures to reduce direct mortality and loss of hollow-bearing trees during site preparation and execution of prescribed burns. • Protect and maintain sufficient areas of suitable habitat, including denning and foraging resources and habitat connectivity, to sustain viable subpopulations throughout the species' range. • Protect hollow-bearing trees on private property, roadside reserves, and along the edges of roads/tracks. Prior to removing trees identified to be a 'hazard', undertake a risk assessment by a suitably qualified person to determine whether their removal is necessary, including a consideration of the potential impacts of removal on the greater glider. Incorporate measures to ensure ongoing recruitment of hollow-	Threats include (DCCEEW, 2022a): • Frequent and intense bushfires • Inappropriate prescribed burning • Climate change – increased temperature and changes in rainfall patterns • Habitat loss by land clearing (including timber harvesting) Other threats with minor consequences are: • Mortality from barbed wire fencing • Hyper predation by owls • Competition by sulphur-crested cockatoos • Predation by feral cats • Predation by European red foxes	• Species habitat has been mapped and the Proponent has continued to design a Disturbance Footprint that minimises disturbance to habitat wherever possible, with particular focus on avoided areas of higher value denning habitat. • Areas mapped to be impacted by the Proposed Action will be clearly delineated and communicated, ensuring that the Disturbance Footprint does not extend further than planned to create unnecessary fragmentation or disturbance. • Pre-clearance surveys will be undertaken at the 30% and 80% Disturbance Footprint design to search for MNES, to define locations of populations, and guide micro-siting and additional avoidance measures, such as species translocation. • Prior to final design and construction, the Proposed Action layout will incorporate design features to further minimise habitat fragmentation and patch isolation, such as road pinch points. • Greater gliders usually glide no further than 30 m and tend to have a steeper glide trajectory compared to other gliding mammals (NSW Scientific Committee, 2024). However, they can reportedly cover distances up to 100 m (NSW Scientific Committee, 2024), and observations have been made of individuals gliding over distances of 75 m from a tree canopy 45 m high (Taylor & Goldingay, 2009). Glider poles will be installed at identified locations impacted by the Proposed Action to maintain greater glider habitat connectivity. • Where required, a licensed and suitably qualified FSC will search each infrastructure location for fauna within 48 hours prior to any vegetation clearing, to further avoid identified MNES and key habitat features, and relocate MNES and key habitat features where not. • Invasive plant and animals will be managed in accordance with a Biosecurity Management Plan in accordance with the *Biosecurity Act 2014 (Qld).* • This Biosecurity Management Plan will be implemented for the site which includes requirements for vehicle washdowns and protocols to ensure activities are planned to minimise movement of vehicles, equipment and machinery outside of designated access corridors. • A Bushfire Management Plan will be developed and implemented during construction and operation to mitigate the potential impact of fires to MNES and their habitat. • Best-practice measures will be implemented to manage and mitigate the potential impacts from altered hydrology, such as habitat degradation, caused by increased erosion and sedimentation as a result of the Proposed Action. • Environmental pollutants affecting MNES will be managed through the site-specific CEMP. Staff and contractors will be made aware through general site induction and	Where reasonable and practicable, all near misses and incidents will be investigated to establish root cause. 7.2.2	No more than 19 ha (or 1.1%) of Likely/Current Denning Habitat, 0.8 ha (or 0.2%) of Potential/Future Denning Habitat and 623.9 ha (or 3.1%) of Foraging and Dispersal Habitat will be subject to long-term disturbance as a result of the Proposed Action. The functional value of all remaining habitat within the Study Area will be maintained. Linear clearing will not permanently impact the dispersal ability of the species and therefore will not fragment habitat for the species.

MNES	Relevant Conservation Advice and Policy Objectives	Threats	Avoidance, Mitigation and Management Measures	Corrective Action	Environmental Outcome
	bearing trees into planning processes. • Avoid fragmentation and loss of habitat due to development of new transport corridors. Include consideration of the species in planning processes, and re-locate recreational activities and roads away from habitat. • Revise mitigation and offset guidelines for development and linear infrastructure (e.g. pipelines, transport corridors) to reflect the limited effectiveness of artificial structures (nest boxes, glider poles) as mitigation actions for loss, degradation or fragmentation of greater glider habitat. • Protect all habitat likely to be climate change refuges, including sites buffered against desiccating conditions (e.g. sheltered and/or on south-facing aspects), under future climate change scenarios. Maintain or establish connectivity with other habitat in order to facilitate movement.		training of the potential to generate pollution (including through improper handling of hazardous materials and generation of dust, light and noise) and management measures that must be implemented. • Site inductions, training, pre-start meetings and inspections will be undertaken according to the CEMP. All staff and contractors visiting or working on site will be made aware of the potential to impact MNES and measures to be followed, such as safe driving speeds, fauna-safe excavation practices, and their obligations to report any injured, sick or dead fauna. • Rehabilitation of disturbed areas will be undertaken post-construction, as well at the end-of life decommissioning phase, restoring erosion and weed resilience and to re-establishing vegetation cover for ground-dwelling species to forage and disperse. • As a result of the Impact Assessment (see Section 6 of the Theodore Wind Farm PER), it was determined that the Proposed Action is likely to have a SRI on greater glider. As such, the Proponent is required to offset the removal of greater glider habitat, which will be managed in line with the OMP (see Section 9 of the Theodore Wind Farm PER).		
Yellow-bellied glider (south-eastern) (Vulnerable under the EPBC Act)	*Conservation Advice for Petaurus australis australis (Yellow-bellied Glider (south-eastern))* (DAWE, 2022a) Conservation and management priorities (that are relevant to the Proposed Action) include: • Ensure suitable habitat is maintained and protected from known threats (such as high severity bushfires) around important subpopulations, as well as in areas where subpopulations have already declined through loss of habitat. When protecting an area, retain sufficient suitable habitat for subpopulation viability.	Threats include (DAWE, 2022a): • Climate change • Altered fire regimes • Land clearing and fragmentation (including timber harvesting) Other threats with less severe consequences are: • Predation by invasive species • Mortality by barbed wire fence • Habitat degradation by feral deer • Habitat degradation by *Phytophthora cinnamon*	• Species habitat has been mapped and the Proponent has continued to design a Disturbance Footprint that minimises disturbance to habitat wherever possible, with particular focus on avoided areas of higher value denning habitat. • Areas mapped to be impacted by the Proposed Action will be clearly delineated and communicated, ensuring that the Disturbance Footprint does not extend further than planned to create unnecessary fragmentation or disturbance. • Pre-clearance surveys will be undertaken at the 30% and 80% Disturbance Footprint design to search for MNES, to define locations of populations, and guide micro-siting and additional avoidance measures, such as species translocation. • Prior to final design and construction, the Proposed Action layout will incorporate design features to further minimise habitat fragmentation and patch isolation, such as road pinch points. • Yellow-bellied glider has a glide ratio of around 2.0 and a maximum glide distance that could be as high as 120 m–140 m (DAWE, 2022a). All clearing for access corridors will not exceed the dispersal ability of the species, such that all habitat within the Study Area remaining after the construction phase will still be accessible for the species. • Where required, a licensed and suitably qualified FSC will search each infrastructure location for fauna within 48 hours prior to any vegetation clearing, to further avoid identified MNES and key habitat features, and relocate MNES and key habitat features where not.	If species is identified within Study Area, re-mapping of habitat will occur as required, and additional mitigation measures will be implemented. Where reasonable and practicable, all near misses and incidents will be investigated to establish root cause. Where necessary, corrective actions will be developed to improve existing processes. This may include installation of glider poles or hollow boxes to restore habitat connectivity and denning	No more than 0.3 ha (or 1.6%) of Potential Denning Habitat and 5.4 ha (or 4.9%) of Potential Foraging Habitat will be subject to long-term disturbance as a result of the Proposed Action. The functional value of all remaining habitat within the Study Area will be maintained. Linear clearing will not permanently impact the dispersal ability of the species and therefore will not fragment habitat for the species.

MNES	Relevant Conservation Advice and Policy Objectives	Threats	Avoidance, Mitigation and Management Measures	Corrective Action	Environmental Outcome
	• Avoid planned burns, clearing, timber harvesting or other disturbance in a 65 ha zone around habitat which has been burnt in the past 10 years. • If possible, avoid the use of barbed wire and modify existing barbed wire by replacing the top strand of barbed wire with plain or plastic-coated wire. • Protect all habitat projected to be suitable as refuge sites under future climate change scenarios (as informed by research) and maintain and establish connectivity to facilitate movement.		• Invasive plant and animals will be managed in accordance with a Biosecurity Management Plan in accordance with the *Biosecurity Act 2014 (Qld).* • This Biosecurity Management Plan will be implemented for the site which includes requirements for vehicle washdowns and protocols to ensure activities are planned to minimise movement of vehicles, equipment and machinery outside of designated access corridors. • A Bushfire Management Plan will be developed and implemented during construction and operation to mitigate the potential impact of fires to MNES and their habitat. • Best-practice measures will be implemented to manage and mitigate the potential impacts from altered hydrology, such as habitat degradation, caused by increased erosion and sedimentation as a result of the Proposed Action. • Environmental pollutants affecting MNES will be managed through the site-specific CEMP. Staff and contractors will be made aware through general site induction and training of the potential to generate pollution (including through improper handling of hazardous materials and generation of dust, light and noise) and management measures that must be implemented. • Site inductions, training, pre-start meetings and inspections will be undertaken according to the CEMP. All staff and contractors visiting or working on site will be made aware of the potential to impact MNES and measures to be followed, such as safe driving speeds, fauna-safe excavation practices, and their obligations to report any injured, sick or dead fauna. • Rehabilitation of disturbed areas will be undertaken post-construction, as well at the end-of life decommissioning phase, restoring erosion and weed resilience and to re-establishing vegetation cover for ground-dwelling species to forage and disperse.	resources, under guidance addressed within the CEMP (see Section 7.2.2 for further detail).	
Koala (Endangered under EPBC Act)	*Conservation Advice for Phascolarctos cinereus (Koala) combined populations of Queensland, New South Wales and the Australian Capital Territory* (DAWE, 2022b). Conservation and management priorities (that are relevant to the Proposed Action) include: • Building and sharing knowledge. • Strong community engagement. • Increase habitat protection. • Conservation integrated into policy, statutory and land-use plans. • Strategic habitat restoration. • Active metapopulation management. *National Recovery Plan for the Koala Phascolarctos cinereus (combined populations of Queensland, New South Wales and the Australian Capital Territory)* (DAWE, 2022c)	Threats include (DAWE, 2022b): • Habitat loss and fragmentation • Increased intensity and frequency of drought • Decreased nutritional value of foliage • Heat stress, climate change, bushfire • Wild dog predation • Direct vehicle mortality • Disease	• Species habitat has been mapped and the Proponent has continued to design a Disturbance Footprint that minimises disturbance to habitat wherever possible, with particular focus on avoided areas of higher value breeding and foraging habitat. • Areas mapped to be impacted by the Proposed Action will be clearly delineated and communicated, ensuring that the Disturbance Footprint does not extend further than planned to create unnecessary fragmentation or disturbance. • Pre-clearance surveys will be undertaken at the 30% and 80% Disturbance Footprint design to search for MNES, to define locations of populations, and guide micro-siting and additional avoidance measures, such as species translocation. • Prior to final design and construction, the Proposed Action layout will incorporate design features to further minimise habitat fragmentation and patch isolation, such as road pinch points. • Koalas are known to disperse across distances of 1 to 3 km or more (over 10 km), typically traveling between trees by walking on the ground (Youngentob, Marsh, & Skewes, 2021). Project infrastructure will not inhibit the dispersal ability of koalas across the landscape. • Where required, a licensed and suitably qualified FSC will search each infrastructure location for fauna within 48 hours prior to any vegetation clearing, to further avoid identified MNES and key habitat features where possible, and relocate MNES and key habitat features where not. • Invasive plant and animals will be managed in accordance with a Biosecurity Management Plan in accordance with the *Biosecurity Act 2014 (Qld).* • This Biosecurity Management Plan will be implemented for the site which includes requirements for vehicle washdowns and protocols to ensure activities are planned to minimise movement of vehicles, equipment and machinery outside of designated access corridors.	Where reasonable and practicable, all near misses and incidents will be investigated to establish root cause. Where necessary, corrective actions will be developed to improve existing processes.	No more than 6.2 ha (or 0.4%) of Preferred Breeding and Foraging Habitat and 657.3 ha (or 3.1%) of General Breeding and Foraging Habitat will be subject to long-term disturbance as a result of the Proposed Action. The functional value of all remaining habitat within the Study Area will be maintained. Linear clearing will not exceed the dispersal ability of the species and therefore will not fragment habitat for the species.

MNES	Relevant Conservation Advice and Policy Objectives	Threats	Avoidance, Mitigation and Management Measures	Corrective Action	Environmental Outcome
	Objectives: • Stabilise and increase areas of occupancy that are declining or predicted to decline. • Maintain or increase areas of occupancy that are or are predicted to be stable. • Maintain or improve metapopulation processes. • Give partners, communities, individuals a greater role in listed koala monitoring, conservation, and management.		• A Bushfire Management Plan will be developed and implemented during construction and operation to mitigate the potential impact of fires to MNES and their habitat. • Best-practice measures will be implemented to manage and mitigate the potential impacts from altered hydrology, such as habitat degradation, caused by increased erosion and sedimentation as a result of the Proposed Action. • Environmental pollutants affecting MNES will be managed through the site-specific CEMP. Staff and contractors will be made aware through general site induction and training of the potential to generate pollution (including through improper handling of hazardous materials and generation of dust, light and noise) and management measures that must be implemented. • Site inductions, training, pre-start meetings and inspections will be undertaken according to the CEMP. All staff and contractors visiting or working on site will be made aware of the potential to impact MNES and measures to be followed, such as safe driving speeds, fauna-safe excavation practices, and their obligations to report any injured, sick or dead fauna. • Rehabilitation of disturbed areas will be undertaken post-construction, as well at the end-of life decommissioning phase, restoring erosion and weed resilience and to re-establishing vegetation cover for ground-dwelling species to forage and disperse. • As a result of the Impact Assessment (see Section 6 of the Theodore Wind Farm PER), it was determined that the Proposed Action is likely to have a SRI on koala. As such, the Proponent is required to offset the removal of koala habitat, which will be managed in line with the OMP (see Section 9 of the Theodore Wind farm PER).		
Large-eared pied bat (Endangered under the EPBC Act)	*Conservation Advice for Chalinolobus dwyeri (large-eared pied bat)* (DCCEEW, 2023a) Conservation and management priorities (that are relevant to the Proposed Action) include: • Continue to protect, and prevent adverse impacts to, habitat that is important to the survival of the species in the planning, construction and post construction phases of residential and commercial developments, dam-building, energy production and mining operations. • Reduce the use of pesticides and consider available alternatives in the vicinity of known roosting and foraging habitat. • Establish fire control measures in areas that are burnt by prescribed fire to ensure that vegetation and foraging habitat have an appropriate interval to recover from fire events.	Threats include (DCCEEW, 2023a): • Agricultural, residential and commercial development and associated land clearing. • Dam construction and waterway management. • Energy production and mining. • Fires within foraging distance of roosts. • Climate change. • Habitat disturbance by feral goats. • Predation by introduced species. • Impact of disease. • Disturbance from human recreational activities. • Use of pesticides.	• Species habitat has been mapped and the Proponent has continued to design a Disturbance Footprint that minimises disturbance to habitat wherever possible, with particular focus on avoided areas of higher value foraging habitat. • Areas mapped to be impacted by the Proposed Action will be clearly delineated and communicated, ensuring that the Disturbance Footprint does not extend further than planned to create unnecessary fragmentation or disturbance. • Pre-clearance surveys will be undertaken at the 30% and 80% Disturbance Footprint design to search for MNES, to define locations of populations, and guide micro-siting and additional avoidance measures, such as species translocation. • Prior to final design and construction, the Proposed Action layout will incorporate design features to further minimise habitat fragmentation and patch isolation, such as road pinch points. • Where required, a licensed and suitably qualified FSC will search each infrastructure location for fauna within 48 hours prior to any vegetation clearing, to further avoid identified MNES and key habitat features where possible, and relocate MNES and key habitat features where not. • Invasive plant and animals will be managed in accordance with a Biosecurity Management Plan in accordance with the *Biosecurity Act 2014 (Qld).* • This Biosecurity Management Plan will be implemented for the site which includes requirements for vehicle washdowns and protocols to ensure activities are planned to minimise movement of vehicles, equipment and machinery outside of designated access corridors. • A Bushfire Management Plan will be developed and implemented during construction and operation to mitigate the potential impact of fires to MNES and their habitat. • Best-practice measures will be implemented to manage and mitigate the potential impacts from altered hydrology, such as habitat degradation, caused by increased erosion and sedimentation as a result of the Proposed Action. • Environmental pollutants affecting MNES will be managed through the site-specific CEMP. Staff and contractors will be made aware through general site induction and	Where reasonable and practicable, all near misses and incidents will be investigated to establish root cause. Where necessary, corrective actions will be developed to improve existing processes. Corrective actions with respect to collision risk are outlined in the BBMP (Appendix D), but involve establishment of impact triggers that if met, will trigger adaptive management. The Proposed Action may implement measures, such as curtailment and acoustic and visual deterrents outlined above, as a corrective action in response to the SRI trigger process.	No more than 16.5 ha (or 0.6%) of Foraging Habitat will be subject to long-term disturbance as a result of the Proposed Action. The functional value of habitat within the Study Area will be maintained. Linear clearing will not exceed the dispersal ability of the species and therefore will not fragment habitat for the species. Development of management and corrective actions to minimise risk of turbine collision (significant impact threshold for large-eared pied bat: WTG mortality or injury to 20 individuals).

MNES	Relevant Conservation Advice and Policy Objectives	Threats	Avoidance, Mitigation and Management Measures	Corrective Action	Environmental Outcome
	National recovery plan for the large-eared pied bat Chalinolobus dwyeri (DERM, 2011) Objectives: • Identify priority roost and maternity sites for protection. • Implement conservation and management strategies for priority sites. • Educate the community and industry to understand and participate in the conservation of the large-eared pied bat. • Research the large eared pied bat to augment biological and ecological data to enable conservation management. • Determine the meta-population dynamics.		training of the potential to generate pollution (including through improper handling of hazardous materials and generation of dust, light and noise) and management measures that must be implemented. • Site inductions, training, pre-start meetings and inspections will be undertaken according to the CEMP. All staff and contractors visiting or working on site will be made aware of the potential to impact MNES and measures to be followed, such as safe driving speeds, fauna-safe excavation practices, and their obligations to report any injured, sick or dead fauna. • Rehabilitation of disturbed areas will be undertaken post-construction, as well at the end-of life decommissioning phase, restoring erosion and weed resilience and to re-establishing vegetation cover for ground-dwelling species to forage and disperse. • Mitigation and management measures included in the BBMP will reduce likelihood of turbine collision and barotrauma impacts, such as reducing resources in WTG areas to make these regions less attractive to birds and bats. • The Proponent will use of innovative blade design features for high-risk turbines (identified within the BBMP (Appendix D), to minimise potential collision rates.		
Southern squatter pigeon (Vulnerable under the EPBC Act)	*Conservation Advice for Geophaps scripta scripta (Squatter Pigeon (Southern))* (TSSC, 2015) Conservation and management priorities (that are relevant to the Proposed Action) include: • Identify high-conservation priority populations, especially in the species' southern range. • Protect and rehabilitate areas of vegetation that support important populations. • Develop conservation agreements and stock management plans. • Eradicate feral herbivores in regions of known populations. • Monitor selected sub-populations to observe rates of population change.	Threats include (TSSC, 2015): • Overgrazing, specifically by sheep, though other livestock can be harmful too, specifically trampling of nests from cattle. • Drought. • Vegetation clearing and habitat fragmentation. • Feral herbivores such as rabbits. • Predation by cats and foxes. • Introduction of weeds and understory vegetation thickening. • Inappropriate fire regimes. • Illegal shooting.	• Species habitat has been mapped and the Proponent has continued to design a Disturbance Footprint that minimises disturbance to habitat wherever possible, with particular focus on avoided areas of higher value breeding habitat. • Areas mapped to be impacted by the Proposed Action will be clearly delineated and communicated, ensuring that the Disturbance Footprint does not extend further than planned to create unnecessary fragmentation or disturbance. • Pre-clearance surveys will be undertaken at the 30% and 80% Disturbance Footprint design to search for MNES, to define locations of populations, and guide micro-siting and additional avoidance measures, such as species translocation. • Prior to final design and construction, the Proposed Action layout will incorporate design features to further minimise habitat fragmentation and patch isolation, such as road pinch points. • Squatter pigeon are a highly mobile species, commonly observed utilising habitat near roads and access tracks (DCCEEW, 2024a). Therefore, clearing within squatter pigeon habitat will not disrupt the dispersal ability of the species, such that all habitat within the Study Area remaining after the construction phase will still be accessible for the species. • Where required, a licensed and suitably qualified FSC will search each infrastructure location for fauna within 48 hours prior to any vegetation clearing, to further avoid identified MNES and key habitat features , and relocate MNES and key habitat features where not. • Invasive plant and animals will be managed in accordance with a Biosecurity Management Plan in accordance with the *Biosecurity Act 2014 (Qld).* • This Biosecurity Management Plan will be implemented for the site which includes requirements for vehicle washdowns and protocols to ensure activities are planned to minimise movement of vehicles, equipment and machinery outside of designated access corridors.	Where reasonable and practicable, all near misses and incidents will be investigated to establish root cause. Where necessary, corrective actions will be developed to improve existing processes.	No more than 128.3 ha (or 0.8%) of Breeding Habitat and 24.2 ha (or 0.3%) of Foraging and Dispersal Habitat will be subject to long-term disturbance as a result of the Proposed Action. The functional value of all remaining habitat within the Study Area will be maintained. Linear clearing will not exceed the dispersal ability of the species and therefore will not fragment habitat for the species.

MNES	Relevant Conservation Advice and Policy Objectives	Threats	Avoidance, Mitigation and Management Measures	Corrective Action	Environmental Outcome
			• A Bushfire Management Plan will be developed and implemented during construction and operation to mitigate the potential impact of fires to MNES and their habitat. • Best-practice measures will be implemented to manage and mitigate the potential impacts from altered hydrology, such as habitat degradation, caused by increased erosion and sedimentation as a result of the Proposed Action. • Environmental pollutants affecting MNES will be managed through the site-specific CEMP. Staff and contractors will be made aware through general site induction and training of the potential to generate pollution (including through improper handling of hazardous materials and generation of dust, light and noise) and management measures that must be implemented. • Site inductions, training, pre-start meetings and inspections will be undertaken according to the CEMP. All staff and contractors visiting or working on site will be made aware of the potential to impact MNES and measures to be followed, such as safe driving speeds, fauna-safe excavation practices, and their obligations to report any injured, sick or dead fauna. • Rehabilitation of disturbed areas will be undertaken post-construction, as well at the end-of life decommissioning phase, restoring erosion and weed resilience and to re-establishing vegetation cover for ground-dwelling species to forage and disperse. • As a result of the Impact Assessment (see Section 6 of the Theodore Wind Farm PER), it was determined that the Proposed Action is likely to have a SRI on squatter pigeon. As such, the Proponent is required to offset the removal of squatter pigeon habitat, which will be managed in line with the OMP (see Section 9 of the Theodore Wind Farm PER).		
White-throated needletail (Vulnerable under the EPBC Act)	*Conservation Advice Hirundapus caudacutus white-throated Needletail* (TSSC, 2019) Conservation and management priorities (that are relevant to the Proposed Action) include: • Seek the support of governments in East Asia to protect remaining old growth forests within the breeding range of the species. • Identify requirements of important habitat in Australia. • Support initiatives to improve habitat management at key sites in Australia.	Threats include (TSSC, 2019): • Habitat loss and fragmentation. • Direct mortality (via wind turbines and overhead wires). • Poisoning (by organochlorides).	• Species habitat has been mapped and the Proponent has continued to design a Disturbance Footprint that minimises disturbance to habitat wherever possible, with particular focus on avoided areas of higher value foraging habitat in the north of the Study Area. • Invasive plant and animals will be managed in accordance with a Biosecurity Management Plan in accordance with the *Biosecurity Act 2014 (Qld).* • This Biosecurity Management Plan will be implemented for the site which includes requirements for vehicle washdowns and protocols to ensure activities are planned to minimise movement of vehicles, equipment and machinery outside of designated access corridors. • A Bushfire Management Plan will be developed and implemented during construction and operation to mitigate the potential impact of fires to MNES and their habitat. • Best-practice measures will be implemented to manage and mitigate the potential impacts from altered hydrology, such as habitat degradation, caused by increased erosion and sedimentation as a result of the Proposed Action. • Environmental pollutants affecting MNES will be managed through the site-specific CEMP. Staff and contractors will be made aware through general site induction and training of the potential to generate pollution (including through improper handling of hazardous materials and generation of dust, light and noise) and management measures that must be implemented. • Site inductions, training, pre-start meetings and inspections will be undertaken according to the CEMP. All staff and contractors visiting or working on site will be made aware of the potential to impact MNES and measures to be followed, such as safe driving speeds, fauna-safe excavation practices, and their obligations to report any injured, sick or dead fauna. • Mitigation and management measures included in the BBMP will reduce likelihood of turbine collision and barotrauma impacts, such as reducing resources in WTG areas to make these regions less attractive to birds and bats.	If species is identified within Study Area, re-mapping of habitat will occur as required, and additional mitigation measures will be implemented. Where reasonable and practicable, all near misses and incidents will be investigated to establish root cause. Where necessary, corrective actions will be developed to improve existing processes. Corrective actions with respect to collision risk are outlined in the BBMP (Appendix D), but involve establishment of impact triggers that if met, will trigger adaptive management. The Proposed Action may implement measures, such as curtailment and	The functional value of habitat within the Study Area will be maintained. Development of management and corrective actions to minimise risk of turbine collision (significant impact threshold for White-throated needletail: WTG mortality or injury to 10 individuals).

MNES	Relevant Conservation Advice and Policy Objectives	Threats	Avoidance, Mitigation and Management Measures	Corrective Action	Environmental Outcome
			• The Proponent may use innovative blade design features for high-risk turbines (identified within the BBMP (Appendix D).	acoustic and visual deterrents outlined above, as a corrective action in response to the Significant Residual Impact (SRI) trigger process.	
Black-breasted buttonquail (Vulnerable under the EPBC Act)	*Conservation Advice Turnix melanogaster black-breasted button-quail* (DoE, 2015a) Conservation and management priorities (that are relevant to the Proposed Action) include: • Protect key ecosystems/habitat that support button-quail populations. • Maintain or improve extent, condition and connectivity of habitat. • Where necessary, reduce the impacts of introduced predators and competitors. *National Recovery Plan for the Black-Breasted Button-Quail (Turnix melanogaster)* (Mathieson & Smith, 2009) Objectives: • By 2032, maintain and improve the extent, condition and connectivity of habitat of the black-breasted button-quail. • By 2032, demonstrably reduce the severity of identified anthropogenic threats across the extent of the species' range. • By 2032, achieve, measure and sustain a stable or positive trend in area of occupancy and population size (assessed by new baseline counts) in the number of mature individuals of the black-breasted button-quail.	Threats include (DoE, 2015a): • Habitat degradation as a result of domestic livestock and feral pigs. • Habitat loss or degradation from fires of increasing intensity or frequency; • Predation by feral animals such as feral cats and foxes.	• Species habitat has been mapped and the Proponent has continued to design a Disturbance Footprint that minimises disturbance to habitat wherever possible, with particular focus on avoided areas of higher value foraging and roosting habitat. • Areas mapped to be impacted by the Proposed Action will be clearly delineated and communicated, ensuring that the Disturbance Footprint does not extend further than planned to create unnecessary fragmentation or disturbance. • Pre-clearance surveys will be undertaken at the 30% and 80% Disturbance Footprint design to search for MNES, to define locations of populations, and guide micro-siting and additional avoidance measures, such as species translocation. • Prior to final design and construction, the Proposed Action layout will incorporate design features to further minimise habitat fragmentation and patch isolation, such as road pinch points. The Proponent will also consider the use of innovative turbine blade transportation, such as 'Blade Manipulator' trucks. • Where required, a licensed and suitably qualified FSC will search each infrastructure location for fauna within 48 hours prior to any vegetation clearing, to further avoid identified MNES and key habitat features, and relocate MNES and key habitat features where not. • Invasive plant and animals will be managed in accordance with a Biosecurity Management Plan in accordance with the *Biosecurity Act 2014 (Qld).* • This Biosecurity Management Plan will be implemented for the site which includes requirements for vehicle washdowns and protocols to ensure activities are planned to minimise movement of vehicles, equipment and machinery outside of designated access corridors. • A Bushfire Management Plan will be developed and implemented during construction and operation to mitigate the potential impact of fires to MNES and their habitat. • Best-practice measures will be implemented to manage and mitigate the potential impacts from altered hydrology, such as habitat degradation, caused by increased erosion and sedimentation as a result of the Proposed Action. • Environmental pollutants affecting MNES will be managed through the site-specific CEMP. Staff and contractors will be made aware through general site induction and training of the potential to generate pollution (including through improper handling of hazardous materials and generation of dust, light and noise) and management measures that must be implemented. • Site inductions, training, pre-start meetings and inspections will be undertaken according to the CEMP. All staff and contractors visiting or working on site will be made aware of the potential to impact MNES and measures to be followed, such as safe driving speeds, fauna-safe excavation practices, and their obligations to report any injured, sick or dead fauna. • Rehabilitation of disturbed areas will be undertaken post-construction, as well at the end-of life decommissioning phase, restoring erosion and weed resilience and to re-establishing vegetation cover for ground-dwelling species to forage and disperse.	If species is identified within Study Area, re-mapping of habitat will occur as required, and additional mitigation measures will be implemented. Where reasonable and practicable, all near misses and incidents will be investigated to establish root cause. Where necessary, corrective actions will be developed to improve existing processes.	No more than 5 ha (or 1.8%) of Potential Foraging and Roosting Habitat will be subject to long-term disturbance as a result of the Proposed Action. The functional value of all remaining habitat within the Study Area will be maintained. Linear clearing will not exceed the dispersal ability of the species and therefore will not fragment habitat for the species.
Australian painted snipe	*Approved Conservation Advice for Rostratula australis*	Threats include (DSEWPC, 2013):	• Species habitat has been mapped and the Proponent has continued to design a Disturbance Footprint that minimises disturbance to habitat wherever possible, with particular focus on avoided areas of higher value foraging habitat.	If species is identified within Study Area, re-mapping of habitat will occur as required, and	No more than 1.3 ha (or 2.4%) of Potential Foraging Habitat will be subject to long-term

MNES	Relevant Conservation Advice and Policy Objectives	Threats	Avoidance, Mitigation and Management Measures	Corrective Action	Environmental Outcome
(Endangered under the EPBC Act)	*(Australian painted snipe)* (DSEWPC, 2013) Conservation and management priorities (that are relevant to the Proposed Action) include: • Suitably control and manage access on private land and other land tenure. • Manage any changes to hydrology that may result in changes to water table levels, run-off, salinity, algal blooms, sedimentation or pollution. • Manage any disruptions to water flows. • Manage any other known, potential or emerging threats including inappropriate fire regimes and coastal port/infrastructure development. • Identify and remove weeds in wetland areas that could become a threat to the Australian painted snipe, using appropriate methods. • Implement the national threat abatement plans for the European red fox and feral cats. • Develop and implement a suitable fire management strategy for the habitat of the Australian painted snipe. *National Recovery Plan for the Australian Painted Snipe (Rostratula australis)* (DCCEEW, 2022b) Objectives: By 2032, sustain a positive population trend (compared to 2020 baseline counts) in the number of mature individuals of the Australian painted snipe.	• Loss and degradation of wetlands, through drainage and the diversion of water for agriculture and reservoirs. • Grazing and the associated trampling of wetland vegetation/nests, nutrient enrichment and disturbance to substrate by livestock may threaten the Australian painted snipe in certain regions. • Predation by feral animals (e.g. foxes and cats) may be a threat to the Australian painted snipe, however there is no evidence for this.	• Areas mapped to be impacted by the Proposed Action will be clearly delineated and communicated, ensuring that the Disturbance Footprint does not extend further than planned to create unnecessary fragmentation or disturbance. • Pre-clearance surveys will be undertaken at the 30% and 80% Disturbance Footprint design to search for MNES, to define locations of populations, and guide micro-siting and additional avoidance measures, such as species translocation. • Prior to final design and construction, the Proposed Action layout will incorporate design features to further minimise habitat fragmentation and patch isolation, such as road pinch points. The Proponent will also consider the use of innovative turbine blade transportation, such as 'Blade Manipulator' trucks. • Where required, a licensed and suitably qualified FSC will search each infrastructure location for fauna within 48 hours prior to any vegetation clearing, to further avoid identified MNES and key habitat features, and relocate MNES and key habitat features where not possible to avoid. • Invasive plant and animals will be managed in accordance with a Biosecurity Management Plan in accordance with the *Biosecurity Act 2014 (Qld).* • This Biosecurity Management Plan will be implemented for the site which includes requirements for vehicle washdowns and protocols to ensure activities are planned to minimise movement of vehicles, equipment and machinery outside of designated access corridors. • A Bushfire Management Plan will be developed and implemented during construction and operation to mitigate the potential impact of fires to MNES and their habitat. • Best-practice measures will be implemented to manage and mitigate the potential impacts from altered hydrology, such as habitat degradation, caused by increased erosion and sedimentation as a result of the Proposed Action. • Environmental pollutants affecting MNES will be managed through the site-specific CEMP. Staff and contractors will be made aware through general site induction and training of the potential to generate pollution (including through improper handling of hazardous materials and generation of dust, light and noise) and management measures that must be implemented. • Site inductions, training, pre-start meetings and inspections will be undertaken according to the CEMP. All staff and contractors visiting or working on site will be made aware of the potential to impact MNES and measures to be followed, such as safe driving speeds, fauna-safe excavation practices, and their obligations to report any injured, sick or dead fauna. • Rehabilitation of disturbed areas will be undertaken post-construction, as well at the end-of life decommissioning phase, restoring erosion and weed resilience and to re-establishing vegetation cover for ground-dwelling species to forage and disperse.	additional mitigation measures will be implemented. Where reasonable and practicable, all near misses and incidents will be investigated to establish root cause. Where necessary, corrective actions will be developed to improve existing processes.	disturbance as a result of the Proposed Action. The functional value of all remaining habitat within the Study Area will be maintained. Linear clearing will not exceed the dispersal ability of the species and therefore will not fragment habitat for the species.
Diamond firetail (Vulnerable under the EPBC Act)	*Conservation Advice for Stagonopleura guttata (diamond firetail)* (DCCEEW, 2023b)	Threats include (DCCEEW, 2023b): • Habitat loss, degradation and fragmentation.	• Species habitat has been mapped and the Proponent has continued to design a Disturbance Footprint that minimises disturbance to habitat wherever possible, with particular focus on avoided areas of higher value breeding and foraging habitat.	If species is identified within Study Area, re-mapping of habitat will occur as required, and additional mitigation	No more than 95.8 ha (or 1.2%) of Potential Breeding and Foraging Habitat will be subject to long-term disturbance as a

MNES	Relevant Conservation Advice and Policy Objectives	Threats	Avoidance, Mitigation and Management Measures	Corrective Action	Environmental Outcome
	Conservation and management priorities (that are relevant to the Proposed Action) include: • Retain and protect woodland, open forest, grassland and mallee habitat from clearing, fragmentation and disturbance (areas of 200 ha or greater within woody vegetation are particularly significant). • Protect and maintain areas of high-quality habitat, which includes open forest, woodland, mallee and grasslands with a diverse ground layer dominated by a mixture of grass species which seed at different times of year (providing a year-round food supply) and provides scattered shrubs for shelter. Areas with access to water, especially riparian areas, are especially important. • Undertake revegetation using a diverse mix of locally appropriate native species, which will produce high quality habitat. • Restore native perennial grasses and casuarinas to habitat fragments. • Retain mistletoe and scattered patches of dense shrubs for nesting habitat, particularly in areas close to water. • Expand and reconnect smaller fragments of habitat by fencing and encouraging natural regeneration or applying revegetation techniques where regeneration fails. • Targeted removal of weeds significantly compromising habitat values (e.g., invasive perennial grasses) and restore native vegetation) in conjunction with restoration of native perennial grasses, ideally in a landscape mosaic, ensuring that large areas of exotic food plants (such as *Ehrharta longiflora*, or abundant annual grasses) are not removed at once	• Weeds. • Introduced pest species (rabbits). • Fire and inappropriate fire regimes. • Climate change. • Predation by pied currawongs. • Competition from noisy miners.	• Areas mapped to be impacted by the Proposed Action will be clearly delineated and communicated, ensuring that the Disturbance Footprint does not extend further than planned to create unnecessary fragmentation or disturbance. • Pre-clearance surveys will be undertaken at the 30% and 80% Disturbance Footprint design to search for MNES, to define locations of populations, and guide micro-siting and additional avoidance measures, such as species translocation. • Prior to final design and construction, the Proposed Action layout will incorporate design features to further minimise habitat fragmentation and patch isolation, such as road pinch points. The Proponent will also consider the use of innovative turbine blade transportation, such as 'Blade Manipulator' trucks. • Where required, a licensed and suitably qualified FSC will search each infrastructure location for fauna within 48 hours prior to any vegetation clearing, to further avoid identified MNES and key habitat features, and relocate MNES and key habitat features where not. • Invasive plant and animals will be managed in accordance with a Biosecurity Management Plan in accordance with the *Biosecurity Act 2014 (Qld).* • This Biosecurity Management Plan will be implemented for the site which includes requirements for vehicle washdowns and protocols to ensure activities are planned to minimise movement of vehicles, equipment and machinery outside of designated access corridors. • A Bushfire Management Plan will be developed and implemented during construction and operation to mitigate the potential impact of fires to MNES and their habitat. • Best-practice measures will be implemented to manage and mitigate the potential impacts from altered hydrology, such as habitat degradation, caused by increased erosion and sedimentation as a result of the Proposed Action. • Environmental pollutants affecting MNES will be managed through the site-specific CEMP. Staff and contractors will be made aware through general site induction and training of the potential to generate pollution (including through improper handling of hazardous materials and generation of dust, light and noise) and management measures that must be implemented. • Site inductions, training, pre-start meetings and inspections will be undertaken according to the CEMP. All staff and contractors visiting or working on site will be made aware of the potential to impact MNES and measures to be followed, such as safe driving speeds, fauna-safe excavation practices, and their obligations to report any injured, sick or dead fauna. • Rehabilitation of disturbed areas will be undertaken post-construction, as well at the end-of life decommissioning phase, restoring erosion and weed resilience and to re-establishing vegetation cover for ground-dwelling species to forage and disperse.	measures will be implemented. Where reasonable and practicable, all near misses and incidents will be investigated to establish root cause. Where necessary, corrective actions will be developed to improve existing processes.	result of the Proposed Action. The functional value of all remaining habitat within the Study Area will be maintained. Linear clearing will not exceed the dispersal ability of the species and therefore will not fragment habitat for the species.

MNES	Relevant Conservation Advice and Policy Objectives	Threats	Avoidance, Mitigation and Management Measures	Corrective Action	Environmental Outcome
	without provision of an alternative, native food source.				
Ooline (Vulnerable under the EPBC Act)	*Approved Conservation Advice for Cadellia pentastylis (Ooline)* (DEWHA, 2008a) Conservation and management priorities (that are relevant to the Proposed Action) include: • Suitably control and manage access on private land. • Minimise adverse impacts from land use at known sites. • Prepare advice and assist in the removal weed species within ooline habitat, such as tiger pear. • Identify and remove weeds in the local area, which could become a threat to ooline, using appropriate methods. • Ensure chemicals or other mechanisms used to eradicate weeds do not have a significant adverse impact on ooline. • Manage sites to prevent introduction of invasive weeds, which could become a threat to ooline, using appropriate methods. • Manage known sites to ensure appropriate grazing regimes occur. • Implement threat abatement plans for the control and eradication of feral goats and pigs in the region.	Threats include (DEWHA, 2008a): • Localised extinction due to small and scattered populations. • Inbreeding which threatens genetic diversity in small populations. • Low seed viability which threatens breeding success. • Clearing for agriculture. • Grazing and soil compaction by domestic stock, feral goats and pigs. • Invasion of habitat by weeds, such as tiger pear (*Opuntia aurantiaca*). • Frequent fires. • Tunnel and sheet erosion. • Damage to roadside populations during roadworks. • High insect attack.	• Species habitat has been mapped and the Proponent has continued to design a Disturbance Footprint that minimises disturbance to habitat wherever possible. • Areas mapped to be impacted by the Proposed Action will be clearly delineated and communicated, ensuring that the Disturbance Footprint does not extend further than planned to create unnecessary fragmentation or disturbance. • Pre-clearance surveys will be undertaken at the 30% and 80% Disturbance Footprint design to search for MNES, to define locations of populations, and guide micro-siting and additional avoidance measures, such as species translocation. • Prior to final design and construction, the Proposed Action layout will incorporate design features to further minimise habitat fragmentation and patch isolation, such as road pinch points. • Invasive plant and animals will be managed in accordance with a Biosecurity Management Plan in accordance with the *Biosecurity Act 2014 (Qld).* • This Biosecurity Management Plan will be implemented for the site which includes requirements for vehicle washdowns and protocols to ensure activities are planned to minimise movement of vehicles, equipment and machinery outside of designated access corridors. • A Bushfire Management Plan will be developed and implemented during construction and operation to mitigate the potential impact of fires to MNES and their habitat. • Best-practice measures will be implemented to manage and mitigate the potential impacts from altered hydrology, such as habitat degradation, caused by increased erosion and sedimentation as a result of the Proposed Action. • Environmental pollutants affecting MNES will be managed through the site-specific CEMP. Staff and contractors will be made aware through general site induction and training of the potential to generate pollution (including through improper handling of hazardous materials and generation of dust, light and noise) and management measures that must be implemented. • Site inductions, training, pre-start meetings and inspections will be undertaken according to the CEMP. All staff and contractors visiting or working on site will be made aware of the potential to impact MNES and measures to be followed, such as safe driving speeds, and their obligations to report any damaged vegetation. • Rehabilitation of disturbed areas will be undertaken post-construction, as well at the end-of life decommissioning phase, restoring erosion and weed resilience and to re-establishing vegetation cover for potential flora habitat.	If species is identified within Study Area, re-mapping of habitat will occur as required, and additional mitigation measures will be implemented. Where reasonable and practicable, all near misses and incidents will be investigated to establish root cause. Where necessary, corrective actions will be developed to improve existing processes.	No more than 5 ha (or 1.8%) of potential habitat will be subject to long-term disturbance as a result of the Proposed Action. The functional value of all remaining habitat within the Study Area will be maintained. Linear clearing will not exceed the dispersal ability of the species and therefore will not fragment habitat for the species.
Cossinia (Endangered under the EPBC Act)	*Approved Conservation Advice for Cossinia australiana (Cossinia)* (DEWHA, 2008b) Conservation and management priorities (that are relevant to the Proposed Action) include: • Identify populations of high conservation priority. • Ensure road widening and maintenance activities involving substrate or vegetation disturbance in areas where cossinia occurs	Threats include (DEWHA, 2008b): • Exotic weeds, including lantana, dutchman's pipe, madeira vine, cat's claw creeper and climbing asparagus. • Invasion of vine forest margins by weeds also increases fuel loads and leads to fire incursion.	• Species habitat has been mapped and the Proponent has continued to design a Disturbance Footprint that minimises disturbance to habitat wherever possible. • Areas mapped to be impacted by the Proposed Action will be clearly delineated and communicated, ensuring that the Disturbance Footprint does not extend further than planned to create unnecessary fragmentation or disturbance. • Pre-clearance surveys will be undertaken at the 30% and 80% Disturbance Footprint design to search for MNES, to define locations of populations, and guide micro-siting and additional avoidance measures, such as species translocation. • Prior to final design and construction, the Proposed Action layout will incorporate design features to further minimise habitat fragmentation and patch isolation, such as road pinch points. • Invasive plant and animals will be managed in accordance with a Biosecurity Management Plan in accordance with the *Biosecurity Act 2014 (Qld).*	If species is identified within Study Area, re-mapping of habitat will occur as required, and additional mitigation measures will be implemented. If threatened flora are identified during pre-clearance surveys, additional measures, such as species translocation, seed collection and	No more than 5 ha (or 1.8%) of potential habitat will be subject to long-term disturbance as a result of the Proposed Action. The functional value of all remaining habitat within the Study Area will be maintained.

MNES	Relevant Conservation Advice and Policy Objectives	Threats	Avoidance, Mitigation and Management Measures	Corrective Action	Environmental Outcome
	do not adversely impact on known populations. • Identify and remove weeds in the local area, which could become a threat to cossinia, using appropriate methods. • Manage sites to prevent introduction of invasive weeds, which could become a threat to cossinia, using appropriate methods. • Develop and implement a management plan for the control of invasive weeds, especially Lantana, dutchman's pipe, madeira vine, cat's claw creeper and climbing asparagus in the region. • Ensure chemicals or other mechanisms used to eradicate weeds do not have a significant adverse impact on cossinia.		• This Biosecurity Management Plan will be implemented for the site which includes requirements for vehicle washdowns and protocols to ensure activities are planned to minimise movement of vehicles, equipment and machinery outside of designated access corridors. • A Bushfire Management Plan will be developed and implemented during construction and operation to mitigate the potential impact of fires to MNES and their habitat. • Best-practice measures will be implemented to manage and mitigate the potential impacts from altered hydrology, such as habitat degradation, caused by increased erosion and sedimentation as a result of the Proposed Action. • Environmental pollutants affecting MNES will be managed through the site-specific CEMP. Staff and contractors will be made aware through general site induction and training of the potential to generate pollution (including through improper handling of hazardous materials and generation of dust, light and noise) and management measures that must be implemented. • Site inductions, training, pre-start meetings and inspections will be undertaken according to the CEMP. All staff and contractors visiting or working on site will be made aware of the potential to impact MNES and measures to be followed, such as safe driving speeds, and their obligations to report any damaged vegetation. • Rehabilitation of disturbed areas will be undertaken post-construction, as well at the end-of life decommissioning phase, restoring erosion and weed resilience and to re-establishing vegetation cover for potential flora habitat.	propagation, may be utilised to ensure species dispersal between all remaining available habitat is maintained. Where reasonable and practicable, all near misses and incidents will be investigated to establish root cause. Where necessary, corrective actions will be developed to improve existing processes.	
Austral cornflower (Vulnerable under the EPBC Act)	*Approved Conservation Advice for Stemmacantha australis (Austral Cornflower)* (DEWHA, 2008c) Conservation and management priorities (that are relevant to the Proposed Action) include: • Identify populations of high conservation priority. • Ensure road widening and maintenance activities (or other infrastructure or development activities) involving substrate and vegetation disturbance in areas where austral cornflower occurs do not adversely impact on known populations. • Suitably control and manage access on private land. • Minimise adverse impacts from land use at known sites. • Ensure chemicals or other mechanisms used to eradicate weeds do not have a significant adverse impact on austral cornflower. • Identify and remove weeds in the local area, which could	Threats include (DEWHA, 2008c): • Broad-scale vegetation clearing. • Invasion by exotic weeds. • Grazing pressure. • Roadworks.	• Species habitat has been mapped and the Proponent has continued to design a Disturbance Footprint that minimises disturbance to habitat wherever possible. • Areas mapped to be impacted by the Proposed Action will be clearly delineated and communicated, ensuring that the Disturbance Footprint does not extend further than planned to create unnecessary fragmentation or disturbance. • Pre-clearance surveys will be undertaken at the 30% and 80% Disturbance Footprint design to search for MNES, to define locations of populations, and guide micro-siting and additional avoidance measures, such as species translocation. • Prior to final design and construction, the Proposed Action layout will incorporate design features to further minimise habitat fragmentation and patch isolation, such as road pinch points. • The species exhibits a specialised structure called a pappus, which aids in wind dispersal of seeds (characteristic of wind-dispersed species in the Asteraceae family) (DEWHA, 2008c). All clearing for access corridors will be limited to 40 m, which is not expected to disrupt the dispersal ability of austral cornflower, such that all habitat within the Study Area remaining after the construction phase will still be accessible for the species. • All linear clearing within mapped threatened flora species habitat will be conducted so as not to exceed the dispersal ability of that species, such that all habitat within the Study Area remaining after the construction phase will still be functional for the species. • Invasive plant and animals will be managed in accordance with a Biosecurity Management Plan in accordance with the *Biosecurity Act 2014 (Qld).* • This Biosecurity Management Plan will be implemented for the site which includes requirements for vehicle washdowns and protocols to ensure activities are planned to minimise movement of vehicles, equipment and machinery outside of designated access corridors. • A Bushfire Management Plan will be developed and implemented during construction and operation to mitigate the potential impact of fires to MNES and their habitat.	If species is identified within Study Area, re-mapping of habitat will occur as required, and additional mitigation measures will be implemented. Where reasonable and practicable, all near misses and incidents will be investigated to establish root cause. Where necessary, corrective actions will be developed to improve existing processes.	No more than 233.5 ha (or 1.1%) of potential habitat will be subject to long-term disturbance as a result of the Proposed Action. The functional value of all remaining habitat within the Study Area will be maintained. Linear clearing will not exceed the dispersal ability of the species and therefore will not fragment habitat for the species.

MNES	Relevant Conservation Advice and Policy Objectives	Threats	Avoidance, Mitigation and Management Measures	Corrective Action	Environmental Outcome
	become a threat to Austral Cornflower, using appropriate methods. • Manage sites to prevent introduction of invasive weeds, which could become a threat to austral cornflower, using appropriate methods.		• Best-practice measures will be implemented to manage and mitigate the potential impacts from altered hydrology, such as habitat degradation, caused by increased erosion and sedimentation as a result of the Proposed Action. • Environmental pollutants affecting MNES will be managed through the site-specific CEMP. Staff and contractors will be made aware through general site induction and training of the potential to generate pollution (including through improper handling of hazardous materials and generation of dust, light and noise) and management measures that must be implemented. • Site inductions, training, pre-start meetings and inspections will be undertaken according to the CEMP. All staff and contractors visiting or working on site will be made aware of the potential to impact MNES and measures to be followed, such as safe driving speeds, and their obligations to report any damaged vegetation. • Rehabilitation of disturbed areas will be undertaken post-construction, as well at the end-of life decommissioning phase, restoring erosion and weed resilience and to re-establishing vegetation cover for potential flora habitat.		
Solanum dissectum (Endangered under the EPBC Act)	*Conservation Advice Solanum dissectum* (TSSC, 2016a) Conservation and management priorities (that are relevant to the Proposed Action) include: • Maintain and protect existing populations, and protect and enhance habitat to provide potential for reproduction of plants within existing populations. • Consult with private landowners with *Solanum dissectum* on their properties and develop site-specific management actions and the implementation of conservation agreements. • Manage sites to identify, control and reduce the spread of invasive species such as introduced grasses, especially buffel grass (*Cenchrus ciliaris*).	Threats include (TSSC, 2016a): • Continuing land clearance of areas too small to be mapped as remnant under the Queensland Vegetation Management Act 1999. • Invasion of habitats by exotic grass species (especially buffel grass (*Cenchrus ciliaris*) and Guinea grass (*Megathyrsus maximus*)).	• Species habitat has been mapped and the Proponent has continued to design a Disturbance Footprint that minimises disturbance to habitat wherever possible. • Areas mapped to be impacted by the Proposed Action will be clearly delineated and communicated, ensuring that the Disturbance Footprint does not extend further than planned to create unnecessary fragmentation or disturbance. • Pre-clearance surveys will be undertaken at the 30% and 80% Disturbance Footprint design to search for MNES, to define locations of populations, and guide micro-siting and additional avoidance measures, such as species translocation. • Invasive plant and animals will be managed in accordance with a Biosecurity Management Plan in accordance with the *Biosecurity Act 2014 (Qld).* • This Biosecurity Management Plan will be implemented for the site which includes requirements for vehicle washdowns and protocols to ensure activities are planned to minimise movement of vehicles, equipment and machinery outside of designated access corridors. • A Bushfire Management Plan will be developed and implemented during construction and operation to mitigate the potential impact of fires to MNES and their habitat. • Best-practice measures will be implemented to manage and mitigate the potential impacts from altered hydrology, such as habitat degradation, caused by increased erosion and sedimentation as a result of the Proposed Action. • Environmental pollutants affecting MNES will be managed through the site-specific CEMP. Staff and contractors will be made aware through general site induction and training of the potential to generate pollution (including through improper handling of hazardous materials and generation of dust, light and noise) and management measures that must be implemented. • Site inductions, training, pre-start meetings and inspections will be undertaken according to the CEMP. All staff and contractors visiting or working on site will be made aware of the potential to impact MNES and measures to be followed, such as safe driving speeds, and their obligations to report any damaged vegetation. • Rehabilitation of disturbed areas will be undertaken post-construction, as well at the end-of life decommissioning phase, restoring erosion and weed resilience and to re-establishing vegetation cover for potential flora habitat.	If species is identified within Study Area, re-mapping of habitat will occur as required, and additional mitigation measures will be implemented. Where reasonable and practicable, all near misses and incidents will be investigated to establish root cause. Where necessary, corrective actions will be developed to improve existing processes.	No more than 0.3 ha (or 0.1%) of potential habitat will be subject to long-term disturbance as a result of the Proposed Action. The functional value of all remaining habitat within the Study Area will be maintained. Linear clearing will not exceed the dispersal ability of the species and therefore will not fragment habitat for the species.
Solanum johnsonianum (Endangered under the EPBC Act)	*Conservation Advice Solanum johnsonianum* (TSSC, 2016b) Conservation and management priorities (that are relevant to the Proposed Action) include:	Threats include (TSSC, 2016b): • Continuing land clearance. • Invasion of habitats by exotic grass species introduced	• Species habitat has been mapped and the Proponent has continued to design a Disturbance Footprint that minimises disturbance to habitat wherever possible. • Areas mapped to be impacted by the Proposed Action will be clearly delineated and communicated, ensuring that the Disturbance Footprint does not extend further than planned to create unnecessary fragmentation or disturbance.	If species is identified within Study Area, re-mapping of habitat will occur as required, and additional mitigation measures will be implemented.	No more than 0.3 ha (or 0.1%) of potential habitat will be subject to long-term disturbance as a result of the Proposed Action.

MNES	Relevant Conservation Advice and Policy Objectives	Threats	Avoidance, Mitigation and Management Measures	Corrective Action	Environmental Outcome
	• Maintain and protect existing populations, and protect and enhance habitat to provide potential for reproduction of plants within existing populations. • Consult with private landowners with *Solanum johnsonianum* on their properties and develop site-specific management actions and the implementation of conservation agreements. • Manage sites to identify, control and reduce the spread of invasive species such as introduced grasses.	for pasture for livestock.	• Pre-clearance surveys will be undertaken at the 30% and 80% Disturbance Footprint design to search for MNES, to define locations of populations, and guide micro-siting and additional avoidance measures, such as species translocation. • Invasive plant and animals will be managed in accordance with a Biosecurity Management Plan in accordance with the *Biosecurity Act 2014 (Qld).* • This Biosecurity Management Plan will be implemented for the site which includes requirements for vehicle washdowns and protocols to ensure activities are planned to minimise movement of vehicles, equipment and machinery outside of designated access corridors. • A Bushfire Management Plan will be developed and implemented during construction and operation to mitigate the potential impact of fires to MNES and their habitat. • Best-practice measures will be implemented to manage and mitigate the potential impacts from altered hydrology, such as habitat degradation, caused by increased erosion and sedimentation as a result of the Proposed Action. • Environmental pollutants affecting MNES will be managed through the site-specific CEMP. Staff and contractors will be made aware through general site induction and training of the potential to generate pollution (including through improper handling of hazardous materials and generation of dust, light and noise) and management measures that must be implemented. • Site inductions, training, pre-start meetings and inspections will be undertaken according to the CEMP. All staff and contractors visiting or working on site will be made aware of the potential to impact MNES and measures to be followed, such as safe driving speeds, and their obligations to report any damaged vegetation. • Rehabilitation of disturbed areas will be undertaken post-construction, as well at the end-of life decommissioning phase, restoring erosion and weed resilience and to re-establishing vegetation cover for potential flora habitat.	Where reasonable and practicable, all near misses and incidents will be investigated to establish root cause. Where necessary, corrective actions will be developed to improve existing processes.	The functional value of all remaining habitat within the Study Area will be maintained. Linear clearing will not exceed the dispersal ability of the species and therefore will not fragment habitat for the species.
Xerothamnella herbacea (Endangered under the EPBC Act)	*Approved Conservation Advice for Xerothamnella herbacea* (DEWHA, 2008d) Conservation and management priorities (that are relevant to the Proposed Action) include: • Ensure road widening and maintenance activities (or other infrastructure or development activities) involving substrate or vegetation disturbance in areas where *X. herbacea* occurs do not adversely impact on known populations. • Ensure chemicals or other mechanisms used to eradicate weeds do not have a significant adverse impact on *Xerothamnella herbacea.* • Manage sites to prevent introduction of invasive weeds, which could become a threat to *X. herbacea*, using appropriate methods. • Develop and implement a suitable fire management	Threats include (DEWHA, 2008d): • Competition from invasive plant species as it occurs in a niche with few other ground layer species. Green panic (*Megathyrsus maximus* var. *pubiglumis*) and to a lesser extent buffel grass are species that tolerate shade and colonise these habitats. • Both of these introduced grasses threaten *X. herbacea* either by direct competition or by increasing the fuel load and altering fire regimes.	• Species habitat has been mapped and the Proponent has continued to design a Disturbance Footprint that minimises disturbance to habitat wherever possible. • Areas mapped to be impacted by the Proposed Action will be clearly delineated and communicated, ensuring that the Disturbance Footprint does not extend further than planned to create unnecessary fragmentation or disturbance. • Pre-clearance surveys will be undertaken at the 30% and 80% Disturbance Footprint design to search for MNES, to define locations of populations, and guide micro-siting and additional avoidance measures, such as species translocation. • Invasive plant and animals will be managed in accordance with a Biosecurity Management Plan in accordance with the *Biosecurity Act 2014 (Qld).* • This Biosecurity Management Plan will be implemented for the site which includes requirements for vehicle washdowns and protocols to ensure activities are planned to minimise movement of vehicles, equipment and machinery outside of designated access corridors. • A Bushfire Management Plan will be developed and implemented during construction and operation to mitigate the potential impact of fires to MNES and their habitat. • Best-practice measures will be implemented to manage and mitigate the potential impacts from altered hydrology, such as habitat degradation, caused by increased erosion and sedimentation as a result of the Proposed Action. • Environmental pollutants affecting MNES will be managed through the site-specific CEMP. Staff and contractors will be made aware through general site induction and training of the potential to generate pollution (including through improper handling of hazardous materials and generation of dust, light and noise) and management measures that must be implemented. • Site inductions, training, pre-start meetings and inspections will be undertaken according to the CEMP. All staff and contractors visiting or working on site will be	If species is identified within Study Area, re-mapping of habitat will occur as required, and additional mitigation measures will be implemented. If threatened flora are identified during pre-clearance surveys, additional measures, such as species translocation, seed collection and propagation, may be utilised to ensure species dispersal between all remaining available habitat is maintained. Where reasonable and practicable, all near misses and incidents will be investigated to establish root cause. Where necessary, corrective actions will be	No more than 2.2 ha (or 0.8%) of potential habitat will be subject to long-term disturbance as a result of the Proposed Action. The functional value of all remaining habitat within the Study Area will be maintained.

MNES	Relevant Conservation Advice and Policy Objectives	Threats	Avoidance, Mitigation and Management Measures	Corrective Action	Environmental Outcome
	strategy to minimise the intensity and frequency of fires in remnant Brigalow and Semi-evergreen vine thicket communities.		made aware of the potential to impact MNES and measures to be followed, such as safe driving speeds, and their obligations to report any damaged vegetation. • Rehabilitation of disturbed areas will be undertaken post-construction, as well at the end-of life decommissioning phase, restoring erosion and weed resilience and to re-establishing vegetation cover for potential flora habitat.	developed to improve existing processes.	
Fork-tailed swift (listed as migratory under the EPBC Act)	*Referral Guideline for 14 Birds Listed as Migratory Under the EPBC Act* (DoE, 2015b) Conservation and management priorities (that are relevant to the Proposed Action) include: • Retain habitat and resources necessary for this species to successfully migrate throughout their natural range in Australia. • Provide guidance on significant impact threshold for fork-tailed swift.	There are no significant threats in Australia (DoE, 2015b). Potential threats include habitat destruction and predation by feral animals.	• Species habitat has been mapped and the Proponent has continued to design a Disturbance Footprint that minimises disturbance to habitat wherever possible, with particular focus on avoided areas of higher value foraging habitat in the north of the Study Area. • Invasive plant and animals will be managed in accordance with a Biosecurity Management Plan in accordance with the *Biosecurity Act 2014 (Qld).* • This Biosecurity Management Plan will be implemented for the site which includes requirements for vehicle washdowns and protocols to ensure activities are planned to minimise movement of vehicles, equipment and machinery outside of designated access corridors. • A Bushfire Management Plan will be developed and implemented during construction and operation to mitigate the potential impact of fires to MNES and their habitat. • Best-practice measures will be implemented to manage and mitigate the potential impacts from altered hydrology, such as habitat degradation, caused by increased erosion and sedimentation as a result of the Proposed Action. • Environmental pollutants affecting MNES will be managed through the site-specific CEMP. Staff and contractors will be made aware through general site induction and training of the potential to generate pollution (including through improper handling of hazardous materials and generation of dust, light and noise) and management measures that must be implemented. • Site inductions, training, pre-start meetings and inspections will be undertaken according to the CEMP. All staff and contractors visiting or working on site will be made aware of the potential to impact MNES and measures to be followed, such as safe driving speeds, fauna-safe excavation practices, and their obligations to report any injured, sick or dead fauna. • Mitigation and management measures included in the BBMP will reduce likelihood of turbine collision and barotrauma impacts, such as reducing resources in WTG areas to make these regions less attractive to birds and bats. • The Proponent may use innovative blade design features for high-risk turbines (identified within the BBMP (Appendix D).	If species is identified within Study Area, re-mapping of habitat will occur as required, and additional mitigation measures will be implemented. Where reasonable and practicable, all near misses and incidents will be investigated to establish root cause. Where necessary, corrective actions will be developed to improve existing processes. Corrective actions with respect to collision risk are outlined in the BBMP (Appendix D), but involve establishment of impact triggers that if met, will trigger adaptive management. The Proposed Action may implement measures, such as curtailment and acoustic and visual deterrents outlined above, as a corrective action in response to the SRI trigger process.	The functional value of habitat within the Study Area will be maintained. Development of management and corrective actions to minimise risk of turbine collision (significant impact threshold for fork-tailed swift: WTG mortality or injury to 100 individuals).

7.7 EFFECTIVENESS OF PROPOSED MEASURES

Each proposed avoidance and mitigation measure has been assessed for their likely effectiveness when implemented for the Proposed Action. The criteria for assessment are detailed in Table 7-3.

TABLE 7-3 CRITERIA FOR ASSESSMENT OF PROPOSED MITIGATION MEASURES

Effective Rating	Effective Rating Criteria Description
High Effectiveness	No impact to species and/or habitats due to prevention and/or avoidance.
Moderate Effectiveness	Direct and indirect impacts are minimised, no substantial recurring impact (often related to engineering changes).
Low Effectiveness	Minimal reduction in impact through control, survey and observation measures (often to do with PPE or administrative changes).
No Effect	There is no reduction in the impact.

Evaluation and examples/evidence of each proposed avoidance and mitigation measure and effectiveness are outlined in Table 7-4 below.

TABLE 7-4 EVALUATION OF PROPOSED AVOIDANCE AND MITIGATION MEASURES

Mitigation Measures for Proposed Action	Effectiveness Rating	Justification for Rating
Design and Construction Phase Measures		
Avoid disturbing MNES habitat	Moderate Effectiveness	Habitat for MNES has been identified within the Study Area and, subject to design and construction constraints, this habitat will be avoided. Constraints may include safety, buildability and connectivity of WTGs. Impacts to higher value habitat (such as watercourses and riparian areas) have been avoided as much as possible during the design of the Proposed Action, avoiding important habitat for multiple MNES species. However, MNES habitat is still located within the Disturbance Footprint, and the Proposed Action has been deemed 'likely' to have a significant impact on several MNES.
Pre-clearance surveys and micro-siting	Moderate Effectiveness	At the 30% and 80% Disturbance Footprint design, habitat for MNES will be further identified during pre-clearance ecological surveys, and infrastructure locations will be refined to minimise impacts. Micro-siting during the construction phase will minimise impacts by identifying MNES habitat and habitat features within the Disturbance Footprint before clearance begins, allowing for the avoidance of these features.

Mitigation Measures for Proposed Action	Effectiveness Rating	Justification for Rating
Designing layout to reduce habitat fragmentation impacts to MNES	Moderate Effectiveness	Indirect impacts to species through creating barriers to movement and dispersal will be minimised using detailed layout design features and Study Area habitat mapping. All linear clearing within mapped threatened flora and fauna species habitat will be conducted so as not to exceed the dispersal ability of that species, such that all habitat within the Study Area remaining after the construction phase will still be accessible for the species.
Installing fauna crossing infrastructure	Low Effectiveness	Adaptive management measures will include a commitment to install glider poles to re-connect fragmented greater glider denning habitat patches, and undertake monitoring of the glider poles to monitor species presence and infrastructure use. However, only one example of greater gliders using these structures currently exists, and conservation advice and species-specific guidance suggests further research on glide pole use by greater gliders, dispersal ability and persistence in fragmented habitat is required.
Fauna spotter-catchers	Low Effectiveness	FSC will minimise impact by identifying, catching and relocating species. Although impacts to MNES while clearing will be minimised through this mitigation measure, they will not be completely avoided. Alternatively, works will be postponed until the species migrates out of the work zones on their own accord. Presence of a spotter catcher will minimise direct mortality or injury to native fauna during construction.
Manage invasive plants and animals	Moderate Effectiveness	This measure will reduce the risk of introduction and establishment of invasive plant and animal species that may impact MNES. Moreover, it will reduce the risk of spreading existing WoNS and Restrictive Invasive weed species. The development of the Biosecurity Management Plan minimises biosecurity risk through a series of procedures used in pre-construction, construction and operation phases.
Manage fire regimes and bushfire risk	Moderate Effectiveness	This measure will reduce the risk of reduction of MNES habitat outside of the Operation Footprint due to fire. Moreover, it will reduce the overall fire risk within the Project Area and increase safety for on-site workers. The development of the Bushfire Management Plan will include outlining best-practice hazard reduction measures to minimise bushfire risk and environmental impacts.
Manage impacts from altered hydrology	High Effectiveness	Erosion and sediment control during construction will be managed in accordance with a Best Practice Erosion and Sediment Control (BPESC) guidelines for Australia (International Erosion Control Association).

Mitigation Measures for Proposed Action	Effectiveness Rating	Justification for Rating
		An ESCPC will be prepared which includes details of how measures will be implemented to prevent increased sediment runoff as a result of vegetation clearing, from entering into watercourses, drainage features, wetlands and/or surrounding landscapes during all construction phases from vegetation clearing, undertaking civil works and during the construction of wind turbines and ancillary infrastructure. The ESCPC will include recommended measures and devices to prevent accelerated soil erosion and instability; or where prevention is not possible, minimise and mitigate accelerated soil erosion and instability. A monitoring program will be implemented during construction that is responsive to the seasonal erosion risks of the site, and is adaptive to rectifying negative monitoring results, and includes an emergency erosion management response protocol that must be enacted ahead of forecast weather events that will substantially increase the likelihood of accelerated erosion. Compliance auditing and water monitoring will ensure standards are met to minimise adverse impacts to sediment and erosion processes, and potential downstream impacts to the Great Barrier Reef.
Reduce environmental pollution	High Effectiveness	Risk of impacts from environmental pollution will be reduced once the construction phase has been completed. Environmental pollutants will be effectively managed through the site-specific CEMP, which will be audited monthly during construction. Staff and contractors will be aware through general site induction and training of the potential to generate pollution, and relevant measures to reduce potential impacts.
Site inductions and training	High Effectiveness	Awareness of site-specific management plans and obligations will ensure prompt action by staff and contractors working within the Study Area. Awareness of MNES and habitat will prompt reporting of listed threatened species within the Disturbance Footprint. Inclusion of MNES information at inductions and pre-start meetings will minimise direct impacts of the proposed works and improve detection within the Study Area.
Revegetation and rehabilitation (Type 1 and 2)	Moderate Effectiveness	Direct impacts will be reduced once the construction phase has been completed. Type 1 and 2 rehabilitation of vegetation adjacent to the access tracks will mitigate the effects of erosion, sedimentation and the establishment of weed species. Clearing for access corridors (40 m maximum) will be rehabilitated and reduced down to 30 m in width.

Mitigation Measures for Proposed Action	Effectiveness Rating	Justification for Rating
		This measure will also act in providing regrowth habitat for listed threatened species within the Study Area.
Operational Phase Measures		
Avoid locating turbines in key MNES habitat	Moderate Effectiveness	Habitat and resources for MNES have been identified within the Study Area and this habitat will be avoided during the design and construction phases. Impacts to higher value habitat (such as areas likely to provide prominent thermals and updraughts in the north of the Study Area) have been avoided as much as possible during the design of the Proposed Action, avoiding important resources for multiple MNES species. However, one migratory species, white-throated needletail, is still considered likely to be impacted by the Proposed Action in terms of collision risk and changes in site utilisation due to records in the wider Locality.
Reduce likelihood of turbine collision and barotrauma impacts	Moderate Effectiveness	Impacts to bird and bat species will be minimised through the implementation of the BBMP. This will enable the Proponent to respond to potential impacts throughout the life of the Proposed Action, including future potential significant impacts, through continuous monitoring and adaptive management. It is expected that impacts to bird and bat species will be minimised, but not completely avoided, by considering innovative turbine design features for high-risk turbines and reducing resources in the vicinity of WTGs.
Manage impacts from altered hydrology	High Effectiveness	Erosion and sediment control will be managed in accordance with BPESC guidelines for Australia (International Erosion Control Association). A Site Stabilisation Plan will be prepared which will detail how erosion and sediment control devices are to be incorporated into finished profiles in conjunction with revegetation measures included in the Rehabilitation Management Plan to: • Prevent increased sediment runoff, including increased sediment runoff as a result of vegetation clearing and/or civil works, from entering into watercourses, drainage features, wetlands and/or surrounding landscapes; • Prevent accelerated soil erosion and instability or where prevention is not possible, minimise and mitigate accelerated soil erosion and instability; and • Detail a monitoring plan and program that is responsive to the seasonal erosion risks of the site and is adaptive to rectifying negative monitoring results.
Maintenance and Decommissioning Phase Measures		

Mitigation Measures for Proposed Action	Effectiveness Rating	Justification for Rating
Revegetation and rehabilitation (Type 3)	Moderate Effectiveness	Long-term impacts to MNES habitat will be reduced once the end-of-life stage of the Proposed Action is reached (approximately 35 years). Type 3 rehabilitation of vegetation will act in providing regrowth habitat for listed threatened species within the Study Area.
Management Plans		
Specific Management Plans have been developed to manage and mitigate impacts to listed threatened species known or likely to occur within the Study Area. These management plans include a BBMP and CEMP.	Moderate Effectiveness	Designated Management Plans, including a BBMP and CEMP, will inform workers on how to mitigate impacts to threatened species known or likely to occur within the Study Area. These plans are being developed to be specific and effective, however 'zero impact' to MNES cannot be guaranteed.

7.8 ONGOING MANAGEMENT

Once the operational phase of the Proposed Action begins, ongoing mitigation and management measures will include the implementation of the following management plans.

7.8.1 CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

A site-specific CEMP will be developed for the Proposed Action. The purpose of the CEMP will be to provide a structured approach to the management of potential environmental impacts during the construction phase of the Proposed Action so that all appropriate management measures and corrective actions are implemented. All required construction phase control measures, site maps, and ongoing monitoring activities and schedules will be outlined in the CEMP, including but not limited to:

- Site inductions, training requirements and pre-start meeting schedules;
- Site-specific road rules and speed limits for personnel operating vehicles and machinery;
- Control measures for potential environmental pollutants (light, noise, dust, hazardous materials);
- A site-specific ESCPC; and
- Requirements for ongoing monthly site inspections.

The parties responsible for the controls and procedures adopted to mitigate construction phase environmental impacts will also be clearly identified. Auditing of the CEMP will occur quarterly to ensure that the Proposed Action continually meets all relevant regulatory requirements, and improves systems where necessary. At the operational phase, the CEMP will be transitioned into an OEMP.

7.8.2 BIRD AND BAT MANAGEMENT PLAN

A BBMP (Appendix D) has been developed and will be implemented for the Proposed Action. The BBMP aims to provide a monitoring and adaptive management framework for potential operating impacts on bird and bat species known, likely or with potential to occur within the Study Area.

The BBMP identifies certain monitoring protocols to track and manage species that are directly impacted by wind turbines, through the following procedure:

- Baseline (pre-construction), construction and operational phase bird and bat (using Anabat devices) surveys;
- Carcass searches for species impacted by the WTGs;
- Measures to check for survey adequacy and to account for bias through scavenger and detectability trials;
- Statistical analysis of the results from such targeted field surveys and carcass searches to determine the mortality rates throughout the Study Area; and
- Subsequent reporting and consultations with the Department.

Species triggers will be implemented so that if impacts reach or exceed an indicative significant impact threshold, appropriate adaptive management measures can be implemented. This BBMP is an adaptive management framework that will have the ability to be adjusted as the Proposed Action progresses to better manage and monitor species that may be impacted by the WTGs, should it occur.

7.8.3 BUSHFIRE MANAGEMENT PLAN

A Bushfire Management Plan will be developed and implemented during construction and operation to mitigate the potential impact of fires on the MNES habitat.

The Bushfire Management Plan will outline the use of industry best-practice hazard reduction measures to minimise bushfire risk and environmental impacts, such as:

- Controlled burning of cleared vegetation;
- Reducing on-site fuel loads; and
- Maintenance of firebreaks and trails.

Maintenance of an asset protection zone within the Operations Footprint will be required to reduce the risk of reduction of MNES habitat outside of the Operation Footprint due to fire. This includes establishing a 30 m bushfire setback from vegetation around electrical infrastructure. Maintaining safe distances between vegetation and potential fire-starting hazards will increase safety and reduce fire risk.

Weed management and control methods (in line with the EMP) will also reduce the potential of invasive plants changing species composition on-site and increasing fire risk.

7.8.4 CORRECTIVE ACTIONS

The mitigation measures described above and those presented in site-specific management plans will be reviewed as part of the respective monitoring plans, with corrective actions identified to respond to any defined impact triggers. The relevant management plans are:

- CEMP (to be provided prior to commencement of construction of the Proposed Action);

- BBMP (Appendix D); and
- Bushfire Management Plan (to be provided prior to commencement of construction of the Proposed Action).

These plans will be monitored for success throughout all phases of the Proposed Action, and if any impact triggers are identified, then the corrective actions will be applied to manage these impacts. MNES-specific corrective actions for each avoidance and mitigation measure are described in Section 7.6.

SECTION 7 REFERENCES

Commander, L. E., Coates, D. J., Broadhurst, L., Offord, C., Makinson, R. O., & Matthes, M. (2018). *Guidelines for the Translocation of Threatened Plants in Australia (3rd Edn).* Australian Network for Plant Conservation.

DAWE. (2022a). *Conservation Advice for Petaurus australis australis (yellow-bellied glider (south-eastern)).* Department of Agriculture, Water and the Environment.

DAWE. (2022b). *Conservation Advice for Phascolarctos cinereus (Koala) combined populations of Queensland, New South Wales and the Australian Capital Territory.* Canberra: Department of Agriculture, Water and the Environment. Retrieved In effect under the EPBC Act from 12-Feb-2022., from http://www.environment.gov.au/biodiversity/threatened/species/pubs/85104-conservation-advice-12022022.pdf.

DAWE. (2022c). *National Recovery Plan for the Koala Phascolarctos cinereus (combined populations of Queensland, New South Wales and the Australian Capital Territory).* Canberra: Department of Agriculture, Water and the Environment. Retrieved In effect under the EPBC Act from 08-Apr-2022., from http://www.dcceew.gov.au/environment/biodiversity/threatened/publications/recovery/koala-2022.

DCCEEW. (2022). *National Recovery Plan for Black-breasted Button-quail (Turnix melanogaster).* Canberra: Department of Climate Change, Energy, the Environment and Water. Retrieved from http://www.dcceew.gov.au/environment/biodiversity/threatened/publications/recovery/black-breasted-button-quail

DCCEEW. (2022a). *Conservation Advice for Petauroides volans (greater glider (southern and central)).* Canberra: Department of Climate Change, Energy, the Environment and Water.

DCCEEW. (2022b). *National Recovery Plan for the Australian Painted Snipe (Rostratula australis).* Canberra: Department of Climate Change, Energy, the Environment and Water.

DCCEEW. (2023a). *Conservation Advice for Chalinolobus dwyeri (large-eared pied bat).* Canberra: Department of Climate Change, Energy, the Environment and Water.

DCCEEW. (2023b). *Conservation Advice for Stagonopleura guttata (diamond firetail).* Canberra: Department of Climate Change, Energy, the Environment and Water.

DCCEEW. (2024a). *Environmental Management Plan Guidelines, Version 1.2.* Canberra: Department of Climate Change, Energy, the Environment and Water.

DCCEEW. (2024b, November 27). *Offsets mitigation hierarchy.* Retrieved from Department of Climate Change, Energy, the Environment and Water: https://www.dcceew.gov.au/environment/epbc/approvals/offsets/guidance/mitigation-hierarchy

DCCEEW. (2025). *Species Profile and Threats Database*. Retrieved from Department of the Environment, Canberra: https://www.environment.gov.au/sprat.

DERM. (2011). *National recovery plan for the Large-eared Pied Bat Chalinolobus dwyeri.* Department of Environment and Resource Management.

DES. (2022). *Guide to greater glider habitat in Queensland.* Brisbane: Department of Envuironment and Science.

DES. (2022). *Koala Sensitive Design Guideline.* Department of Environment and Science Government.

DEWHA. (2008a). *Approved Conservation Advice for Cadellia pentastylis (Ooline).* Canberra: Department of the Environment, Water, Heritage and the Arts.

DEWHA. (2008b). *Approved Conservation Advice for Cossinia australiana (Cossinia).* Canberra: Department of the Environment, Water, Heritage and the Arts.

DEWHA. (2008c). *Approved Conservation Advice for Stemmacantha australis (Austral Cornflower).* Canberra: Department of the Environment, Water, Heritage and the Arts.

DEWHA. (2008d). *Approved Conservation Advice for Xerothamnella herbacea.* Canberra: Department of the Environment, Water, Heritage and the Arts.

DoE. (2013). *Approved Conservation Advice for the Brigalow (Acacia harpophylla dominant and co-dominant) ecological community.* Canberra: Department of the Environment.

DoE. (2015a). *Conservation Advice Turnix melanogaster black-breasted button-quail.* Canberra: Department of the Environment.

DoE. (2015b). *Draft referral guidelines for 14 birds listed as migratory species under the EPBC Act.* Canberra: Department of the Environment.

DoEE. (2019). *Conservation Advice (including listing advice) for the Poplar Box Grassy Woodland on Alluvial Plains.* Canberra: Department of the Environment and Energy.

DSEWPC. (2012). *Environment Protection and Biodiversity Conservation Act 1999 Environmental Offset Policy.* Canberra: Department of Sustainability, Environment, Water, Population and Communities.

DSEWPC. (2013). *Approved Conservation Advice for Rostratula australis (Australian painted snipe).* Canberra: Department of Sustainability, Environment, Water, Population and Communities.

DTMR. (2024). *Fauna Sensitive Transport Infrastructure Delivery, Chapter 6: Mitigation.* Department of Transport and Main Roads, Queensland Government.

Garnett, S. T., & Baker, G. B. (2021). *The Action Plan for Australian Birds 2020.* Melbourne: CSIRO Publishing.

Goldingay, R. L., Quin, D. G., & Thomas, K. J. (2024). *Habitat preferences of arboreal mammals in box-ironbark forest during maternal and non-maternal periods.* CSIRO Publishing.

Goldingay, R. L., Rohweder, D., & Taylor, B. D. (2020). Nest box contentions: Are nest boxes used by the species they target? *Ecological Management & Restoration*, 21(2).

Gracanin, A., Hofman, M., Willson, S., Clough, J. B., Brown, T., & Mikac, K. M. (2025, February 17). *Rapid Uptake of Nest Boxes by the Engangered Greater Glider (Petauroides volans).* Retrieved from Wiley Online Library: https://doi.org/10.1111/emr.70000

IECA. (2008). *Best Practice Erosion and Sediment Control (BPESC).* Picton, NSW: International Erosion Control Association .

Mathieson, M., & Smith, G. (2009). *National recovery plan for the black-breasted button-quail Turnix melanogaster.* Canberra: Report to the Department of the Environment, Water Heritage and the Arts.

Neldner, V., Laidlaw, M., McDonald, K., Mathieson, M., Melzer, R., McDonald, W., . . . Seaton, R. (2017). *Scientific review of the impacts of land clearing on threatened species in Queensland.* Brisbane: Department of Science, Information Technology and Innovation.

NSW Scientific Committee. (2024, 09 12). *Greater Glider population in the Seven Mile Beach National Park area.* Retrieved from Scientific Committee Determinations: https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Animals-and-plants/Scientific-Committee/Determinations/2016/greater-glider-population-seven-mile-beach-national-park-nsw-scientific-committee-final-dtermination.pdf?la=en&hash=0B0DEBB

Queensland Government. (2018). *Erosion control on property roads and tracks – managing runoff.* Science notes - Land series L240.

Taylor, B. D., & Goldingay, R. L. (2009). Can road-crossing structures improve population viability of an urban gliding mammal? *Ecology and Society 14(2): 13*.

TSSC. (2015). *Conservation Advice Geophaps scripta scripta squatter pigeon (southern).* Canberra: Threatened Species Scientific Committee, Department of the Environment. Retrieved In effect under the EPBC Act from 27-Oct-2015., from http://www.environment.gov.au/biodiversity/threatened/species/pubs/64440-conservation-advice-31102015.pdf.

TSSC. (2016a). *Conservation Advice Solanum dissectum.* Canberra: Threatened Species Scientific Committee.

TSSC. (2016b). *Conservation Advice Solanum johnsonianum.* Canberra: Threatened Species Scientific Committee.

TSSC. (2019). *Conservation Advice Hirundapus caudacutus White-throated Needletail.* Canberra: Department of the Environment and Energy. Retrieved from http://www.environment.gov.au/biodiversity/threatened/species/pubs/682

Wildlife Preservation Society of Queensland. (2025, April 8). *Greater Glider Nest Box Project.* Retrieved from wildlife.org.au : https://wildlife.org.au/project/greater-glider-nest-box-project-sheep-station-creek-conservation-park/

Williams, E., & Thomson, B. (2018). Aspects of the foraging and roosting ecology of the large-earedpied bat (Chalinolobus dwyeri) in the western Blue Mountains, with implications for conservation. *Australian Mammalogy*.

Youngentob, K. N., Marsh, K. F., & Skewes, J. (2021). *A review of koala habitat assessment criteria and methods.* Canberra: Department of Agriculture, Water and.

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Public Environment Report – Rehabilitation (Section 8)

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ACRONYMS AND ABBREVIATIONS

Acronym	Description
DCCEEW	Department of Climate Change, Energy, the Environment and Water
Disturbance Footprint	The area whereby the final layout and impacts have been considered and occupies an area of 1,590.1 ha
ESCPC	Erosion and Sediment Control Plan for Construction
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
EP Act	*Environmental Protection Act 1994*
Ha	Hectares
MNES	Matters of National Environmental Significance
Planning Act	*Planning Act 2016*
Project Area	The corridor of land on which the Proposed Action will be located, including a 100-metre buffer for micro-siting
Proposed Action	Theodore Wind Farm
RE	Regional Ecosystem
Study Area	The 9 land parcels, across 3 properties, and road reserve areas, 46,830 ha, in which the Proposed Action will be located.
Type 1 natural regeneration	Natural regeneration restricted to low shrubbery and grass post-construction
Type 2 rehabilitation/ revegetation	Revegetation reinstated of equivalent pre-construction vegetation without height restrictions post-construction
Type 3 rehabilitation / revegetation	Revegetation reinstated of equivalent pre-construction vegetation at end-of-life
VM Act	*Vegetation Management Act 1999*
WTG	Wind turbine generator

8. REHABILITATION

Rehabilitation of disturbed areas will be undertaken for the Proposed Action post-construction as well at the end-of life decommissioning phase. In both cases, the intention is to progressively stabilise areas of disturbance, making them resilient to erosion and weed infestation, and to re-establish appropriate vegetation cover. Rehabilitation of on-ground vegetation will be managed through adaptive management to ensure rehabilitation acceptance criteria are met, as outlined in the following Sections. Rehabilitation and revegetation are to continue until all proposed rehabilitation/ rehabilitation areas as outlined within this chapter and identified in Figure 8-1 and Figure 8-2 are self-sustaining and meet the benchmarks for the relevant areas outlined within the final rehabilitation management plan, post-approval and prior to construction. The final rehabilitation management plan will incorporate, at a minimum, all aspects relating to the objectives, management measures and completion criteria outlined in this section (8. Rehabilitation) of the PER.

8.1 POST-CONSTRUCTION REHABILITATION

Following the completion of construction, areas not required for ongoing operational disturbance will be rehabilitated and or regenerated in accordance with rehabilitation management practices in this Section of the PER and where not required for ongoing grazing or agricultural practices.

The approximate rehabilitation / revegetation opportunities encompass up to 1,031 ha, representing 64.8% of the total Disturbance Footprint required to facilitate construction.

Post-construction rehabilitation/revegetation has been separated into two types:

- Type 1 – Natural regeneration restricted to low shrubbery and grass; and
- Type 2 – Rehabilitation by reinstating equivalent pre-construction vegetation without height restrictions.

The extent of Type 1 and 2 rehabilitation/revegetation will be as per the required bushfire setback and minimum offset requirement for electrical cabling.

Preliminary rehabilitation objectives have been developed in consideration of the existing condition, potential ongoing direct and indirect impacts, the need to maintain setbacks to reduce bushfire risk, and any disturbance during the end-of-life decommissioning phase. Post-construction rehabilitation areas available for rehabilitation to pre-disturbance functionality are outlined in Figure 8-1.

Legend

- Study Area
- Operation Footprint
- Type 1 natural regeneration
- Type 2 revegetation/ rehabilitation
- Road
- Track and Path

Coordinate System:
GDA2020 MGA Zone 56

Date: 05/06/2025
Created By: HD
Drawing Size: A3

0 1 2 3km

1:125,000

F8-1 Post-Construction Rehabilitation

Theodore Wind Farm

Theodore Energy Development Pty Ltd

ERM

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8.1.1 TYPE 1 NATURAL REGENERATION

Post-construction there is an opportunity to naturally regenerate 383.8 ha of Type 1, which includes low shrubbery and grass. These areas are identified as not being required within the Permanent Footprint of the Proposed Action, but full rehabilitation and planting of tree species cannot occur due to the likelihood of re-disturbance during any maintenance requirements and decommissioning of infrastructure. Therefore, the key object of Type 1 areas is to restore natural ground cover providing stabilisation and the ability for ground-dwelling species to forage.

8.1.1.1 OBJECTIVES

Natural regeneration efforts will focus on the return of a predominantly natural grassland cover, through minimising the disturbance and revegetation having consideration for bushfire setbacks and minimum offset requirements for electrical cabling.

Key revegetation objectives will:

- Ensure that the vegetation post-construction is appropriately planned in a manner that promotes self-sustaining ecosystems;
- Ensure revegetation areas can develop into a viable ecological system where functionality for impacted MNES is returned (typically where functionality is retained in a low shrubbery and grass state);
- Ensure revegetation continues until all impacted areas are self-sustaining (i.e. do not require interference to flourish);
- Re-planting will be consistent with the groundcover composition of broad vegetation communities where disturbance has occurred;
- Ensure connectivity for native wildlife through species-specific management practices, this will include at a minimum:
    - Groundcover revegetation is focused on establishing a diverse grassy understorey suitable for foraging, to provide for small native mammals;
    - Maintenance of connectivity for dispersal habitat;
    - Larger logs (>10 cm diameter and 0.5 m in length) that are cleared from the Disturbance Footprint will be placed within the revegetation area to provide additional habitat features; and
    - The presence of a fauna spotter-catcher(s) on-site to relocate fauna from designated areas to be cleared into retained vegetation or habitat;
- Reusing topsoil and utilising mulch made from cleared vegetation;
- Preventing erosion of soil, particularly on sloped terrain; and
- Ensure exotic plant species do not take hold and dominate regrowth vegetation.

8.1.2 TYPE 2 REHABILITATION

Post-construction there is an opportunity to rehabilitate 647.2 ha of Type 2 rehabilitation/ revegetation areas, which includes vegetation without height restrictions. Type 2 rehabilitation will be undertaken to return areas to a pre-development state based on broad habitat types within the nominated footprint.

8.1.2.1 OBJECTIVES

Rehabilitation/ revegetation efforts will focus on maintaining ecosystem functionality by minimising the disturbance and rehabilitating these areas in accordance with pre-clearance vegetation, bushfire setbacks and minimum offset requirements for electrical cabling.

Key rehabilitation objectives will at a minimum:

- Ensure that the rehabilitation of vegetation post-construction is properly planned in a manner that promotes self-sustaining ecosystems;
- Ensure rehabilitation of native vegetation is able to develop into a viable ecological system, comparable to pre-clearing native vegetation;
- Ensure rehabilitation continues until the ecosystem and all impacted areas are self-sustaining (i.e. do not require interference to flourish);
- Restore pre-clearance levels of biodiversity and ecosystem functionality;
- Re-planting to be consistent with the composition of broad vegetation communities where disturbance is planned;
- Ensure connectivity for native wildlife through species-specific management practices, including:
    - Revegetation would focus on replicating canopy diversity observed within the pre-construction broad vegetation communities the without height restrictions, suitable for foraging and providing habitat for fauna;
    - Larger logs (>10 cm diameter and 0.5 m in length) that are cleared from the Disturbance Footprint would be placed within the revegetation area to provide additional habitat features; and
    - The presence of a fauna spotter-catcher(s) on-site to relocate fauna from designated areas to be cleared into retained vegetation or habitat;
- Reusing topsoil and utilising mulch made from cleared vegetation;
- Preventing erosion of soil, particularly on sloped terrain; and
- Ensuring exotic plant species do not take hold and dominate regrowth vegetation.

8.1.3 MANAGEMENT MEASURES FOR POST-CONSTRUCTION REHABILITATION

Rehabilitation aims to implement environmental management practices and procedures, that will:

- Restore and improve areas disturbed during the construction phase;
- Reinstate connectivity of fauna habits, thus improving ecological processes;
- Minimise soil erosion and sedimentation;
- Prevent/minimise the outbreak of exotic species within the area of rehabilitation;
- Ensure that topsoil is managed effectively; and
- Monitor, inspect, and maintain the revegetated areas.

Rehabilitation as described in Section 8.2 will occur in a rolling manner following practical completion of each portion of the wind farm during the construction phase.

8.2 END-OF-LIFE REHABILITATION

Following the completion of construction, areas not required for ongoing operational disturbance will be rehabilitated and or regenerated in accordance with rehabilitation management practices established in this Section of the PER and where not required for ongoing grazing or agricultural practices.

Each WTG generally has a useful life of approximately 35 years, after which the WTG, footings (down to 0.5 m below natural ground surface) and any overhead transmission lines may be removed and the area returned to pre-disturbance conditions, in consultation with the relevant landowner. End-of-life rehabilitation areas available for rehabilitation to pre-disturbance functionality are outlined in Figure 8-2. It is noted, access tracks have not been included due to the potential continued use of landholders for rural purposes, however, the Proponent is committed to analysing any potential areas of roads to be rehabilitated.

Legend

- Study Area
- Type 3 revegetation/ rehabilitation
- Road
- Track and Path

Coordinate System:
GDA2020 MGA Zone 56

Date: 25/06/2025
Created By: HD
Drawing Size: A3

0 1 2 3km

1:125,000

F8-2 End-of-Life Rehabilitation

Theodore Wind Farm PER

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8.2.1 TYPE 3 REHABILITATION

End-of-life there is an opportunity to rehabilitate 506.4 ha of Type 3 rehabilitation/ revegetation areas, which includes returning areas to a pre-development state based on broad habitat types within the nominated footprint. It is noted, access tracks have not been included due to the potential continued use of landholders for rural purposes, however, the Proponent is committed to analysing any potential areas of roads to be rehabilitated.

Type 3 refers to the rehabilitation/ revegetation efforts that will be undertaken after the decommissioning and end-of-life of the Proposed Action, including all areas of disturbance with the exception of those areas to be used for on-going rural activities such as formed access tracks under agreement by the landowner.

8.2.1.1 OBJECTIVES

Rehabilitation efforts for flora and fauna will focus on maintaining ecosystem functionality through minimising the disturbance and rehabilitating in accordance with pre-clearance vegetation, bushfire setbacks and minimum offset requirements for electrical cabling.

Key rehabilitation objectives at a minimum will:

- Ensure rehabilitation continues until the ecosystem and all impacted areas are self-sustaining (i.e. do not require interference to flourish);
- Ensure rehabilitation of native vegetation able to develop into a viable ecological system, comparable to pre-clearing native vegetation and its land uses;
- Ensure rehabilitation continues until the ecosystem and all impacted areas are self-sustaining;
- Restore pre-clearance levels of biodiversity and ecosystem functionality;
- Re-plant and re-establish vegetation consistent with the species and structural composition of broad vegetation communities where disturbance has occurred;
- Ensure connectivity for native wildlife through species-specific management practices, including:
    - Groundcover revegetation would be focused on establishing a diverse grassy understorey suitable for foraging, to provide for small native fauna;
    - Ensuring clearances to potential habitat are rehabilitated, where possible, to no further than 50 m apart, to allow for viable connectivity;
    - Larger logs (>10 cm diameter and 0.5 m in length) that are cleared from the Disturbance Footprint would be placed within the revegetation area to provide additional habitat features; and
    - The presence of a fauna spotter-catcher(s) on-site to relocate fauna from designated areas to be cleared into retained vegetation or habitat;
- Reusing topsoil and utilising mulch made from cleared vegetation;
- Preventing erosion of soil, particularly on sloped terrain; and
- Ensuring exotic plant species do not take hold and dominate regrowth vegetation.

8.2.1.2 MANAGEMENT

Rehabilitation aims to implement environmental management practices and procedures, that:

- Restore and improve areas disturbed during the construction phase;
- Reinstate connectivity of fauna habitats, thus improving ecological processes;
- Minimise soil erosion and sedimentation;
- Prevent/minimise the outbreak of exotic species within the area of rehabilitation;
- Ensure that topsoil is managed effectively; and
- Monitor, inspect, and maintain the revegetated areas.

It is important to note that the principles and methods detailed in Table 8-2, despite their focus on post-construction rehabilitation, should be implemented at the earliest possible opportunity.

8.3 REHABILITATION METHODS

Table 8-1 provides an overview of the rehabilitation methods for all infrastructure associated with the Proposed Action. Table 8-2 provides a more detailed and focused rehabilitation methodology for rehabilitation around areas cleared for infrastructure.

TABLE 8-1 REHABILITATION METHODS FOR INFRASTRUCTURE

Infrastructure	Rehabilitation Methods
Access Tracks	• Determine rehabilitation availability post-construction based on rehabilitation opportunity areas. • Roads and access tracks are to be constructed with a suitable gravel road base and will remain unsealed. In sections where the access tracks will be remediated, gravel will be removed from the access tracks and treated. • Cleared areas for access tracks are to be backfilled with compatible and certifiably clean sub-grade material, aerated and graded in accordance with the slope of the surrounding area, and seeded with appropriate vegetation. • Every possible attempt made to avoid vegetation in habitat crossings. Where this is unavoidable, cleared wooden vegetation will be placed within, or near to the cleared area, where possible, to encourage fauna habitat continuation.
Turbine Location	• After construction, disturbed areas not covered by infrastructure are to be naturally regenerated. • Ensure the Bushfire Protection Zone is maintained. • Monitor for weeds post-construction and treat them accordingly. • Consider potential future uses for maintenance and observation activities.
Watercourse Crossings	• After construction, disturbed areas of the bed and banks of the waterway outside the permanent Disturbance Footprint are returned to their original profile and stabilised to promote the regeneration of natural fish habitats. • Rehabilitation criteria for watercourse crossings are to be consistent with the Erosion and Sediment Control Plan for Construction (ESCPC). • Fertiliser and sedimentation management are required when working close to watercourses. • Installed crossings and culverts would likely be retained after rehabilitation of the Study Area, at the discretion of host landowners.
Transmission Corridor	• Cleared areas for the transmission corridor are to be backfilled with compatible and certifiably clean sub-grade material. • Respread topsoil and cleared vegetation across the corridor. • Monitor for weeds post-construction and treat them accordingly. This will be rehabilitated through a combination of methods described in this table and Table 8-2.

Infrastructure	Rehabilitation Methods
Construction & Laydown Compounds (areas not required post-construction)	• Avoid sealing temporary construction laydown areas, unless necessary for Health and Safety purposes. • Monitor for weeds post-construction and treat them accordingly. • Clear infrastructure is not required for future O&M and is rehabilitated in accordance with Table 8-2.
Construction & Laydown Compounds (areas that are required post-construction)	• Consider potential future uses for operations and maintenance activities. • Identify and progressively and partially rehabilitate areas surrounding required infrastructure.

The design of the rehabilitation program and inclusive monitoring will be facilitated by a suitably qualified person.

TABLE 8-2 REHABILITATION PRINCIPLES, METHODS AND PERFORMANCE OUTCOMES

Principles	Rehabilitation Methods	Performance Outcome	Monitoring
Rehabilitation in accordance with pre-clearance vegetation	• The use of tube-stock containing native species that reflects the surrounding environment will assist in speeding up the rehabilitation process in areas outside of the corridor. • Matting also helps to conserve soil moisture, improves water infiltration and soil structure, and moderates soil temperatures, thereby improving plant growth. • Plastic tree guards, held away from a seedling by 3 stakes, to protect against grazing by feral pests, and provide protection from dying winds. • Revegetation will range from grassing areas with species that were common on the site before construction, planting trees, and/ or allowing for natural regrowth. • Approximately 70% understory cover to be successfully established with a successful establishment of native species representative of the existing Regional Ecosystem or neighbouring vegetation. This serves to protect and cover soils and vegetation, to minimise the risk of erosion and provide homogeneity with the surrounding vegetation. • Provide areas of newly rehabilitated areas with pre-clearance values and ecological secondary succession through planting and regenerating native species in line with pre-existing Regional Ecosystem values • Replacement of native trees along the second order streams within the Study Area to increase the vegetation density along the creek-lines and enhance its value as a linking corridor with remnant vegetation fragments. • Strong focus and ongoing management of rehabilitation of koala and greater glider eucalypt feed species.	Progressing towards 70% height and 50% cover in accordance with the *Vegetation Management Act 1999* for defining remnant vegetation with a successful establishment of native species representative of the existing Regional Ecosystem or neighbouring vegetation; Rehabilitated vegetation will reflect pre-existing Regional Ecosystem; and Post-construction, there will be no loss of ecosystem function.	• Completion of rehabilitation task sheets; • Visual and monitoring assessment; • Quantitative vegetation monitoring; and • Chronological photographic documentation.
Progressive Restoration of Temporary Disturbance Areas	• In areas identified for progressive restoration, it will likely be appropriate to regenerate the cleared area with grass species, with weed management processes in place. This weed management may involve the use of mulch formed from vegetation cleared from the Study Area.	Land stability and grass cover with a successful establishment of 70% neighbouring grass species.	Visual and monitoring assessment for a 12–24-month period.
Topsoil Management	• Topsoil to be replaced before seeding takes place. • Topsoil to be stockpiled where appropriate (not in areas of high weed seed) and used in the rehabilitation process. • Topsoil from similar vegetation communities to be respread at similar depths (~5cm) to those originally removed.	Appropriate topsoil stockpiled and re-used where appropriate.	Completion of topsoil records; soil testing.

Principles	Rehabilitation Methods	Performance Outcome	Monitoring
Erosion and Sedimentation Management	• Sloping areas around the hardstand used for construction will be revegetated post-construction, through natural revegetation, planting of tube-stock, hydro-seeding and direct seeding. • Hydroseeding from seed mixes that reflect pre-existing vegetation should be implemented within 24 months of the completion of construction, where seasonally appropriate. • Soil stabilisation involving the use of mulch formed from vegetation cleared from the Study Area, geotextiles or mulch from an appropriately certified provider. • Approximately two-thirds understory cover to be successfully established with a successful establishment of native species. This serves to protect and cover soils and vegetation, to minimise the risk of erosion.	Sloped areas to be appropriately revegetated as soon as disturbance period is finalised.	Visual inspection and documentation of any erosion, particularly on slopes.
Biosecurity Management	• Weeds within the Study Area and access areas will be controlled in accordance with the Biosecurity Management Plan. • Presence of weeds and pests listed under the *Biosecurity Act 2014* (Qld) is controlled regularly throughout a 24-month period post-construction, and where possible, regularly throughout the operational phase in areas within the rehabilitation opportunity area. • An annual weed monitoring program will be implemented within areas of natural regeneration ensure weed infestation is not preventing the natural regeneration of ground cover.	Weeds will not be allowed to establish in rehabilitated areas	Weed and pest monitoring

8.4 REHABILITATION ACCEPTANCE CRITERIA

The proposed rehabilitation activities outlined in this Section aim to restore areas of disturbance to pre-disturbance conditions, subject to the appropriate safety and bushfire vegetation setbacks required. This process is a continuous one, beginning immediately post-construction, with areas of temporary disturbance not required for the operational and maintenance phases (such as linear assets i.e., access tracks) to be revegetated through natural regeneration and areas of permanent disturbance to be subject to active rehabilitation (restoration) measures such as direct seeding of native plant and grass species where it aligns with pre-disturbance vegetation and ecosystem types. Tube stock will be considered when assessing the best rehabilitation methods for the rehabbed areas. Rehabilitation and revegetation are to continue until all proposed areas are self-sustaining and meet the benchmarks for the relevant areas outlined within the final rehabilitation management plan to be completed post-approval.

Following construction, the rehabilitation and revegetation areas will be restored or managed in accordance with pre-disturbance vegetation communities' composition or an altered acceptable state. The use of endemic native species appropriate to the rehabilitation and revegetation areas will be used to meet objectives and management outcomes. Monitoring is undertaken to confirm and assess the effectiveness of the rehabilitation outcomes.

Effective rehabilitation will ensure that the final landform meets the following completion criteria, outlined in Table 8-3.

TABLE 8-3 COMPLETION CRITERIA

Goal	Objective	Completion Criteria	Indicator of Completion Criteria Success
Return to Pre-Disturbance State (without canopy for areas of revegetation)	Vegetation is homogenous and blends in with surrounding pre-disturbance vegetation.	Secondary succession occurs through the establishment of revegetated species.	Visual assessment of rehabilitated areas compared to pre-disturbance site.
		Vegetation of similar species richness and species diversity is established and self-sustaining.	Visual assessment of rehabilitated areas compared to pre-disturbance site
		No discernible difference in rehabilitated vegetation from surrounding pre-disturbance vegetation.	Aerial / drone photography.
	Establishment of functionally important native vegetation species and communities.	Vegetation type and density are of topologically and geographically appropriate species.	Ground cover assessment.
	Ensure rehabilitated land can be used for pre-disturbance grazing purposes.	Monitoring results show that rehabilitation is achieving a sustainable agreed post land use standard.	Rehabilitated landforms are capable of supporting post land use agreements.

Goal	Objective	Completion Criteria	Indicator of Completion Criteria Success
Stable Landform	Ensure native vegetation cover is adequate to minimise erosion.	Native ground cover increases throughout the remediation phase, is self-sustaining and forms the predominant ground cover.	Ground cover assessment.
		Weeds have not established and formed ground cover in areas of rehabilitation.	Ground cover assessment.
	Ensure quality soil structure and fertility.	No rills or erosion is identified and the landform of areas of previous disturbance is considered stable. Areas of erosion or soil compaction are managed under an Erosion and Sediment Control Plan.	Visual and progressive assessment of erosion.
		Topsoil from similar vegetation communities has been spread at ~5cm depth from where it has been originally removed.	Soil testing and completion of topsoil records.
Safety & Pollution	Ensure that the site is safe for, and accessible to humans and animals.	A risk assessment has been completed and hazards relative to accessibility and grazing purposes are appropriately addressed.	Safety assessment of decommissioned and rehabilitated areas.
		Access to rehabilitated areas for humans and animals is to a level the same as, or better than pre-disturbance.	Safety assessment of decommissioned and rehabilitated areas.
		Contaminated land resulting from transportation, construction, operation and decommissioning is remediated and rehabilitated.	Contaminated land assessment report.
		Certification by a suitably qualified person in the final rehabilitation report that infrastructure has been decommissioned and demolished with no remaining unsafe infrastructure.	Safety assessment of decommissioned and rehabilitated areas.

The rehabilitation principles outlined in Table 8-1 apply broadly to all infrastructure. Table 8-2 provides a more detailed and focused rehabilitation methodology for rehabilitation around areas cleared for infrastructure. Table 8-3 expands on the completion criteria and provides further guidance as to how to successfully meet the criteria outlined above. As such, it is expected that the proposed rehabilitation activities will be an effective means to establishing secondary succession and meeting the completion criteria.

In accordance with best practice, final detailed engineering will inform the final rehabilitation requirement for a safe and stable final landform.

8.5 REHABILITATION TIMING, FREQUENCY, DURATION AND ONGOING MANAGEMENT

The facilitation of the proposed rehabilitation activities will occur immediately post-construction and focus on areas not required for ongoing operational disturbance. Such areas will be rehabilitated and or regenerated in accordance with rehabilitation management practices established in Section 8 of the PER and where not required for ongoing grazing or agricultural practices.

The monitoring objectives for the Proposed Action aim to:

- Measure the effectiveness of rehabilitation and identify areas that need improving to meet acceptance criteria;
- Measure the effectiveness of mitigation measures imposed;
- Measure the effectiveness of plan growth and secondary succession;
- Measure the effectiveness of weed management and control measures; and
- Identify areas of erosion and compaction.

Rehabilitation activities will be undertaken in accordance with Table 8-1 and Table 8-2, will be continuous, and carried out contemporaneously with frequent monitoring, photographic documentation and quantitative vegetation monitoring and assessments throughout the post-construction and decommissioning phases.

A key component in achieving the above objectives is the frequency of monitoring. Monitoring will occur at the following intervals:

- A rehabilitation or revegetation monitoring report, including (but not limited to) native vegetation regeneration progress, week presence, plant survival rates, plant losses and causes, weed control measures and their effectiveness, maintenance and water regimes and plant replacement will be prepared for the first five operational years of the Proposed Action.
- Every 5 years after the submission of the fifth monitoring report, for the remainder of the Proposed Action operating lifespan.
- Annual weed and pest monitoring will occur.

All of the following documentation and records relating to rehabilitation activities and monitoring programs will be retained:

- Proposed Action checklists;
- Audit reports;
- Monitoring records;
- Aerial photographs;
- Incident investigation reports;
- Rehabilitation failure notes; and
- Records of training and induction.

8.6 CORRECTIVE ACTIONS

Corrective action and maintenance will be required to be undertaken where rehabilitated areas have not met or are failing to meet rehabilitation objectives and criteria. Some of these on-ground corrective actions include:

- **Supplementary seeding:** the causes of poor vegetation growth should be determined. If necessary, maintenance will be undertaken to repair eroded or compacted soil. Supplementary seeding can be used to increase ground cover and minimise soil erosion, as well as seeding of native vegetation that has failed to be established. The use of tube stock will be considered when assessing the best rehabilitation methods for these areas.
- **Erosion and sediment control:** Erosion will be managed in accordance with the ESCPC. Where downstream sedimentation, decline in soil fertility, stream bank erosion and poor rehabilitation outcomes occur, corrective actions guided by the ESCP will occur.
- **Weed treatment:** Weed infestation will, once identified in areas of rehabilitation, require treatment to an appropriate standard, guided by the Biosecurity Management Plan. Feral animal control will also be conducted where appropriate, in accordance with the Biosecurity Management Plan.
- **Safety:** Maintenance work will be required where there is an identified risk to human or animal health, because of landform stability, soil contamination or sedimentation. Safety work will be conducted in accordance with a property management plan, to be developed throughout the operational phase.

8.7 REHABILITATION OF MNES HABITAT

Areas of rehabilitated MNES habitat, that have been impacted by the Proposed Action, are not considered part of the residual impact to a species if rehabilitation is expected to restore the habitat's previous functionality. As outlined in Section 6, the rehabilitation process outlined above is considered to return habitat functionally for six species. This habitat includes:

- 322.3 ha of dispersal habitat for koala;
- 33.4 ha of foraging and dispersal habitat for squatter pigeon;
- 167.8 ha of breeding and foraging habitat for diamond firetail;
- 434 ha of Austral cornflower habitat;
- 1.8 ha of *Solanum dissectum* habitat; and
- 1.8 ha of *Solanum johnsonianum* habitat.

The three flora species have shown evidence of responding positively to disturbance and therefore are expected to have habitat functionality return immediately post-construction in areas no longer required for the Proposed Action (DEWHA, 2008; TSSC, 2016a; TSSC, 2016b). Alternatively, the three fauna species are expected to have habitat functionality restored due to their habitat requirements for areas of grasslands with scattered trees (further discussed in Section 6 of the Theodore Wind Farm PER). Therefore, it is expected that the functionality of these habitat types will be restored once the ground cover is re-established post-construction.

Given the defined habitat functions for each species, habitat functionality may be reinstated within one to two years through the successful establishment of native groundcover and grass cover. For each species, the primary short-term requirement is the presence of continuous or patchy native ground-layer vegetation to support movement, foraging, and landscape connectivity.

Koalas can use early-stage regenerating areas for movement where groundcover vegetation has been established and contributes to broader landscape connectivity. Dispersal functionality can begin to be reinstated within one to two years where native grasses and regenerating seedlings are present, even in the absence of mature trees.

Functional habitat for southern squatter pigeon can be re-established within one to two years through the development of open native grass cover with low weed competition. These areas provide critical foraging resources, particularly where seed-producing grasses are present.

Foraging habitat for diamond firetail can become functional within one to two years following the establishment of native grasses that provide seed and low structural cover. While breeding habitat may require longer for shrub development, the re-establishment of native groundcover allows the species to return and use the area for feeding relatively early in the rehabilitation process.

As the rehabilitation of these three habitat types do not require any additional habitat features other than ground cover, the management measures, completion criteria, interim targets and corrective actions outlined in the previous section above are also relevant to the rehabilitation of koala dispersal habitat, squatter pigeon foraging and dispersal habitat and diamond firetail breeding and foraging habitat.

8.8 LEGISLATIVE REQUIREMENTS

The primary responsibility for rehabilitation management resides with state and local governments in accordance with their respective legislative frameworks, policies, and guidelines. The Commonwealth Government is responsible for legislation, strategies and policy frameworks for rehabilitation at the national level.

Table 8-4 provides a summary of relevant legislation and best practice guidelines that may be applicable during the rehabilitation process. It is to be noted that this summary is not intended to be exhaustive but rather is tailored to reflect the current context.

TABLE 8-4 REHABILITATION LEGISLATIVE REQUIREMENTS

Legislation	Applicability
Commonwealth	
Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)	The EPBC Act provides a legal framework to safeguard and manage flora, fauna, ecological communities, and heritage places of national and international significance, collectively referred to as Matters of National Environmental Significance (MNES). The Proposed Action has been referred to the Department of Climate Change, Energy, the Environment and Water (DCCEEW) under the EPBC Act and a 'controlled action' decision received. The rehabilitation of listed threatened species habitat temporarily impacted by the Proposed Action is a requirement of the Public Environment Report Guidelines.

Legislation	Applicability
State	
Environmental Protection Act 1994 (EP Act)	The key legislation governing environmental protection in Queensland is the EP Act, which establishes effective management strategies to safeguard the environment and promote ecologically sustainable development. The EP Act is the primary legislative framework for protecting and managing environmental values within Queensland. Its overarching objective is to preserve the natural environment and associated ecological systems and processes while facilitating sustainable development. The EP Act imposes a 'general environmental duty' (s319) on any individual or entity engaged in activities that could cause environmental harm to "take all responsible care and practicable measures to prevent or minimise environmental harm". Additionally, the EP Act imposes a 'duty to notify' (s320) of any person who becomes aware of their activities, or those of their associates, causing or threatening to cause environmental harm.
Environmental Protection Regulation 2008 (EP Regulation)	The EP Regulation outlines the regulatory framework for managing the environmental impacts of industrial, agricultural, and resource development projects. The EP Regulation defines Environmentally Relevant Activities (ERAs), which are activities that may potentially cause environmental harm and necessitate approval.
Vegetation Management Act 1999 (VM Act)	The VM Act governs the lawful clearing of vegetation in Queensland. The VM Act establishes a regulatory framework that permits certain low-risk clearing activities and routine maintenance tasks to proceed without requiring development approval. However, all other clearing activities necessitate the acquisition of a development approval. The Proposed Action is seeking Operational Works approval for the clearing of native vegetation within Regional Ecosystems and certain regulated vegetation situated near watercourses.
Planning Act 2016 (Planning Act)	The Planning Act is the primary planning legislation administered by the Queensland Government. The Proposed Action is seeking a Material Change of Use approval pursuant to State Code 23. A Post-Construction Rehabilitation Plan and an End-of-Life Rehabilitation Plan are likely to be required as a condition of the Development Permit.
Local	
Banana Shire Planning Scheme 2021	The management of vegetation (including clearing) may be subject to regulation by local governments through their respective planning schemes and/or local laws. In instances where vegetation management requirements are not explicitly specified within these local instruments, such requirements must continue to be addressed in accordance with applicable state legislation. The Banana Shire Planning Scheme 2021's Performance Outcome 38 for assessable developments in the Rural zone stipulates that rehabilitation of the site must not lead to an increase in waste deposited at a Council landfill facility.

SECTION 8 REFERENCES

DEWHA. (2008). *Approved Conservation Advice for Stemmacantha australis (Austral Cornflower).* Canberra: Department of the Environment, Water, Heritage and the Arts. Retrieved from http://www.environment.gov.au/biodiversity/threatened/species/pubs/23949-conservation-advice.pdf

TSSC. (2016a). *Conservation Advice Solanum dissectum.* Canberra: Departement of Agriculture, Water and the Environement. Retrieved from https://www.environment.gov.au/biodiversity/threatened/species/pubs/75720-conservation-advice-07122016.pdf

TSSC. (2016b). *Conservation Advice Solanum johnsonianum.* Canberra: Department of the Environment and Energy. Retrieved from http://www.environment.gov.au/biodiversity/threatened/species/pubs/84820-conservation-advice-07122016.pdf.

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Theodore Wind Farm

Public Environment Report – Offsets

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SIGNATURE PAGE

Theodore Wind Farm

Public Environment Report – Offsets

0661076



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ACRONYMS AND ABBREVIATIONS

Acronym	Description
BBMP	Bird and Bat Management Plan
dbh	Diameter at breast height
DCCEEW	Department of Climate Change, Energy, the Environment and Water
Disturbance Footprint	The area whereby the final layout and impacts have been considered and occupies an area of 1,590.1 ha.
OMP	Offset Management Plan
DMY	Dry matter yield
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
MHQA	Modelled Habitat Quality Assessment
MNES	Matters of National Environmental Significance
OAG	*Offset Assessment Guide*
PER	Public Environment Report
Proposed Action	Theodore Wind Farm
Proponent	Theodore Energy Development Pty Ltd
Project Area	The corridor of land on which the Disturbance Footprint will be located, including a 100 metre buffer for micro-siting.
RE	Regional ecosystem
SIG 1.1	*Significant Impact Guidelines 1.1 – Matters of National Environmental Significance*
Study Area	The 9 land parcels and road reserve areas, 46,830 ha, in which the Proposed Action will be located.
TEC	Threatened Ecological Community
WTG	Wind Turbine Generator

9. OFFSETS

9.1 SUMMARY OF RESIDUAL IMPACTS

An assessment was undertaken for relevant listed species against the *Significant Impact Guidelines 1.1 – Matters of National Environmental Significance* (SIG 1.1) as part of Section 6 of the Theodore Wind Farm Public Environment Report (PER). This assessment concluded that the Proposed Action is likely or has the potential to result in a residual significant impact to one Threatened Ecological Community (TEC), Poplar Box Grassy Woodlands on Alluvial Plains TEC (Poplar Box TEC), and four threatened species, southern squatter pigeon, greater glider, koala and diamond firetail.

Additionally, if a significant impact is to occur from Wind Turbine Generator (WTG) collision over the course of the life of the Proposed Action, after adaptive management has been implemented (outlined within the Bird and Bat Management Plan (BBMP) (Appendix D)), an offset for that species may be required. Further information on potential offsets for collision risk impacts is provided in Section 9.2.4.

9.1.1 RESIDUAL IMPACTS TO POPLAR BOX TEC

The potential significant impact conclusions for the Poplar Box TEC are based on the direct impact to 6.6 ha of the Poplar Box TEC.

Permanent impact to 6.6 ha of the Poplar Box TEC will result in a reduction of approximately 1.4% of the Poplar Box TEC within the Study Area. Although this is a relatively low percent, an impact to 6.6 ha is considered likely to constitute a reduction in the extent of the Poplar Box TEC. Additionally, as the Proposed Action will result in an impact to Condition Class B Poplar Box TEC (which may be considered habitat critical to the survival of the TEC), the Proposed Action has the potential to adversely affect habitat critical to the survival of the TEC. Therefore, it is considered likely that the Proposed Action will have a significant residual impact on Poplar Box TEC.

9.1.2 RESIDUAL IMPACTS TO SOUTHERN SQUATTER PIGEON

The potential significant impact conclusions for the southern squatter pigeon are based on direct impact during construction of the Proposed Action that would result in the removal of 128.3 ha of Breeding Habitat and 57.6 ha of Foraging and Dispersal Habitat. Revegetation associated with the Proposed Action (refer to Section 8 of the Theodore Wind Farm PER) is expected to return the functionality required for southern squatter pigeon in Foraging and Dispersal Habitat and therefore this impact is considered temporary. Based on the assumed post-construction rehabilitation, there will be a permanent impact (residual impact) to 128.3 ha of Breeding Habitat and 24.2 ha of Foraging and Dispersal Habitat (152.5 ha total) within the Study Area.

Southern squatter pigeon habitat within the Study Area has been considered habitat critical to the survival of the species. The projected permanent impact to 128.3 ha (or 0.8%) of available Breeding Habitat and 24.2 ha (or 0.3%) of available Foraging and Dispersal Habitat is considered likely to adversely affect habitat critical to the survival of the species. Therefore, it is considered likely that the Proposed Action will have a significant residual impact on the southern squatter pigeon.

9.1.3 RESIDUAL IMPACT TO GREATER GLIDER

The potential significant impact conclusions for the greater glider are based on direct impact during construction of the Proposed Action that would result in the removal of 19.0 ha of Likely/Current Denning Habitat, 0.8 ha of Potential Denning Habitat and 623.9 ha of Foraging and Dispersal Habitat (643.8 ha total).

All greater glider habitat within the Study Area has been considered habitat critical to the survival of the species due to the observation of 24 individuals within the Study Area during field surveys. As a result, it has been considered likely that the Proposed Action will adversely affect habitat critical to the survival of the species, even with mitigation measures such as micro-siting at areas of proposed infrastructure. Therefore, it is considered likely that the Proposed Action will have a significant residual impact on the greater glider.

9.1.4 RESIDUAL IMPACT TO KOALA

The potential significant impact conclusions for the koala are based on direct impact during construction of the Proposed Action that would result in the removal of 6.2 ha of Preferred Breeding and Foraging Habitat, 657.3 ha of General Breeding and Foraging Habitat and 237.9 ha of Dispersal Habitat. Revegetation associated with the Proposed Action (Section 8) is expected to return the functionality required for koala dispersal habitat and therefore, impacts to this habitat type are considered temporary. Based on the assumed post-construction rehabilitation, there will be a permanent impact (residual impact) to 663.5 ha of koala habitat within the Study Area (6.2 ha of Preferred Breeding and Foraging Habitat, 657.3 ha of General Breeding and Foraging Habitat and 0 ha of dispersal habitat).

All habitat within the Study Area has been considered habitat critical to the survival of the species. Despite the implementation of mitigation measures, including pre-clearance surveys and micro-siting of planned infrastructure, avoidance of high-value habitat and retention of movement and dispersal function through linear WTG design (see Section 7 of the Theodore Wind Farm PER for further detail), it is considered likely that the Proposed Action will adversely affect habitat critical to the survival of the species. Therefore, it is considered likely that the Proposed Action will have a significant residual impact on the koala.

9.1.5 RESIDUAL IMPACT TO DIAMOND FIRETAIL

The potential significant impact conclusions for diamond firetail are based on direct impact during construction of the Proposed Action that would result in the removal of 263.6 ha of Potential Breeding and Foraging Habitat. Revegetation associated with the Proposed Action (refer to Section 8 of the Theodore Wind Farm PER) is expected to return the functionality required for diamond firetail habitat and therefore the impact is considered temporary. Based on the assumed post-construction rehabilitation, there will be a permanent impact (residual impact) to 95.8 ha of Potential Breeding and Foraging Habitat within the Study Area.

Diamond firetail potential habitat within the Study Area has been considered habitat critical to the survival of the species. The projected permanent impact to 95.8 ha (or 1.2%) of Potential Breeding and Foraging Habitat is considered to have the potential to adversely affect habitat critical to the survival of the species. Therefore, it is considered potential that the Proposed Action will have a significant residual impact on the diamond firetail.

9.2 OFFSET SUMMARY

9.2.1 OFFSET REQUIREMENTS

Suitable offsets must deliver an overall conservation outcome that improves or maintains the viability of the protected matter (DSEWPC, 2012). The overall objective of managing the Proposed Actions offset is to improve the quality of habitat for the identified MNES so that it reaches a higher MHQA habitat quality score, than has been measured for the existing baseline condition, within a 20-year period and continues for the life of the approval. A baseline condition assessment has been undertaken and is presented in the Draft Offset Management Plan (OMP) (Appendix F).

Under the *EPBC Act Offsets Policy* (for land-based offsets) (Offsets Policy) (DSEWPC, 2012), affected threatened species require a like for like replacement of impacted vegetation communities and offsets are required to consider the risk of loss to potential offset areas when considering an appropriate offset areas size. Surveys conducted for the Proposed Action undertook 19 MHQAs to provide an indication of potential offset liability and habitat condition for the five Matters of National Environmental Significance (MNES) identified.

MHQAs were undertaken and subsequently scored in accordance with Queensland's the *Guide to determining terrestrial habitat quality* (DES, 2020). Habitat quality scores derive for each MNES are shown in Table 9-3.

9.2.2 OFFSET AREA

The Offset Area is located in the southwest of the Study Area and has an area of 5,268.9 ha (see Figure 9-1). Relevant details of the Offset Area are described in Table 9-1. The Offset Area occurs entirely within the Study Area and has therefore been classified and mapped into broad habitat types as classified in Section 4.2 of the Theodore Wind Farm PER.

TABLE 9-1 OFFSET AREA DETAILS

Offset Area	Land owner	Lot on Plan	Lot Size (ha)	Proposed Area for Offset (ha)
Offset Area	Land owner	[redacted]	19,594	5,268.9

Offset delivery will be undertaken by the Proponent in collaboration with land owner/land manager. It is important to note that the contractual agreement with the potential land owner of the Offset Area must be confirmed to ensure that the management actions, monitoring plan, interim performance targets, and Offset Area environmental objectives outlined in the Final OMP are achievable. In this light, the boundaries of the Offset Area is currently flexible and may vary slightly following the confirmation of the contractual agreement with the potential land owner.

In addition to this, additional offset areas are currently under consideration to support the delivery of these direct, land-based offsets. These areas have been further discussed in the OMP (Appendix F).

9.2.3 MEETING OFFSET AREA REQUIREMENTS

To assess the suitability of the Offset Area at meeting the offset requirements for each MNES, habitat quality scores for both the habitat impacted by the Proposed Action (Impact Area) and

the Offset Area were used within the OAG calculator. MHQA habitat scores within the Offset Area will look to be improved by an integer of one for Poplar Box TEC, southern squatter pigeon and diamond firetail, and an integer of two for koala and greater glider within 20 years. Based on the OAG calculator, the Offset Area will sufficiently cover the offsets required for all MNES. This process is discussed in detailed within the Draft Offset Management Plan (OMP) (Appendix F) (including the additional parameters entered into the calculator tool), with the results summarised within Table 9-2

TABLE 9-2 MNES OFFSET SUMMARY REQUIREMENTS

MNES	Residual Impact (ha)	Habitat quality score (Impact area)	Habitat quality score (Offset area)	Offset Area (ha)	Target habitat quality score (Offset area)	Percent of Residual Impacts Offset
TECs						
Poplar Box TEC	6.6	6	7	114.3	8	136.42%
Fauna						
Southern squatter pigeon	152.5	7	7	4,112	8	314.56%
Greater glider	643.8	8	6	5,068.2	8	131.78%
Koala	663.5	7	5	5,268.9	7	151.92%
Diamond firetail	95.8	6	6	1,226	7	174.22%

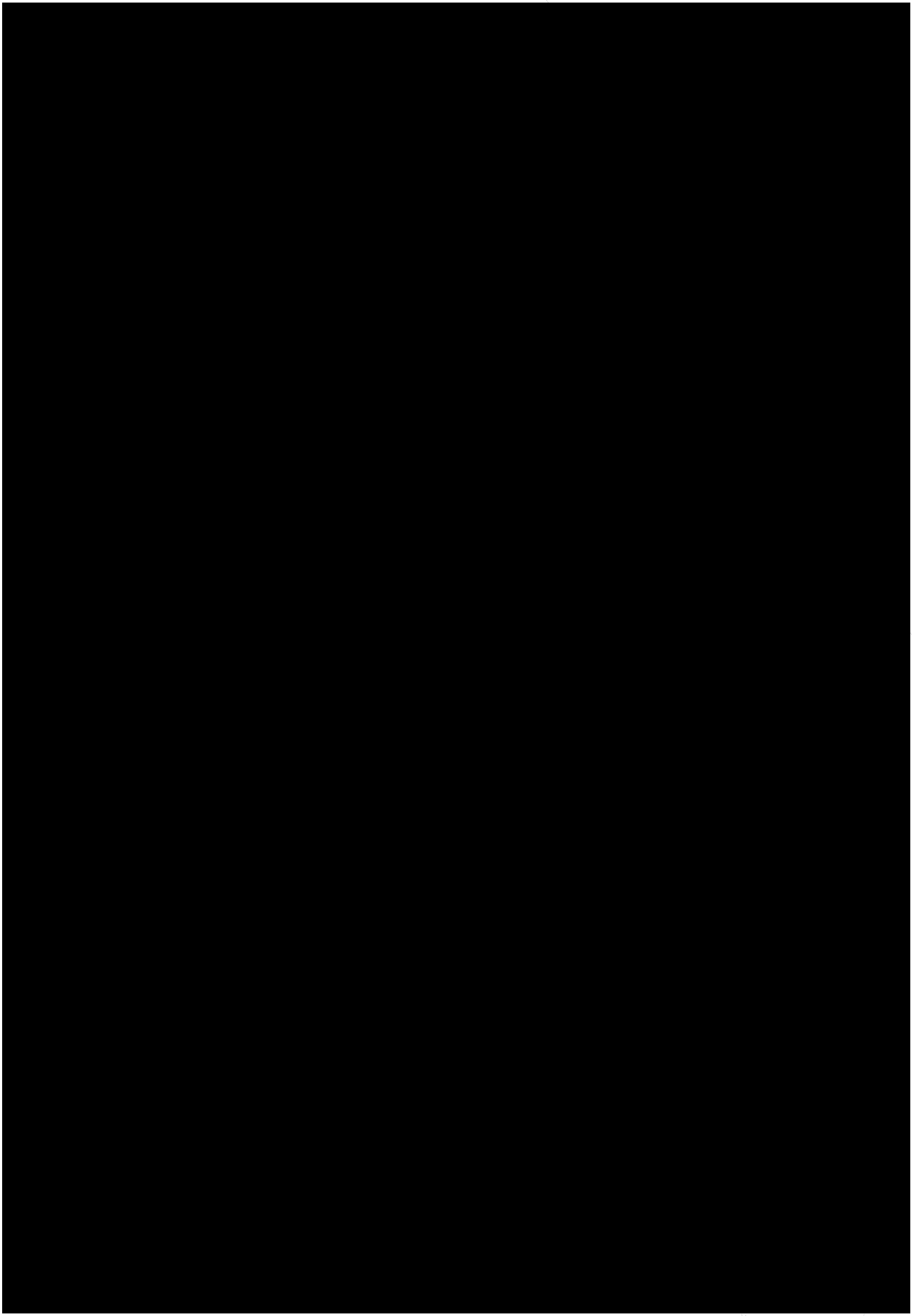
9.2.4 POTENTIAL OFFSET REQUIREMENTS FOR BIRD AND BAT SPECIES AS A RESULT OF TURBINE COLLISION

The above sections discuss the offset requirements for MNES due to significant residual impacts to the species resulting from the Proposed Action. The significant impact assessments conducted in Section 6 of the Theodore Wind Farm PER determined that, additional to southern squatter pigeon, a significant residual impact to any listed threatened and/or migratory bird or bat species in the Study Area was unlikely.

Based on the assessments completed as part of this PER, there is unlikely to be any significant residual impacts from WTG strike. The risk assessments and Collision Risk Model (as detailed in Section 6.11 of the Theodore Wind Farm PER) have been conducted and show no significant residual impact to listed threatened or migratory bird and bat species as a result of the Proposed Action.

The BBMP (Appendix D) lists the relevant management measures to be undertaken during construction and operation to mitigate impact to listed threatened or migratory species across the lifetime of the Proposed Action. Of particular consideration is the implementation of an adaptive management approach, in which potential impact to listed threatened or migratory bird or bat species will be monitored throughout the life of the Proposed Action. Should the potential for significant residual impact be triggered as a result of monitoring during the operational phase for any listed bird or bat species, financial or other indirect offsets will be adopted by the Proponent.

It is acknowledged that mitigation, rather than offsetting, will form the primary approach for managing collision and barotrauma mortality, given the difficulty in quantifying and offsetting such impacts under the current Offsets Policy. Therefore, to guide corrective action implementation, species-specific impact thresholds have been defined in the BBMP (Appendix D), based on relevant Commonwealth and State guidelines and ecological literature. This BBMP and the adaptive management framework are intended to ensure that any mortality remains within ecologically acceptable limits, with timely corrective actions implemented where required to mitigation for any impacts.



9.3 OFFSET MANAGEMENT PLAN

9.3.1 OMP PURPOSE

A OMP (Appendix F) has been prepared that specifically outlines the requirements to deliver and manage the offset, per the conditions of the approvals for the Proposed Action and developed in accordance with the Offsets Policy (DSEWPC, 2012). The OMP outlines the preliminary *Offset Assessment Guide* (OAG) calculator for the required MNES offsets and outlines the potential offset area and its suitability in providing the offsets required.

The purpose of the OMP is to:

- Summarise the Proposed Action impacts to the Poplar Box TEC, southern squatter pigeon, greater glider, koala, and diamond firetail;
- Identify and describe the Offset Area;
- Outline the regulatory framework guiding the development of the OMP, and demonstrate compliance with requirements;
- Provide objectives of the offset and site-specific management actions to be implemented within the Offset Area, including specific timing and outcomes to be achieved;
- Establish the requirements for monitoring, reporting and corrective actions;
- Demonstrates complete acquittal of the calculated offset requirement; and
- Assess the risks associated with achieving the offset.

It is important to note that the contractual agreement with the potential land owner of the Offset Area must be confirmed to ensure that the management actions, monitoring plan, interim performance targets, and Offset Area environmental objectives outlined in the OMP are achievable. In this light, the boundaries of the Offset Area is currently flexible and may vary slightly following the confirmation of the contractual agreement with the potential land owner. The OMP presents the current opportunities for available land for offsets and management measures that are workable to meet the objectives of the Offset Area onsite (within the Study Area of the Proposed Action). There is currently a preference for onsite offsetting, however, there may be the opportunity to offsite the Offset Area if required. Additionally, the management actions presented within the OMP are desirable management actions, however they may be subject to change following offset negotiation with land owners. A Final OMP will be for the implementation and ongoing management of the Offset Area prepared following the contractual agreement with the potential land owner.

This OMP has been prepared in accordance with *The Environmental Management Plan Guidelines* (DCCEEW, 2024), and has been reviewed and approved by Dr David Dique, a Commonwealth Approved Ecologist with 30 years' experience (Suitably Qualified Ecologist).

9.3.2 OFFSET AREA MANAGEMENT ACTIONS

Management actions have been designed to ensure that the completion criteria for the offset area are supported and achieved. Management actions have been designed to achieve the predicted gains in vegetation integrity and habitat quality scoring required to deliver the offset for the five MNES.

The focus of the management actions will be to increase the MHQA metrics most associated with improving habitat quality for the five MNES outlined above. These MHQA metrics primarily relate to aspects such as large tree canopy and cover, shrub and grass cover, flora species diversity and abundance, but some MNES have specific targets that are also measurable outside of standard BioCondition inputs for the MHQA (i.e., related to species or TEC context). These include metrics such as increases in food trees for greater glider (i.e., over the >30cm diameter at breast height (dbh) benchmark), juvenile food trees for koala, recruitment and progression to mature trees for Poplar Box TEC, and bare ground coverage for southern squatter pigeon.

Management actions have been divided into five categories which have been detailed within Table 9-3.

Furthermore, management actions will be implemented through a zoned approach that integrates enhancement of existing remnant vegetation with active regeneration and revegetation of regrowth and previously cleared/disturbed areas.

- The zoned management framework applies two management zones that represent different levels of intervention linked to ecological condition and limiting factors:Baseline zone: MNES habitat where vegetation structure and function are present and recoverable using protection and maintenance measures. Management focuses on weed suppression, pest control, appropriate fire, managed grazing, and protection of existing structure to maintain or improve BioCondition attributes and reduce threats.
- Active Regeneration zone: MNES habitat where natural recruitment and structural development are constrained by one or more limiting factors and require intensified intervention to deliver timely recovery. Management adds assisted regeneration and targeted revegetation to the baseline measures and applies stronger threat abatement and stock exclusion to restore vegetation structure, floristic diversity and microhabitat.

The zoning differentiates where protection and maintenance alone are sufficient compared to where intensified management is required to restore vegetation structure and improve MHQA attributes. Baseline zone actions include habitat, weed, pest, fire, grazing and general management as described in the following Section. Active regeneration zone actions include all baseline actions plus assisted regeneration measures such as propagation or planting to accelerate canopy and mid-story development, intensified weed suppression in priority locations, temporary total stock exclusion where needed to protect recruitment, and increased monitoring to confirm response.

TABLE 9-3 ZONED MANAGEMENT STRATEGY FOR IMPACTED MNES

Management zones	Management Areas	Proposed Management Actions
Baseline zone	• Areas where MNES habitat occurs in locations defined as 'remnant' by VM Act RE mapping 13.1 (DES, 2024)	The proposed management actions for the Baseline zone include the following: • Habitat management; • Targeted weed management; • Pest animal management; • Fire management; • Grazing management; and • General management.

Management zones	Management Areas	Proposed Management Actions
Active Regeneration zone	• Areas where MNES habitat occurs in locations defined as 'non-remnant' VM Act RE mapping 13.1 (DES, 2024)	Additional to the baseline management ties: • Habitat management – propagation of source material in selected areas to increase speed of canopy regeneration; • Weed management – more frequent and intensified removal of woods and management of burgeoning infestations; • Grazing management – total cattle exclusion in selected locations to enable enhanced and more successful canopy recruitment; and • General management – increased monitoring to ensure sufficient barrier maintenance and species utilization.

This zoned approach will support the HQS improvement required for each MNES. Offset management is designed to achieve a two point HQS gain for koala and greater glider habitat. This will require areas of habitat for these species to be managed inline with Baseline Zone management action and for habitat to created and uplifted. A one point gain for Poplar Box TEC, southern squatter pigeon and diamond firetail habitat is proposed. These gains apply at the Offset Area scale and are achieved through the combined effect of baseline and active regeneration zone actions over the 20 year time horizon of the offset.

TABLE 9-4 MANAGEMENT CATEGORIES AND ACTIONS TO MEET MNES OFFSET LIABILITY

Management Categories	Management Actions
Habitat Management	Implementation of the management actions and adaptive management framework as outlined in the OMP. Maintaining and promoting eucalypt growth to support natural recruitment and regeneration (pest, weed, fire and grazing management as per the routine outlined in the OMP). No unapproved and/or intentional clearing of vegetation within the offset area will be completed, except for clearing that is required for fencing, access tracks, firebreaks and public safety.
Weed Management	Baseline weed mapping will be undertaken for WoNS and locally significant weeds relevant to the threatened species within the Offset Area. The following management actions will be implemented to manage the establishment and spread of non-native weeds: • Low intensity grazing by cattle (stock management); • Herbicide, mechanical and Biological control; and • Fire. All machinery and vehicles required to access the Offset Area for construction or maintenance will be certified to be weed free upon arrival.
Pest Management	Undertake surveys to establish pest animal occurrence and detailed mapping of targeted pest animals within the Offset Area, prior to active management. Surveys will determine presence and densities of identified targeted pest animals. Noting that feral animal management currently occur by land owner, the OMP commitment formalises that ongoing control will remain. Where an unplanned or uncontrolled fire affects the Offset Area, an assessment will be undertaken to determine the extent and severity of impact

Management Categories	Management Actions
	to habitat quality. This assessment will determine if the impact of the unplanned fire is likely to result in changes in the number of pest animals present. A review of the management actions will be carried out to ensure targeted pest animal species are adequately monitored. Where targeted pest animal densities are found to increase after a fire event, immediate application of corrective actions will be carried out. For example, where an increase in the number of feral cats or foxes are observed post-fire event, additional control programs (baiting, trapping) will be immediately implemented to reduce risk to MNES.
Fire Management	If there are one or more bushfires that are current in the region and they are considered threatening to the Offset Area, then coordinate with all relevant fire authorities to determine an appropriate method to protect the Offset Area. The approval holder will maintain firebreaks along boundaries of the Lots within which the Offset Area is defined. These breaks must be inspected periodically and have maintenance occur once every three years at a minimum. Important note: if there is fire damage to the Offset Area then it must be reported by the land owner. The approval holder is required to report any damage to the Offset Area to the Commonwealth. Surveys will be undertaken by suitably qualified professionals to re-establish a baseline of fuel loads within the Offset Area prior to active management, which can be monitored against for implementation of corrective actions. Management activities to reduce fuel loads will be undertaken within the Offset Area and include: • Low intensity grazing by livestock; and • Cool controlled burns. Controlled burns must follow the fire management guidelines specific for the REs within the Offset Area (Queensland Government, 2024).
Grazing Management	Management actions associated with minimising the pressure and habitat impacts of grazing include: • Monitor stocking rates within the Offset Area; and • Reduce current stocking rates (to be negotiated with land owner property to property). Stock will be grazed only when required to reduce dry matter yield (DMY), and only during the dry season. A specific DMY lower limit will be determined after negotiation with land owners to avoid overgrazing the Offset Area.
General Offset Management	Selective logging practices will be excluded from the Offset Area to maintain the extent of mature trees within the Offset Area. Gates at the entrance of Offset Area will be maintained to: • Prevent the entry of unauthorised large domestic animals; and • Remove vehicle access and limit any potential harvesting of timber. Vehicle access is limited to authorised contractors undertaking offset area management in accordance with this plan. A speed limit within the Offset Area will also be imposed.

9.3.3 MONITORING AND REPORTING

A monitoring program, described within the OMP (Appendix F), details the monitoring actions that will occur within the Offset Area. The OMP will continue monitoring actions for the life of the approval to ensure corrective actions are undertaken when required and the Offset Area continues to meet criteria set by the approval. The monitoring program has been developed to assess success of the management actions, to improve the overall habitat quality scores for MNES. Monitoring data will be submitted electronically to DCCEEW in accordance with the Guidelines for biological survey and mapped data.

The monitoring actions described in the OMP will be managed by the Offset Provider and will be completed by a suitably qualified expert, as required by the conditions of approval. The placement of permanent MHQA transects and photo monitoring locations will correspond to the same locations used for the calculation of the start habitat quality scores used in the assessment of the Offset Area suitability.

Thirteen field-based ecological condition indicators used in the MHQA will be monitored to track the effectiveness and success of the OMP:

- Recruitment of woody perennial species – includes koala and greater glider canopy feed and shelter tree species, canopy and indicator species for TEC classification.
- Native plant species richness (trees, shrubs and grasses) – as an indicator of ecological succession and regeneration progress after mitigating ecosystem threats as well as improvement to potential condition class and structure of TEC.
- Tree canopy height – indicates progress towards ecological maturity and increases in habitat availability and TEC quality progression.
- Tree canopy cover – indicates progress towards ecological maturity and increases in habitat availability and TEC quality progression.
- Shrub canopy cover – indicates progress towards ecological maturity, composition of ground cover for southern squatter pigeon.
- Native perennial grass cover – which suppresses weeds and thereby encourages recruitment of juvenile eucalypt foraging and shelter trees and creates open composition of woodlands, indicates foraging capacity for southern squatter pigeon.
- Organic litter cover – important for surface soil moisture retention, cycling of nutrients and providing interstitial spaces to enhance tree seed germination and growth and recruitment of canopy species including actively-growing species that support MNES and foraging activity.
- Large trees per hectare – includes koala and greater glider canopy feed and shelter tree species, canopy and indicator species for TEC classification.
- Coarse woody debris per hectare – habitat surrogate for ground-dwelling fauna and an indicator of management disturbance.
- Non-native plant cover – which can compete with native plants for light, moisture and nutrients, especially recruiting koala and greater glider food and shelter tree canopy species, TEC condition, microhabitat reference. Invasive plants can increase fuel load and change fire regimes and susceptibility to unplanned fires.
- Quality and availability of food and foraging – e.g. number, size and health of foraging trees, available foraging space in ground cover, richness and density of grass species.

- Quality and availability of shelter – e.g. density and health of denning trees.
- Threats to species and ecosystems – e.g. pest animals, weed species, vehicle strike.

These attributes will be put through the MHQA to assess the progress of the Offset Area towards the completion criteria. The location of the monitoring transects will be decided upon completion of the Final OMP.

9.3.4 PERFORMANCE OBJECTIVES AND COMPLETION CRITERIA

The overall objective of managing the offset is to improve the quality of habitat so that it reaches a higher MHQA habitat quality score than has been measured for the existing baseline condition within a 20-year period and continues for the life of the approval.

A demonstrated increase in measurable habitat criteria (see Table 9-5), as defined in the MHQA, will be provided against the baseline condition assessments, to be finalised on selection of a final Offset Area.

Monitoring results will be analysed against performance targets to determine whether performance objectives are met prior to the completion criteria being achieved. Monitoring against the targets and the criteria will provide an indication of the success of the management and monitoring actions being implemented to improve the quality of MNES habitat and TECs. They will also serve to trigger implementation of corrective actions where targets and criteria are not being met.

TABLE 9-5 MNES SPECIFIC COMPLETION CRITERIA

MNES	Completion criteria metric	Measured by
Koala	• Increase available foraging tree species diversity and available juvenile tree species. • Increase baseline scores to number of large canopy tree species known to be koala trees (as compared to regional ecosystem benchmark; 75% or greater than RE benchmark). • Increase of baseline scores to canopy height (as compared to RE benchmark; 75% or greater than RE benchmark). • Decrease of shrub cover (with a focus on any invasive shrubs that may restrict movement such as lantana) to <200% of the RE benchmark.	• Native plant species richness – Trees • Juvenile tree count per ha (as per koala habitat methodology within MHA guidelines) • Number of large eucalypt trees; • Tree canopy height (average of emergent, canopy and sub-canopy); and • Shrub canopy cover.
Greater glider (southern and central)	• >75% of RE benchmark for species diversity. • Increase of baseline scores to canopy height (as compared to RE benchmark; 75% or greater than RE benchmark) • Increase of baseline scores to canopy cover (as compared to RE benchmark; 75% or greater than RE benchmark). • Increase abundance of large trees suitable for current denning (as per the *Greater Glider Guides* large hollow-bearing tree dbh proxy the Brigalow Belt Bioregion >46 cm).	• Tree canopy height (average of emergent, canopy and sub-canopy); • Tree canopy cover (average of emergent, canopy and sub-canopy); • Large trees per ha; • Suitable habitat trees >30 • cm dbh per ha; and • Species confirmed utilisation of regenerated areas.

MNES	Completion criteria metric	Measured by
	• Increase abundance of large trees suitable for potential denning (as per the *Greater Glider Guides* foraging tree dbh proxy the Brigalow Belt Bioregion (>30 cm). • >75% of large trees as a % of RE benchmark. • Species presence.	
Southern squatter pigeon	• Native grass richness 6 or above (relevant to RE baseline scored for current impact area). • Native grass cover maintained between 34-50% to ensure correct bare ground and structural preferences for the species. • Shrub cover <50%.	• Native plant species richness – grasses; • Native perennial grass cover (%); • Bare ground (%); • Litter (%); • Shrub cover (%); and • Canopy cover (%).
Diamond firetail	• Increase native grass ground cover and richness (>60% native grass species cover and species richness consistent with reference RE). • Tree and shrub density consistent with reference RE. • Management of non-native grass species (non-native ground cover <5%). • Decrease rabbit density (threat from rabbit degrading habitat decreased to negligible).	• Native plant species richness – grasses; • Native plant species richness – forbs; • Native perennial grass cover (%); • Shrub cover (%); • Large trees; • Non-native plant cover (%); and • Rabbit abundance.
Poplar Box TEC	• Improvement of RE condition. • Increased abundance of diagnostic species already present TEC (as per Appendix A1 of the Conservation Advice). • Increased diversity of diagnostic species not yet present within the TEC (as per Appendix A1 of the Conservation Advice). • Increased number of large canopy trees (*Eucalyptus populnea*) relative to baseline conditions. • Increased number of native ground layer species per ha. • Increased connectivity between fragmented patches.	• Native plant species richness – grasses; • Native plant species richness – forbs; • Native plant species richness – low shrubs; • Weed cover; and • Recruitment.

9.4 OFFSETS POLICY

The Offsets Policy (DSEWPC, 2012), provides guidance on the role of offsets in environmental impact assessments of MNES and the suitability of any proposed offsets for those MNES. If significant impacts to MNES are considered likely, and the Proposed Action is determined a 'controlled action' under the EPBC Act (such as this Proposed Action has), the Offsets Policy will apply.

The Offsets Policy has five key aims, being to:

- Ensure the efficient, effective, timely, transparent, proportionate, scientifically robust and reasonable use of offsets under the EPBC Act;

- Provide proponents, the community, and other stakeholders with greater certainty and guidance on how offsets are determined, and when they may be considered under the EPBC Act;
- Deliver improved environmental outcomes by consistently applying the policy;
- Outline the appropriate nature and scale of offsets and how they are determined; and
- Provide guidance on acceptable delivery mechanisms for offsets.

9.4.1 CORE PRINCIPLES OF THE EPBC ACT OFFSETS POLICY

Table 9-6 details how the Proposed Action, through the Offset Area, will aim to meet the core principles of the Offsets Policy (DSEWPC, 2012).

TABLE 9-6 OFFSETS POLICY APPLICATION TO THE PROPOSED ACTION

Offsets Policy Principles (DSEWPC, 2012)	Proposed Offset Anticipated Compliance
Must deliver an overall conservation outcome that improves or maintains the viability of the aspect of the environment that is protected by national environment law and affected by the Proposed Action	The offset includes a direct, land-based offset that will result in the protection and improvement of Poplar Box TEC, southern squatter pigeon, greater glider, koala and diamond firetail habitat. The offset is like-for-like, comprising habitat values commensurate with the habitat impacted. Management actions will be undertaken across six broad categories (habitat management, weed management, pest animal management, fire management, grazing management and general Offset Area management), to ensure the Offset Area's habitat quality is improved throughout the lifetime of the offset. The Offset Area will be managed exclusively for conservation purposes and will be protected and managed under the OMP for the life of the approval.
Must be built around direct offsets but may include other compensatory measures	The Offset Area for the Poplar Box TEC, southern squatter pigeon, greater glider, koala and diamond firetail is a direct land-based offset. The offset secures a land-based offset that meets the offset obligation and will be managed in accordance with the OMP.
Must be in proportion to the level of statutory protection that applies to the protected matter	The Offset Area calculation has been informed by the EPBC Act threat status for all TECs and impacted species, through the use of the EPBC Act Offsets Assessment Guide (OAG).
Must be of a size and scale proportionate to the residual impacts on the protected matter	The size and scale of the offset has been assessed using the EPBC Act OAG, with the following percent of impact offset for each MNES: • 136.42% for Poplar Box TEC; • 314.56% for southern squatter pigeon habitat; • 131.78% for greater glider habitat; • 151.92% for koala habitat; and • 174.22% for diamond firetail habitat. Refer to Section 4.5.2 and Appendix C of the OMP (Appendix F) for full OAG assessments. It should be noted that this OMP has been developed based on a maximum significant residual impact for each MNES. Therefore, the offset for MNES values will provide protection for above the required offset amount.

Offsets Policy Principles (DSEWPC, 2012)	Proposed Offset Anticipated Compliance
Must effectively account for and manage the risks of the offset not succeeding.	A detailed risk assessment has been provided in the OMP, which details the relevant mitigation measures and residual risk rating in accordance with the *Environmental Management Plan Guidelines* (DCCEEW, 2024). Key threats to the Offset Area will be actively managed in accordance with this OMP. The risk of the offsets not succeeding has been factored into the EPBC Act OAG calculator, with 'confidence in result' set at: • 60% for Poplar Box TEC; • 85% for southern squatter pigeon offset; • 85% for greater glider offset; • 85% for koala offset; and • 85% for diamond firetail. Adaptive management will be implemented as part of the OMP and will ensure that changes and updates can be made to Management Actions, if circumstances in the Offset Area change.
Must be additional to what is already required, determined by law or planning regulations or agreed to under other schemes or programs (this does not preclude the recognition of state or territory offsets that may be suitable as offsets under the EPBC Act for the same action, see Section 7.6)	The Offset Area is not protected through a State or Commonwealth mechanism. By designating the Offset Area as a Category A (offset area) under the *Vegetation Management Act 1999* (VM Act), additional protection is placed over the vegetation so that existing pressures on the condition can be removed. The Offset Area has not previously been used as part of a recovery plan or conservation outcome. Thus, the Offset Area offers additional protection to what is already in place under planning regulations/schemes.
Must be efficient, effective, timely, transparent, scientifically robust and reasonable	The Offset Area will be governed by the OMP, which includes a management, monitoring, and reporting program. The OMP provides transparency around offset delivery and clear requirements around timing and required outcomes. The management actions have been informed by species-specific requirements and technical knowledge regarding key threats and effective control measures. Therefore, the offset is considered to be efficient, effective, timely, transparent, scientifically robust and reasonable.
Must have transparent governance arrangements including being able to be readily measured, monitored, audited and enforced	The OMP includes clear and detailed objectives, as well as the specific timelines that will be in place to ensure management of the Offset Area are followed and implemented. The responsibilities of the Proponent and land owner, as well as monitoring and auditing measures, are detailed in Section 2.3 and Section 6 within the OMP.

SECTION 9 REFERENCES

DCCEEW. (2024). *Environmental Management Plan Guidelines.* Canberra: Department of Climate Change, Energy, the Environment and Water.

DES. (2020). *Guide to determining terrestrial habitat quality, Methods for assessing habitat quality under the Queensland Environmental Offsets Policy.* Department of theEnvironement and Science. Retrieved from https://environment.des.qld.gov.au/__data/assets/pdf_file/0017/102833/habitat-quality-assessment-guide-v1-3.pdf

DES. (2024). *2021 remnant and pre-clearing regional ecosystem (RE) mapping version 13.1.* Brisbane: Department of the Environment, Tourism, Science and Innovation.

DSEWPC. (2012). *Environment Protection and Biodiversity Conservation Act 1999 Environemntal Offset Policy.* Canberra: Department of Sustainability, Environment, Water, Population and Communities.

Queensland Government. (2024). *Fire management guidelines*. Retrieved from Regional Ecosystems: https://www.qld.gov.au/environment/plants-animals/plants/ecosystems/fire-management

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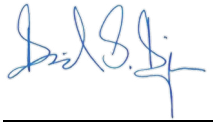
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ACRONYMS AND ABBREVIATIONS

Acronym	Description
AoI	Area of Influence
BBMP	Bird and Bat Management Plan
CEC	Community Engagement Committee
CEMP	Construction Environmental Management Plan
CVMP	Cleared Vegetation Management Plan
Disturbance Footprint	The area whereby the final layout and impacts have been considered and occupies an area of 1,590.1 ha.
DMP	Decommissioning Management Plan
ESCP	Erosion and Sediment Control Plan
MNES	Matters of National Environmental Significance
PER	Public Environment Report
Proposed Action	Theodore Wind Farm
Project Area	The corridor of land on which the Disturbance Footprint will be located, including a 100 metre buffer for micro-siting.
RWE	RWE Renewables Australia Pty Ltd
SEIA	Socio-Economic Impact Analysis
Study Area	The 9 land parcels, across 3 properties, and road reserve areas, 46,830 ha, in which the Proposed Action will be located.
SWMP	Stormwater Management Plan
The Proponent	Theodore Energy Development Pty Ltd
VFMP	Vegetation and Fauna Management Plan
WTG	Wind Turbine Generator

10. OTHER APPROVALS AND CONDITIONS

On 20 June 2025, a Development Permit for a Material Change of Use (Wind Farm) and Operational Works (Native Vegetation Clearing) was granted by the Queensland State Assessment Referral Agency.

The following State Development Assessment Provisions State Codes have conditions imposed as part of the Queensland State Development Approval:

- State Code 16: Native vegetation clearing;
- State Code 23: Wind farm development.

Table 10-1 identifies relevant conditions applied to the Proposed Action.

TABLE 10-1 ANTICIPATED MODEL CONDITIONS

Condition Number	Condition	Description
3	Prepare a Vegetation and Fauna Management Plan (VFMP)	The VFMP must be prepared by a suitable qualified ecologist and include: • The location and extent of all vegetation clearing and subsequent site works including areas to be used for soil and felled vegetation stockpiles; • Outline the proposed approach to the staging of vegetation clearing and how it will be managed to respond to the requirements of this condition (for example whether clearing will occur simultaneously over multiple parts of the site or on a single clearing front); • Outline measures to be used to ensure that vegetation that is not approved for clearing is not affected by clearing activities and subsequent site works; • Outline a detailed strategy to be deployed to ensure that important flora (that is not approved for clearing) and fauna is not unduly harmed during clearing activities. This strategy should include but not be limited to: ◦ how and when qualified fauna spotters/wildlife officers will be used during clearing operations (particularly if clearing is to occur on multiple areas of the site simultaneously); ◦ protection, recovery and relocation procedures to be used by fauna spotters/wildlife officers in the course of their duties.
4	Prepare a Cleared Vegetation Management Plan	The Cleared Vegetation Management Plan must be prepared by a suitability qualified person and include: • The overall strategy to be deployed for the felling an managing of vegetation approved for clearing; • the location and extent of storage and stockpile areas for cleared vegetation and mulch; • outline how cleared vegetation is to be treated and managed through a combination of: ◦ strategies for the on-site reuse of felled, non-mulched logs as part of the Rehabilitation Management Plan including how timbers will be stored and managed prior ot being relocated during rehabilitation activities; ◦ ensuring that felled timber logs that are pushed into permanent rows do not exceed approximately three (3) metres in height; ◦ any removal off-site of salvaged logs;

Condition Number	Condition	Description
		◦ use of mulched material both on-site and mulched material to be removed off-site. • Measures to manage bushfire risks of all on-site cleared vegetation including managing risk of spontaneous combustion of mulch piles. • Industry best practice measures to be used to minimize bush fire risks and environmental impacts of any on-site burning of cleared vegetation. • Measures to ensure that cleared vegetation is not pushed, stacked or in any way damages habitat or vegetation not approved to be cleared.
5	Prepare a Rehabilitation Management Plan	The Rehabilitation Management Plan must outline how areas cleared of vegetation will be replanted, revegetation, and management after construction. It must be prepared by a suitability qualified person and: • Be in accordance with the Post-Construction Rehabilitation Plan prepared for the Proposed Action; • Detail all activities, actions and measures to demonstrate how all Type 2 Rehabilitation Area, will be rehabilitated to the pre-clear state; • Ensure the proposed timing of the rehabilitation activities minimizes to the greatest extent practicable the time the disturbance footprint is left unvegetated; • Include requirement o undertake adaptive management responses to rectify any negative results to ensure that over time compliance is achieved; • Include strategies and measures that may be deployed as adaptive management responses if monitoring highlights negative results.
6	Prepare Rehabilitation Monitoring Reports	Rehabilitation Monitoring Reports must be completed for the first five years following commencement of export of electricity and include: • Details of the implementation of the Rehabilitation Management Plan, including: ◦ Plant growth; ◦ % cover and survival rates; ◦ Estimated plan losses through herbivores, disease, vandalism, storm damage, etc.; ◦ Weed regrowth and control measures; ◦ Plant replacement; ◦ Guard repair and weeding inside guards; ◦ Maintenance watering regime; • Report on any adaptive management responses to rectify negative results from monitoring undertake.
8	Prepare a finalised Bird and Bat Management Plan (BBMP)	The BBMP must: • Be prepared by a suitably qualified ecologist • Be based on the final location of WTG • Identify all 'at risk' bird and bat species (i.e. all threatened and common species), seasons, and areas within the project site which may attract high levels of mortality • Incorporate baseline data, including where relevant, additional pre-operational surveys, Collision Risk Modelling and Population Viability Analysis • Identify threshold (trigger) levels for all species • Identify mitigation measures and implementation strategies to reduce impacts on bird and bat species

Condition Number	Condition	Description
		• Include a decision-making framework and adaptive management approach, including triggers for mitigation measures such as operational shut-down of relevant turbines during certain periods.
8	Prepare a first-year postconstruction report.	The report must: • Be prepared by suitably qualified ecologist • Demonstrate whether the site continues to be utilised by the range of species identified during surveys conducted before the full commencement of the use and asses any changes in abundance or behaviour • Include a recommendation on the need for additional surveys • The BACI sampling design will be tested using the data collected in baseline and post-construction bird utilisation surveys.
9	Prepare a Stormwater Management Plan (SWMP)	The SWMP must: • Be certified by a Registered Professional Engineer of Queensland • Relate to the operational phase of the wind farm • Be prepared in accordance with section 2.3 of the Queensland Urban Drainage Manual and demonstrate all stormwater, wastewater, discharges and overland flows leaving the site during the operational phase are of the same quality and quantity of receiving waters prior to development • Have regard to erosion management and site stabilisation.
10	Prepare an Erosion and Sediment Control Plan	The Erosion and Sediment Control Plan must: • Be prepared by an appropriately qualified professional; • Incorporate mitigation measures as identified in the Stormwater Assessment prepared for the Proposed Action; • Be prepared in accordance with the Best Practice Erosion and Sediment Control guidelines for Australia; • Prevent increased sediment runoff, including sediment runoff as a result of vegetation clearing, from entering into watercourses, drainage features, wetlands and/or surrounding landscapes during all construction phases from vegetation clearing, undertaking civil works and during the construction of wind turbines and ancillary infrastructure; • Recommend measures and devices to prevent accelerated soil erosion and instability or where prevention is not possible, minimize and mitigate; • Include a monitoring plan and program that is responsive to the seasonal erosion risks of the site, and is adaptive to rectifying negative monitoring results; • Include an emergency erosion management response protocol that must be enacted ahead of forecast weather events that will substantially increase the likelihood of accelerated erosion.
12	Prepare a Construction Environmental Management Plan (CEMP)	The CEMP must: • Be prepared by a suitably qualified person • Include measures necessary to minimise impacts to agricultural or active including stock routes and cattle movements • Identity activities necessary to ensure the removal and disposal of waste and details of the nominated waste facilities (waste, except for vegetation must not be burnt or allowed to be burnt onsite) • Ensure the location of infrastructure required for construction is within the final Project Layout Plan

Condition Number	Condition	Description

		• provide appropriate weed and pest management in accordance with the Department of Agriculture and Fisheries' principles of pest management
		• include measures to manage construction noise, dust and vibration, including:
		  ◦ construction noise in accordance with the Environmental Protection (Noise) Policy 2019
		  ◦ construction vibration to meet the construction vibration criteria in the Department of Transport and Main Roads' Transport Noise Management Code of Practice dated March 2016
		  ◦ the activities and equipment likely to generate noise and vibration
		  ◦ identification of the proposed hours of work and what work will be undertaken during those hours, including where works are proposed outside of the hours and days specified in the default noise standards within Chapter 8, Part 3B, Division 3 of the Environmental Protection Act 1994
		  ◦ the identification of the sensitive receptor locations that may be affected by noise, vibration, and dust emissions from the construction work activities
		  ◦ assessment of potential noise and vibration impacts at sensitive receptors (i.e. via noise modelling) with respect to the relevant criteria
		  ◦ mitigation measures to reduce noise, vibration and dust impacts at sensitive receptors, including:
		  ◦ scheduling of activities
		  ◦ consultation with relevant sensitive receptors
		  ◦ an effective complaints resolution process per Condition 30
		  ◦ a blasting plan
		• include erosion and sediment control measures in accordance with the Best Practice Erosion and Sediment Control guidelines for Australia (International Erosion Control Association) and includes measures to:
		  ◦ prevent accelerated soil erosion
		  ◦ where prevention is not possible, minimise, and mitigate accelerated soil erosion
		  ◦ monitor and respond accelerated soil erosion events
		• achieve no net worsening of stormwater management in accordance with the Queensland Urban Drainage Manual, certified by a Registered Professional Engineer of Queensland
		• geotechnical and slope stability risk assessment, certified by a Registered Professional Engineer of Queensland.

13	Prepare a Bushfire Management Plan	The Bushfire Management Plan must: • Be prepared by a suitability qualified person; • Be prepared in consultation with the Rural Fire Service Queensland and all host land owners; • Provide evidence of consultation; • Include a fire hazard analysis; • Include mitigation strategies to achieve the development outcomes in Part E of the Queensland State Planning Policy 2017.
32	Prepare an End of Construction Decommissioning Management Plan (DMP)	The End of Construction DMP must: • be prepared by a suitably qualified person • Address the actions to be undertaken to remove all construction facilities and infrastructure not required for the ongoing operation of the wind farm, including:

Condition Number	Condition	Description
		◦ Removal of above ground non-operational equipment, such as storage areas, site offices, construction areas, access tracks, construction laydown areas. ◦ Removal and clean up of any contamination caused by the development as defined in the *Environmental Protection Act 1994*
30	Prepare an End of Operation Decommissioning Management Plan (DMP)	The End of Operation DMP must: • be prepared by a suitably qualified person • demonstrate how all wind turbine components and ancillary infrastructure will be reused and/or recycled to the maximum extent possible; • address the actions to be undertaken where any or all turbines have permanently ceased operating including: ◦ removal of above ground non-operational equipment ◦ removal and clean-up of any contamination caused by the development as defined in the Environmental Protection Act 1994 ◦ rehabilitation/regeneration of storage areas, construction areas, access tracks and other areas affected by the decommissioning of the turbines if those areas are not otherwise useful to the ongoing use of the land ◦ a consultation program with relevant parties including surrounding landowners.

Table 10-2 below details the potential secondary approvals that may be required for the Proposed Action.

TABLE 10-2 SUMMARY OF POTENTIAL SECONDARY APPROVALS

Legislation	Approval Requirement
Aboriginal Cultural Heritage Act 2003 (Qld)	Cultural Heritage Management Plan or Other Agreement to satisfy Cultural Heritage Duty of Care Guidelines
Planning Act 2016	Secondary approvals are required under the *Planning Act 2016* for accommodation facilities, concrete batching, quarrying, and earthworks associated with the Proposed Action.
Environmental Protection Act 1994	General Environmental Duty - Construction will need to comply with general environmental duty not to cause environmental harm, and to notify of environmental incidents if they occur.
Fisheries Act 1994	Approvals under the *Fisheries Act 1994* are required for waterway barrier works associated with impacts to waterways within the Proposed Action.
Water Act 2000	A Riverine Protection Permit is required if vegetation clearing associated with watercourse crossings does not comply with the exemption requirements for Riverine Protection A Water Licence is required if the Proposed Action takes or interferes with water in a watercourse, lake or spring.
Transport Infrastructure Act 1994	Upgrades to the road network trigger approvals under the *Transport Infrastructure Act 1994.*
Nature Conservation Act 1992	Approvals under the *Nature Conservation Act 1992* required for impacts to animal breeding places and the clearing of protected plants

Legislation	Approval Requirement
Banana Shire Council Planning Scheme	A number of secondary approvals may need to be sought from the Banana Shire Council in accordance with the Planning Scheme. These secondary approvals may include: • Development Permit for Reconfiguring a lot (for the purpose of a lease) for the establishment of a lease for a term greater than 10 years • Development Permit for a Material Change of Use (medium or high impact industry) for the establishment of a concrete batching plant • Development Permit for a Material Change of Use (extractive industry) for the establishment of a quarry / borrow pit • Development Permit for Operational Work (filling and excavation & waterway barrier works) over the site. • Development Permit for Building Works • Development Permit for Plumbing and Drainage

11. CONSULTATION

Theodore Energy Development Pty Ltd (the Proponent) has engaged with stakeholders regarding the Theodore Wind Farm (Proposed Action) since 2021. The focus has been on building transparent and constructive relationships with landholders, neighbours, the community, Traditional Owners, and other interested parties. Further information is included in Appendix L.

Public drop-in sessions have provided valuable forums for community feedback. Key topics of interest have included:

- Noise;
- Visual amenity;
- Local housing;
- Biodiversity;
- Cultural heritage;
- Traffic;
- Workforce accommodation;
- Potential demands on Council infrastructure; and
- Servies and materials.

11.1 IDENTIFICATION OF AFFECTED PARTIES

A Community and Stakeholder Engagement Plan has been prepared to guide stakeholder engagement for the Proposed Action, and establishes the overarching guidelines, principles, objectives, and approach to delivering stakeholder engagement during the Development Phase of the Proposed Action.

The Proponent undertook a mapping exercise to identify affected parties located near the Study Area who were most likely to directly benefit or be impacted by the Proposed Action. The purpose of this mapping exercise was to understand the community context in which the Proposed Action sits, and to ensure that appropriate attention and communication was made to address concerns and/or queries.

The affected parties identified via the mapping as potentially impacted by the Proposed Action, are outlined in Table 11-1.

TABLE 11-1 AFFECTED PARTIES

Parties	Specific Parties
Landowners	Landowners hosting Proposed Action infrastructure for the proposed Theodore Wind Farm.
Fenceline Neighbours	Fencline neighbours are identified as neighbours share a fence line or property boundary with the host landowner(s)/Study Area.
Near Neighbours	Neighbours with a dwelling within 10 km of the proposed Theodore Wind Farm site boundary.

Parties	Specific Parties
Traditional Owners and First Nations People	• Wulli Wulli People • Wulli Wulli Nation Aboriginal Corporation RNTBC • Wulli Wulli Ranger program • Wulli Wulli Elder Group
Opponents (no active opponents identified)	Individuals and organised groups actively opposed to the proposal in proximity to the proposed Study Area.
Wider Community	Residents of the local geographic area hosting the Proposed Action, as well as local interest groups not defined in any previous categories, including: • Residents outside of the boundary determined for neighbours; • Aged care and healthcare organisations; • Business organisations, including but not limited to farmer associations, local progress associations, chambers of commerce or local business structures; • Churches and faith-based organisations; • Conservation and environmental organisations; • Local climate action and sustainability groups; • Not-for-profit organisations; • Primary, secondary, or tertiary educational institutions; and • Recreational groups and clubs.
Local Government	Councillors and staff employed by: • Banana Shire Council • Gladstone Regional Council
Infrastructure owners / operators	• Australia Pacific LNG Pty Limited • Bureau of Meteorology • Geoscience Australia • Telstra • Optus
Aviation Industry	• Airservices Australia • Department of Defence • IDS Australia (procedure designer for Theodore Airport instrument flight procedures) • Queensland Royal Flying Doctor Servies
Industry Bodies	• Clean Energy Council • Re-Alliance • Gladstone Ports Corporation • Stanwell Corporation • Barfield Road Producers Group
Government and Associated Agencies	• Federal Department of Climate Change, Energy, the Environment, and Water • State Assessment and Referral Agency • Queensland Department of Environment, Technology, Science and Innovation • Queensland Department of Natural Resources, Mines, Manufacturing and Regional and Rural Development • Queensland Department of Transport and Main Roads • Australian Energy Infrastructure Commissioner
Emergency Services	• Queensland Fire Department • Camboon Rural Fire Brigade • Moura Rural Fire Brigade • Rural Fire Service Gladstone • Queensland Ambulance Service • Queensland Police Service

Parties	Specific Parties
State and Federal Members of Parliament (MPs)	Federal Member for Flynn Colin Boyce MP (Liberal National Party) State Member for Callide Bryson Head MP (Liberal National Party)
Media	Print and online media: • The Focus Magazine • The Gladstone Observer • The Courier Mail • CQ Today • Biloela Beacon Broadcast media (radio and TV): • ABC 4CC • Hot FM • Triple M Central Queensland • Fresh FM • Win News • Channel 7 • Nine News

A variety of consultation activities have been carried out for the Proposed Action since 2021 and will continue through the construction and operation of the Proposed Action. Engagement with affected parties undertaken by the Proponent has provided feedback from local residents, local Councils, and the wider community, helping to determine the sentiment of those likely to be impacted by the Proposed Action.

Engagement undertaken by the Proponent to-date, has included:

- Meetings with landowners, near neighbours, the community and other interested parties;
- Meetings with and site visits by Traditional Owners;
- Letterbox drops to all homes within 10 kilometres (km) of the Proposed Action in 2023 and 2024;
- A newsletter to introduce the Proposed Action and the Proponent to the community in 2023 and 2024;
- Five two-day community drop-in sessions attended by about 90 community and other key stakeholders in August 2023, February 2024, May 2025, June 2025 and July 2025;
- Formal presentations to Banana Shire Council;
- Eight ‘shopfronts’ at the Theodore Community Hall for two consecutive days;
- Four café sessions; and
- A dedicated website that includes Proposed Action information, news, updates and engagement opportunities.

The Community Engagement Drop-In Sessions were conducted in the towns of Theodore and Banana, with a turnout of approximately 90 attendees. The key takeaways and feedback from the sessions included the following:

- The Proponent is to remain as the primary point of contact for stakeholders;
- Technical information being readily disseminated by the Proponent was appreciated by the community; and

- The level of transparency that the Proponent has given in relation to the Proposed Action is generally higher than other developers in the region.

Actions arising from the Community Engagement Drop-In Sessions included the following:

- The Proponent to investigate a 'shopfront' to foster local relationships;
- The potential for the Proponent to sponsor local events was highly desired by the community; and
- Future Community Engagement Sessions are to be conducted to foster community feedback.

A summary of the outcomes of engagement undertaken with these affected groups to date is described in Table 11-2.

TABLE 11-2 KEY MATTERS RAISED IN ENGAGEMENT

Key Matters Raised	Detail
Workforce Accommodation	Stakeholders expressed an interest in understanding the Proposed Action's workforce accommodation arrangements for construction and if there would be an impact on the local housing market. This is a particular topic of interest for the Theodore community due to the significant number of mining camps and FIFO workers in the area. A Workforce Accommodation and Infrastructure Report has been prepared for the Proposed Action and attached as Appendix M.
Grid Connection	The community was generally not supportive of the proposed multiple grid route options and had expressed concerns about transmission lines crossing strategic cropping land. It is noted that Powerlink is responsible for the grid connection engagement with landowners and community as part of the Theodore Wind Farm Connection Project.
Road Network	Stakeholders expressed concerns about potential impacts on the road network and traffic safety during construction. The community also raised concerns about potential impacts on school bus routes.
Aerial Operations	Graziers in the local area use helicopter mustering as part of their grazing operations. Some graziers queried if the Project would impact on their ability to muster using helicopters.
Noise	Stakeholders expressed concerns about potential noise impacts on nearby sensitive land uses, including residential dwellings.
Biodiversity	Stakeholders expressed concerns about the potential impacts of the Project on matters of state environmental significance and matters of national environmental significance.
Fire Risk and Mitigation	The local Rural Fire Services (RFS) Brigades indicated that they would like to see firebreaks incorporated into the Proposed Action design. Their preference is that the Project actively manages and mitigates bushfire risk.
Visual Amenity	Stakeholders queried the potential impacts of the Proposed Action on the landscape.

Key Matters Raised	Detail
Wind farm preference	Generally, the local community expressed a preference for wind farms over solar farms. In their experience, solar proponents have not properly engaged with or considered the community in project design or layout. The community also feels that solar farms take up high quality agricultural land (cropping) whereas wind farms can coexist with grazing.
Local employment and procurement	There is a lack of interest from locals in working on the wind farm, however there is interest from local businesses to provide services and supplies for construction and operation of workforce accommodation and wind farm development.

11.2 COUNCIL CONSULTATION

The Proponent has been undertaking bi-annual briefing sessions for the Proposed Action with the Banana Shire Council since 2023. The Briefing Sessions centred on the Proposed Action location and outlined consultation undertaken to-date, and generally considered the following:

- Community input/benefit will be discussed with the local community in order to understand how a Community Benefit Fund would be most useful;
- The Proponent is committed to seeking employment within the region where possible;
- Potential jobs generated during construction;
- Potential jobs generated during operation;
- Community and stakeholder engagement;
- Workforce management;
- Local business procurement; and
- Housing and accommodation.

11.3 FUTURE ENGAGEMENT

The Stakeholder Engagement Tools set out in Table 11-3 have been developed as part of the Proponent's commitment to genuine dialogue with affected parties and will be employed as part of ongoing engagement for the Proposed Action, including when engaging with the local community in relation to workforce accommodation opportunities and/or impacts.

TABLE 11-3 ENGAGEMENT TOOLS

Engagement Tool	Objective
Personal phone calls	• Personal phone calls will be a significant aspect of stakeholder engagement, particularly with those stakeholder groups most interested in a Proposed Action. Direct phone calls are a deliberative engagement tool to facilitate immediate and direct conversations.
Meetings	• Personal meetings with individuals and sometimes groups will be a key avenue of personalised engagement. These may be one-on-one meetings with landowners or near neighbours, or meetings with a local community groups. Meetings provide an opportunity to educate, inform, and listen to issues and concerns.

Engagement Tool	Objective
Emails/letters	• Emails and letters will be used to provide notification of important information, such as works, surveys or other activities, or provide stakeholder-specific information and engagement.
Briefings	• Briefings will take place as and when required with representatives of stakeholder groups including local Councillors and Council executives, Members of Parliament and government departments. Briefings allow stakeholders to stay informed about a Proposed Actions progress.
Door knocks	• Door knocks can be used to speak personally with neighbours within a pre-determined distance band of the Proposed Action. Direct outreach allows community members to engage and interact in their own environment.
Letterbox drops	• Letterbox drops provide the opportunity to directly contact residents and/or ratepayers within a certain geographical boundary depending on the delivery method employed. Letterbox drops can be used to distribute newsletters, flyers, FAQs, and other Proposed Action information.
Shopfront (permanent or 'pop up')	• A shopfront in a Study Area can take on a variety of forms. It can be a fixed space that is open one or multiple days per fortnight. Another option is a temporary 'pop up' venue which could include a stall in a public space such as a Council office, shopping centre or public library. This option is usually more informal and may occur as a one-off or for shorter periods.
Drop-in sessions/ pop-ups	• Drop-in sessions provide an opportunity for stakeholders to meet with members of the Proposed Action team and Subject Matter Experts about the Proposed Action. Drop-in sessions are advertised in the local community and generally held over multiple days (often two consecutive days) in a local hall or halls. These drop-in sessions do not have a formal structure, but usually incorporate Proposed Action poster and fact sheets, industry materials, and catering. Subject materials should be selected in response to the community's interests.
Attendance at community events	• This may include information stands at agricultural shows, sporting, and other events, providing a platform for community members to ask questions and provide feedback.
Workshops	• Workshops can create a space for affected parties to discuss any questions or concerns with the Proposed Action team and/or subject matter experts, as well as positively contribute to the development of the Proposed Action by brainstorming ideas and community-led problem solving.
Focus groups	• Create an opportunity for key parties, selected by the Proposed Action team, the Proposed Action team, to provide detailed community feedback in a group setting, as well as raise Proposed Action-related concerns, considerations, or issues with the Proponent team and/or subject matter experts.
Free call 1800 number	• A free call 1800 number, 1800 879 435, has been established for the Proposed Action.
Electronic direct mail	• Electronic direct mail will be an important part of communications and could be used to share information such as newsletters, flyers, invitations to upcoming events, fact sheets and more. A sign-up list will be made available on the Proposed Action website and at community events.
SMS notifications	• SMS notifications can be used for time critical notifications, such as works and deadlines for public submissions.
RWE website	• The RWE Renewables Australia Pty Ltd (RWE) website is live and can be found at www.au.rwe.com. This site contains information about RWE globally, RWE Renewables Australia and Australian projects, as well as links to Project-specific sites.

Engagement Tool	Objective
Proposed Action website	• A Proposed Action website has been established at theodorewindfarm.com.au and will be regularly updated to provide more information, as well as digital versions of Proposed Action collateral. The website URL is included on printed and digital collateral.
Media releases and advertisements	• Media releases will be prepared and shared with media outlets based on communications objectives throughout the Proposed Action timeline. Advertisements will be booked when required.
Proposed Action email address	• A Proposed Action-specific email address, theodorewindfarm@rwe.com has been created and will be used as a central point of obtaining community feedback.
Newsletters	• Proposed Action newsletters should be developed and distributed regularly. These should provide Proposed Action updates and be posted to all landowners within a pre-determined Proposed Action radius (suggested to be 10 kilometres from the Study Area). They can also be delivered electronically.
Flyers	• Flyers can be used to promote information sessions or events. Flyers can reach community members who may not have access to digital communications or online platforms.
Information packs	• Information packs can include a combination of Proposed Action collateral, such as newsletters, fact sheets, maps, information on upcoming events, photo montages, independent third-party studies and more. These can be tailored to the specific needs of the community or individual stakeholders and can include information on topics of particular focus for the Proposed Action community. These could be posted to individuals as required or left at key locations, such as Council offices.
Surveys	• Surveys are a useful data collection tool to understand community issues, needs and preferences. Surveys can help gauge public opinion on a variety of topics, including framing of benefit sharing initiatives, the Proposed Action, and renewable energy in general.

In addition, the Proponent has committed to the following stakeholder engagement initiatives:

- Community Engagement Committee (CEC): It is the Proponents intention to establish a CEC, assuming there is interest from Theodore and surrounding communities to do so. The CEC's purpose would be to capture the voice and sentiments of the community, to help to inform the Proposed Action, and direct how the Proponent engages with the community as well as the content of such engagement. The CEC will provide a tool to share information with the community and to build a sense of trust. It is anticipated the CEC would be established in 2025 and run beyond the Planning Phase, into construction, operations and potentially decommissioning.
- Community Benefit Fund: Development of a Community Benefit Fund of at least $500,000 per year ($17.5 million over the operation life of the Proposed Action).
- Complaints Management: Development and implementation of a Theodore Wind Farm Complaints and Grievance Management System (in accordance with the Australian Standard AS/NZS 10002:2014 – Guidelines for Complaint Management in Organisations). The Proponent Complaints Handling Procedure will ensure that complaints are dealt with in a timely and effective manner, and includes the below:
    - Stage One: Receiving;

- Stage Two: Responding;
- Stage Three: Managing;
- Stage Four: Closing; and
- Stage Five: Continuous Improvement.
- All instances are recorded within TED's internal SET, with the intent to archive, allocate, monitor, action, resolve, close and analyse all relevant enquiries. The Proponent aims to resolve complaints within 10 working days. If this is not possible the Proponent commits to continued engagement with the stakeholder.

11.4 INDIGENOUS ENGAGEMENT

The Proponent has undertaken engagement with the Traditional Owners of the Study Area in line with the *Interim Engaging with First Nations People and Communities on Assessments and Approvals* under the EPBC Act.

There are no distinguished Native Title rights held over the Study Area, however the Proponents have acknowledged Indigenous consultation is required with the Wulli Wulli People, the Traditional Owners of the Study Area. The Proponent is committed to ensuring areas and objects that are of particular significance to Indigenous peoples and communities are identified and potential impacts managed.

The Proponents commitment to working closely with the Wulli Wulli People, has been demonstrated through regular meetings since 2022 and is proposed to continue throughout the life of the project. The Proponent have signed an early works agreement, and various site visits have been undertaken by Wulli Wulli Elders, WWNAC board members and cultural heritage monitors to understand and influence the detailed design phase of the Proposed Action and indicate areas of cultural significant across the Project Area. The Proponent have also agreed to undertake additional survey works in collaboration with the Wulli Wulli People and agreed to a Cultural Heritage Management Plan under Part 7 of the *Aboriginal Cultural Heritage Act 2003* (Qld).

The details of the engagements, including meeting minutes, Shared Benefits and Project Services Agreement, early works agreements, site reports and pro-forma documents for investigations are covered by confidentiality clauses and therefore cannot be disclosed.

A summary of engagement is provided below.

TABLE 11-4 DETAILS OF INDIGENOUS ENGAGEMENT

Type of Engagement	Number of Engagements	Details
Meetings	7	• Initial engagement meeting, including introductions and Project overview. Understanding of how WWNAC like to be engaged and agreed steps going forward. • Meetings to discuss and agree early works agreement, arrange site visits. • Meetings to discuss and agree Shared Benefit and Project Services Agreement. • Meetings to discuss CHMP and agree terms.

Type of Engagement	Number of Engagements	Details
Site Visits	2	• Site visit to understand proposed Project layout, cultural values and reconnaissance for met mast locations. • Monitoring of agreed met mast locations and visitation to areas of interest to Wulli Wulli People.
Field work	15 weeks total	• Rolling schedule of ongoing inspections and monitoring of early works program.
Workshop	1	• Classroom and fieldwork training on artefact identification and site recording, use of GPS and field methods

In response to the feedback received from WWNAC, a Shared Benefits and Project Services Agreement was developed and presented to WWNAC for consideration. Discussions and engagement are still ongoing.

12. ENVIRONMENTAL RECORD OF THE PERSON PROPOSING TO TAKE THE ACTION

Theodore Energy Development Pty Ltd is a wholly owned subsidiary of RWE Renewables Europe & Australia GmbH (RWE), a specialised renewable energy company. The Proponent is a new special purpose vehicle incorporated for the Proposed Action. Therefore, the Proponent has not been subject to any proceedings against it under Commonwealth, State or Territory law for protection of the environment or the conservation and sustainable use of natural resources.

RWE owns and operates the Limondale Sun Farm through its wholly owned subsidiary RWE Limondale Sun Farm Holding Pty Ltd. RWE and RWE Limondale Sun Farm Holding Pty Ltd have no current or historical proceedings under Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources.

RWE is committed to protection of the environment, conservation of natural resources and reducing emissions evidenced through the RWE Biodiversity Policy. RWE ensures compliance through environmental policies to ensure that environmental protection is implemented responsibly according to operator obligations and in line with RWE's sustainability practices to prevent serious adverse effects on the environment.

RWE has a suite of policies and guidelines surrounding environmental protection, biodiversity and sustainability.

An environmental protection policy was implemented by RWE in January 2024 and remains in force and available for public view (environmental-protection.pdf (rwe.com). This directive outlines that in the context of environmental protection, RWE fulfils its responsibility and ensures that the business-related environmental aspects are identified and considered throughout all Proposed Action phases. RWE are investing heavily in the expansion of renewable energies and are consistently reducing CO2 emissions with the intention of reaching climate- neutral by 2040. RWE is also working towards implementing strategies to achieve net positive impact on biodiversity.

RWE published a biodiversity policy in December 2022 that is intended to establish a reference framework for integrating the protection and promotion of biodiversity within the scope of our business activities (RWE Biodiversity Policy). The biodiversity framework encompasses principles such as choosing asset locations, minimising impacts during construction, monitoring impacts during operation as well as taking into account end-of-life solutions years prior to decommissioning requirements.

Finally, and as of January 2024, RWE committed to start making nature-related disclosures based on the recommendations made by the Taskforce on Nature-related Financial Disclosures. As an early adopter of this scheme, RWE are supporting broader climate-related sustainability reporting and policies.

RWE communicate all environmental and biodiversity activities on the website and in the annual sustainability reporting.

13. ECOLOGICALLY SUSTAINABLE DEVELOPMENT

The Proposed Action has been designed with a thorough investigation of the short- and long-term socio-economic benefits and potential impacts to environmental values of conducting the Proposed Action. With a projected lifespan of 35 years, the Proposed Action will add both economic and social benefits by contributing to the employment and energy markets with a renewable wind resource and creating jobs. This is further discussed in Section 14.

There are no expected threats of serious or irreversible environmental damage arising from the Proposed Action. The Proposed Action has been designed to minimize environmental degradation and any potential adverse impacts to environmental values at the location.

The principle of inter-generational equity has been applied to the Proposed Action that will contribute to ensuring Queensland has a renewable source of energy and the next generation has access to wind resource benefits. The health, diversity and productivity of the environment is expected to be maintained for the benefit of future generations due to the Proposed Action.

The Proposed Action supports the ecological sustainable development principle of inter-generational equity through its extended design process, design iterations, and secondary high resolution pre-clearance surveys prior to construction, alongside required management plans and processes as determined by relevant regulations. Cumulatively, these efforts aim to reduce immediate environmental impacts as much as possible. Significant effort has been taken to ensure works do not fragment sections of vegetation or impede the effectiveness of wildlife corridors and general wildlife movement patterns. These considerations are to allow continued connectivity and dispersion of fauna and flora in the immediate area. Maintaining movement and avoiding fragmentation has significant environmental benefits that contribute to the wellbeing of fauna and flora in the specific area, and generally into the future. Thus, allowing the present and future generations to benefit from the health, diversity and productivity of the environment.

Additionally, the impact area of the infrastructure is inherently and intentionally designed to be minimal. Often, these lands and lifestyles are inherited by younger generations. The low impact of the Proposed Action allows the land use to continue with minimal disturbance.

Inherently, a renewable energy project supports the principle of inter-generational equality by providing an energy source that seeks to reduce greenhouse gas emissions and reliance on fossil-fuelled energy production. By contributing to low emission energy production, the health diversity, and productivity of the environment is improved which benefits both the environment and future generations.

An extensive ecological assessment has been undertaken as part of the detailed design process. The conservation of biological diversity has been prioritised throughout the development and design process.

The construction of the proposed wind farm will improve the valuation and pricing of the current energy market and incentivise wind resources as a renewable energy. The Proposed Action will contribute renewable energy that promotes reliable and cost-effective electricity to the market and reduced greenhouse gas emissions.

Further, the Proposed Action will contribute to the Queensland Government’s target to achieve 50% renewable energy by 2030. Additionally, the Proposed Action also allows for the continuation of farming activities across the Study Area and provides supplementary income for involved landowners.

14. ECONOMIC AND SOCIAL MATTERS

Once operational the Proposed Action will have the capacity to provide, clean, renewable electricity to approximately 500,000 Queensland homes. The Proposed Action progress time-critical, national decarbonisation objectives which include the 82% renewable energy generation target set by the Australian Government required to achieve its global carbon reduction commitments (Australian Government, 2024). Additionally, the Proposed Action demonstrates action towards addressing the critical shortage of supply expected by retailers from 2025 supporting reliability and security of supply, and downward pressure on costs for consumers.

A Socio-Economic Impact Analysis (SEIA) (see Appendix I) was undertaken to provide a high-level understanding of the socio-economic context of the surrounding local communities of relevant to the Proposed Action, including the potential social and economic impacts that may be experienced. The SEIA determined a Proposed Action Area of Influence (AoI) based on identified affected parties (described in Table 11-1) and involved two components:

- Primary AoI: The Study Area and immediate surrounding areas comprising an area 5 km from the Study Area Boundary, including ABS SA1 No. 30804152801, ABS SA1 No. 31902150815 and the Urban Centres and Localities of Theodore, Banana, Moura, and Biloela.
- Secondary AoI: The Local Government Areas of the Banana Shire LGA and Gladstone Region LGA are included as the Secondary AoI. There are several possible transportation and haulage routes to the Study Area.

The Primary and Secondary AoI is depicted in Figure 14-1.

The following sections provide an overview of the economic and social impacts/benefits expected from the Proposed Action.

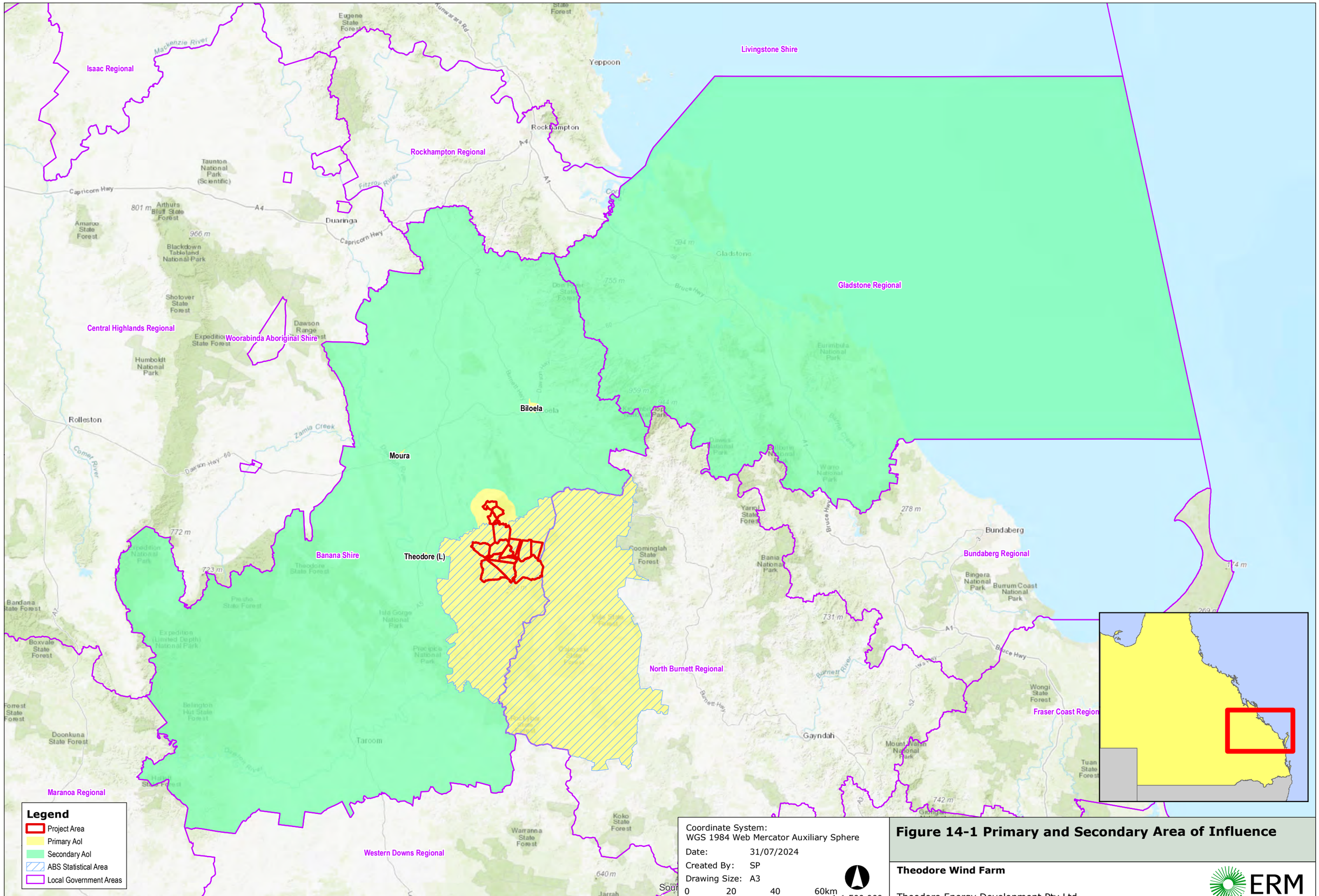


Figure 14-1 Primary and Secondary Area of Influence

Theodore Wind Farm

Theodore Energy Development Pty Ltd

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14.1 ECONOMIC AND EMPLOYMENT COSTS AND BENEFITS

The direct and indirect economic impacts of the Proposed Action during the construction and operation phases were considered as part of the analysis.

The anticipated construction phase economic impacts/benefits assumes:

- Direct employment of 500 employees, including:
- 100 local workers, across roles such as skilled labour (e.g. electricians), plant/machinery drivers, civil workers, site maintenance and cleaning workers, and truck drivers.
- 325 workers from Queensland, across specialised roles, such as crane operators, over-dimensional truck drivers, project management, concrete batch plan operators, and IT and communication specialists.
- 75 workers from across Australia, across roles such as senior management, specialised workers, wind turbine specialists and other technical engineering specialists.
- An anticipated total local spend of approximately $1 billion AUD on various aspects of the Proposed Action, such as plant, materials, and labour. In addition, there is a further approximate spend of $800 million AUD in Queensland, and $500 million AUD Australia-wide.
- A Community Benefit Fund has been set up which will contribute $500,000 per annum to selected community groups through the construction phase.
- The Proponent will develop and implement Local Business and Industry Procurement Plan to seek local industry involvement in the Proposed Action, and will provide training and upskilling.

The anticipated operational phase economic impacts/benefits assumes:

- Direct employment of 25 workers in roles such as maintenance technicians, operations management staff, and facility management staff.
- The anticipated total local spend of approximately $33 million AUD mainly on wages, maintenance, landowner payments, community benefit fund. In addition, there is a further approximate $8 million AUD in Queensland, and $5 million AUD Australia-wide.
- A Community Benefit Fund has been set up which will contribute $500,000 per annum to selected community groups through the operation phase.

The main indirect economic impacts/benefits of the Proposed Action were determined to include:

- A greater spend by workers in the local economy;
- The upskilling of the local workforce;
- Reduced electricity cost;
- Potential impacts on tourism associated with the Isla Gorge National Park; and
- Disruption to cattle grazing capacity during the construction phase, however, co-existence of cattle grazing with the Proposed Action during operation diversifying landowner income streams.

14.2 SOCIAL IMPACTS AND BENEFITS

The potential social impacts and/or benefits associated with the Proposed Action were analysed through a methodology based on the Queensland Social Impact Assessment Guidelines and the New South Wales Social Impact Assessment Guidelines. Impacts and benefits were analysed to determine their level of significance, based on the likelihood of an impact/benefit occurring, the magnitude of the impact/benefit, and prior to the application of any mitigation or management measures.

The key social impacts and benefits that may affect communities in the Proposed Action AoI resulting from the Proposed Action relate to:

- Procurement opportunities from local businesses and employment opportunities for the local workforce (including Theodore, Banana, Moura, Biloela and Gladstone);
- Opportunities for diversification of income streams for host landowners;
- Financial benefits for local community economies, and the potential for indirect benefits such as workforce upskilling and increased localised spend;
- Disruptions due to construction related activities (noise, dust, transportation of materials and workers, etc);
- Amenity (e.g. visual) and other land use and landscape changes due to altered landscapes; and
- Accommodation arrangements for construction workforce.

It should be noted that the only impact to remain at a high level of significance post the implementation of management and mitigation measures, was the disruption due to construction relation activities, specifically the transportation of materials and workers. This remains at a high level of significance due to the sheer magnitude of material and workers travelling to the Study Area during the construction phase. A Traffic Management Plan will be developed and implemented for the Proposed Action and will include recommendations made by the local community and Banana Shire Council.

A range of mitigation and management measures have been devised to either enhance benefits or mitigate impacts, and are included in the Socio-Economic Impact Analysis (refer to Appendix I).

15. INFORMATION SOURCES PROVIDED IN THE PER

The Public Environment Report (PER) was informed by technical studies carried out to understand the existing environmental value of the Study Area and the potential impacts from the Proposed Action. Ecological surveys were undertaken by flora and fauna specialists and involved reviewing literature, undertaking desktop assessments, and conducting field surveys. Additionally, a number of technical assessments including a Landscape and Visual Impact Assessment, Traffic Impact Assessment and Socio-Economic Impact Analysis were undertaken to inform the design of the Proposed Action.

All technical studies used and reference a large number of existing sources. Information sources referenced throughout the PER and appendices. A list of references is provided for each PER section. Each appendix also includes a list of all referenced material.

The reliability and accuracy of the information sources in the PER has been tested via technical review from recognised specialists in their field. The PER has used data sources widely accepted in the environmental industry, where these data sources have been used, referencing has been included for accuracy. The PER utilised DCCEEW listed threatened species guidelines and recovery plans to inform field survey design, impact assessment and reporting. The accuracy of information available from sources was considered adequate for the purposes of identifying potential impacts from the Proposed Action, as data sources are consistently being updated as new information becomes available. Where data sources have been used, referencing including the year published has been included.

Notwithstanding, the precautionary principle has been applied to uncertainties regarding impact. While extensive areas of the Study Area have been surveyed, some areas of habitat mapping have been extrapolated from field knowledge and understanding of species habitat requirements, including Species Profile and Threat Database and Conservation Advices.

16. CONCLUSION

Theodore Energy Development Pty Ltd is developing the Proposed Action approximately 22 km east of the township of Theodore, 50 km west of Biloela and 150 km south-west of Gladstone, in the Banana Shire Council Local Government Area. The Proposed Action consists of up to 170 WTG, and ancillary infrastructure including, foundations and hardstands, temporary infrastructure such as concrete batching plants, laydown areas, construction offices, parking and on-site accommodation, access tracks and electrical reticulation, switching stations and substations, Battery Energy Storage Systems, meteorological masts, and operation and maintenance facilities. The Proposed Action is located across three properties and road reserve areas, totaling 46,830 hectares (ha) (Study Area), with a Development Footprint of 1,590.1 ha within a corridor of land including a 100 meter micro-siting buffer (the Project Area).

Detailed ecological investigations have been undertaken between October 2022 and February 2026. Desktop and field assessments involved a review of both State and Commonwealth databases as well as targeted field surveys, to determine presence/absence of Matters of National Environmental Significance (MNES) and habitat availability.

An impact assessment has been undertaken to identify potential impacts to MNES against the *Significant Impact Guidelines 1.1 – Matters of National Environmental Significance* (Department of Environment, Water, Heritage and the Arts , 2013). A number of minimisation, management and mitigation measures have been discussed to reduce the potential impacts to MNES. Impacts to MNES have been avoided where possible during the design phase of the Proposed Action, and mitigation and management measures put in place to minimise both direct and indirect impacts, including implementing specific management plans. Additionally, cleared areas not required for the operation of the Proposed Action will be subject to natural regeneration and rehabilitation, with approximately 68% of the Disturbance Footprint having the potential to regain habitat function for certain species.

Based on the above, it is considered that the Proposed Action is likely to have a significant residual impact on Poplar Box TEC, greater glider, koala, squatter pigeon (southern) and has the potential to have a significant residual impact on diamond firetail. Impacts from the Proposed Impact will be contained within the Study Area and are considered unlikely to be of significant impact to the Great Barrier Reef.

In summary, the Proposed Action will result in the following potential permanent impacts:

- 1.2 ha of Poplar Box TEC;
- 19.0 ha of likely/current denning habitat, 0.8 ha of potential/future denning habitat and 623.9 ha of foraging and dispersal habitat for greater glider (southern and central);
- 6.2 ha of preferred foraging and breeding habitat and 657.3 ha of general foraging and breeding habitat for koala;
- 128.3 ha of breeding habitat, and 24.2 ha of foraging and dispersal habitat for squatter pigeon (southern); and
- 95.8 ha of potential breeding and foraging habitat for diamond firetail.

A draft Offset Management Plan has been provided outlining the proposed offset areas and management to improve the quality of habitat for the identified MNES.

SECTION 10-16 REFERENCES

Australian Government. (2024). *Net Zero*. Retrieved from Department of Climate Change, Energy, the Environment and Water : https://www.dcceew.gov.au/climate-change/emissions-reduction/net-zero

Department of Environment, Water, Heritage and the Arts . (2013). *Significant Impact Guidelines 1.1 - Matters of National Environmental Significance .*

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APPENDIX A PER GUIDELINES

Australian Government
Department of Climate Change, Energy, the Environment and Water

GUIDELINES FOR THE CONTENT OF A PUBLIC ENVIRONMENT REPORT

Theodore Wind Farm, Queensland

(EPBC 2024/09842)

Environment Protection and Biodiversity Conservation Act 1999

DCCEEW.gov.au
John Gorton Building - King Edward Terrace, Parkes ACT 2600 Australia
GPO Box 3090 Canberra ACT 2601 ABN: 63 573 932 849

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PREAMBLE

Theodore Energy Development Pty Ltd (the proponent) is proposing to construct, operate, and decommission the Theodore Wind Farm approximately 22 kilometres east of Theodore, Queensland. The project consists of:

- up to 170 wind turbine generators (WTGs) of up to 270 metre (m) tip height and 175 m rotor diameter
- access tracks and reticulation (cabling), including underground and overhead electrical works where necessary
- switching stations and substations
- battery energy storage systems (BESS)
- meteorological masts
- operations and maintenance facilities, with a variety of associated site facilities and storage laydowns
- temporary infrastructure such as concrete batching plants, laydown areas, construction offices, parking and accommodation camp, fencing, and other standard construction site ancillary works including local road upgrades to facilitate component delivery

On 9 July 2024, a delegate of the Minister for the Environment and Water determined the proposed action is a controlled action due to likely significant impacts on the following matters protected under Part 3 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act):

- listed threatened species and ecological communities (s18 & s18A)
- listed migratory species (s20 & s20A)
- the World Heritage values of a declared World Heritage property (s12 & s15A)
- the National Heritage values of a National Heritage place (s15B & s15C)
- the environment in the Great Barrier Reef Marine Park (s24B and s24C).

The delegate also determined that the proposed action would be assessed by public environment report (PER).

These tailored guidelines have been developed for the preparation of a draft PER about the relevant impacts of the proposed action and set out requirements for the content and presentation of the draft report in relation to the proposed action.

Information about the action and its relevant impacts, as outlined below, is to be provided in the PER. This information should be sufficient to allow the Minister to make

an informed decision on whether or not to approve, under Part 9 of the EPBC Act, the taking of the action for the purposes of each controlling provision.

GENERAL ADVICE ON GUIDELINES

1 GENERAL CONTENT

The PER should be a stand-alone document that primarily focuses on the protected matters listed above. It should contain sufficient information to avoid the need to search out previous or supplementary reports. The PER should take into consideration the EPBC Act *Significant Impact Guidelines 1.1* and other relevant EPBC Act policy statements that can be accessed at: https://www.dcceew.gov.au/environment/epbc/publications.

The PER should enable interested stakeholders and the Minister to understand the environmental consequences of the proposed action. Information provided in the PER should be objective, clear, and succinct and, where appropriate, be supported by maps, plans, diagrams or other descriptive detail. The body of the PER is to be written in a clear and concise style that is easily understood by the general reader. Technical jargon should be avoided wherever possible. Cross-referencing should be used to avoid unnecessary duplication of text.

Detailed technical information, studies or investigations necessary to support the main text should be included as appendices to the PER. It is recommended that any additional supporting documentation and studies, reports or literature not normally available to the public from which information has been extracted be made available at appropriate locations during the period of public display of the PER.

After receiving the Minister's written approval to publish the report, the proponent is required to make the draft PER available for a period of public comment. Specific instructions regarding publication requirements will be provided as part of the Minister's approval to publish.

If it is necessary to make use of material that is considered to be of a confidential nature, the proponent should consult with the department on the preferred presentation of that material, before submitting it to the Minister for approval for publication.

The level of analysis and detail in the PER should reflect the level of significance of the expected impacts on the environment. Any and all unknown variables or assumptions made in the assessment must be clearly stated and discussed. The extent to which the limitations, if any, of available information may influence the conclusions of the environmental assessment should be discussed.

The proponent should ensure that the PER assesses compliance of the action with the principles of ecologically sustainable development as set out in the EPBC Act, and the objects of the Act at Appendix A. A copy of Schedule 4 of the EPBC Regulations, *Matters to be addressed by draft public environment report and environmental impact statement*, is at Appendix B.

2 FORMAT AND STYLE

The PER should comprise three elements, namely:

- the executive summary
- the main text of the document
- appendices containing detailed technical information, plans, and other information that can be made publicly available.

These guidelines are set out in a manner that may be adopted as the format for the PER. This format need not be followed where the required information can be more effectively presented in an alternative way. However, each of the elements must be addressed to meet the requirements of the EPBC Act and EPBC Regulations.

The PER should be written so that any conclusions reached can be independently assessed. To this end, all sources must be appropriately referenced, and the reference list should include the address of any websites used as data sources.

The main text of the PER should include a list of abbreviations, a glossary of terms, and appendices containing:

- a copy of these guidelines
- a list of persons and agencies consulted during the PER
- contact details for the proponent
- the names of the persons involved in preparing the PER and work done by each of these persons.

Maps, diagrams and other illustrative material should be included in the PER. The PER should be produced on A4 size paper capable of being photocopied, with maps and diagrams on A4 or A3 size and in colour where possible. All maps must follow the Guide to providing maps and boundary data for EPBC Act projects – DCCEEW.

The proponent should consider the format and style of the document appropriate for publication on the Internet. The capacity of the website to store data and display the material may have some bearing on how the document is constructed.

SPECIFIC CONTENT

1 GENERAL INFORMATION

This should provide the background and context of the proposed action, including:

(a) the title of the proposed action

(b) the full name and postal address of the designated proponent

(c) a clear outline of the objective of the proposed action

(d) the location of the proposed action

(e) the background to the development of the proposed action

(f) how the proposed action relates to any other actions (of which the proponent should reasonably be aware) that have been, or are being, taken or that have been approved in the region affected by the proposed action

(g) the current status of the proposed action

(h) the consequences of not proceeding with the proposed action

(i) any consultation about the action including any consultation that has already taken place and any proposed consultation about relevant impacts of the action

(j) identification of affected parties, including a statement mentioning any communities that may be affected and describing their views.

2 DESCRIPTION OF THE ACTION

All construction, operational and decommissioning components of the proposed action should be described in detail (including stages of development and their timing). This should include the precise location (including coordinates) of all works to be undertaken, structures to be built or elements of the proposed action that may have impacts on protected matters.

The description of the action must also include details on how the works are to be undertaken (including stages of development and their timing) and design parameters for those aspects of the structures or elements of the action that may have relevant impacts.

Include an indicative layout plan for the project area, including the location and type of land use, turbine locations, access tracks, key infrastructure, and the number and location of other relevant buildings and features. Include mapping for each of the above that includes grid coordinates.

Provide the total size (in hectares) of the project area and the total size (in hectares) of the disturbance area.

Include further description of the operational requirements of the action including any anticipated maintenance works including details on whether wind turbine components will need to be replaced during operation as a standard procedure. For any works that come under this point, provide detail of potential impacts to protected matters, such as clearing of habitat for protected matters along roadsides to facilitate replacement of wind turbine blades.

Indicate whether proposed rehabilitation areas will be re-disturbed for decommissioning or recommissioning activities.

Provide a description of decommissioning including, but not limited to:

- the activities that will be undertaken for decommissioning
- timing and duration of decommissioning activities
- clearing of vegetation to facilitate the removal of wind turbine blades and other infrastructure

Any changes that have been made to the project since the referral documentation was submitted need to be clearly identified and explained.

3 FEASIBLE ALTERNATIVES

Describe any feasible alternatives to the action, to the extent reasonably practicable, including:

(a) if relevant, the alternative of taking no action

(b) a comparative description of the impacts of each alternative on protected matters

(c) sufficient detail to make clear why any alternative is preferred to another.

Discuss the short, medium and long-term advantages and disadvantages of the options.

4 DESCRIPTION OF THE ENVIRONMENT

Provide a description of the environment of the project area and surrounds, including the gradient, the vegetation, the hydrology, the soil and any outstanding natural features. Include details of current and historical land uses.

5 MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE (MNES)

5.1 General MNES information

The PER must include a detailed assessment of the presence, or likelihood of presence, of protected matters in the project area and its vicinity.

The description and assessment of protected matters should focus on the following controlling provisions:

- listed threatened species and ecological communities (s18 & s18A)

- listed migratory species (s20 & s20A)
- the World Heritage values of a declared World Heritage property (s12 & s15A)
- the National Heritage values of a National Heritage place (s15B & s15C)
- the environment in the Great Barrier Reef Marine Park (s24B and s24C).

A recent report from the Protected Matters Search Tool must also be considered and included as an appendix. This can be accessed at the following website: https://www.dcceew.gov.au/environment/epbc/protected-matters-search-tool.

The PER must address, at a minimum, the following protected matters (the relevant protected matters) and any others listed under the EPBC Act at the time of the controlled action decision that may be impacted by the proposed action:

(a) Listed threatened species and ecological communities

- Brigalow (*Acacia harpophylla* dominant and co-dominant) threatened ecology community (TEC) – Endangered
- Poplar box grassy woodland on alluvial plains TEC – Endangered
- Greater Glider (southern and central) (*Petauroides volans*) – Endangered
- Yellow-bellied glider (*Petaurus australis australis*) – Vulnerable
- Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) (*Phascolarctos cinereus*) – Endangered
- Large-eared pied bat (*Chalinolobus dwyeri*) – Endangered
- Ornamental Snake (*Denisonia maculata*) – Vulnerable
- South-eastern Long-eared bat (*Nyctophilus corbeni*) – Vulnerable
- Squatter Pigeon (southern) (*Geophaps scripta scripta*) – Vulnerable
- White-throated Needletail (*Hirundapus caudacutus*) – Vulnerable

(b) Listed migratory species

- White-throated Needletail (*Hirundapus caudacutus*)
- Fork-tailed Swift (*Apus Pacificus*)

(c) World Heritage Property

- Values of the Great Barrier Reef World Heritage Property

(d) National Heritage Place

- Values of the Great Barrier Reef National Heritage Place

(e) The environment of the Great Barrier Reef Marine Park.

Note: this may not be a complete list and it is the proponent's responsibility to ensure that any matters protected under the above controlling provisions, listed at the time of the controlled action decision, which may be present or potentially significantly impacted, are assessed as part of the PER.

Table 5.1 Relevant protected matters – information required

Information required	
5.1.1	Provide a habitat assessment for the relevant protected matters in the project area, including protected matters outside the project area where they have the potential to be impacted (including downstream). Habitat assessments must be informed by desktop searches and field surveys, with reference to relevant departmental documents (e.g. approved conservation advices, survey guidelines, referral guidelines and listing advices, and the SPRAT Database) and relevant literature. Please note, the department does not accept the consideration of only Queensland Regional Ecosystem (RE) mapping to determine habitat for protected matters. Further, habitat assessments must not only consider remnant vegetation, but also non-remnant and regrowth vegetation. Where habitat assessments depart from the department's published standards, adequate justification must be provided to substantiate their suitability to the assessment.
5.1.2	Provide distinct, specific definitions (including any thresholds or exclusions used) for each identified category of habitat (breeding, foraging, dispersal, etc).
5.1.3	Identify and describe known historical records of protected matters in the broader region. All known records must be supported by an appropriate source (i.e., Commonwealth and State databases, Queensland Government's WildNet, Atlas of Living Australia, published research, publicly available survey reports, etc.), and, where possible, include the year of the record and a description of the habitat in which the record was identified.
5.1.4	Include details of the scope, methodology, timing and effort of field surveys to identify protected matters in the project area and surrounds, including: • how surveys were undertaken in accordance with relevant Commonwealth, State and/or best practice survey guidelines, including departmental survey guidelines: https://www.dcceew.gov.au/environment/epbc/advice/surveys-and-data.

	• evidence that surveys were undertaken over a sufficient scale and period to adequately determine the likely presence or absence of the targeted species or value, or confirmation that a conservative approach was taken where this was not possible (i.e. assumed presence). • if relevant, the justification for divergence from relevant Commonwealth, State and/or best practice survey guidelines. Attach all referenced ecological surveys as supporting documents to the PER.
5.1.5	Provide detailed mapping of habitat (within, adjacent to and downstream of the project area, where relevant) for all listed threatened species and ecological communities, and listed migratory species, that may be impacted by the proposed action, which: • is specific to the habitat requirements for each listed species and community (i.e. does not only illustrate relevant Queensland Regional Ecosystems) • includes an overlay of the project disturbance footprint • identifies any specific habitat requirements (e.g. breeding, foraging, dispersal, known important habitat, suitable habitats, roosting etc.) • includes, where relevant, the regional context, and illustrates connectivity of habitat in the broader landscape • includes known records of individuals derived from desktop analysis and field surveys • is provided separately as attachments in JPEG format.
5.1.6	Include the total area of habitat (in hectares) for each relevant protected matter, including: • total habitat within the project area • where relevant, total habitat in the project area and surrounds.
5.1.7	Where potential habitat for protected matters is identified in the project area, an assessment must be undertaken regardless of whether the species was recorded. As such, the potential for occurrence of these species must also be considered and assessed.
5.1.8	Include an appendix of occurrence records (both sightings and evidence of presence) for all listed threatened species and migratory species identified during field surveys for the proposed action. This data may be used by the department to update the relevant species distribution models that underpin the publicly available Protected Matters Search Tool (PMST). Species occurrence records must be provided in accordance with the department's *Guidelines for biological survey and mapped data* (2018) and using the department's Species observation data template. Sensitive

	ecological data must be identified and treated in accordance with the department's *Sensitive Ecological Data – Access and Management Policy V1.0* (2016).

5.2 Listed threatened species and ecological communities habitat assessment

The PER must include relevant information listed in section 5.1 in addition to the following information listed in Table 5.2 for specific listed threatened species.

Table 5.2 Listed threatened species – information required

Information required	
Greater Glider (southern and central) (*Petauroides volans*) – Endangered	
5.2.1	Include a map with likely/current denning habitat, potential/future denning habitat and foraging/dispersal habitat across the project area. Please note, the department considers the following habitat definitions for denning habitat are appropriate: • Likely/current denning habitat: All areas containing appropriate trees with a diameter at breast height greater than the relevant Regional Ecosystem threshold for large trees stated in the *Guide to greater glider habitat in Queensland* (2022). • Potential/future denning habitat: all areas containing appropriate trees with a diameter at breast height greater than 30 cm as stated in the *Conservation Advice for* Petauroides volans *(greater glider (southern and central)),* but less than the relevant Regional Ecosystem threshold for large trees.
Ornamental Snake (*Denisonia maculata*) – Vulnerable	
5.2.2	The referral documentation states there is potential habitat for the species in the study area associated with cracking clay soils, but a significant impact is unlikely due to the potential habitat being of low quality and threats being present. Please provide further information on the area (in hectares) of potential habitat, the methodology used to define habitat, and a more detailed description of why the habitat is considered low quality.

5.3 Listed migratory species

The PER must include relevant information listed in section 5.1 in addition to the following information listed in Table 5.3 for specific listed migratory species.

Information required

White-throated Needletail (*Hirundapus caudacutus*) – Vulnerable; Migratory	
5.3.1	Provide a detailed discussion and map of potential foraging habitat identifying areas with prominent updrafts, and potential roosting habitat.
5.3.2	Provide total area (in hectares) of each identified habitat type (e.g. roosting habitat, foraging habitats, etc.).
5.3.3	Provide more detail on observations of white-throated needletails. Include: • location of incidental observations • number of observations from each vantage point / incidental observation point (include number of times evening surveys conducted and no birds detected) • number of individuals per observation • detail on time period observed at each observation point (currently a four-hour window) • discussion on any individuals observed coming in to roost.

5.4 The Great Barrier Reef Marine Park, World Heritage Property, and National Heritage Place (the Great Barrier Reef)

Assessment of the impact of the proposed action on the Great Barrier Reef should focus on the potential to impact water quality through erosion and sedimentation. Provide information on the following relevant parameters for the project area, including numerical data where available:

- local rainfall and other climatic conditions
- historical land use
- topography, including slope and aspect
- soil type(s) and erodibility
- known contaminants or other potential to cause chemical pollution
- groundcover
- hydrological connection to the Great Barrier Reef

6 IMPACT ASSESSMENT

6.1 General impact information

The PER must include an assessment of all relevant impacts to MNES from all phases of the proposed action (including construction, operation and decommissioning).

Impacts must be assessed in accordance with relevant departmental policies and guidelines, including the SPRAT Database and the Significant Impact Guidelines 1.1.

The PER must include the following information:

- a detailed assessment of the nature and extent of the likely short-term and long-term impacts
- a statement on whether any impacts are likely to be unknown, unpredictable or irreversible
- which component/s and stage/s of the action are of relevance to impacts on each protected matter
- analysis of the significance of impacts to protected matters
- any technical data and other information used or needed to make a detailed assessment of the relevant impacts.

The PER must include a summary table containing the following information:

- listed threatened species, ecological community or migratory species
- habitat description utilised in impact assessment
- likelihood of occurrence
- direct and indirect impacts (including area of impact within the disturbance footprint)
- significance conclusion.

Table 6.1 Impact assessment – information required

Direct and indirect impacts on MNES	

6.1.1	The PER must, at a minimum, assess the following potential impacts to protected matters from the proposed action:
	• habitat loss and individual mortality from vegetation clearing
	• habitat fragmentation and patch isolation within the project area and surrounds, including consideration of, at a minimum:
	  ○ the proposed action's location between Belmont State Forest and the Camboon State Forest, and its position within a mapped regionally-significant Biodiversity Corridor
	  ○ width of easements and any implications on habitat connectivity and the dispersal ability of threatened species
	  ○ species' movement patterns and site utilisation (including consideration of likely launch heights and gliding distances for the Greater Glider, supported by scientific literature)

	○ height of electricity infrastructure and risk of obstruction and entanglement of threatened species • increased prevalence of invasive plants and animals • individual mortality and injury from turbine collisions and barotrauma • increased vehicle collisions with fauna • altered fire regimes • altered hydrology • environmental pollution, including light and noise pollution • site alienation resulting in fauna avoiding the project area.
6.1.2	Include the direct and indirect loss and/or disturbance of protected matters and their habitat as a result of the proposed action. This must include the area (in hectares) for each type of habitat, the quality of the habitat to be impacted, and quantification of the individuals to be impacted (where applicable).
6.1.3	Assess the potential impacts to protected matters within and downstream of the project area with consideration of the site hydrology and topography, including during the construction, operation and decommissioning phases of the proposed action. The PER must, at a minimum, assess the following potential impacts to protected matters from the proposed action: • increased sediment and erosion run-off associated with vegetation clearing, earthworks, altered surface runoff, steep terrain and relatively high flow velocities. • changes in the hydrology of stream beds and banks, and changes to hydrological regimes within and downstream of the project area • changes to water quality in the watercourses within and downstream of the project area • increased rates of nutrient enrichment and eutrophication • effect of increased fine sediment loads on benthic communities • degradation of seagrass communities due to sedimentation and subsequent impacts to listed threatened and migratory marine fauna • concrete pollution into water bodies • changes in pH due to the use of concrete in the construction of turbine pads and associated infrastructure or other activities • effect of turbine construction on underground water systems and natural seepage in the area during the wet season.

	The PER should include flood modelling for the relevant catchments, with information on the hydrology of the project area, the intensity and quantum of water over single flood events, and the intensity of slope angles detailed.
6.1.4	Where potential impacts are in addition to existing impacts of other activities in the region (including any future expansions or developments by the proponent and other proponents in the region and vicinity), cumulative impacts should be considered over appropriate temporal and geographical scales. Consider the proposed action's unique topographical location, orientation and the cumulative effect of any proposed neighbouring wind farm developments, where relevant to protected matters. This should include an assessment of the cumulative impact of the proposed action and other wind farm projects (e.g. Kariboe Wind Farm (2022/09428), Boulder Creek Wind Farm (2020/8772), Mt Hopeful Wind Farm (2021/9137), Callide Wind Farm (2021/9057), and Specimen Hill Wind Farm (2020/8864)) on: • habitat loss • habitat fragmentation • bird and bat turbine strike, including the potential barrier effect of multiple wind farms • sedimentation and run-off downstream, including (where relevant) to the Great Barrier Reef.
6.1.5	Where relevant, consider predicted future climatic conditions at the project site in the assessment of impacts on protected matters, and how changes in climate and the frequency and severity of weather events may interact with, exacerbate or reduce the impacts of the action on protected matters over time. This should include: • increased erosion and run-off associated with predicted increases in high rainfall events and how this may compound the impacts of vegetation clearance along ridgelines • loss, fragmentation, or drying of potential climate refugia for protected matters as a result of the proposed action – consider the potential impacts of removing or otherwise impacting this climate refugia for the long-term survival of protected matters in the region • increased risk of fire as a result of the proposed action under drier conditions and periods of extreme heat • changes in the frequency and intensity of extreme weather events that may exacerbate impacts to protected matters within the project area and downstream • inclusion of different climate scenarios in any hydrological modelling.

6.1.6	A discussion of whether the impacts are likely to be repeated, for example, as part of maintenance or during decommissioning.

6.2 Impacts to listed threatened species and ecological communities

For listed threatened species and ecological communities, the PER must include relevant information listed in section 6.1 in addition to the following information listed in Table 6.2.

Table 6.2 Listed threatened species and communities – information required

Information required	
6.2.1	Justification, with supporting evidence, as to how the proposed action will not be inconsistent with: • Australia's obligations under the Biodiversity Convention, the Convention on Conservation of Nature in the South Pacific (Apia Convention), and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) • a recovery plan or threat abatement plan. Justification, with supporting evidence, as to how the proposed action has taken into account any relevant approved conservation advice.

6.3 Impacts to listed migratory species

For listed migratory species, the PER must include relevant information listed in section 6.1 in addition to the following information listed in Table 6.3.

Table 6.3 Listed migratory species – information required

Information required	
6.3.1	Justification, with supporting evidence, as to how the proposed action will not be inconsistent with Australia's obligations under: • The Bonn Convention • China-Australia Migratory Bird Agreement • Japan-Australia Migratory Bird Agreement • International Agreement – Republic of Korea-Australia Migratory Bird Agreement • Any international agreement approved under subsection 209(4) of the EPBC Act.

6.4 Impacts associated with turbine strike and site utilisation

The PER must include the information in section 6.1 in addition to the following information listed in Table 6.4 for relevant listed threatened and migratory bird and bat species. Please note, these requirements are also set out in Appendix C in relation to the preparation of a draft BBMP.

Table 6.4 Turbine strike and site utilisation – information required

Information required	
6.4.1	*Desktop assessment* To predict the potential for at risk threatened and migratory bird and bat species to use the project area and its surrounds, the PER must include the process and outcomes of a preliminary site characterisation (desktop and/or initial site visit) for each species to identify all drivers of presence on the project area and utilisation of the project area. This characterisation must include, at a minimum, the consideration of: • site characteristics: focal habitat features, topography, prevailing wind and weather patterns, wetlands (including adjacent to project area), and distance to potential nesting, roosting and foraging areas. • species characteristics: behaviour, flight or demographic factors (e.g. species presence [ongoing, transitory/migratory]), site use (e.g. transit, roosting, breeding and/or foraging), flight paths (including migratory flight paths), flight heights, soaring, flocking, and population numbers.
6.4.2	*Site-specific assessment* To validate the outcomes of the desktop assessment, the PER must include a site-specific assessment of how at-risk listed threatened and migratory bird and bat species are using, or likely to use, the project area and surrounds. This assessment must be informed by site-specific and species-specific site utilisation surveys (undertaken by a suitably qualified expert) and supported by other relevant scientific evidence. At least 24 months of site utilisation surveys must be undertaken to provide sufficient baseline data on a relevant species' potential to utilise the project area and its surrounds. This means that site utilisation surveys must be undertaken for each relevant season over a minimum two years (up to 8 survey events). Each site utilisation survey must be of an appropriate duration and spatial coverage (including taking into consideration the potential turbine layout and visibility) to adequately evaluate site utilisation.

	At a minimum, each site utilisation survey must record the relevant information specified in 'Species characteristics' of the 'Desktop Assessment' requirements (6.4.1) for each relevant species. The proposed site utilisation survey methodology for each relevant species must be included as an appendix to the PER. Discussion must be provided that includes detailed information on: • How the design of the site utilisation surveys for each relevant species has been informed by its drivers of presence on the project area and utilisation of the project area and its surrounds (as determined through preliminary site characterisation). • How site utilisation surveys for each relevant species have been designed to improve understanding of site utilisation of the project area and its surrounds, and support an ongoing Before-After, Control Impact (BACI) framework for an adaptive Bird and Bat Management Plan (BBMP).

6.4.3	*Long-term impact risk assessment*
	
	The PER must include, at a minimum:
	• An assessment of the potential impact pathways on each relevant species (based on the desktop assessment and site utilisation surveys) including, at a minimum:
	  ○ direct mortality from turbine collision and barotrauma
	  ○ potential changes to species utilisation of the project area and surrounds during construction and operation of the proposed action.
	• Identification of potential impacts to each relevant species from direct mortality, including but not limited to:
	  ○ analysis and mapping of suitable habitat, territories and activity/utilisation patterns/rates (e.g. 'heat maps') in the project area and its surrounds
	  ○ flight path analysis of relevant birds and bats including heights and speeds
	  ○ estimation of the quantity of individuals to be impacted.
	• a collision risk assessment, which must incorporate:
	  ○ an assessment of the project area and surrounds to identify any high risk turbines
	  ○ baseline data collected during the minimum 24 months of site utilisation surveys

	○ a statement of all assumptions and uncertainties. The PER must include a map for each relevant species that identifies area/s in the project area and its surrounds determined to be 'high risk' based on the collision risk assessment. The PER must clearly demonstrate how relevant departmental policies and guidelines, and the SPRAT Database, have been used to assess the above potential impacts on listed threatened and migratory bird and bat species.

6.5 Impacts to the Great Barrier Reef Marine Park, Great Barrier Reef World Heritage Area and Great Barrier Reef National Heritage Place

Based on the information provided in the referral documentation, the department considers the project may result in impacts to the water quality of the Great Barrier Reef from erosion and sedimentation, particularly during the project's construction.

The Fitzroy River flows into the Great Barrier Reef and in accordance with *the Reef 2050 Water Quality Improvement Plan (WQIP)* is currently listed under high management priority (orange) for fine sediment loads in Table 2 of the WQIP.

In addition to the general impact assessment requirements outlined under section 6.1, the impact assessment must include, at a minimum:

- information on the timing and duration of erosion and sedimentation impacts impacts (including construction versus operational impacts)
- an assessment of potential impacts to water quality, with consideration of the quantities and types of sediment that will potentially be released into watercourses within and downstream of the project area, including the Great Barrier Reef, along with the associated impacts on MNES.
- a description of how the project will meet the requirements of the *Reef 2050 Water Quality Improvement Plan 2017-2022*, the *Reef 2050 Long-Term Sustainability Plan 2021-25* and the *Water Plan (Baffle Creek Basin) 2010*, with reference to project construction, soils, hydrology and hydrological modelling, including risks posed by extreme weather events.
- a qualitative characterisation of the following aspects of likely erosion and sedimentation impacts on Great Barrier Reef water quality (with reference to the *Reef 2050 Water Quality Improvement Plan 2017-2022*, and associated catchment level water quality targets):

7 PROPOSED AVOIDANCE, MINIMISATION, MITIGATION AND MANAGEMENT MEASURES

Avoidance, minimisation, and mitigation measures are the primary methods of eliminating and reducing impacts on protected matters. Where possible and practicable, it is best to avoid impacts. Even if it is not possible to completely avoid a protected

matter there may be ways to reduce the impact. If impacts cannot be avoided, then they should be minimised or mitigated as much as possible. Residual impacts should then be managed. Avoidance, minimisation and mitigation measures must be investigated thoroughly as a part of the assessment and be supported by evidence to demonstrate likely success.

The PER must demonstrate how the mitigation hierarchy has been applied and all options exhausted to avoid and mitigate harm to protected matters, before resorting to environmental offsets.

The department encourages the proponent to establish, test, and monitor novel methods for avoiding, minimising and mitigating impacts of the proposed action on protected matters. The department also encourages the development of scientifically rigorous monitoring programs to measure impacts and assess the effectiveness of mitigation.

7.1 Avoidance, mitigation and management measures

Specific details on avoidance, minimisation, mitigation and management measures, along with relevant monitoring, must be provided for all stages of the project.

Table 7.1 Avoidance, mitigation and management – information required

Information required	
7.1.1	A detailed summary of measures proposed to be undertaken by the proponent to avoid, minimise, mitigate and manage relevant impacts of the proposed action on protected matters, for all stages of the proposed action. Include details of any relevant measures to avoid, mitigate and manage impacts required through other Commonwealth, State and local government approvals.
7.1.2	Provide discussion on the measures employed to avoid, minimise and mitigate impacts to MNES from turbine strike, including but not limited to: • turbine placement • turbine design (e.g. blade design features) • acoustic and visual deterrents (e.g. ultrasound acoustic devices) • scheduling of activity (to avoid ecologically sensitive periods across construction, operation and decommissioning stages), including curtailment and consideration of appropriate cut-in speeds • detection systems (e.g. IdentiFlight®, Robin Radar Systems).
7.1.3	Provide discussion on the measures employed to avoid, minimise and mitigate impacts to protected matters from habitat loss and fragmentation, including but not limited to:

	• micro-siting of infrastructure to utilise existing clearance areas and avoid habitat fragmentation and patch isolation, with consideration of whether avoidance areas would still be connected to habitat in the broader landscape • minimising clearance widths for linear infrastructure • incorporating road pinch points to maintain habitat connectivity • innovative turbine blade transportation, including methods to minimise necessary clearance widths (e.g. 'Blade Manipulator' trucks) • installing fauna crossing infrastructure (e.g. glider poles or rope bridges) as supported by scientific literature, noting the *Conservation Advice for Petauroides volans (greater glider (southern and central))* states artificial structures (nest boxes, glide poles) have limited effectiveness as mitigation actions for loss, degradation or fragmentation of Greater Glider habitat • adjusting powerline heights to avoid fauna obstruction/entanglement and maximise canopy retention • where fencing is proposed, incorporating fauna friendly design to avoid fauna obstruction/entanglement (e.g. avoiding the use of barbed wire).
7.1.4	Provide discussion on proposed pre-clearance and clearance procedures to ensure fauna are detected and managed to minimise mortality, stress, injury, or introduction of disease. Describe any statutory or policy basis for the proposed procedures (e.g. any state or local government requirements).
7.1.5	Provide discussion on the measures employed to avoid, minimise and mitigate impacts to protected matters from short- and long-term erosion and sedimentation, including but not limited to: • identification of potentially affected wetlands, waterways, tributaries and drainage lines • scheduling of activity (e.g. avoiding construction during wet periods) • implementation of best-practice erosion and sediment control measures, including the details of the type and location of erosion and sediment control devices to be installed, based on the anticipated soil, weather and construction conditions • minimising the extent and duration of soil disturbance • prompt stabilisation of disturbed areas • controlling water movement through the project area, including the diversion of clean flows around disturbed areas

	• the development of performance criteria • regular monitoring during construction, operation and decommissioning to ensure performance criteria are being maintained, including a full inspection of erosion and sediment controls following a heavy rainfall event (>25 mm in 24 hours) to identify and undertake any necessary rectification works. Make reference to any mandatory or voluntary regulations, best practice standards, codes of practice, guidelines etc, with which the action will comply.
7.1.7	Proposed measures must be based on best available practices, appropriate standards, evidence of success for other similar actions and supported by published scientific evidence. The SPRAT Database, conservation advice, recovery plans and associated statutory and policy documents may provide a starting point for relevant mitigation and management measures.
7.1.8	All measures must be developed to meet the 'S.M.A.R.T' principle: • S – Specific (what and how) • M – Measurable (supported by baseline information, number/value, quantifiable, auditable) • A – Achievable (with consideration of e.g., timeframe, money, personnel) • R – Relevant (consistent with conservation advices, recovery plans, threat abatement plans, scientific literature) • T – Time-bound (specific timeframe to complete, include timeframe and frequency)
7.1.9	Include details of specific and measurable environmental outcomes to be achieved for relevant protected matters. All commitments must be drafted using committal language (e.g. 'will' and 'must') when describing the proposed measures. Any commitments by the person proposing to take the action must be clearly distinguished from recommendations or statements of best practice made by the document author or other technical expert.
7.1.10	Include an assessment of the expected or predicted effectiveness of the proposed measures.
7.1.11	Include any statutory or policy basis for the proposed measures, including reference to the SPRAT Database and relevant approved conservation

	advice, recovery plan or threat abatement plan, and a discussion on how the proposed measures are not inconsistent with relevant plans.
7.1.12	Provide bushfire mitigation and management measures, including information on preventing the spread of bushfires that may start as a result of the proposed action to areas outside of the project area.
7.1.13	Provide details of ongoing management, including monitoring programs to support an adaptive management approach, that validate the effectiveness of the proposed measures and overall demonstrate that environmental outcomes will be achieved. Include: • a scientifically robust monitoring program for the detection/quantification of impacts on protected matters, including as a result of turbine strike and barotrauma. The monitoring program must be able to accurately and in a timely manner detect when impact triggers are reached. Impact triggers, at suitable increments, should be informed by scientific literature and relevant departmental guidelines such as the *Referral guideline for 14 birds listed as migratory species under the EPBC Act*.
7.1.14	Details of tangible, on-ground corrective actions that will be implemented in the event the monitoring programs indicate that the environmental outcomes have not or will not be achieved, and when these corrective actions would be triggered. Include corrective actions to be undertaken in the event that incremental impact triggers are reached or exceeded from impacts on protected matters from turbine strike and barotrauma, including: • the implementation of additional/alternative mitigation measures (such as additional curtailment or deterrents) • shutdown procedures – the wind turbine/s that contributed to reaching or exceeding an impact trigger to cease operation • note that provision of environmental offsets will also be expected for any residual significant impact (see section 9).

7.2 Management plans

Management plans describe how an action might impact on the natural environment in which it occurs and set out clear commitments from the person taking the action on how those impacts will be avoided, minimised and managed so that they are environmentally acceptable. Management plans should be designed to achieve the best possible environmental outcome for the relevant protected matters.

Any management plans relevant to the mitigation and management of impacts to protected matters should be provided either as separate documents attached to the

PER or provided as subsections in the PER. Relevant plans should be included prior to publication of the draft PER. A final version of each plan is likely to require approval prior to commencement of the action, should it be approved.

Note that a decommissioning plan may also be required.

The table below includes likely requirements for management plans. Consideration should be given to outcomes-based commitments that can be proposed as an alternative to specific management commitments and management plans. Combining management plans to simplify management arrangements should be considered, where appropriate.

Table 7.2 Management plans – information required

Information required	
7.2.1	A detailed outline of an Environmental Management Plan (EMP) that sets out the framework for management, mitigation and monitoring of relevant impacts of the action, including any provisions for independent environmental auditing. The EMP needs to address the project phases (construction, operation, decommission) separately. It must state the environmental objectives, performance criteria, monitoring, reporting, corrective action, responsibility and timing for each environmental issue. The EMP should also describe contingencies for events such as heavy or prolonged rainfall. In the construction phase of the EMP, include management measures such as dust suppression and enforcement of reduced construction zone vehicle speeds. The EMP should incorporate weed and pest management actions, including monitoring. The *Environmental Management Plan Guidelines* provides general guidance to stakeholders preparing environmental management plans for environmental impact assessments and approvals under Chapter 4 of the EPBC Act. This is available at: https://www.dcceew.gov.au/sites/default/files/documents/environmental-management-plan-guidelines.pdf
7.2.2	A Sediment and Erosion Management Plan outlining avoidance, mitigation and monitoring of sediment loads (see section 7.1.5) and developed in accordance with the *International Erosion Control Association (IECA) Best Practice Erosion and Sediment Control Manual* (2008).
7.2.4	A Bird and Bat Management Plan (BBMP) in relation to risk of turbine collision and barotrauma. A framework for this plan is provided in Appendix C.

7.2.5	A Rehabilitation Management Plan. Requirements are set out in section 8.
7.2.6	An Offset Management Plan (OMP). Requirements are set out in section 9 and in Appendix D.

8 REHABILITATION REQUIREMENTS

Where rehabilitation is proposed and relevant to protected matters, the information in Table 8.1 must be included in a Rehabilitation Management Plan or a subsection of the PER.

Table 8.1 Rehabilitation – information required

Information required	
8.1	Provide details of rehabilitation methods and how they meet best practice standards, including for the restoration of habitat for relevant protected matters and avoidance of sedimentation/erosion.
8.2	A summary of the vegetation community/habitat that is being rehabilitated and the dominant species that will be included in the rehabilitation site.
8.3	The details of any rehabilitation activities proposed to be undertaken as required by Commonwealth, State or Territory, and local government legislation.
8.4	Maps showing the areas that will be rehabilitated within the project area and the size in hectares of these areas.
8.5	Information on management of the rehabilitation site, including, but not limited to, weed and pest management.
8.6	Rehabilitation acceptance criteria relevant to MNES and the procedures, including contingency measures, that will be undertaken to achieve them.
8.7	Details of a monitoring program to determine the success of rehabilitation activities implemented by the proponent, including any contingency measures and when they would be triggered.
8.8	Include information on whether any post-construction rehabilitation sites will be subsequently cleared during the decommissioning stage.

9 OFFSETS

Background

Environmental offsets are measures that compensate for the residual significant impacts of an action on protected matters. Offsets provide environmental benefits to counterbalance the impacts that remain after consideration of avoidance and mitigation

measures. Please note, offsets do not reduce the impacts of an action, and are not intended to make proposals with unacceptable impacts acceptable.

It is important to consider environmental offsets early in the assessment process. Correspondence with the department regarding offsetting is highly encouraged. The department's EPBC Act Environmental Offsets Policy (2012) (Offsets Policy) is available at: https://www.dcceew.gov.au/environment/epbc/publications/epbc-act-environmental-offsets-policy

Any proposed offsets must meet the key principles of the Offsets Policy.

The PER must include an assessment of the likelihood of residual significant impacts occurring on MNES for each controlling provision after avoidance, mitigation and management measures have been applied.

The assessment of residual significant impacts must also take into account likely impacts to MNES from turbine strike and barotrauma. The department is likely to recommend to the Minister (or delegate) that the conditions of approval require the monitoring of incremental impact triggers that, if reached or exceeded, result in additional mitigation measures, shutdown procedures, and, if necessary, provision of offsets for any residual significant impact.

If a residual significant impact is likely, then environmental offsets will be required, and a draft Offset Management Plan (OMP) must be included as an appendix to the PER. The OMP should be included prior to publication of the draft PER for potential approval concurrently with approval of the action itself.

Table 9 Offsets – information required

Information required	
9.1	An assessment of the likelihood of residual significant impacts occurring on relevant MNES, after avoidance, mitigation and management measures have been applied.
9.2	A summary of the proposed environmental offset and key commitments to achieve a conservation gain for each protected matter.
9.3	Include a draft OMP as an appendix to the PER. The draft OMP must meet the information requirements set out in Appendix D, and must be prepared by a suitably qualified ecologist and in accordance with the department's *Environmental Management Plan Guidelines* (2014), available at: Environmental Management Plan Guidelines 2014 (dcceew.gov.au).
9.4	The environmental offset/s proposed for the project must meet the core principles of the Offset Policy.
9.5	Offset proposals must engage specifically with the ecological requirements of the protected matter. For example, for a species like the Greater Glider, management measures such as weeding and fencing will not generally be

	accepted as suitable compensation for the loss of hollows suitable for denning, which is a limiting habitat requirement for the species. Where denning resources are proposed to be impacted, offset proposals should demonstrate an increase in the quality and/or availability of denning resources at an offset site, relative to the quantum of impact. Offset proposals based on creation of hollows (or artificial denning resources) must realistically address whether they will be used by Greater Gliders, whether they will attract predator or competitor species and their durability, accompanied by suitable monitoring and performance measures. Deviations from these principles will need to be explained and justified.

10 OTHER APPROVALS AND CONDITIONS

The PER must include information on any other requirements for approval or conditions that apply, or that the proponent reasonably believes are likely to apply, to the proposed action. This must include:

(a) details of any local or State Government planning scheme, or plan or policy under any local or State Government planning system that deals with the proposed action, including

- what environmental assessment of the proposed action has been, or is being, carried out under the scheme, plan or policy
- how the scheme provides for the prevention, minimisation and management of any relevant impacts

(b) a description of any approval that has been obtained from a State, Territory or Commonwealth agency or authority (other than an approval under the Act), including any conditions that apply to the action

(c) a statement identifying any additional approval that is required

(d) a description of the monitoring, enforcement and review procedures that apply, or are proposed to apply, to the action.

Attach relevant Commonwealth, State or Territory, and local government approvals and permits as supporting documents to the PER.

11 CONSULTATION

11.1 General consultation information

Discuss any consultation undertaken in relation to the proposed action, including:

(a) identification of affected parties, including a statement mentioning any communities that may be affected and describing their views

(b) any consultation that has already taken place, including any documented response to, or result of, the consultation

(c) any consultation proposed to take place.

11.2 Indigenous engagement

Identify existing or potential native title rights and interests that may be impacted by the proposed action, including any areas and objects that are of particular significance to Indigenous peoples and communities. Include information on how these impacts will be managed.

Describe any Indigenous consultation that has been undertaken, or will be undertaken, in relation to the proposed action and their outcomes. This should include details regarding the specific Indigenous groups and Traditional Owners consulted and an indication of the areas, both tangible and intangible, of cultural significance across the project area.

The department considers that best practice consultation, in accordance with The Interim Engaging with First Nations People and Communities on Assessments and Approvals under Environment Protection and Biodiversity Conservation Act 1999 (interim guidance) - DCCEEW (2023) includes:

- ensuring cultural safety
- building and maintaining trust
- engaging early and often
- negotiating suitable timeframes
- negotiating suitable submission formats.

Describe any State requirements for approval or conditions that apply, or that the proponent reasonably believes are likely to apply, to the proposed action with regards to Indigenous peoples and communities.

12 ENVIRONMENTAL RECORD OF PERSON(S) PROPOSING TO TAKE THE ACTION

The information provided must include details of any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources against:

(a) the person proposing to take the action

(b) for an action for which a person has applied for a permit, the person making the application.

If the person proposing to take the action is a corporation, details of the corporation's environmental policy and planning framework must also be included.

13 ECOLOGICALLY SUSTAINABLE DEVELOPMENT (ESD)

Describe how the proposed action meets the principle of ESD, as defined in section 3A of the EPBC Act (see Appendix A).

14 ECONOMIC AND SOCIAL MATTERS

The economic and social impacts of the action, both positive and negative, must be analysed. Matters of interest may include:

- details of any public consultation activities undertaken, and their outcomes (see section 11)
- projected economic costs and benefits of the project, including the basis for their estimation through cost/benefit analysis or similar studies
- employment opportunities expected to be generated by the project (including construction and operational phases).

Economic and social impacts should be considered at the local, regional and national levels. Details of the relevant cost and benefits of alternative options to the proposed action, as identified in section 3 above, should also be included.

15 INFORMATION SOURCES PROVIDED IN THE PER

For information given in a draft Public Environment Report, the draft must state:

(a) the source of the information

(b) how recent the information is

(c) how the reliability of the information was tested

(d) what uncertainties (if any) are in the information.

16 CONCLUSION

An overall conclusion as to the environmental acceptability of the proposal should be provided, including discussion on compliance with the principles of ecologically sustainable development and the objects and requirements of the EPBC Act. Reasons justifying undertaking the proposal in the manner proposed should also be outlined.

Measures proposed or required by way of offset for any unavoidable impacts on MNES, and the relative degree of compensation, should be summarised here.

APPENDIX A

THE OBJECTS AND PRINCIPLES OF THE

ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999

SECTIONS 3 AND 3A

3 Objects of the Act

(a) to provide for the protection of the environment, especially those aspects of the environment that are matters of national environmental significance;

(b) to promote ecologically sustainable development through the conservation and ecologically sustainable use of natural resources;

(c) to promote the conservation of biodiversity;

(d) to promote a co-operative approach to the protection and management of the environment involving governments, the community, land-holders and indigenous peoples;

(e) to assist in the co-operative implementation of Australia's international environmental responsibilities;

(f) to recognise the role of indigenous people in the conservation and ecologically sustainable use of Australia's biodiversity; and

(g) to promote the use of indigenous peoples' knowledge of biodiversity with the involvement of, and in co-operation with, the owners of the knowledge.

3A Principles of Ecologically Sustainable Development

The following principles are principles of ecologically sustainable development.

(a) Decision-making processes should effectively integrate both long-term and short-term economic, environmental, social and equitable considerations.

(b) If there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.

(c) The principle of inter-generational equity – that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.

(d) The conservation of biological diversity and ecological integrity should be a fundamental consideration in decision-making.

(e) Improved valuation, pricing and incentive mechanisms should be promoted.

APPENDIX B

MATTERS THAT MUST BE ADDRESSED IN A PER (SCHEDULE 4 OF THE EPBC REGULATIONS 2000)

1 General information

1.01 The background of the action including:

(a) the title of the action;

(b) the full name and postal address of the designated Proponent;

(c) a clear outline of the objective of the action;

(d) the location of the action;

(e) the background to the development of the action;

(f) how the action relates to any other actions (of which the Proponent should reasonably be aware) that have been, or are being, taken or that have been approved in the region affected by the action;

(g) the current status of the action; and

(h) the consequences of not proceeding with the action.

2 Description

2.01 A description of the action, including:

(a) all the components of the action;

(b) the precise location of any works to be undertaken, structures to be built or elements of the action that may have relevant impacts;

(c) how the works are to be undertaken and design parameters for those aspects of the structures or elements of the action that may have relevant impacts;

(d) relevant impacts of the action;

(e) proposed safeguards and mitigation measures to deal with relevant impacts of the action;

(f) any other requirements for approval or conditions that apply, or that the Proponent reasonably believes are likely to apply, to the proposed action;

(g) to the extent reasonably practicable, any feasible alternatives to the action, including:

(i) if relevant, the alternative of taking no action;

(ii) a comparative description of the impacts of each alternative on the matters protected by the controlling provisions for the action; and

(iii) sufficient detail to make clear why any alternative is preferred to another;

(h) any consultation about the action, including:

(i) any consultation that has already taken place;

(ii) proposed consultation about relevant impacts of the action; and

(iii) if there has been consultation about the proposed action — any documented response to, or result of, the consultation; and

(i) identification of affected parties, including a statement mentioning any communities that may be affected and describing their views.

3 Relevant impacts

3.01 Information given under paragraph 2.01(d) must include

(a) a description of the relevant impacts of the action;

(b) a detailed assessment of the nature and extent of the likely short term and long term relevant impacts;

(c) a statement whether any relevant impacts are likely to be unknown, unpredictable or irreversible;

(d) analysis of the significance of the relevant impacts; and

(e) any technical data and other information used or needed to make a detailed assessment of the relevant impacts.

4 Proposed safeguards and mitigation measures

4.01 Information given under paragraph 2.01(e) must include:

(a) a description, and an assessment of the expected or predicted effectiveness of, the mitigation measures;

(b) any statutory or policy basis for the mitigation measures;

(c) the cost of the mitigation measures;

(d) an outline of an environmental management plan that sets out the framework for continuing management, mitigation and monitoring programs for the relevant impacts of the action, including any provisions for independent environmental auditing;

(e) the name of the agency responsible for endorsing or approving each mitigation measure or monitoring program; and

(f) a consolidated list of mitigation measures proposed to be undertaken to prevent, minimise or compensate for the relevant impacts of the action, including mitigation measures proposed to be taken by State governments, local governments or the Proponent.

5 Other Approvals and Conditions

5.01 Information given under paragraph 2.01(f) must include:

(a) details of any local or State government planning scheme, or plan or policy under any local or State government planning system that deals with the proposed action, including:

(i) what environmental assessment of the proposed action has been, or is being carried out under the scheme, plan or policy; and

(ii) how the scheme provides for the prevention, minimisation and management of any relevant impacts;

(b) a description of any approval that has been obtained from a State, Territory or Commonwealth agency or authority (other than an approval under the Act), including any conditions that apply to the action;

(c) a statement identifying any additional approval that is required; and

(d) a description of the monitoring, enforcement and review procedures that apply, or are proposed to apply, to the action.

6 Environmental record of person proposing to take the action

6.01 Details of any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources against:

(a) the person proposing to take the action; and

(b) for an action for which a person has applied for a permit, the person making the application.

6.02 If the person proposing to take the action is a corporation — details of the corporation's environmental policy and planning framework.

7 Information sources

7.01 For information given the PER must state:

(a) the source of the information; and

(b) how recent the information is; and

(c) how the reliability of the information was tested; and

(d) what uncertainties (if any) are in the information.

APPENDIX C

BIRD AND BAT MANAGEMENT PLAN (BBMP) REQUIREMENTS

The following table outlines the framework for the preparation and submission of a draft BBMP as an appendix to the PER. The purpose of the BBMP is to enable a robust long-term approach to mitigate and manage potential impacts of the proposed action associated with individual mortality from turbine collision and barotrauma, and potential changes to species utilisation of the project area and its surrounds on relevant listed threatened and migratory bird and bat species.

The draft BBMP must be prepared by a suitably qualified ecologist and in accordance with the department's Environmental Management Plan Guidelines (2014). The draft BBMP must be informed by desktop and field-derived information, best available practices, appropriate standards, evidence of effectiveness for other similar actions and supported by published scientific evidence.

C1. Pre-commissioning requirements	
C1.1	**Desktop assessment** To predict the potential for listed threatened and migratory bird and bat species to be using the project area and its surrounds, the BBMP must include the process and outcomes of a preliminary site characterisation (desktop and/or initial site visit) for each species to identify all drivers of presence on the project area and utilisation of the project area. This characterisation must include, at a minimum, the consideration of: • site characteristics: focal habitat features, topography, prevailing wind and weather patterns, wetlands (including adjacent to project area), and distance to potential nesting, roosting and foraging areas. • species characteristics: behaviour, flight or demographic factors (e.g. species presence [ongoing, transitory/migratory]), site use (e.g. transit, roosting, breeding and/or foraging), flight paths (including migratory flight paths), flight heights, soaring, flocking, and population numbers.
C1.2	**Site-specific assessment** To validate the outcomes of the desktop assessment, the BBMP must include a site-specific assessment of how at-risk listed threatened and migratory bird and bat species are using, or likely to use, the project area and surrounds. This assessment must be informed by site-specific and species-specific site utilisation surveys (undertaken by a suitably qualified expert) and supported by other relevant scientific evidence. At least 24 months of site utilisation surveys must be undertaken to provide sufficient baseline data about a relevant species' potential to utilise the project area and its surrounds. This means that site utilisation surveys must be

	undertaken for each relevant season over a minimum two years (up to 8 survey events). Each site utilisation survey must be of an appropriate duration and spatial coverage (including taking into consideration the potential turbine layout and visibility) to adequately evaluate site utilisation. At a minimum, each site utilisation survey must record the relevant information specified in 'Species characteristics' of the desktop assessment (Section C1.1 above). The BBMP must include the site utilisation survey methodology for each relevant species. Discussion must be provided that includes detailed information on: • How the design of the site utilisation surveys for each relevant species has been informed by its drivers of presence on the project area and utilisation of the project area (as determined through the preliminary site characterisation). • How site utilisation surveys for each relevant species have been designed to improve understanding of site utilisation on the project area and its surrounds, and support an ongoing Before-After, Control Impact (BACI) framework in the BBMP.

C1.3	**Long-term impact risk assessment**
	
	To enable a robust assessment of the potential impacts of the proposed action on listed threatened and migratory bird and bat species, the BBMP must include, at a minimum:
	• An assessment of the potential impact pathways on each relevant species (based on the desktop assessment [Section C1.1 above] and site utilisation surveys [Section C1.2 above]) including, at a minimum:
	  ○ direct mortality from turbine collision and barotrauma
	  ○ potential changes to species utilisation of the project area and surrounds during construction and operation of the proposed action.
	• Identification of potential impacts to each relevant species from direct mortality, including but not limited to:
	  ○ analysis and mapping of suitable habitat, territories and activity/utilisation patterns/rates (e.g. 'heat maps') in the project area and its surrounds
	  ○ flight path analysis of relevant birds and bats including heights and speeds.
	• a collision risk assessment, which must incorporate:

	○ an assessment of the project area and surrounds to identify any high risk turbines ○ baseline data collected during the minimum 24 months of site utilisation surveys ○ a statement of all assumptions and uncertainties. The BBMP must include a map for each relevant species that identifies area/s in the project area and its surrounds determined to be 'high risk' based on the collision risk assessment. The BBMP must clearly demonstrate how relevant departmental policies and guidelines, and the SPRAT Database, have been used to assess the above potential impacts on listed threatened and migratory bird and bat species.

C2. Post-Commissioning requirements	
C2.1	**Environmental outcomes** To enable a robust long-term approach to mitigate and manage potential impacts from turbine collision and barotrauma, and potential changes to species utilisation of the project area and its surrounds, the BBMP must include specific environmental outcomes to be achieved by the implementation of the BBMP. This may include, but is not limited to: • an improved understanding of the risk of turbine collision and barotrauma impacts on listed bird and bat species. • an improved understanding of whether or how project area usage changes as a result of wind farm construction and operation. • an improved monitoring approach for the timely identification of turbine collisions and the timely collection and analysis of data. • an improved approach to the timely and regular validation and update to the collision risk assessment using monitoring data, to support a robust adaptive management approach. • the development and implementation of tangible, on-ground management measures and corrective actions to promote a long-term reduction in the risk of turbine collision and barotrauma impacts on listed bird and bat species.
C2.2	**Long-term site utilisation surveys** To detect potential long-term changes to species utilisation of the project area and its surrounds as a result of operations, the BBMP must include a long-term site utilisation survey program (prepared by a suitably qualified expert) for each relevant species. The program must, at a minimum:

	• be designed to ensure that species behavioural responses can be detected, including avoidance of turbines and changes to site utilisation • be designed to support a BACI monitoring framework • include site utilisation survey methodologies, and proposed timings, which are consistent with the pre-commissioning site utilisation survey methodologies • be undertaken by a suitable qualified expert • be statistically reliable • be able to inform adaptive mitigation and management measures, and corrective actions, to ensure environmental outcomes will be achieved and impacts are minimised to the greatest extent reasonably possible.

C2.3	**Long-term turbine collision and barotrauma monitoring**
	To manage potential long-term mortality impacts on relevant species as a result of turbine collision and barotrauma, the BBMP must include a long-term monitoring and collision risk assessment update approach. The approach must, at a minimum:
	• include details of the nature, timing and frequency of monitoring to inform progress against achieving the environmental outcomes, and be sufficient to determine whether the BBMP is likely to achieve those environmental outcomes in adequate time to implement all necessary corrective actions
	• demonstrate how species-specific factors (e.g., size, colour) and site-specific factors (e.g., terrain, ground cover, seasonality, obstructions) have been incorporated into the design of monitoring programs (i.e., turbine selection, feasibility of conducting searches etc.)
	• include a proposed timeframe for the regular validation and update of the collision risk assessment using site-specific data collected through ongoing monitoring activities
	• include a commitment to DNA test carcasses, where identification of a carcass based upon morphology is inconclusive and cannot rule out a potential listed species
	• include a commitment for carcass persistence trials and searcher efficiency trials to maximise the accuracy of total mortality estimates by determining the appropriate correction factor.
	  ○ For carcass persistence trials, ensure carcass type and placement around the site is appropriate.
	  ○ For searcher efficiency trials, ensure trials are completely blind.

	• include a commitment to determine whether there is variation in detection and persistence rates due to seasonality, substrate, or location at windfarm. The BBMP must take into account the following paper in the development of a long-term monitoring program, including the survey data requirements set out in Appendix 2: Moloney, P.D., Lumsden, L.F. and Smales, I. (2019). *Investigation of existing post-construction mortality monitoring at Victorian wind farms to assess its utility in estimating mortality rates*. Arthur Rylah Institute for Environmental Research Technical Report Series No. 302. Department of Environment, Land, Water and Planning, Heidelberg, Victoria.

C2.4	**Reporting requirements to the department**
	
	The BBMP must include, at a minimum, the following reporting commitments (and proposed timeframes) for the provision of site-specific and species-specific information to the department:
	
	• Annual turbine strike reports, comprising:
	  ○ raw strike data and strike notifications
	  ○ survey methodologies
	  ○ results of detection/persistence trials
	  ○ environmental/meteorological conditions
	  ○ associated statistical analysis.
	• Estimations of annual mortality rate for each relevant species, comprising:
	  ○ supporting evidence from case studies of listed species carcass size classes
	  ○ results of persistence trials and searcher efficiency trials
	  ○ annual probability of detection and monthly strike monitoring
	  ○ collision monitoring protocol and survey effort.
	• Species occurrence records for all listed threatened and migratory species recorded during surveys in accordance with the department's *Guidelines for biological survey and mapped data* (2018) using the species observation data template on the department's website (sensitive ecological data must be identified and treated in accordance with the department's *Sensitive Ecological Data – Access and Management Policy V1.0* (2016)).

C2.5	**Adaptive management framework**

	To ensure the environmental outcomes will be achieved for relevant species, the BBMP must include an adaptive management framework. The adaptive management framework must, at a minimum:
	• Be designed to clearly demonstrate the linkages between:
	  ○ environmental outcomes
	  ○ implementation of mitigation and management measures
	  ○ monitoring, reporting and investigations
	  ○ implementation of corrective actions to ensure environmental outcomes will be achieved.
	• Be designed to incorporate site-specific data collected through ongoing monitoring activities (see requirement C2.4 above) and take into account changes to turbine risk ratings based on the collision risk assessment.
	• Identify, with proposed timeframes for implementation, tangible, on-ground corrective actions to be implemented if monitoring activities indicate the environmental outcomes have not been achieved.

C2.6	**Offset requirements and shutdown procedures** The BBMP must include a framework for the ongoing assessment of impacts on protected matters as a result of turbine strike and/or barotrauma. Annual impact triggers (informed by scientific literature and relevant departmental guidelines) must be tracked and reported to the department. Incremental impact triggers must be tracked that, if reached or exceeded, require: • the implementation of additional/alternative mitigation measures (including curtailment) • the provision of environmental offsets • shutdown procedures – the wind turbine/s that contributed to reaching or exceeding an impact trigger would be required to cease operation.

APPENDIX D

INFORMATION REQUIREMENTS FOR EPBC ACT OFFSET PROPOSALS

Minimum Requirements for a draft Offset Management Plan The Offset Management Plan (OMP) outlines what needs to be done to manage an offset site once it is in place, such as setting milestones, monitoring, and reporting. It should also include a risk assessment and identify triggers for adaptive management. All direct offsets require an OMP.	
D1.1	Details of the residual impacts to MNES from the project, including the inputs to the Offsets Assessment Guide in relation to the impact area for each MNES (i.e. the quantum of impact), including: • total area of habitat (in hectares) • habitat quality (see D1.7)
D1.2	Specific, committal and measurable environmental outcomes which detail the nature of the conservation gain to be achieved for relevant MNES, including the creation, restoration and revegetation of habitat in the proposed offset area/s.
D1.3	A description of the offset area/s, including location, size, condition, environmental values present and surrounding land uses. Include maps and shapefiles to clearly define the location and boundaries of the offset area/s.
D1.4	Baseline data and other supporting evidence that documents the presence of the relevant MNES, and the quality of their habitat within the offset area/s.
D1.5	Details of how the offset area/s will provide connectivity with other habitats and biodiversity corridors and/or will contribute to a larger strategic offset for the relevant MNES.
D1.6	Details, with supporting evidence, to demonstrate how the environmental offset/s compensate for residual significant impacts of the proposed action on relevant MNES, and/or their habitat, in accordance with the principles of the Offsets Policy and all requirements of the Offsets Assessment Guide including: • time over which loss is averted (max. 20 years) • time until ecological benefit • risk of loss (%) without offset • risk of loss (%) with offset • confidence in result (%).

	When calculating offsets, please refer to the department's published guidance: How to use the Offsets Assessment Guide. Please note, risk of loss should not include consideration of stochastic events (e.g. bushfires), activities that contribute to changes in habitat quality scores or impacts that would otherwise require an offset under any relevant legislation.
D1.7	An assessment of the site habitat quality for the offset area/s. Please note, the department currently uses an adaptation of the Queensland *Guide to determining terrestrial habitat quality v1.2* (2017) – the Modified Habitat Quality Assessment (MHQA). MHQA was developed to better reflect the requirements of the EPBC Act Environmental Offsets Policy for determining habitat quality. A copy of the MHQA scoring spreadsheet template and guidance material is attached. The Queensland Guide (v1.2) should also be subject to the following modifications: • The species richness scores in Table 2 of the DEHP Guide are printed as having three scoring ranges: 2.5 points, 3 points, and 5 points. Instead, those scores should be 0 points, 2.5 points, and 5 points. • Though the Queensland Guide makes reference to the possibility of alternative scoring methods and weightings, the department is not able to accept alternative weightings or scorings, as that would necessarily introduce unacceptable subjectivity and variation between scoring on different projects and by different site surveyors.
D1.8	Specific offset completion criteria derived from the site habitat quality to demonstrate the improvement in the quality of habitat in the offset area/s over a 20-year period.
D1.9	Details of the management actions, and timeframes for implementation, to be carried out to meet the offset completion criteria.
D1.10	Interim milestones that set targets at a maximum of 5-yearly intervals for progress towards achieving the offset completion criteria.
D1.11	Details of the nature, timing and frequency of monitoring to inform progress against achieving the maximum 5-yearly interim milestones (the frequency of monitoring must be sufficient to track progress towards each set of milestones, and sufficient to determine whether the offset area/s are likely to achieve those milestones in adequate time to implement all necessary corrective actions).
D1.12	Proposed timing for the submission of monitoring reports which provide evidence demonstrating whether the interim milestones have been achieved.

D1.13	Timing for the implementation of tangible, on-ground corrective actions to be implemented if monitoring activities indicate the interim milestones have not been achieved.
D1.14	Evidence of how the management actions and corrective actions take into account relevant approved conservation advices and are consistent with relevant recovery plans and threat abatement plans.
D1.15	Details and execution timing of the mechanism to legally secure the proposed offset area/s, such that legal security remains in force over the offset area/s for at least 20 years to provide enduring protection for the offset area/s against development incompatible with conservation. Please note, should the proposed action be approved, conditions of an approval are likely to require that environmental offset/s be legally secured prior to the commencement of the proposed action.
D1.16	All measures must be written using committed language (e.g. 'will' and 'must') and in accordance with the 'S.M.A.R.T' principle: • S – Specific (what and how) • M – Measurable (supported by baseline information, number/value, quantifiable, auditable) • A – Achievable (with consideration of e.g., timeframe, money, personnel) • R – Relevant (consistent with conservation advices, recovery plans, threat abatement plans, scientific literature) • T – Time-bound (specific timeframe to complete, include timeframe and frequency)
D1.17	Risk analysis and a risk management and mitigation strategy for all risks to the successful implementation of the OMP and timely achievement of the offset completion criteria, including a rating of all initial and post-mitigation residual risks in accordance with a risk assessment matrix.

APPENDIX B WILDNET AND PMST SEARCH RESULTS

AREA REPORT

ATLAS OF LIVING AUSTRALIA
sharing biodiversity knowledge

www.ala.org.au

Area: 2,037.45 sq km	Species: 564	Occurrences: 1661
Endemic species: 0	All threatened species: 103	Migratory species: 0
All invasive species: 7	Iconic species: 24	JournalMap Articles: 0
Animals: 266	Plants: 296	Birds: 164

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TheodoreWF26082024

Area: 2,037.45 sq km

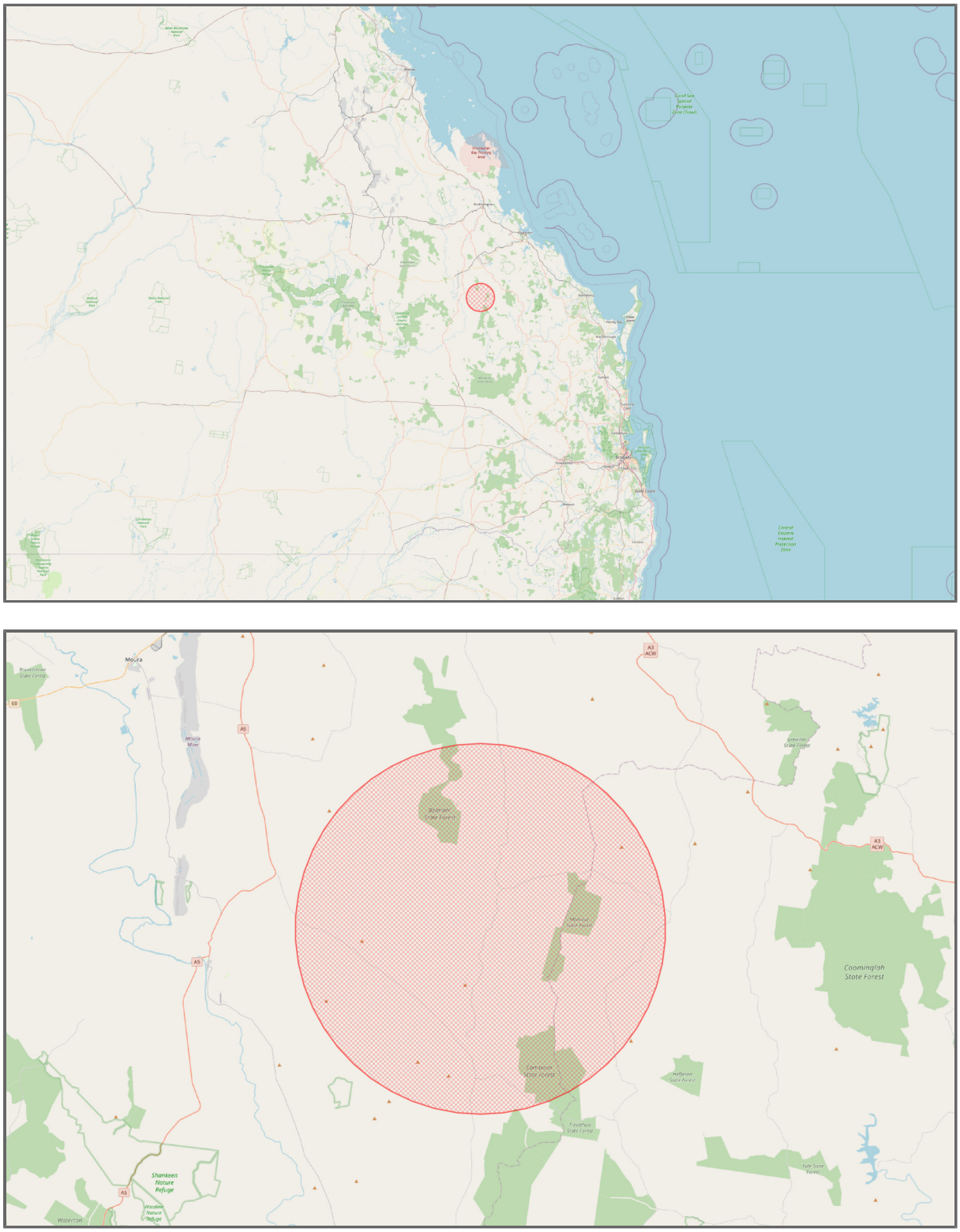


Figure 1 : Map of TheodoreWF26082024

Occurrences

Occurrences: **1661**

Spatially valid records are considered those that do not have any type of flag questioning their location, for example a terrestrial species being recorded in the ocean. [Ref6]

Number of occurrences (spatially valid only): **1661**

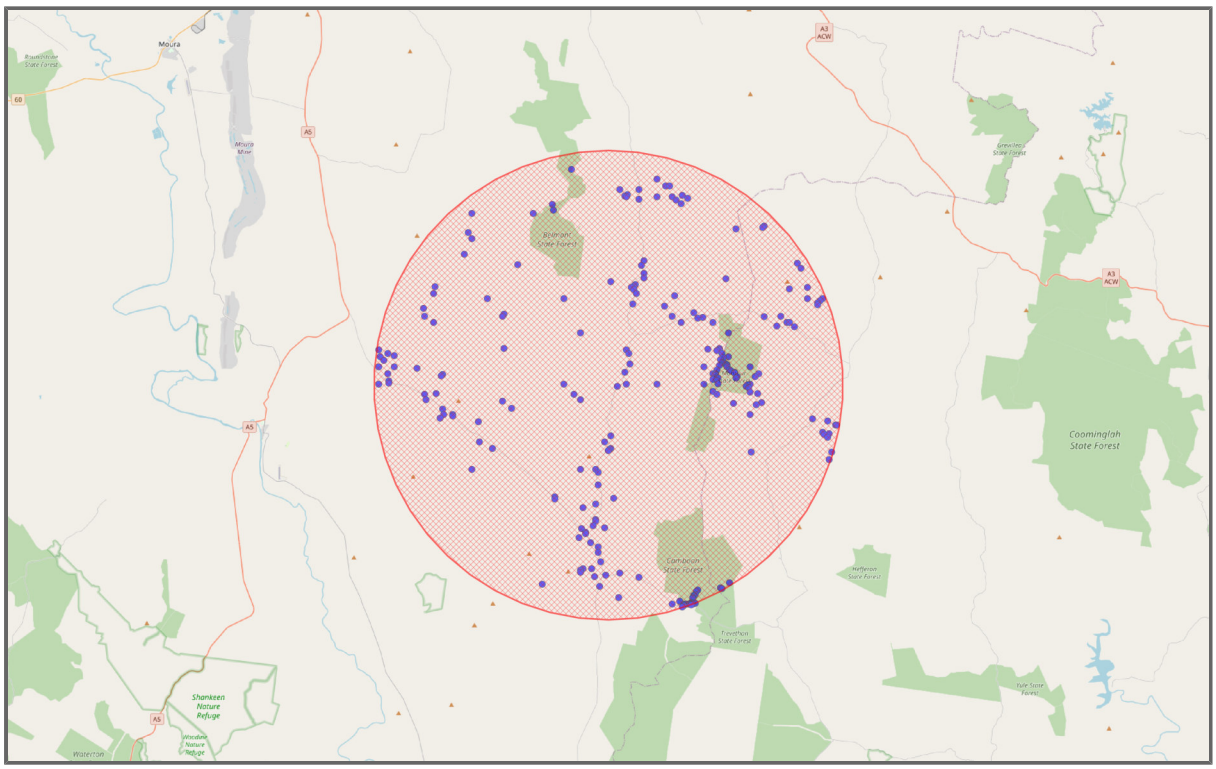


Figure 2 : Map of Occurrences

Species

Species: **564**

Spatially valid records are considered those that do not have any type of flag questioning their location, for example a terrestrial species being recorded in the ocean. [Ref6]

Number of species (spatially valid only): **564**

Table 1: Species

Family	*Scientific Name*	Common Name	No. Occurrences
Meliphagidae	Manorina (Myzantha) melanocephala	Noisy Miner	35
Artamidae	Gymnorhina tibicen	Australian Magpie	32
Pardalotidae	Pardalotus (Pardalotinus) striatus	Striated Pardalote	25
Corvidae	Corvus orru	Torresian Crow	23
Gekkonidae	Heteronotia binoei	Bynoe's Gecko	21
Psittacidae	Platycercus (Violania) adscitus	Pale-headed Rosella	20
Artamidae	Cracticus torquatus	Grey Butcherbird	19
Cacatuidae	Cacatua (Cacatua) galerita	Sulphur-crested Cockatoo	17
Artamidae	Cracticus nigrogularis	Pied Butcherbird	17
Artamidae	Strepera (Strepera) graculina	Pied Currawong	17
Campephagidae	Coracina (Coracina) novaehollandiae	Black-faced Cuckoo-shrike	16
Cacatuidae	Eolophus roseicapilla	Galah	16
Monarchidae	Grallina cyanoleuca	Magpie-lark	16
Acanthizidae	Smicrornis brevirostris	Weebill	15
Alcedinidae	Dacelo (Dacelo) novaeguineae	Laughing Kookaburra	14
Cuculidae	Heteroscenes pallidus	Pallid Cuckoo	13
Columbidae	Ocyphaps lophotes	Crested Pigeon	13
Rhipiduridae	Rhipidura (Sauloprocta) leucophrys	Willie Wagtail	13
Corcoracidae	Struthidea cinerea	Apostlebird	13
Psittacidae	Trichoglossus haematodus	Rainbow Lorikeet	13
Agamidae	Diporiphora australis	Tommy Roundhead	12
Meliphagidae	Myzomela (Myzomela) sanguinolenta	Scarlet Honeyeater	12
Accipitridae	Aquila (Uroaetus) audax	Wedge-tailed Eagle	11
Casuariidae	Dromaius novaehollandiae	Emu	11
Meliphagidae	Entomyzon cyanotis	Blue-faced Honeyeater	11
Gekkonidae	Gehyra dubia	Dubious Dtella	11
Cuculidae	Scythrops novaehollandiae	Channel-billed Cuckoo	11
Diplodactylidae	Strophurus taenicauda albiocularis		11
Falconidae	Falco (Tinnunculus) cenchroides	Nankeen Kestrel	10
Maluridae	Malurus (Musciparus) melanocephalus	Red-backed Fairy-wren	10
Meliphagidae	Melithreptus (Melithreptus) albogularis	White-throated Honeyeater	10
Meropidae	Merops (Merops) ornatus	Rainbow Bee-eater	10
Monarchidae	Myiagra (Myiagra) rubecula	Leaden Flycatcher	10
Oriolidae	Oriolus (Mimeta) sagittatus	Olive-backed Oriole	10
Pachycephalidae	Pachycephala (Alisterornis) rufiventris	Rufous Whistler	10
Meliphagidae	Philemon (Tropidorhynchus) corniculatus	Noisy Friarbird	10
Psittacidae	Aprosmictus erythropterus	Red-winged Parrot	9
Scincidae	Carlia pectoralis	Open-litter Rainbow-skink	9
Pachycephalidae	Colluricincla (Colluricincla) harmonica	Grey Shrike-thrush	9
Climacteridae	Cormobates leucophaea metastasis	Central Eastern White-throated Treecreeper	9
Scincidae	Cryptoblepharus pulcher pulcher	Elegant Snake-eyed Skink	9
Myrtaceae	Eucalyptus crebra	Yellow-branched Ironbark	9
Scincidae	Lerista fragilis	Eastern Mulch-slider	9
Scincidae	Lygisaurus foliorum	Tree-base Litter-skink	9

Meliphagidae	Meliphaga (Meliphaga) lewinii	Lewin's Honeyeater	9
Acanthizidae	Acanthiza (Acanthiza) pusilla	Brown Thornbill	8
Aegothelidae	Aegotheles (Aegotheles) cristatus	Australian Owlet-nightjar	8
Anatidae	Chenonetta jubata	Australian Wood Duck	8
Petroicidae	Eopsaltria (Eopsaltria) australis	Eastern Yellow Robin	8
Columbidae	Geopelia humeralis	Bar-shouldered Dove	8
Diplodactylidae	Oedura tryoni	Southern Spotted Velvet Gecko	8
Meliphagidae	Philemon (Microphilemon) citreogularis	Little Friarbird	8
Vespertilionidae	Scotorepens		8
Meliphagidae	Caligavis chrysops	Yellow-faced Honeyeater	7
Cuculidae	Centropus phasianinus	Pheasant Coucal	7
Diplodactylidae	Diplodactylus vittatus	Eastern Stone Gecko	7
Ardeidae	Egretta novaehollandiae	White-faced Heron	7
Petroicidae	Microeca (Microeca) fascinans	Jacky Winter	7
Cacatuidae	Nymphicus hollandicus	Cockatiel	7
Pittosporaceae	Pittosporum angustifolium	Native Willow	7
Poaceae	Poaceae	Grasses	7
Psittacidae	Trichoglossus chlorolepidotus	Scaly-breasted Lorikeet	7
Accipitridae	Accipiter (Leucospiza) fasciatus	Brown Goshawk	6
Otididae	Ardeotis australis	Australian Bustard	6
Euphorbiaceae	Bertya pedicellata		6
Myrtaceae	Corymbia citriodora	Lemon-scented Gum	6
Caprimulgidae	Eurostopodus (Eurostopodus) mystacalis	White-throated Nightjar	6
Acanthizidae	Gerygone olivacea olivacea	Eastern White-throated Gerygone	6
Molossidae	MOLOSSIDAE		6
Muridae	Mus musculus	House Mouse	6
Vespertilionidae	Nyctophilus gouldi	Gould's Long-eared Bat	6
Pomatostomidae	Pomatostomus (Pomatostomus) temporalis	Grey-crowned Babbler	6
Solanaceae	Solanum furfuraceum	Corky Nightshade	6
Psittacidae	Trichoglossus		6
Acanthizidae	Acanthiza (Geobasileus) reguloides	Buff-rumped Thornbill	5
Acanthizidae	Acanthiza (Subacanthiza) nana	Yellow Thornbill	5
Elapidae	Brachyurophis australis	Coral Snake	5
Camaenidae	CAMAENIDAE		5
Vespertilionidae	Chalinolobus picatus	Little Pied Bat	5
Neosittidae	Daphoenositta (Neositta) chrysoptera leucocephala	White-headed Sittella	5
Accipitridae	Elanus axillaris	Black-shouldered Kite	5
Coraciidae	Eurystomus orientalis	Dollarbird	5
Falconidae	Falco (Ieracidea) berigora	Brown Falcon	5
Campephagidae	Lalage (Lalage) tricolor	White-winged Triller	5
Pelodryadidae	Litoria caerulea	Green Tree Frog	5
Pygopodidae	Paradelma orientalis	Brigalow Scaly-foot	5
Petauridae	Petaurus norfolcensis	Squirrel Glider	5
Hirundinidae	Petrochelidon (Hylochelidon) nigricans	Tree Martin	5
Meliphagidae	Ptilotula fusca	Fuscous Honeyeater	5
Estrildidae	Stizoptera bichenovii	Double-barred Finch	5
Fabaceae	Vachellia bidwillii		5
Fabaceae	Acacia conferta	Crowded-leaved Wattle	4
Fabaceae	Acacia sparsiflora	Currawang	4
Anatidae	Anas (Anas) superciliosa	Pacific Black Duck	4
Anatidae	Anas gracilis	Grey Teal	4
Artamidae	Artamus (Angroyan) minor minor	Western Little Woodswallow	4
Accipitridae	Aviceda (Aviceda) subcristata	Pacific Baza	4
Cuculidae	Chalcites osculans	Black-eared Cuckoo	4
Elapidae	Cryptophis nigrescens	Eastern Small-eyed Snake	4
Ebenaceae	Diospyros humilis	Ebony	4

Columbidae	Geopelia		4
Acanthizidae	Gerygone olivacea	White-throated Gerygone	4
Vespertilionidae	Nyctophilus geoffroyi	Lesser Long-eared Bat	4
Cactaceae	Opuntia tomentosa	Velvet Pear	4
Molossidae	Ozimops ridei	Ride's Free-tailed Bat	4
Columbidae	Phaps (Phaps) chalcoptera	Common Bronzewing	4
Acanthizidae	Sericornis (Sericornis) frontalis	White-browed Scrubwren	4
Tachyglossidae	Tachyglossus aculeatus	Short-beaked Echidna	4
Campanulaceae	Wahlenbergia queenslandica	Bluebell	4
Fabaceae	Acacia bancroftiorum		3
Accipitridae	Accipiter (Paraspizias) cirrocephalus	Collared Sparrowhawk	3
Megapodiidae	Alectura lathami	Australian Brush-turkey	3
Psittacidae	Alisterus scapularis	Australian King-parrot	3
Casuarinaceae	Allocasuarina littoralis	Black Sheoak	3
Rhamnaceae	Alphitonia excelsa	Red Ash	3
Diplodactylidae	Amalosia rhombifer	Zigzag Velvet Gecko	3
Motacillidae	Anthus (Anthus) novaeseelandiae novaeseelandiae		3
Artamidae	Artamus (Campbellornis) personatus	Masked Woodswallow	3
Cuculidae	Chalcites basalis	Horsfield's Bronze-cuckoo	3
Cuculidae	Chalcites lucidus	Shining Bronze-cuckoo	3
Vespertilionidae	Chalinolobus gouldii	Gould's Wattled Bat	3
Locustellidae	Cincloramphus (Maclennania) mathewsi	Rufous Songlark	3
Accipitridae	Circus assimilis	Spotted Harrier	3
Corvidae	Corvus coronoides	Australian Raven	3
Neosittidae	Daphoenositta (Neositta) chrysoptera	Varied Sittella	3
Elapidae	Denisonia maculata	Ornamental Snake	3
Dicruridae	Dicrurus bracteatus	Spangled Drongo	3
Scincidae	Egernia striolata	Tree Skink	3
Poaceae	Enneapogon gracilis	Slender Nineawn	3
Poaceae	Enneapogon lindleyanus	Purple-head Nine-awn	3
Falconidae	Falco (Falco) longipennis	Australian Hobby	3
Goodeniaceae	Goodenia grandiflora	Mountain Primrose	3
Fabaceae	Hovea longipes	Brush Hovea	3
Pygopodidae	Lialis burtonis	Burton's Snake-lizard	3
Pelodryadidae	Litoria latopalmata	Broad-palmed Frog	3
Meliphagidae	Melithreptus (Eidopsarus) brevirostris	Brown-headed Honeyeater	3
Psittacidae	Melopsittacus undulatus	Budgerigar	3
Alaudidae	Mirafra (Mirafra) javanica	Horsfield's Bushlark	3
Carphodactylidae	Nephrurus asper	Prickly Knob-tailed Gecko	3
Strigidae	Ninox (Ninox) boobook	Southern Boobook	3
Macropodidae	Notamacropus parryi	Whiptail Wallaby	3
Leporidae	Oryctolagus cuniculus	Rabbit	3
Poaceae	Panicum effusum	Hairy Panic	3
Pardalotidae	Pardalotus (Pardalotus) punctatus	Spotted Pardalote	3
Psittacidae	Parvipsitta pusilla	Little Lorikeet	3
Pseudocheiridae	Petauroides minor	Northern Greater Glider	3
Petauridae	Petaurus notatus	Krefft's Glider	3
Meliphagidae	Plectorhyncha lanceolata	Striped Honeyeater	3
Agamidae	Pogona barbata	Common Bearded Dragon	3
Bufonidae	Rhinella marina	Cane Toad	3
Rhipiduridae	Rhipidura (Rhipidura) albiscapa	Grey Fantail	3
Cyperaceae	Schoenus kennyi		3
Solanaceae	Solanum mitchellianum		3
Diplodactylidae	Strophurus taenicauda	Golden-tailed Gecko	3
Elapidae	Suta dwyeri	Dwyer's Snake	3
Charadriidae	Vanellus (Lobipluvia) miles	Masked Lapwing	3

Varanidae	Varanus varius	Lace Monitor	3
Camaenidae	Xanthomelon pachystylum		3
Zosteropidae	Zosterops lateralis	Silvereye	3
Malvaceae	Abutilon auritum	Chinese Lantern	2
Fabaceae	Acacia leiocalyx	Black Wattle	2
Rutaceae	Acronychia pauciflora	Soft Acronychia	2
Culicidae	Aedes (Rampamyia) notoscriptus		2
Sapindaceae	Alectryon diversifolius	Scrub Boonaree	2
Ardeidae	Ardea alba	Great Egret	2
Poaceae	Aristida calycina var. calycina	Dark Wire-grass	2
Aristolochiaceae	Aristolochia elegans	Calico-flower	2
Artamidae	Artamus (Campbellornis) superciliosus	White-browed Woodswallow	2
Poaceae	Arundinella nepalensis	Reedgrass	2
Cyperaceae	Bolboschoenus caldwellii	Salt Club-sedge	2
Acanthaceae	Brunoniella australis	Blue Trumpet	2
Cacatuidae	Cacatua (Licmetis) sanguinea	Little Corella	2
Cuculidae	Cacomantis (Vidgenia) flabelliformis	Fan-tailed Cuckoo	2
Asteraceae	Calotis dentex	White Burr Daisy	2
Asteraceae	Camptacra barbata		2
Canidae	Canis familiaris	Common Dog	2
Fabaceae	Cassia brewsteri	Bean Tree	2
Fabaceae	Cassia tomentella	Velvet Cassia	2
Pteridaceae	Cheilanthes distans	Bristly Cloak-fern	2
Agamidae	Chlamydosaurus kingii	Frilled Lizard	2
Locustellidae	Cincloramphus (Cincloramphus) cruralis	Brown Songlark	2
Poaceae	Cleistochloa subjuncea		2
Rutaceae	Coatesia paniculata	Axe-breaker	2
Scincidae	Concinnia tenuis	Barred-sided Skink	2
Campephagidae	Coracina (Coracina) papuensis	White-bellied Cuckoo-shrike	2
Campephagidae	Coracina	Bebik	2
Corcoracidae	Corcorax melanorhamphos	White-winged Chough	2
Asteraceae	Cotula australis	Common Cotula	2
Phasianidae	Coturnix ypsilophora		2
Rubiaceae	Cyclophyllum coprosmoides var. coprosmoides		2
Cyperaceae	Cyperus gracilis	Slender Flat-sedge	2
Elapidae	Demansia psammophis	Yellow-faced Whip Snake	2
Celastraceae	Denhamia pittosporoides	Orange Boxwood	2
Fabaceae	Desmodium rhytidophyllum	Desmodium	2
Hemerocallidaceae	Dianella brevipedunculata		2
Hemerocallidaceae	Dianella longifolia	Blueberry Lily	2
Dicaeidae	Dicaeum (Dicaeum) hirundinaceum	Mistletoebird	2
Sapindaceae	Elattostachys xylocarpa	White Tamarind	2
Poaceae	Eragrostis megalosperma	A Love Grass	2
Scrophulariaceae	Eremophila deserti	Turkey-bush	2
Scrophulariaceae	Eremophila mitchellii	Budda	2
Poaceae	Eriochloa pseudoacrotricha	Early Spring Grass	2
Myrtaceae	Eucalyptus bakeri	Baker's Mallee	2
Myrtaceae	Eucalyptus crebra x Eucalyptus melanophloia		2
Myrtaceae	Eucalyptus decorticans	Gum Top Ironbark	2
Cuculidae	Eudynamys orientalis	Eastern Koel	2
Euphorbiaceae	Euphorbia tannensis subsp. eremophila	Bottle Tree Caustic	2
Asparagaceae	Eustrephus latifolius	Wombat Berry	2
Rubiaceae	Everistia vacciniifolia	Small-leaved Canthium	2
Euphorbiaceae	Excoecaria dallachyana	Scrub Poison Tree	2
Gekkonidae	Gehyra versicolor	Eastern Tree Dtella	2
Rutaceae	Geijera parviflora	Wilga	2

Columbidae	Geopelia cuneata	Diamond Dove	2
Columbidae	Geopelia placida	Peaceful Dove	2
Columbidae	Geophaps (Geophaps) scripta	Squatter Pigeon	2
Myrtaceae	Gossia bidwillii	Python Tree	2
Proteaceae	Grevillea longistyla	Long-style Grevillea	2
Accipitridae	Hieraaetus (Hieraaetus) morphnoides	Little Eagle	2
Apodidae	Hirundapus caudacutus	White-throated Needletail	2
Elapidae	Hoplocephalus bitorquatus	Pale-headed Snake	2
Fabaceae	Indigofera colutea	Sticky Indigo	2
Fabaceae	Jacksonia scoparia	Dogwood	2
Apocynaceae	Leichhardtia viridiflora	Green Berry Creeper	2
Asteraceae	Leiocarpa websteri	Narrow Plover-daisy	2
Brassicaceae	Lepidium didymum	Lesser Swine's-cress	2
Scincidae	Lerista punctatovittata	Eastern Robust Slider	2
Columbidae	Leucosarcia melanoleuca	Wonga Pigeon	2
Linderniaceae	Lindernia hyssopoides		2
Asparagaceae	Lomandra confertifolia subsp. pallida	Matrush	2
Macropodidae	Macropus giganteus	Eastern Grey Kangaroo	2
Maluridae	Malurus (Leggeornis) lamberti	Variegated Fairy-wren	2
Meliphagidae	Manorina (Myzantha) flavigula	Yellow-throated Miner	2
Petroicidae	Melanodryas (Melanodryas) cucullata	Hooded Robin	2
Ericaceae	Melichrus sp. Isla Gorge (P.Sharpe+ 601)		2
Scincidae	Morethia boulengeri	Boulenger's Snake-eyed Skink	2
Scincidae	Morethia taeniopleura	Fire-tailed Skink	2
Meliphagidae	Nesoptilotis leucotis	White-eared Honeyeater	2
Macropodidae	Notamacropus rufogriseus	Red-necked Wallaby	2
Oleaceae	Notelaea microcarpa	Native Olive	2
Asteraceae	Olearia canescens subsp. discolor		2
Cactaceae	Opuntia streptacantha	Cardona Pear	2
Meliaceae	Owenia venosa	Crow's Apple	2
	PASSERIFORMES	Yellowhammer	2
Poaceae	Panicum mitchellii	Mitchell's Panick Grass	2
Poaceae	Paspalidium gracile	Paspalidium	2
Passifloraceae	Passiflora aurantia	Norfolk Island Passionfruit	2
Petauridae	Petaurus australis	Yellow-bellied Glider	2
Petroicidae	Petroica (Petroica) goodenovii	Red-capped Robin	2
Phalacrocoracidae	Phalacrocorax (Phalacrocorax) sulcirostris	Little Black Cormorant	2
Phascolarctidae	Phascolarctos cinereus	Koala	2
Araceae	Pistia stratiotes	Water Lettuce	2
Dasyuridae	Planigale maculata	Common Planigale	2
Podargidae	Podargus strigoides	Tawny Frogmouth	2
Acanthaceae	Pseuderanthemum variabile	Pastel Flower	2
Muridae	Pseudomys patrius	Eastern Pebble-mound Mouse	2
Fabaceae	Pultenaea bracteamajor		2
Acanthizidae	Pyrrholaemus sagittatus	Speckled Warbler	2
Acanthaceae	Rostellularia adscendens	Purple Pipe-cleaner	2
Asteraceae	Rutidosis murchisonii		2
Santalaceae	Santalum lanceolatum	Northern Sandalwood	2
Cyperaceae	Scleria sphacelata	Scleria	2
Vespertilionidae	Scotorepens greyii	Little Broad-nosed Bat	2
Fabaceae	Senna artemisioides subsp. zygophylla	Narrow-leaf Desert Cassia	2
Fabaceae	Senna coronilloides		2
Malvaceae	Seringia corollata	Keraudrenia	2
Malvaceae	Sida hackettiana	Spiked Sida	2
Brassicaceae	Sisymbrium erysimoides	Smooth Mustard	2
Solanaceae	Solanum aviculare	Kangaroo Apple	2

Solanaceae	Solanum jucundum		2
Solanaceae	Solanum nemophilum		2
Solanaceae	Solanum seaforthianum	Brazilian Nightshade	2
Poaceae	Sporobolus creber	Western Rat-tail Grass	2
Celastraceae	Stackhousia muricata	Stackhousia	2
Fabaceae	Swainsona queenslandica	Smooth Darling Pea	2
Podicipedidae	Tachybaptus novaehollandiae	Australasian Grebe	2
Estrildidae	Taeniopygia guttata	Zebra Finch	2
Asteraceae	Tagetes minuta	Stinking Roger	2
Alcedinidae	Todiramphus (Lazulena) macleayii	Forest Kingfisher	2
Alcedinidae	Todiramphus (Todiramphus) sanctus	Sacred Kingfisher	2
Meliaceae	Turraea pubescens	Native Honeysuckle	2
Tytonidae	Tyto javanica	Eastern Barn Owl	2
Myobatrachidae	Uperoleia laevigata	Smooth Toadlet	2
Myobatrachidae	Uperoleia rugosa	Wrinkled Toadlet	2
Varanidae	Varanus gouldii	Gould's Goanna	2
Vespertilionidae	Vespadelus troughtoni	Eastern Cave Bat	2
Vespertilionidae	Vespadelus		2
Asteraceae	Vittadinia bicolor		2
Asteraceae	Vittadinia hispidula var. setosa		2
Cacatuidae	Zanda funerea	Yellow-tailed Black-cockatoo	2
Fabaceae	Zornia pallida		2
	AVES	Birds	1
Malvaceae	Abutilon calliphyllum	Velvet Lanternflower	1
Malvaceae	Abutilon oxycarpum var. incanum		1
Malvaceae	Abutilon oxycarpum var. oxycarpum		1
Malvaceae	Abutilon tubulosum		1
Fabaceae	Acacia amblygona	Fan Wattle	1
Fabaceae	Acacia angusta		1
Fabaceae	Acacia crassa	Curracabah	1
Fabaceae	Acacia fasciculifera	Scaly Bark	1
Fabaceae	Acacia glaucocarpa	Hickory Wattle	1
Fabaceae	Acacia leiocalyx subsp. leiocalyx	Curracabah	1
Fabaceae	Acacia penninervis	Mountain Hickory	1
Fabaceae	Acacia podalyriifolia	Mount Morgan Wattle	1
Fabaceae	Acacia rhodoxylon	Ringy Rosewood	1
Acanthizidae	Acanthiza (Geobasileus) chrysorrhoa	Yellow-rumped Thornbill	1
Potoroidae	Aepyprymnus rufescens	Rufous Bettong	1
Fabaceae	Aeschynomene brevifolia		1
Violaceae	Afrohybanthus stellarioides		1
Estrildidae	Aidemosyne modesta	Plum-headed Finch	1
Lamiaceae	Ajuga australis	Austral Bugle	1
Apocynaceae	Alstonia constricta	Quinine Bush	1
Amaranthaceae	Amaranthus viridis	Green Amaranth	1
Vitaceae	Ampelocissus gardineri		1
Loranthaceae	Amyema congener subsp. rotundifolia		1
Poaceae	Ancistrachne uncinulata	Hooked-hairy Panic Grass	1
Anhingidae	Anhinga novaehollandiae	Australasian Darter	1
Culicidae	Anopheles (Cellia) annulipes	Spear Mosquito	1
Motacillidae	Anthus (Anthus) novaeseelandiae	Australian Pipit	1
Apodidae	Apus (Apus) pacificus	Fork-tailed Swift	1
Papaveraceae	Argemone ochroleuca subsp. ochroleuca	Prickly Poppy	1
Poaceae	Aristida gracilipes	Three-awn Speargrass	1
Artamidae	Artamus (Angroyan) minor	Little Woodswallow	1
Pythonidae	Aspidites melanocephalus	Black-headed Python	1
Sapindaceae	Atalaya hemiglauca	Whitewood	1

Sapindaceae	Atalaya salicifolia	Atalaya	1
Argiolestidae	Austroargiolestes icteromelas	Pale-mouth Common Flatwing	1
Anatidae	Aythya (Nyroca) australis	Hardhead	1
Myrtaceae	Backhousia angustifolia	Narrow Leaf Myrtle	1
Colubridae	Boiga irregularis	Night Tiger	1
Poaceae	Bothriochloa decipiens	Bothriochloa	1
Burhinidae	Burhinus (Burhinus) grallarius	Bush Stone-curlew	1
Asteraceae	Calotis cuneata	Mountain Burr-daisy	1
Cacatuidae	Calyptorhynchus (Calyptorhynchus) banksii	Red-tailed Black Cockatoo	1
Capparaceae	Capparis anomala	Warrior Bush	1
Capparaceae	Capparis arborea	Native Pomegranate	1
Capparaceae	Capparis canescens	Wild Orange	1
Capparaceae	Capparis lasiantha	Nepine	1
Capparaceae	Capparis mitchellii	Native Orange	1
Capparaceae	Capparis sarmentosa	Scrambling Caper	1
Cyperaceae	Carex inversa	Dwarf Sedge	1
Apocynaceae	Carissa ovata	Conkerberry	1
Asteraceae	Cassinia laevis	Cough Bush	1
Lauraceae	Cassytha paniculata	Ribbed Dodder Laurel	1
Casuarinaceae	Casuarina cristata	Belah	1
Cyperaceae	Caustis flexuosa	Slender Twist-rush	1
Asteraceae	Centipeda minima subsp. minima	Spreading Sneezeweed	1
Cuculidae	Chalcites minutillus barnardi	Eastern Little Bronze-cuckoo	1
Vespertilionidae	Chalinolobus morio	Chocolate Wattled Bat	1
Pteridaceae	Cheilanthes sieberi subsp. sieberi	Rock Fern	1
Chelidae	Chelodina (Chelodina) longicollis	Snake-necked Turtle	1
Poaceae	Chloris truncata	Windmill Grass	1
Poaceae	Chloris ventricosa	Tall Windmill Grass	1
Asteraceae	Cirsium vulgare	Spear Thistle	1
Cisticolidae	Cisticola (Cisticola) exilis	Golden-headed Cisticola	1
Vitaceae	Clematicissus opaca	Pepper Vine	1
Climacteridae	Climacteris (Climacteris) picumnus	Brown Treecreeper	1
Gyrostemonaceae	Codonocarpus attenuatus	Bell-fruit Tree	1
Commelinaceae	Commelina cyanea	Scurvy Weed	1
Climacteridae	Cormobates leucophaea	White-throated Treecreeper	1
Corvidae	Corvus		1
Myrtaceae	Corymbia trachyphloia	White Bloodwood	1
Sapindaceae	Cossinia australiana	Cossinia	1
Fabaceae	Crotalaria medicaginea var. neglecta	Trefoil Rattlepod	1
Euphorbiaceae	Croton insularis	Silver Queensland Cascarilla	1
Scincidae	Ctenotus spaldingi	Spalding's Ctenotus	1
Cucurbitaceae	Cucumis anguria var. anguria	West Indian Gherkin	1
Asteraceae	Cyanthillium cinereum	Ironweed	1
Scincidae	Cyclodomorphus gerrardii	Pink-tongued Skink	1
Orchidaceae	Cymbidium canaliculatum	Tiger Orchid	1
Cyperaceae	Cyperus concinnus	Trim Flat-sedge	1
Cyperaceae	Cyperus exaltatus	Tall Flat-sedge	1
Cyperaceae	Cyperus fulvus	Sticky Sedge	1
Dasyuridae	Dasyurus hallucatus	Digul	1
Fabaceae	Daviesia filipes subsp. filipes		1
Amaranthaceae	Deeringia amaranthoides	Redberry	1
Anatidae	Dendrocygna eytoni	Plumed Whistling-duck	1
Celastraceae	Denhamia cunninghamii	Narrow-leaf Maytenus	1
Celastraceae	Denhamia pittosporoides subsp. pittosporoides	Veiny Denhamia	1
Fabaceae	Desmodium varians	Slender Tick-trefoil	1
Poaceae	Dichanthium sericeum subsp. humilius	Dwarf Bluegrass	1

Poaceae	Dichanthium sericeum subsp. sericeum	Silky Blue-grass	1
Dioscoreaceae	Dioscorea transversa	Native Yam	1
Libellulidae	Diplacodes bipunctata	Wandering Percher	1
Cucurbitaceae	Diplocyclos palmatus subsp. affinis	Native Cucumber	1
Cucurbitaceae	Diplocyclos palmatus subsp. palmatus		1
Sapindaceae	Dodonaea triangularis	Hopbush	1
Bignoniaceae	Dolichandra unguis-cati	Cat's Claw Creeper	1
Droseraceae	Drosera lunata		1
Chenopodiaceae	Dysphania pumilio	Small Crumbweed	1
Boraginaceae	Ehretia saligna var. membranifolia	Peach Bush	1
Celastraceae	Elaeodendron australe var. integrifolium		1
Celastraceae	Elaeodendron australe	White Cedar	1
Charadriidae	Elseyornis melanops	Black-fronted Dotterel	1
Poaceae	Enneapogon nigricans	Black-head Grass	1
Poaceae	Enneapogon truncatus	Bottlewashers	1
Poaceae	Enteropogon unispiceus		1
Poaceae	Eragrostis alveiformis	Granite Love-grass	1
Poaceae	Eragrostis sororia	Lovegrass	1
Poaceae	Eragrostis spartinoides	Lovegrass	1
Fabaceae	Erythrina vespertilio subsp. vespertilio		1
Fabaceae	Erythrostemon gilliesii	Bird-of-paradise Flower	1
Myrtaceae	Eucalyptus coolabah	Coolabah	1
Myrtaceae	Eucalyptus exserta	Queensland Peppermint	1
Myrtaceae	Eucalyptus moluccana	Gum-topped Box	1
Myrtaceae	Eucalyptus tereticornis	Forest Red Gum	1
Myrtaceae	Eucalyptus	Studley Park Gum	1
Scincidae	Eulamprus quoyii	Eastern Water-skink	1
Euphorbiaceae	Euphorbia hirta	Asthma Plant	1
Euphorbiaceae	Euphorbia papillifolia var. papillifolia		1
Rubiaceae	Everistia vacciniifolia var. vacciniifolia		1
Falconidae	Falco (Ieracidea) berigora berigora	Eastern Brown Falcon	1
Cyperaceae	Fimbristylis dichotoma	Fringe-rush	1
Rutaceae	Flindersia collina	Broad-leaved Leopard Tree	1
Nectriaceae	Fusarium oxysporum f.sp. vasinfectum		1
Cyperaceae	Gahnia aspera	Rough Saw-sedge	1
Fabaceae	Galactia tenuiflora var. lucida		1
Araneidae	Gasteracantha		1
Gekkonidae	Gehyra		1
Geraniaceae	Geranium solanderi var. solanderi	Austral Crane's-bill	1
Geraniaceae	Geranium solanderi	Austral Geranium	1
Verbenaceae	Glandularia aristigera	Mayne's Pest	1
Psittacidae	Glossopsitta concinna	Musk Lorikeet	1
Fabaceae	Glycine	Twining Glycine	1
Planorbidae	Glyptophysa		1
Goodeniaceae	Goodenia glabra	Smooth Goodenia	1
	Goodenia paradoxa	Spur Velleia	1
Goodeniaceae	Goodenia rotundifolia		1
Malvaceae	Grewia latifolia	Dysentery Plant	1
Accipitridae	Haliastur sphenurus	Whistling Kite	1
Haloragaceae	Haloragis glauca	Grey Raspwort	1
Haloragaceae	Haloragis stricta		1
Fabaceae	Hardenbergia violacea	Native Lilac	1
Poaceae	Heteropogon contortus	Black Speargrass	1
Dilleniaceae	Hibbertia stricta	Upright Guinea-flower	1
Dilleniaceae	Hibbertia	Guinea Flowers	1
Araliaceae	Hydrocotyle acutiloba	Broad-leaf Pennywort	1

Hypoxidaceae	Hypoxis pratensis	Golden Weather-grass	1
Fabaceae	Indigofera linifolia	Flax-leaf Indigo	1
Fabaceae	Indigofera linnaei	Birdsville Indigo	1
Formicidae	Iridomyrmex pallidus		1
Oleaceae	Jasminum didymum subsp. racemosum	Native Jasmine	1
Campephagidae	Lalage (Karua) leucomela	Varied Triller	1
Verbenaceae	Lantana montevidensis	Creeping Lantana	1
Asparagaceae	Laxmannia gracilis	Slender Wire Lily	1
Apocynaceae	Leichhardtia viridiflora subsp. viridiflora	Native Pear	1
Brassicaceae	Lepidium bonariense	Peppercress	1
Poaceae	Leptochloa digitata	Umbrella Cane-grass	1
Scincidae	Lerista		1
Asteraceae	Leuzea australis	Austral Cornflower	1
Limnodynastidae	Limnodynastes peronii	Striped Marsh Frog	1
Pelodryadidae	Litoria peronii	Peron's Tree Frog	1
Pelodryadidae	Litoria rubella	Little Red Tree Frog	1
Arecaceae	Livistona nitida	Carnavon Gorge Cabbage Palm	1
Asparagaceae	Lomandra multiflora subsp. multiflora	Lomandra	1
Estrildidae	Lonchura (Munia) castaneothorax	Chestnut-breasted Munia	1
Myrtaceae	Lophostemon suaveolens	Swamp Box	1
Onagraceae	Ludwigia octovalvis	Willow Primrose	1
Moraceae	Maclura pomifera	Osage-orange	1
Fabaceae	Medicago polymorpha	Spineless Burr Medic	1
Petroicidae	Melanodryas (Melanodryas) cucullata cucullata	South-eastern Hooded Robin	1
Poaceae	Melinis repens	Red Natal-grass	1
Curculionidae	Myllocerus		1
Primulaceae	Myrsine variabilis	Rapanea	1
Myrtaceae	Myrtaceae	Myrtle Family	1
Camaenidae	Neveritis misella	Mid-eastern Velvet Snail	1
Solanaceae	Nicotiana forsteri		1
Solanaceae	Nicotiana megalosiphon	Wild Tobacco	1
Strigidae	Ninox (Ninox) novaeseelandiae	Southern Boobook	1
Macropodidae	Notamacropus dorsalis	Black-striped Wallaby	1
Scolopacidae	Numenius (Phaeopus) phaeopus	Whimbrel	1
Ardeidae	Nycticorax caledonicus	Nankeen Night-heron	1
Vespertilionidae	Nyctophilus bifax	Eastern Long-eared Bat	1
Amaranthaceae	Nyssanthes diffusa	Barbed-wire Weed	1
Asteraceae	Olearia canescens	Daisy Bush	1
Oreoicidae	Oreoica gutturalis	Crested Bellbird	1
Libellulidae	Orthetrum villosovittatum	Fiery Skimmer	1
Hydrocharitaceae	Ottelia ovalifolia subsp. ovalifolia	Swamp Lily	1
Meliaceae	Owenia x reliqua	Bellata Owenia	1
Oxalidaceae	Oxalis perennans	Native Sorrel	1
Asteraceae	Ozothamnus cassinioides	Everlasting	1
	POLYDESMIDA		1
Pachycephalidae	Pachycephala (Pachycephala) pectoralis	Golden Whistler	1
Bignoniaceae	Pandorea pandorana	Wonga Vine	1
Poaceae	Panicum larcomianum		1
Apocynaceae	Parsonsia eucalyptophylla	Gargaloo	1
Poaceae	Paspalidium caespitosum	Brigalow Grass	1
Poaceae	Paspalidium jubiflorum	Warrego Grass	1
Passifloraceae	Passiflora aurantia var. aurantia	Blunt-leaved Passionfruit	1
Pelecanidae	Pelecanus conspicillatus	Australian Pelican	1
Pseudocheiridae	Petauroides volans	Southern Greater Glider	1
Macropodidae	Petrogale herberti	Herbert's Rock-wallaby	1
Carabidae	Philoscaphus mastersii		1

Phyllanthaceae	Phyllanthus maderaspatensis	Spurge	1
Phyllanthaceae	Phyllanthus virgatus	Phyllanthus	1
Phytolaccaceae	Phytolacca octandra	Red-ink Weed	1
Thymelaeaceae	Pimelea glauca	Smooth Riceflower	1
Sapotaceae	Planchonella cotinifolia	Yellow Lemon	1
Dasyuridae	Planigale maculata maculata		1
Plantaginaceae	Plantago debilis	Shade Plantain	1
Limnodynastidae	Platyplectrum ornatum	Ornate Burrowing Frog	1
Caryophyllaceae	Polycarpaea corymbosa var. minor		1
Phyllanthaceae	Poranthera microphylla	Small Poranthera	1
Scincidae	Praeteropus brevicollis	Short-necked Worm-skink	1
Elapidae	Pseudechis australis	Mulga Snake	1
Muridae	Pseudomys		1
Rubiaceae	Psydrax longipes		1
Rubiaceae	Psydrax odorata f. buxifolia		1
Rubiaceae	Psydrax odorata	Psydrax	1
Carabidae	Pterostichini		1
Meliphagidae	Ptilotula penicillata	White-plumed Honeyeater	1
Fabaceae	Pultenaea millarii var. angustifolia		1
Scincidae	Pygmaeascincus timlowi	Dwarf Litter-skink	1
Rhipiduridae	Rhipidura (Howeavis) rufifrons	Rufous Fantail	1
Asteraceae	Rhodanthe polyphylla		1
Fabaceae	Rhynchosia minima	Rhynchosia	1
Lamiaceae	Salvia reflexa	Mintweed	1
Chenopodiaceae	Sclerolaena birchii	Galvinised Burr	1
Chenopodiaceae	Sclerolaena muricata var. muricata	Sclerolaena	1
Apocynaceae	Secamone elliptica	Secamone	1
Asteraceae	Senecio bathurstianus	Dissected Fireweed	1
Asteraceae	Senecio brigalowensis		1
Fabaceae	Senna occidentalis	Western Senna	1
Malvaceae	Sida corrugata	Variable Sida (peltate-hairy)	1
Asteraceae	Sigesbeckia orientalis	Indian Weed	1
Brassicaceae	Sisymbrium thellungii	African Turnip-weed	1
Solanaceae	Solanaceae	Tomato	1
Solanaceae	Solanum ellipticum	Potato Bush	1
Solanaceae	Solanum parvifolium	Nightshade	1
Fabaceae	Spartium junceum	Spanish Broom	1
Rubiaceae	Spermacoce brachystema	Spermacoce	1
Rubiaceae	Spermacoce multicaulis		1
Oriolidae	Sphecotheres vieilloti	Australasian Figbird	1
Stylidiaceae	Stylidium eglandulosum	Woolly-stemmed Triggerplant	1
Elapidae	Suta suta	Curl Snake	1
Phasianidae	Synoicus ypsilophora	Brown Quail	1
Helicarionidae	Tarocystis megaspira	Amber Dome Glass-snail	1
Fabaceae	Tephrosia filipes subsp. filipes		1
Lamiaceae	Teucrium junceum		1
Poaceae	Themeda triandra	Kangaroo Grass	1
Poaceae	Thyridolepis xerophila	Thyridolepis	1
Poaceae	Tragus australianus	Tickgrass	1
Hemerocallidaceae	Tricoryne elatior	Yellow Rush Lily	1
Turnicidae	Turnix		1
Poaceae	Urochloa foliosa	Leafy Panic	1
Poaceae	Urochloa gilesii	Hairy-edged Armgrass	1
Poaceae	Urochloa panicoides var. panicoides		1
Poaceae	Urochloa subquadripara	Armgrass Millet	1
Urticaceae	Urtica incisa	Scrub Nettle	1

Charadriidae	Vanellus (Lobipluvia) miles novaehollandiae	Southern Masked Lapwing	1
Charadriidae	Vanellus (Lobivanellus) tricolor	Banded Lapwing	1
Varanidae	Varanus tristis	Black-headed Monitor	1
Verbenaceae	Verbena africana	Inland Verbena	1
Asteraceae	Verbesina encelioides subsp. encelioides	Crownbeard	1
Asteraceae	Vittadinia dissecta var. hirta	Dissected New Holland Daisy	1
Asteraceae	Vittadinia hispidula var. hispidula		1
Asteraceae	Vittadinia hispidula		1
Asteraceae	Vittadinia sulcata	Furrowed New Holland Daisy	1
Asteraceae	Xanthium spinosum	Bathurst Burr	1
Xanthorrhoeaceae	Xanthorrhoea	Grasstree	1
Rutaceae	Zanthoxylum brachyacanthum	Thorny Yellowwood	1
Rutaceae	Zieria cytisoides	Downy Zieria	1
Rutaceae	Zieria smithii	Sandfly Zieria	1
Fabaceae	Zornia muriculata subsp. muriculata		1
Fabaceae	Zornia muriculata	Upright Zornia	1

All threatened species

Number of threatened species: **103**

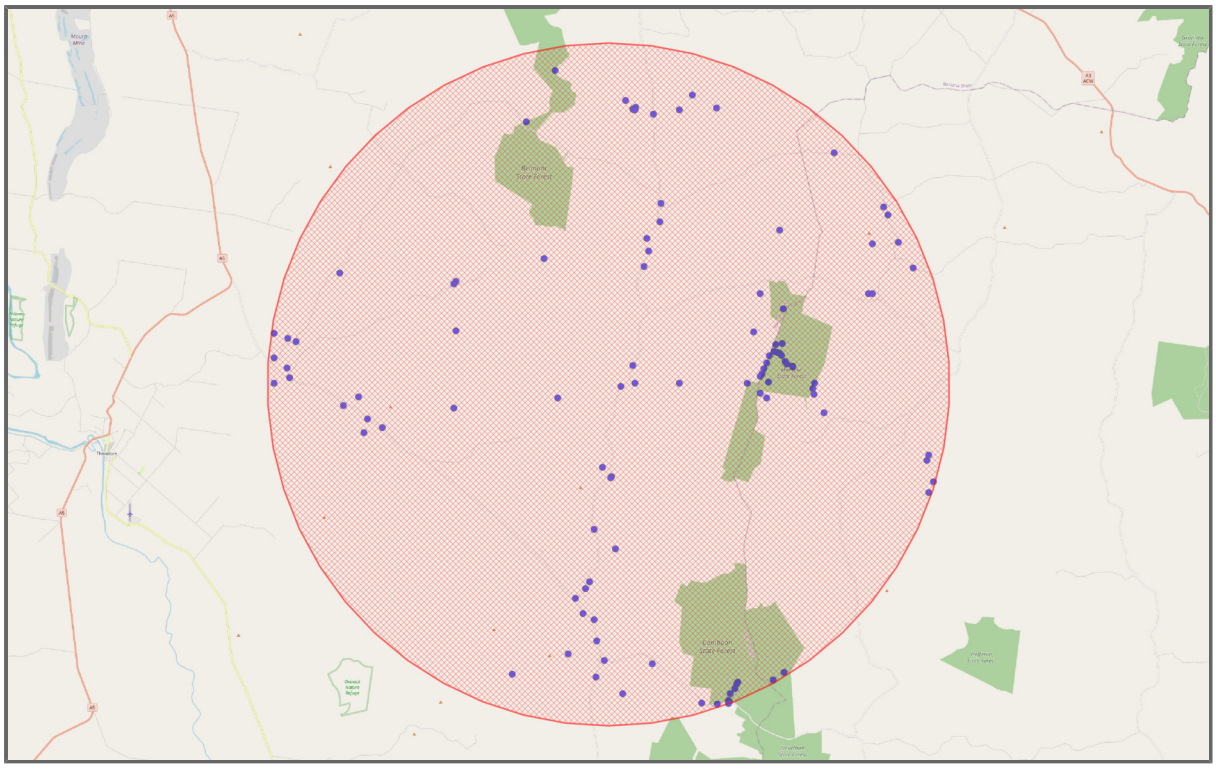


Figure 3 : Map of All threatened species

Table 2: All threatened species (Link to full list)

Family	*Scientific Name*	Common Name	No. Occurrences
Corcoracidae	Struthidea cinerea	Apostlebird	13
Casuariidae	Dromaius novaehollandiae	Emu	11
Otididae	Ardeotis australis	Australian Bustard	6
Acanthizidae	Gerygone olivacea olivacea	Eastern White-throated Gerygone	6
Vespertilionidae	Nyctophilus gouldi	Gould's Long-eared Bat	6
Pomatostomidae	Pomatostomus (Pomatostomus) temporalis	Grey-crowned Babbler	6
Vespertilionidae	Chalinolobus picatus	Little Pied Bat	5
Campephagidae	Lalage (Lalage) tricolor	White-winged Triller	5
Petauridae	Petaurus norfolcensis	Squirrel Glider	5
Rhamnaceae	Alphitonia excelsa	Red Ash	3
Diplodactylidae	Amalosia rhombifer	Zigzag Velvet Gecko	3
Accipitridae	Circus assimilis	Spotted Harrier	3
Neosittidae	Daphoenositta (Neositta) chrysoptera	Varied Sittella	3
Elapidae	Denisonia maculata	Ornamental Snake	3
Poaceae	Enneapogon gracilis	Slender Nineawn	3
Goodeniaceae	Goodenia grandiflora	Mountain Primrose	3
Alaudidae	Mirafra (Mirafra) javanica	Horsfield's Bushlark	3
Psittacidae	Parvipsitta pusilla	Little Lorikeet	3
Pseudocheiridae	Petauroides minor	Northern Greater Glider	3
Meliphagidae	Plectorhyncha lanceolata	Striped Honeyeater	3
Agamidae	Pogona barbata	Common Bearded Dragon	3
Varanidae	Varanus varius	Lace Monitor	3
Poaceae	Aristida calycina var. calycina	Dark Wire-grass	2
Cyperaceae	Bolboschoenus caldwellii	Salt Club-sedge	2
Canidae	Canis familiaris	Common Dog	2

Pteridaceae	Cheilanthes distans	Bristly Cloak-fern	2
Rutaceae	Coatesia paniculata	Axe-breaker	2
Corcoracidae	Corcorax melanorhamphos	White-winged Chough	2
Cyperaceae	Cyperus gracilis	Slender Flat-sedge	2
Fabaceae	Desmodium rhytidophyllum	Desmodium	2
Euphorbiaceae	Euphorbia tannensis subsp. eremophila	Bottle Tree Caustic	2
Rutaceae	Geijera parviflora	Wilga	2
Columbidae	Geopelia cuneata	Diamond Dove	2
Accipitridae	Hieraaetus (Hieraaetus) morphnoides	Little Eagle	2
Apodidae	Hirundapus caudacutus	White-throated Needletail	2
Elapidae	Hoplocephalus bitorquatus	Pale-headed Snake	2
Petroicidae	Melanodryas (Melanodryas) cucullata	Hooded Robin	2
Poaceae	Paspalidium gracile	Paspalidium	2
Petauridae	Petaurus australis	Yellow-bellied Glider	2
Phascolarctidae	Phascolarctos cinereus	Koala	2
Dasyuridae	Planigale maculata	Common Planigale	2
Acanthizidae	Pyrrholaemus sagittatus	Speckled Warbler	2
Santalaceae	Santalum lanceolatum	Northern Sandalwood	2
Celastraceae	Stackhousia muricata	Stackhousia	2
Meliaceae	Turraea pubescens	Native Honeysuckle	2
Myobatrachidae	Uperoleia rugosa	Wrinkled Toadlet	2
Vespertilionidae	Vespadelus troughtoni	Eastern Cave Bat	2
Cacatuidae	Zanda funerea	Yellow-tailed Black-cockatoo	2
Potoroidae	Aepyprymnus rufescens	Rufous Bettong	1
Apodidae	Apus (Apus) pacificus	Fork-tailed Swift	1
Sapindaceae	Atalaya salicifolia	Atalaya	1
Anatidae	Aythya (Nyroca) australis	Hardhead	1
Poaceae	Bothriochloa decipiens	Bothriochloa	1
Burhinidae	Burhinus (Burhinus) grallarius	Bush Stone-curlew	1
Cacatuidae	Calyptorhynchus (Calyptorhynchus) banksii	Red-tailed Black Cockatoo	1
Capparaceae	Capparis canescens	Wild Orange	1
Cyperaceae	Carex inversa	Dwarf Sedge	1
Apocynaceae	Carissa ovata	Conkerberry	1
Asteraceae	Cassinia laevis	Cough Bush	1
Poaceae	Chloris ventricosa	Tall Windmill Grass	1
Climacteridae	Climacteris (Climacteris) picumnus	Brown Treecreeper	1
Commelinaceae	Commelina cyanea	Scurvy Weed	1
Sapindaceae	Cossinia australiana	Cossinia	1
Orchidaceae	Cymbidium canaliculatum	Tiger Orchid	1
Cyperaceae	Cyperus concinnus	Trim Flat-sedge	1
Cyperaceae	Cyperus fulvus	Sticky Sedge	1
Dasyuridae	Dasyurus hallucatus	Digul	1
Fabaceae	Desmodium varians	Slender Tick-trefoil	1
Droseraceae	Drosera lunata		1
Chenopodiaceae	Dysphania pumilio	Small Crumbweed	1
Poaceae	Eragrostis sororia	Lovegrass	1
Poaceae	Eragrostis spartinoides	Lovegrass	1
Myrtaceae	Eucalyptus	Studley Park Gum	1
Cyperaceae	Fimbristylis dichotoma	Fringe-rush	1
Geraniaceae	Geranium solanderi var. solanderi	Austral Crane's-bill	1
Fabaceae	Glycine	Twining Glycine	1
Haloragaceae	Haloragis stricta		1
Fabaceae	Hardenbergia violacea	Native Lilac	1
Dilleniaceae	Hibbertia	Guinea Flowers	1
Asteraceae	Leuzea australis	Austral Cornflower	1
Limnodynastidae	Limnodynastes peronii	Striped Marsh Frog	1

Arecaceae	Livistona nitida	Carnavon Gorge Cabbage Palm	1
Asparagaceae	Lomandra multiflora subsp. multiflora	Lomandra	1
Petroicidae	Melanodryas (Melanodryas) cucullata cucullata	South-eastern Hooded Robin	1
Myrtaceae	Myrtaceae	Myrtle Family	1
Macropodidae	Notamacropus dorsalis	Black-striped Wallaby	1
Scolopacidae	Numenius (Phaeopus) phaeopus	Whimbrel	1
Vespertilionidae	Nyctophilus bifax	Eastern Long-eared Bat	1
Oreoicidae	Oreoica gutturalis	Crested Bellbird	1
Hydrocharitaceae	Ottelia ovalifolia subsp. ovalifolia	Swamp Lily	1
Bignoniaceae	Pandorea pandorana	Wonga Vine	1
Apocynaceae	Parsonsia eucalyptophylla	Gargaloo	1
Pseudocheiridae	Petauroides volans	Southern Greater Glider	1
Phyllanthaceae	Phyllanthus maderaspatensis	Spurge	1
Plantaginaceae	Plantago debilis	Shade Plantain	1
Elapidae	Pseudechis australis	Mulga Snake	1
Chenopodiaceae	Sclerolaena birchii	Galvinised Burr	1
Chenopodiaceae	Sclerolaena muricata var. muricata	Sclerolaena	1
Rubiaceae	Spermacoce brachystema	Spermacoce	1
Poaceae	Tragus australianus	Tickgrass	1
Hemerocallidaceae	Tricoryne elatior	Yellow Rush Lily	1
Rutaceae	Zieria cytisoides	Downy Zieria	1
Rutaceae	Zieria smithii	Sandfly Zieria	1

All invasive species

Number of invasive species: **7**

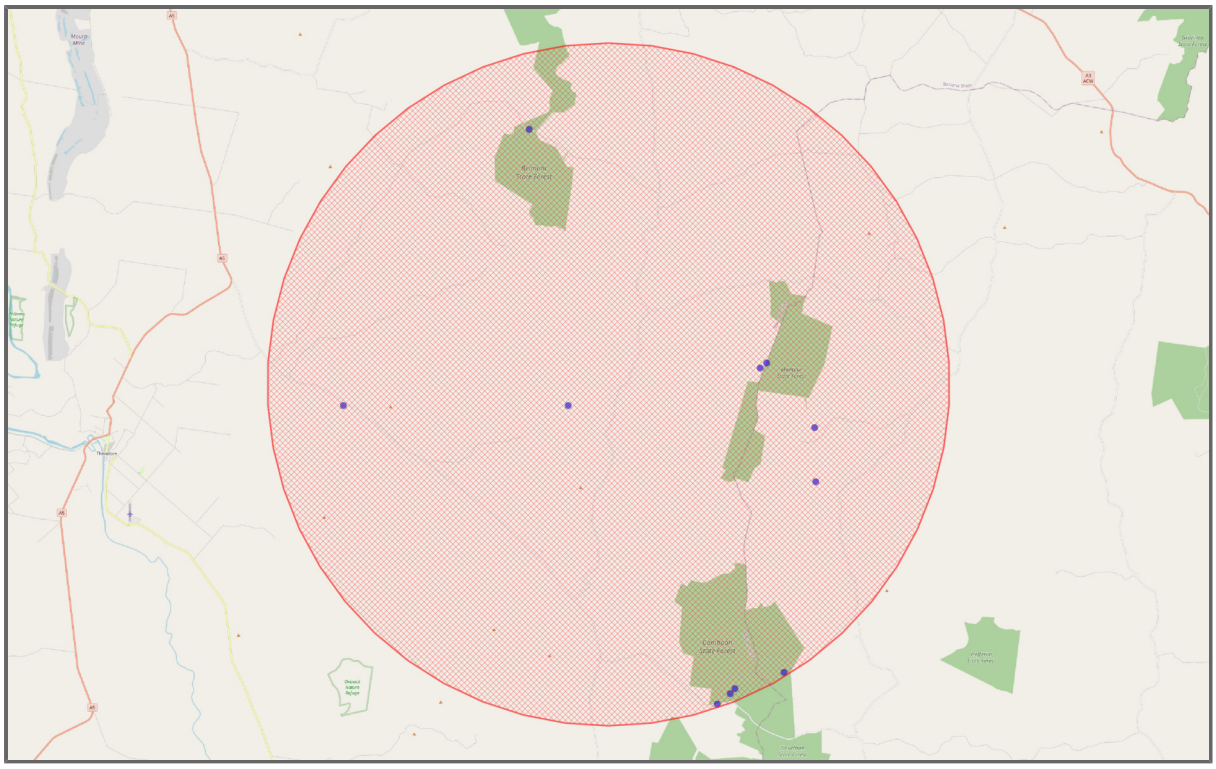


Figure 4 : Map of All invasive species

Table 3: All invasive species (Link to full list)

Family	*Scientific Name*	Common Name	No. Occurrences
Leporidae	Oryctolagus cuniculus	Rabbit	3
Bufonidae	Rhinella marina	Cane Toad	3
Araceae	Pistia stratiotes	Water Lettuce	2
Bignoniaceae	Dolichandra unguis-cati	Cat's Claw Creeper	1
Nectriaceae	Fusarium oxysporum f.sp. vasinfectum		1
Lamiaceae	Salvia reflexa	Mintweed	1
Asteraceae	Xanthium spinosum	Bathurst Burr	1

Migratory species

Number of migratory species: **0**

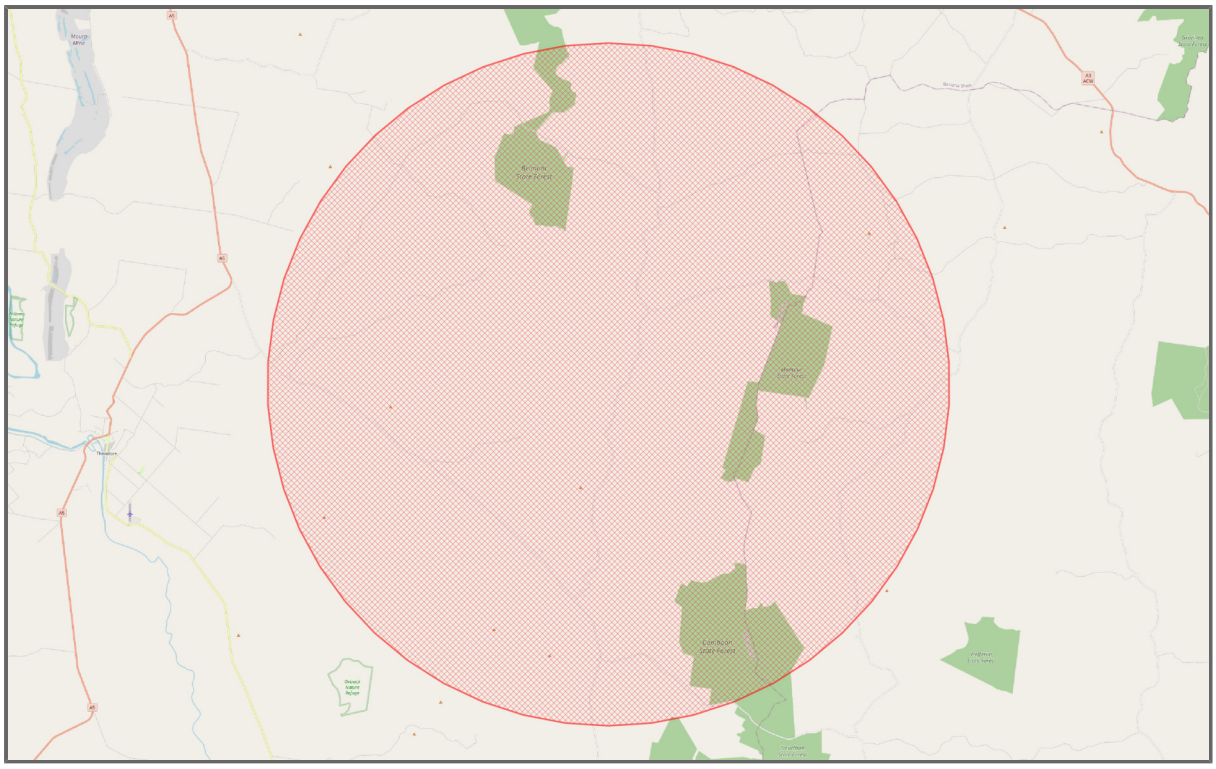


Figure 5 : Map of Migratory species

Table 4: Migratory species (Link to full list)

Family	*Scientific Name*	Common Name	No. Occurrences

Lifeform - Algae

Number of Algae **0**

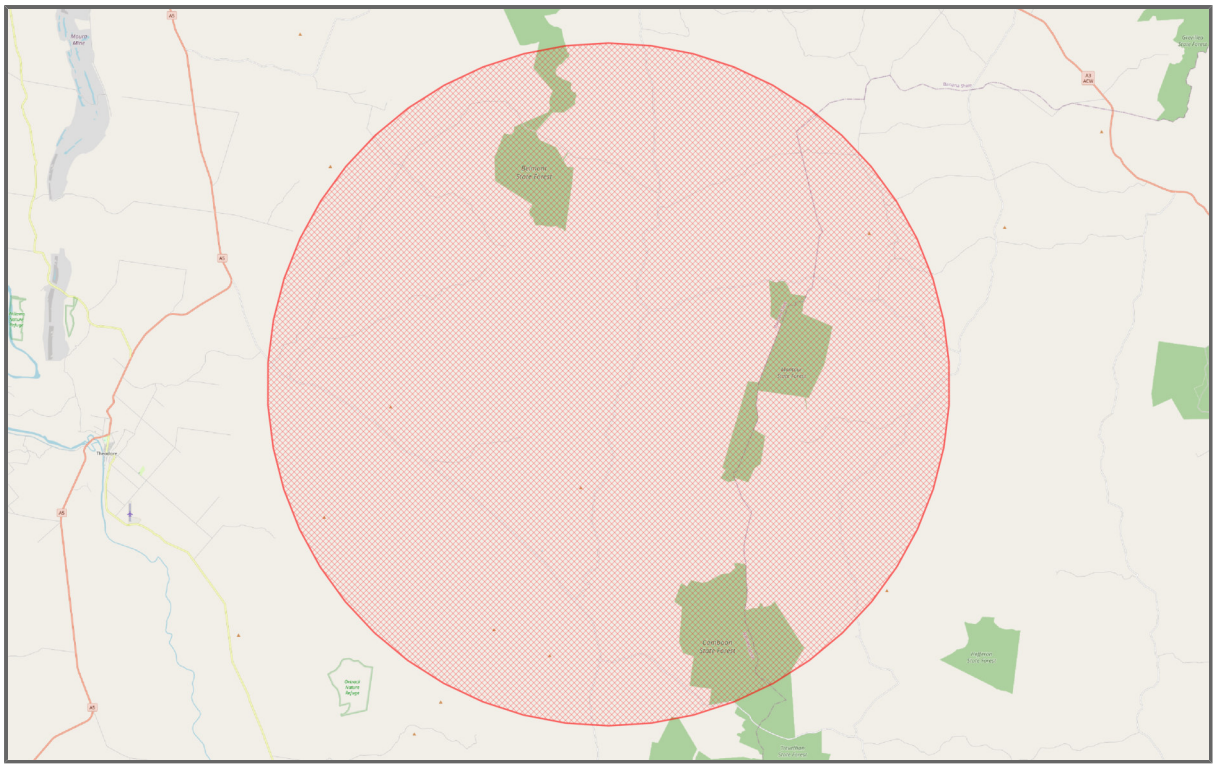


Figure 6 : Map of Lifeform - Algae

Table 5: Lifeform - Algae (Link to full list)

Family	*Scientific Name*	Common Name	No. Occurrences

Lifeform - Amphibians

Number of Amphibians **9**

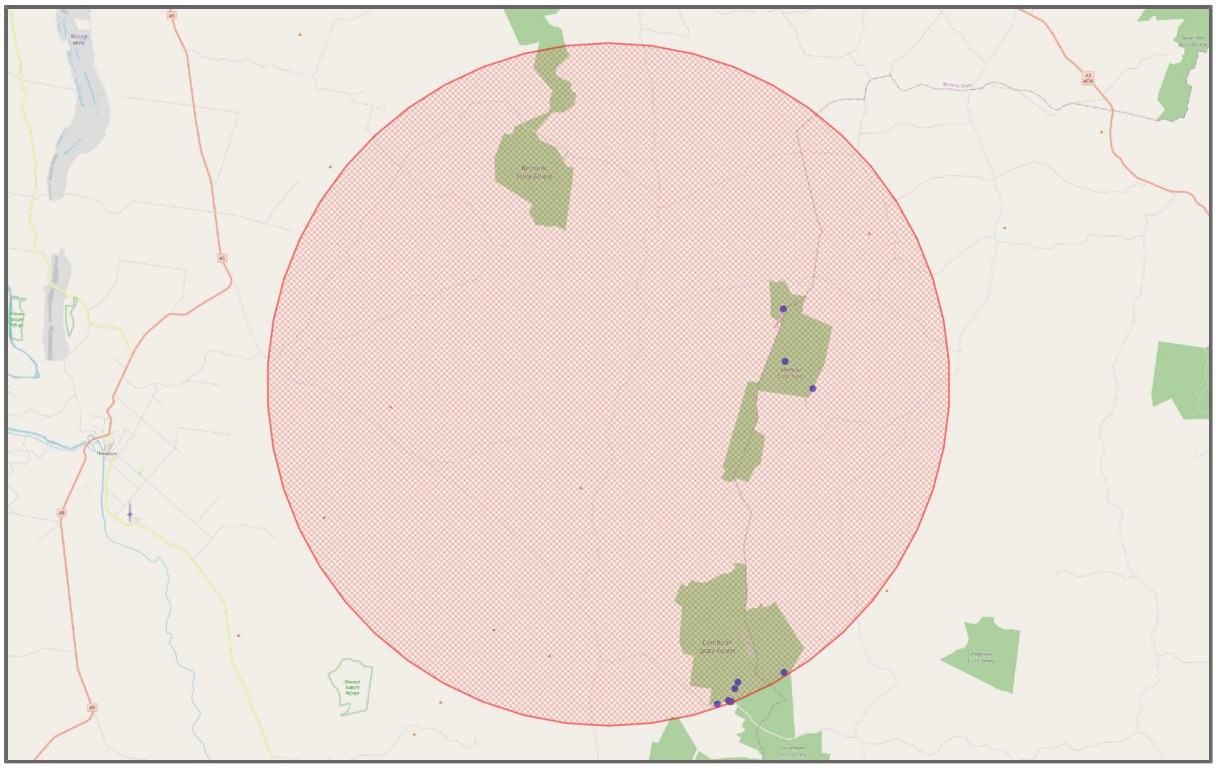


Figure 7 : Map of Lifeform - Amphibians

Table 6: Lifeform - Amphibians (Link to full list)

Family	*Scientific Name*	Common Name	No. Occurrences
Pelodryadidae	Litoria caerulea	Green Tree Frog	5
Pelodryadidae	Litoria latopalmata	Broad-palmed Frog	3
Bufonidae	Rhinella marina	Cane Toad	3
Myobatrachidae	Uperoleia laevigata	Smooth Toadlet	2
Myobatrachidae	Uperoleia rugosa	Wrinkled Toadlet	2
Limnodynastidae	Limnodynastes peronii	Striped Marsh Frog	1
Pelodryadidae	Litoria peronii	Peron's Tree Frog	1
Pelodryadidae	Litoria rubella	Little Red Tree Frog	1
Limnodynastidae	Platyplectrum ornatum	Ornate Burrowing Frog	1

Lifeform - Angiosperms

Number of Angiosperms **0**

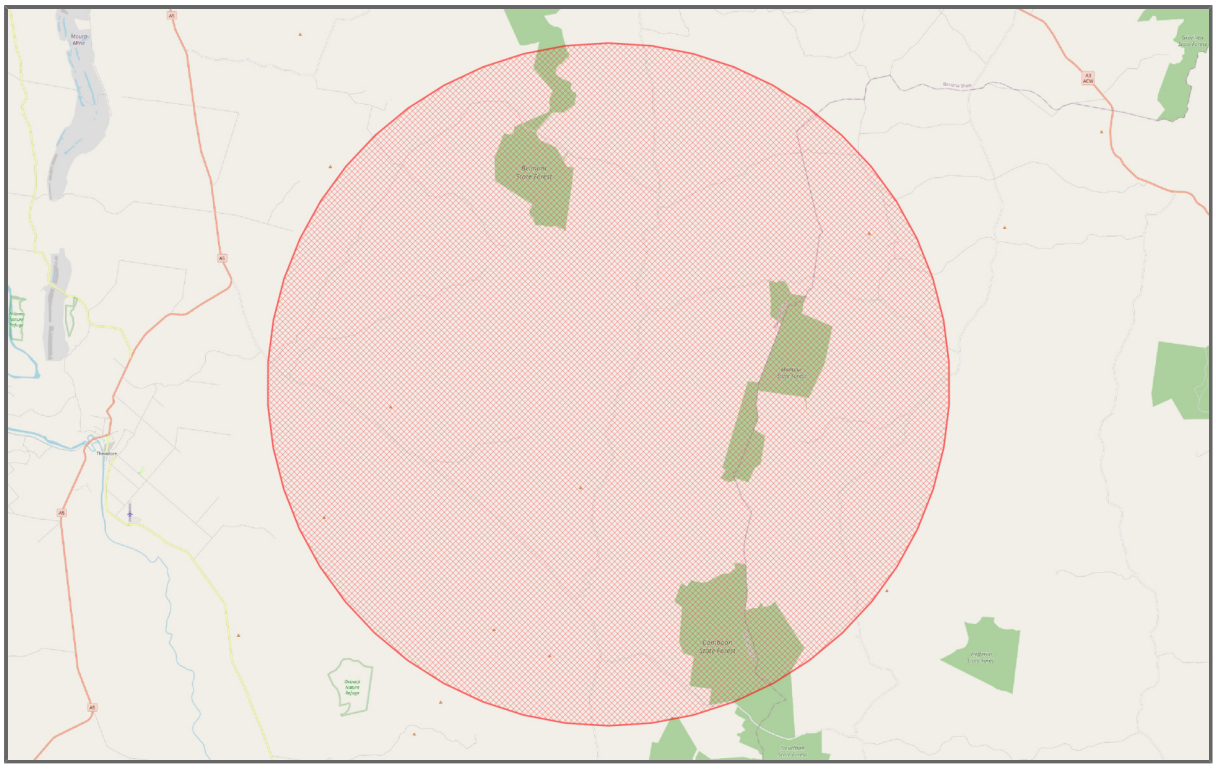


Figure 8 : Map of Lifeform - Angiosperms

Table 7: Lifeform - Angiosperms (Link to full list)

Family	*Scientific Name*	Common Name	No. Occurrences

Lifeform - Animals

Number of Animals **266**

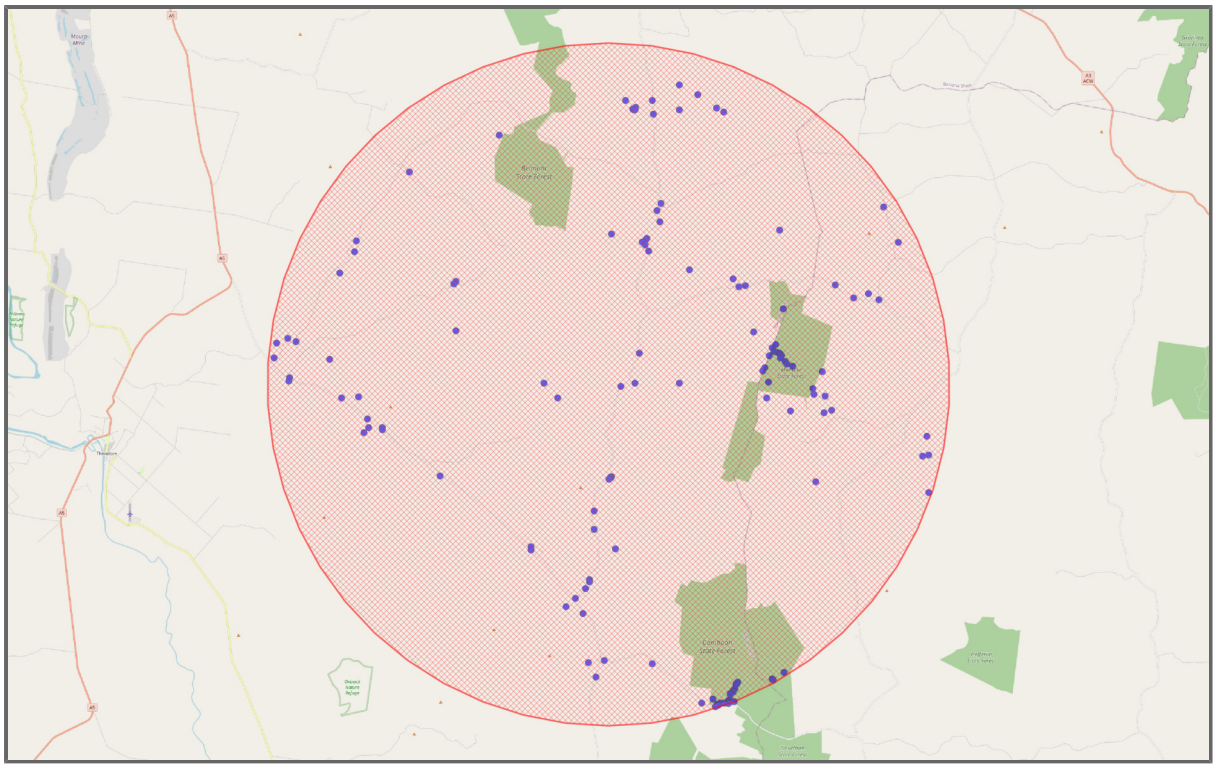


Figure 9 : Map of Lifeform - Animals

Table 8: Lifeform - Animals (Link to full list)

Family	*Scientific Name*	Common Name	No. Occurrences
Meliphagidae	Manorina (Myzantha) melanocephala	Noisy Miner	35
Artamidae	Gymnorhina tibicen	Australian Magpie	32
Pardalotidae	Pardalotus (Pardalotinus) striatus	Striated Pardalote	25
Corvidae	Corvus orru	Torresian Crow	23
Gekkonidae	Heteronotia binoei	Bynoe's Gecko	21
Psittacidae	Platycercus (Violania) adscitus	Pale-headed Rosella	20
Artamidae	Cracticus torquatus	Grey Butcherbird	19
Cacatuidae	Cacatua (Cacatua) galerita	Sulphur-crested Cockatoo	17
Artamidae	Cracticus nigrogularis	Pied Butcherbird	17
Artamidae	Strepera (Strepera) graculina	Pied Currawong	17
Campephagidae	Coracina (Coracina) novaehollandiae	Black-faced Cuckoo-shrike	16
Cacatuidae	Eolophus roseicapilla	Galah	16
Monarchidae	Grallina cyanoleuca	Magpie-lark	16
Acanthizidae	Smicrornis brevirostris	Weebill	15
Alcedinidae	Dacelo (Dacelo) novaeguineae	Laughing Kookaburra	14
Cuculidae	Heteroscenes pallidus	Pallid Cuckoo	13
Columbidae	Ocyphaps lophotes	Crested Pigeon	13
Rhipiduridae	Rhipidura (Sauloprocta) leucophrys	Willie Wagtail	13
Corcoracidae	Struthidea cinerea	Apostlebird	13
Psittacidae	Trichoglossus haematodus	Rainbow Lorikeet	13
Agamidae	Diporiphora australis	Tommy Roundhead	12
Meliphagidae	Myzomela (Myzomela) sanguinolenta	Scarlet Honeyeater	12
Accipitridae	Aquila (Uroaetus) audax	Wedge-tailed Eagle	11
Casuariidae	Dromaius novaehollandiae	Emu	11
Meliphagidae	Entomyzon cyanotis	Blue-faced Honeyeater	11

Gekkonidae	Gehyra dubia	Dubious Dtella	11
Cuculidae	Scythrops novaehollandiae	Channel-billed Cuckoo	11
Diplodactylidae	Strophurus taenicauda albiocularis		11
Falconidae	Falco (Tinnunculus) cenchroides	Nankeen Kestrel	10
Maluridae	Malurus (Musciparus) melanocephalus	Red-backed Fairy-wren	10
Meliphagidae	Melithreptus (Melithreptus) albogularis	White-throated Honeyeater	10
Meropidae	Merops (Merops) ornatus	Rainbow Bee-eater	10
Monarchidae	Myiagra (Myiagra) rubecula	Leaden Flycatcher	10
Oriolidae	Oriolus (Mimeta) sagittatus	Olive-backed Oriole	10
Pachycephalidae	Pachycephala (Alisterornis) rufiventris	Rufous Whistler	10
Meliphagidae	Philemon (Tropidorhynchus) corniculatus	Noisy Friarbird	10
Psittacidae	Aprosmictus erythropterus	Red-winged Parrot	9
Scincidae	Carlia pectoralis	Open-litter Rainbow-skink	9
Pachycephalidae	Colluricincla (Colluricincla) harmonica	Grey Shrike-thrush	9
Climacteridae	Cormobates leucophaea metastasis	Central Eastern White-throated Treecreeper	9
Scincidae	Cryptoblepharus pulcher pulcher	Elegant Snake-eyed Skink	9
Scincidae	Lerista fragilis	Eastern Mulch-slider	9
Scincidae	Lygisaurus foliorum	Tree-base Litter-skink	9
Meliphagidae	Meliphaga (Meliphaga) lewinii	Lewin's Honeyeater	9
Acanthizidae	Acanthiza (Acanthiza) pusilla	Brown Thornbill	8
Aegothelidae	Aegotheles (Aegotheles) cristatus	Australian Owlet-nightjar	8
Anatidae	Chenonetta jubata	Australian Wood Duck	8
Petroicidae	Eopsaltria (Eopsaltria) australis	Eastern Yellow Robin	8
Columbidae	Geopelia humeralis	Bar-shouldered Dove	8
Diplodactylidae	Oedura tryoni	Southern Spotted Velvet Gecko	8
Meliphagidae	Philemon (Microphilemon) citreogularis	Little Friarbird	8
Vespertilionidae	Scotorepens		8
Meliphagidae	Caligavis chrysops	Yellow-faced Honeyeater	7
Cuculidae	Centropus phasianinus	Pheasant Coucal	7
Diplodactylidae	Diplodactylus vittatus	Eastern Stone Gecko	7
Ardeidae	Egretta novaehollandiae	White-faced Heron	7
Petroicidae	Microeca (Microeca) fascinans	Jacky Winter	7
Cacatuidae	Nymphicus hollandicus	Cockatiel	7
Psittacidae	Trichoglossus chlorolepidotus	Scaly-breasted Lorikeet	7
Accipitridae	Accipiter (Leucospiza) fasciatus	Brown Goshawk	6
Otididae	Ardeotis australis	Australian Bustard	6
Caprimulgidae	Eurostopodus (Eurostopodus) mystacalis	White-throated Nightjar	6
Acanthizidae	Gerygone olivacea olivacea	Eastern White-throated Gerygone	6
Molossidae	MOLOSSIDAE		6
Muridae	Mus musculus	House Mouse	6
Vespertilionidae	Nyctophilus gouldi	Gould's Long-eared Bat	6
Pomatostomidae	Pomatostomus (Pomatostomus) temporalis	Grey-crowned Babbler	6
Psittacidae	Trichoglossus		6
Acanthizidae	Acanthiza (Geobasileus) reguloides	Buff-rumped Thornbill	5
Acanthizidae	Acanthiza (Subacanthiza) nana	Yellow Thornbill	5
Elapidae	Brachyurophis australis	Coral Snake	5
Camaenidae	CAMAENIDAE		5
Vespertilionidae	Chalinolobus picatus	Little Pied Bat	5
Neosittidae	Daphoenositta (Neositta) chrysoptera leucocephala	White-headed Sittella	5
Accipitridae	Elanus axillaris	Black-shouldered Kite	5
Coraciidae	Eurystomus orientalis	Dollarbird	5
Falconidae	Falco (Ieracidea) berigora	Brown Falcon	5
Campephagidae	Lalage (Lalage) tricolor	White-winged Triller	5
Pelodryadidae	Litoria caerulea	Green Tree Frog	5
Pygopodidae	Paradelma orientalis	Brigalow Scaly-foot	5
Petauridae	Petaurus norfolcensis	Squirrel Glider	5

Hirundinidae	Petrochelidon (Hylochelidon) nigricans	Tree Martin	5
Meliphagidae	Ptilotula fusca	Fuscous Honeyeater	5
Estrildidae	Stizoptera bichenovii	Double-barred Finch	5
Anatidae	Anas (Anas) superciliosa	Pacific Black Duck	4
Anatidae	Anas gracilis	Grey Teal	4
Artamidae	Artamus (Angroyan) minor minor	Western Little Woodswallow	4
Accipitridae	Aviceda (Aviceda) subcristata	Pacific Baza	4
Cuculidae	Chalcites osculans	Black-eared Cuckoo	4
Elapidae	Cryptophis nigrescens	Eastern Small-eyed Snake	4
Columbidae	Geopelia		4
Acanthizidae	Gerygone olivacea	White-throated Gerygone	4
Vespertilionidae	Nyctophilus geoffroyi	Lesser Long-eared Bat	4
Molossidae	Ozimops ridei	Ride's Free-tailed Bat	4
Columbidae	Phaps (Phaps) chalcoptera	Common Bronzewing	4
Acanthizidae	Sericornis (Sericornis) frontalis	White-browed Scrubwren	4
Tachyglossidae	Tachyglossus aculeatus	Short-beaked Echidna	4
Accipitridae	Accipiter (Paraspizias) cirrocephalus	Collared Sparrowhawk	3
Megapodiidae	Alectura lathami	Australian Brush-turkey	3
Psittacidae	Alisterus scapularis	Australian King-parrot	3
Diplodactylidae	Amalosia rhombifer	Zigzag Velvet Gecko	3
Motacillidae	Anthus (Anthus) novaeseelandiae novaeseelandiae		3
Artamidae	Artamus (Campbellornis) personatus	Masked Woodswallow	3
Cuculidae	Chalcites basalis	Horsfield's Bronze-cuckoo	3
Cuculidae	Chalcites lucidus	Shining Bronze-cuckoo	3
Vespertilionidae	Chalinolobus gouldii	Gould's Wattled Bat	3
Locustellidae	Cincloramphus (Maclennania) mathewsi	Rufous Songlark	3
Accipitridae	Circus assimilis	Spotted Harrier	3
Corvidae	Corvus coronoides	Australian Raven	3
Neosittidae	Daphoenositta (Neositta) chrysoptera	Varied Sittella	3
Elapidae	Denisonia maculata	Ornamental Snake	3
Dicruridae	Dicrurus bracteatus	Spangled Drongo	3
Scincidae	Egernia striolata	Tree Skink	3
Falconidae	Falco (Falco) longipennis	Australian Hobby	3
Pygopodidae	Lialis burtonis	Burton's Snake-lizard	3
Pelodryadidae	Litoria latopalmata	Broad-palmed Frog	3
Meliphagidae	Melithreptus (Eidopsarus) brevirostris	Brown-headed Honeyeater	3
Psittacidae	Melopsittacus undulatus	Budgerigar	3
Alaudidae	Mirafra (Mirafra) javanica	Horsfield's Bushlark	3
Carphodactylidae	Nephrurus asper	Prickly Knob-tailed Gecko	3
Strigidae	Ninox (Ninox) boobook	Southern Boobook	3
Macropodidae	Notamacropus parryi	Whiptail Wallaby	3
Leporidae	Oryctolagus cuniculus	Rabbit	3
Pardalotidae	Pardalotus (Pardalotus) punctatus	Spotted Pardalote	3
Psittacidae	Parvipsitta pusilla	Little Lorikeet	3
Pseudocheiridae	Petauroides minor	Northern Greater Glider	3
Petauridae	Petaurus notatus	Krefft's Glider	3
Meliphagidae	Plectorhyncha lanceolata	Striped Honeyeater	3
Agamidae	Pogona barbata	Common Bearded Dragon	3
Bufonidae	Rhinella marina	Cane Toad	3
Rhipiduridae	Rhipidura (Rhipidura) albiscapa	Grey Fantail	3
Diplodactylidae	Strophurus taenicauda	Golden-tailed Gecko	3
Elapidae	Suta dwyeri	Dwyer's Snake	3
Charadriidae	Vanellus (Lobipluvia) miles	Masked Lapwing	3
Varanidae	Varanus varius	Lace Monitor	3
Camaenidae	Xanthomelon pachystylum		3
Zosteropidae	Zosterops lateralis	Silvereye	3

Culicidae	Aedes (Rampamyia) notoscriptus		2
Ardeidae	Ardea alba	Great Egret	2
Artamidae	Artamus (Campbellornis) superciliosus	White-browed Woodswallow	2
Cacatuidae	Cacatua (Licmetis) sanguinea	Little Corella	2
Cuculidae	Cacomantis (Vidgenia) flabelliformis	Fan-tailed Cuckoo	2
Canidae	Canis familiaris	Common Dog	2
Agamidae	Chlamydosaurus kingii	Frilled Lizard	2
Locustellidae	Cincloramphus (Cincloramphus) cruralis	Brown Songlark	2
Scincidae	Concinnia tenuis	Barred-sided Skink	2
Campephagidae	Coracina (Coracina) papuensis	White-bellied Cuckoo-shrike	2
Campephagidae	Coracina	Bebik	2
Corcoracidae	Corcorax melanorhamphos	White-winged Chough	2
Phasianidae	Coturnix ypsilophora		2
Elapidae	Demansia psammophis	Yellow-faced Whip Snake	2
Dicaeidae	Dicaeum (Dicaeum) hirundinaceum	Mistletoebird	2
Cuculidae	Eudynamys orientalis	Eastern Koel	2
Gekkonidae	Gehyra versicolor	Eastern Tree Dtella	2
Columbidae	Geopelia cuneata	Diamond Dove	2
Columbidae	Geopelia placida	Peaceful Dove	2
Columbidae	Geophaps (Geophaps) scripta	Squatter Pigeon	2
Accipitridae	Hieraaetus (Hieraaetus) morphnoides	Little Eagle	2
Apodidae	Hirundapus caudacutus	White-throated Needletail	2
Elapidae	Hoplocephalus bitorquatus	Pale-headed Snake	2
Scincidae	Lerista punctatovittata	Eastern Robust Slider	2
Columbidae	Leucosarcia melanoleuca	Wonga Pigeon	2
Macropodidae	Macropus giganteus	Eastern Grey Kangaroo	2
Maluridae	Malurus (Leggeornis) lamberti	Variegated Fairy-wren	2
Meliphagidae	Manorina (Myzantha) flavigula	Yellow-throated Miner	2
Petroicidae	Melanodryas (Melanodryas) cucullata	Hooded Robin	2
Scincidae	Morethia boulengeri	Boulenger's Snake-eyed Skink	2
Scincidae	Morethia taeniopleura	Fire-tailed Skink	2
Meliphagidae	Nesoptilotis leucotis	White-eared Honeyeater	2
Macropodidae	Notamacropus rufogriseus	Red-necked Wallaby	2
	PASSERIFORMES	Yellowhammer	2
Petauridae	Petaurus australis	Yellow-bellied Glider	2
Petroicidae	Petroica (Petroica) goodenovii	Red-capped Robin	2
Phalacrocoracidae	Phalacrocorax (Phalacrocorax) sulcirostris	Little Black Cormorant	2
Phascolarctidae	Phascolarctos cinereus	Koala	2
Dasyuridae	Planigale maculata	Common Planigale	2
Podargidae	Podargus strigoides	Tawny Frogmouth	2
Muridae	Pseudomys patrius	Eastern Pebble-mound Mouse	2
Acanthizidae	Pyrrholaemus sagittatus	Speckled Warbler	2
Vespertilionidae	Scotorepens greyii	Little Broad-nosed Bat	2
Podicipedidae	Tachybaptus novaehollandiae	Australasian Grebe	2
Estrildidae	Taeniopygia guttata	Zebra Finch	2
Alcedinidae	Todiramphus (Lazulena) macleayii	Forest Kingfisher	2
Alcedinidae	Todiramphus (Todiramphus) sanctus	Sacred Kingfisher	2
Tytonidae	Tyto javanica	Eastern Barn Owl	2
Myobatrachidae	Uperoleia laevigata	Smooth Toadlet	2
Myobatrachidae	Uperoleia rugosa	Wrinkled Toadlet	2
Varanidae	Varanus gouldii	Gould's Goanna	2
Vespertilionidae	Vespadelus troughtoni	Eastern Cave Bat	2
Vespertilionidae	Vespadelus		2
Cacatuidae	Zanda funerea	Yellow-tailed Black-cockatoo	2
	AVES	Birds	1
Acanthizidae	Acanthiza (Geobasileus) chrysorrhoa	Yellow-rumped Thornbill	1

Potoroidae	Aepyprymnus rufescens	Rufous Bettong	1
Estrildidae	Aidemosyne modesta	Plum-headed Finch	1
Anhingidae	Anhinga novaehollandiae	Australasian Darter	1
Culicidae	Anopheles (Cellia) annulipes	Spear Mosquito	1
Motacillidae	Anthus (Anthus) novaeseelandiae	Australian Pipit	1
Apodidae	Apus (Apus) pacificus	Fork-tailed Swift	1
Artamidae	Artamus (Angroyan) minor	Little Woodswallow	1
Pythonidae	Aspidites melanocephalus	Black-headed Python	1
Argiolestidae	Austroargiolestes icteromelas	Pale-mouth Common Flatwing	1
Anatidae	Aythya (Nyroca) australis	Hardhead	1
Colubridae	Boiga irregularis	Night Tiger	1
Burhinidae	Burhinus (Burhinus) grallarius	Bush Stone-curlew	1
Cacatuidae	Calyptorhynchus (Calyptorhynchus) banksii	Red-tailed Black Cockatoo	1
Cuculidae	Chalcites minutillus barnardi	Eastern Little Bronze-cuckoo	1
Vespertilionidae	Chalinolobus morio	Chocolate Wattled Bat	1
Chelidae	Chelodina (Chelodina) longicollis	Snake-necked Turtle	1
Cisticolidae	Cisticola (Cisticola) exilis	Golden-headed Cisticola	1
Climacteridae	Climacteris (Climacteris) picumnus	Brown Treecreeper	1
Climacteridae	Cormobates leucophaea	White-throated Treecreeper	1
Corvidae	Corvus		1
Scincidae	Ctenotus spaldingi	Spalding's Ctenotus	1
Scincidae	Cyclodomorphus gerrardii	Pink-tongued Skink	1
Dasyuridae	Dasyurus hallucatus	Digul	1
Anatidae	Dendrocygna eytoni	Plumed Whistling-duck	1
Libellulidae	Diplacodes bipunctata	Wandering Percher	1
Charadriidae	Elseyornis melanops	Black-fronted Dotterel	1
Scincidae	Eulamprus quoyii	Eastern Water-skink	1
Falconidae	Falco (Ieracidea) berigora berigora	Eastern Brown Falcon	1
Araneidae	Gasteracantha		1
Gekkonidae	Gehyra		1
Psittacidae	Glossopsitta concinna	Musk Lorikeet	1
Planorbidae	Glyptophysa		1
Accipitridae	Haliastur sphenurus	Whistling Kite	1
Formicidae	Iridomyrmex pallidus		1
Campephagidae	Lalage (Karua) leucomela	Varied Triller	1
Scincidae	Lerista		1
Limnodynastidae	Limnodynastes peronii	Striped Marsh Frog	1
Pelodryadidae	Litoria peronii	Peron's Tree Frog	1
Pelodryadidae	Litoria rubella	Little Red Tree Frog	1
Estrildidae	Lonchura (Munia) castaneothorax	Chestnut-breasted Munia	1
Petroicidae	Melanodryas (Melanodryas) cucullata cucullata	South-eastern Hooded Robin	1
Curculionidae	Myllocerus		1
Camaenidae	Neveritis misella	Mid-eastern Velvet Snail	1
Strigidae	Ninox (Ninox) novaeseelandiae	Southern Boobook	1
Macropodidae	Notamacropus dorsalis	Black-striped Wallaby	1
Scolopacidae	Numenius (Phaeopus) phaeopus	Whimbrel	1
Ardeidae	Nycticorax caledonicus	Nankeen Night-heron	1
Vespertilionidae	Nyctophilus bifax	Eastern Long-eared Bat	1
Oreoicidae	Oreoica gutturalis	Crested Bellbird	1
Libellulidae	Orthetrum villosovittatum	Fiery Skimmer	1
	POLYDESMIDA		1
Pachycephalidae	Pachycephala (Pachycephala) pectoralis	Golden Whistler	1
Pelecanidae	Pelecanus conspicillatus	Australian Pelican	1
Pseudocheiridae	Petauroides volans	Southern Greater Glider	1
Macropodidae	Petrogale herberti	Herbert's Rock-wallaby	1
Carabidae	Philoscaphus mastersii		1

Dasyuridae	Planigale maculata maculata		1
Limnodynastidae	Platyplectrum ornatum	Ornate Burrowing Frog	1
Scincidae	Praeteropus brevicollis	Short-necked Worm-skink	1
Elapidae	Pseudechis australis	Mulga Snake	1
Muridae	Pseudomys		1
Carabidae	Pterostichini		1
Meliphagidae	Ptilotula penicillata	White-plumed Honeyeater	1
Scincidae	Pygmaeascincus timlowi	Dwarf Litter-skink	1
Rhipiduridae	Rhipidura (Howeavis) rufifrons	Rufous Fantail	1
Oriolidae	Sphecotheres vieilloti	Australasian Figbird	1
Elapidae	Suta suta	Curl Snake	1
Phasianidae	Synoicus ypsilophora	Brown Quail	1
Helicarionidae	Tarocystis megaspira	Amber Dome Glass-snail	1
Turnicidae	Turnix		1
Charadriidae	Vanellus (Lobipluvia) miles novaehollandiae	Southern Masked Lapwing	1
Charadriidae	Vanellus (Lobivanellus) tricolor	Banded Lapwing	1
Varanidae	Varanus tristis	Black-headed Monitor	1

Lifeform - Arthropods

Number of Arthropods **11**

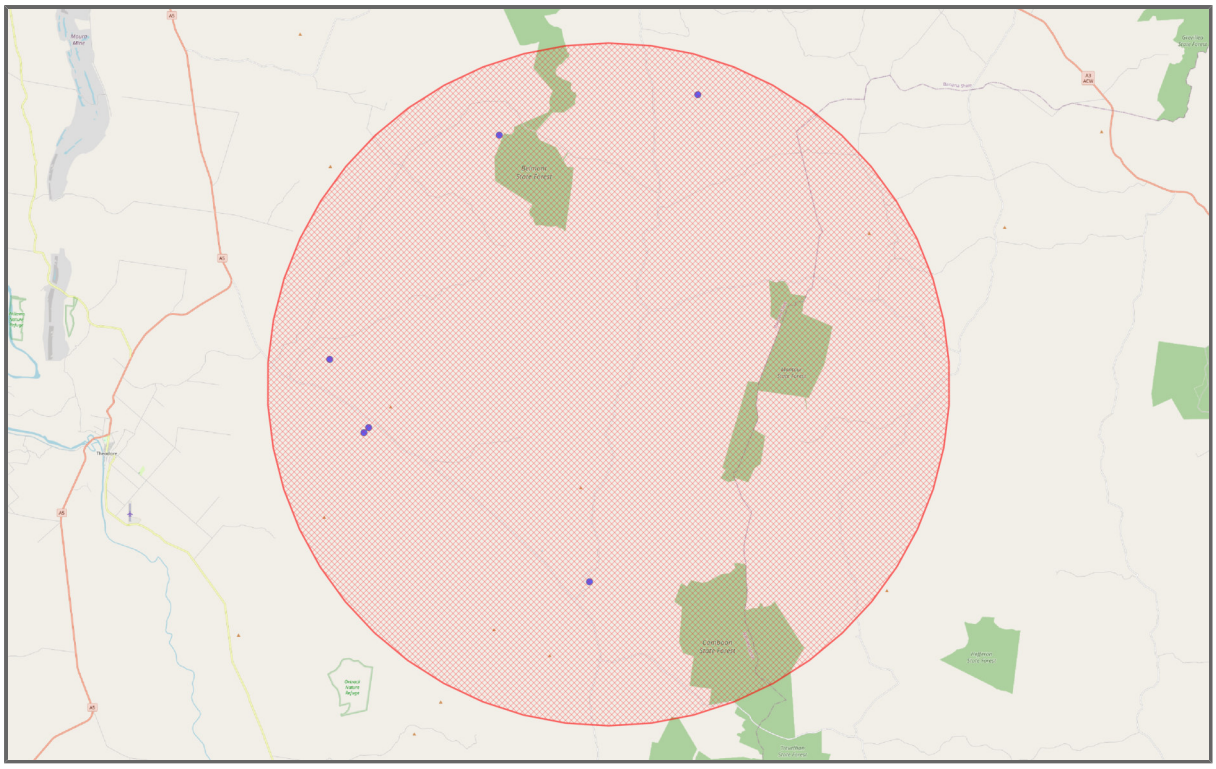


Figure 10 : Map of Lifeform - Arthropods

Table 9: Lifeform - Arthropods (Link to full list)

Family	*Scientific Name*	Common Name	No. Occurrences
Culicidae	Aedes (Rampamyia) notoscriptus		2
Culicidae	Anopheles (Cellia) annulipes	Spear Mosquito	1
Argiolestidae	Austroargiolestes icteromelas	Pale-mouth Common Flatwing	1
Libellulidae	Diplacodes bipunctata	Wandering Percher	1
Araneidae	Gasteracantha		1
Formicidae	Iridomyrmex pallidus		1
Curculionidae	Myllocerus		1
Libellulidae	Orthetrum villosovittatum	Fiery Skimmer	1
	POLYDESMIDA		1
Carabidae	Philoscaphus mastersii		1
Carabidae	Pterostichini		1

Lifeform - Bacteria

Number of Bacteria **0**

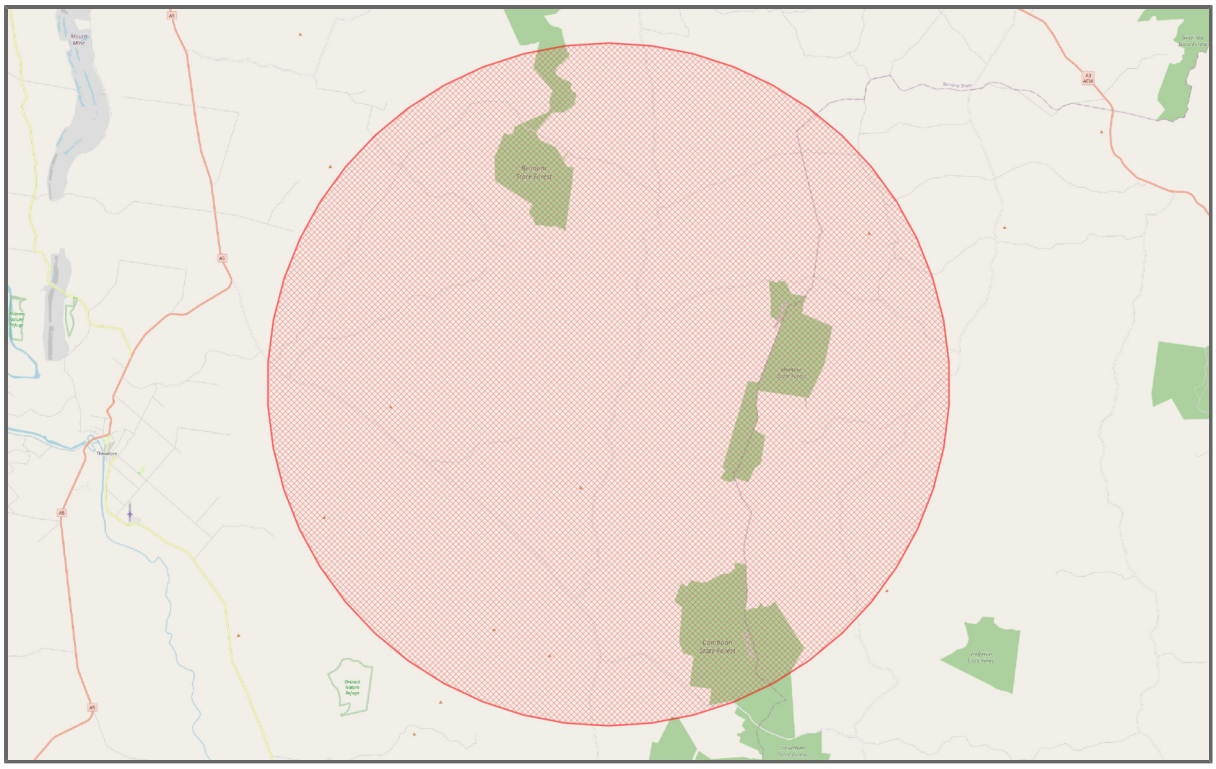


Figure 11 : Map of Lifeform - Bacteria

Table 10: Lifeform - Bacteria (Link to full list)

Family	*Scientific Name*	Common Name	No. Occurrences

Lifeform - Birds

Number of Birds **164**

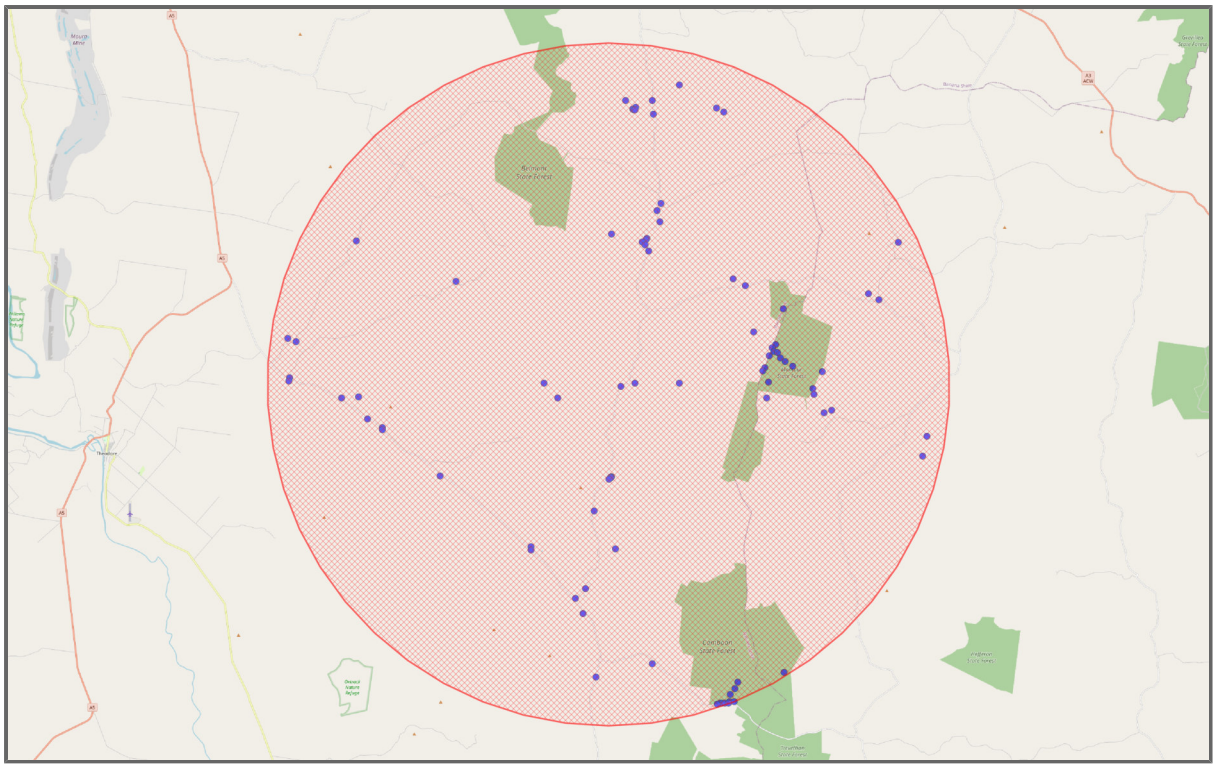


Figure 12 : Map of Lifeform - Birds

Table 11: Lifeform - Birds (Link to full list)

Family	*Scientific Name*	Common Name	No. Occurrences
Meliphagidae	Manorina (Myzantha) melanocephala	Noisy Miner	35
Artamidae	Gymnorhina tibicen	Australian Magpie	32
Pardalotidae	Pardalotus (Pardalotinus) striatus	Striated Pardalote	25
Corvidae	Corvus orru	Torresian Crow	23
Psittacidae	Platycercus (Violania) adscitus	Pale-headed Rosella	20
Artamidae	Cracticus torquatus	Grey Butcherbird	19
Cacatuidae	Cacatua (Cacatua) galerita	Sulphur-crested Cockatoo	17
Artamidae	Cracticus nigrogularis	Pied Butcherbird	17
Artamidae	Strepera (Strepera) graculina	Pied Currawong	17
Campephagidae	Coracina (Coracina) novaehollandiae	Black-faced Cuckoo-shrike	16
Cacatuidae	Eolophus roseicapilla	Galah	16
Monarchidae	Grallina cyanoleuca	Magpie-lark	16
Acanthizidae	Smicrornis brevirostris	Weebill	15
Alcedinidae	Dacelo (Dacelo) novaeguineae	Laughing Kookaburra	14
Cuculidae	Heteroscenes pallidus	Pallid Cuckoo	13
Columbidae	Ocyphaps lophotes	Crested Pigeon	13
Rhipiduridae	Rhipidura (Sauloprocta) leucophrys	Willie Wagtail	13
Corcoracidae	Struthidea cinerea	Apostlebird	13
Psittacidae	Trichoglossus haematodus	Rainbow Lorikeet	13
Meliphagidae	Myzomela (Myzomela) sanguinolenta	Scarlet Honeyeater	12
Accipitridae	Aquila (Uroaetus) audax	Wedge-tailed Eagle	11
Casuariidae	Dromaius novaehollandiae	Emu	11
Meliphagidae	Entomyzon cyanotis	Blue-faced Honeyeater	11
Cuculidae	Scythrops novaehollandiae	Channel-billed Cuckoo	11
Falconidae	Falco (Tinnunculus) cenchroides	Nankeen Kestrel	10

Maluridae	Malurus (Musciparus) melanocephalus	Red-backed Fairy-wren	10
Meliphagidae	Melithreptus (Melithreptus) albogularis	White-throated Honeyeater	10
Meropidae	Merops (Merops) ornatus	Rainbow Bee-eater	10
Monarchidae	Myiagra (Myiagra) rubecula	Leaden Flycatcher	10
Oriolidae	Oriolus (Mimeta) sagittatus	Olive-backed Oriole	10
Pachycephalidae	Pachycephala (Alisterornis) rufiventris	Rufous Whistler	10
Meliphagidae	Philemon (Tropidorhynchus) corniculatus	Noisy Friarbird	10
Psittacidae	Aprosmictus erythropterus	Red-winged Parrot	9
Pachycephalidae	Colluricincla (Colluricincla) harmonica	Grey Shrike-thrush	9
Climacteridae	Cormobates leucophaea metastasis	Central Eastern White-throated Treecreeper	9
Meliphagidae	Meliphaga (Meliphaga) lewinii	Lewin's Honeyeater	9
Acanthizidae	Acanthiza (Acanthiza) pusilla	Brown Thornbill	8
Aegothelidae	Aegotheles (Aegotheles) cristatus	Australian Owlet-nightjar	8
Anatidae	Chenonetta jubata	Australian Wood Duck	8
Petroicidae	Eopsaltria (Eopsaltria) australis	Eastern Yellow Robin	8
Columbidae	Geopelia humeralis	Bar-shouldered Dove	8
Meliphagidae	Philemon (Microphilemon) citreogularis	Little Friarbird	8
Meliphagidae	Caligavis chrysops	Yellow-faced Honeyeater	7
Cuculidae	Centropus phasianinus	Pheasant Coucal	7
Ardeidae	Egretta novaehollandiae	White-faced Heron	7
Petroicidae	Microeca (Microeca) fascinans	Jacky Winter	7
Cacatuidae	Nymphicus hollandicus	Cockatiel	7
Psittacidae	Trichoglossus chlorolepidotus	Scaly-breasted Lorikeet	7
Accipitridae	Accipiter (Leucospiza) fasciatus	Brown Goshawk	6
Otididae	Ardeotis australis	Australian Bustard	6
Caprimulgidae	Eurostopodus (Eurostopodus) mystacalis	White-throated Nightjar	6
Acanthizidae	Gerygone olivacea olivacea	Eastern White-throated Gerygone	6
Pomatostomidae	Pomatostomus (Pomatostomus) temporalis	Grey-crowned Babbler	6
Psittacidae	Trichoglossus		6
Acanthizidae	Acanthiza (Geobasileus) reguloides	Buff-rumped Thornbill	5
Acanthizidae	Acanthiza (Subacanthiza) nana	Yellow Thornbill	5
Neosittidae	Daphoenositta (Neositta) chrysoptera leucocephala	White-headed Sittella	5
Accipitridae	Elanus axillaris	Black-shouldered Kite	5
Coraciidae	Eurystomus orientalis	Dollarbird	5
Falconidae	Falco (Ieracidea) berigora	Brown Falcon	5
Campephagidae	Lalage (Lalage) tricolor	White-winged Triller	5
Hirundinidae	Petrochelidon (Hylochelidon) nigricans	Tree Martin	5
Meliphagidae	Ptilotula fusca	Fuscous Honeyeater	5
Estrildidae	Stizoptera bichenovii	Double-barred Finch	5
Anatidae	Anas (Anas) superciliosa	Pacific Black Duck	4
Anatidae	Anas gracilis	Grey Teal	4
Artamidae	Artamus (Angroyan) minor minor	Western Little Woodswallow	4
Accipitridae	Aviceda (Aviceda) subcristata	Pacific Baza	4
Cuculidae	Chalcites osculans	Black-eared Cuckoo	4
Columbidae	Geopelia		4
Acanthizidae	Gerygone olivacea	White-throated Gerygone	4
Columbidae	Phaps (Phaps) chalcoptera	Common Bronzewing	4
Acanthizidae	Sericornis (Sericornis) frontalis	White-browed Scrubwren	4
Accipitridae	Accipiter (Paraspizias) cirrocephalus	Collared Sparrowhawk	3
Megapodiidae	Alectura lathami	Australian Brush-turkey	3
Psittacidae	Alisterus scapularis	Australian King-parrot	3
Motacillidae	Anthus (Anthus) novaeseelandiae novaeseelandiae		3
Artamidae	Artamus (Campbellornis) personatus	Masked Woodswallow	3
Cuculidae	Chalcites basalis	Horsfield's Bronze-cuckoo	3
Cuculidae	Chalcites lucidus	Shining Bronze-cuckoo	3
Locustellidae	Cincloramphus (Maclennania) mathewsi	Rufous Songlark	3

Accipitridae	Circus assimilis	Spotted Harrier	3
Corvidae	Corvus coronoides	Australian Raven	3
Neosittidae	Daphoenositta (Neositta) chrysoptera	Varied Sittella	3
Dicruridae	Dicrurus bracteatus	Spangled Drongo	3
Falconidae	Falco (Falco) longipennis	Australian Hobby	3
Meliphagidae	Melithreptus (Eidopsarus) brevirostris	Brown-headed Honeyeater	3
Psittacidae	Melopsittacus undulatus	Budgerigar	3
Alaudidae	Mirafra (Mirafra) javanica	Horsfield's Bushlark	3
Strigidae	Ninox (Ninox) boobook	Southern Boobook	3
Pardalotidae	Pardalotus (Pardalotus) punctatus	Spotted Pardalote	3
Psittacidae	Parvipsitta pusilla	Little Lorikeet	3
Meliphagidae	Plectorhyncha lanceolata	Striped Honeyeater	3
Rhipiduridae	Rhipidura (Rhipidura) albiscapa	Grey Fantail	3
Charadriidae	Vanellus (Lobipluvia) miles	Masked Lapwing	3
Zosteropidae	Zosterops lateralis	Silvereye	3
Ardeidae	Ardea alba	Great Egret	2
Artamidae	Artamus (Campbellornis) superciliosus	White-browed Woodswallow	2
Cacatuidae	Cacatua (Licmetis) sanguinea	Little Corella	2
Cuculidae	Cacomantis (Vidgenia) flabelliformis	Fan-tailed Cuckoo	2
Locustellidae	Cincloramphus (Cincloramphus) cruralis	Brown Songlark	2
Campephagidae	Coracina (Coracina) papuensis	White-bellied Cuckoo-shrike	2
Campephagidae	Coracina	Bebik	2
Corcoracidae	Corcorax melanorhamphos	White-winged Chough	2
Phasianidae	Coturnix ypsilophora		2
Dicaeidae	Dicaeum (Dicaeum) hirundinaceum	Mistletoebird	2
Cuculidae	Eudynamys orientalis	Eastern Koel	2
Columbidae	Geopelia cuneata	Diamond Dove	2
Columbidae	Geopelia placida	Peaceful Dove	2
Columbidae	Geophaps (Geophaps) scripta	Squatter Pigeon	2
Accipitridae	Hieraaetus (Hieraaetus) morphnoides	Little Eagle	2
Apodidae	Hirundapus caudacutus	White-throated Needletail	2
Columbidae	Leucosarcia melanoleuca	Wonga Pigeon	2
Maluridae	Malurus (Leggeornis) lamberti	Variegated Fairy-wren	2
Meliphagidae	Manorina (Myzantha) flavigula	Yellow-throated Miner	2
Petroicidae	Melanodryas (Melanodryas) cucullata	Hooded Robin	2
Meliphagidae	Nesoptilotis leucotis	White-eared Honeyeater	2
	PASSERIFORMES	Yellowhammer	2
Petroicidae	Petroica (Petroica) goodenovii	Red-capped Robin	2
Phalacrocoracidae	Phalacrocorax (Phalacrocorax) sulcirostris	Little Black Cormorant	2
Podargidae	Podargus strigoides	Tawny Frogmouth	2
Acanthizidae	Pyrrholaemus sagittatus	Speckled Warbler	2
Podicipedidae	Tachybaptus novaehollandiae	Australasian Grebe	2
Estrildidae	Taeniopygia guttata	Zebra Finch	2
Alcedinidae	Todiramphus (Lazulena) macleayii	Forest Kingfisher	2
Alcedinidae	Todiramphus (Todiramphus) sanctus	Sacred Kingfisher	2
Tytonidae	Tyto javanica	Eastern Barn Owl	2
Cacatuidae	Zanda funerea	Yellow-tailed Black-cockatoo	2
	AVES	Birds	1
Acanthizidae	Acanthiza (Geobasileus) chrysorrhoa	Yellow-rumped Thornbill	1
Estrildidae	Aidemosyne modesta	Plum-headed Finch	1
Anhingidae	Anhinga novaehollandiae	Australasian Darter	1
Motacillidae	Anthus (Anthus) novaeseelandiae	Australian Pipit	1
Apodidae	Apus (Apus) pacificus	Fork-tailed Swift	1
Artamidae	Artamus (Angroyan) minor	Little Woodswallow	1
Anatidae	Aythya (Nyroca) australis	Hardhead	1
Burhinidae	Burhinus (Burhinus) grallarius	Bush Stone-curlew	1

Cacatuidae	Calyptorhynchus (Calyptorhynchus) banksii	Red-tailed Black Cockatoo	1
Cuculidae	Chalcites minutillus barnardi	Eastern Little Bronze-cuckoo	1
Cisticolidae	Cisticola (Cisticola) exilis	Golden-headed Cisticola	1
Climacteridae	Climacteris (Climacteris) picumnus	Brown Treecreeper	1
Climacteridae	Cormobates leucophaea	White-throated Treecreeper	1
Corvidae	Corvus		1
Anatidae	Dendrocygna eytoni	Plumed Whistling-duck	1
Charadriidae	Elseyornis melanops	Black-fronted Dotterel	1
Falconidae	Falco (Ieracidea) berigora berigora	Eastern Brown Falcon	1
Psittacidae	Glossopsitta concinna	Musk Lorikeet	1
Accipitridae	Haliastur sphenurus	Whistling Kite	1
Campephagidae	Lalage (Karua) leucomela	Varied Triller	1
Estrildidae	Lonchura (Munia) castaneothorax	Chestnut-breasted Munia	1
Petroicidae	Melanodryas (Melanodryas) cucullata cucullata	South-eastern Hooded Robin	1
Strigidae	Ninox (Ninox) novaeseelandiae	Southern Boobook	1
Scolopacidae	Numenius (Phaeopus) phaeopus	Whimbrel	1
Ardeidae	Nycticorax caledonicus	Nankeen Night-heron	1
Oreoicidae	Oreoica gutturalis	Crested Bellbird	1
Pachycephalidae	Pachycephala (Pachycephala) pectoralis	Golden Whistler	1
Pelecanidae	Pelecanus conspicillatus	Australian Pelican	1
Meliphagidae	Ptilotula penicillata	White-plumed Honeyeater	1
Rhipiduridae	Rhipidura (Howeavis) rufifrons	Rufous Fantail	1
Oriolidae	Sphecotheres vieilloti	Australasian Figbird	1
Phasianidae	Synoicus ypsilophora	Brown Quail	1
Turnicidae	Turnix		1
Charadriidae	Vanellus (Lobipluvia) miles novaehollandiae	Southern Masked Lapwing	1
Charadriidae	Vanellus (Lobivanellus) tricolor	Banded Lapwing	1

Lifeform - Bryophytes

Number of Bryophytes **0**

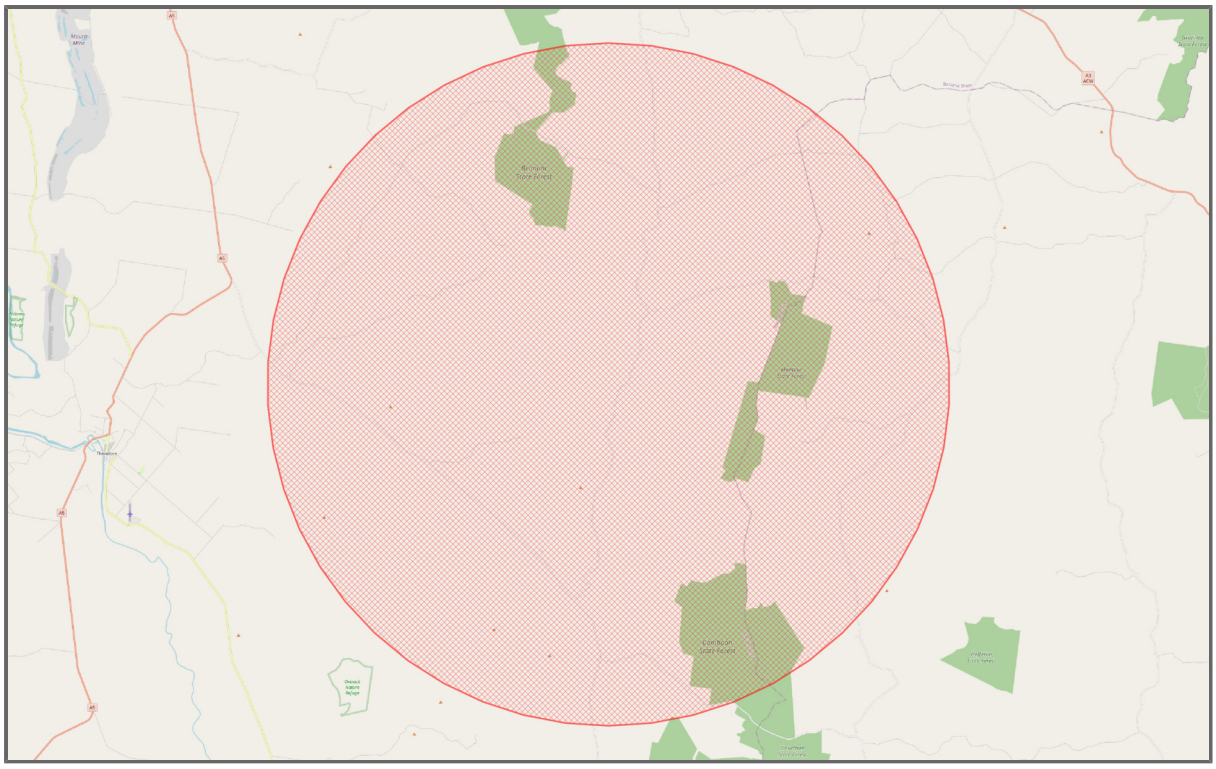


Figure 13 : Map of Lifeform - Bryophytes

Table 12: Lifeform - Bryophytes (Link to full list)

Family	*Scientific Name*	Common Name	No. Occurrences

Lifeform - Chromista

Number of Chromista **0**

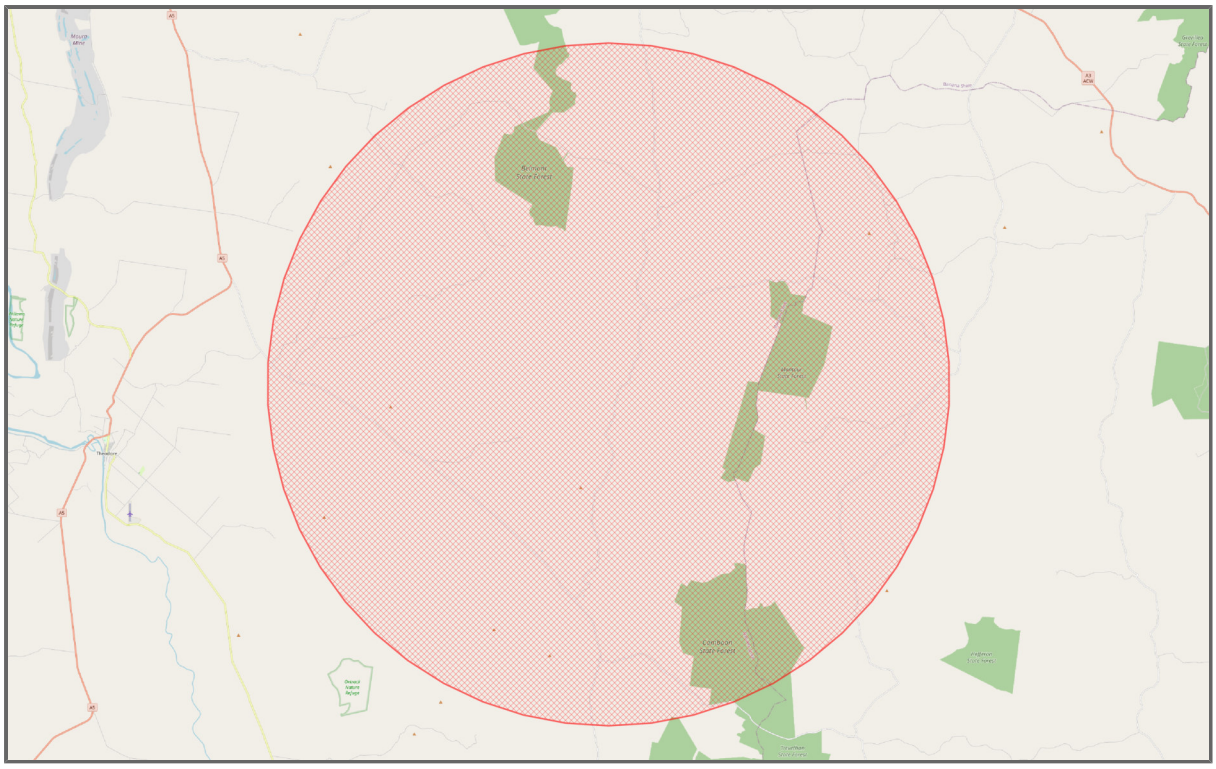


Figure 14 : Map of Lifeform - Chromista

Table 13: Lifeform - Chromista (Link to full list)

Family	*Scientific Name*	Common Name	No. Occurrences

Lifeform - Crustaceans

Number of Crustaceans **0**

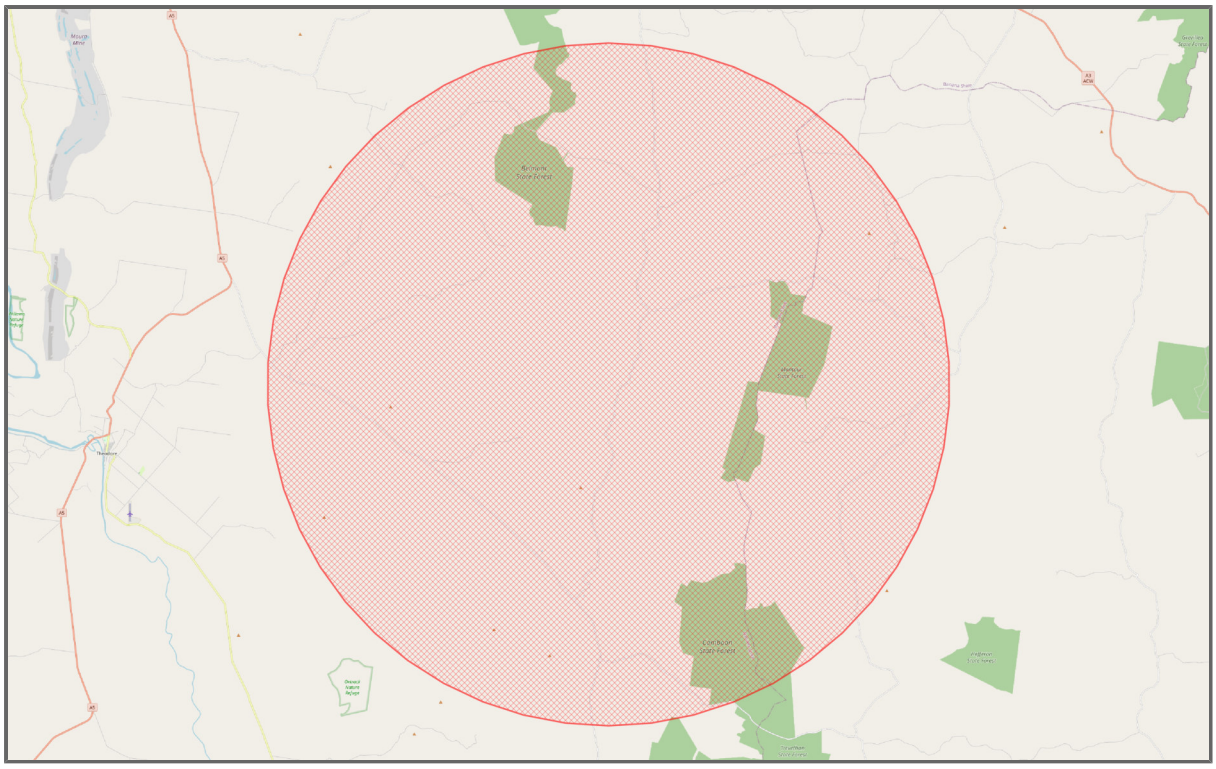


Figure 15 : Map of Lifeform - Crustaceans

Table 14: Lifeform - Crustaceans (Link to full list)

Family	*Scientific Name*	Common Name	No. Occurrences

Lifeform - Dicots

Number of Dicots **230**



Figure 16 : Map of Lifeform - Dicots

Table 15: Lifeform - Dicots (Link to full list)

Family	*Scientific Name*	Common Name	No. Occurrences
Myrtaceae	Eucalyptus crebra	Yellow-branched Ironbark	9
Pittosporaceae	Pittosporum angustifolium	Native Willow	7
Euphorbiaceae	Bertya pedicellata		6
Myrtaceae	Corymbia citriodora	Lemon-scented Gum	6
Solanaceae	Solanum furfuraceum	Corky Nightshade	6
Fabaceae	Vachellia bidwillii		5
Fabaceae	Acacia conferta	Crowded-leaved Wattle	4
Fabaceae	Acacia sparsiflora	Currawang	4
Ebenaceae	Diospyros humilis	Ebony	4
Cactaceae	Opuntia tomentosa	Velvet Pear	4
Campanulaceae	Wahlenbergia queenslandica	Bluebell	4
Fabaceae	Acacia bancroftiorum		3
Casuarinaceae	Allocasuarina littoralis	Black Sheoak	3
Rhamnaceae	Alphitonia excelsa	Red Ash	3
Goodeniaceae	Goodenia grandiflora	Mountain Primrose	3
Fabaceae	Hovea longipes	Brush Hovea	3
Solanaceae	Solanum mitchellianum		3
Malvaceae	Abutilon auritum	Chinese Lantern	2
Fabaceae	Acacia leiocalyx	Black Wattle	2
Rutaceae	Acronychia pauciflora	Soft Acronychia	2
Sapindaceae	Alectryon diversifolius	Scrub Boonaree	2
Aristolochiaceae	Aristolochia elegans	Calico-flower	2
Acanthaceae	Brunoniella australis	Blue Trumpet	2
Asteraceae	Calotis dentex	White Burr Daisy	2
Asteraceae	Camptacra barbata		2

Fabaceae	Cassia brewsteri	Bean Tree	2
Fabaceae	Cassia tomentella	Velvet Cassia	2
Rutaceae	Coatesia paniculata	Axe-breaker	2
Asteraceae	Cotula australis	Common Cotula	2
Rubiaceae	Cyclophyllum coprosmoides var. coprosmoides		2
Celastraceae	Denhamia pittosporoides	Orange Boxwood	2
Fabaceae	Desmodium rhytidophyllum	Desmodium	2
Sapindaceae	Elattostachys xylocarpa	White Tamarind	2
Scrophulariaceae	Eremophila deserti	Turkey-bush	2
Scrophulariaceae	Eremophila mitchellii	Budda	2
Myrtaceae	Eucalyptus bakeri	Baker's Mallee	2
Myrtaceae	Eucalyptus crebra x Eucalyptus melanophloia		2
Myrtaceae	Eucalyptus decorticans	Gum Top Ironbark	2
Euphorbiaceae	Euphorbia tannensis subsp. eremophila	Bottle Tree Caustic	2
Rubiaceae	Everistia vacciniifolia	Small-leaved Canthium	2
Euphorbiaceae	Excoecaria dallachyana	Scrub Poison Tree	2
Rutaceae	Geijera parviflora	Wilga	2
Myrtaceae	Gossia bidwillii	Python Tree	2
Proteaceae	Grevillea longistyla	Long-style Grevillea	2
Fabaceae	Indigofera colutea	Sticky Indigo	2
Fabaceae	Jacksonia scoparia	Dogwood	2
Apocynaceae	Leichhardtia viridiflora	Green Berry Creeper	2
Asteraceae	Leiocarpa websteri	Narrow Plover-daisy	2
Brassicaceae	Lepidium didymum	Lesser Swine's-cress	2
Linderniaceae	Lindernia hyssopoides		2
Ericaceae	Melichrus sp. Isla Gorge (P.Sharpe+ 601)		2
Oleaceae	Notelaea microcarpa	Native Olive	2
Asteraceae	Olearia canescens subsp. discolor		2
Cactaceae	Opuntia streptacantha	Cardona Pear	2
Meliaceae	Owenia venosa	Crow's Apple	2
Passifloraceae	Passiflora aurantia	Norfolk Island Passionfruit	2
Acanthaceae	Pseuderanthemum variabile	Pastel Flower	2
Fabaceae	Pultenaea bracteamajor		2
Acanthaceae	Rostellularia adscendens	Purple Pipe-cleaner	2
Asteraceae	Rutidosis murchisonii		2
Santalaceae	Santalum lanceolatum	Northern Sandalwood	2
Fabaceae	Senna artemisioides subsp. zygophylla	Narrow-leaf Desert Cassia	2
Fabaceae	Senna coronilloides		2
Malvaceae	Seringia corollata	Keraudrenia	2
Malvaceae	Sida hackettiana	Spiked Sida	2
Brassicaceae	Sisymbrium erysimoides	Smooth Mustard	2
Solanaceae	Solanum aviculare	Kangaroo Apple	2
Solanaceae	Solanum jucundum		2
Solanaceae	Solanum nemophilum		2
Solanaceae	Solanum seaforthianum	Brazilian Nightshade	2
Celastraceae	Stackhousia muricata	Stackhousia	2
Fabaceae	Swainsona queenslandica	Smooth Darling Pea	2
Asteraceae	Tagetes minuta	Stinking Roger	2
Meliaceae	Turraea pubescens	Native Honeysuckle	2
Asteraceae	Vittadinia bicolor		2
Asteraceae	Vittadinia hispidula var. setosa		2
Fabaceae	Zornia pallida		2
Malvaceae	Abutilon calliphyllum	Velvet Lanternflower	1
Malvaceae	Abutilon oxycarpum var. incanum		1
Malvaceae	Abutilon oxycarpum var. oxycarpum		1
Malvaceae	Abutilon tubulosum		1

Fabaceae	Acacia amblygona	Fan Wattle	1
Fabaceae	Acacia angusta		1
Fabaceae	Acacia crassa	Curracabah	1
Fabaceae	Acacia fasciculifera	Scaly Bark	1
Fabaceae	Acacia glaucocarpa	Hickory Wattle	1
Fabaceae	Acacia leiocalyx subsp. leiocalyx	Curracabah	1
Fabaceae	Acacia penninervis	Mountain Hickory	1
Fabaceae	Acacia podalyriifolia	Mount Morgan Wattle	1
Fabaceae	Acacia rhodoxylon	Ringy Rosewood	1
Fabaceae	Aeschynomene brevifolia		1
Violaceae	Afrohybanthus stellarioides		1
Lamiaceae	Ajuga australis	Austral Bugle	1
Apocynaceae	Alstonia constricta	Quinine Bush	1
Amaranthaceae	Amaranthus viridis	Green Amaranth	1
Vitaceae	Ampelocissus gardineri		1
Loranthaceae	Amyema congener subsp. rotundifolia		1
Papaveraceae	Argemone ochroleuca subsp. ochroleuca	Prickly Poppy	1
Sapindaceae	Atalaya hemiglauca	Whitewood	1
Sapindaceae	Atalaya salicifolia	Atalaya	1
Myrtaceae	Backhousia angustifolia	Narrow Leaf Myrtle	1
Asteraceae	Calotis cuneata	Mountain Burr-daisy	1
Capparaceae	Capparis anomala	Warrior Bush	1
Capparaceae	Capparis arborea	Native Pomegranate	1
Capparaceae	Capparis canescens	Wild Orange	1
Capparaceae	Capparis lasiantha	Nepine	1
Capparaceae	Capparis mitchellii	Native Orange	1
Capparaceae	Capparis sarmentosa	Scrambling Caper	1
Apocynaceae	Carissa ovata	Conkerberry	1
Asteraceae	Cassinia laevis	Cough Bush	1
Lauraceae	Cassytha paniculata	Ribbed Dodder Laurel	1
Casuarinaceae	Casuarina cristata	Belah	1
Asteraceae	Centipeda minima subsp. minima	Spreading Sneezeweed	1
Asteraceae	Cirsium vulgare	Spear Thistle	1
Vitaceae	Clematicissus opaca	Pepper Vine	1
Gyrostemonaceae	Codonocarpus attenuatus	Bell-fruit Tree	1
Myrtaceae	Corymbia trachyphloia	White Bloodwood	1
Sapindaceae	Cossinia australiana	Cossinia	1
Fabaceae	Crotalaria medicaginea var. neglecta	Trefoil Rattlepod	1
Euphorbiaceae	Croton insularis	Silver Queensland Cascarilla	1
Cucurbitaceae	Cucumis anguria var. anguria	West Indian Gherkin	1
Asteraceae	Cyanthillium cinereum	Ironweed	1
Fabaceae	Daviesia filipes subsp. filipes		1
Amaranthaceae	Deeringia amaranthoides	Redberry	1
Celastraceae	Denhamia cunninghamii	Narrow-leaf Maytenus	1
Celastraceae	Denhamia pittosporoides subsp. pittosporoides	Veiny Denhamia	1
Fabaceae	Desmodium varians	Slender Tick-trefoil	1
Cucurbitaceae	Diplocyclos palmatus subsp. affinis	Native Cucumber	1
Cucurbitaceae	Diplocyclos palmatus subsp. palmatus		1
Sapindaceae	Dodonaea triangularis	Hopbush	1
Bignoniaceae	Dolichandra unguis-cati	Cat's Claw Creeper	1
Droseraceae	Drosera lunata		1
Chenopodiaceae	Dysphania pumilio	Small Crumbweed	1
Boraginaceae	Ehretia saligna var. membranifolia	Peach Bush	1
Celastraceae	Elaeodendron australe var. integrifolium		1
Celastraceae	Elaeodendron australe	White Cedar	1
Fabaceae	Erythrina vespertilio subsp. vespertilio		1

Fabaceae	Erythrostemon gilliesii	Bird-of-paradise Flower	1
Myrtaceae	Eucalyptus coolabah	Coolabah	1
Myrtaceae	Eucalyptus exserta	Queensland Peppermint	1
Myrtaceae	Eucalyptus moluccana	Gum-topped Box	1
Myrtaceae	Eucalyptus tereticornis	Forest Red Gum	1
Myrtaceae	Eucalyptus	Studley Park Gum	1
Euphorbiaceae	Euphorbia hirta	Asthma Plant	1
Euphorbiaceae	Euphorbia papillifolia var. papillifolia		1
Rubiaceae	Everistia vacciniifolia var. vacciniifolia		1
Rutaceae	Flindersia collina	Broad-leaved Leopard Tree	1
Fabaceae	Galactia tenuiflora var. lucida		1
Geraniaceae	Geranium solanderi var. solanderi	Austral Crane's-bill	1
Geraniaceae	Geranium solanderi	Austral Geranium	1
Verbenaceae	Glandularia aristigera	Mayne's Pest	1
Fabaceae	Glycine	Twining Glycine	1
Goodeniaceae	Goodenia glabra	Smooth Goodenia	1
Goodeniaceae	Goodenia rotundifolia		1
Malvaceae	Grewia latifolia	Dysentery Plant	1
Haloragaceae	Haloragis glauca	Grey Raspwort	1
Haloragaceae	Haloragis stricta		1
Fabaceae	Hardenbergia violacea	Native Lilac	1
Dilleniaceae	Hibbertia stricta	Upright Guinea-flower	1
Dilleniaceae	Hibbertia	Guinea Flowers	1
Araliaceae	Hydrocotyle acutiloba	Broad-leaf Pennywort	1
Fabaceae	Indigofera linifolia	Flax-leaf Indigo	1
Fabaceae	Indigofera linnaei	Birdsville Indigo	1
Oleaceae	Jasminum didymum subsp. racemosum	Native Jasmine	1
Verbenaceae	Lantana montevidensis	Creeping Lantana	1
Apocynaceae	Leichhardtia viridiflora subsp. viridiflora	Native Pear	1
Brassicaceae	Lepidium bonariense	Peppercress	1
Asteraceae	Leuzea australis	Austral Cornflower	1
Myrtaceae	Lophostemon suaveolens	Swamp Box	1
Onagraceae	Ludwigia octovalvis	Willow Primrose	1
Moraceae	Maclura pomifera	Osage-orange	1
Fabaceae	Medicago polymorpha	Spineless Burr Medic	1
Primulaceae	Myrsine variabilis	Rapanea	1
Myrtaceae	Myrtaceae	Myrtle Family	1
Solanaceae	Nicotiana forsteri		1
Solanaceae	Nicotiana megalosiphon	Wild Tobacco	1
Amaranthaceae	Nyssanthes diffusa	Barbed-wire Weed	1
Asteraceae	Olearia canescens	Daisy Bush	1
Meliaceae	Owenia x reliqua	Bellata Owenia	1
Oxalidaceae	Oxalis perennans	Native Sorrel	1
Asteraceae	Ozothamnus cassinioides	Everlasting	1
Bignoniaceae	Pandorea pandorana	Wonga Vine	1
Apocynaceae	Parsonsia eucalyptophylla	Gargaloo	1
Passifloraceae	Passiflora aurantia var. aurantia	Blunt-leaved Passionfruit	1
Phyllanthaceae	Phyllanthus maderaspatensis	Spurge	1
Phyllanthaceae	Phyllanthus virgatus	Phyllanthus	1
Phytolaccaceae	Phytolacca octandra	Red-ink Weed	1
Thymelaeaceae	Pimelea glauca	Smooth Riceflower	1
Sapotaceae	Planchonella cotinifolia	Yellow Lemon	1
Plantaginaceae	Plantago debilis	Shade Plantain	1
Caryophyllaceae	Polycarpaea corymbosa var. minor		1
Phyllanthaceae	Poranthera microphylla	Small Poranthera	1
Rubiaceae	Psydrax longipes		1

Rubiaceae	Psydrax odorata f. buxifolia		1
Rubiaceae	Psydrax odorata	Psydrax	1
Fabaceae	Pultenaea millarii var. angustifolia		1
Asteraceae	Rhodanthe polyphylla		1
Fabaceae	Rhynchosia minima	Rhynchosia	1
Lamiaceae	Salvia reflexa	Mintweed	1
Chenopodiaceae	Sclerolaena birchii	Galvinised Burr	1
Chenopodiaceae	Sclerolaena muricata var. muricata	Sclerolaena	1
Apocynaceae	Secamone elliptica	Secamone	1
Asteraceae	Senecio bathurstianus	Dissected Fireweed	1
Asteraceae	Senecio brigalowensis		1
Fabaceae	Senna occidentalis	Western Senna	1
Malvaceae	Sida corrugata	Variable Sida (peltate-hairy)	1
Asteraceae	Sigesbeckia orientalis	Indian Weed	1
Brassicaceae	Sisymbrium thellungii	African Turnip-weed	1
Solanaceae	Solanaceae	Tomato	1
Solanaceae	Solanum ellipticum	Potato Bush	1
Solanaceae	Solanum parvifolium	Nightshade	1
Fabaceae	Spartium junceum	Spanish Broom	1
Rubiaceae	Spermacoce brachystema	Spermacoce	1
Rubiaceae	Spermacoce multicaulis		1
Stylidiaceae	Stylidium eglandulosum	Woolly-stemmed Triggerplant	1
Fabaceae	Tephrosia filipes subsp. filipes		1
Lamiaceae	Teucrium junceum		1
Urticaceae	Urtica incisa	Scrub Nettle	1
Verbenaceae	Verbena africana	Inland Verbena	1
Asteraceae	Verbesina encelioides subsp. encelioides	Crownbeard	1
Asteraceae	Vittadinia dissecta var. hirta	Dissected New Holland Daisy	1
Asteraceae	Vittadinia hispidula var. hispidula		1
Asteraceae	Vittadinia hispidula		1
Asteraceae	Vittadinia sulcata	Furrowed New Holland Daisy	1
Asteraceae	Xanthium spinosum	Bathurst Burr	1
Rutaceae	Zanthoxylum brachyacanthum	Thorny Yellowwood	1
Rutaceae	Zieria cytisoides	Downy Zieria	1
Rutaceae	Zieria smithii	Sandfly Zieria	1
Fabaceae	Zornia muriculata subsp. muriculata		1
Fabaceae	Zornia muriculata	Upright Zornia	1

Lifeform - FernsAndAllies

Number of FernsAndAllies **0**

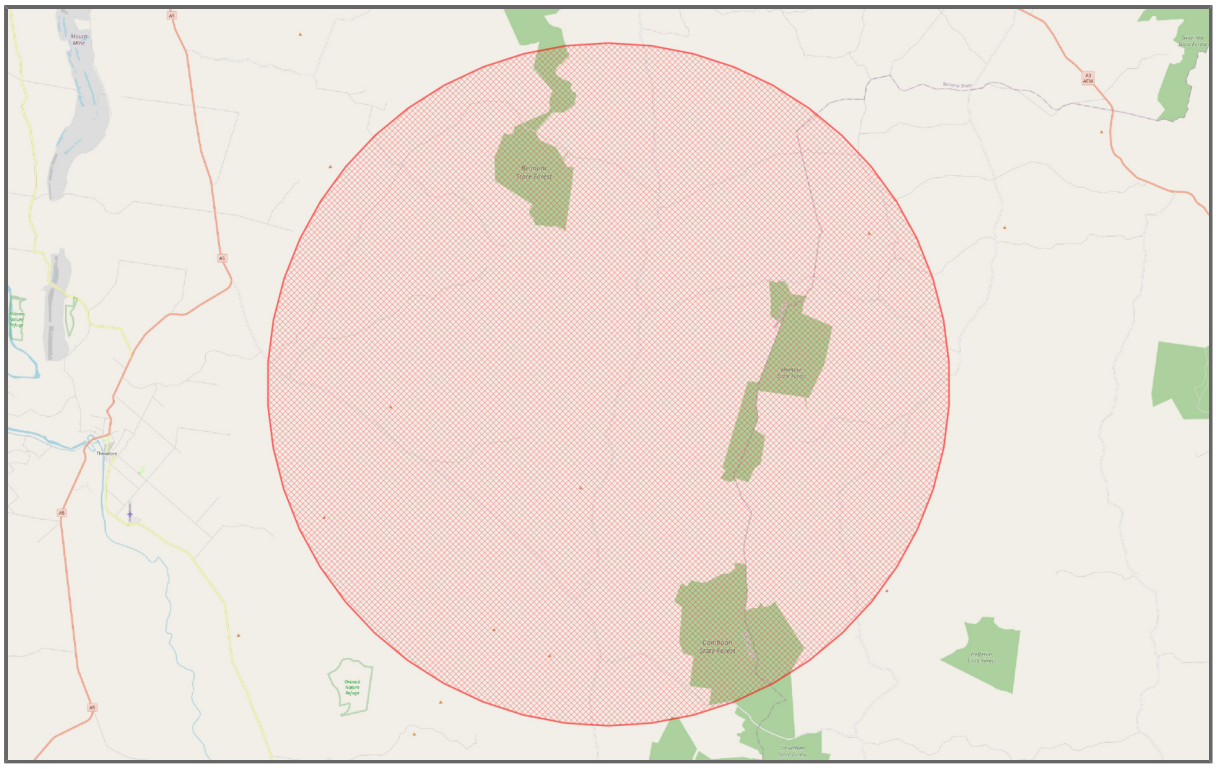


Figure 17 : Map of Lifeform - FernsAndAllies

Table 16: Lifeform - FernsAndAllies (Link to full list)

Family	*Scientific Name*	Common Name	No. Occurrences

Lifeform - Fishes

Number of Fishes **0**

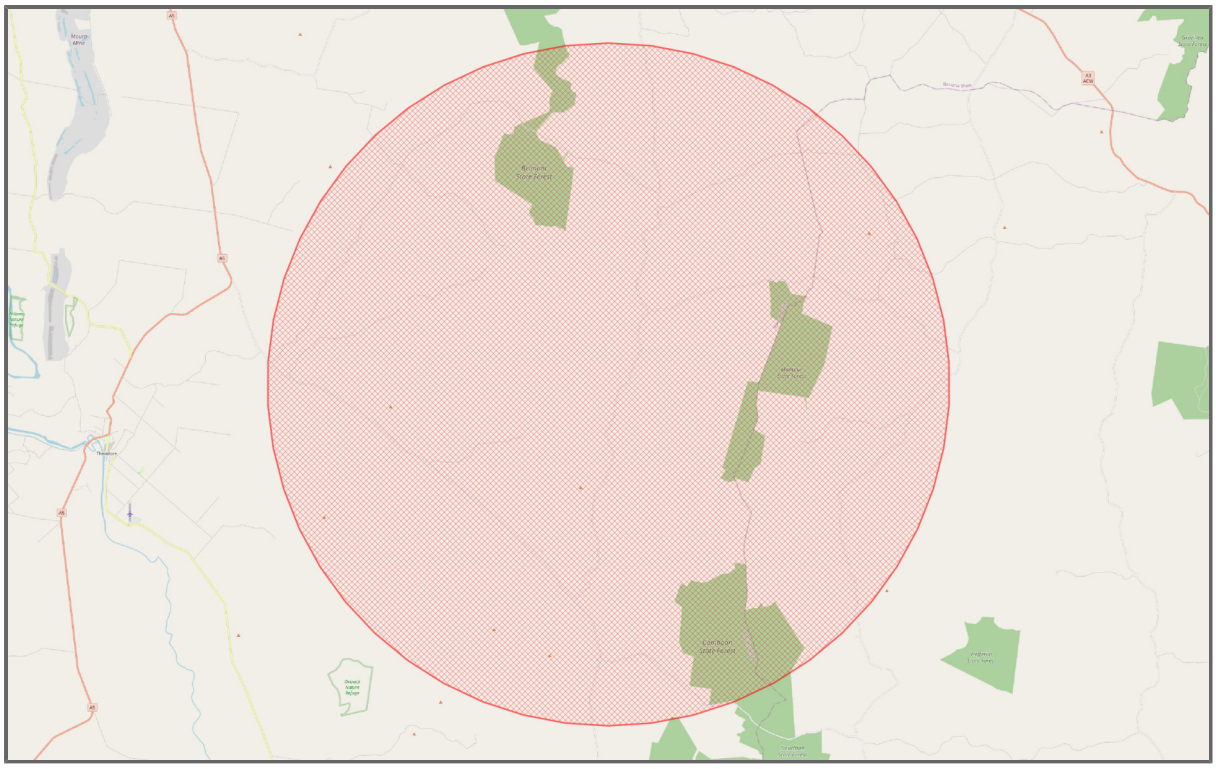


Figure 18 : Map of Lifeform - Fishes

Table 17: Lifeform - Fishes (Link to full list)

Family	*Scientific Name*	Common Name	No. Occurrences

Lifeform - Fungi

Number of Fungi **1**

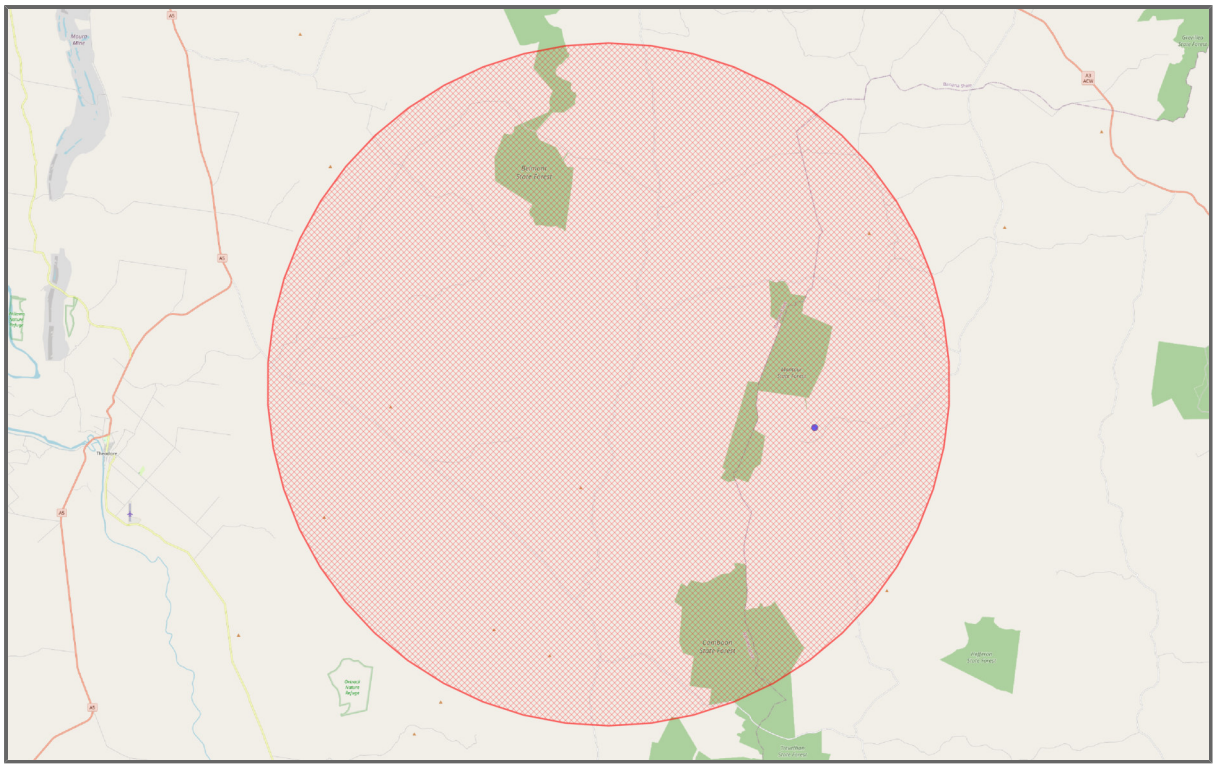


Figure 19 : Map of Lifeform - Fungi

Table 18: Lifeform - Fungi (Link to full list)

Family	*Scientific Name*	Common Name	No. Occurrences
Nectriaceae	Fusarium oxysporum f.sp. vasinfectum		1

Lifeform - Gymnosperms

Number of Gymnosperms **0**

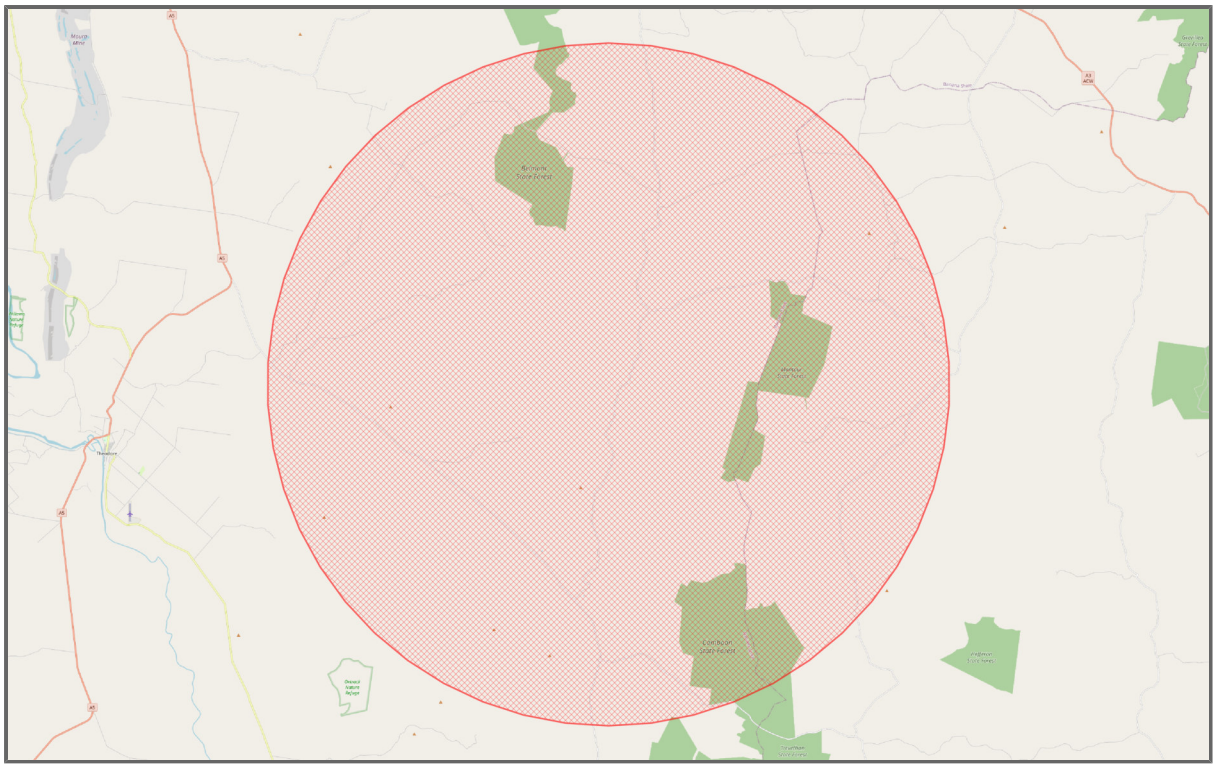


Figure 20 : Map of Lifeform - Gymnosperms

Table 19: Lifeform - Gymnosperms (Link to full list)

Family	*Scientific Name*	Common Name	No. Occurrences

Lifeform - Insects

Number of Insects **9**

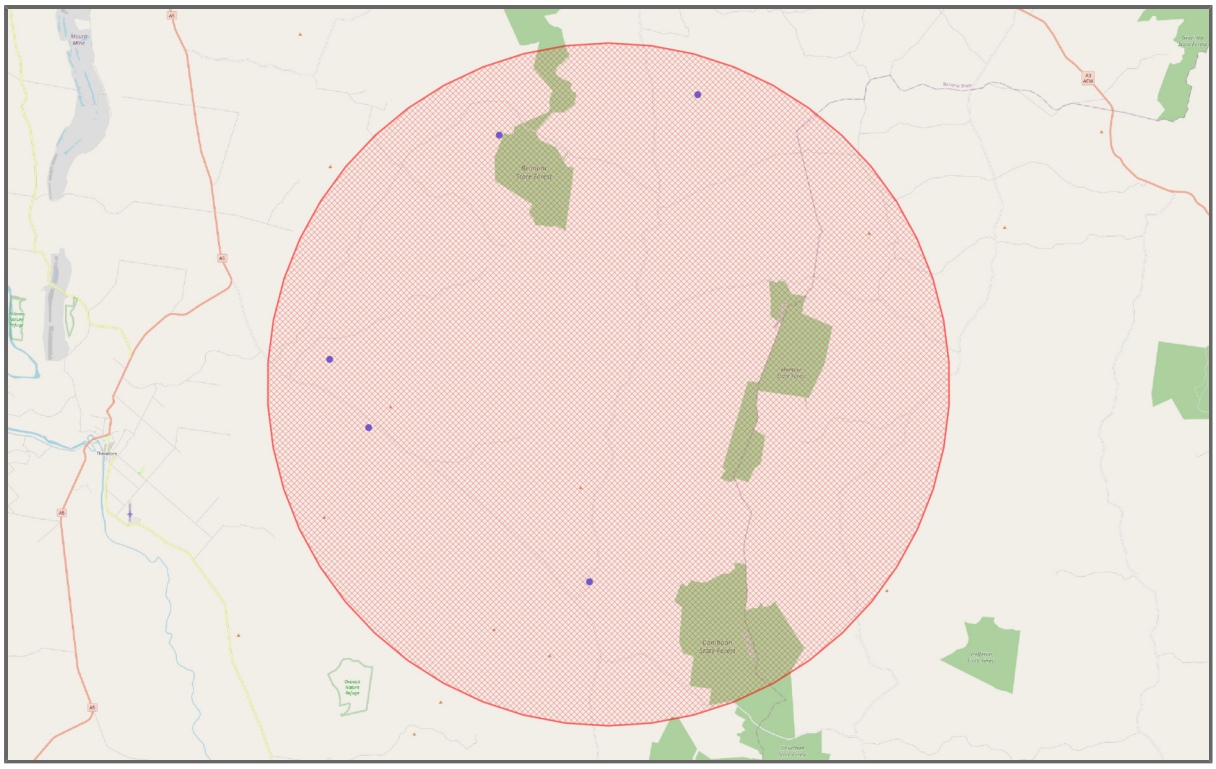


Figure 21 : Map of Lifeform - Insects

Table 20: Lifeform - Insects (Link to full list)

Family	*Scientific Name*	Common Name	No. Occurrences
Culicidae	Aedes (Rampamyia) notoscriptus		2
Culicidae	Anopheles (Cellia) annulipes	Spear Mosquito	1
Argiolestidae	Austroargiolestes icteromelas	Pale-mouth Common Flatwing	1
Libellulidae	Diplacodes bipunctata	Wandering Percher	1
Formicidae	Iridomyrmex pallidus		1
Curculionidae	Myllocerus		1
Libellulidae	Orthetrum villosovittatum	Fiery Skimmer	1
Carabidae	Philoscaphus mastersii		1
Carabidae	Pterostichini		1

Lifeform - Mammals

Number of Mammals **33**

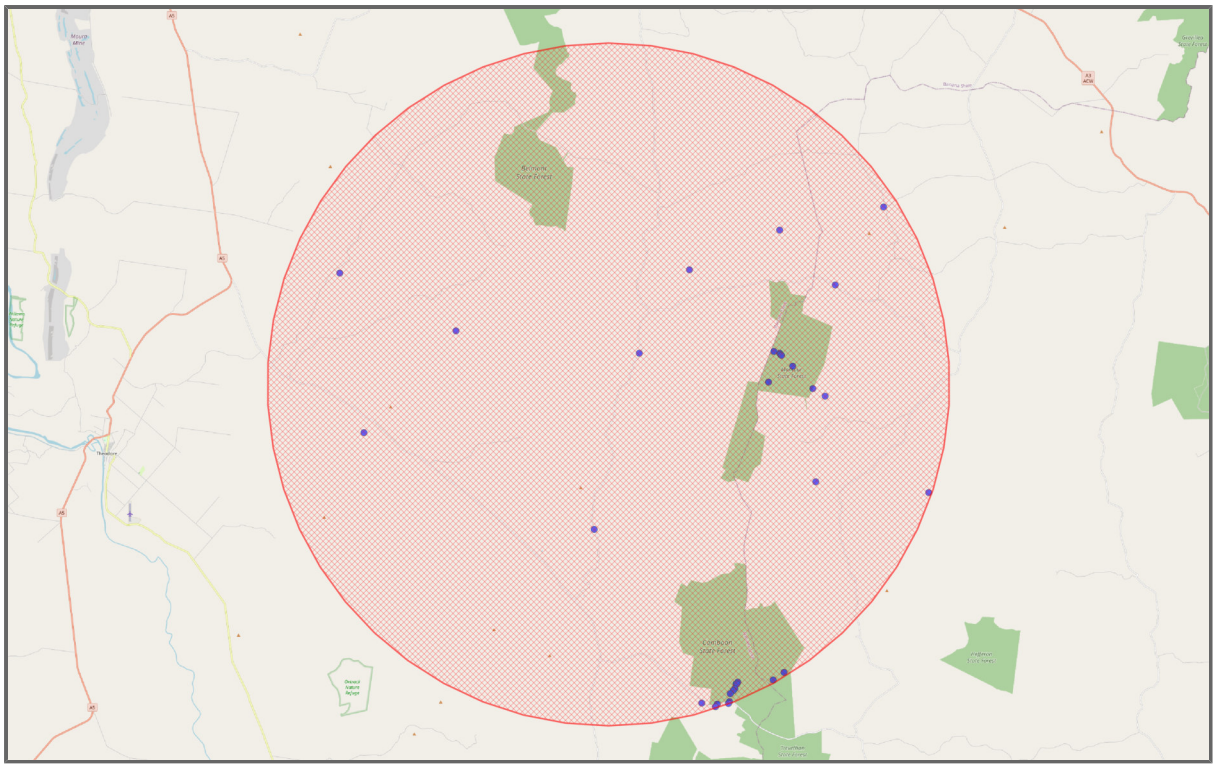


Figure 22 : Map of Lifeform - Mammals

Table 21: Lifeform - Mammals (Link to full list)

Family	*Scientific Name*	Common Name	No. Occurrences
Vespertilionidae	Scotorepens		8
Molossidae	MOLOSSIDAE		6
Muridae	Mus musculus	House Mouse	6
Vespertilionidae	Nyctophilus gouldi	Gould's Long-eared Bat	6
Vespertilionidae	Chalinolobus picatus	Little Pied Bat	5
Petauridae	Petaurus norfolcensis	Squirrel Glider	5
Vespertilionidae	Nyctophilus geoffroyi	Lesser Long-eared Bat	4
Molossidae	Ozimops ridei	Ride's Free-tailed Bat	4
Tachyglossidae	Tachyglossus aculeatus	Short-beaked Echidna	4
Vespertilionidae	Chalinolobus gouldii	Gould's Wattled Bat	3
Macropodidae	Notamacropus parryi	Whiptail Wallaby	3
Leporidae	Oryctolagus cuniculus	Rabbit	3
Pseudocheiridae	Petauroides minor	Northern Greater Glider	3
Petauridae	Petaurus notatus	Krefft's Glider	3
Canidae	Canis familiaris	Common Dog	2
Macropodidae	Macropus giganteus	Eastern Grey Kangaroo	2
Macropodidae	Notamacropus rufogriseus	Red-necked Wallaby	2
Petauridae	Petaurus australis	Yellow-bellied Glider	2
Phascolarctidae	Phascolarctos cinereus	Koala	2
Dasyuridae	Planigale maculata	Common Planigale	2
Muridae	Pseudomys patrius	Eastern Pebble-mound Mouse	2
Vespertilionidae	Scotorepens greyii	Little Broad-nosed Bat	2
Vespertilionidae	Vespadelus troughtoni	Eastern Cave Bat	2
Vespertilionidae	Vespadelus		2
Potoroidae	Aepyprymnus rufescens	Rufous Bettong	1

Vespertilionidae	Chalinolobus morio	Chocolate Wattled Bat	1
Dasyuridae	Dasyurus hallucatus	Digul	1
Macropodidae	Notamacropus dorsalis	Black-striped Wallaby	1
Vespertilionidae	Nyctophilus bifax	Eastern Long-eared Bat	1
Pseudocheiridae	Petauroides volans	Southern Greater Glider	1
Macropodidae	Petrogale herberti	Herbert's Rock-wallaby	1
Dasyuridae	Planigale maculata maculata		1
Muridae	Pseudomys		1

Lifeform - Molluscs

Number of Molluscs **5**

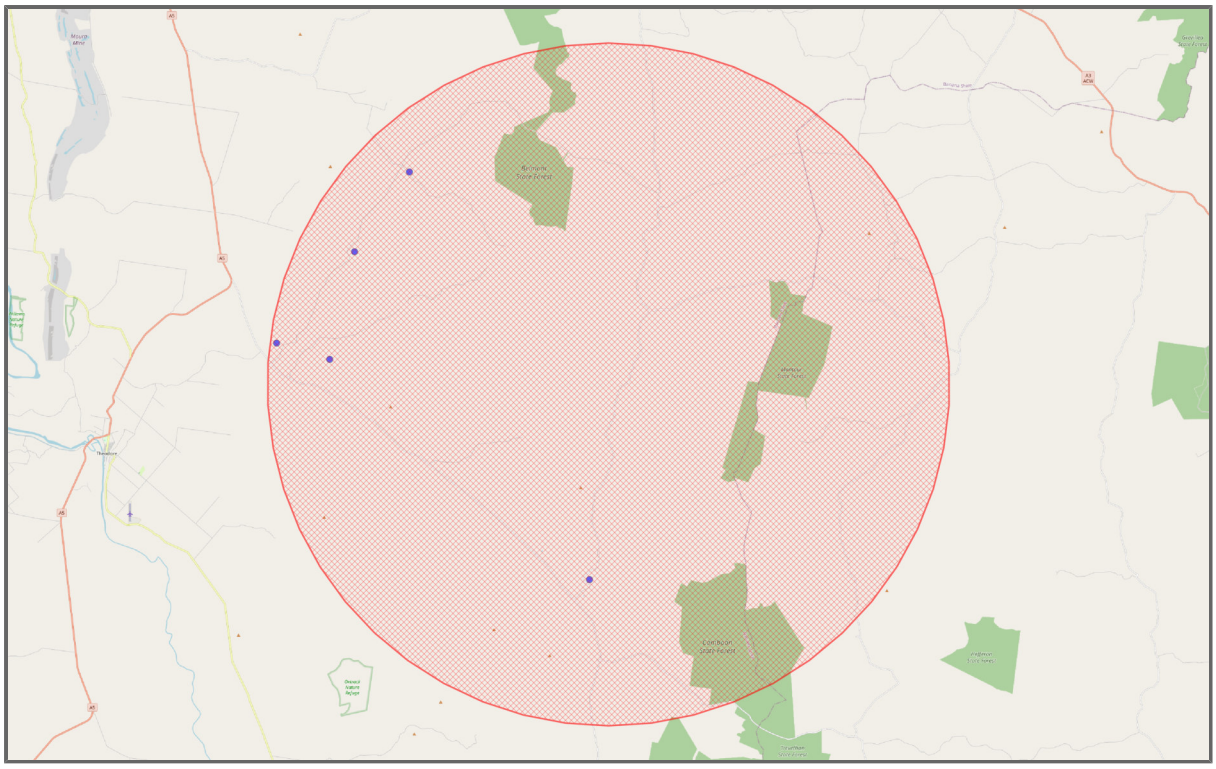


Figure 23 : Map of Lifeform - Molluscs

Table 22: Lifeform - Molluscs (Link to full list)

Family	*Scientific Name*	Common Name	No. Occurrences
Camaenidae	CAMAENIDAE		5
Camaenidae	Xanthomelon pachystylum		3
Planorbidae	Glyptophysa		1
Camaenidae	Neveritis misella	Mid-eastern Velvet Snail	1
Helicarionidae	Tarocystis megaspira	Amber Dome Glass-snail	1

Lifeform - Monocots

Number of Monocots **64**

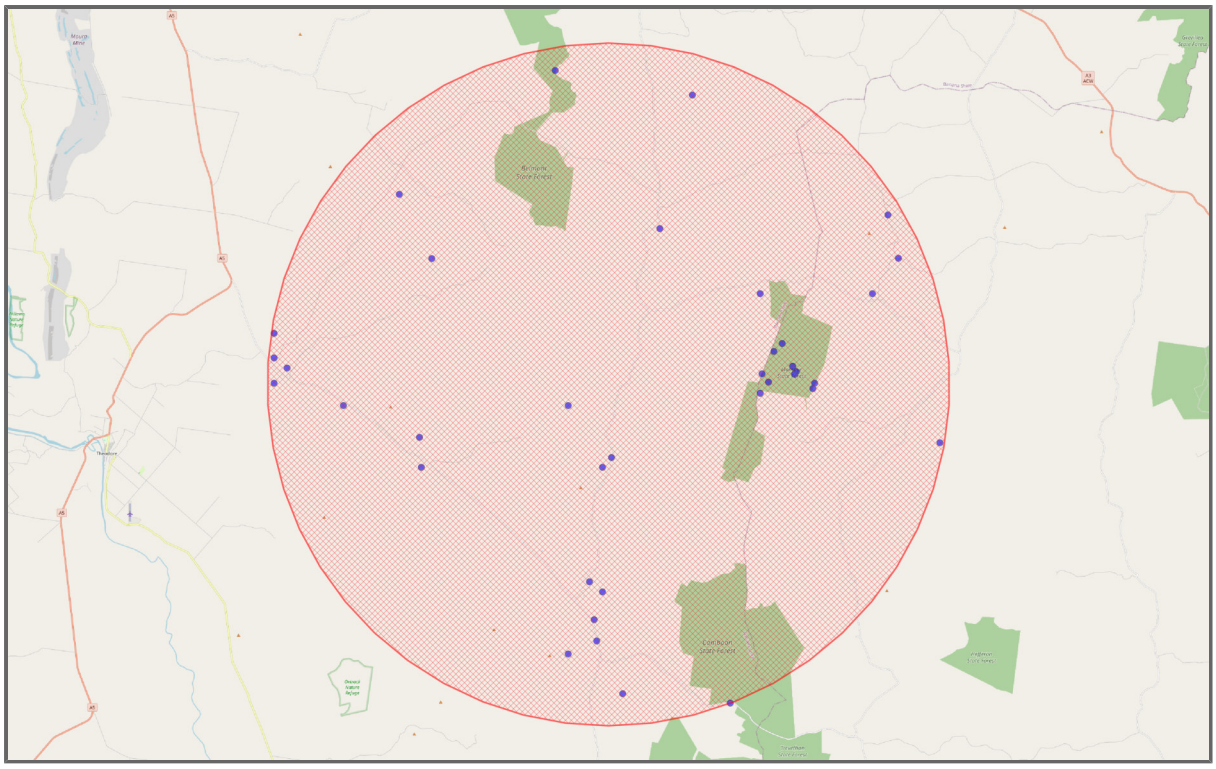


Figure 24 : Map of Lifeform - Monocots

Table 23: Lifeform - Monocots (Link to full list)

Family	*Scientific Name*	Common Name	No. Occurrences
Poaceae	Poaceae	Grasses	7
Poaceae	Enneapogon gracilis	Slender Nineawn	3
Poaceae	Enneapogon lindleyanus	Purple-head Nine-awn	3
Poaceae	Panicum effusum	Hairy Panic	3
Cyperaceae	Schoenus kennyi		3
Poaceae	Aristida calycina var. calycina	Dark Wire-grass	2
Poaceae	Arundinella nepalensis	Reedgrass	2
Cyperaceae	Bolboschoenus caldwellii	Salt Club-sedge	2
Poaceae	Cleistochloa subjuncea		2
Cyperaceae	Cyperus gracilis	Slender Flat-sedge	2
Hemerocallidaceae	Dianella brevipedunculata		2
Hemerocallidaceae	Dianella longifolia	Blueberry Lily	2
Poaceae	Eragrostis megalosperma	A Love Grass	2
Poaceae	Eriochloa pseudoacrotricha	Early Spring Grass	2
Asparagaceae	Eustrephus latifolius	Wombat Berry	2
Asparagaceae	Lomandra confertifolia subsp. pallida	Matrush	2
Poaceae	Panicum mitchellii	Mitchell's Panick Grass	2
Poaceae	Paspalidium gracile	Paspalidium	2
Araceae	Pistia stratiotes	Water Lettuce	2
Cyperaceae	Scleria sphacelata	Scleria	2
Poaceae	Sporobolus creber	Western Rat-tail Grass	2
Poaceae	Ancistrachne uncinulata	Hooked-hairy Panic Grass	1
Poaceae	Aristida gracilipes	Three-awn Speargrass	1
Poaceae	Bothriochloa decipiens	Bothriochloa	1
Cyperaceae	Carex inversa	Dwarf Sedge	1

Cyperaceae	Caustis flexuosa	Slender Twist-rush	1
Poaceae	Chloris truncata	Windmill Grass	1
Poaceae	Chloris ventricosa	Tall Windmill Grass	1
Commelinaceae	Commelina cyanea	Scurvy Weed	1
Orchidaceae	Cymbidium canaliculatum	Tiger Orchid	1
Cyperaceae	Cyperus concinnus	Trim Flat-sedge	1
Cyperaceae	Cyperus exaltatus	Tall Flat-sedge	1
Cyperaceae	Cyperus fulvus	Sticky Sedge	1
Poaceae	Dichanthium sericeum subsp. humilius	Dwarf Bluegrass	1
Poaceae	Dichanthium sericeum subsp. sericeum	Silky Blue-grass	1
Dioscoreaceae	Dioscorea transversa	Native Yam	1
Poaceae	Enneapogon nigricans	Black-head Grass	1
Poaceae	Enneapogon truncatus	Bottlewashers	1
Poaceae	Enteropogon unispiceus		1
Poaceae	Eragrostis alveiformis	Granite Love-grass	1
Poaceae	Eragrostis sororia	Lovegrass	1
Poaceae	Eragrostis spartinoides	Lovegrass	1
Cyperaceae	Fimbristylis dichotoma	Fringe-rush	1
Cyperaceae	Gahnia aspera	Rough Saw-sedge	1
Poaceae	Heteropogon contortus	Black Speargrass	1
Hypoxidaceae	Hypoxis pratensis	Golden Weather-grass	1
Asparagaceae	Laxmannia gracilis	Slender Wire Lily	1
Poaceae	Leptochloa digitata	Umbrella Cane-grass	1
Arecaceae	Livistona nitida	Carnavon Gorge Cabbage Palm	1
Asparagaceae	Lomandra multiflora subsp. multiflora	Lomandra	1
Poaceae	Melinis repens	Red Natal-grass	1
Hydrocharitaceae	Ottelia ovalifolia subsp. ovalifolia	Swamp Lily	1
Poaceae	Panicum larcomianum		1
Poaceae	Paspalidium caespitosum	Brigalow Grass	1
Poaceae	Paspalidium jubiflorum	Warrego Grass	1
Poaceae	Themeda triandra	Kangaroo Grass	1
Poaceae	Thyridolepis xerophila	Thyridolepis	1
Poaceae	Tragus australianus	Tickgrass	1
Hemerocallidaceae	Tricoryne elatior	Yellow Rush Lily	1
Poaceae	Urochloa foliosa	Leafy Panic	1
Poaceae	Urochloa gilesii	Hairy-edged Armgrass	1
Poaceae	Urochloa panicoides var. panicoides		1
Poaceae	Urochloa subquadripara	Armgrass Millet	1
Xanthorrhoeaceae	Xanthorrhoea	Grasstree	1

Lifeform - Plants

Number of Plants **296**

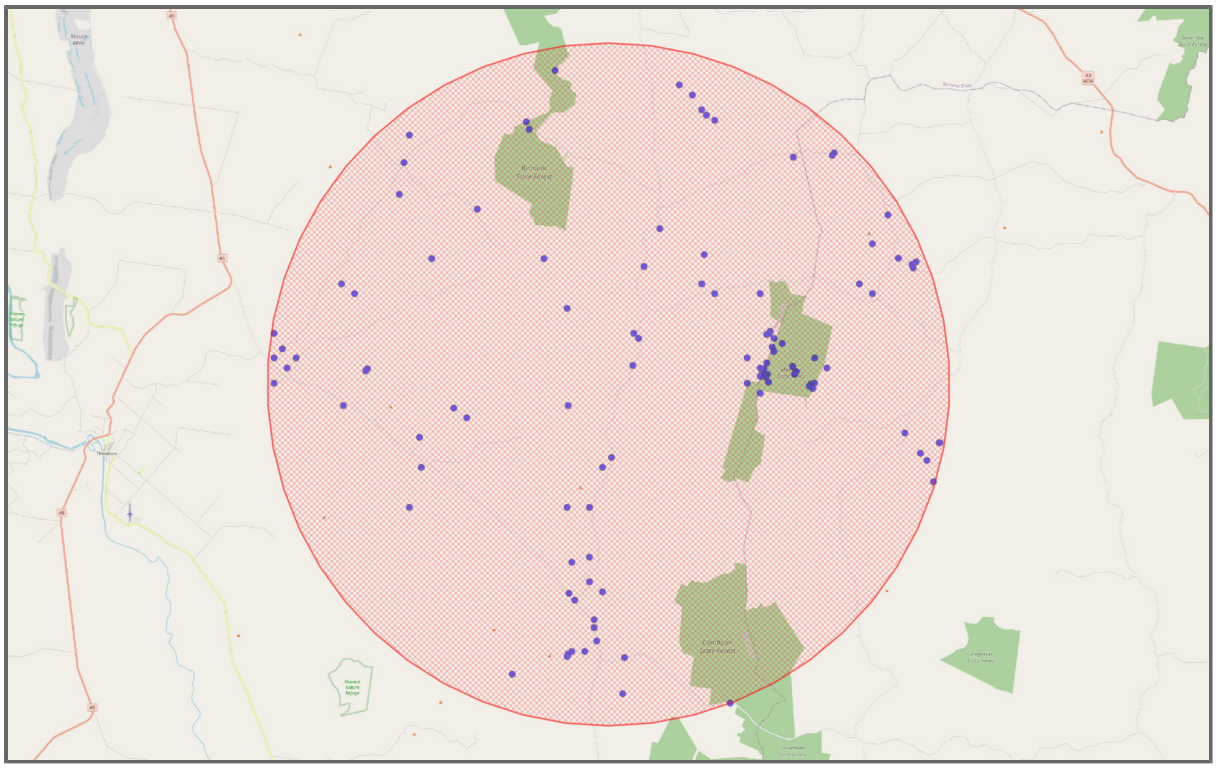


Figure 25 : Map of Lifeform - Plants

Table 24: Lifeform - Plants (Link to full list)

Family	*Scientific Name*	Common Name	No. Occurrences
Myrtaceae	Eucalyptus crebra	Yellow-branched Ironbark	9
Pittosporaceae	Pittosporum angustifolium	Native Willow	7
Poaceae	Poaceae	Grasses	7
Euphorbiaceae	Bertya pedicellata		6
Myrtaceae	Corymbia citriodora	Lemon-scented Gum	6
Solanaceae	Solanum furfuraceum	Corky Nightshade	6
Fabaceae	Vachellia bidwillii		5
Fabaceae	Acacia conferta	Crowded-leaved Wattle	4
Fabaceae	Acacia sparsiflora	Currawang	4
Ebenaceae	Diospyros humilis	Ebony	4
Cactaceae	Opuntia tomentosa	Velvet Pear	4
Campanulaceae	Wahlenbergia queenslandica	Bluebell	4
Fabaceae	Acacia bancroftiorum		3
Casuarinaceae	Allocasuarina littoralis	Black Sheoak	3
Rhamnaceae	Alphitonia excelsa	Red Ash	3
Poaceae	Enneapogon gracilis	Slender Nineawn	3
Poaceae	Enneapogon lindleyanus	Purple-head Nine-awn	3
Goodeniaceae	Goodenia grandiflora	Mountain Primrose	3
Fabaceae	Hovea longipes	Brush Hovea	3
Poaceae	Panicum effusum	Hairy Panic	3
Cyperaceae	Schoenus kennyi		3
Solanaceae	Solanum mitchellianum		3
Malvaceae	Abutilon auritum	Chinese Lantern	2
Fabaceae	Acacia leiocalyx	Black Wattle	2
Rutaceae	Acronychia pauciflora	Soft Acronychia	2

Sapindaceae	Alectryon diversifolius	Scrub Boonaree	2
Poaceae	Aristida calycina var. calycina	Dark Wire-grass	2
Aristolochiaceae	Aristolochia elegans	Calico-flower	2
Poaceae	Arundinella nepalensis	Reedgrass	2
Cyperaceae	Bolboschoenus caldwellii	Salt Club-sedge	2
Acanthaceae	Brunoniella australis	Blue Trumpet	2
Asteraceae	Calotis dentex	White Burr Daisy	2
Asteraceae	Camptacra barbata		2
Fabaceae	Cassia brewsteri	Bean Tree	2
Fabaceae	Cassia tomentella	Velvet Cassia	2
Pteridaceae	Cheilanthes distans	Bristly Cloak-fern	2
Poaceae	Cleistochloa subjuncea		2
Rutaceae	Coatesia paniculata	Axe-breaker	2
Asteraceae	Cotula australis	Common Cotula	2
Rubiaceae	Cyclophyllum coprosmoides var. coprosmoides		2
Cyperaceae	Cyperus gracilis	Slender Flat-sedge	2
Celastraceae	Denhamia pittosporoides	Orange Boxwood	2
Fabaceae	Desmodium rhytidophyllum	Desmodium	2
Hemerocallidaceae	Dianella brevipedunculata		2
Hemerocallidaceae	Dianella longifolia	Blueberry Lily	2
Sapindaceae	Elattostachys xylocarpa	White Tamarind	2
Poaceae	Eragrostis megalosperma	A Love Grass	2
Scrophulariaceae	Eremophila deserti	Turkey-bush	2
Scrophulariaceae	Eremophila mitchellii	Budda	2
Poaceae	Eriochloa pseudoacrotricha	Early Spring Grass	2
Myrtaceae	Eucalyptus bakeri	Baker's Mallee	2
Myrtaceae	Eucalyptus crebra x Eucalyptus melanophloia		2
Myrtaceae	Eucalyptus decorticans	Gum Top Ironbark	2
Euphorbiaceae	Euphorbia tannensis subsp. eremophila	Bottle Tree Caustic	2
Asparagaceae	Eustrephus latifolius	Wombat Berry	2
Rubiaceae	Everistia vacciniifolia	Small-leaved Canthium	2
Euphorbiaceae	Excoecaria dallachyana	Scrub Poison Tree	2
Rutaceae	Geijera parviflora	Wilga	2
Myrtaceae	Gossia bidwillii	Python Tree	2
Proteaceae	Grevillea longistyla	Long-style Grevillea	2
Fabaceae	Indigofera colutea	Sticky Indigo	2
Fabaceae	Jacksonia scoparia	Dogwood	2
Apocynaceae	Leichhardtia viridiflora	Green Berry Creeper	2
Asteraceae	Leiocarpa websteri	Narrow Plover-daisy	2
Brassicaceae	Lepidium didymum	Lesser Swine's-cress	2
Linderniaceae	Lindernia hyssopoides		2
Asparagaceae	Lomandra confertifolia subsp. pallida	Matrush	2
Ericaceae	Melichrus sp. Isla Gorge (P.Sharpe+ 601)		2
Oleaceae	Notelaea microcarpa	Native Olive	2
Asteraceae	Olearia canescens subsp. discolor		2
Cactaceae	Opuntia streptacantha	Cardona Pear	2
Meliaceae	Owenia venosa	Crow's Apple	2
Poaceae	Panicum mitchellii	Mitchell's Panick Grass	2
Poaceae	Paspalidium gracile	Paspalidium	2
Passifloraceae	Passiflora aurantia	Norfolk Island Passionfruit	2
Araceae	Pistia stratiotes	Water Lettuce	2
Acanthaceae	Pseuderanthemum variabile	Pastel Flower	2
Fabaceae	Pultenaea bracteamajor		2
Acanthaceae	Rostellularia adscendens	Purple Pipe-cleaner	2
Asteraceae	Rutidosis murchisonii		2
Santalaceae	Santalum lanceolatum	Northern Sandalwood	2

Cyperaceae	Scleria sphacelata	Scleria	2
Fabaceae	Senna artemisioides subsp. zygophylla	Narrow-leaf Desert Cassia	2
Fabaceae	Senna coronilloides		2
Malvaceae	Seringia corollata	Keraudrenia	2
Malvaceae	Sida hackettiana	Spiked Sida	2
Brassicaceae	Sisymbrium erysimoides	Smooth Mustard	2
Solanaceae	Solanum aviculare	Kangaroo Apple	2
Solanaceae	Solanum jucundum		2
Solanaceae	Solanum nemophilum		2
Solanaceae	Solanum seaforthianum	Brazilian Nightshade	2
Poaceae	Sporobolus creber	Western Rat-tail Grass	2
Celastraceae	Stackhousia muricata	Stackhousia	2
Fabaceae	Swainsona queenslandica	Smooth Darling Pea	2
Asteraceae	Tagetes minuta	Stinking Roger	2
Meliaceae	Turraea pubescens	Native Honeysuckle	2
Asteraceae	Vittadinia bicolor		2
Asteraceae	Vittadinia hispidula var. setosa		2
Fabaceae	Zornia pallida		2
Malvaceae	Abutilon calliphyllum	Velvet Lanternflower	1
Malvaceae	Abutilon oxycarpum var. incanum		1
Malvaceae	Abutilon oxycarpum var. oxycarpum		1
Malvaceae	Abutilon tubulosum		1
Fabaceae	Acacia amblygona	Fan Wattle	1
Fabaceae	Acacia angusta		1
Fabaceae	Acacia crassa	Curracabah	1
Fabaceae	Acacia fasciculifera	Scaly Bark	1
Fabaceae	Acacia glaucocarpa	Hickory Wattle	1
Fabaceae	Acacia leiocalyx subsp. leiocalyx	Curracabah	1
Fabaceae	Acacia penninervis	Mountain Hickory	1
Fabaceae	Acacia podalyriifolia	Mount Morgan Wattle	1
Fabaceae	Acacia rhodoxylon	Ringy Rosewood	1
Fabaceae	Aeschynomene brevifolia		1
Violaceae	Afrohybanthus stellarioides		1
Lamiaceae	Ajuga australis	Austral Bugle	1
Apocynaceae	Alstonia constricta	Quinine Bush	1
Amaranthaceae	Amaranthus viridis	Green Amaranth	1
Vitaceae	Ampelocissus gardineri		1
Loranthaceae	Amyema congener subsp. rotundifolia		1
Poaceae	Ancistrachne uncinulata	Hooked-hairy Panic Grass	1
Papaveraceae	Argemone ochroleuca subsp. ochroleuca	Prickly Poppy	1
Poaceae	Aristida gracilipes	Three-awn Speargrass	1
Sapindaceae	Atalaya hemiglauca	Whitewood	1
Sapindaceae	Atalaya salicifolia	Atalaya	1
Myrtaceae	Backhousia angustifolia	Narrow Leaf Myrtle	1
Poaceae	Bothriochloa decipiens	Bothriochloa	1
Asteraceae	Calotis cuneata	Mountain Burr-daisy	1
Capparaceae	Capparis anomala	Warrior Bush	1
Capparaceae	Capparis arborea	Native Pomegranate	1
Capparaceae	Capparis canescens	Wild Orange	1
Capparaceae	Capparis lasiantha	Nepine	1
Capparaceae	Capparis mitchellii	Native Orange	1
Capparaceae	Capparis sarmentosa	Scrambling Caper	1
Cyperaceae	Carex inversa	Dwarf Sedge	1
Apocynaceae	Carissa ovata	Conkerberry	1
Asteraceae	Cassinia laevis	Cough Bush	1
Lauraceae	Cassytha paniculata	Ribbed Dodder Laurel	1

Casuarinaceae	Casuarina cristata	Belah	1
Cyperaceae	Caustis flexuosa	Slender Twist-rush	1
Asteraceae	Centipeda minima subsp. minima	Spreading Sneezeweed	1
Pteridaceae	Cheilanthes sieberi subsp. sieberi	Rock Fern	1
Poaceae	Chloris truncata	Windmill Grass	1
Poaceae	Chloris ventricosa	Tall Windmill Grass	1
Asteraceae	Cirsium vulgare	Spear Thistle	1
Vitaceae	Clematicissus opaca	Pepper Vine	1
Gyrostemonaceae	Codonocarpus attenuatus	Bell-fruit Tree	1
Commelinaceae	Commelina cyanea	Scurvy Weed	1
Myrtaceae	Corymbia trachyphloia	White Bloodwood	1
Sapindaceae	Cossinia australiana	Cossinia	1
Fabaceae	Crotalaria medicaginea var. neglecta	Trefoil Rattlepod	1
Euphorbiaceae	Croton insularis	Silver Queensland Cascarilla	1
Cucurbitaceae	Cucumis anguria var. anguria	West Indian Gherkin	1
Asteraceae	Cyanthillium cinereum	Ironweed	1
Orchidaceae	Cymbidium canaliculatum	Tiger Orchid	1
Cyperaceae	Cyperus concinnus	Trim Flat-sedge	1
Cyperaceae	Cyperus exaltatus	Tall Flat-sedge	1
Cyperaceae	Cyperus fulvus	Sticky Sedge	1
Fabaceae	Daviesia filipes subsp. filipes		1
Amaranthaceae	Deeringia amaranthoides	Redberry	1
Celastraceae	Denhamia cunninghamii	Narrow-leaf Maytenus	1
Celastraceae	Denhamia pittosporoides subsp. pittosporoides	Veiny Denhamia	1
Fabaceae	Desmodium varians	Slender Tick-trefoil	1
Poaceae	Dichanthium sericeum subsp. humilius	Dwarf Bluegrass	1
Poaceae	Dichanthium sericeum subsp. sericeum	Silky Blue-grass	1
Dioscoreaceae	Dioscorea transversa	Native Yam	1
Cucurbitaceae	Diplocyclos palmatus subsp. affinis	Native Cucumber	1
Cucurbitaceae	Diplocyclos palmatus subsp. palmatus		1
Sapindaceae	Dodonaea triangularis	Hopbush	1
Bignoniaceae	Dolichandra unguis-cati	Cat's Claw Creeper	1
Droseraceae	Drosera lunata		1
Chenopodiaceae	Dysphania pumilio	Small Crumbweed	1
Boraginaceae	Ehretia saligna var. membranifolia	Peach Bush	1
Celastraceae	Elaeodendron australe var. integrifolium		1
Celastraceae	Elaeodendron australe	White Cedar	1
Poaceae	Enneapogon nigricans	Black-head Grass	1
Poaceae	Enneapogon truncatus	Bottlewashers	1
Poaceae	Enteropogon unispiceus		1
Poaceae	Eragrostis alveiformis	Granite Love-grass	1
Poaceae	Eragrostis sororia	Lovegrass	1
Poaceae	Eragrostis spartinoides	Lovegrass	1
Fabaceae	Erythrina vespertilio subsp. vespertilio		1
Fabaceae	Erythrostemon gilliesii	Bird-of-paradise Flower	1
Myrtaceae	Eucalyptus coolabah	Coolabah	1
Myrtaceae	Eucalyptus exserta	Queensland Peppermint	1
Myrtaceae	Eucalyptus moluccana	Gum-topped Box	1
Myrtaceae	Eucalyptus tereticornis	Forest Red Gum	1
Myrtaceae	Eucalyptus	Studley Park Gum	1
Euphorbiaceae	Euphorbia hirta	Asthma Plant	1
Euphorbiaceae	Euphorbia papillifolia var. papillifolia		1
Rubiaceae	Everistia vacciniifolia var. vacciniifolia		1
Cyperaceae	Fimbristylis dichotoma	Fringe-rush	1
Rutaceae	Flindersia collina	Broad-leaved Leopard Tree	1
Cyperaceae	Gahnia aspera	Rough Saw-sedge	1

Fabaceae	Galactia tenuiflora var. lucida		1
Geraniaceae	Geranium solanderi var. solanderi	Austral Crane's-bill	1
Geraniaceae	Geranium solanderi	Austral Geranium	1
Verbenaceae	Glandularia aristigera	Mayne's Pest	1
Fabaceae	Glycine	Twining Glycine	1
Goodeniaceae	Goodenia glabra	Smooth Goodenia	1
Goodeniaceae	Goodenia rotundifolia		1
Malvaceae	Grewia latifolia	Dysentery Plant	1
Haloragaceae	Haloragis glauca	Grey Raspwort	1
Haloragaceae	Haloragis stricta		1
Fabaceae	Hardenbergia violacea	Native Lilac	1
Poaceae	Heteropogon contortus	Black Speargrass	1
Dilleniaceae	Hibbertia stricta	Upright Guinea-flower	1
Dilleniaceae	Hibbertia	Guinea Flowers	1
Araliaceae	Hydrocotyle acutiloba	Broad-leaf Pennywort	1
Hypoxidaceae	Hypoxis pratensis	Golden Weather-grass	1
Fabaceae	Indigofera linifolia	Flax-leaf Indigo	1
Fabaceae	Indigofera linnaei	Birdsville Indigo	1
Oleaceae	Jasminum didymum subsp. racemosum	Native Jasmine	1
Verbenaceae	Lantana montevidensis	Creeping Lantana	1
Asparagaceae	Laxmannia gracilis	Slender Wire Lily	1
Apocynaceae	Leichhardtia viridiflora subsp. viridiflora	Native Pear	1
Brassicaceae	Lepidium bonariense	Peppercress	1
Poaceae	Leptochloa digitata	Umbrella Cane-grass	1
Asteraceae	Leuzea australis	Austral Cornflower	1
Arecaceae	Livistona nitida	Carnavon Gorge Cabbage Palm	1
Asparagaceae	Lomandra multiflora subsp. multiflora	Lomandra	1
Myrtaceae	Lophostemon suaveolens	Swamp Box	1
Onagraceae	Ludwigia octovalvis	Willow Primrose	1
Moraceae	Maclura pomifera	Osage-orange	1
Fabaceae	Medicago polymorpha	Spineless Burr Medic	1
Poaceae	Melinis repens	Red Natal-grass	1
Primulaceae	Myrsine variabilis	Rapanea	1
Myrtaceae	Myrtaceae	Myrtle Family	1
Solanaceae	Nicotiana forsteri		1
Solanaceae	Nicotiana megalosiphon	Wild Tobacco	1
Amaranthaceae	Nyssanthes diffusa	Barbed-wire Weed	1
Asteraceae	Olearia canescens	Daisy Bush	1
Hydrocharitaceae	Ottelia ovalifolia subsp. ovalifolia	Swamp Lily	1
Meliaceae	Owenia x reliqua	Bellata Owenia	1
Oxalidaceae	Oxalis perennans	Native Sorrel	1
Asteraceae	Ozothamnus cassinioides	Everlasting	1
Bignoniaceae	Pandorea pandorana	Wonga Vine	1
Poaceae	Panicum larcomianum		1
Apocynaceae	Parsonsia eucalyptophylla	Gargaloo	1
Poaceae	Paspalidium caespitosum	Brigalow Grass	1
Poaceae	Paspalidium jubiflorum	Warrego Grass	1
Passifloraceae	Passiflora aurantia var. aurantia	Blunt-leaved Passionfruit	1
Phyllanthaceae	Phyllanthus maderaspatensis	Spurge	1
Phyllanthaceae	Phyllanthus virgatus	Phyllanthus	1
Phytolaccaceae	Phytolacca octandra	Red-ink Weed	1
Thymelaeaceae	Pimelea glauca	Smooth Riceflower	1
Sapotaceae	Planchonella cotinifolia	Yellow Lemon	1
Plantaginaceae	Plantago debilis	Shade Plantain	1
Caryophyllaceae	Polycarpaea corymbosa var. minor		1
Phyllanthaceae	Poranthera microphylla	Small Poranthera	1

Rubiaceae	Psydrax longipes		1
Rubiaceae	Psydrax odorata f. buxifolia		1
Rubiaceae	Psydrax odorata	Psydrax	1
Fabaceae	Pultenaea millarii var. angustifolia		1
Asteraceae	Rhodanthe polyphylla		1
Fabaceae	Rhynchosia minima	Rhynchosia	1
Lamiaceae	Salvia reflexa	Mintweed	1
Chenopodiaceae	Sclerolaena birchii	Galvinised Burr	1
Chenopodiaceae	Sclerolaena muricata var. muricata	Sclerolaena	1
Apocynaceae	Secamone elliptica	Secamone	1
Asteraceae	Senecio bathurstianus	Dissected Fireweed	1
Asteraceae	Senecio brigalowensis		1
Fabaceae	Senna occidentalis	Western Senna	1
Malvaceae	Sida corrugata	Variable Sida (peltate-hairy)	1
Asteraceae	Sigesbeckia orientalis	Indian Weed	1
Brassicaceae	Sisymbrium thellungii	African Turnip-weed	1
Solanaceae	Solanaceae	Tomato	1
Solanaceae	Solanum ellipticum	Potato Bush	1
Solanaceae	Solanum parvifolium	Nightshade	1
Fabaceae	Spartium junceum	Spanish Broom	1
Rubiaceae	Spermacoce brachystema	Spermacoce	1
Rubiaceae	Spermacoce multicaulis		1
Stylidiaceae	Stylidium eglandulosum	Woolly-stemmed Triggerplant	1
Fabaceae	Tephrosia filipes subsp. filipes		1
Lamiaceae	Teucrium junceum		1
Poaceae	Themeda triandra	Kangaroo Grass	1
Poaceae	Thyridolepis xerophila	Thyridolepis	1
Poaceae	Tragus australianus	Tickgrass	1
Hemerocallidaceae	Tricoryne elatior	Yellow Rush Lily	1
Poaceae	Urochloa foliosa	Leafy Panic	1
Poaceae	Urochloa gilesii	Hairy-edged Armgrass	1
Poaceae	Urochloa panicoides var. panicoides		1
Poaceae	Urochloa subquadripara	Armgrass Millet	1
Urticaceae	Urtica incisa	Scrub Nettle	1
Verbenaceae	Verbena africana	Inland Verbena	1
Asteraceae	Verbesina encelioides subsp. encelioides	Crownbeard	1
Asteraceae	Vittadinia dissecta var. hirta	Dissected New Holland Daisy	1
Asteraceae	Vittadinia hispidula var. hispidula		1
Asteraceae	Vittadinia hispidula		1
Asteraceae	Vittadinia sulcata	Furrowed New Holland Daisy	1
Asteraceae	Xanthium spinosum	Bathurst Burr	1
Xanthorrhoeaceae	Xanthorrhoea	Grasstree	1
Rutaceae	Zanthoxylum brachyacanthum	Thorny Yellowwood	1
Rutaceae	Zieria cytisoides	Downy Zieria	1
Rutaceae	Zieria smithii	Sandfly Zieria	1
Fabaceae	Zornia muriculata subsp. muriculata		1
Fabaceae	Zornia muriculata	Upright Zornia	1

Lifeform - Protozoa

Number of Protozoa **0**

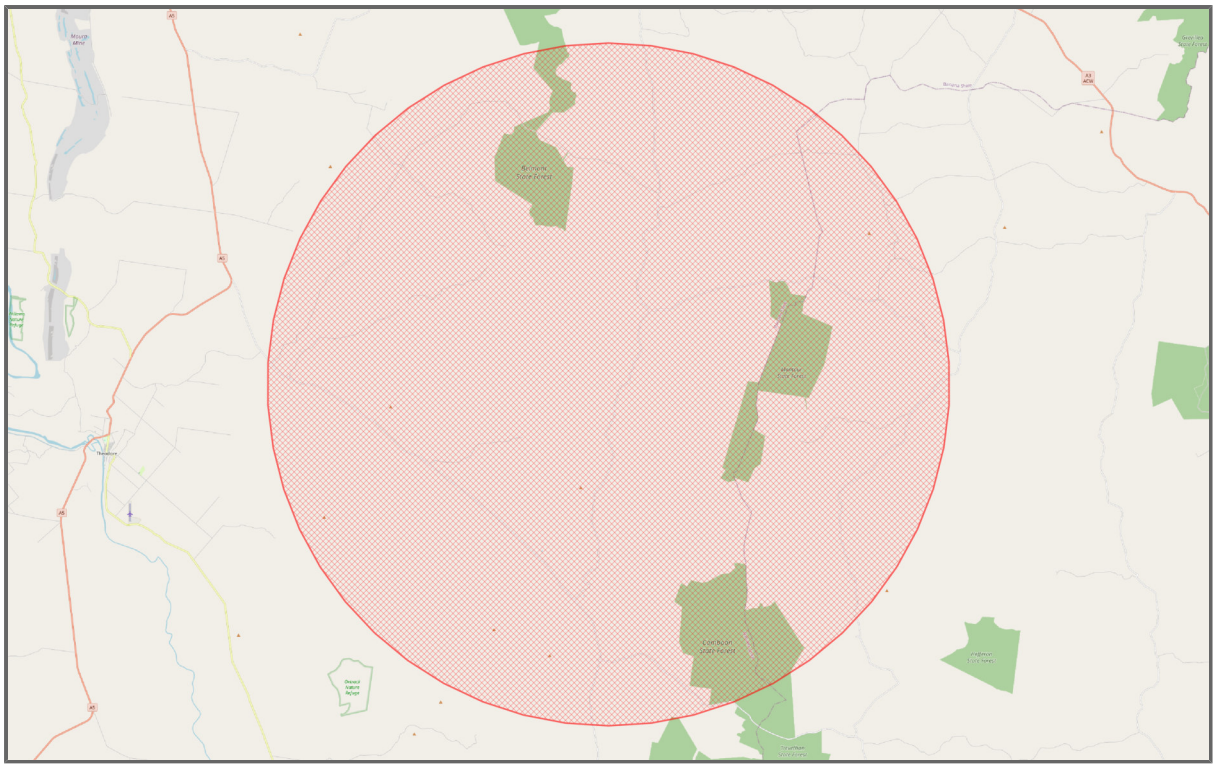


Figure 26 : Map of Lifeform - Protozoa

Table 25: Lifeform - Protozoa (Link to full list)

Family	*Scientific Name*	Common Name	No. Occurrences

Lifeform - Reptiles

Number of Reptiles **44**

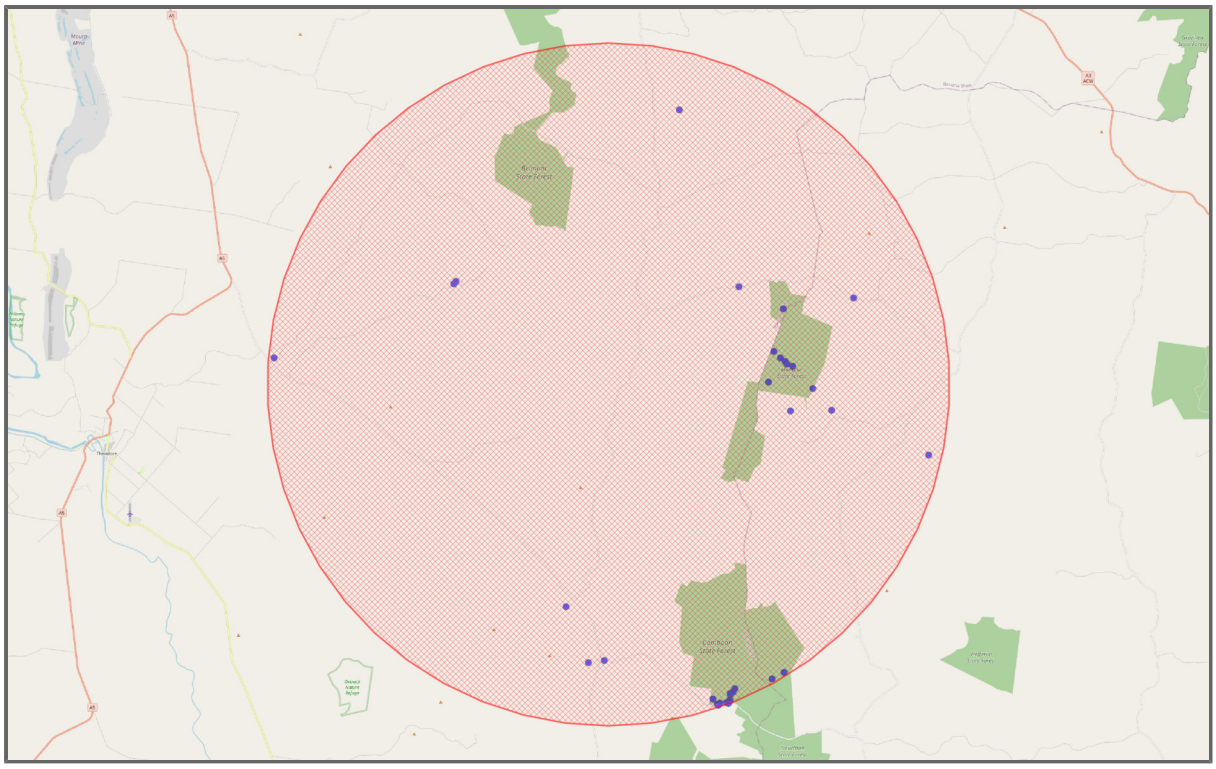


Figure 27 : Map of Lifeform - Reptiles

Table 26: Lifeform - Reptiles (Link to full list)

Family	*Scientific Name*	Common Name	No. Occurrences
Gekkonidae	Heteronotia binoei	Bynoe's Gecko	21
Agamidae	Diporiphora australis	Tommy Roundhead	12
Gekkonidae	Gehyra dubia	Dubious Dtella	11
Diplodactylidae	Strophurus taenicauda albiocularis		11
Scincidae	Carlia pectoralis	Open-litter Rainbow-skink	9
Scincidae	Cryptoblepharus pulcher pulcher	Elegant Snake-eyed Skink	9
Scincidae	Lerista fragilis	Eastern Mulch-slider	9
Scincidae	Lygisaurus foliorum	Tree-base Litter-skink	9
Diplodactylidae	Oedura tryoni	Southern Spotted Velvet Gecko	8
Diplodactylidae	Diplodactylus vittatus	Eastern Stone Gecko	7
Elapidae	Brachyurophis australis	Coral Snake	5
Pygopodidae	Paradelma orientalis	Brigalow Scaly-foot	5
Elapidae	Cryptophis nigrescens	Eastern Small-eyed Snake	4
Diplodactylidae	Amalosia rhombifer	Zigzag Velvet Gecko	3
Elapidae	Denisonia maculata	Ornamental Snake	3
Scincidae	Egernia striolata	Tree Skink	3
Pygopodidae	Lialis burtonis	Burton's Snake-lizard	3
Carphodactylidae	Nephrurus asper	Prickly Knob-tailed Gecko	3
Agamidae	Pogona barbata	Common Bearded Dragon	3
Diplodactylidae	Strophurus taenicauda	Golden-tailed Gecko	3
Elapidae	Suta dwyeri	Dwyer's Snake	3
Varanidae	Varanus varius	Lace Monitor	3
Agamidae	Chlamydosaurus kingii	Frilled Lizard	2
Scincidae	Concinnia tenuis	Barred-sided Skink	2
Elapidae	Demansia psammophis	Yellow-faced Whip Snake	2

Gekkonidae	Gehyra versicolor	Eastern Tree Dtella	2
Elapidae	Hoplocephalus bitorquatus	Pale-headed Snake	2
Scincidae	Lerista punctatovittata	Eastern Robust Slider	2
Scincidae	Morethia boulengeri	Boulenger's Snake-eyed Skink	2
Scincidae	Morethia taeniopleura	Fire-tailed Skink	2
Varanidae	Varanus gouldii	Gould's Goanna	2
Pythonidae	Aspidites melanocephalus	Black-headed Python	1
Colubridae	Boiga irregularis	Night Tiger	1
Chelidae	Chelodina (Chelodina) longicollis	Snake-necked Turtle	1
Scincidae	Ctenotus spaldingi	Spalding's Ctenotus	1
Scincidae	Cyclodomorphus gerrardii	Pink-tongued Skink	1
Scincidae	Eulamprus quoyii	Eastern Water-skink	1
Gekkonidae	Gehyra		1
Scincidae	Lerista		1
Scincidae	Praeteropus brevicollis	Short-necked Worm-skink	1
Elapidae	Pseudechis australis	Mulga Snake	1
Scincidae	Pygmaeascincus timlowi	Dwarf Litter-skink	1
Elapidae	Suta suta	Curl Snake	1
Varanidae	Varanus tristis	Black-headed Monitor	1

Further Links

Geoscience Australia: http://www.ga.gov.au/
Global Biodiversity Information Facility: https://www.gbif.org/
Threatened Species & Ecological Communities: https://www.environment.gov.au/topics/threatened-species-ecological-communities
WWF Ecoregions: https://worldwildlife.org/biomes
Environmental Resources Information Network (ERIN): https://www.environment.gov.au/topics/science-and-research/databases-and-maps/erin
Australian National Fish Expert Distributions: https://collections.ala.org.au/public/show/dr803
Lists of Australian endemic species: http://Intreasures.com/australia.html

Federal

Department of the Environment: https://www.environment.gov.au/

State/Territory

Australian Capital Territory

Environment and Sustainable Development Directorate: https://www.environment.act.gov.au/

New South Wales

Office of Environment and Heritage: http://www.environment.nsw.gov.au/

Northern Territory

Department of Land Resource Management: 'https://www.lrm.nt.gov.au/

Queensland

Department of Environment and Heritage Protection: https://www.ehp.qld.gov.au/

South Australia

Department of Environment, Water and Natural Resources: 'https://www.environment.sa.gov.au/Home

Tasmania

Department of Primary Industries, Parks, Water and Environment: http://www.dpiw.tas.gov.au/

Western Australia

Department of Parks and Wildlife: https://www.dpaw.wa.gov.au/

Victoria

Department of Environment and Primary Industries: http://www.depi.vic.gov.au/

References

1. Lymburner, L., Tan, P., Mueller, N., Thackway, R., Lewis, A., Thankappan, M., Randall, L., Islam, A. and Senarath, U. (2010). 250 metre Dynamic Land Cover Dataset of Australia (1st Edition), Geoscience Australia, Canberra.
2. Olson, D. M., Dinerstein, E., Wikramanayake, E. D., Burgess, N. D., Powell, G. V. N., Underwood, E. C., D'Amico, J. A., Itoua, I., Strand, H. E., Morrison, J. C., Loucks, C. J., Allnutt, T. F., Ricketts, T. H., Kura, Y., Lamoreux, J. F., Wettengel, W. W., Hedao, P. and Kassem, K. R. (2001). Terrestrial ecoregions of the world: a new map of life on Earth. Bioscience 51(11):933-938.
3. Commonwealth of Australia (2006). A Guide to the Integrated Marine and Coastal Regionalisation of Australia Version 4.0. Department of the Environment and Heritage, Canberra, Australia.
4. Spalding, M.D., Fox, H.E., Allen, G.R., Davidson, N., Ferdaña, Z.A., Finlayson, M., Halpern, B.S., Jorge, M.A., Lombana, A., Lourie, S.A., Martin, K.D., McManus, E., Molnar, Jennifer, Recchia, C.A. and Robertson, J. (2007). Marine Ecoregions of the World: A Bioregionalization of Coastal and Shelf Areas. Bioscience 57(7): 573–583.
https://www.nature.org/ourinitiatives/regions/northamerica/unitedstates/colorado/scienceandstrategy/marine-ecoregions-of-the-world.pdf
5. Abell, R., Thieme, M.L., Revenga, C., Bryer, M., Kottelat, M., Bogutskaya, N., Coad, B., Mandrak, N., Contreras Balderas, S., Bussing, W., Stiassny, M.L.J., Skelton, P., Allen, G.R., Unmack, P., Naseka, A., Ng, R., Sindorf, N., Robertson, J., Armijo, E., Higgins, J.V., Heibel, T.J., Wikramanayake, E., Olson, D., Lopez, H.L., Reis, R.E., Lundberg, J.G., Sabaj Pérez, M.H. and Petry, P. (2008). Freshwater Ecoregions of the World: A new map of biogeographic units for freshwater biodiversity conservation. BioScience 58(5): 403-414.
http://www.feow.org/download/Abell_et_al_08_BioScience.pdf
6. Crisp, M.D., Laffan, S. Linder, H.P. and Monro, A. (2001). Endemism in the Australian flora. Journal of Biogeography 28: 183-198.
7. Atlas of Living Australia (2013). Spatial Portal Help: Area Report. https://www.ala.org.au/spatial-portal-help/area-report/
8. Commonwealth of Australia (2013). Migratory Species in Australia. Department of the Environment, Canberra.
https://www.environment.gov.au/topics/biodiversity/migratory-species
9. Atlas of Living Australia (2013). FAQ: Data Sensitivity. https://www.ala.org.au/faq/data-sensitivity/
10. Commonwealth of Australia (2010). Gazetteer of Australia Place Name Search. Geoscience Australia, Canberra.
http://www.ga.gov.au/place-names/
11. NASA Earth Observatory (2000). Net Primary Productivity. https://earthobservatory.nasa.gov/GlobalMaps/view.php?d1=MOD17A2_M_PSN

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 26-Aug-2024

Summary
Details
- Matters of NES
- Other Matters Protected by the EPBC Act
- Extra Information

Caveat
Acknowledgements

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	5
Listed Threatened Species:	38
Listed Migratory Species:	12

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at https://www.dcceew.gov.au/parks-heritage/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	18
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	1
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	6
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.
Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text	Buffer Status
Brigalow (Acacia harpophylla dominant and co-dominant)	Endangered	Community known to occur within area	In feature area
Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions	Endangered	Community may occur within area	In feature area
Poplar Box Grassy Woodland on Alluvial Plains	Endangered	Community likely to occur within area	In feature area
Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions	Endangered	Community likely to occur within area	In buffer area only
Weeping Myall Woodlands	Endangered	Community likely to occur within area	In feature area

Listed Threatened Species [Resource Information]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Erythrotriorchis radiatus Red Goshawk [942]	Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Falco hypoleucos](#) Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area	In feature area
[Gallinago hardwickii](#) Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat may occur within area	In feature area
[Geophaps scripta scripta](#) Squatter Pigeon (southern) [64440]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Grantiella picta](#) Painted Honeyeater [470]	Vulnerable	Species or species habitat may occur within area	In feature area
[Hirundapus caudacutus](#) White-throated Needletail [682]	Vulnerable	Species or species habitat may occur within area	In feature area
[Neochmia ruficauda ruficauda](#) Star Finch (eastern), Star Finch (southern) [26027]	Endangered	Species or species habitat likely to occur within area	In feature area
[Rostratula australis](#) Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area	In feature area
[Stagonopleura guttata](#) Diamond Firetail [59398]	Vulnerable	Species or species habitat may occur within area	In feature area
[Turnix melanogaster](#) Black-breasted Button-quail [923]	Vulnerable	Species or species habitat may occur within area	In feature area
MAMMAL			
[Chalinolobus dwyeri](#) Large-eared Pied Bat, Large Pied Bat [183]	Endangered	Species or species habitat may occur within area	In feature area
[Dasyurus hallucatus](#) Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] [331]	Endangered	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Macroderma gigas](#)			
Ghost Bat [174]	Vulnerable	Species or species habitat may occur within area	In feature area
[Nyctophilus corbeni](#)			
Corben's Long-eared Bat, South-eastern Long-eared Bat [83395]	Vulnerable	Species or species habitat may occur within area	In feature area
[Petauroides volans](#)			
Greater Glider (southern and central) [254]	Endangered	Species or species habitat known to occur within area	In feature area
[Petaurus australis australis](#)			
Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat may occur within area	In feature area
[Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)](#)			
Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat likely to occur within area	In feature area
[Pteropus poliocephalus](#)			
Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour may occur within area	In feature area
PLANT			
[Arthraxon hispidus](#)			
Hairy-joint Grass [9338]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Cadellia pentastylis](#)			
Ooline [9828]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Cossinia australiana](#)			
Cossinia [3066]	Endangered	Species or species habitat known to occur within area	In feature area
[Dichanthium queenslandicum](#)			
King Blue-grass [5481]	Endangered	Species or species habitat known to occur within area	In feature area
[Dichanthium setosum](#)			
bluegrass [14159]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Leuzea australis listed as Rhaponticum australe			
Austral Cornflower, Native Thistle [9363]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Polianthion minutiflorum			
[82772]	Vulnerable	Species or species habitat may occur within area	In feature area
Solanum dissectum			
[75720]	Endangered	Species or species habitat may occur within area	In buffer area only
Solanum johnsonianum			
[84820]	Endangered	Species or species habitat may occur within area	In buffer area only
Xerothamnella herbacea			
[4146]	Endangered	Species or species habitat may occur within area	In feature area
REPTILE			
Delma torquata			
Adorned Delma, Collared Delma [1656]	Vulnerable	Species or species habitat may occur within area	In feature area
Denisonia maculata			
Ornamental Snake [1193]	Vulnerable	Species or species habitat known to occur within area	In feature area
Egernia rugosa			
Yakka Skink [1420]	Vulnerable	Species or species habitat may occur within area	In feature area
Elseya albagula			
Southern Snapping Turtle, White-throated Snapping Turtle [81648]	Critically Endangered	Species or species habitat may occur within area	In feature area
Furina dunmalli			
Dunmall's Snake [59254]	Vulnerable	Species or species habitat may occur within area	In feature area
Hemiaspis damelii			
Grey Snake [1179]	Endangered	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Rheodytes leukops](#)			
Fitzroy River Turtle, Fitzroy Tortoise, Fitzroy Turtle, White-eyed River Diver [1761]	Vulnerable	Species or species habitat likely to occur within area	In feature area
SNAIL			
[Adclarkia dawsonensis](#)			
Boggomoss Snail, Dawson River Snail, Dawson Valley Snail [67458]	Critically Endangered	Species or species habitat may occur within area	In buffer area only

Listed Migratory Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
[Apus pacificus](#)			
Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Migratory Terrestrial Species			
[Cuculus optatus](#)			
Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may occur within area	In feature area
[Hirundapus caudacutus](#)			
White-throated Needletail [682]	Vulnerable	Species or species habitat may occur within area	In feature area
[Monarcha melanopsis](#)			
Black-faced Monarch [609]		Species or species habitat may occur within area	In feature area
[Motacilla flava](#)			
Yellow Wagtail [644]		Species or species habitat may occur within area	In feature area
[Myiagra cyanoleuca](#)			
Satin Flycatcher [612]		Species or species habitat likely to occur within area	In feature area
[Rhipidura rufifrons](#)			
Rufous Fantail [592]		Species or species habitat known to occur within area	In feature area
Migratory Wetlands Species			
[Actitis hypoleucos](#)			
Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Calidris acuminata](#) Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
[Calidris ferruginea](#) Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
[Calidris melanotos](#) Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
[Gallinago hardwickii](#) Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat may occur within area	In feature area

Other Matters Protected by the EPBC Act

Listed Marine Species			[Resource Information]
Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
[Actitis hypoleucos](#) Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
[Anseranas semipalmata](#) Magpie Goose [978]		Species or species habitat may occur within area overfly marine area	In feature area
[Apus pacificus](#) Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
[Bubulcus ibis as Ardea ibis](#) Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
[Calidris acuminata](#) Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Calidris ferruginea](#) Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In feature area
[Calidris melanotos](#) Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area
[Chalcites osculans as Chrysococcyx osculans](#) Black-eared Cuckoo [83425]		Species or species habitat known to occur within area overfly marine area	In feature area
[Gallinago hardwickii](#) Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat may occur within area overfly marine area	In feature area
[Haliaeetus leucogaster](#) White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area	In feature area
[Hirundapus caudacutus](#) White-throated Needletail [682]	Vulnerable	Species or species habitat may occur within area overfly marine area	In feature area
[Merops ornatus](#) Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
[Monarcha melanopsis](#) Black-faced Monarch [609]		Species or species habitat may occur within area overfly marine area	In feature area
[Motacilla flava](#) Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Myiagra cyanoleuca			
Satin Flycatcher [612]		Species or species habitat likely to occur within area overfly marine area	In feature area
Pterodroma cervicalis			
White-necked Petrel [59642]		Species or species habitat may occur within area	In feature area
Rhipidura rufifrons			
Rufous Fantail [592]		Species or species habitat known to occur within area overfly marine area	In feature area
Rostratula australis as Rostratula benghalensis (sensu lato)			
Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area

Extra Information

State and Territory Reserves			[Resource Information]
Protected Area Name	Reserve Type	State	Buffer Status
Oxtrack	Nature Refuge	QLD	In buffer area only

EPBC Act Referrals				[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Theodore Wind Farm	2024/09842		Assessment	In feature area
Controlled action				
Construct and operate 447km high pressure gas transmission pipeline	2009/4976	Controlled Action	Post-Approval	In feature area
Construction of a high pressure buried gas pipeline, Kogan to Gladstone, QLD	2009/5029	Controlled Action	Post-Approval	In feature area
Queensland Curtis LNG Project - Pipeline Network	2008/4399	Controlled Action	Post-Approval	In feature area
Not controlled action				
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
Surat Basin Railway	2008/3944	Not Controlled Action	Completed	In buffer area only

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact us page.

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Queensland Government

WildNet species list

Search Criteria: Species List for a Specified Point
Species: All
Type: Native
Queensland status: Rare and threatened species
Records: All
Date: Since 1980
Latitude: -24.9007
Longitude: 150.4475
Distance: 25.5
Email: jethro.ottley@erm.com
Date submitted: Friday 23 Aug 2024 16:58:50
Date extracted: Friday 23 Aug 2024 17:00:05

The number of records retrieved = 8

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The information provided should be appropriately acknowledged as being derived from WildNet database when it is used. As the WildNet Program is still in a process of collating and vetting data, it is possible the information given is not complete. Go to the WildNet database webpage (https://www.qld.gov.au/environment/plants-animals/species-information/wildnet) to find out more about WildNet and where to access other WildNet information products approved for publication. Feedback about WildNet species lists should be emailed to wildlife.online@des.qld.gov.au.

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	birds	Apodidae	*Hirundapus caudacutus*	white-throated needletail		V	V	1
animals	mammals	Petauridae	*Petaurus australis australis*	yellow-bellied glider (southern subspecies)		V	V	3
animals	mammals	Phascolarctidae	*Phascolarctos cinereus*	koala		E	E	1
animals	mammals	Pseudocheiridae	*Petauroides volans volans*	southern greater glider		E	E	3
animals	reptiles	Diplodactylidae	*Strophurus taenicauda*	golden-tailed gecko		NT		5
plants	land plants	Asteraceae	*Leuzea australis*			V	V	1/1
plants	land plants	Euphorbiaceae	*Bertya pedicellata*			NT		2/2
plants	land plants	Sapindaceae	*Cossinia australiana*			E	E	1/1

CODES

I - Y indicates that the taxon is introduced to Queensland and has naturalised.

Q - Indicates the Queensland conservation status of each taxon under the *Nature Conservation Act 1992.*
The codes are Extinct (EX), Extinct in the Wild (PE), Critically Endangered (CR), Endangered (E), Vulnerable (V), Near Threatened (NT), Special Least Concern (SL) and Least Concern (C).

A - Indicates the Australian conservation status of each taxon under the *Environment Protection and Biodiversity Conservation Act 1999.*
The values of EPBC are Extinct (EX), Extinct in the Wild (XW), Critically Endangered (CE), Endangered (E), Vulnerable (V) and Conservation Dependent (CD).

Records - The first number indicates the total number of records of the taxon (wildlife records and species listings for selected areas).
This number is output as 99999 if it equals or exceeds this value. A second number located after a / indicates the number of specimen records for the taxon.
This number is output as 999 if it equals or exceeds this value.

APPENDIX C LIKELIHOOD OF OCCURENCE

A total of 46 MNES were considered in the LoO Assessment, including 41 threatened or migratory species and five threatened ecological communities (TECs). Of these, four threatened species and one migratory species are considered known or likely to occur in the Study Area, with two TECs considered known or likely to occur. 13 threatened or migratory species are considered as having the potential to occur (six flora, five fauna and two migratory species). The remaining species are considered unlikely to occur in the Study Area. Species that are MNES considered as known, likely or as having the potential to occur in the Study Area are presented in Table 1 below.

Of the five ecological communities considered under the LoO Assessment, **two** are known to occur in the Study Area:

- Brigalow (*Acacia harpophylla* dominant and co-dominant; and
- Poplar Box Grassy Woodland on Alluvial Plains.

The remaining **three** TECs are considered unlikely to occur based on ground-truthing completed within the Study Area:

- Semi-evergreen Vine Thickets of the Brigalow Belt (North and South) and Nandewar Bioregions
- Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions; and
- Weeping Myall Woodlands.

TABLE 1 THREATENED OR MIGRATORY SPECIES AND TECS THAT ARE KNOWN, LIKELY OR HAVE POTENTIAL TO OCCUR WITHIN THE STUDY AREA

Scientific Name	Common Name	EPBC Act Listing
Known		
Poplar Box Grassy Woodlands on Alluvial Plains TEC		E
Brigalow (Acacia harpophylla dominant and co-dominant) TEC		E
Geophaps scripta scripta	Squatter pigeon (southern)	V
Petauroides volans	Greater glider (southern and central)	E
Phascolarctos cinereus	Koala	E
Likely		
Chalinolobus dwyeri	Large-eared pied-bat	E
Potential		
Hirundapus caudacutus	White-throated needletail	V and Mi
Rostratula australis	Australian painted snipe	E
Stagonopleura guttata	Diamond firetail	V
Turnix melanogaster	Black-breasted button-quail	V
Apus pacificus	Fork-tailed swift	Mi
Petaurus australis australis	Yellow-bellied glider (south-eastern)	V
Xerothamnella herbacea		E
Solanum johnsonianum		E
Solanum dissectum		E
Rhaponticum australe	Austral cornflower	V
Cadellia pentastylis	Ooline	V
Cossinia australiana	Cossinia	E

Status listing per EPBC Act: CE = Critically Endangered; E = Endangered; V = Vulnerable; Mi = Migratory

Satin flycatcher (*Myiagra cyanoleuca*) and rufous fantail (*Rhipidura rufifrons*) were originally included in the referral information and assessed for potential impacts of the Proposed Action. Following recent changes to the EPBC Act Migratory Species list, these de-listed species no longer require assessment under the EPBC Act as MNES and are therefore not assessed as part of this PER.

Species Name	EPBC Act Status	Habitat Requirements	Study Area within Species Distribution	Records in the Study Area/ Locality	Comment on Likelihood of Occurrence in Study Area
Birds (including listed and migratory species)					
Sharp-tailed sandpiper (*Calidris acuminata*)	V and Mi	Prefers habitat on muddy edges of freshwater wetlands or brackish wetlands. Can be found at dams inland. Will often occupy coastal mudflats when ephemeral terrestrial wetlands have dried out. **Breeding habitat**: Does not breed in Australia. **Foraging habitat**: Foraging habitat is at the edge of the water of wetlands or intertidal mudflats, either on bare wet mud or sand, or in shallow water. Also among inundated vegetation of saltmarsh, grass or sedges. They forage in sewage ponds, and often in hypersaline environments. After rain, they may forage in paddocks of short grass, well away from water. They may forage on coastal mudflats at low tide, and move to freshwater wetlands near the coast to feed at high tide. **Roosting habitat:** Roosting occurs at the edges of wetlands, on wet open mud or sand, in shallow water, or in short sparse vegetation, such as grass or saltmarsh. Occasionally, they roost on sandy beaches, stony shores or on rocks in water. Potential foraging and roosting habitat is present within the Study Area associated with farm dams.	Yes	No	**Unlikely** to occur • Study Area is within the distribution for this species. PMST states species or species habitat may occur. • Marginal foraging and roosting habitat present within the Study Area associated with farm dams. Study Area is non-coastal, species prefers coastal environments. • No records for the species exist within the Study Area/Locality. The closest historic record (2000) is approx. 30km south-west (ALA, 2024). • No important habitat for this migratory species was detected in the Study Area during field surveys.
Curlew sandpiper (*Calidris ferruginea*)	CE and Mi	This species is recorded inland, though less often, including around ephemeral and permanent lakes, dams, waterholes and bore drains, usually with bare edges of mud or sand. They occur in both fresh and brackish waters. Occasionally they are recorded around floodwaters. **Breeding habitat:** This species does not breed in Australia.	Yes	No	**Unlikely** to occur • Study Area is within the distribution for this species. PMST states species or species habitat may occur. • Marginal foraging habitat in the form of farm dams present. • Study Area is non-coastal.

Species Name	EPBC Act Status	Habitat Requirements	Study Area within Species Distribution	Records in the Study Area/ Locality	Comment on Likelihood of Occurrence in Study Area
		Foraging habitat: potential marginal foraging habitat exists in the Study Area in the form of dams. **Roosting habitat:** this species roost in open situations with damp substrate, especially on bare shingle, shell or sand beaches, sandspits and islets in or around coastal or near-coastal lagoons and other wetlands, occasionally roosting in dunes during very high tides and sometimes in saltmarsh. Low quality foraging and roosting habitat associated with farm dams. Non-coastal environment.			• No records within the Study Area/Locality, closest record is approximately 30 km to the west of the Study Area (ALA, 2024). • No habitat critical to the survival of the species was identified from field surveys within the Study Area.
Red goshawk (*Erythrotriorchis radiatus*)	V	This species prefers wooded and forested lands of tropical and warm-temperate Australia. Forests of intermediate density, with tall stands or individual trees so that nests are supported, are favoured, or ecotones between habitats of differing densities, e.g. between rainforest and eucalypt forest, between gallery forest and woodland, or on edges of woodland and forest where they meet grassland, cleared land, roads or watercourses. This species avoids very dense and very open habitats. This species has a large home range. **Breeding and roosting habitat:** This species rarely breeds in areas with fragmented vegetation. Breeding habitat is restricted to trees that are taller than 20m and within 1km of a watercourse or wetland. **Foraging habitat**: Habitat must be open enough for fast hunting and maneuvering in flight, but with enough cover for ambushing of prey. No preferred ecotones are present within the Study Area as the plateaus and plains are dominated by stunted ironbark.	Yes	No	**Unlikely** to occur • Study Area is within the distribution for this species. PMST states species or species habitat may occur. • No preferred ecotones are present within the Study Area as the plateaus and plains are dominated by stunted ironbark. • No records within the Study Area/Locality. • No habitat critical to the survival of the species identified from field surveys within the Study Area.

Species Name	EPBC Act Status	Habitat Requirements	Study Area within Species Distribution	Records in the Study Area/ Locality	Comment on Likelihood of Occurrence in Study Area
Grey falcon (*Falco hypoleucos*)	V	This species prefers arid and semi-arid Australia and frequents timbered lowland plains, particularly acacia shrublands that are crossed by tree-lined watercourses. This species has also been observed in treeless areas, frequenting tussock grassland and open woodland for foraging. **Breeding habitat**: Nests chosen are usually in the tallest trees along watercourses, particularly River Red Gum (*Eucalyptus camaldulensis*) and Coolibah (*E. coolabah*) **Foraging habitat:** timbered lowland plains, acacia shrubland crossed by tree-line watercourses, as well as treeless areas, tussock grasslands and open woodlands. **Roosting habitat**: this species is likely to roost in both its breeding and foraging habitat. This species has also been observed roosting on the ground. Study Area lacks preferred breeding, roosting and foraging habitat in the form of riverine Eucalypt communities, open woodlands, grasslands, and acacia shrublands near tree-lined watercourses.	Yes	No	**Unlikely** to occur • Study Area is within the distribution for this species. PMST states species or species habitat may occur. • Study Area lacks preferred breeding, roosting and foraging habitat in the form of riverine Eucalypt communities, open woodlands, grasslands, and acacia shrublands near tree-lined watercourses. • No records within the Study Area/Locality.
Latham's snipe (*Gallinago hardwickii*)	V and Mi	They usually occur in open, freshwater wetlands that have some form of shelter (usually low and dense vegetation) nearby. They generally occupy flooded meadows, seasonal or semi-permanent swamps, or open waters, but various other freshwater habitats can be used including bogs, waterholes, billabongs, lagoons, lakes, creek or river margins, river pools and floodplains. This species has been said to occur very rarely in small patches of habitat such as roadside ditches and alpine bogs (Higgins & Davies, 1996). **Breeding habitat**: Does not breed in Australia.	Yes	No	**Unlikely** to occur • Study Area is within the distribution for this species. PMST states species or species habitat may occur. • Marginal foraging and roosting habitat present within the Study Area associated with farm dams. • No records for the species exist within the Study Area/Locality, closest record

Species Name	EPBC Act Status	Habitat Requirements	Study Area within Species Distribution	Records in the Study Area/ Locality	Comment on Likelihood of Occurrence in Study Area
		Foraging habitat: characterized by areas of mud (either exposed or beneath a very shallow covering of water) and some form of cover (e.g. low, dense vegetation). **Roosting habitat:** on the ground near (or sometimes in) their foraging areas, usually in sites that provide some degree of shelter, e.g. beside or under clumps of vegetation, among dense tea-tree, in forests, in drainage ditches or plough marks, among boulders, or in shallow water if cover is unavailable. Potential foraging and roosting habitat present within the Study Area associated with farm dams.			(2000) is approximately 20km to the south-west of the Study Area (ALA, 2024). • No important habitat for this migratory species was detected in the Study Area during field surveys.
Southern squatter pigeon (*Geophaps scripta scripta*)	V	Squatter pigeon (southern) habitat is generally defined as open-forests to sparse, open-woodlands and scrub that are mostly dominated by *Eucalyptus, Corymbia* or *Callitris* species. Additionally, they also favour remnant regrowth or partly modified vegetation communities that are within 3 km of water bodies. **Breeding habitat**: Breeding habitat occurs on stony rises on sandy, gravelly soils, within 1 km of a suitable, permanent waterbody (including farm dams and watercourses). **Foraging habitat**: Natural foraging habitat for the species is any remnant or regrowth open-forest to sparse, open-woodland or scrub dominated by *Eucalyptus, Corymbia, Acacia* or *Callitris* species, on sandy or gravelly soils, within 3 km of a suitable, permanent or seasonal waterbody	Yes	Yes	**Known** to occur • Study Area is within the distribution for this species. PMST states species or species habitat is likely to occur. • General habitat exists as areas close to bodies of water, remnant grasslands and remnant Eucalypt vegetation within the Study Area. • Three observations of the species were made during field surveys in October 2022, September/October 2023 and December 2023. The species was observed in the northern section of the Study Area

Species Name	EPBC Act Status	Habitat Requirements	Study Area within Species Distribution	Records in the Study Area/ Locality	Comment on Likelihood of Occurrence in Study Area
		Dispersal habitat: Dispersal habitat is any forest or woodland occurring between patches of foraging or breeding habitat, and suitable waterbodies. Habitat within the Study Area exists as areas close to bodies of water, remnant grasslands and remnant *Eucalypt* vegetation.			outside the Development Footprint.
Painted honeyeater (*Grantiella picta*)	V	The painted honeyeater is a specialized mistletoe honeyeater. This species inhabits dry, open forests and woodlands with a preference of high numbers of mature trees, as these host larger quantities of mistletoe. The species usually occurs in areas with flowering and fruiting mistletoe and flowering Eucalypts. **Breeding habitat**: breeding habitat is typically mature trees in remnant vegetation with high quantities of mistletoe. **Foraging and roosting habitat:** Associated with woodlands and forests with mistletoe. There is a lack of preferred mistletoe present throughout the riverine eucalypt communities, however potential breeding and foraging habitat does exist in these communities.	Yes	No	**Unlikely** to occur • Study Area is within the distribution for this species. PMST states species or species habitat may occur. • A distinct lack of mistletoe in woodlands, or associated with tall eucalypts in riverine communities, and so the habitat is generally unsuitable for the species. • No records of the species exist within the Study Area/Locality, closest record (2017) is approximately 25 km to the south-west of the Study Area (ALA, 2024). • No habitat critical to the survival of the species identified from field surveys within the Study Area.

Species Name	EPBC Act Status	Habitat Requirements	Study Area within Species Distribution	Records in the Study Area/ Locality	Comment on Likelihood of Occurrence in Study Area
White-throated needletail (*Hirundapus caudacutus*)	V and Mi	According to Higgins (1999), this species occurs over most types of habitat, but are recorded most often above wooded areas, including open forest and rainforest, and may also fly between trees or in clearings, below the canopy, but they are less commonly recorded flying above woodland (as cited in DSEWPC, 2019b). Whilst rare, they have been recorded on wooded ends of ridges, roosting after dark high in the eucalypt tree canopies (Tarburton, 1993). **Breeding habitat:** this species does not breed in Australia. **Roosting habitat**: the species is noted to roost in tall mature forests and woodlands amongst dense foliage and in hollows often associated with ridgelines. **Foraging habitat**: the species almost always will fly aerially at 'cloud level' and forage over farmland, heathland and mudflats. Species likely to fly aerially over the Study Area. The Study Area does contain potential roosting and foraging habitat in the form of eucalypt forests, specifically on elevated areas with ridges.	Yes	Yes (Locality, 2002)	**Potential** to occur • Study Area is within the distribution for this species. PMST states species or species habitat may occur. • Species likely to disperse aerially over the Study Area, which also contains potential foraging and roosting habitat in the form of tall eucalypt forests, likely in elevated areas. • There is one record within the Locality from 2002 (ALA, 2024).

Species Name	EPBC Act Status	Habitat Requirements	Study Area within Species Distribution	Records in the Study Area/ Locality	Comment on Likelihood of Occurrence in Study Area
Star finch (eastern) (*Neochmia ruficauda ruficauda*)	E	This species occurs mainly in grasslands and grassy woodlands that are located close to bodies of freshwater. Habitats can be habitats dominated by trees typically associated with permeant water or areas regularly inundated; with the most common species being *Eucalyptus Coolabah, E. tereticornis, E. tessellaris, Melaleuca leucadendra, E. camaldulensis and Casuarina cunninghamii.* Records that are more recent indicate that preferred habitat is areas dominated by grasses or have been in areas where the native vegetation has been partially cleared. Breeding, foraging and roosting habitat is not clearly delineated for this species, however, all preferred habitat types are expected to be close to water and comprising of grasslands and grassy woodlands. Potential foraging and breeding habitat occurs in the Study Area present as Eucalypt dominated habitat associated with riparian areas.	Yes	No	**Unlikely** to occur • Study Area is within the distribution for this species. PMST states species or species habitat is likely to occur. • Potential foraging and breeding habitat of Eucalypt dominated habitat adjacent to the riparian areas (*E crebra and E. melanophloia*), and partially cleared grasslands/grassy woodlands are located throughout the Study Area. • No records of the species exist within the Study Area/Locality, one undated record approximately 80km to the south-west of the Study Area (ALA, 2024). • No habitat critical to the survival of the species identified from field surveys within the Study Area.

Species Name	EPBC Act Status	Habitat Requirements	Study Area within Species Distribution	Records in the Study Area/ Locality	Comment on Likelihood of Occurrence in Study Area
Australian painted snipe (*Rostratula australis*)	E	This species prefers shallow terrestrial freshwater (occasionally brackish) wetlands, including temporary and permanent lakes, swamps and claypans. That also utilise inundated or waterlogged grassland or saltmarsh, dams, rice crops, sewage farms and bore drains. Typical sites include those with rank emergent tussocks of grass, sedges, rushes or reeds, or samphire; often with scattered clumps of lignum *Muehlenbeckia* or canegrass or sometimes tea-tree (*Melaleuca*). **Breeding habitat:** may be specific for this species, shallow wetlands with bare mud and both upper and canopy cover nearby. Nest records are all, or nearly all, from or near small islands in freshwater wetlands. **Foraging habitat**: Terrestrial freshwater (occasionally brackish) wetlands, including temporary and permanent lakes, swamps and claypans. Farm dams in the Study Area are regarded as potential foraging habitat for the species.	Yes	No	**Potential** to occur • Study Area is within the distribution for this species. PMST states species or species habitat is likely to occur. • Potential foraging and roosting habitat in the form of farm dams present. • No records of the species exist within the Study Area/Locality, closest record (2000) approximately 17km to the south-west of the Study Area (ALA, 2024. • No habitat critical to the survival of the species identified from field surveys within the Study Area.

Species Name	EPBC Act Status	Habitat Requirements	Study Area within Species Distribution	Records in the Study Area/ Locality	Comment on Likelihood of Occurrence in Study Area
Diamond firetail (*Stagonopleura guttata*)	V	Found in grassy eucalypt, acacia or casuarina woodlands, including Box-Gum Woodlands and Snow Gum *Eucalyptus pauciflora* Woodlands. Also occurs in open forest, mallee, Natural Temperate Grassland, and in secondary grassland derived from other communities. Often found in riparian areas (rivers and creeks), and sometimes in lightly wooded farmland. **Breeding habitat**: Nests are globular structures built either in the shrubby understorey, or higher up associated in woodland areas, especially under hawk's or raven's nests. **Roosting habitat**: Birds roost in dense shrubs of woodlands or in smaller nests built especially for roosting. **Foraging habitat**: Feeds exclusively on the ground, on ripe and partly-ripe grass and herb seeds and green leaves, and on insects (especially in the breeding season). Suitable habitat includes any Eucalyptus or Acacia woodlands/forests throughout the Study Area, particularly riparian areas.	Yes	No	**Potential** to occur • Study Area is within the distribution for this species. PMST states species or species habitat may occur. • Potential foraging and breeding habitat of Eucalypt woodland and open forest dominated by *E. crebra* with a grassy understory is present throughout the Study Area. • No records of the species exist within the Study Area/Locality, closest (undated) record approximately 30km to the west of the Study Area (ALA, 2024).

Species Name	EPBC Act Status	Habitat Requirements	Study Area within Species Distribution	Records in the Study Area/ Locality	Comment on Likelihood of Occurrence in Study Area
Black-breasted button-quail (*Turnix melanogaster*)	V	The black-breasted button-quail is restricted to rainforests and forests, mostly in areas with 770-1200 mm rainfall per annum. In south-eastern Queensland, they are recorded on rare occasions in open eucalypt forest. It also occurs within semi-evergreen vine thicket habitats. Habitat considered critical to the survival of the black-breasted button-quail includes: • Vine thickets and rainforest vegetation types that are periodically water-stressed. These include: semi-evergreen vine thicket, low microphyll vine forest, Araucarian microphyll vine forest, Araucarian notophyll vine forest and *Brachychiton* scrubs that may incorporate bottle trees (*Brachychiton sp.*), brigalow (*Acacia harpophylla*) and belah (*Casuarina cristata*); • Low thickets or woodlands with a dense understorey but little ground cover, typically dominated by *Acacia* spp.; and • In littoral situations, dry vine scrubs, acacia thickets and areas densely covered in shrubs, particularly midgen berry *Austromyrtus dulcis*. Small areas of potential foraging and roosting habitat with rainforest vegetation types do occur within the Study Area. There is a lack of good quality habitat and connectivity in the Study Area.	Yes	No	**Potential** to occur • Study Area is within the distribution for this species. PMST states species or species habitat may occur. • Low density of suitable quality habitat in the Study Area. • No records within the Study Area/Locality. Closest dated record from Coominglah State Forest 20km to the east in 2021 (ALA, 2024). • No habitat critical to the survival of the species identified from field surveys within the Study Area.
Birds (Migratory)					
Oriental cuckoo (*Cuculus optatus*)	Mi	The species is found in forest canopy, open wooded areas and orchards, often in hill country, also in coniferous forest and in birch (*Betula*) above the treeline. The species may occur in association with remnant and regrowth RE types 11.3.2, 11.3.25, 11.9.4, 11.9.5, 11.9.10, 11.3.19, 11.5.1. The species winters in many different countries,	Yes	No	**Unlikely** to occur • Study Area is within the distribution for this species. PMST states species or species habitat may occur. • There is limited potential roosting and foraging habitat

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		including the coastal parts of northern and eastern Australia (BirdLife International, 2015). **Breeding habitat**: Does not breed in Australia. **Foraging and roosting habitat**: Monsoonal rainforest, vine thickets, wet sclerophyll forest or open *Casuarina, Acacia,* or *Eucalyptus* woodlands. Frequently at the edges or ecotones between habitat types. There is limited potential roosting and foraging habitat of monsoonal rainforest or vine thickets present within the Study Area.			of monsoonal rainforest or vine thickets present within the Study Area. • No records for the species exist within the Study Area/Locality, closest dated record (2019) approximately 48 km to the east of the Study Area (ALA, 2024). • No important habitat for this migratory species was detected in the Study Area during field surveys.
Fork-tailed swift (*Apus pacificus*)	Mi	In Australia, they occur over cliffs and beaches and also over islands and sometimes well out to sea. They also occur over settled areas, including towns, urban areas and cities. They mostly occur over dry or open habitats, including riparian woodland and tea-tree swamps, low scrub, heathland or saltmarsh. **Breeding habitat**: Does not breed in Australia. **Foraging and roosting habitat**: exclusively aerial and found across a range of habitats. Potential aerial foraging habitat over dry open habitats present. There is a lack of preferred coastal and riparian heathland or swamp habitat.	Yes	Yes (Locality, 2002)	**Potential** to occur • Study Area is within the distribution for this species. PMST states species or species habitat is likely to occur. • Potential aerial foraging habitat over dry open habitats present. There is a lack of preferred coastal and riparian heathland or swamp habitat. • One record of the species exists within the Locality from 2002 (ALA, 2024). • No important habitat for this migratory species was detected in the Study Area during field surveys.
Common sandpiper (*Actitis hypoleucos*)	Mi	The species utilises a wide range of coastal wetlands and some inland wetlands, with varying levels of salinity, and is mostly found around muddy margins	Yes	No	**Unlikely** to occur

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		or rocky shores and rarely on mudflats. The common sandpiper has been recorded in estuaries and deltas of streams, as well as on banks farther upstream; around lakes, pools, billabongs, reservoirs, dams and claypans, and occasionally piers and jetties. **Breeding habitat**: Does not breed in Australia. **Foraging habitat**: This species forages in shallow water and on bare soft mud at the edges of wetlands; often where obstacles project from substrate, e.g. rocks or mangrove roots. Birds sometimes venture into grassy areas adjoining wetlands. **Roosting habitat:** Roost sites are typically on rocks or in roots or branches of vegetation, especially mangroves. The species is known to perch on posts, jetties, moored boats and other artificial structures, and to sometimes rest on mud or 'loaf' on rocks. Potential foraging and roosting habitat present within the Study Area associated with farm dams.			• Study Area is within the distribution for this species. PMST states species or species habitat may occur. • Potential marginal to low quality foraging and roosting habitat present within the Study Area associated with farm dams non-coastal area. Coastal environments preferred. • No records of the species within the Study Area/Locality. The closest record from 2007 is approx. 42km north-west of the Study Area (ALA, 2024). • No important habitat for this migratory species was detected in the Study Area during field surveys.
Pectoral sandpiper (*Calidris melanotos*)	Mi	In Australasia, the pectoral sandpiper prefers shallow fresh to saline wetlands. The species is found at coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, river pools, creeks, floodplains and artificial wetlands. **Breeding habitat**: Does not breed in Australia. **Foraging habitat**: Forages in shallow water or soft mud at the edge of wetlands. **Roosting habitat:** Prefers shallow fresh to saline wetlands. The species is found at coastal lagoons, estuaries, bays, swamps, lakes, inundated	Yes	No	**Unlikely** to occur • Study Area is within the distribution for this species. PMST states species or species habitat may occur. • No wetland habitats, however, potential marginal foraging and roosting habitat present within the Study Area associated with farm dams. • No records for the species exist within the Study Area/Locality. The closest

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		grasslands, saltmarshes, river pools, creeks, floodplains and artificial wetlands. No wetland habitats, however, potential marginal foraging and roosting habitat present within the Study Area associated with farm dams.			records are over 180km east (ALA, 2024). • No important habitat for this migratory species was detected in the Study Area during field surveys.
Black-faced monarch (*Monarcha melanopsis*)	Mi	The black-faced monarch mainly occurs in rainforest ecosystems, including semi-deciduous vine-thickets, complex notophyll vine-forest, tropical (mesophyll) rainforest, subtropical (notophyll) rainforest, mesophyll (broadleaf) thicket/shrubland, warm temperate rainforest, dry (monsoon) rainforest and (occasionally) cool temperate rainforest. It is also sometimes found in nearby open eucalypt forests (mainly wet sclerophyll forests), especially in gullies with a dense, shrubby understorey as well as in dry sclerophyll forests and woodlands, often with a patchy understorey. The species especially occurs in 'marginal' habitats during winter or during passage (migration). **Breeding habitat:** Species breeds in specific locations including the Atherton Region in Queensland, Julatten south to the Paluma Range and inland to the Atherton Tableland. **Roosting and foraging habitat:** Species feeds in mostly rainforest ecosystems, at all vertical levels of the forest. There is limited suitable foraging and roosting habitat in the Study Area.	Yes	No	**Unlikely** to occur • Study Area is within the distribution for this species. PMST states species or species habitat may occur. • There is a lack of suitable rainforest foraging and roosting habitat in the Study Area. • No records for the species within the Study Area/Locality and no observations were made during field surveys. The closest record (2000) is approximately 18km south-west of the Study Area (ALA, 2024). • Habitat present is marginal with limited patches of vine thickets. The fragmentation and small size of these habitat patches in the landscape mean they are unlikely to be utilised by black-faced monarch.
Yellow wagtail (*Motacilla flava*)	Mi	Habitat requirements for the yellow wagtail are highly variable, but typically include open grassy flats near water. Habitats include open areas with low vegetation such as grasslands, airstrips,	Yes	No	**Unlikely** to occur • Study Area is within the distribution for this species.

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		pastures, sports fields; damp open areas such as muddy or grassy edges of wetlands, rivers, irrigated farmland, dams, waterholes; sewage farms, sometimes utilise tidal mudflats and edges of mangroves (Garnett et al., 2010). This species may occur in association with non-remnant vegetation. **Breeding habitat**: Does not breed in Australia. **Foraging and roosting habitat**: Not clearly defined however will be in line with habitat requirements stated above. Potential breeding and foraging habitat of open grasslands associated with farm dams present within the Study Area.			PMST states species or species habitat may occur. • No records for the species exist within the Study Area/Locality. Closest record over 130km away in Gladstone from 2016. • Open grasslands associated with farm dams are present within the Study Area however these dams are small in size and lack dense vegetation for roosting. • No important habitat for this migratory species was detected in the Study Area during field surveys.
Gastropods					
Boggomoss snail, Dawson River snail *(Adclarkia dawsonensis)*	CE	The snail appears to be restricted to alluvial flats and riparian environments between Mt Rose and south of Theodore. They are considered to occur as a single population connected by the Dawson River. The preferred habitat is the floodplain of the Dawson River in places where there is good canopy cover, a moist environment, fallen logs and deep leaf litter. This habitat once formed as an extensive archipelago of suitable patches connected by riparian vegetation, but most of the snail's habitat has been cleared for farming and little original vegetation remains (Clarke and Spier-Ashcroft 2003, cited in Queensland Department of Environment and Heritage Protection 2017). **Foraging habitat:** Foraging habitat is the floodplain of the Dawson River in places where there is good	No	No	**Unlikely** to occur • The Study Area does not occur within the distribution for this species (buffer area only). PMST states species or species habitat may occur. • Species occurrence is unlikely as the Study Area is outside the preferred habitat of the floodplain of the Dawson River. • No records occur within the Study Area/Locality.

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		canopy cover, a moist environment, fallen logs and deep leaf litter. **Breeding habitat:** Breeding habitat is the floodplain of the Dawson River in places where there is good canopy cover, a moist environment, fallen logs and deep leaf litter. The species is unlikely as the Study Area is outside the preferred habitat of the floodplain of the Dawson River.			
Mammals					
Large-eared pied-bat (*Chalinolobus dwyeri*)	E	This microbat species is found mainly in areas with extensive cliffs and caves, from Rockhampton in Queensland, down south to Bungonia in the NSW Southern Highlands. The species has close association with the presence of sandstone escarpment (for roosts) and fertile valleys (for foraging). **Foraging habitat:** Foraging tends to occur in riverine and riparian corridors however eucalypt dominated patches of vegetation are also suitable. **Roosting and breeding habitat:** The large-eared pied bat requires the presence of diurnal roosts in order to shelter. Females have been recorded raising young in maternity roosts (c. 20-40 females) from November through to January in roof domes in sandstone caves and overhangs. Foraging habitat for the species is likely to occur within the Study Area in eucalypt open and riparian woodland however there is a lack of suitable roosting habitat.	Yes	No	**Likely** to occur • Study Area is within the distribution for this species. PMST states species or species habitat may occur. • The species may forage in the Study Area in ironbark woodlands however, there is a lack of suitable roosting habitat. • 'Probable' recordings of the species via Anabat detection equipment were recorded at five locations within the Study Area.

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Ghost bat (*Macroderma gigas*)	V	This species occupies habitats ranging from the arid Pilbara to tropical savannah woodlands and rainforests. Ghost bats roost in caves or crevices that are generally deep with relatively stable temperatures and moderate to high relative humidity roosting cave dependency. **Breeding habitat**: Breeding habitat is within their roosting sites and is confined to caves with multiple entrances. **Foraging habitat**: Foraging habitat is comprised of tropical savanna woodlands and rainforests approximately 2km away from roosting sites. **Roosting habitat:** Roost sites used permanently are generally deep natural caves or disused mines with a relatively stable temperature of 23-28 degrees C and a moderate to high relative humidity of 50-100 percent. Suitable breeding, roosting and foraging habitat of deep crevices with stable temperatures and relatively high humidity were not observed within the Study Area.	Yes	No	**Unlikely** to occur • Study Area is within the distribution for this species. PMST states species or species habitat may occur. • Suitable breeding, roosting and foraging habitat of deep crevices with stable temperatures and relatively high humidity were not observed within the Study Area. • No records for the species exist within the Study Area/Locality. Closest record (1985) approx. 65km north of the Study Area. • No habitat critical to the survival of the species was observed during fieldwork within the Study Area.

Species Name	EPBC Act Status	Habitat Requirements	Study Area within Species Distribution	Records in the Study Area/ Locality	Comment on Likelihood of Occurrence in Study Area
South-eastern long-eared bat (*Nyctophilus corbeni*)	V	This microbat species has a scattered distribution mostly within the Murray-Darling Basin, but with some records outside of this area. It is more common in box, ironbark and cypress pine woodland on the western slopes and plains. Its stronghold seems to be the Pilliga scrub. It roosts in tree hollows, crevices and under loose bark. **Foraging habitat:** Foraging tends to be located around patches of trees in the landscape. **Breeding habitat:** Little information is available on the breeding behaviour for the species. **Roosting habitat:** Roosting behaviour is located within dead trees including ironbark's, cypress and bulloak. Marginal habitat of ironbark woodland is present in areas within the Study Area.	Marginally	No	**Unlikely** to occur • Study Area is within the distribution for this species, though close to the north-eastern extent. PMST states species or species habitat may occur. • Marginal habitat of ironbark woodland is present, though suitable roosting habitat is generally absent from the Study Area. • No records for the species exist within the Study Area/Locality. The closest record is approx. 40km south-west of the Study Area from 2000 (ALA, 2024). • Desktop review and bat call analysis indicate that the Study Area location is more consistent with the distribution of two unlisted species of *Nyctophilus*.
Greater glider (*Petauroides volans*)	V	The greater glider is an arboreal, nocturnal marsupial, largely restricted to eucalypt forests and woodlands. It is primarily folivorous, with a diet mostly comprising eucalypt leaves, and occasionally flowers. It is more common in taller, montane older forests which have an abundance of hollows. There is no information available that differentiates foraging, breeding and roosting habitat for the species however, for roosting it prefers tall mature forests with hollow bearing trees.	Yes	Yes	**Known** to occur • Study Area is within the distribution for this species. PMST states species or species habitat is known to occur. • Potential foraging and roosting habitat of tall, mature eucalypt forests present within sections of the

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		Potential foraging and roosting habitat of tall, mature eucalypt forests present within the Study Area, although large trees with large hollows are present at low densities.			Study Area, with large hollow bearing trees present at low densities. • There is one ALA record (2020) within the Locality (ALA, 2024), and three records listed in the WildNet search results (n.d.). • This species was observed on 14 occasions during June 2023 surveys, and on 12 occasions during the September 2024 surveys.
Northern quoll (*Dasyurus hallucatus*)	E	The northern quoll occurs in a range of habitats, including open dry sclerophyll forest and woodland, riparian woodland, low dry vine thicket, the margins of notophyll vineforest, sugarcane farms and in urban areas. They are most abundant in hilly or rocky areas close to permanent water. **Breeding habitat**: generally requires habitat encompassing some form of rocky area for denning purposes with surrounding vegetated habitats used for foraging and dispersal, as well as connection to permanent water. Dens are made in rock crevices, tree holes or occasionally termite mounds. **Foraging and dispersal habitat:** this species more likely to be present in Queensland where there are high relief areas that have shallower soils, greater cover of boulders, less fire impact and closer to permanent water. Habitat within the Study Area was observed as generally unsuitable for northern quoll.	Yes	Yes (Locality, 1966)	**Unlikely** to occur • Study Area is within the distribution for this species. PMST states species or species habitat is likely to occur. • Habitat within the Study Area was observed as generally unsuitable for northern quoll. • There is one historic ALA record within the Locality from 1966 (ALA, 2024), though this does not meet recency criteria (within 20 years). • No habitat critical to the survival of the species was observed during fieldwork within the Study Area.

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Koala (*Phascolarctos cinereus*)	E	Koalas naturally inhabit a range of temperate, sub-tropical and tropical forest, woodland and semi-arid communities dominated by Eucalyptus species as explained by Martin & Handasyde 1999 (as cited in, DoE, 2019h). **Breeding and foraging habitat**: Koala habitat can be broadly defined as any forest or woodland containing species that are known koala food trees, or shrubland with emergent food trees. **Dispersal habitat**: Dispersal habitat is recognised as habitat that the koala can disperse into and is typically open woodland, paddock trees, riparian habitat and habitat where there are koala food trees. Foraging and breeding habitat associated with eucalypt dominated communities occurs within the Study Area, and potential dispersal habitat associated with *E. crebra* and *E. tereticornis* woodlands and forests.	Yes	Yes	**Known** to occur • Study Area is within the distribution for this species. PMST states species or species habitat is likely to occur. • Foraging and breeding habitat associated with Eucalypt dominated communities occurs within the Study Area, and potential dispersal habitat associated with *E. crebra* woodlands. Potential dispersal habitat present in the form of open grassy areas and cleared agricultural land with occasional standalone koala food trees. • There is one undated ALA record within the Locality (ALA, 2024), and one record listed in the WildNet search results (n.d.). • This species was not directly observed, a single faecal pellet was recorded during field surveys. One koala was also heard bellowing within the Survey Area at dusk during the September 2024 survey period prior to any call playback.
Grey-headed flying fox (*Pteropus poliocephalus*)	V	Grey-headed flying fox is a canopy-feeding frugivore and nectarivore, which utilises vegetation communities including rainforests, open forests, closed and open woodlands, *Melaleuca* swamps and	Yes	No	**Unlikely** to occur • Study Area is within the distribution for this species.

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		Banksia woodlands. It also feeds on commercial fruit crops and on introduced tree species in urban areas. Ebv (1998) explained that the primary food source is blossom from *Eucalyptus* and related genera but in some areas it also utilises a wide range of rainforest fruits (as cited in, DoE, 2019i). **Breeding habitat:** No specific information is available for breeding habitat requirements however it is understood that roosting camps constitute breeding habitat. **Foraging and roosting habitat**: The listing advice for this species says that individuals can travel up to 50 km from their known roosting camps, in order to forage. They generally roost within 20 km of food sources which include the nectar and pollen of *Eucalyptus*, *Melaleuca* and *Banksia* native trees.			PMST states species or species habitat is likely to occur. • The Study Area is approximately 190 km north-west from the closest active colony with recent grey-headed flying fox activity (per the interactive flying-fox viewer of the Department of Environment). This colony is located near Woocoo National Park. • No records for the species exist within the Study Area/Locality. The closest record (1980) is approx. 22km west of the Study Area (ALA, 2024).
Yellow-bellied glider (south-eastern) (*Petaurus australis australis*)	V	This species is found in eucalypt-dominated woodlands and forests, including both wet and dry sclerophyll forests (Kavanagh et al. 1995; Rees et al. 2007). **Breeding habitat:** No specific information is available on breeding habitat for the species. **Foraging and roosting habitat:** Species shows a preference for larger patches of mature growth forests that contain suitable trees that they require for foraging and roosting. The Study Area does contain some old growth eucalypt forests that could be used as suitable habitat for the species. Larger remnant forests, which have records for the species, occur in the Locality and are likely more favourable for the	Yes	Yes (Locality, 1998)	**Potential** to occur • Study Area is within the distribution for this species. PMST states species or species habitat may occur. • There is potential foraging habitat for the species in the form of old growth eucalypt forests present within the Study Area. The Locality contains remnant vegetation such as state forests that would make the Study Area a movement corridor, should suitable foraging resources be present.

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		species in terms of foraging and denning. It is noted that smooth-barked Eucalypts are important due to the range of foraging substrates (and therefore food resources) they provide, as loose bark hanging in strips from these trees provides shelter for insect prey (DCCEEW 2022). Study Area may be a corridor for movement.			• There are three records listed in the WildNet search results (n.d.) and several in the Locality from 1998 (ALA, 2024), though these do not meet recency criteria (within 20 years).
Reptiles					
Yakka skink (*Egernia rugosa*)	V	The yakka skink is known to occur in open dry sclerophyll forest, woodland and scrub. The core habitat of this species is within the Mulga lands and Brigalow belt south bioregions. It is known from rocky outcrops and sand plain areas with dense ground vegetation. This species will often take refuge among dense ground vegetation, large hollow logs, cavities in soil-bound root systems of fallen trees and beneath rocks. There is no delineation between breeding, dispersal and foraging habitat for this species. There is potential habitat occurs throughout the Study Area, as there are open woodlands associated with ironbark (*Eucalyptus spp*.).	Yes	No	**Unlikely** to occur • Study Area is within the distribution for this species. PMST states species or species habitat may occur. • There is potential habitat throughout the Study Area, as there are open woodlands associated with ironbark (*Eucalyptus spp*.) • No records exist for this species within the Study Area/Locality. The closest record (undated) is approx. 35km north of the Study Area (ALA, 2024). • No habitat critical to the survival of the species was observed during fieldwork within the Study Area.
Adorned delma (*Delma torquata*)	V	This species normally inhabits eucalypt-dominated woodlands and open-forests in Queensland Regional Ecosystem Land Zones (LZ). The regional ecosystems it prefers are ones dominated by poplar box (*Eucalyptus populnea*) on alluvial plains, lemon-	Yes	No	**Unlikely** to occur • Study Area is within the distribution for this species.

Species Name	EPBC Act Status	Habitat Requirements	Study Area within Species Distribution	Records in the Study Area/ Locality	Comment on Likelihood of Occurrence in Study Area
		scented gum (*Corymbia citriodora*) open forest on coarse-grained sedimentary rocks and poplar box/brigalow (*Acacia harpophylla*) open forests on fine-grained sedimentary rocks. There is no delineation between breeding, dispersal and foraging habitat for this species. However, microhabitat requirements include presence of rocks, logs and specific mats of leaf litter typically 30-100 mm thick. There is some preferred canopy species, such as poplar box and brigalow trees, but there is generally a lack of microhabitat features due to heavy grazing throughout the Study Area.			PMST states species or species habitat may occur. • Some potential habitat of poplar box, brigalow woodlands and open forests is present within the Study Area. However, there is an overall lack of preferred canopy species, such as poplar box and brigalow, and generally a lack of microhabitat features (such as thick matts of leaf litter) due to heavy grazing throughout the Study Area. • No records for this species occur within the Study Area/Locality and no observations were made during field surveys. The closest records from 1997 and 2010 are in Kroombit Tops National Park, approx. 60km north-east of the Study Area (ALA, 2024).
Dunmall's snake (*Furina dunmalli*)	V	This species is found in forests and woodlands on black alluvial cracking clay and clay loams dominated by Brigalow (*Acacia harpophylla*), other Wattles (*A. burowii, A. deanii, A. leioclyx*), native Cypress (Callitris spp.) or Bull-oak (*Allocasuarina luehmannii)*. There is no delineation between breeding, dispersal and foraging habitat for this species. Microhabitat features preferred includes fallen timber and ground litter.	Yes	No	**Unlikely** to occur • Study Area is within the distribution for this species. PMST states species or species habitat may occur. • There is some black cracking clay necessary for this species, but there is generally a lack of good quality habitat features due to heavy grazing throughout the Study Area.

Species Name	EPBC Act Status	Habitat Requirements	Study Area within Species Distribution	Records in the Study Area/ Locality	Comment on Likelihood of Occurrence in Study Area
		There is potential habitat on the Study Area associated with cracking clay soils, however due to the presence of cane toads and quality of soils being degraded due to grazing, suitable habitat would be considered low.			• No records for this species occur within the Study Area/Locality and no observations were made during field surveys. The closest record (2002) is approx. 48km south-west of the Study Area (ALA, 2024).
Ornamental snake (*Denisonia maculata*)	V	The Ornamental Snake's preferred habitat is within, or close to, habitat that is favoured by its prey - frogs. The species is known to prefer woodlands and open forests associated with moist areas, particularly gilgai (melon-hole) mounds and depressions in Queensland Regional Ecosystem Land Zone 4, but also lake margins and wetlands. There is no delineation between breeding, dispersal and foraging habitat for this species. Brigalow vegetation communities (known to be associated with ornamental snake habitat) were identified within the Study Area, however lacked key microhabitat features, however due to the presence of cane toads and quality of soils being degraded due to grazing, suitable habitat would be considered low.	Yes	Yes	**Unlikely** to occur • Study Area is within the distribution for this species. PMST states species or species habitat is known to occur. • Brigalow vegetation communities (known to be associated with ornamental snake habitat) were identified within the Study Area, however lacked key microhabitat features. Deep cracking clay soils were not observed and, due to the notable presence of cane toads and soil degradation resultant of historic land clearing and pastoral use, suitable habitat is considered generally absent. • There is one record with unknown date in the Locality, +/- 500m from the Study Area (ALA, 2024). • No habitat critical to the survival of the species was

Species Name	EPBC Act Status	Habitat Requirements	Study Area within Species Distribution	Records in the Study Area/ Locality	Comment on Likelihood of Occurrence in Study Area
					observed during fieldwork within the Study Area.
Grey snake (*Hemiaspis damelii)*	E	The distribution and ecology of *H. damelii* is poorly known. It tends to favour dry sclerophyll forests and woodlands on clay soils where water bodies or gullies are present. It shelters under rocks, logs and other debris, as well as in cracks in soil. There is no delineation between breeding, dispersal and foraging habitat for this species. There is potential habitat in the Study Area associated with clay soils, however due to the presence of cane toads and quality of soils being degraded due to grazing, suitable habitat would be considered low.	Yes	No	**Unlikely** to occur • Study Area is within the distribution for this species. PMST states species or species habitat may occur. • There are some clay soils necessary for this species, but there is generally a lack of good quality habitat features due to heavy grazing throughout the Study Area. • No records for this species occur within the Study Area/Locality and no observations were made during field surveys. The closest dated records (1982 and 2010) are approx. 140km south of the Study Area in Barakula State Forest (ALA, 2024).
Southern snapping turtle (*Elseya albagula*)	CE	Habitat preferences of the white-throated snapping turtle are somewhat unclear. The species is considered by some to be a habitat specialist (Todd et al., 2013). **Breeding habitat and foraging habitat:** Prefer clear, flowing, well-oxygenated waters (Hamann et al., 2007). This preference is associated with its physiological adaptation to extract oxygen from water via cloacal (aquatic) respiration (Mathie & Franklin, 2006; Clark et al., 2008).	Yes	No	**Unlikely** to occur • Study Area is within the distribution for this species. PMST states species or species habitat may occur. • There is potential habitat in the Study Area when ephemeral waterways are holding water. Likelihood is low with quality of water,

Species Name	EPBC Act Status	Habitat Requirements	Study Area within Species Distribution	Records in the Study Area/ Locality	Comment on Likelihood of Occurrence in Study Area
		There is potential habitat in the Study Area when ephemeral waterways are holding water. Likelihood is low with quality of water, when flowing, reduced due to livestock grazing.			when flowing, reduced due to livestock grazing. • No records for this species occur within the Study Area/Locality and no observations were made during field surveys. The closest records (1986 and 2002) are approx. 20km west of the Study Area adjacent the Dawson River in Theodore (ALA, 2024).
Fitzroy River turtle (*Rheodytes leukops)*	V	The Fitzroy River Turtle is found in rivers with large deep pools with rocky, gravelly or sandy substrates, connected by shallow riffles. **Breeding habitat and foraging habitat:** Preferred areas have high water clarity, and are often associated with Ribbonweed (*Vallisneria sp*.) beds (Cogger et al. 1993). Common riparian vegetation associated with the Fitzroy River Turtle includes Blue Gums (*Eucalyptus tereticornis*), River Oaks (*Casuarina cunninghamiana*), Weeping Bottlebrushes (*Callistemon viminalis*) and Paperbarks (*Melaleuca linariifolia*) (Tucker et al. 2001). There is potential habitat in the Study Area when ephemeral waterways are holding water. Likelihood is low with quality of water, when flowing, reduced due to livestock grazing.	Yes	No	**Unlikely** to occur • Study Area is within the distribution for this species. PMST states species or species habitat may occur. • There is potential habitat in the Study Area when ephemeral waterways are holding water. Likelihood is low with quality of water, when flowing, reduced due to livestock grazing. • No records for this species occur within the Study Area/Locality and no observations were made during field surveys. The closest recent record (2009) is approx. 40km north-west of the Study Area adjacent the Dawson River in Moura (ALA, 2024).

Species Name	EPBC Act Status	Habitat Requirements	Study Area within Species Distribution	Records in the Study Area/ Locality	Comment on Likelihood of Occurrence in Study Area
Flora					
Xerothamnella herbacea	E	*Xerothamnella herbacea* occurs in brigalow (*Acacia harpophylla*) dominated communities in shaded situations, often in leaf litter and is associated with gilgais (shallow ground depressions). Soils are heavy, grey to dark brown clays. This species is not known to occur in any conservation reserves. Three of the four known populations occur in cleared areas or non-remnant vegetation that are not protected under the Vegetation Management Act 1999 (Queensland Herbarium 2012).	Yes	No	**Potential** to occur • Study Area is within the distribution for this species. PMST states species or species habitat may occur. • There is potential habitat of brigalow woodlands within the Study Area. • There are no records within the Study Area/Locality. The nearest records exist from Moura and Biloela, beyond the 10km Locality radius (ALA, 2024). However, it should be noted that this is a very cryptic and under-collected species.
Solanum johnsonianum	E	*Solanum johnsonianum* is endemic to Queensland, and found within a region bounded by the towns of Rolleston to Theodore to Biloela to Dululu, which is centred about 160 km due west of Gladstone (Bean 2004; ALA 2016). However, it is restricted to very small localised areas where stands of the species exist (ALA 2016). The speciesd is almost always found in open forest and woodland habitats where brigalow (*Acacia harpophylla*) dominates or co-dominates on heavy cracking clay soils (Bean 2004). Other associated species include lapunyah (*Eucalyptus thozetiana)* with an understory of wilga *(Geijera parviflora*) (Queensland Herbarium 2012, cited in DEHP 2015).	Yes	No	**Potential** to occur • Study Area is within the distribution for this species. PMST states species or species habitat may occur. • There is potential habitat of eucalypt woodlands and brigalow woodlands present within the Study Area. • There are no records within the Study Area/Locality. The nearest records exist from Moura approx. 30km north-west (ALA, 2024).

Species Name	EPBC Act Status	Habitat Requirements	Study Area within Species Distribution	Records in the Study Area/ Locality	Comment on Likelihood of Occurrence in Study Area
Solanum dissectum	E	*Solanum dissectum* is a Queensland-endemic species and found within a region bounded by the towns of Blackwater to Bauhinia to Thangool to Dululu, which is centred about 150 km due west of Gladstone (Bean 2004; ALA 2016). However, it is restricted to very small localised areas where populations exist (ALA 2016). In these areas, it may be found in open forest and woodland habitats where brigalow (*Acacia harpophylla*) and potentially lapunyah (*Eucalyptus thozetiana*) characterise the dominant vegetation types on solodic clay soils (Bean 2004; Queensland Herbarium 2012, cited in DEHP 2015).	Yes	No	**Potential** to occur • Study Area is within the distribution for this species. PMST states species or species habitat may occur. • There is potential habitat of eucalypt woodlands present within the Study Area. • There are no records within the Study Area/Locality. The nearest records exist from Moura and Biloela, beyond the 10km Locality radius (ALA, 2024).
Austral cornflower *(Rhaponticum australe)*	V	The Austral cornflower usually grows on heavy black or red-brown clay, or clay loams derived from basalt. Populations are often confined to roadsides and cultivation headlands and is often found in woodland and grassland and in association with *Eucalyptus crebra* (Narrow-leaved Ironbark*), E. orgadophila* (Mountain Coolibah), E. populnea (Poplar Box), *E. tereticornis* (Forest Red Gum), *E. melanophloia* (Silver-leaved Ironbark), *Angophora subvelutina* (Broad-leaved Apple), *A. floribunda* (Rough-barked Apple), *Cirsium vulgare* (Spear Thistle - introduced species), *Dichanthium sericeum* (Queensland Bluegrass) and Themeda triandra (Kangaroo Grass). The Austral cornflower is considered to be a poor competitor and prefers habitat where grass competition has been reduced by fire or other forms of disturbance. However, the species is unlikely to benefit from disturbance that allows the development of a dense cover of exotic grasses such as Chloris gayana (Rhodes Grass).	Yes	No	**Potential** to occur • Study Area is within the distribution for this species. PMST states species or species habitat may occur. • There is potential habitat of eucalypt woodlands and open forests present within the Study Area. • There are no records within the Study Area/Locality. The nearest records (3) exist 20km east of the Study Area, from 1996 and 1997 (ALA, 2024).

Species Name	EPBC Act Status	Habitat Requirements	Study Area within Species Distribution	Records in the Study Area/ Locality	Comment on Likelihood of Occurrence in Study Area
Cossinia *(Cossinia australiana)*	E	Cossinia is found only in restricted habitat areas of central-eastern to south-eastern Queensland. It grows naturally in habitats of seasonal–drought adapted rainforests and associated vegetation types not adapted to fire, typically on nutrient–rich soils derived from basalt parent materials. Study Area is connected to the Montour State Forest to the South-East where the sighting occurred. With some potentially suitable drought adapted rainforests and associated vegetation types present.	Yes	Yes (Locality, 2002)	**Potential** to occur • Study Area is within the distribution for this species. PMST states species or species habitat may occur. • There is potential habitat of drought adapted rainforests and associated vegetation types within the Study Area. • There is one record within the Locality from 2002 bordering the Study Area in the Montour State Forest (ALA, 2024).
Ooline *(Cadellia pentastylis)*	V	Ooline grows in semi-evergreen vine thickets and sclerophyll vegetation on undulating terrain of various geology, including sandstone, conglomerate and claystone. Soils generally have low to medium nutrient content and are normally associated with upper and mid-slopes in the landscape. The altitude is generally 300-460 m above sea level, with some stands known to occur at 600 m above sea level. The species forms a closed or open canopy, as a dominant or commonly with White box (*Eucalyptus albens*) and White cypress pine (*Callitris glaucophylla*), with an open understorey and leaf litter dominating the forest floor. There is some uniformity in the understorey, with Native olive (*Notelaea microcarpa*), Pinkwood (*Beyeria viscosa*), Bitterbark (Alstonia constricta), Wilga (*Geijera parviflora*), Berry saltbush (*Einadia hastata*), Stipa spp. and Aristida spp., abundant at many locations. Small areas of potential habitat with semi-evergreen vine thickets and sclerophyll vegetation types do occur within the Study Area. There is a lack of good quality habitat and connectivity in the Study Area.	Yes	No	**Potential** to occur • Study Area is within the distribution for this species. PMST states species or species habitat may occur. • There is potential habitat within semi-evergreen vine thickets and sclerophyll vegetation types present within the Study Area. • There are no records within the Study Area/Locality. The nearest record (2003) exists approx. 47km east of the Study Area (ALA, 2024).

Species Name	EPBC Act Status	Habitat Requirements	Study Area within Species Distribution	Records in the Study Area/ Locality	Comment on Likelihood of Occurrence in Study Area
Polianthion minutiflorum	V	*Polianthion minutiflorum* grows in forests and woodlands on sandstone slopes and gullies with skeletal soil, or deeper soils adjacent to deeply weathered laterite. The distribution of this species overlaps with semi-evergreen vine thicket TEC. It is a one-meter-high shrub, with densely covered hairy leaves, and hairy minute white flowers. Flowering throughout the year, fruits observed in August and November. No associated species or vegetation was observed during field surveys.	Yes	No	**Unlikely** to occur • Study Area is within the distribution for this species. PMST states species or species habitat may occur. • No records within the Study Area Locality. Closest records are approximately 40km east of the Study Area in the Coominglah State Forest from 1995 and 1996 (ALA, 2024). • No associated species or vegetation was observed during field surveys.
Hairy-joint grass *(Arthraxon hispidus)*	V	Hairy-joint grass is found in or on the edges of rainforest and in wet eucalypt forest, often near creeks or swamps, as well as woodland.	Yes	No	**Unlikely** to occur • Study Area is within the distribution for this species. PMST states species or species habitat may occur. • No potential habitat in the Study Area in the form of rainforest, wet eucalypt forest or sedgelands. • There are no records within the Study Area/Locality. The closest records are approx. 50km south-west of the Study Area from between 1995 and 2004 (ALA, 2024).
King blue-grass *(Dichanthium queenslandicum)*	E	*Dichanthium queenslandicum* occurs on black cracking clay in tussock grasslands mainly in association with other species of blue grasses, but also with other grasses restricted to this soil type. *Dichanthium queenslandicum* is mostly confined to	Yes	No	**Unlikely** to occur • Study Area is within the distribution for this species.

Species Name	EPBC Act Status	Habitat Requirements	Study Area within Species Distribution	Records in the Study Area/ Locality	Comment on Likelihood of Occurrence in Study Area
		natural grassland on the heavy black clay soils (basalt downs, basalt cracking clay, open downs) on undulating plains. There is potential habitat in the Study Area associated with clay soils, however due to poor quality of soils being degraded due to grazing, quality of suitable habitat would be considered low.			PMST states species or species habitat may occur. • There is potential habitat in the Study Area associated with clay soils, however due to poor quality of soils being degraded due to grazing, quality of suitable habitat would be considered low. • There are no records within the Study Area/Locality. The nearest record is approximately 17km east of the Study Area, from 2012 (ALA, 2024).
Bluegrass *(Dichanthium setosum)*	V	Associated with heavy basaltic black soils and red-brown loams with clay subsoils. Often found in moderately disturbed areas. Threats relate to heavy grazing, clearing for pasture improvement and cropping, fire, introduced grasses and road widening. Associated species include White Box (*Eucalyptus albens*), Silver-leaved Ironbark (*E. melanophloia*), Yellow Box (*E. melliodora*), Manna Gum (*E. viminalis*), Amulla (*Myoporum debile*), Purple Wire-grass (*Aristida ramosa*), Kangaroo Grass (*Themeda triandra*). Due to poor quality of soils being degraded due to grazing, clearing for pasture improvement and cropping and introduced grasses suitable habitat would be considered low. No individuals were observed during field surveys.	Yes	No	**Unlikely** to occur • Study Area is within the distribution for this species. PMST states species or species habitat may occur. • Habitat is generally unsuitable, and no individuals were observed during field surveys. • There are no records within the Study Area/Locality. The nearest record is over 250km west of the Study Area (ALA, 2024).

Status listing per EPBC Act: CE = Critically Endangered; E = Endangered; V = Vulnerable; Mi = Migratory

Theodore WF MHQA Scoring Criteria and Justification
Koala

MNES	Attribute	Criteria		Justification
Koala	Quality and availability of food and foraging habitat (40)	Important and ancillary food trees	0: Neither in EDL 4: Only ancillary in EDL and non-large (per benchmark) 8: Only ancillary in EDL and large (per benchmark) 12: Important food tree in EDL and non-large (per benchmark) 16: Important food tree in EDL and large (per benchmark) 20: Both in EDL and large (per benchmark)	This was determined by the presence (number) of koala habitat trees within the MHQA transect and amended to reflect a per ha rate. Koala habitat trees, for the purposes of food and foraging habitat, were any tree of the *Eucalyptus, Corymbia, Angophora, Lophostemon or Melaleuca* genera present within the MHQA. Subsequent scoring for this metric was derived from a range with a higher number range yielding a positive habitat score and inverse for lower ranged results.
		Non-juvenile koala habitat tree	0: 0 p/ ha 4: ≤ 39 p/ ha 8: 40 - 69 p/ ha 12: 60 - 89 p/ ha 16: 90 - 119 p/ ha 20: ≥ 120 p/ ha	
	Quality and availability of shelter and breeding habitat (40)	Canopy cover (% of benchmark)	0: ≤ 10% 4: 10% - 14% 8: 15% - 19% 12: 20% - 24% 16: 25% - 29% 20: ≥ 30%	Quality and availability of shelter has been determined by canopy cover (measured along a 100 m transect as per the BioCondition assessment methodology and compared with the canopy cover benchmark for the state-mapped RE) as dense canopies may provide more shelter for the species during extreme weather (e.g. intense heat or rain) (Beale, Marsh & Youngentob 2022).
		Large eucalyptus trees per ha	0: ≤ 9% of benchmark 4: 10% - 29% of benchmark 8: 30% - 49% of benchmark 12: 50% - 69% of benchmark 16: 70% - 89% of benchmark 20: ≥ 90% of benchmark	Quality and availability of shelter has been determined by the presence of large trees (Eucalypt spp. trees of a diameter at breast height (DBH) as determined by the BioCondition Benchmark for the respective MHQA plot) per hectare. Scoring is subsequently derived from a range. Large trees are deemed to provide shelter habitat due to both their developed canopy structure and ability to produce a stable food resource where other more juvenile koala habitat trees may be more prone to senescence from a stochastic event such as drought and fire.
	Absence of threats to species (10)	Inappropriate fire regimes i.e. evidence of fire intensity		High severity fires immediately affect food quality and availability and shelter. Negative impacts and scale are dependent on many factors, however high severity fires remove canopy foliage having impacts on shelter, affects microclimate and quality and availability of food (Beale, P 2022).
		Zoning i.e. mapped under PMAV/ non rem and can be cleared, or is it regulated veg		Zoning may impact koala with relation to varying inconsistencies between Commonwealth and State laws for land use (i.e. Category X vegetation may legally be cleared under the Queensland VM Act). Areas of koala habitat may can legally be impacted under state laws, diminishing connectivity, quality and availability of koala habitat.
		Fragmentation i.e. barbed wire fences, roads		Land-use changes, through habitat fragmentation, is one of the most significant impacts to koala where it reduces the area to which the koala can safely occupy (DAWE, 2022a). Such habitat fragmentation can result in genetically isolated populations, increase risk of predation, as well as increasingly prone to threats from extreme weather events (DAWE, 2022a).
		Evidence of feral predators i.e. wild dogs		Feral predators, particularly wild dogs, are known to prey upon koalas resulting in direct mortality and subsequent reduced fecundity (DAWE, 2022b). Dog attacks leading to koala mortality have the ability to potentially remove otherwise healthy breeding koalas from the population (Gonzales-Astudillo, 2018).
		Proximity to roads		This metric was used as direct mortality from vehicle collisions is a known and listed threat for the species within the Conservation Advice (DAWE, 2022a).
	Ecological corridors (10)	Queensland Globe's 'Statewide Biodiversity Corridors' layer, proximity of the site to a state, bioregional, regional or subregional corridor (terrestrial or riparian);	0: Not located within 5: Sharing common boundary with 10: Located within (in whole or in part) an ecological corridor or an ecological corridor buffer	Ecological corridors are critical to the scoring and assessment of habitat for all MNES under Guide to Determining Terrestrial Habitat Quality 1.2 (Eyre et al. 2017) and is applied to MHQA for the purposes of this assessment.

References

Beale, P.K., Marsh, K.J., & Youngentob, K.N. (2022). Revegetating Koala Habitat: Report

Bilney, R., Cooke, R., & White, J. (2010). Underestimated and severe: Small mammal decline from the forests of south-eastern Australia since European settlement, as revealed by a top-order predator. Biological Conservation, 143, 52–59.

Choquenot D, McIlroy J and Korn T (1996). Managing vertebrate pests: feral pigs. Bureau of Resource Sciences, Australian Government Printing Services. Canberra

Department of Agriculture, Water and the Environment (2022a). Conservation Advice for Phascolarctos cinereus (Koala) combined populations of Queensland, New South Wales and the Australian Capital Territory. Canberra: Department of Agriculture, Water and the Environment. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/85104-conservation-advice-12022022.pdf. In effect under the EPBC Act from 12-Feb-2022.

Department of Agriculture, Water and the Environment (2022b). National Recovery Plan for the Koala Phascolarctos cinereus (combined populations of Queensland, New South Wales and the Australian Capital Territory). Department of Agriculture, Water and the Environment, Canberra. Available from: http://www.dcceew.gov.au/environment/biodiversity/threatened/publications/recovery/koala-2022. In effect under the EPBC Act from 08-Apr-2022.

Gonzalez-Astudillo, V., Henning, J., Valenza, L., Knott, L., McKinnon, A., Larkin., R & Allavena, R. (2019), A necropsy study of disease and comorbidity trends in morbidity and mortality in the Koala (Phascolarctos cinereus) in SouthEast Queensland, Australia. Scientific Reports, 9(1), 17494, DOI: 10.1038/s41598-019-53970-0.

Lindenmayer, D.B., Wood, J.T., McBurney, L., MacGregor, C., Youngentob, K., & Banks, S.C. (2011). How to make a common species rare: a case against conservation complacency. Biological Conservation, 144, 1663–1672.

Lindenmayer D.B., Blanchard W., McBurney L., Blair D., Driscoll D., Smith A.L., & Gill A.M. (2013) Fire severity and landscape context effects on arboreal marsupials. Biological Conservation 167, 137–148.

Mitchell D.L., Soto-Berelov M, Jones S.D. (2023) Remote sensing shows south-east Queensland koalas (Phascolarctos cinereus) prefer areas of higher tree canopy height within their home ranges. Wildlife Research, 50, 939-953.

Newsome, T.M., Cairncross, R., Cunningham, C.X., Spencer, E.E., Barton, P.S., Ripple, W.J., & Wirsing, A.J. (2024). Scavenging with invasive species. i, 562–581. https://doi.org/10.1111/brv.13035

APPENDIX E BAT CALL ANALYSIS REPORT GREENTAPE SOLUTIONS

Bat Call Analysis Report

Theodore Project

Prepared for ERM

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1.0 Introduction

1.1 Background

Green Tape Solutions were commissioned to undertake bat call analysis for a Project Area in Theodore, Queensland.

1.2 Scope of Work

The specific scope of works for this report includes the following:

- Outline the methodology used to analyse the microbat call within the subject site; and,
- Present the findings of all of the bat call surveys conducted at the project site.

2.0 Methodology

2.1 Capture Technique

Microbat calls were sampled using Anabat Swift devices and Anabat Chorus devices (Titley Electronics). Passive monitoring was undertaken from several periods within the last 12 months totalling 77 trap nights (One trap night being one detector recording for one night) including 17-22 October 2022, 13-17 February 2023 and 27-31 March 2023. The original call files display Australian Eastern Standard Time. The data was analysed using Anabat Insight.

Monitoring commenced at dusk (approximately 1800 hours) and continued until dawn (approximately 0530 hours). Ultrasonic call monitoring surveys on anabat detectors were conducted using full-spectrum fitted with omnidirectional ultrasonic microphone.

2.2 Call Identification

Anabat recordings were analysed using Anabat software (Anabat Insight). Identifications were made by categorising call shape and frequency, with a species match given in consideration to region, known bat distributions, and habitats present. The focus of the bat surveys was to assess the presence of bat species found within the Project Area, and to assess the potential for rare and threatened species to occur.

Call identification for this dataset was based on call keys and descriptions published for Queensland (Reinhold *et al.*, 2001) and New South Wales (Pennay *et al.*, 2004).

Species' identification was further refined using the probability of occurrence of each species based on their geographic distribution (Churchill, 2008, Van Dyck and Strahan, 2008). Species nomenclature used in this report follows Churchill (2008).

The reliability of identification is as follows:

- **Definite** - one or more calls where there is no doubt about the identification of the species;
- **Probable** - most likely to be the species named, low probability of confusion with species that use similar calls; and,
- **Possible -** call is comparable with the named species, with a moderate to high probability of confusion with species of similar calls.

2.3 National Standard

The format and content of this report complies with the nationally accepted standards for the interpretation and reporting of Anabat and Songmeter data (Reardon, 2003), which is currently available from the Australasian Bat Society at www.ausbats.org.au.

3.0 Results

3.1 Total Species Recorded

The majority of calls were considered to be of medium to good quality calls.

A total of 8,840 sequence files were analysed. Two devices did not have any identifiable calls. A small proportion of the files in this dataset contained background noise or resulted in poor quality calls that did not provide bat calls for analysis. While some call sequences were recognised as bat calls, the quality was not sufficient to assign species identification.

A summary of the species identified through bat call analysis is provided in **Table 1**.

Table 1: Summary of bat call analysis (QLD)

Species	NC Act	EPBC Act	October 2022		February 2023			March 2023		
			A9	A12	A14	A19	A26	C2	C11	C15
Austronomus australis	LC	NOC	Definite	Definite		Definite			Definite	Definite
Chaerephon jobensis	LC	NOC		Probable	Probable	Probable			Definite	Probable
Chalinolobus dwyeri	V	V		Probable	Probable	Probable	Probable			Probable
Chalinolobus gouldii	LC	NOC	Definite	Definite	Definite	Definite	Probable	Definite	Definite	Definite
Chalinolobus morio	LC	NOC			Probable			Definite	Probable	Probable
Chalinolobus nigrogriseus	LC	NOC		Definite	Definite	Definite	Definite		Definite	Definite
Chalinolobus picatus	LC	NOC			Probable	Probable	Probable		Probable	Probable
Miniopterus australis	LC	NOC								Probable
Miniopterus orianae oceanensis	LC	NOC		Probable	Probable	Probable	Probable		Probable	Probable
Myotis macropus	LC	NOC	Possible		Possible	Possible	Possible	Possible	Possible	Possible
Nyctophilus sp	LC	NOC	Possible		Possible	Possible	Possible	Possible	Possible	Possible
Ozimops lumsdenae	LC	NOC	Possible		Possible	Possible	Possible	Possible	Possible	Possible
Ozimops ridei	LC	NOC	Definite	Definite	Definite	Definite	Probable			Probable
Rhinolophus megaphyllus	LC	NOC	Definite	Definite	Definite	Definite			Definite	Definite
Saccolaimus flaviventris	LC	NOC								Definite
Scotorepens balstoni	LC	NOC	Definite	Definite	Definite	Definite			Definite	Definite
Scotorepens greyii	LC	NOC	Probable	Probable	Probable	Probable	Probable		Probable	Probable
Scotorepens sp.	LC	NOC		Probable	Probable	Probable	Probable		Probable	Probable
Setirostris eleryi	LC	NOC		Possible	Possible	Possible	Possible		Possible	Possible

Taphozous troughton	LC	NOC	Definite	Definite	Definite	Definite		Definite	Definite
Vespadelus troughtoni	LC	NOC		Probable					Probable
Vespadelus vulturnus	LC	NOC		Probable			Probable		Probable

LC: Least Concern, NOC: Not of Concern, V: Vulnerable

3.2 Samples of Calls / Sequences Files

Samples of call extracted from the dataset for each species identified is provided in the following figures

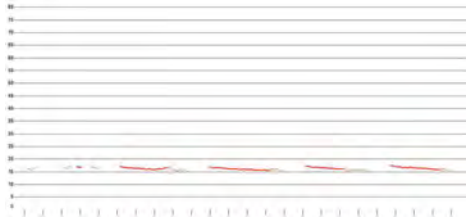
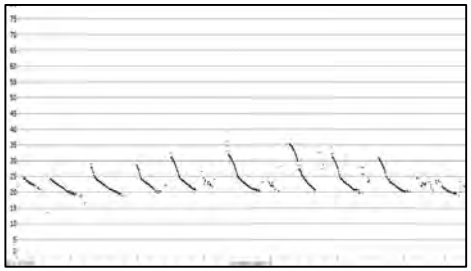
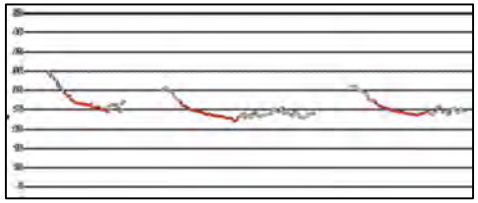
Species	Calls	Known distribution (Extract from Ausbats maps from Australian Bat Society)
Figure 1: *Austronomus australis*		
Definite call. This bat is easily recognised by its constant frequency calls range in bandwidth from 10.5 to 15 kHz (Pennay *et al.*, 2004).		
Figure 2: *Chaerephon jobensis*		
Definite call. Their characteristic frequency average 19.8 kHz (range 16.12-23.6kHz). Pulse shape variable and inconsistent with abrupt changes in frequency. *C. jobensis* often flies in pairs and therefore produce paired call pulses at alternating frequencies with intermittent, “excited”, linear pulses.		

Figure 3: *Chalinolobus dwyeri*

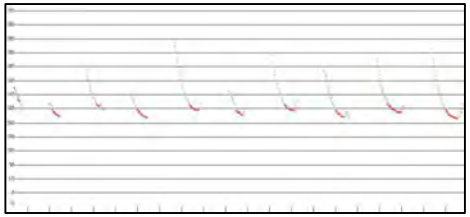




Probable call.

The call is composed of alternate curved pulses, which have up-sweeping, down-sweeping or no tail. The average call characteristic frequency varies between 23 to 24 kHz. Every second pulse stepped-up by about 2 kHz, so that the lower pulses are about 22.5 kHz and the higher pulses are about 25 kHz.

Figure 4: *Chalinolobus gouldii*

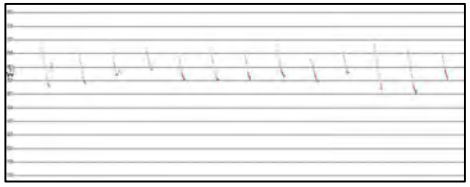




Definite call.

This species has a curved shape call with characteristic frequency 28 to 34kHz. Pulse alternates in frequency and mostly down-sweeping tail or no tail.

Figure 5: *Chalinolobus morio*

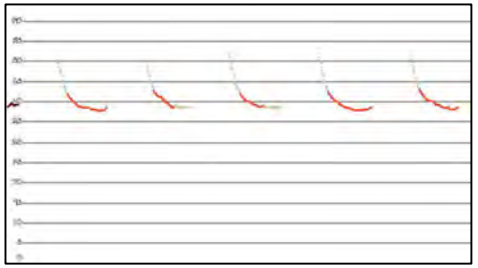




Definite call.

C. morio has a down-sweeping tail curved pulse with characteristic frequency 47.5 to 53 kHz. It often has a very brief characteristic section. Species that overlap in frequency (*Vespadelus troughtoni, V. pumilus* and *V. vulturnus*) but all have up-sweeping tails.

Figure 6: *Chalinolobus nigrogriseus*

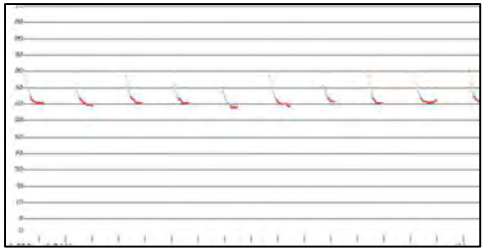




Definite call.

This species has a curved shape pulse with characteristic frequency between 37 to 40 kHz. Usually with no tail or occasionally up sweeping tail. *C. nigrogriseus* have relatively longer characteristic and tail sections, usually 2/3 or more of the total pulse (Pennay *et al* 2004).

Figure 7: *Chalinolobus picatus*

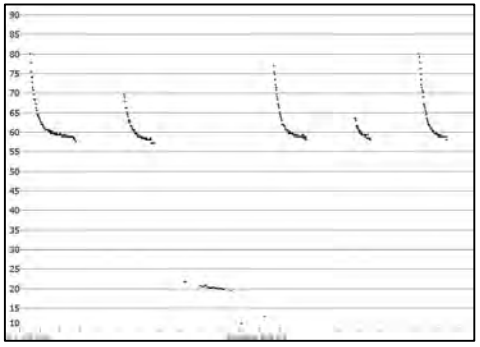




Probable call.

The call is composed of alternate curved pulses without a tail or short up-sweeping tail when in search phase. Average characteristic frequency 38 to 42 kHz. Every second pulse is stepped-up by about 2 kHz.

Figure 8: *Miniopterus australis*

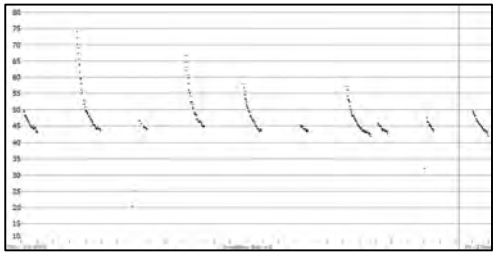




Definite call.

This species displays a characteristic frequency between 54.5 – 64.5 kHz with a curved, usually down-sweeping tail (Pennay *et al* 2004). It overlaps in frequency with *Vespadelus pumilus* between 57 – 58 kHz but the latter exhibits curved up-sweeping tail.

Figure 9: ***Miniopterus orianae oceanensis***





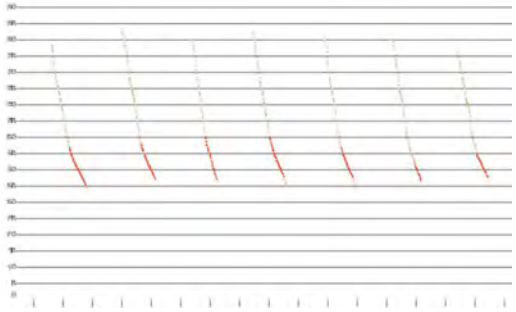
Probable call.

The species call is characterised by its long curved pulse with a small down-sweeping tail and its frequency between 43-47kHz (Reinhold, 2001).

Pulse shape and time between calls usually variable within a sequence.

Shorter duration, can be distinguished from *V. vulturnus* by having a longer pre-characteristic section (drop in frequency usually greater than 2 kHz) and most pulses do not have an up-sweeping tail (Reinhold, 2001). Pulse shape and time between calls can be quite variable within a sequence (Reinhold, 2001).

Figure 10: ***Myotis macropus***





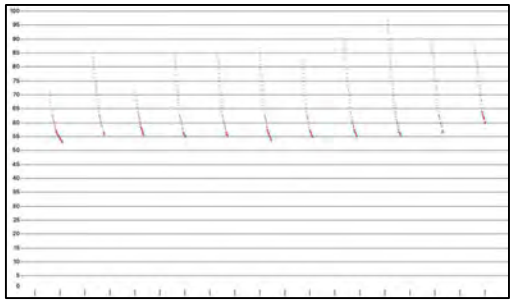
Possible call.

Near-vertical pulse dropping to about 30 to 35-50kHz. *M. macropus* mostly have a pulse interval of less than 75ms and usually have one kink close to the middle so that the second part has a lesser slope than the first (Reinhold, 2001).

This call can be confused with *Nyctophilus spp* calls. The latest have usually a pulse interval greater than 95ms and are slightly more complicated structure

with two kinks instead of one.

Figure 11: Nyctophilus spp



Possible call.

This species displays a near-vertical pulse, characteristic frequency between 80 and 35KHz (Pennay *et al*, 2004).

The species from this genus cannot be distinguished from each other.

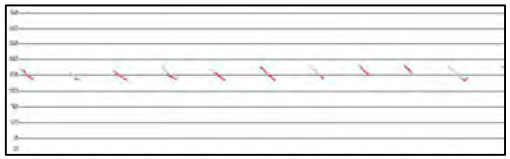


N. geoffroyi



N. gouldi

Figure 12: *Ozimops lumsdenae*

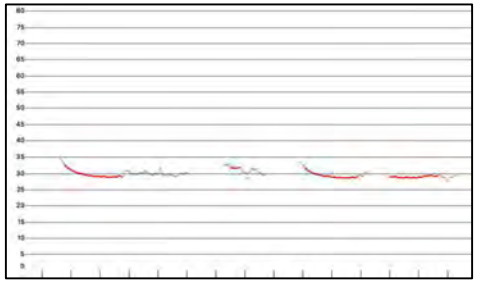


Definite call.

Characteristic frequency higher than 22 and lower than 24kHz. *O. lumsdenae* pulse can be confused with *S. flaviventris* However, the latter rarely has calls above 22kHz. *O. lumsdenae* reference calls have pulses] rising in frequency and can get up to 27kHz.



Figure 13: *Ozimops ridei*

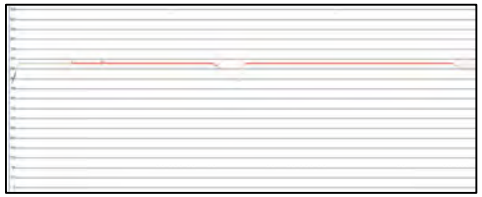




Definite call.

O. ridei calls are flat and sometimes a bit curved with frequency a bit lower than 30kHz. Characteristic frequency of this species is between 28 to 36 kHz. Calls in the same frequency range as *Micronomus norfolkensis*, but *O. ridei* calls may jump up to a higher frequency than the surrounding pulses, this does not occur in a regular pattern like in *M. norfolkensis*.

Figure 14: *Rhinolophus megaphyllus*

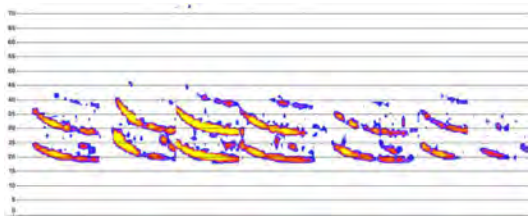




Definite call.

The species call cannot be misidentified with any other species. Pulses have an up-sweeping initial section a perfectly flat, relatively long characteristic section and a down sweeping tail (Reinhold, 2001). Characteristic frequency ranges from 66 to 72 kHz.

Figure 15: *Saccolaimus flaviventris*



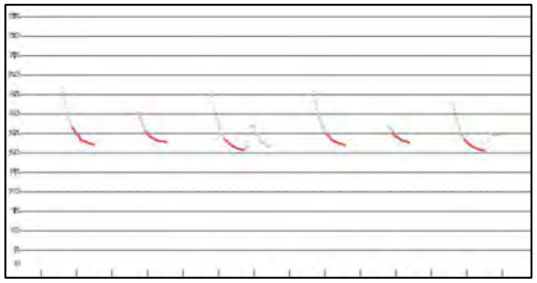


Definite call.

Curved, characteristic frequency 18 to 21.5 kHz. The characteristic frequency does not go above 22 kHz. Other species that could overlap do not occur in this area.

T. troughtoni also produces a flat type call pulse at the same frequency as *S. saccolaimus*. It is typically long and straight or slightly curved and almost horizontal, similar to *S. saccolaimus*.

Figure 16: *Scotorepens balstoni*

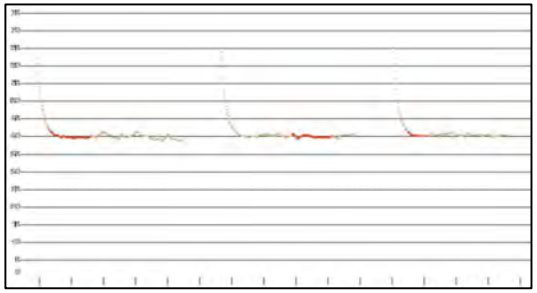




Probable call.

Pulse of this species is curved with tail variable, but an up-sweeping tail is often more prominent with greater duration. Characteristic frequency 31 to 35 kHz (n = 28) and the frequency of the knee 33 to 37 kHz.

Figure 17: *Scotorepens greyii*



Probable call.

S. greyii has a curved and up-sweeping tail pulse. Its characteristic frequency is between 36 to 41.5 kHz. *S. eleryi* and S. sp (Parnaby) cannot be distinguished from S. greyii.



S. eleryi

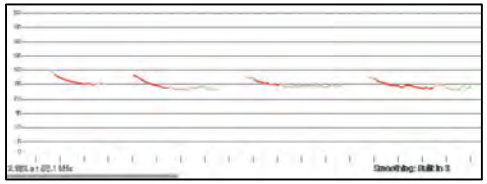


S. sp. (Parnaby



S. greyii

Figure 18: *Taphozous troughtoni*

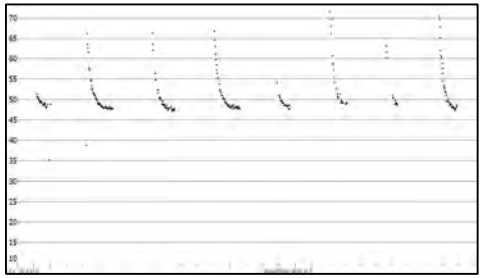




Definite call.

T. troughtoni produces a flat type call pulse at the same frequency as *S. saccolaimus*. It is typically long and straight or slightly curved and almost horizontal, similar to *S. saccolaimus*.

Figure 19: *Vespadelus troughtoni*





Possible call.

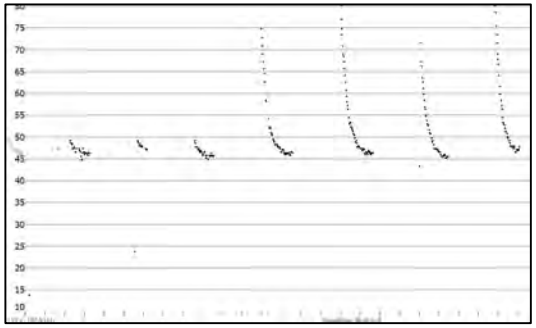
This species displays a curved pulse with not prominent up-sweeping tail. Its characteristic frequency is between 48.5 to 55 kHz (Pennay *et al*, 2004). If the end frequency is lower than 51 kHz, then the call can be identified to *V. Troughtoni* and be differentiated from *V. pumilus*.

Figure 20: Vespadelus vulturnus

Curved and up-sweeping tail calls with characteristic frequency between 45 to 53 kHz.

It cannot be distinguished from *V. regulus*, or some *V. darlingtoni* when up-sweeping tail.

It is distinguished from *Miniopterus schreibersii oceanensis* by having consecutive pulses even, with mostly up-sweeping tails and drop in frequency of pre-characteristic section mostly less than 2 kHz.





4.0 Conclusion

A total of 23 microbat species were either confirmed ‘definite’, ‘probable’ or ‘possible’ within the Project area. All bats identified on the site were expected to be present within the region.

Calls from *Nyctophilus sp* have been identified as possible in the project areas, as they are very similar to *Myotis macropus*. Two species of *Nyctophilus* possibly occur within the Project Area.

Chalinolobus dwyeri calls have been detected as probable at several sites. This species is listed as vulnerable under state and federal legislation.

Two of the reliably identified call types were only attributable to genus level due to similarities in call characteristics of the following groups:

- Nyctophilus/Myotis species
    - ✓ Steep, almost-linear linear (FM) call pulses are distinctive from those of other bat calls but cannot be reliably identified to species
    - ✓ Three species of Nyctophilus potentially occur in the project area (*N. geoffroyi* or *N. gouldii*)
    - ✓ These calls are also often confused with *Myotis Macropus* therefore all four species are listed as possible
- *Scotorepens greyii, Scotorepens sp. (Parnaby) and Setirostris eleryi*
    - Steep, curvilinear (FM-qCF) pulses with Fc of 37-41 kHz and a long tail
    - This species can be distinguished from *Chalinolobus nigrogriseus* in same Fc range by shorter pulse duration and hooked pulse body (cf. longer and flatter body in C. nigrogriseus)
    - Both Scotorepens spp. and *S. eleryi* are likely to occur in the project area, *S. eleryi* and *S. sp. (Parnaby)* calls are indistinguishable from *S. greyii* therefore both these species have been marked as ‘possible’ alongside *S. greyii identified* calls.

5.0 References

CHURCHILL, S. 2008. *Australian Bats,* Sydney, Allen and Unwin.

DEWHA 2010. Survey guidelines for Australia's threatened bats. Guidelines for detecting bats listed as threatened under the *Environment Protection and Biodiversity Conservation Act 1999*. *In:* DEPARTMENT OF THE ENVIRONMENT WATER HERITAGE AND THE ARTS (ed.). Canberra.

PENNAY, M., LAW, B. A. & REINHOLD, L. 2004. Bat calls of New South Wales: Region based guide to the echolocation calls of microchiropteran bats. *In:* NSW DEPARTMENT OF ENVIRONMENT AND CONSERVATION (ed.). Hurstville.

PWCNT 2002. Key to the Bat Calls of the Top End of the Northern Territory. *In:* PARKS AND WILDLIFE COMMISSION OF THE NORTHERN TERRITORY (ed.). Damian J. Milne.

REARDON, T. 2003. Standards in bat detector based surveys. *Australasian Bat Society* Newsletter 20.

REINHOLD, L., LAW, B., FORD, G. A. & PENNAY, M. 2001. *Key to the Bat Calls of South-east Queensland and North-east New South Wales*, Queensland Department of Natural Resources and Mines.

VAN DYCK, S. & STRAHAN, R. 2008. *The Mammals of Australia (Third Edition); ,* Sydney, New Holland.

APPENDIX G PRELIMINARY VEGETATION AND FAUNA MANAGEMENT PLAN

Theodore Wind Farm

Preliminary Vegetation and Fauna Management Plan

PREPARED FOR

RWE Renewables Australia Pty Ltd

DATE
12 December 2024

REFERENCE
0661076



DOCUMENT DETAILS

DOCUMENT TITLE	Theodore Wind Farm
DOCUMENT SUBTITLE	Preliminary Vegetation and Fauna Management Plan
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Date	12 December 2024
Version	5.0
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Client name	RWE Renewables Australia Pty Ltd

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Final	5.0	Sophie Allan	David Dique	David Dique	12.12.2024	

SIGNATURE PAGE

Theodore Wind Farm

Preliminary Vegetation and Fauna Management Plan

0661076





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ACRONYMS AND ABBREVIATIONS

Name	Description
DCCEEW	Department of Climate Change, the Environment and Water
DoR	Department of Resources
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
ERM	Environmental Resources Management Australia Pty Ltd
VFMP	Vegetation and Fauna Management Plan
ha	Hectares
km	kilometres
LC	Least Concern
MNES	Matters of National Environmental Significance
MSES	Matters of State Environmental Significance
NC Act	*Nature Conservation Act 1992*
OC	Of Concern
PMST	Protected Matters Search Tool
PR	*Planning Regulation 2017*
RE	Regional Ecosystem
TEC	Threatened Ecological Communities
VM Act	*Vegetation Management Act 1999*
WN	WildNet
WONS	Weeds of National Significance
WTG	Wind Turbine Generator

1. INTRODUCTION

Environmental Resources Management Australia Pty Ltd (ERM) has been engaged by Theodore Energy Development Pty Ltd (TED) / (the Proponent) to prepare a Preliminary Vegetation and Fauna Management Plan (VFMP) for the proposed Theodore Wind Farm located approximately 22 km east of the township of Theodore, Queensland (herein referred to as the Proposed Action).

The VFMP has been prepared for the area considered for the Proposed Action (herein referred to as the 'Study Area').

The Proposed Action consists of up to 170 WTG and ancillary infrastructure including, but not limited to, access tracks, substations, overhead and underground electrical cabling, hardstands, and an operation and maintenance compound. In order to facilitate connection to the electricity grid, TED is working with Powerlink to determine the optimal connection point to the existing network. The Proposed Action is being developed across 9 land parcels, 8 freehold lots and 1 lands lease lot (currently being converted to freehold), on alluvial plains with non-remnant grasslands predominantly used for agricultural grazing.

The objective of this VFMP is to minimise any potential residual impacts to vegetation, fauna and associated habitats with the Proposed Action. This includes describing how impacts on species will be minimised and managed during construction and operation of the Proposed Action. The purpose of this Preliminary VFMP is to support the Development Application, with a detailed VFMP to be prepared prior to construction.

1.1 STUDY AREA AND CONTEXT

The Study Area is approximately 46,830 ha in size and is located 22 km to the east of the township of Theodore, and approximately 50 km south of Biloela in the Banana Shire Council Local Government Area, Central Queensland. The Study Area lies adjacent to and within the locality (10 km) of several state forests including Belmont State Forest to the east, Montour State Forest to the north and Trevethan State Forest to the south of the Study Area.

The Study Area is comprised of 9 lots on 3 properties. The lot on plans are outlined below in Table 1-1.

TABLE 1-1 RELEVANT STUDY AREA LAND PARCELS

Property	Lot on Plan
Landowner 1	Lot 4 on SP131475 Lot 2 on RP617749 Lot 1 on RP617748 Lot 8 on DW2
Landowner 2	Lot 17 on DW49 Lot 18 on DW550
Landowner 3	Lot 11 on DW446 Lot 19 on DW551 Lot 20 on SP100500
Road Reserves	Part of Defence Road Part of Crowsdale Camboon Road Unnamed Road Reserves
Total Study Area	46,830 ha

The Study Area occurs within the Banana Shire Council Local Government Area and is zoned as Rural under the Banana Shire Council Planning Scheme 2017. Cattle grazing is the dominant land use in the Study Area, with largely cleared areas associated with lower slopes dominating the landscape.

The Study Area is located within the Southern Brigalow Belt bioregion as defined by the Interim Biogeographic Regionalisation for Australia (IBRA) framework. Ecological and topographical features observed within the Study Area are typical of the region and include eucalypt dominated open forest and woodlands on alluvial plains and igneous rock. Open forests and woodlands consistent with this bioregion are generally observed in the south of the Study Area. In the north, the landscape is characterised by non-remnant grasslands with historic land clearing and severe dieback.

Access to the Study Area is primarily from Defence Road, with crossings and smaller access from Crowsdale-Camboon Road in the centre of Study Area. Throughout the duration of the construction and operational phases of the Proposed Action, host properties are able to continue to use land for agricultural activities throughout the life of the Proposed Action and it is anticipated that tracks established during construction of the Proposed Action will aid in continued agricultural activities.

1.2 AVOIDANCE MEASURES AND POTENTIAL RESIDUAL IMPACT MANAGMENT

The Proposed Action has the potential to directly and indirectly impact flora and fauna values within the Study Area. Generally, the greatest potential impact to biodiversity values is associated with clearing and grading activities during which vegetation and fauna habitat is removed. Where possible, vegetation disturbance associated with the Proposed Action has been avoided, and where avoidance is not possible, it is being minimised through the ongoing detailed design process. However, possible residual impacts to biodiversity values may include:

- Vegetation clearing;
- Fauna habitat loss;
- Mortality or injury of fauna;
- Dust impacts;
- Noise and light impacts;
- Exacerbation of exotic flora and fauna (animal pests and weeds).

An ecological impact assessment was prepared by ERM in 2024, and this management plan aims to minimise the potential residual impacts associated with the Proposed Action.

The key component of the vegetation and fauna management strategy is avoidance through layout design. The avoidance strategy will occur in two phases. The first design phase is based on avoidance of vegetation and potential habitat mapped as a result of the field investigations conducted, and subsequent constraints identified. The second design phase will involve pre-clearance surveys which includes on the ground micro siting at each location proposed for infrastructure (such as WTGs). The pre-clearance surveys will assess the localised environmental values, including threatened species breeding habitat and protected plants to determine if micro-siting can be used to avoid key values.

Several more avoidance measures have been implemented, including, but not limited to, the following:

- Identification of areas with high ecological value and avoidance of these;
- Clearly delineate approved vegetation clearance areas/ work zones to prevent over-clearing;
- WTGs will be sited where possible to minimise impacts to mature trees;
- Implementation of the VFMP; and
- Where required, a qualified fauna spotter-catcher will conduct a search immediately prior to clearing of vegetation for the presence of fauna species and important habitat values. Where fauna or important habitat values are detected, the spotter catcher will assess and implement the most appropriate method to avoid or minimise impacts as a result of clearing.

2. EXISTING ENVIRONMENT

2.1 LANDSCAPE ATTRIBUTES

The Study Area occurs within Brigalow Belt bioregion as defined by the Interim Biographic Regionalisation of Australia (IBRA) framework and includes a range of landscape features, vegetation communities and habitats typical of the region. The Study Area contains stream orders 1-7 watercourses mapped under the *Vegetation Management Act 1999* (VM Act). Impacts within these watercourses will be limited to linear infrastructure such as access tracks and underground/overhead electrical reticulation. Generally, the ecological condition of most of the Area is influenced by historical land clearing and cattle grazing, which is currently the dominant land use throughout the Study Area. The areas that are most heavily impacted by grazing are associated with alluvial plains as well as notable disturbance around permanent water sources (farm dams and watercourses) and cattle yards. The Study Area includes a number of existing made and unmade road reserve areas.

No protected areas occur within the Study Area. However, the north-east section of the Study Area neighbours:

- The Belmont State Forest;
- The south-east section of the Study Area is adjacent to Montour State Forest; and
- The southern section of the Study Area abuts Trevethan State Forest.

The topography of the Study Area is characterised by steep ridgelines and flat alluvial plains. Across the Study Area the landscape features minor variation in geology, from torsdale volcanics mixed with camboon volcanics, to rocky outcrops of large boulders, open flat areas on tops of ridges, and sedimentary stratigraphy on the western extent of the site. The Study Area is intersected by serval major waterways, those being Castle Creek in the northern section of the Study Area, and Boam Creek in the southern end of the Study Area.

The ecological condition of the Study Area is majorly influenced by historical land clearing and cattle grazing, with large patches of cleared land featuring no remnant vegetation occurring throughout. This is most prominent in the centre and north of the Study Area, though some large swathes of cleared land also occur in the southeast of the Study Area.

The Study Area has been classified into six vegetation and broad habitat types:

- Grasslands and cultivated agricultural land;
- Waterbodies and drainage features;
- Riparian woodland and open forest dominated by Eucalyptus populnea, E. tereticornis often associated with stream channels;
- Vine Forest/Thickets and Dry Rainforest;
- Eucalypt woodland and open forest dominated by E. crebra with a grassy understorey; and
- Brigalow woodlands.

2.2 REGIONAL ECOSYSTEMS AND REGULATED VEGETATION

There are 11 Regional Ecosystems (RE) mapped by the Queensland Government DoR data as present in the Study Area, as detailed in Table 2-1. The majority of the Study Area is cleared agricultural land with grasslands, and occasional regrowth dominant throughout the middle and the northern portion of the Study Area. The Study Area, particularly the southern section and a pocket in the north section, contains eucalypt woodlands and dominated by narrow leaved ironbark (*E. crebra*) and silver-leaved ironbark (*E. melanophloia*) (REs 11.12.1 and 11.12.2), with the south section also supporting open forest dominated by lemon-scented gum (*Corymbia citriodora*) (RE 11.12.6). Eucalypt woodlands (*E. populnea)* and blue gum (*E. tereticornis, E. camaldulensis*) woodlands (REs 11.12.3 and 11.3.2) are present and occur largely in the southern sections of the Study Area along alluvium associated with ephemeral watercourses. Brigalow open forest (*Acacia harpophylla)* are present mostly in the centre of the Study Area (RE 11.12.21). Small, isolated patches of semi evergreen vine thicket are also present, largely in the south and south-east corner (RE 11.12.4). Some woodland is mapped on Cainozoic lateritic duricrust, with presence of lemon-scented gum (*C. citriodora),* gum-top ironbark *(E. decorticans)* and *Acacia* spp. (REs 11.7.6 and 11.7.4c). The majority of remnant vegetation within the Study Area is classed as:

- Category B Regulated Vegetation, which totals 1,657.5 ha;
- Category C high value regrowth, which totals 1.9ha;
- Category R GBR riverine regrowth, which totals 191.1 ha.

Clearing of regulated vegetation is required to facilitate the development of the Proposed Action. Clearing of regulated vegetation will be avoided and minimised where possible. Where clearing of regulated vegetation cannot avoided, all clearing will comply with the DoR Accepted Development Vegetation Clearing Code.

TABLE 2-1 REGIONAL ECOSYSTEMS WITHIN THE STUDY AREA

RE	Regional Ecosystem Description	Structure Category	VM Act Status	Biodiversity Status	Study Area (ha)	% of Study Area
11.12.1	*Eucalyptus crebra* woodland on igneous rocks	Sparse	LC	NoC	13,448	28.72
11.12.2	*Eucalyptus melanophloia* woodland on igneous rocks	Sparse	LC	NoC	931.8	1.99
11.12.21	*Acacia harpophylla* open forest on igneous rocks. Colluvial lower slopes	Mid-dense	E	E	146.1	0.31
11.12.3	*Eucalyptus crebra, E. tereticornis, Angophora leiocarpa* woodland on igneous rocks especially granite	Sparse	LC	OC	372.3	0.8
11.12.4	Semi-evergreen vine thicket and microphyll vine forest on igneous rocks	Dense	LC	NoC	196.1	0.42
11.12.6	*Corymbia citriodora* open forest on igneous rocks (granite)	Mid-dense	LC	NoC	2885.8	6.16
11.3.2	*Eucalyptus populnea* woodland on alluvial plains	Sparse	OC	OC	523.9	1.12
11.3.25	*Eucalyptus tereticornis* or *E. camaldulensis* woodland fringing drainage lines	Sparse	LC	OC	47.6	0.1
11.3.4	*Eucalyptus tereticornis* and/or *Eucalyptus spp.* woodland on alluvial plains	Sparse	OC	OC	166.6	0.36
11.7.4c	*Eucalyptus decorticans +/- Eucalyptus spp. +/- Acacia spp.* Occurs on low hills and ranges with shallow soils. On Cainozoic lateritic duricrust	Sparse	LC	NoC	13.5	0.03
11.7.6	*Corymbia citriodora* or *Eucalyptus crebra* woodland on Cainozoic lateritic duricrust.	Sparse	LC	NoC	0.2	0.0004
Non-remnant/ cleared agricultural areas or grasslands (with occasional regrowth and individual paddock trees)					28,098.10	60.00
Total					**46,830**	**100**

RE listing status:
E = Endangered;
LC = Least Concern;
OC = Of Concern; and
NoC = No concern of present.

2.3 THREATENED ECOLOGICAL COMMUNITIES

Two TECs were identified as known or likely to occur within the Study Area:

- Brigalow (Acacia harpophylla dominant and co-dominant); and
- Poplar Box Grassy Woodland on Alluvial Plains.

Areas of Poplar Box Grassy Woodland on Alluvial Plains retained canopy cover and, with the exception of one patch to the east of the TEC associated with a linear patch of RE 11.3.25 which lacked canopy species of *Eucalyptus populnea*, other patches were ground-truthed to qualify as Category B Good Quality.

Some vegetation patches within the Study Area were considered to not meet the key diagnostic criteria and condition thresholds listed in the Approved Conservation Advice Brigalow TEC and Poplar Box Grassy Woodland on Alluvial Plains TEC. Predominantly patches of potential associated Brigalow REs in the centre of the Study Area which lacked canopy species of *Acacia harpophylla*.

2.4 FLORA SPECIES

2.4.1 THREATENED FLORA SPECIES

Six listed threatened flora species were determined to have the potential to occur within the Study Area. No threatened flora species were detected across nine field survey events between 2022 and 2024. However, the distribution of these species overlaps with the Study Area and suitable habitat was observed. On this basis, their potential presence cannot be rules out. The threatened flora species with potential to occur within the Study Area are listed in Table 2-2.

TABLE 2-2 EPBC ACT AND NC ACT LISTED FLORA SPECIES WITH POTENTIAL TO OCCUR WITHIN THE STUDY AREA

Species Name	Common Name	NC Act Status	EPBC Act Status	Potential Habitat Mapped within the Study Area
Cadellia pentastylis	Ooline	VU	V	• There is potential habitat of vine forest/thickets and dry rainforest present within the Study Area for this species. • The total potential habitat is 277.4 ha
Cossinia australiana	Cossinia	EN	E	• There is potential habitat of vine forest/thickets and dry rainforest present within the Study Area for this species. • The total potential habitat is 277.4 ha
Rhaponticum australe	Austral cornflower	VU	V	• There is potential habitat of eucalypt woodlands and open forests present within the Study Area. • The total potential habitat is 21,768.5 ha
Solanum dissectum	-	EN	E	• There is potential habitat of eucalypt woodlands and open forests present within the Study Area. • The total potential habitat is 260.6 ha
Solanum johnsonianum	-	EN	E	• There is potential habitat of brigalow woodlands present within the Study Area for this species. • The total potential habitat is 260.6 ha

Species Name	Common Name	NC Act Status	EPBC Act Status	Potential Habitat Mapped within the Study Area
Xerothamnella herbacea	-	EN	E	• There is potential habitat of brigalow woodlands present within the Study Area. • The total potential habitat is 260.6 ha

Status listing per NC Act: CR = Critically Endangered; EN = Endangered; VU= Vulnerable.

Status listing per EPBC Act: CE = Critically Endangered; E = Endangered; V= Vulnerable; Mi =Migratory.

2.4.2 INTRODUCED FLORA SPECIES

Weeds of National Significance (WONS) or as Category 3 restricted invasive species under the *Queensland Biosecurity Act 2014* (*Biosecurity Act 2014*) were observed occurring within the Study Area.

WONS and Category 3 restricted invasive plants include:

- lantana – (*Lantana camara*)
- velvet tree pear (*Opuntia tomentosa*);
- parthenium (*Parthenium hysterophorus*); and
- cats claw creeper (*Dolichandra unguis-cati*).

The Australian Weeds Strategy (2017-2027) provides information on the best practices for management of WONS, including prevention and early detection of weeds and the minimisation of the impact of established weeds (Invasive Plants and Animals Committee, 2016). Such principles from the Australian Weed Strategy should be considered as part the Proposed Action Biosecurity Management Plan.

The Proponent must take reasonable and practical measures to minimise the biosecurity risks associated with dealing with Category 3 restricted matters. Local government biosecurity plans may also need to be consulted to determine any local measures that should be adopted for management and included into the Proposed Action Biosecurity Management Plan. Other introduced species recorded in the Study Area during field surveys, but not listed as WONS or under the *Biosecurity Act 2014* include:

- blue billygoat weed (*Ageratum houstonianum*);
- balloon cotton bush (*Gomphocarpus physocarpus*);
- noogoora burr (*Xanthium occidentale*)
- cobblers' pegs (*Bidens pilosa*);
- rhodes grass (*Chloris gayana*);
- red natal grass (*Melinis repens*); and
- Brazilian nightshade (*Solanum seaforthianum*).

2.5 FAUNA SPECIES

Nine ecological field surveys were undertaken from October 2022 to September 2024 by ERM. Based on these field surveys and a likelihood of occurrence assessment, four EPBC Act and NC Act listed threatened fauna species, were considered known to occur within the Study Area. Additionally, one EPBC Act and NC Act listed threatened fauna species was considered likely to

occur within the Study Area. These EPBC Act and NC Act listed threatened fauna species that are considered known or likely to occur within the Study Area are listed in Table 2-3.

Additionally, one NC Act only fauna species is considered known to occur within the Study Area and one NC Act only species is considered likely to occur within the Study Area.

TABLE 2-3 EPBC ACT AND NC ACT LISTED FAUNA CONSIDERED KNOWN OR LIKELY TO OCCUR WITHIN THE STUDY AREA

Species Name	Common Name	NC Act Status	EPBC Act Status	Habitat Mapped within the Study Area
Phascolarctos cinereus	Koala	EN	E	There was found to be 1,613.4 ha of preferred foraging and breeding habitat, 21,216.6 ha of general foraging and breeding habitat and 6,950.5 ha of dispersal habitat.
Petauroides volans	Greater Glider (southern and central)	EN	E	There was found to be 1,662.1 ha of likely/current denning habitat, 381.4 ha of potential/habitat denning habitat, 20,070.2 ha of foraging and dispersal habitat.
Geophaps scripta scripta	Squatter Pigeon (southern)	VU	V	There was found to be 15,502.5 ha of breeding habitat and 8,152.0 ha of foraging and dispersal habitat.
Chalinolobus dwyeri	Large-eared Pied-bat	VU	V	There was found to be 2,856.1 of ha foraging habitat.
Myiagra cyanoleuca	Satin flycatcher	SLC		There was found to be 1,964.6 ha of foraging and dispersal habitat.
Tachyglossus aculeatus	Short-beaked Echidna	SLC	-	The entire Study Area, 46,830 ha, is considered suitable habitat.
Strophurus taenicauda albiocularis	Golden tailed gecko	NT	-	There was found to be 14,720 ha of suitable habitat.

Status listing per NC Act: CR = Critically Endangered; EN = Endangered; VU = Vulnerable; NT = Near Threatened; SLC = Special Least Concern.

Status listing per EPBC Act: CE = Critically Endangered; E = Endangered; V= Vulnerable; Mi =Migratory.

Five EPBC Act and NC Act listed threatened fauna species have been assessed as having the potential to occur within the Study Area, outlined in Table 2-4.

TABLE 2-4 EPBC ACT AND NC ACT LISTED SPECIES WITH POTENTIAL TO OCCUR WITHIN THE STUDY AREA

Species Name	Common Name	NC Act Status	EPBC Act Status	Potential Habitat Mapped within the Study Area
Hirundapus caudacutus	white-throated needletail	VU	V, Mi	Species likely to fly aerially over the Study Area, which also contains potential foraging and roosting habitat in the form of tall eucalypt forests likely in elevated areas. No elevated areas for roosting. Habitat not mapped for this species as likely only an aerial flyover visitor as the species does not utilise terrestrial habitats for foraging.
Turnix melanogaster	black-breasted buttonquail	VU	V	Potential foraging habitat present within the Study Area associated with isolated patches of dense vegetation associated with SEVT. Potential foraging and roosting habitat is 277.4 ha.
Rostratula australis	Australian painted snipe	EN	E	Potential foraging habitat present within the Study Area associated with waterbodies and drainage features (predominantly farm dams). Potential foraging habitat is 56.0 ha.
Petaurus australis australis	Yellow-bellied glider (south-eastern)	VU	V	A total of 1,284.2ha of potential foraging habitat and 388.4 ha of potential denning habitat has been mapped within the Study Area associated with old growth eucalypt forests.
Stagonopleura guttata	Diamond firetail	V	V	A total of 7,899.3 ha of potential foraging habitat has been mapped within the Study Area.

Status listing per NC Act: CR = Critically Endangered; EN = Endangered; VU= Vulnerable.

Status listing per EPBC Act: CE = Critically Endangered; E = Endangered; V= Vulnerable; Mi =Migratory.

3. ASPECTS AND RISKS

3.1 CONSTRUCTION ACTIVITIES

During the construction phase, vegetation will need to be cleared to establish a construction footprint. Clearing works may impact on flora species and breeding places, shelter and food sources for fauna species. Key aspects of the Proposed Action that could result in impacts to flora and fauna include:

- Habitat clearance for permanent and temporary construction facilities (e.g. WTGs and associated infrastructure, transmission lines, compound sites, stockpile sites, access tracks). The consequences of this impact may include:
  - Direct loss of native flora and fauna habitat;
  - Injury and mortality to fauna during clearing of fauna habitat;
  - Fragmentation of connectivity areas;
  - Introduction and spread of priority weeds and pathogens that impact fauna;
- Disturbance to fallen timber, dead wood and bush rock; and
  - Indirect impacts identified include risks for soil and water contamination, creation of barriers to fauna movement, or the generation of excessive dust, light or noise.

3.2 OPERATIONAL ACTIVITIES

Vegetation impacts are largely associated with the construction phase of the Proposed Action. Potential impacts during the operational phase can arise from:

- Routine maintenance and servicing of WTGs, access tracks, weed management (around WTGs and infrastructure) and infrastructure as required;
- Disturbance effects that exclude fauna from habitat; and
- Barrier effects that limit fauna movement between essential resources, such as foraging and roosting areas.

4. MANAGEMENT MEASURES

Aspect	Implementation
Purpose	The purpose of the Vegetation and Fauna Management Plan (VFMP) is to describe how impacts on vegetation and fauna will be minimised and managed during construction of the Proposed Action.
Objectives	The key objective of the VFMP is to ensure that impacts to vegetation and fauna are managed and are within the scope permitted by the Development Permit. To achieve this objective, the following will be undertaken: • Ensure appropriate controls and procedures are implemented during construction activities to avoid (where necessary) or minimise potential adverse impacts to biodiversity values in the Proposed Action footprint; • Ensure appropriate measures are implemented to address the mitigation measures detailed in the Development Permit; and • Ensure appropriate measures are implemented to comply with relevant legislation and other requirements.
Targets	The following targets have been established for the management of vegetation and fauna impacts during construction of the Proposed Action: • Ensure full compliance with the relevant legislative requirements; • Ensure full compliance with relevant requirements of the Development Permit; • No disturbance to vegetation outside the construction footprint; • Minimise disturbance to vegetation within the Study Area; • Minimise disturbance to fauna within the Study Area; • No increase in distribution of noxious weeds currently existing within the Study Area; • No new noxious weeds introduced to the Study Area; • No threatened fauna mortality during clearing and construction; and • No pollution or siltation of aquatic ecosystems, wetlands, endangered ecological communities or threatened species habitat.
Key References	• *Planning Act 2016;* • *Nature Conservation Act 1992 (NC Act);* • *Environmental Protection Act 1994 (and Regulation) (EP Act);* • *Vegetation Management Act 1999 (VM Act);* • *Biosecurity Act 2014 (and Regulation); and* • *Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth) (EPBC Act).*

Stage	Management Actions	Responsibility	Timing
Pre-Development	Undertake a 'constructability assessment' to ensure vegetation clearing is minimised through design process.	Proponent	Design
	The two-stage design process where impact and disturbance mitigation surveys and procedures will be put in place. Areas of remnant and regrowth vegetation will be avoided through development design following the constraints identified during the first-stage field surveys and subsequent micro-siting (pre-clearance) survey stages.	Proponent	Design
	Design of a turbine with a blade sweep area >40 m above ground level to provide a collision-free foraging zone within the canopy and 20 m above the canopy	Proponent	Design
	Locating turbines away from key habitats where feasible (including remnant vegetation and waterways and drainage lines)	Proponent	Design

Stage	Management Actions	Responsibility	Timing
Pre-Construction	Pre-clearance surveys and on ground micro-siting will ensure infrastructure is located in areas which avoid, and subsequently minimise edge effects and the isolation, fragmentation, or dissection of tracts of native vegetation and identified habitat for listed protected species.	Principal Contractor	Prior to Construction
	A biosecurity plan will be developed and implemented for the Proposed Action. This will include measures such as vehicle wash downs, weed certification and obligations to remain on access tracks throughout the Study Area.	Principal Contractor	Pre-Start Works
Construction	All clearing shall be within clearly marked boundaries and in accordance with the Development Permit.	Principal Contractor	At All Times
	Staff and contractors will be made aware through general site induction and training of the potential to generate dust emissions and mitigation and management measures that should be implemented to avoid clearing prior to pre-clearing checks.	Principal Contractor	At All Times
	Implementation of the Queensland Fauna Stock Management Plan	Principal Contractor	At All times
	Where trenching and excavations are created which may entrap fauna, suitable escape measures are put in place, and excavation are checked for fauna before backfilling.	Principal Contractor	At all times
	Provide site specific information on relevant threatened species.	Principal Contractor	At all times
	Include toolbox talks for site specific flora and fauna information to all field staff and contractors.	Principal Contractor	Daily
	Construction activities must not interfere or block natural drainage e.g. disturbing channel contours.	Principal Contractor	At All Times
	Where required, watercourse crossing points will be adequately stabilised to prevent erosion.	Principal Contractor	At All Times
	Activities will be planned so that movement of vehicles, plant, machinery and equipment avoids moving between properties as required.	Principal Contractor	At All Times
	Ensure appropriate waste management (lidded bins), including food scraps, to reduce potential for feral species to become established on-site	Principal Contractor	At All times
	Imported materials with the potential to transport weed seeds will be assessed to ensure they are free of contamination, disease and invasive weeds.	Principal Contractor	At All Times

Stage	Management Actions	Responsibility	Timing
	Access roads, easements and yards will be kept weed free where practicable.	Principal Contractor	At All Times
	Only registered herbicides will be used by licenced weed sprayer.	Principal Contractor	At All Times
Monitoring	Inspections by spotter / catcher during clearing, specifically hollow trees or food tree species.	Principal Contractor	As Required
	Weekly site inspections to review flora and fauna control measures during construction.	Principal Contractor	Weekly
	Auditing of CEMP during construction.	Principal Contractor	Quarterly
Reporting	Sightings and incidents reported in daily pre-starts during construction.	Principal Contractor	Daily
	Fauna spotter-catcher will keep an inventory of any fauna species encountered with details of species, capture and release condition and capture and release GPS co-ordinates during construction, in accordance with NC Act.	Spotter Catcher	Daily
	Injured native fauna to be reported to HSEQ Manager.	Principal Contractor	Within 24 hours
	GPS co-ordinates of all MNES and MSES flora locations to be reported when clearing activities are planned.	Principal Contractor	As Required
	Any cleared vegetation not designated to be cleared to be reported to Health. Safety Environment and Quality Manager.	Principal Contractor	Within 24 hours
	Monthly report during construction to report on clearing activities aligned with approval requirements.	Principal Contractor	Monthly
	Annual report on weed management measures and maintenance of vegetation activities, aligned with approval requirements	Principal Contractor	Annually
Corrective Action	All near misses and incidents will be investigated to establish root cause. Where necessary corrective actions will be developed to improve existing processes.	All Personnel	As Required

5. CONCLUSION

The nine field investigations undertaken between October 2022 and September 2024 have determined the ecological values with associated vegetation communities and habitats that occur within the Study Area. As a result of these field investigations, the layout design has been informed such that areas with high ecological value vegetation within the Study Area have been avoided.

The second phase of layout design will result in further avoidance of remnant and regrowth vegetation as a result of pre-clearance surveys. These pre-clearance surveys will assess the proposed locations for infrastructure and adjust these accordingly if any vegetation communities or habitats for threatened species are located within the proposed locations.

Construction and operational activities that will potentially impact vegetation have been identified and subsequent mitigation measures have been outlined in this Preliminary VFMP, in order to adequately manage these potential impacts. A detailed VFMP will be prepared prior to construction.

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APPENDIX H CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

Preliminary Construction Environmental Management Plan

Theodore Wind Farm

PREPARED FOR

Theodore Energy Developments Pty Ltd

DATE

15 July 2025

REFERENCE

0661076



DOCUMENT DETAILS

DOCUMENT TITLE	Preliminary Construction Environmental Management Plan
DOCUMENT SUBTITLE	Theodore Wind Farm
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	06	Sophie Allan	Michael Rookwood	David Dique	12.12.24	
	07	Kelsie Youman			14.07.25	Proposed Action layout update

SIGNATURE PAGE

Preliminary Construction Environmental Management Plan

Theodore Wind Farm

0661076





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ACRONYMS AND ABBREVIATIONS

Acronym	Description
BESS	Battery Energy Storage System
CEMP	Construction Environmental Management Plan
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DTMR	Department of Transport and Main Roads
EP Act	*Environmental Protection Act 1994*
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
ERM	Environmental Resources Management Australia Pty Ltd
ESCP	Erosion and Sediment Control Plan
FDI	Fire Danger Indicator
Ha	Hectares
HSE	Health, Safety and Environment Advisor
Km	Kilometre
NC Act	*Nature Conservation Act 1992*
PO	Performance Outcome
The Proponent	Theodore Energy Development Pty Ltd, a wholly owned subsidiary of RWE Renewables Europe & Australia
The Project	Theodore Wind Farm
SDAP	State Development Assessment Provision
SDS	Safety Data Sheet
SMP	Stormwater Management Plan
State Code 23	State Code 23: Wind farm development
SWMS	Safe Work Method Statement
VM Act	*Vegetation Management Act 1999*
VMP	Vegetation Management Plan
WTG	Wind Turbine Generator
WONS	Weeds of National Significance

1. INTRODUCTION

Environmental Resources Management Australia Pty Ltd (**ERM**) has been engaged by Theodore Energy Development Pty Ltd (**TED**) / (**the Proponent**) to prepare a Preliminary Construction Environmental Management Plan (**CEMP**) for the proposed Theodore Wind Farm located approximately 22 km east of the township of Theodore, Queensland (herein referred to as the Project).

The CEMP has been prepared for the area considered for the Project (herein referred to as the Project Area).

The Project consists of up to 170 WTG and ancillary infrastructure including, but not limited to, access tracks, substations, overhead and underground electrical cabling, hardstands, and an operation and maintenance compound. In order to facilitate connection to the electricity grid, TED is working with Powerlink to determine the optimal connection point to the existing network. The Project is being developed across 9 freehold land parcels, on alluvial plains with non-remnant grasslands predominantly used for agricultural grazing.

The Proponent has identified the proposed design and layout, and as such, potential impacts as a result of the Project have been identified. Baseline management measures are required to avoid or minimise these impacts to the greatest extent possible through the construction process.

1.1 PURPOSE

The purpose of this CEMP is to provide an overview of key infrastructure required for the Project, outline the potential impacts from the Project, and to provide baseline management and mitigation measures for these potential impacts.

This Preliminary CEMP has been prepared to support the Development Application (**DA**) for the Project in accordance with the Queensland State Development Assessment Provisions (**SDAP**) State Code 23: Wind farm development (**State Code 23**). The purpose of this preliminary CEMP is to demonstrate compliance with the performance outcomes (**POs**) relating to construction management of SDAP State Code 23.

In accordance with PO16 of State Code 23 this Preliminary CEMP addresses potential project impacts to environmental values, water quality objectives and amenity. A separate Traffic Impact Assessment has been prepared to address the Projects potential impacts to the local transport networks and infrastructure during construction.

It is anticipated that this Preliminary CEMP will provide the management and mitigation measures to support construction, as well as roles and responsibilities for key parties, with a Final CEMP to be prepared prior to commencement of construction. baseline foundation for the detail CEMP that is to be prepared once the Project has undergone the detailed design phase. Additional information may also be required by the Department of Climate Change, Energy, the Environment and Water (**DCCEEW**) to support the *Environment Protection and Biodiversity Conservation Act 1999* (**EPBC Act**) assessment process.

1.2 SUITABLY QUALIFIED PERSON

Management measures noted in this preliminary CEMP have been subject to technical review by Dr David Dique, a 30-year experienced ecologist. Additionally, David led all field survey design which identifies the species of interest for the Project Area and informed required avoidance and mitigation strategies.

2. CONSTRUCTION ENVIRONMENTAL MANAGEMENT FRAMEWORK

2.1 ROLES AND RESPONSIBILITIES

The Project construction team is divided into numerous roles, including:

- The Proponent;
- The Principal Contractor;
- All other personnel (including contractors).

The responsibilities of each of the above listed roles are outlined in **Table 2-1**.

TABLE 2-1 ROLES AND RESPONSIBILITIES

Roles	Responsibilities
Proponent	• Responsible for obtaining primary State and Federal approvals for the Project, with secondary consents a shared responsibility between the Proponent and Principal Contractor; and • Responsible for reviewing all plans prepared for the Project.
Principal Contractor	• Preparation of site-specific management plans including CEMP and Health and Safety documentation; • Preparing, reviewing and implementing this CEMP and communicating the CEMP requirements to all Project personnel; • Engage qualified and experienced staff and provide management support to ensure all activities relating to environmental performance are undertaken by trained and competent personnel; and • Report to administrating authorities where required. • Ensure all environmental requirements are implemented in accordance with the project approvals, client requirements, the specification, the contract requirements and legislative obligations; • Establish and maintain a list of current contact names and telephone numbers for all personnel relevant to environmental matters; • Ensure that all personnel are inducted in their roles and responsibilities; • Escalating environmental incidents to the Principal Contractor where required; • Responsible for ensuring all required training and competencies are up-to-date as required; • Undertake and record corrective actions, release incidents and non-compliance; and- • Support the continued review and update of the environmental management framework to address risks relevant to each construction phase or activity.
All personnel	• Follow the requirements of the CEMP and the Principal Contractor • Undertake pre-start meetings and Tool Box Talks; • Undertake the appropriate training and inductions prior to commencement of construction works; • Report any site-specific environmental issues (i.e., dust generation, spillages, excessive noise and vibration etc.) to the appropriate representative as communicated in the site induction; and • Comply with all relevant environmental laws associated with the delivery of the Project.

2.2 PROJECT HEALTH AND SAFETY RECORDS

The Principal Contractor will appoint a suitably qualified and experienced management team who will be responsible for the site, including legal and environmental responsibilities, site health and safety, ensure adherence to the CEMP, approved method statements and the DA and other consents. Contractors and subcontractors will be required to adhere to this CEMP.

All construction management documents are subject to ongoing review and continual improvement. This includes times of change to scheduled activities or to legislative or licensing requirements. Only the relevant Principal Contractor, or delegate, has the authority to change any of the environmental management documentation.

All construction management documentation will be in accordance with Theodore Energy Development Pty Ltd Health and Safety Policy.

2.3 ASSOCIATED ENVIRONMENTAL MANAGEMENT PLAN COMMITMENTS

In association with this CEMP, the Project commits to preparing the following environmental management plans to support the construction of the Project:

- Vegetation and Fauna Management Plan;
- Bird and Bat Management Plan;
- Bushfire Management Plan;
- Stormwater Management Plan;
- Erosion and Sediment Control Management Plan;
- Construction Traffic Management Plan;
- Post-Construction Rehabilitation Management Plan;
- Safety and Emergency Management Plan;
- Complete Investigation and Response Plan;
- Cultural Heritage Management Plan;
- Biosecurity Management Plan.

2.4 CEMP UPDATES, APPROVAL AND DISTRIBUTION

The Principal Contractor appointed prior to the commencement of construction work will coordinate the preparation, review, and distribution, as appropriate, of construction management documents. During the construction and commissioning phases of the Project, CEMPs and site generated documentation will be held at either the site office, online or other appropriate locations as required.

The Principal Contractor will implement a document control procedure to control the flow and revisions of documents within and between stakeholders and sub-contractors. The procedure will also ensure that documentation is:

- Developed, reviewed prior to issue e.g. checklist/compliance forms, Safe Work Management Systems, Journey Hazard Assessments, and site access procedures;
- Issued for use;
- Controlled and stored for the legally required timeframe;
- Removed from use when superseded or obsolete; and
- Archived.

A register and distribution list will identify the current revision of documents or data.

2.5 COMMUNICATION

The suitably qualified management team appointed by the Principal Contractor are to be the main point of contact for any environmental issues that may arise during the construction phase of the project. Onsite personnel will report any environmental issues as they arise to the relevant manager as advised during the site induction, who are then to take further action where required.

All personnel onsite are required to undertake a site-specific site induction prior to commencement of works.

2.6 STAFF TRAINING AND AWARENESS

All workers including subcontractors will receive induction to ensure that they are aware of their responsibilities relating to safety. Designated emergency response trained staff members will be trained according to their level of responsibility:

- First Aiders – Emergency First Aid response; and
- Fire Wardens – Warden Training.

3. PROJECT DESCRIPTION

3.1 PROJECT AREA LOCATION

The Project involves the construction and operation of a large-scale wind farm, approximately 22 kilometres (km) east of the township of Theodore, Queensland within the Banana Shire Council Local Government Area. The Project Area is within the Rural Zone of the Banana Shire Council, with the predominant land use being cattle grazing.

The Project Area is 46,830 hectares (ha) in size. The Project Area consists of nine properties owned by three individuals. The total Disturbance Footprint is anticipated to be 1,590.1 ha, which accounts for approximately 4.1% of the Project Area.

3.2 SENSITIVE LAND USES

Sensitive Land Uses is defined in Schedule 24 of the Planning Regulation 2017 and means any of the following land uses:

1. Caretakers' accommodation
2. Child care centre
3. Community care centre
4. Community residence
5. Detention facility
6. Dual occupancy
7. Dwelling house
8. Dwelling unit
9. Educational establishment
10. Health care services
11. Hospital
12. Hotel
13. Multiple dwelling
14. Non-resident workforce accommodation
15. Relocatable home park
16. Residential care facility
17. Resort complex
18. Retirement facility
19. Rooming accommodation
20. Rural workers' accommodation
21. Short-term accommodation
22. Tourist park

Construction activities have the potential to impact the amenity sensitive land uses through increased traffic, noise, dust, visual impact and environmental degradation. **Table 3-1** outlines the sensitive land uses identified within the locality of the Project as shown on **Figure 1-1.** Impacts to these land uses are heightened within 3km of construction activities, which is limited to sensitive land uses on host lots for this Project.

TABLE 3-1 SENSITIVE LAND USES WITHIN LOCALITY

ID	Lot Description	Status	Distance to nearest WTG (approx.)
H01	Lot 2 on SP131475	Associated Non-host Lot	15,789 m
H02	Lot 1 on RP617748	Host Lot	8,154 m
H03	Lot 8 on DW2	Host Lot	5,326 m
H04	Lot 17 on DW49	Host Lot	2,678 m
H05	Lot 11 on DY446	Host Lot	1,534 m
H06	Lot 18 on DW550	Host Lot	2,025 m
H07	Lot 18 on DW550	Host Lot	2,904 m
H08	Lot 20 on SP100500	Host Lot	2,020 m
H09	Lot 20 on SP100500	Host Lot	5,743 m
N1	Lot 4 on DW559	Non-host Lot	6,463 m
N2	Lot 4 on DW559	Non-host Lot	6,447 m
N3	Lot 4 on DW559	Non-host Lot	6,391m
N4	Lot 22 on DW526	Non-host Lot	3,521 m
N5	Lot 10 on DW40	Non-host Lot	8,298 m
N6	Lot 15 on SP257659	Non-host Lot	5,093 m
N7	Lot 16 on DW388	Non-host Lot	3,493 m
N8	Lot 16 on DW388	Non-host Lot	3,513 m
N9	Lot 16 on DW388	Non-host Lot	3,535 m
N10	Lot 16 on DW388	Non-host Lot	3,524 m
N11	Lot 20 on DW2	Non-host Lot	4,355 m
N12	Lot 9 on DW19	Non-host Lot	4,470 m
N13	Lot 9 on DW19	Non-host Lot	5,385 m
N14	Lot 9 on DW19	Non-host Lot	5,309 m
N15	Lot 13 on DW2	Non-host Lot	5,704 m
N16	Lot 9 on DW198	Non-host Lot	4,355 m
N17	Lot 3 on RP617750	Non-host Lot	6,455 m
N18	Lot 26 on SP179635	Non-host Lot	13,932 m

3.3 PROJECT OVERVIEW

The Theodore Wind Farm is proposed to include up to 170 WTG project, consisting of:

- Up to 170 WTGs;
- WTG foundations and hardstand areas;
- Temporary infrastructure such as concrete batching plants, laydown areas, temporary construction offices, welfare facilities and parking;
- On-site accommodation;
- Access tracks including public road and water crossings;
- Electrical reticulation including underground cabling and overhead lines;
- Switching stations and substations;
- Battery Energy Storage Systems (**BESS**);
- Temporary and Permanent meteorological masts; and
- Permanent operations and maintenance facilities, with a variety of associated site facilities and storage laydowns around the proposed site.

The infrastructure design has been based on refining the infrastructure design through an iterative process including environmental, wind resource, constructability, landowner, traditional owner, and transmission network considerations. The design refinement process focused on the avoidance and minimisation of impacts to important ecological values (vegetation and mapped habitat for listed threatened species), identified from the desktop and field investigations conducted from October 2022 to September 2023, and the coordination of these aspects with engineering design and wind resource restrictions.

The proposed development is proposed to be connected to the grid network via the Banana Range Wind Farm Connection Project 275kV transmission line, approx. 50 km north of the Project Area, with the transmission line to be under separate ownership and subject to separate approvals.

It should be noted that existing land management practices will be largely unaffected by the proposed development as the host properties are able to continue to use for agricultural activities throughout the life of the Project.

3.3.1 WIND TURBINE GENERATORS

The final selection of turbine numbers, locations and dimensions will be determined as part of the detailed design. However, the Project Area has been designed to accommodate the following maximum turbine dimensions (**Table 3-2**) so that potential impacts of environmental values can be properly considered.

TABLE 3-2 KEY GENERATION AND TURBINE SPECIFICATIONS

Feature	Statistic
Estimated Project generation capacity	1152 MW *
Turbine electrical output	Up to 8.0 MW
Number of Turbines	Up to 170
Hub height**	UP to 185 m
Tip height**	Up to 270 m
Rotor diameter**	Up to 175 m

**The actual output of the wind farm will depend on the size and type of turbine chosen during the detailed design phase. Regardless of the size of the wind farm generation capacity, the proposed development will still need to comply with the Queensland Wind Farm State Code and supporting Planning Guidelines, particularly in relation to acoustic amenity and setback criteria.*
***The specifications contained within the table are based on current, projected turbine size. Whilst they are an estimated maximum, changes in technology and constructability may result in larger turbines being installed*

3.3.2 TURBINE FOUNDATIONS AND HARDSTAND FOUNDATIONS

Each WTG foundation will consist of a mass concrete footing or rock anchor foundation where suitable. WTG foundations may vary in size depending on the selected WTGs, imposed loadings, ground conditions, construction methodology and the drainage design. The detailed design of the foundations will be undertaken prior to construction of the proposed development and will be dependent on the final selection of WTG model to be installed at the Project Area.

The final design will also consider the geotechnical conditions identified through detailed site investigations. The ground surrounding the WTG will be finished, so it is tidy and usable for shared agricultural purposes. This may include mounding.

At each WTG site, a hardstand area may be established for the laydown of key WTG equipment including the crane boom laydown and assembly area, nacelle, tower sections, blades, and other WTG components. The hardstand is the area used for the assembly, construction, and erection of the WTG. Each WTG foundation and hardstand area will be up to approximately 2.67 ha in size. Where suitable just in time delivery and tower cranes might be utilised which may result in a smaller hardstand area. The smaller hardstand area is dependent on geotechnical studies, detailed engineering design including construction methodology review.

3.3.3 TEMPORARY INFRASTRUCTURE

The preliminary layout includes 12 construction laydown areas, totalling at 102 ha in size. Temporary construction laydown areas are proposed for the storage of WTG components when initially delivered to site as well as other construction items. Alongside the laydown areas, 5 locations for concrete batching plants are proposed, with approximately 2 concrete batching plants to be operations, with the potential to move around the Project Area. The concrete batching plants are to be established on the site for production of concrete for the WTGs foundations and other infrastructure footings, these are proposed to be approximately 2 ha in size.

3.3.4 ACCESS AND UNDERGROUND CABLING AND OVERHEAD TRANSMISSION LINES

Up to 223 km of access roads will be required for the proposed development within the Project Area. Access tracks between the existing State-controlled road network and the wind farm components will be established and or upgraded to allow access to the site for construction and operational traffic. Considerations in the establishment of these routes will include load requirements, turning radii, topography of the land, soils, watercourse crossings, vegetation clearing and potential colocation of wind farm infrastructure. The onsite access road layout will be designed to utilise existing tracks where appropriate and usage does not significantly impact on planned agricultural usage.

The proposed access/infrastructure corridors are as narrow as reasonably practical given the design maturity. This width is necessary to accommodate the access road, elements of the electrical collection system between the WTGs and where co-located, parts of the transmission system. Proposed access/infrastructure corridors will be further refined in the detailed design phase prior to construction.

The road formation will generally not exceed 12 m in width (table drain – table drain), with regular widening to accommodate passing bays. The area of the corridors outside the road formation may be cleared for the installation of reticulation/overhead lines. Access corridors will be their widest during the construction phase, and areas outside the final road formation will undergo progressive restoration of grass species post construction activities.

3.3.5 CONNECTION SYSTEM, SUBSTATION AND GRID CONNECTION

A cable system (33kV) will be installed to transfer the power from each WTG to a collection substation. Currently 4 substations are proposed. The collection system will be installed in a mix of underground cables, and above-ground cables supported by poles.

The substations will include equipment necessary to collect the power flow from each WTG, increase the voltage and dispatch to the electricity grid. Hardware would include switches, breakers, transformers, meters, synchronous condensers (as needed), Battery Energy Storage Systems (BESS), the earthing grid, and other electrical equipment. The nominal size of the substations is approximately 1.5 ha each with potential for an adjacent switching station/BESS of up to 16 ha each to ensure space for appropriate ability to isolate areas of the wind farm from the transmission system and ensure system stability as well as provision suitable BESS. A BESS for the storage of produced electricity may be installed at the substations/switching stations. The BESS would be designed to provide storage for export, system strength, and firming support.

The voltage will be “stepped up” at the substations (up to 275kV) and transmitted to the transmission grid.

The planning approval for the export transmission line is outside the scope of this report and will be subject to a separate application submitted by a different proponent.

3.3.6 PERMANENT METEOROLGICAL MASTS

Three metrological monitoring (met) masts have been erected within the Project Area, for data collection purposes for Project feasibility.

Approximately 4 met masts are to be installed to monitor wind conditions for the operation of the wind farm. Installed meteorological masts will be up to 200 m in height. The exact location of these masts is indicated in **Appendix A**. The marking, lighting, and notification requirements accordance with regulatory requirements and conditions of approval.

3.3.7 CENTRAL OPERATIONAL AND MAINTENANCE FACILITY

The preliminary layout includes 2 operations and maintenance facilities, which are approximately 8.5 ha in total size. The operational infrastructure for the proposed development will include management offices, workshops, storage, equipment laydown, and warehousing facilities.

3.4 CONSTRUCTION SPECIFICATIONS

3.4.1 CONSTRUCTION EQUIPMENT AND MACHINERY

It is anticipated that the construction work (subject to geotechnical conditions) may include the following:

- Cut and fill earthworks (including excavating, hammering, ripping, crushing, material haulage, blasting, compacting, moisture conditioning, testing etc.);
- Erection of turbines (including component delivery, cranage, fitting of ancillary items);
- Cabling works (including trenching and laying of cables by various methods);
- Substation construction;
- Vegetation clearing (utilising appropriate methods);
- Construction of site compounds, camps and facilities; and
- Delivery of various Project components.

It is anticipated that an on-site borrow pit will be utilised to source much of the required construction material, where possible.

3.4.2 CONSTRUCTION NOISE MANAGEMENT

Noise emissions from construction plant(s) can be reduced by fitting exhaust mufflers, using reversing alarms that emit a broadband noise (e.g. white noise) rather than a beep, maintaining plant in good working order and following industry standard construction methodologies.

Noise will be generated by mobile plant such as excavators, bulldozers, mobile cranes and the movement of heavy vehicles.

3.4.3 CONSTRUCTION HOURS AND TIMEFRAME

Approximately 300-500 staff will be employed during the peak construction period, and will include locally sourced staff, contractors and manufacturers, however, this is dependent on qualifications, suitability, local procurement policies and commercial terms.

The general construction hours of the Project will be refined prior to the commencement of construction, however, is likely to be:

- Monday to Sunday: 7:00am to 7:00pm.
- Public holidays: As required.

It is expected that a roster system is adopted and that construction activities will continue seven days per week. Core hours on site will be 7.00am to 7.00pm but on occasion, work outside of these times will be required. This would include for example, concrete pouring of foundations, Turbine installation to take advantage of low winds, and where not to continue would create safety issues, any emergency or works which would impact normal work so needs to be performed out of hours

Outside of emergencies, night works would be minimised.

3.4.4 TEMPORARY SITE ILLUMINATION

As a general rule, construction activities will be planned to be undertaken during daylight hours and scheduled to maximise the use of the longer summer days. However, there will be occasions where temporary site illumination will be required to ensure work can be undertaken in a safe environment.

Temporary site lighting and the use of lights on construction plant will be required on occasions where work will continue outside daylight hours or where adverse weather conditions impact on the available natural light. Lighting may also be required if work is required within a building or structure. Temporary lighting shall be provided to allow the construction activities to be carried out safely and will only be used during the site working hours.

When providing temporary lighting or using lights on construction plant the potential for light pollution or nuisance will be considered, although there are no residential receptors within close proximity to working areas.

The placing of temporary lighting will also consider species which may be disturbed by unnatural light such as bats.

Site lighting outside of working hours will be designed to the minimum required level to ensure safety and security to prevent potential impacts on neighbours. Exterior out of hour's site lighting shall be limited to floodlights mounted on temporary welfare cabins to provide sufficient lighting levels to ensure that site workers are able to access the cabins and circulatory spaces safety. Additionally, PIR activated floodlights may be utilised on site and located at strategic locations, for example, to facilitate safe access at gates, highlight safety controls near excavations or deter unauthorised access in the vicinity of plant and material storage.

3.4.5 WATER SUPPLY

The provision of water is essential for the construction of the proposed development. The construction activities likely to require water are:

- Bulk earthworks and material conditioning;
- Concrete batching;
- Dust suppression; and
- Drinking water for personnel and water for ablution facilities.

Water demand will vary over time, depending on the stages of the work and required water quality standards for each activity. Potable water fit for human consumption will be required at the site offices, while both medium (suitable for use in the concrete batching) and low-quality raw water (for earthworks and dust suppression) may be used for construction purposes. Water will be tested from various supply options and allocated to the most appropriate use.

A water sourcing strategy will be developed so that water used during the construction phase does not cause issues to adjacent landowners or other stakeholders. Where possible, potable water will be obtained from the local government water reticulation network or otherwise trucked to the site.

Lower quality water (for earthworks and dust suppression) is likely to be locally sourced from:

- Groundwater – to include artesian and sub-artesian.
- Rainwater – to be sourced from dams or collection ranks.
- Offsite – to be sourced offsite and trucked in.

Construction water supply options will be determined during the detailed design of the proposed development and confirmed with DoR prior to construction. Appropriate permits and approvals will be sourced to ensure compliance where required.

4. CONSTRUCTION RISK IDENTIFICATION AND MANAGEMENT MEASURES

4.1 SUMMARY OF RELEVANT IMPACTS

The Project has the potential to impact numerous ecological values, particularly during the clearing and construction phases, these include:

- Impacts to flora and fauna through habitat clearing and direct mortality;
- Introduction of weed and pest species;
- Impacts to traffic and access in the area;
- Impacts to stormwater and waterways through worsening of stormwater management, spills, leakage, seepages and impacts to aquatic ecology;
- Impacts to air quality from dust and exhaust emissions, fugitive dust emissions from construction activities and indirect impacts to adjacent habitat areas as a result of noise and dust;
- Noise and vibration impacts to sensitive receptors;
- Risk of bushfire;
- An increase in erosion and sediment runoff; and
- Potential disturbance to cultural heritage sites / items / values (if located onsite).

The above potential impacts have been considered, and impact-specific objectives and management measures have been applied for each. The management of each of these impacts is discussed in further detail in the following subsections, with specific management measures listed.

It is noted that construction activities in general may also pose the risk of light pollution, disturbance of contaminated land and exposure. Based on site assessments completed to date it is considered unlikely these factors will impact the Project Area. This is based on the Project Area location, proposed operating hours being Monday to Sunday from 7:00AM to 7:00PM and land not being listed on any contaminated land or environmental management registers. Should additional impacts be identified as part of detailed project design, the CEMP will be amended as required.

4.2 FLORA AND FAUNA

The construction of wind turbines within the Project Area has potential to impact MNES and MSES flora and fauna through the following:

- Habitat clearance for permanent and temporary construction facilities (e.g. wind turbines and associated infrastructure, transmission lines, compound sites, stockpile sites, access tracks). The consequences of this impact may include:
  - Direct loss of native flora and fauna habitat;
  - Injury and mortality to fauna during clearing of fauna habitat;
  - Fragmentation of connectivity areas;
  - Introduction and spread of priority weeds and pathogens that impact fauna;
  - Disturbance to fallen timber, dead wood and bush rock; and
  - Indirect impacts identified include risks for soil and water contamination, creation of barriers to fauna movement, or the generation of excessive dust, light or noise.

A Vegetation and Fauna Management Plan has been development for the Project, and preliminary management measures outlined in **Table 4-1** below.

TABLE 4-1 FLORA AND FAUNA MANAGEMENT MEASURES

Flora and Fauna Objectives

- Compliance with legal requirements including permits, licences, approval conditions and Federal (e.g., EPBC Act) and State Acts (e.g., *Nature Conservation Act 1992*, VM Act*, Environmental Protection Act 1994*).
- Ensure the Project avoids causing unlawful environmental harm;
- Ensure harm to flora and fauna is minimised to the greatest extent practicable, particularly including direct fauna mortality; and
- Ensure all staff are made aware of potential impacts and management measures regarding flora and fauna within the Project Area.

Potential Impact	Action	Responsibility	Project Phase
Direct Fauna mortality	Include daily toolbox talks for site specific bird, bat and fauna information during clearing and construction.	Principal Contractor	Clearing and construction
	Speed limits are to be signed and enforced on all site access tracks.	All personnel	Clearing, construction and operation
	Implementation of the Queensland Fauna Stock Management Plan	Principal Contractor	Clearing and construction
	Provide site specific information on relevant threatened species.	Principal Contractor	Clearing, construction and operation
	BACI surveys conducted at impact and control areas during construction to determine bird and bat composition, abundance and density at control and development areas. This includes BUS and use of bat survey techniques (as required in the Projects Bird and Bat Management Plan).	Principal Contractor	Construction
	Fauna exclusion devices (i.e., fencing) must be implemented where practical around areas of potential risk to fauna, to discourage fauna from entering. Temporary fencing will assist in keeping animals out of the Project Area and will guide them away from unsafe environments to remaining habitats.	Principal Contractor	Construction
	A qualified fauna spotter catcher will inspect the areas to be cleared immediately prior to clearing activities occurring. Where fauna are detected the spotter catcher will assess and implement the most appropriate method to avoid or minimise impacts on that fauna as a result of clearing.	Principal Contractor	Clearing and Construction
	Where trenching and excavations are created which may entrap fauna, suitable escape measures are put in place, and excavation are checked for fauna before backfilling.	Principal Contractor	Clearing and construction

Flora and Fauna Objectives			
Habitat Clearing	All clearing shall be within clearly marked boundaries and in accordance with the Development Permit.	Principal Contractor	Clearing and construction
	Any adjacent vegetation to the impact area shall be clearly marked off to avoid unnecessary clearing/vegetation damage.	Principal Contractor	Clearing and Construction
	A Vegetation and Fauna Management Plan (**VFMP**) has been prepared and must be followed during construction to ensure that clearing is undertaken in accordance with legislative standards and requirements.	All personnel	Clearing and Construction
	Avoid the removal of large hollow-bearing trees or dead trees wherever possible. If hollow bearing trees require removal, they must be inspected by a fauna spotter catcher to determine if threatened fauna are present. If present, the species must be safely removed prior to tree felling.	Principal Contractor / Fauna Spotter Catcher	Clearing and Construction
	All threatened fauna and flora, including threatened fauna habitat (i.e., hollows, fallen logs, cracking soils etc) and weed species must be recorded in a detailed register during pre-clearing surveys. Environmental representative is to manage all records of threatened species and upload data to a public mapping register (e.g., ALA or Wildlife Online databases).	All personnel	Clearing and Construction
	A high and low risk Species Management Plan will be required and prepared for the Project, abiding by the Koala regulations within Category C vegetation.	Principal Contractor	Construction
	Infrastructure shall be located preferentially to avoid or minimise edge effects or dissecting tracts of native vegetation.	Principal Contractor / Proponent	Design and Construction
	Where disturbance to threatened species habitat has to occur, individuals and surrounding micro-habitat features (e.g., hollows, nests, logs etc.) will be translocated to suitable areas (if possible).	Principal Contractor / Fauna Spotter Catcher	Clearing and Construction
	Where required, breeding habitat clearing activities will be undertaken in accordance with a Species Management Program approved under the *Nature Conservation Act 1992*.	All personnel	Clearing and Construction
	Toolbox meetings will include information for all personnel on site specific flora information when updates are relevant.	Principal Contractor	Construction
	Natural rehabilitation of access tracks will occur once construction has been completed in accordance with the Post-Construction Rehabilitation Management Plan	Principal Contractor	Construction and Rehabilitation

Flora and Fauna Objectives			
Impact to vegetation under the VM Act	All personnel are to be made aware of potential impacts to vegetation management as a result of the Project, through onsite inductions and training prior to commencement of construction works.	All personnel	Construction
	All clearing boundaries will be clearly marked and complied with in accordance with the Development Permit.	All personnel	Construction
	A Vegetation and Fauna Management Plan (**VFMP**) has been prepared and must be followed during construction to ensure that clearing is undertaken in accordance with legislative standards and requirements.	All personnel	Clearing and Construction
	Turbines will be located in areas previously disturbed and/or less vegetated to avoid and minimise the clearing extent of mature habitat trees.	Principal Contractor / Proponent	Design and Construction
	Any adjacent vegetation to the Project Area shall be clearly marked off to avoid unnecessary clearing/vegetation damage.	Principal Contractor	Clearing and Construction
	Activities will be planned so that movement of vehicles, plant, machinery and equipment avoids moving between properties as required.	Principal Contractor	Clearing and construction
	Construction activities must not interfere or block natural drainage areas including disturbing channel contours without site appropriate engineering mitigations.	All personnel	Construction
	Access roads, easements and yards will be kept weed free where practicable.	Principal Contractor	Construction
	Only registered herbicides will be used by licenced weed sprayer.	Principal Contractor	Clearing and Construction

4.3 WEED AND PEST MANAGEMENT

The introduction of weed and pest species to the Project Area may be harmful to native and threatened species, and as such, relevant objectives and management measures (particularly regarding the clearing and construction phases of the Project) are outlined in **Table 4-2**.

TABLE 4-2 WEED AND PEST MANAGEMENT MEASURES

Weed and Pest Objectives
• Compliance with legal requirements including permits, licences, approval conditions and Federal (e.g., EPBC Act) and State Acts (e.g., NC Act, VM Act, EP Act and *Biosecurity Act 2014*); • Ensure the introduction of invasive weed and pest species during Project construction is minimised to the greatest extent practicable; • Ensure the Project avoids causing unlawful environmental harm; and • Ensure all staff are made aware of potential impacts and management measures regarding flora and fauna within the Project Area. Ensure harm to flora and fauna is minimised to the greatest extent practicable, particularly including direct fauna mortality; and • Ensure all staff are made aware of potential impacts and management measures regarding flora and fauna within the Project Area.

Potential Impact	Action	Responsibility	Project Phase
Introduction of Weed and Pests	All onsite personnel will be made aware of the locations and consequences of biosecurity threats within the Project Area.	Principal Contractor	Construction
	A Biosecurity Management Plan will be developed and implemented for the Project and will include management measures regarding vehicle wash down procedures, weed certification and obligations to restrict vehicle movements to access tracks.	Principal Contractor	Clearing and Construction
	Access to a landholder's property to be in line with protocols outlined in the site induction.	All personnel	Clearing and Construction
	Weeds Of National Significance (**WONS**) and Restrictive Invasive species will be identified and monitored in the impact area. Appropriate weed monitoring will occur to ensure new weed species are identified and recorded.	Principal Contractor	Construction
	Onsite waste disposal strategies (particularly for food wastes) to be employed that will not encourage the presence of pest fauna.	All personnel	Construction
	Monitoring and weed inspections particularly in response to reported outbreaks or complaints from adjacent property owners	Principal Contractor	Construction

4.4 TRAFFIC AND ACCESS

As a result of the clearing and construction phases of the Project, there will likely be an increase of traffic on the surrounding road network, and may occasionally result in detours, delays and decreased road condition. A Preliminary Traffic Impact Assessment has been created to assist with the Development Application approval process. The proposed development will not impede on the Stock Route Network on Crowsdale Camboon Road. Given the nature of the proposal, it is able to co-exist with agricultural activities with minimal impact on the stock route. Additionally, a Construction Traffic Management Plan will be implemented to support the proposed development during the construction phase.

4.5 STORMWATER MANAGEMENT, WATERWAYS, EROSION AND SEDIMENT CONTROL

The construction of the proposed development has the potential to impact stormwater through:

- Adverse impacts on downstream water quality due to:
- The potential increase in suspended solids, nutrients and metal concentrations; and
    - The potential introduction of chemical and fuel contaminants used during construction and maintenance.
- Adverse impacts to aquatic ecology as a result of the construction and implementation of waterway crossings, including:
    - Disturbance to riparian and aquatic vegetation;
    - Changes to the natural flow patterns of waterways;
- Disturbance to fish passages, sediment transport as a results of waterway crossings; and
    - The potential increase in sediment and nutrient loads due to altered roadside drainage arrangements.

A Stormwater Management Plan (SMP) and Erosion and Sediment Control Plan (ESCP) will be prepared prior to commencement of construction activities. The SMP aims to manage potential stormwater quality and quantities, and the ESCP will aim to support the reduction and management of erosion and sedimentation as a result of Project activities.

Mitigation and control measures proposes as part of the SMP include the following:

- Where appropriate, progressive stabilisation of exposed areas by the Principal Contractor to reduce erosion and sediment run-off.
- Construction activities are to be staged and confined to the necessary construction areas.
- Transport of any loads that are subject to loss through wind or spillage shall be covered or sealed to prevent entry of pollutants to stormwater system.
- Regular inspection and maintenance of sediment fences, sediment basins and other erosion control measures by the Principal Contractor. Following rainfall events sufficient to produce runoff, inspection of erosion control measures and removal of collected material should be undertaken. Replacement of any damaged equipment should be performed immediately.
- Adequate inspection and maintenance of controls in high erosion risk areas by the Principal contractor to ensure that the controls in these areas are operating effectively to manage the elevated risk of erosion that is present.

Additionally, a riverine protection permit is generally required prior to the excavation, placement of fill material, or removal of watercourse vegetation under the Water Act 2000. This will be sought during the preliminary stages for stormwater and erosion control if required.

Where works during construction are found to intersect or disturb fish passages, this work must be completed in accordance with the accepted development requirements for operational work that is constructing or raising waterway barrier works per the *Fisheries Act 1994.*

4.6 AIR QUALITY AND DUST

Air quality and dust as a result of the Project have the potential to be harmful to the environment, through the release of exhaust emissions, fugitive dust emissions and indirect impacts to adjacent habitat areas as a result of dust. Preliminary management measures regarding these air quality and dust impacts have been developed and are described in **Table 4-3**.

TABLE 4-3 AIR QUALITY AND DUST MANAGEMENT MEASURES

Air Quality and Dust Objectives

- Compliance with legal requirements including permits, licences, approval conditions and Federal (e.g., EPBC Act) and State Acts (e.g., NC Act, VM Act, EP Act);
- Ensure exhaust emissions and fugitive dust emissions are minimised to the greatest extent practicable;
- Ensure the Project avoids causing unlawful environmental harm.

Potential Impact	Action	Responsibility	Project Phase
Fugitive dust emissions from construction activities	Access track dust generation to be managed through water or application of dust reducing product, especially during prolonged dry periods.	All personnel	Clearing and Construction
	Install washing or shaking facilities to prevent mud from construction operations being transported onto adjacent public roads to be utilised as required.	Principal Contractor	Clearing and Construction
	Regular cleaning of Project Area entrances where necessary.	All personnel	Clearing and Construction
Indirect impacts to adjacent habitat areas as a result of noise, blasting and dust	Staff and contractors will be made aware through general site induction and training of the potential to generate dust emissions and mitigation and management measures that should be implemented. The risk of dust generation is to be monitored on a daily basis and appropriate mitigation measures enacted accordingly.	All personnel	Clearing and Construction
	Vehicles, plant and machinery will comply with site-specific speed limits to minimise dust generation.	All personnel	Clearing and Construction

4.7 NOISE AND VIBRATION

The Project is proposed in a remote location with minimal amenity impacts to surrounding properties, however there remains the potential to impact nearby sensitive receptors through noise and vibration during the clearing and construction phase of the Project. A Noise Impact Assessment has been completed to support construction, identifying that the proposed development does not adversely impact on sensitive land uses and has been designed to satisfy State Code 23 and Planning Scheme provisions which seek to ensure no unreasonable acoustic amenity impacts are experienced by existing or approved sensitive land uses.

Preliminary management measures have been prepared to minimise the impacts of noise and vibration to sensitive receptors to the greatest extent practicable and are presented in **Table 4-4**.

TABLE 4-4 NOISE AND VIBRATION MANAGEMENT MEASURES

Noise and Vibration Objectives

- Compliance with legal requirements including permits, licenses, approval conditions and Federal (e.g., EPBC Act) and State Acts (e.g., NC Act, VM Act, EP Act).
- Compliance with Queensland Wind Farm State Code and Planning Guideline; and
- Ensure the Project avoids causing unlawful environmental harm.

Potential Impact	Action	Responsibility	Project Phase
Impacts on sensitive receptors	Maintain construction equipment in good working order.	All personnel	Construction
	Maintain a noise and vibration complaints procedure and register.	Principal Contractor	Construction
	Noise generation will be minimised through dropping materials utilising methods such as minimising drop height, dropping onto existing piles, dropping in bunded areas and other similar approaches.	Principal Contractor	Clearing and Construction
	Where available, plant will be fitted with exhaust silencers and/or mufflers and will have covers closed when in use	Principal Contractor	Construction
	Working hours may be reduced around residential properties and noise emissions will be considered during the selection of plant	Principal Contractor	Construction
	Toolbox talks will be used to reiterate the importance of minimising noise on site	Principal Contractor	Construction

4.8 WASTE

Without the appropriate management measures, the Project has the potential to produce waste, and as such, the preliminary management measures in **Table 4-5** have been developed to ensure waste generation is minimised to the greatest extent practicable.

A waste management hierarchy will be implemented in accordance with the Waste Reduction and Recycling Act 2011, consisting of the following:

1. Elimination;
2. Reduction;
3. Re-use of materials;
4. Recycling; and
5. Disposal.

TABLE 4-5 WASTE MANAGEMENT MEASURES

Waste Objectives

- Compliance with legal requirements including permits, licenses, approval conditions and Federal (e.g., EPBC Act) and State Acts (e.g., NC Act, VM Act, EP Act).
- Ensure waste generation is minimised to the greatest extent practicable;
- Ensure the Project avoids causing unlawful environmental harm.

Potential Impact	Action	Responsibility	Project Phase
Waste generation	Implement site waste management plan.	Principal Contractor	Clearing and Construction
	Use a hierarchical approach to waste management, from the most preferable (reduce, reuse or recycle wastes) to the least preferable (disposal), and prioritise waste management strategies to avoid waste generation.	All personnel	Clearing and Construction
	Where waste cannot be avoided, waste materials will be segregated by type where appropriate for the waste management methods available for collection and removal (for processing or disposal) by licensed contractors.	Principal Contractor	Clearing and Construction

4.9 BUSHFIRE

Without the appropriate management measures, the clearing and construction activities required for the Project may have the potential to cause environmental harm through an increase in frequency and intensity of bushfires. As such, preliminary management measures regarding bushfires have been prepared and are outlined in **Table 4-6**.

TABLE 4-6 BUSHFIRE MANAGEMENT MEASURES

Bushfire Objectives

- Compliance with legal requirements including permits, licenses, approval conditions and Federal (e.g., EPBC Act) and State Acts (e.g., NC Act, VM Act, EP Act).
- Ensure there is no increase in bushfire risks as a result of the Project; and
- Ensure the Project avoids causing unlawful environmental harm.

Potential Impact	Action	Responsibility	Project Phase
Increase in frequency and/or severity of bushfires	Prepare a Bushfire Management Plan in consultation with Rural Fire Services.	Principal Contractor	Clearing and Construction
	Fire extinguishers must be readily available onsite, in site offices and all construction vehicles. These fire extinguishers are to be appropriately maintained in accordance with Australian Standard AS 1851 – Maintenance of Fire Protection Systems and Equipment.	All personnel	Clearing and Construction
	The Fire Danger Index (FDI) must be monitored daily.	Principal Contractor	Clearing and Construction
	Fire warnings shall be monitored and if considered dangerous, construction shall halt.	All personnel	Construction
	Ensure buildings meet relevant fire safety building codes suitable for where they are situated.	Principal Contractor	Design and Construction
	An Emergency Response Plan shall be prepared prior to clearing and construction.	Principal Contractor	Construction
	If fires occur as a result of the Project, fires must be investigated for the cause and procedures must be updated to prevent further incidents.	Principal Contractor	Construction

5. STANDARD MANAGEMENT PRACTICES

5.1 SPILL MANAGEMENT

The construction phase of the Project may incur spills at times. As part of the induction and training period of all onsite personnel, personnel will be made aware of the correct spill response and management procedures that are to be implemented onsite.

In the instance that chemicals are required to be carried or stored onsite, these will be stored appropriately for the material or chemical type. Safety Data Sheets (**SDS**) must be kept, and where required, a risk assessment is to be entered into a chemical register and appropriate spill kit to be available on site.

5.2 REFUELLING ACTIVITIES

The construction phase of the Project will require a refuelling facility to effectively refuel all onsite vehicles, plant and equipment utilised during Project construction. As such, the Project refuelling activities will occur away from fauna habitat on go lines wherever practicable. Where refuelling is to occur in-situ near to habitat, appropriate spill management materials are to be available on hand.

Due to the operational requirements, it will also be necessary for refuelling to occur where the plant is kept or in the field with drip trays available and to be used when refuelling.

5.3 EMERGENCY MEASURES

In order to effectively minimise the risks and impacts of incidents during the construction period, the following equipment will be readily available in several locations within the Project Area:

- Fire Precaution and Fighting equipment including fire blankets, fire extinguishers (e.g., water, foam, CO2, powder, water mist and wet chemical) to be provided in each vehicle;
- Spill response kits (e.g., absorbent pads and compound, personal protective equipment and bags for storage of used materials) to be provided in each vehicle; and
- First Aid medical equipment including defibrillator and snake bite kits.

In the event of an emergency all personnel on site must comply with the direction given by Rural Fire Service Queensland, and other relevant emergency services. Environmental harm[1] as defined under the *Environmental Protection Act 1994* are to be immediately reported to the Queensland environmental regulator through the 'Pollution Hotline' on 1300 130 372 (option 2).

The development of emergency procedures will be specific to the site and prepared by the Principal Contractor once engaged and prior to mobilising to site.

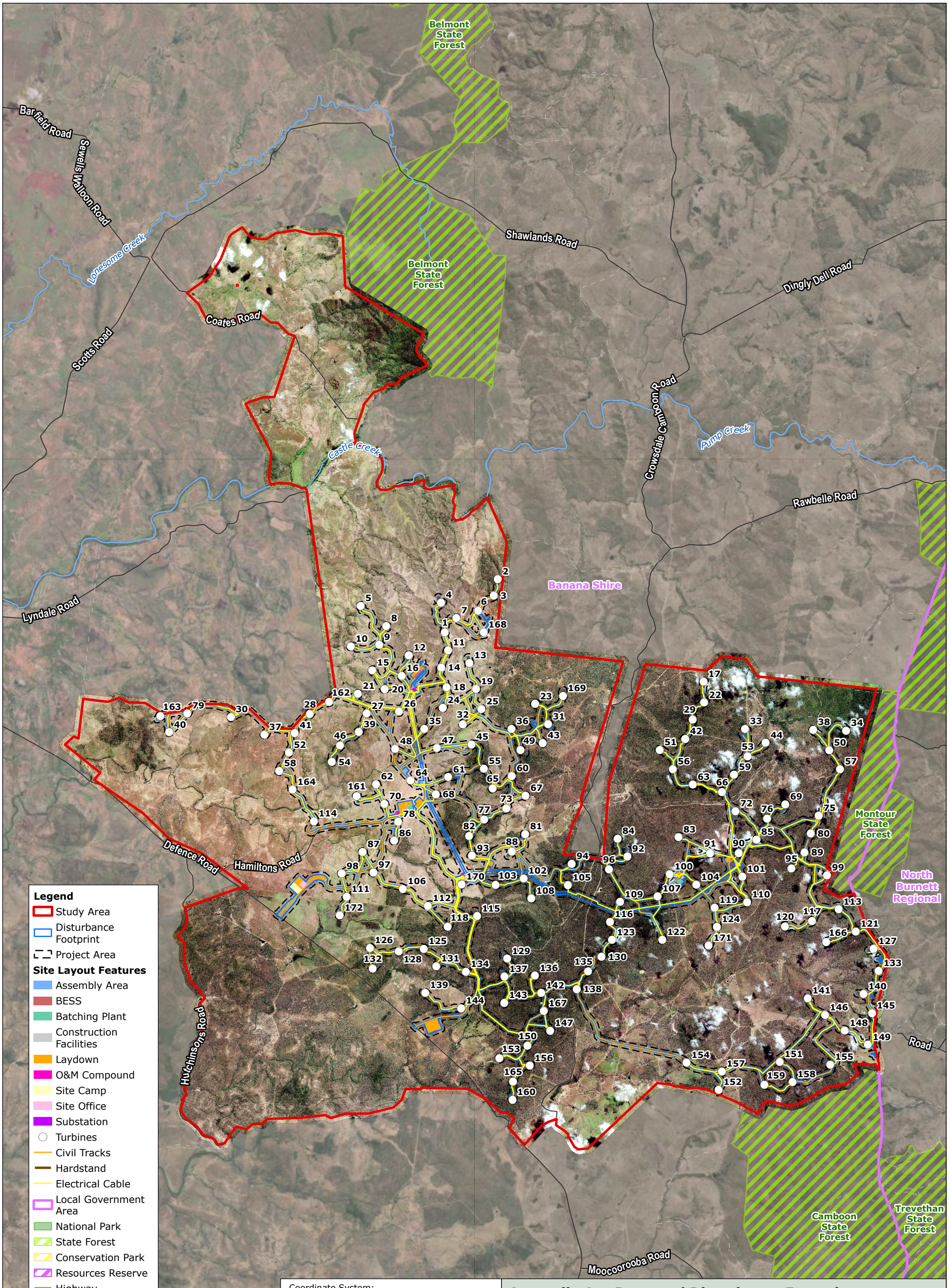
[1] *Environmental harm is any adverse effect, or potential adverse effect (whether temporary or permanent and of whatever magnitude, duration or frequency) on an environmental value, and includes environmental nuisance.*

Project staff and other workers will be made aware of the current requirements of the specific responses through a combination of:

- Site employee record forms;
- Prestart meetings;
- Toolbox talks;
- Posters; and
- Site evacuation or emergency response drills.

The effectiveness of emergency procedures will be tested periodically in accordance with emergency guidelines, amendments to emergency procedures will be made as required. Training will be provided to employees where they have been allocated emergency response responsibilities. First Aiders for the Project will be maintained with First Aid Kits located in suitable areas.

APPENDIX A PROJECT LAYOUT PLAN


Belmont State Forest
Barfield Road
Sewells Walloon Road
Lonesome Creek
Shawlands Road
Belmont State Forest
Dingly Dell Road
Coates Road
Scotts Road
Castle Creek
Crowsdale Camboon Road
Pump Creek
Rawbelle Road
Banana Shire
Lyndale Road
Montour State Forest
Defence Road
Hamiltons Road
North Burnett Regional
Hutchinsons Road
Road
Camboon State Forest
Trevethan State Forest
Moocoorooba Road
Legend
Study Area
Disturbance Footprint
Project Area
Site Layout Features
Assembly Area
BESS
Batching Plant
Construction Facilities
Laydown
O&M Compound
Site Camp
Site Office
Substation
Turbines
Civil Tracks
Hardstand
Electrical Cable
Local Government Area
National Park
State Forest
Conservation Park
Resources Reserve
Highway
Road
Track and Path
Major Watercourse
Coordinate System:
GDA2020 MGA Zone 56
Date: 04/06/2025
Created By: HD
Drawing Size: A3
0 1 2 3km
1:125,000
Appendix A - Proposed Disturbance Footprint and Project Area
Theodore Wind Farm
Theodore Energy Developments Pty Ltd
ERM

ERM HAS OVER 160 OFFICES ACROSS THE FOLLOWING COUNTRIES AND TERRITORIES WORLDWIDE

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New Zealand
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APPENDIX I SOCIO-ECONOMIC IMPACT ANALYSIS

Socio-Economic Impact Analysis

Theodore Wind Farm

PREPARED FOR

Theodore Energy Development Pty Ltd

DATE

5 September 2024

REFERENCE

0661076



DOCUMENT DETAILS

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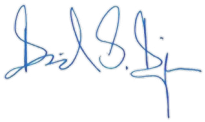
Socio-Economic Impact Analysis

Theodore Wind Farm

0661076



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ACRONYMS AND ABBREVIATIONS

Acronyms	Description
ABS	Australian Bureau of Statistics
AoI	Area of Influence
AOR	Accommodation Options Report
CEC	Community Engagement Committee
CEMP	Construction Environment Management Plan
CQ	Central Queensland
CSEP	Community and Stakeholder Engagement Plan
DA	Development Approval
DCCEEW	Department of Climate Change, Energy, the Environment, and Water
DESI	Department of Environment, Science and Innovation
DOR	Department of Resources
DTMR	Department of Transport and Main Roads
EMS	Environmental Management System
EPBC Act	Environmental Protection and Biodiversity Conservation Act, 1999
ERM	Environmental Resources Management Australia Pty Ltd
FIFO	Fly-In Fly-Out
Ha	Hectares
ILUA	Indigenous Land Use Agreement
km	Kilometres
LGA	Local Government Area
LiDAR	Light Detection and Ranging
LNP	Liberal National Party
MCU	Material Change of Use
MP	Member of Parliament
MW	Megawatt
NSW	New South Wales
QFES	Queensland Fire and Emergency Services
QLD	Queensland
RWE	RWE Renewables Australia Pty Ltd
REZ	Renewable Energy Zone
SA1	ABS Statistical Area 1
SARA	State Assessment and Referral Agency
SIA	Social Impact Assessment
SEIA	Socio-Economic Impact Analysis

Acronyms	Description
SEIFA	ABS Socio-Economic Index for Areas
SET	Stakeholder Engagement Tools
TAFE	Technical and Further Education
TED	Theodore Energy Development Pty Ltd
the Project	Theodore Wind Farm
TMP	Traffic Management Plan
UCL	Urban Centres and Localities
WTG	Wind Turbine Generator
WWNAC	Wulli Wulli Nation Aboriginal Corporation

1. INTRODUCTION

Environmental Resources Management Australia Pty Ltd (ERM) has been engaged by Theodore Energy Development Pty Ltd (TED) to undertake a Socio-Economic Impact Analysis (SEIA) for the proposed Theodore Wind Farm ('the Project').

The Project is located approximately 22 kilometres (km) east of the township of Theodore and approximately 50 km south-west of Biloela, over an area of 46,830 hectares (ha). The regional context of the Project Area is depicted in **Figure 1-1**, with key Project details outlined in **Figure 1-2**.

1.1 PURPOSE AND OBJECTIVE

The purpose of this SEIA is to provide a high-level understanding of the socio-economic context of the surrounding local communities of relevance to the Project, including the potential social and economic impacts that may be experienced by these communities.

A deeper understanding of both the socio-economic context and the potential impacts will help TED to secure its 'Social Licence to Operate' and meet future State and Commonwealth Government requirements (including the Development Application and *Environment Protection and Biodiversity Conservation Act 1999* (EBPC Act) Referral).

The SEIA refers to the Queensland Social Impact Assessment (SIA) Guideline (Department of State Development, Infrastructure, Local Government and Planning 2018), and requires the following:

- An understanding of the socio-economic environment within which the Project is situated;
- Identification of positive benefits and negative impacts to the community;
- Identification of management measures that seek to enhance benefits and mitigate negative impacts; and
- Recommendations to support community stakeholder engagement and benefit-sharing activities.

1.2 PROJECT DESCRIPTION

TED is developing the Project approximately 22 km east of the township of Theodore, 50 km south-west of Biloela and 150 km south-west of Gladstone in the Banana Shire Council Local Government Area (LGA), as shown in **Figure 1-1**.

The Project Area is comprised of nine lots on three properties, comprising approximately 46,830 ha. TED has signed agreements with all the Project landowners. Cattle grazing is the dominant land use in the Project Area, with largely cleared areas associated with lower slopes dominating the landscape.

The road network near the Project Area incorporates a range of local and state sealed and unsealed roads including Defence Road, Crowsdale-Camboon Road, and the Leichardt Highway. Access points will be created to facilitate entry into the site for construction and operation purposes and will stem from public roads.

The Project lies adjacent to and within the locality (10 km) of several state forests including Belmont State Forest to the east, Montour State Forest to the north and Trevethan State Forest to the south.

Key Project details include:

- **Wind Turbines –** up to 170 Wind Turbine Generators (WTGs) with a tip height of up to 270 m and a rotor diameter of up to 175 m.
- **Wind Monitoring –** temporary or permanent wind monitoring towers to be determined with Light Detection and Ranging (LiDARs) on site and met masts installed.
- **Ancillary Infrastructure** – including, but not limited to, access tracks, substations, overhead and underground electrical cabling, hardstands, and an operation and maintenance compound.
- **Operational Date –** target date of Quarter 4, 2027 for commercial operations to commence.
- **Battery Storage –**to co-locate with on-site substations.
- **Nearby dwellings –** No non-associated dwellings were identified 3.09 km of the nearest WTG associated with the Project. 11 non-associated dwellings have been identified within 3.09 km - 6.18 km of the proposed WTGs, and 6 non-associated dwellings have been identified within 6.18 km and the 10 km.
- **Homes Powered –** the Project proposes to power more than 500,000 homes.

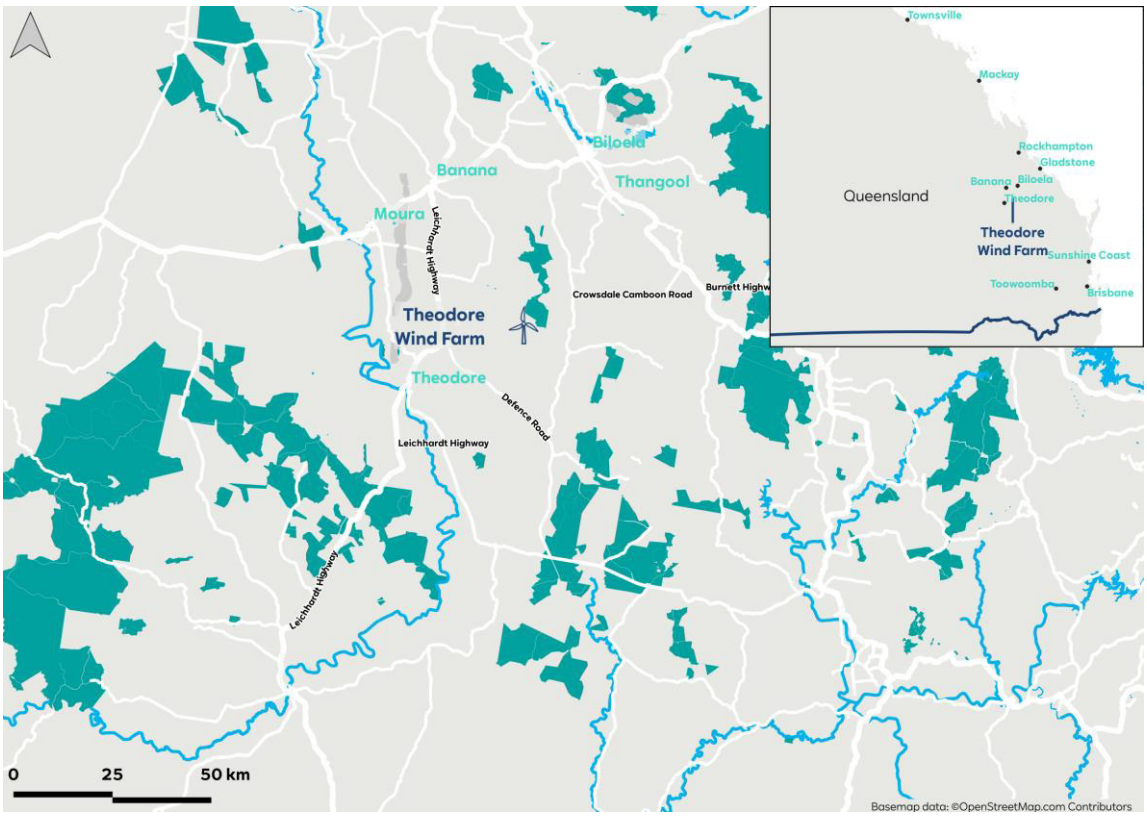


FIGURE 1-1 THEODORE WIND FARM REGIONAL CONTEXT

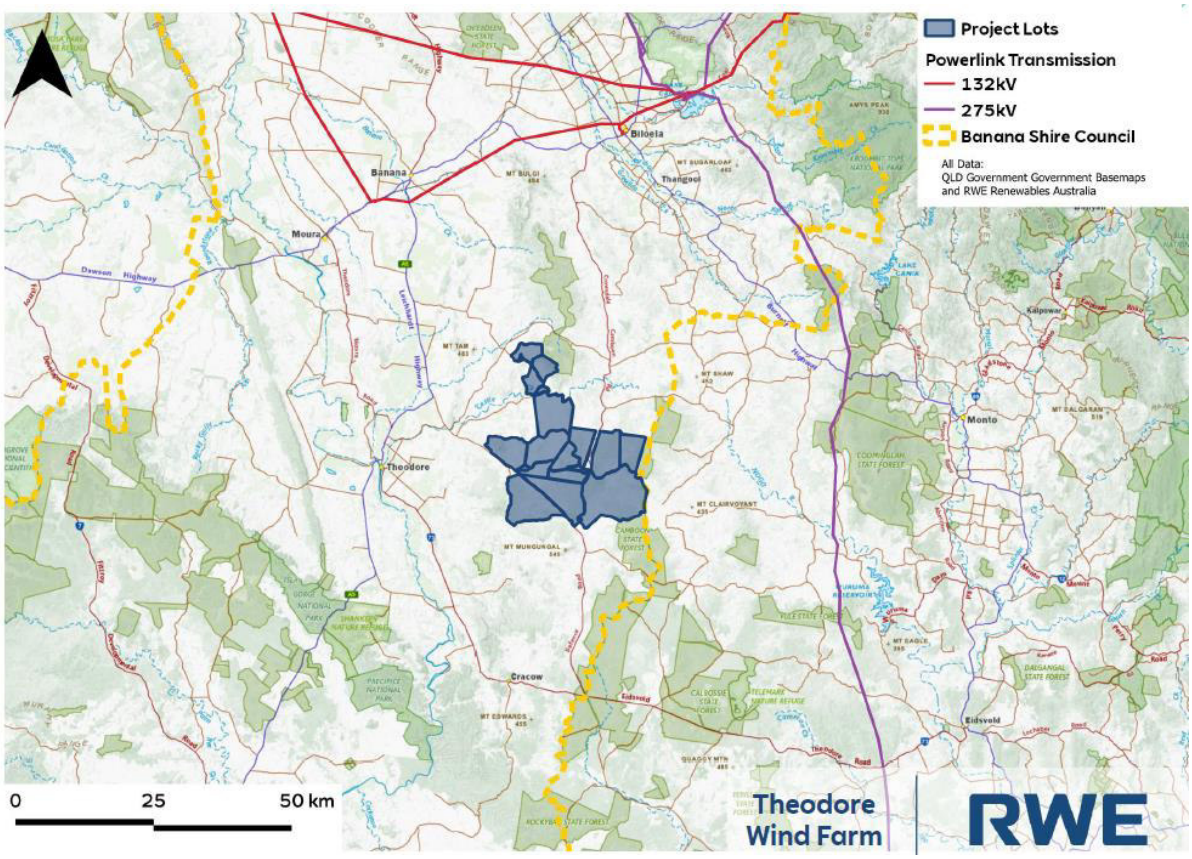


FIGURE 1-2 THEODORE WIND FARM KEY PROJECT DETAILS

1.3 DOCUMENT STRUCTURE

This SEIA is structured as follows:

- **Section 2** provides an overview of the methodology used for the social and economic impact analysis;
- **Section 3** describes the scoping for the Project's Area of Influence (AoI);
- **Section 4** describes the existing baseline conditions in the Project's AoI;
- **Section 5** provides an overview of stakeholder engagement undertaken for the Project to-date, and the outcomes of the engagement;
- **Section 6** provides a quantitative cost-benefit analysis of the Project, and employment opportunities generated by the Project;
- **Section 7** analyses the social impacts that may result from the Project, and provides an overview of social impact enhancement and mitigation measures; and
- **Section 8** outlines the approach that will be followed in monitoring and managing impacts into the Construction and Operation phases of the Project.

1.4 LIMITATIONS

This SEIA has been prepared based on publicly available desktop data and information provided by TED as part of document request responses.

The SEIA seeks to identify and consider the socio-economic impacts within the Project's AoI only. It is also noted that ERM's findings are accurate and complete only to the extent that information provided to ERM was itself accurate and complete.

Finally, ERM's findings reflect the current Project status. It is noted that a number of key decisions have not yet been made, such as the selection of contractors or suppliers. Once such decisions have been made the predicted impacts should be reviewed and updated accordingly.

1.5 AUTHORSHIP

The SEIA was drafted by Loucky Spit, Abbey Fitzroy, Ross Tunmer, and Charlie Knaggs, who hold relevant degrees in social and economic sciences. The SEIA was reviewed from a technical perspective by Louis Penny, who has over 14 years' experience in the field of social performance (including SIA) and holds a Bachelor of Regional and Town Planning from the University of Queensland, and is a member of the Planning Institute of Australia (PIA).

2. METHODOLOGY

This section describes the methodology utilised to conduct the socio-economic analysis for the Project. **Section 2.1** provides an overview of the social impact analysis methodology, with **Section 2.2** providing an overview of the economic analysis. It should be noted that the outcomes of the economic analysis have been incorporated into the final analysis.

2.1 SOCIAL IMPACT ANALYSIS METHODOLOGY

The methodology used for this SEIA has been guided by the requirements of the Queensland SIA Guideline (Department of State Development, Infrastructure, Local Government and Planning 2018) and the New South Wales (NSW) SIA Guideline (NSW Department of Planning and Environment 2023).

To this end, the SEIA involved five key tasks (Scoping, Baseline Data Collection, Stakeholder Engagement Outcomes Review, Social Impact Analysis, and Monitoring and Reporting), which are outlined in the following sub-sections.

2.1.1 TASK #1: SCOPING

The first task undertaken was a scoping exercise, which sought to:

- Determine the Project's AoI, which is the area within which potential social impacts will likely be experienced;
- Develop an initial understanding of the location and characteristics of the communities within the AoI; and
- Undertake an initial review of the likely social and community health impacts that may impact social receptors throughout the Project's lifecycle.

2.1.2 TASK #2: HIGH-LEVEL BASELINE DATA COLLECTION

The social baseline describes the social context within the Project's AoI. The aim of data collection is to identify the social environment, conditions, and trends which will be impacted by the proposed development. The social baseline is the benchmark against which direct, indirect, and cumulative impacts are predicted and analysed.

The scope and content of the social baseline has been tailored to the Project context and the level of analysis of social impacts. Primary data obtained through the engagement activities carried out to-date has also been included where relevant.

The data collected and presented in the social impact analysis is based on a review of available data from a range of primary and secondary sources, including but not limited to:

- The Australian Bureau of Statistics (ABS) Census (Community Profile) and Socio-Economic Index for Areas (SEIFA);
- Queensland Government information;

- Early stakeholder engagement outcomes, including community insights, issues and concerns, which were gathered through the stakeholder consultation process (refer to **Section 2.1.3**);
- Local and State government planning, policy, and strategy documentation (such as the Queensland SIA Guideline); and
- Plans, policies, and other documents provided by TED.

2.1.3 TASK #3: EARLY STAKEHOLDER ENGAGEMENT OUTCOMES REVIEW

Stakeholder engagement has already been undertaken by TED in order to inform Project refinement, and preparation of the Development Application. The extent of this previous engagement, as well the associated outcomes, was reviewed.

The stakeholder engagement outcomes have been used to inform the analysis of potential impacts. In addition to actualised impacts, outcomes relevant to concerns or perceptions held by the community that may not eventuate have also been considered.

2.1.4 TASK #4: SOCIAL IMPACT ANALYSIS

After the completion of the baseline data collection and with input from the community engagement activities, a high-level analysis of the potential social impacts for the Project on the communities and stakeholders located within the AoI was undertaken.

The social impacts were analysed to determine their level of significance, based on the likelihood of an impact occurring, the magnitude of impact, both positive and negative, and prior to the application of any mitigation or management measures.

The likelihood level refers to the probability of a social impact occurring as a result of the Project, while the magnitude is considered as a combination of the following characteristics:

- **Extent:** Who specifically is expected to be affected (directly, indirectly, and/or cumulatively), including any potential vulnerable people[1]? Which location(s) are affected (e.g. local, regional)?
- **Duration:** When is the social impact expected to occur? Will it be time-limited (e.g. over particular Project phases) or permanent?
- **Severity:** What is the likely scale or degree of change (e.g. mild, moderate, severe)?
- **Intensity:** How sensitive or vulnerable (or how adaptable or resilient) are affected people to the impact? How important are positive impacts to them? This might depend on the value they attach to the matter, whether it is rare or unique or replaceable, the extent to which it is tied to their identity, and their capacity to cope with or adapt to change.

[1] This may include people on low incomes; people living with disabilities, chronic medical conditions or in poor health requiring access to services; culturally and linguistically diverse communities; people who are homeless or in insecure housing; people who are unable to represent themselves; or other vulnerable people such as elderly people, children or single-parent households (NSW Department of Planning, Housing and Infrastructure 2023)

- **Level of Concern or Interest:** How concerned or interested are people? Any perceived impacts are considered as impacts for this assessment, even when concerns may be disproportionate to findings from technical assessments of likelihood, duration and/or severity.

Baseline indicators were then used to inform an understanding of the social impacts across five magnitude characteristics:

- **Transformational:** Substantial change experienced in community wellbeing, livelihood, infrastructure, services, health, and/or heritage values; permanent displacement or addition of at least 20% of a community.
- **Major:** Substantial deterioration or improvement to something that people value highly (e.g. amenity, health, etc.), either lasting for an indefinite time, or affecting many people in a widespread area.
- **Moderate:** Noticeable deterioration or improvement to something that people value highly, either lasting for an extensive time, or affecting a group of people.
- **Minor:** Mild deterioration or improvement, for a reasonably short time, for a small number of people who are generally adaptable and not vulnerable.
- **Minimal:** Little noticeable change experienced by people in the AoI.

The likelihood of an impact occurring along with its magnitude of impact combine to provide a rating of social impact significance, as described in **Table 2-1**.

Where a positive social impact is identified, it is designated as 'positive', despite the varying likelihood levels.

TABLE 2-1 SOCIAL IMPACT SIGNIFICANCE MATRIX

		Magnitude Level					
		1 Minimal	**2** Minor	**3** Moderate	**4** Major	**5** Transformational	**6** Positive
Likelihood Level	**A** Almost Certain	Medium	Medium	High	Very High	Very High	Positive
	B Likely	Low	Medium	High	High	Very High	
	C Possible	Low	Medium	Medium	High	High	
	D Unlikely	Low	Low	Medium	Medium	High	
	E Very Unlikely	Low	Low	Low	Medium	Medium	

2.1.5 TASK #5: MONITORING AND REPORTING

Following analysis of the social impacts, measures to manage and/or mitigate predicted negative impacts were considered. Where an impact is predicted to be positive, measures to enhance positive impacts were identified to ensure the maximum benefit to the community. In addition, an outline for the ongoing monitoring, evaluation and reporting of the predicted social impacts has been identified.

2.2 ECONOMIC ANALYSIS METHODOLOGY

The economic analysis was developed across two key tasks (Scoping and Economic Profiling, and Economic Analysis), which are outlined in the following sub-sections.

2.2.1 TASK #1: SCOPING AND ECONOMIC PROFILING

The first task focused on scoping the requirements of the economic analysis, and gathering the information required in order to complete the analysis.

The technical parameters of the economic analysis were established, and Project-specific economic data was obtained. An initial review of key documentation available for the Project and as received from TED was undertaken in order to formulate an understanding of the breadth of economic data available for analysis.

In addition, an economic profile of the AoI was determined. The economic profile sought to appropriately contextualise the local community as relevant to the AoI established for the Project (refer to **Section 3.1**).

2.2.2 TASK #2: ECONOMIC ANALYSIS

Once the economic parameters were determined, and the economic profile developed, the economic analysis could be undertaken. The economic analysis for the Project comprised two main elements:

1. A high level, largely quantitative cost-benefit analysis for the proposed development, focusing on the economic impacts (both positive and negative) for the local economy and community within the AoI; and
2. A more specific, quantitative analysis of the employment outcomes generated by the Project, focusing on the local community.

3. SCOPING

The first step in a SEIA is the scoping process, which helps to define the AoI, as well as the potential interactions between the Project and those communities and stakeholders who be impacted.

For the purposes of this SEIA, 'people' includes individuals, households, groups, communities, businesses, and other types of organisations. Collectively these are often referred to as 'receptors'. Based on our delineation of the Project AoI, there are a number of potential interactions that may occur between the Project and people surrounding the Project.

In determining the Project's AoI, the following Project aspects were taken into consideration:

- The regulatory context;
- The Project Description (refer to **Section 1.2**), with particular focus on the number of WTGs and their locations across the Project Area, the layout of the access tracks, the substation, and transmission line;
- Construction and Operation phase activities, such as:
  - Land clearing and ongoing access for maintenance;
  - Workforce requirements, including skills required and the proposed on-site workforce accommodation facility;
  - Goods and services required by the Project; and
  - Haulage routes to and from the Project Area;
- The location of WTGs and associated infrastructure within the Project Area relative to sensitive land users or receptors (nearby residents, communities, potential vulnerable groups and nearby businesses). This also included consideration of the proximity to environmental values and topographical features;
- The level and/or extent of impact based on technical studies carried out to-date (e.g. landscape and visual impact assessment, noise assessment, etc.); and
- The community and stakeholder engagement undertaken to-date, including the outcomes of the engagements carried out.

When considering these aspects, it was determined that the Project's AoI should include the Project Area, the area surrounding the Project Area wherein noise, visual and other amenity impacts may occur, the haulage routes where amenity impacts may be experienced, and the communities in larger nearby centres from which skills, goods, or services may be procured.

3.1 DESCRIPTION OF THE AREA OF INFLUENCE

Given the prior considerations, the Project AoI is considered to comprise a Primary AoI and Secondary AoI, defined for the purposes of this SEIA as comprising of the following two components:

- **Primary AoI**:
  - The Project Area and immediate surrounding areas comprising an area 5 km from the site boundary, including ABS SA1 No. 30804152801, ABS SA1 No. 31902150815 and the Urban Centres and Localities (UCL) of Theodore, Banana, Moura, and Biloela. ABS data has been used to identify key baseline indicators for this Primary AoI. The UCLs are included in the Primary AoI as these surrounding towns and regional centres may provide goods and services, as well as accommodation options, to support the Construction and/or Operation Phases of the Project.
- **Secondary AoI**:
  - The Local Government Areas of the Banana Shire LGA and Gladstone Region LGA are included as the Secondary AoI. Further, State level data for Queensland, and national data for Australia, has been used so as to provide an understanding of the broader and comparative socio-economic context within which the Project is located.
  - There are several possible transportation and haulage routes to the Project Area. Project equipment is to be shipped into the Port of Gladstone (located approximately 150 km north-east of the Project Area) and transported overland from the Port of Gladstone to the Project Area. It is noted that final route determination will be predicated upon potential road upgrades requirements, given the dimensions of Project components.

Indicative travel distances from the Project Area site access to the various town and regional centres is provided in **Table 3-1**.

TABLE 3-1 APPROXIMATE DISTANCES TO THE PROJECT AREA

Town/Regional Centre	Travel Distance by Road	Approximate Travel Time
Theodore	25 km west	18 minutes
Banana	49 km north	32 minutes
Moura	58 km north-west	42 minutes
Biloela	94 km north-east	1 hour
Gladstone	216 km north-east	2 hours 25 minutes

The Primary and Secondary AoIs are depicted in **Figure 3-1**.

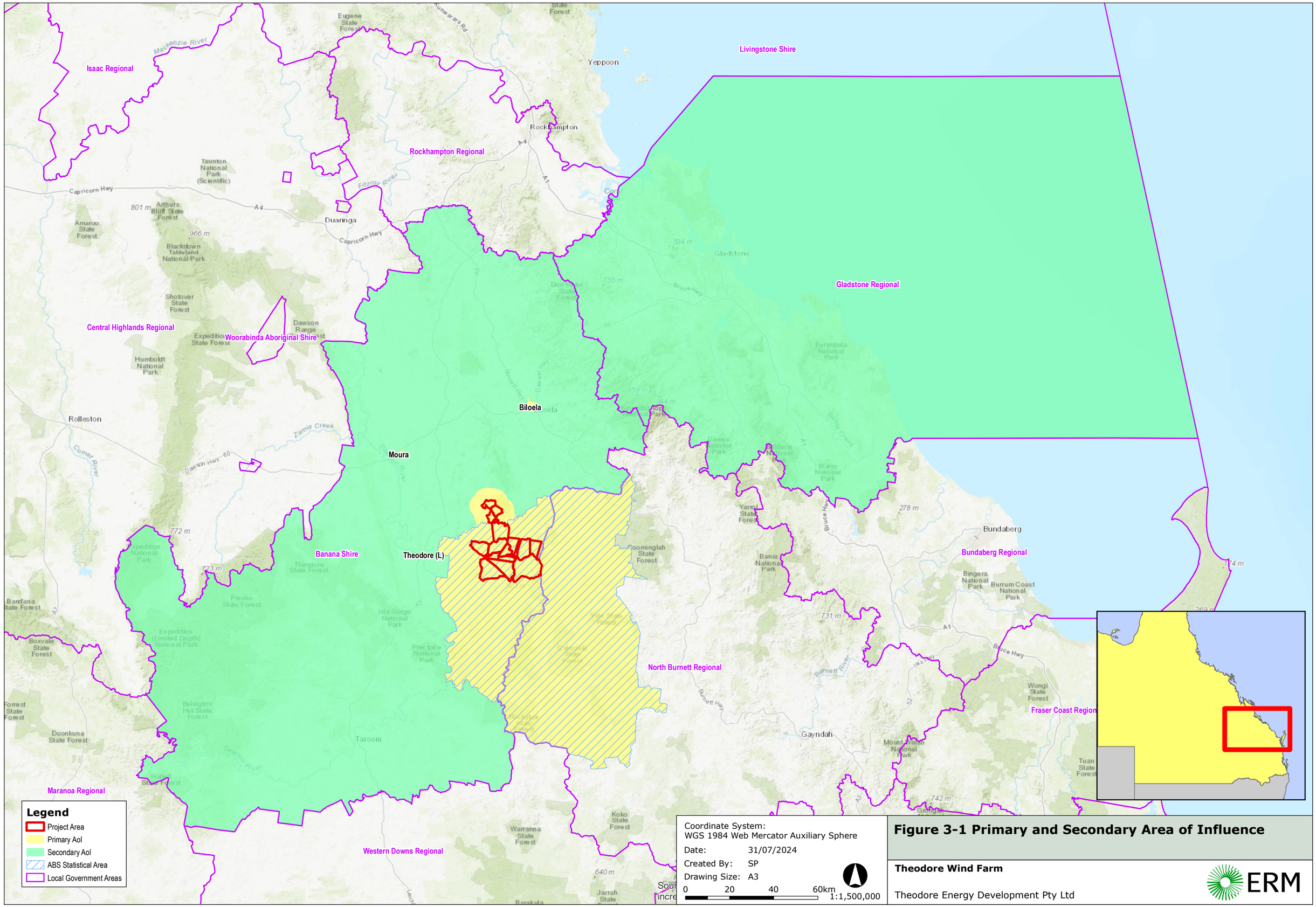


Figure 3-1 Primary and Secondary Area of Influence

Theodore Wind Farm

Theodore Energy Development Pty Ltd

ERM

0661076_AoI_G001_R3.mxd

3.1.1 ABS DATASETS

Table 3-2 outlines the primary ABS datasets used to provide key demographic information across the Project's Primary and Secondary AoIs. For the purposes of this SEIA, a combination of 2021 (i.e. latest available) and 2016 ABS datasets were considered, based on the release timeframes of data.

TABLE 3-2 SUMMARY OF RELEVANT ABS DATASETS

Location	2016 ABS Data Reference	2021 ABS Data Reference
SA1	SA13152801	SA130804152801
SA1	SA13150815	SA131902150815
Theodore (UCL)	UCL322123	UCL322120
Moura (UCL)	UCL315068	UCL315070
Biloela (UCL)	UCL314006	UCL314005
Banana Shire (LGA)	LGA30370	LGA30370
Gladstone Region (LGA)	LGA33360	LGA33360
QLD (State)	Area code 3 (State)	Area code 3 (State)

4. SOCIO-ECONOMIC BASELINE

The high-level socio-economic baseline presented in this section provides the means to contextualise the Project within the AoI. It documents the existing social and economic environments and conditions relevant for the economic and social impact analyses, provided in **Section 6** and **Section 7**, respectively.

4.1 LAND USE CONTEXT

The Project Area is within a landscape dominated by agriculture, with a history of pastural use and associated industries such as logging for the creation of agricultural related infrastructure and amenities (e.g. fences, gates, cattle yards and firewood), vegetation clearing for grazing lands and access tracks. The current land use remains predominantly for cattle grazing purposes.

The Project Area lies adjacent to and within 10 km of several state forests including Belmont State Forest to the east, Montour State Forest to the north and Trevethan State Forest to the south.

4.2 COMMUNITY PROFILE

The community profile presented in this section is based on ABS 2021 Census data, with ABS 2016 Census data used as a means of providing comparison. The specific ABS datasets used those identified in **Table 3-2**, within **Section 3.1.1**.

Table 4-1 draws on these ABS datasets in order to provide a high-level demographic overview of the Project's AoI.

Table 4-1 also includes the SEIFA to provide an indication of comparative socio-economic advantage and disadvantage, alongside details of unoccupied dwellings, dwelling tenure, and household composition.

TABLE 4-1 KEY INDICATORS FOR ALL ABS DATASETS (2021)[2] ACROSS THE PROJECT'S AOI

Population	Median Age	Indigenous Pop. (%)	Gender (M/F)[3]	SEIFA (percentile in Qld)	Dwelling count (occupied/ unoccupied)	Dwelling tenure (owned outright/ mortgaged/ rented, %)	Household composition (families/ singles/ group, %)
Banana Shire LGA30370 (LGA)							
14,514	38	4.6%	51.4% / 48.6%	79	81.6% / 18.4%	33.1% / 27.6% / 30.0%	70.5% / 26.8% / 2.7%
Gladstone Region LGA33360 (LGA)							
63,515	38	6.2%	50.7% / 49.3%	69	85.0% / 15.0%	27.3% / 36.5% / 33.4%	71.3% / 25.6% / 3.1%
Theodore UCL322120 (UCL)							
451	38	15.1%	46.6% / 53.4%	-	80.8% / 15.8%	28.9% / 23.7% / 41.2%	59.6% / 38.8% / 1.6%
Moura UCL315070 (UCL)							
1,843	33	8.0%	53.7% / 46.3%	-	78.6% / 21.9%	25.1% / 25.1% / 45%	65.8% / 31.3% / 2.9%
Biloela UCL314005 (UCL)							
5,667	36	4.8%	50.1% / 49.9%	-	85.2% / 14.8%	25.0% / 32.5% / 38.5%	69.0% / 27.0% / 4.1%
SA130804152801 (SA1)							
192	48	2.6%	57.0% / 43.0%	44	73.6% / 25.0%	52.8% / 11.3% / 24.5%	59.2% / 40.8% / 0%
SA131902150815 (SA1)							
183	39	2.2%	53.4% / 46.6%	77	64.4% / 27.8%	44.8% / 27.6% / 10.3%	87.7% / 12.3% / 0.0%

[2] Refer to **Section 3.1.1** for an explanation of the ABS datasets
[3] Percentages do not necessarily equal 100% as lower population datasets are purposely distorted to preserve anonymity.

Population	Median Age	Indigenous Pop. (%)	Gender (M/F)[3]	SEIFA (percentile in Qld)	Dwelling count (occupied/ unoccupied)	Dwelling tenure (owned outright/ mortgaged/ rented, %)	Household composition (families/ singles/ group, %)
QLD Code 3 (STE)							
5,156,138	38	4.6%	49.3% / 50.7%	-	90.7% / 9.3%	29.1% / 34.4% / 33.1%	71.0% / 24.7% / 4.3%
Australia (AUS)							
25,422,788	38	3.2%	49.3% / 50.7%	-	89.9% / 10.1%	31.0% / 35.0% / 30.6%	70.5% / 25.6% / 3.9%

Source: (ABS 2024*a*, ABS 2024*b,* ABS 2024*c,* ABS 2024*d,* ABS 2024*e,* ABS 2024*f*, ABS 2024*g)*

4.3 ECONOMIC PROFILE

The economic profile presented in this section provides a quantitative and qualitative description of the economic activities and impacts within the Project's AoI in the absence of the Project.

Statistical data in this section has been derived from both the 2016 and 2021 Census, as relevant to the LGAs of Banana Shire and Gladstone Region.

4.3.1 EMPLOYMENT RATES

Table 4-2 summarises the employment rates across the Banana Shire and Gladstone Region LGAs and compares these to the Queensland and Australian employment rates.

The 2021 Census data shows 61.6% of Queensland's population is engaged in the labour force, with 55.9% working full-time. In the Banana Shire and Gladstone Region LGAs, this rate was higher at 65.4% and 58.1% of people working full-time, respectively. The highest percentage of unemployed persons was in the Gladstone Region LGA which recorded 7.4% of people unemployed, and the lowest being in the Banana Shire LGA which recorded 4.0% of people unemployed. The percentage of people 'away from work' has increased across the board between 2016 and 2021 (ABS 2024*a*, ABS 2024*b).*

TABLE 4-2 EMPLOYMENT RATES

	Census Year	Banana Shire LGA	Gladstone Region LGA	Queensland	Australia
Full time work	**2021**	65.4%	58.1%	55.8%	55.9%
	2016	66.0%	58.3%	57.7%	57.7%
Part time work	**2021**	24.2%	28.0%	30.5%	31.2%
	2016	23.8%	25.5%	29.9%	30.4%
Away from work	**2021**	7.7%	6.5%	8.3%	7.8%
	2016	6.2%	5.1%	4.8%	5.0%
Unemployed	**2021**	2.8%	7.4%	5.4%	5.1%
	2016	4.0%	11.1%	7.6%	6.9%

Source: ABS 2024a, ABS 2024b

4.3.2 EMPLOYMENT TYPES

Employment within the Project AoI has been considered across occupation of employment (refer to **Section 4.3.2.1**) and industry of employment (refer to **Section 4.3.2.2**).

4.3.2.1 OCCUPATION OF EMPLOYMENT

Table 4-2 summarises the most common employment types in Banana Shire and Gladstone Region LGAs. There is a higher percentage of technicians and trades workers, labourers and machinery operators/drivers in the Banana Shire and Gladstone Region LGAs comparative to Queensland. This data shows that the population around the Project Area has a range of necessary skills that can be drawn upon for the workforce and construction of the Project (ABS 2024*a*, ABS 2024*b).*

TABLE 4-3 PROJECT AOI OCCUPATION OF EMPLOYMENT SNAPSHOT

	Census Year	Banana Shire LGA	Gladstone Region LGA	Queensland	Australia
Technicians and trades workers	**2021**	15.5%	20.6%	13.7%	12.9%
	2016	16.0%	21.4%	13.5%	13.5%
Labourers	**2021**	14.3%	12.4%	10.1%	9.0%
	2016	15.4%	12.9%	9.5%	9.5%
Professionals	**2021**	10.6%	14.4%	21.4%	24.0%
	2016	9.9%	13.6%	22.2%	22.2%
Machinery operator or driver	**2021**	14.6%	12.2%	6.8%	6.3%
	2016	14.1%	12.4%	6.3%	6.3%
Clerical and administrative worker	**2021**	9.3%	10.2%	12.7%	12.7%
	2016	9.6%	10.8%	13.6%	13.6%
Sales worker	**2021**	6.2%	8.0%	8.7%	8.2%
	2016	6.6%	8.5%	9.4%	9.4%
Managers	**2021**	19.5%	9.3%	12.5%	13.7%
	2016	20.3%	9.5%	13.0%	13.0%
Community and Personal Service Workers	**2021**	7.6%	10.8%	12.3%	11.5%
	2016	6.8%	9.2%	10.8%	10.8%

Source: ABS 2024a, ABS 2024b

4.3.2.2 INDUSTRY OF EMPLOYMENT

Table 4-4 identifies the top industries of employment within the Project AoI. The top industry in the Banana Shire LGA is Beef Cattle Farming (Specialised) (12.7%) and Aluminum Smelting (5.7%) in Gladstone Region LGA. This contrasts with the top industry of employment in Queensland more broadly, being Primary Education (2.5%) (ABS 2024*a*, ABS 2024*b).*

The type of industries prevalent in both the Banana Shire and Gladstone Region LGAs appear to be beneficial to TED given the range of skills available within a relatively short geographic distance that could be of use in the construction of the Project. For instance, 2.9% of those employed in the Banana Shire LGA are already involved in Fossil Fuel Electricity Generation, and therefore may have potentially transferrable skillsets. Further upskilling of the local workforce may be required however, if the Project is to engage a local workforce, which may deliver skills-based benefits to the local area (ABS 2024*a*, ABS 2024*b).*

TABLE 4-4 EMPLOYMENT TYPES

	Census Year	Banana Shire LGA	Gladstone Region LGA	Queensland	Australia
Beed Cattle Farming (Specialised)	**2021**	12.7%	-	0.7%	0.4%
	2016	13.6%	-	0.8%	0.4%
Coal Mining	**2021**	12.2%	-	1.1%	0.4%
	2016	13.7%	-	1.2%	0.4%
Meat Processing	**2021**	3.6%	-	0.5%	0.3%
	2016	4.0%	-	0.5%	0.3%
Local Government Administration	**2021**	3.5%	-	1.4%	1.3%
	2016	3.3%	-	1.4%	1.3%
Fossil Fuel Electricity Generation	**2021**	2.9%	-	0.1%	0.1%
	2016	3.3%	-	0.1%	0.1%
Aluminium Smelting	**2021**	-	5.7%	0.1%	0.0%
	2016	-	3.6%	0.1%	0.0%
Alumina Production	**2021**	-	3.6%	0.0%	0.0%
	2016		5.4%	0.1%	0.0%

	Census Year	Banana Shire LGA	Gladstone Region LGA	Queensland	Australia
Other Heavy and Civil Engineering Construction	**2021**	-	3.2%	0.6%	0.6%
	2016	-	3.2%	0.9%	0.7%
Primary Education	**2021**	-	3.1%	2.5%	2.2%
	2016	-	3.0%	2.5%	2.2%
Supermarket and Grocery Stores	**2021**	-	2.8%	2.5%	2.5%
	2016	-	3.0%	2.4%	2.4%

Source: ABS 2024a, ABS 2024b

4.3.3 HOUSEHOLD INCOME AND EXPENSES

Table 4-5 summarises household income and expense across the Banana Shire and Gladstone Region LGAs and compares this to household expenses across Queensland and Australia.

Personal, family and household income have all increased between 2016 and 2021 within the Banana Shire and Gladstone Region LGAs. Notably, households in Banana Shire LGA, experienced higher personal, family and household incomes compared to the State and nationally. Gladstone Region LGA households, however, experience lower personal incomes and lower household incomes when compared to state-wide and national data.

The median mortgage repayments and rent within the Project Area are also displayed in **Table 4-5**. It is noted that the median weekly rent has increased between 2016 and 2021 across the Banana Shire and Gladstone region LGAs, as well as in Queensland as a whole (ABS 2024*a*, ABS 2024*b).*

TABLE 4-5 HOUSEHOLD INCOME AND EXPENSES

	Census Year	Banana Shire LGA	Gladstone Region LGA	Queensland	Australia
Median weekly income (personal)	**2021**	$856	$758	$787	$805
	2016	$714	$678	$662	$662
Median weekly income (family)	**2021**	$2,138	$2,048	$2,024	$2,120
	2016	$1,895	$1,918	$1,734	$1,734
	2021	$1,766	$1,639	$1,675	$1,746

	Census Year	Banana Shire LGA	Gladstone Region LGA	Queensland	Australia
Median weekly income (household)	***2016***	$1,575	$1,586	$1,438	$1,438
Median monthly mortgage repayments	**2021**	$1,300	$1,625	$1,670	$1,721
	2016	$1,600	$2,000	$1,660	$1,660
Median weekly rent	**2021**	$220	$270	$305	$300
	2016	$198	$240	$250	$255

Source: ABS 2024*a*, ABS 2024*b*

4.4 ACCOMMODATION CONSIDERATIONS

Aspects associated with worker accommodation during the construction phase, including the nature and availability of existing short-term and long-term accommodation within the Project AoI, have been addressed in **Section 5** of the Construction Workers Accommodation Options Report (AOR) for the Project, provided in Appendix B of this SEIA.

The AOR assesses the Project's accommodation options, and how those may potentially have an impact on its surrounding communities, in accordance with the draft updates to State Code 23 and associated Planning Guidance, dated 07 August 2023.

Based on the assessment conducted in the AOR, the following was recommended in relation to the construction phase workforce accommodation for the Project:

- TED is to consider and consult on the accommodation priority hierarchy as denoted in **Table 4-6**; and
- TED is to encourage local employment as part of construction phase hiring practices, particularly for those located in the Primary AoI.

TABLE 4-6 PRIORITISATION OF ACCOMMODATION OPTIONS

Priority	Accommodation Option
1	**On-site workforce accommodation** – construction and operation of an on-site workforce accommodation facility within the Project Area to cater for the majority of workers anticipated to be employed during the construction phase.
2	**Short-term accommodation** – use of e.g. motels, hotels, cabins, caravan parks, and existing workforce accommodation facilities, within the Primary AoI and wider Banana Shire LGA. The intent will be to use the short-term accommodation either for contractors not associated with the main construction workforce, visiting TED employees, or for workforce overflow during peak construction periods.

Priority	Accommodation Option
3	**Long-term accommodation** – rental and/or purchase of existing housing stock within Theodore, Banana, Moura or Biloela is to be limited, and should only be considered where short-term accommodation options cannot be procured.

The recommendation provided in the AOR is not an 'all-in-one' solution, but rather a prioritisation. Whilst the main recommendation is for TED to construct and operate an on-site accommodation facility that will house most of the Project's construction phase workforce, the utilisation of short-term accommodation options will allow for economic benefits to be experienced by local communities, provide flexibility for TED at times of peak construction, and reduce the exposure of local community stakeholders within the Primary AoI to the full extent of the negative social impacts identified in the key matters assessment in the AOR (refer to Appendix B).

The outcomes of the key matters assessment included the AOR, have been incorporated into the social impact analysis in **Section 7** of this SEIA.

4.5 SOCIAL INFRASTRUCTURE

Social infrastructure comprises schools and other education institutions, medical services, emergency services, recreational facilities and community organisations. Some commercial services are also listed under social infrastructure, such as childcare facilities.

4.5.1 RECREATION FACILITIES AND COMMUNITY ORGANISATIONS

As a rural community, the town of Theodore hosts recreation and attractions including Rose's Garden, Dawson Fold Museum, Isla Gorge National Park, historical bridges, Flagstaff Hill and Old Flagged Road, Cracow Beach. Events in and around Thedore include Bull's N' Barrels Bonanza, Theodore Trail Ride, 'Hooked on Theodore' Fishing Competition, Spindles and Spurs Campdraft and Dawson River Festival. Theodore's Hotel pub is the only pub in Queensland that was owned by an entire community. The local community took the pub over in the 1940s, issuing each resident the equivalent of a 25-cent stake (Banana Shire Council 2023).

In terms of social infrastructure, Theodore hosts a selection of retail shops including IGA Theodore, Holmes Enterprises., Theodore Home & Garden Café, Vinnies, Theodore Pharmacy and Theodore Medical Centre. Further, emergency services for the town include Theodore Fire Brigade and Theodore Ambulance Station. In terms of recreational facilities, the Theodore Sport & Recreation Association Inc. includes eight local interest groups, Junior Rugby League Club, Pony Club, Show Society, Touch Football Association, Campdraft & Rodeo Association, Junior Cricket Club & Netball. Additionally, the Theodore Community Link serves the community with public swimming sessions, a community gym, and a Centrelink access point.

Similar to Theodore, Moura hosts a variety of retail shops including Moura IGA, Moura butcher shop (Moura Meat Centre), Mitre 10, Vinnies, Moura Bakery, Country

Atmosphere Cafe, Moura Pharmacy and Moura Tavern. In terms of recreational and community organisations, the town of Moura hosts sports including bowls, tennis and golf clubs, Moura RSL and Memorial Swimming Pool (Banana Shire Council 2023). The town of Moura has both an ambulance and a police station.

Community members in Theodore, Moura and surrounding areas may need to travel to larger centres for access to larger grocery stores, higher-order medical services, larger airports, alternative recreational activities, speciality goods stores, other educational facilities (i.e. childcare, and secondary schooling), and other community organisations.

Compared to Theodore and Moura, Biloela hosts a more highly populated area, therefore encompassing a greater amount of recreation and community organisations. Located at the intersection of the Dawson and Burnett Highways, Biloela is a commercial and tourist centre. Social activities in the region encompasses camping, fishing, and boating adventures along the Callide Dam's banks, as well as the Kroombit Tops National Park which offers a plethora of outdoor adventures. A range of exhibitions can regularly be seen at the Banana Shire Regional Art Gallery.

The closest airport to the Project Area is Theodore Airport, located 7.6 km south of Theodore along Eidsvold-Theodore Road. The next closest airport is located in Biloela (Thangool) which is located 11 km south from Biloela town centre on the A1 highway. Gladstone Airport (located approximately 211 km from the Project Area) also services the region with the most services non-stop to or from Brisbane Airport.

4.5.2 HEALTH SERVICES

The Banana Shire LGA is serviced by six hospitals including Biloela Hospital, Moura Multipurpose Health Service, Theodore Multipurpose Health Service (including the University of Queensland Medical School), Taroom Hospital, Baralaba Multipurpose Health Service, and Wowan/Dululu Multi-Purpose Centre. Private practices exist throughout the district along with Medical Centres. Both Theodore and Moura Multipurpose Health Services are open 24/7 including emergency, general medical and surgical facilities.

The township of Biloela has the options of Biloela Hospital, Biloela Medical Centre, Gladstone Hospital and Calliope Medical Centre as the closest health services.

The Nhulundu Health Service is located in Gladstone and is an Aboriginal Community Controlled Health Service delivering primary care health services to Gladstone and surrounding communities.

4.5.3 SCHOOLS / EDUCATION FACILITIES

Several schools are located in the Banana Shire LGA and Gladstone Region LGA. The schools located within, and/or closest to, the Project AoI are identified in **Table 4-7**. In terms of tertiary education, a technical and further education institution (TAFE) campus is located in Biloela and Gladstone. Central Queensland (CQ) University is also located in Gladstone.

TABLE 4-7 SCHOOL CATCHMENTS IN THE PROJECT AOI

School Name	School Type
Biloela State School	State
Redeemer Lutheran College, Biloela	Lutheran
St Joseph's Catholic Primary School Biloela	Catholic
Calliope State School	State
Baralaba State School	State
Mount Murchison State School	State
Theodore State School	State
Moura State High School	State
Banana State School	State

5. STAKEHOLDER ENGAGEMENT ACTIVITIES

TED commenced stakeholder engagement for the Project in August 2023. This section summarises the engagement activities relevant to the SEIA, and their associated engagement outcomes.

5.1 IDENTIFICATION OF KEY STAKEHOLDER GROUPS

A Community and Stakeholder Engagement Plan (CSEP) has been prepared to guide stakeholder engagement for the Project, and establishes the overarching guidelines, principles, objectives, and approach to delivering stakeholder engagement during the Development (planning and approval) Phase of the Project.

The CSEP (2024) is underpinned by a clear and considered stakeholder and material risk identification and mitigation methodology. TED recognises that engagement in regional areas needs to be different to metropolitan engagement as regional communities tend to rely less on mass communication methods and respond more favourably to an individualised direct engagement (i.e. face-to-face) approach.

To this end, TED undertook a mapping exercise to identify stakeholders located near the Project Area who were most likely to directly benefit or be impacted by the Project. The purpose of this mapping exercise was to understand the community context in which the Project sits, and to ensure that appropriate attention and communication was made to address concerns and/or queries.

The stakeholder groups identified via the mapping as potentially impacted by the Project, are outlined in **Table 5-1**.

TABLE 5-1 KEY STAKEHOLDER GROUPS

Stakeholder	Specific Parties
Landowners	Landowners hosting Project infrastructure for the proposed Theodore Wind Farm.
Fenceline Neighbours	Fenceline neighbours are identified as neighbours share a fence line or property boundary with the host landowner(s)/Project Area.
Near Neighbours	Neighbours with properties touching the site boundary, and/or any community members with a dwelling within 10 km of the proposed Theodore Wind Farm site boundary.
Traditional Owners	Local Aboriginal elders, representatives, and organisations, specifically the Wulli Wulli people and the Wulli Wulli Nation Aboriginal Corporation (WWNAC).
Wider Community	Residents of the AoI hosting the proposed project, as well as local interest groups not defined in any previous categories, including: • Residents outside of the boundary determined for neighbours; • Aged care and healthcare organisations;

Stakeholder	Specific Parties
	• Business organisations, including but not limited to farmer associations, local progress associations, chambers of commerce or local business structures; • Churches and faith-based organisations; • Conservation and environmental organisations; • Local climate action and sustainability groups; • Not-for-profit organisations; • Primary, secondary, or tertiary educational institutions; and • Recreational groups and clubs.
Local Government	Councillors and staff employed by: • Banana Shire Council • Gladstone Regional Council
Industry Bodies	• Clean Energy Council (CEC) • Queensland Renewable Energy Council • Queensland Fire and Emergency Services (QFES) • Gladstone Ports Corporation • Camboon Rural Fire Brigade • Moura Rural Fire Brigade • Rural Fire Service Gladstone
Government and Associated Agencies	• Federal Department of Climate Change, Energy, the Environment, and Water (DCCEEW) • State Assessment and Referral Agency (SARA) • Queensland Department of Environment, Science and Innovation (DESI) • Queensland Department of Resources (DOR) • Queensland Department of Transport and Main Roads (DTMR) Australian Energy Infrastructure Commissioner
State and Federal Members of Parliament (MPs)	• Federal Member for Flynn Colin Boyce MP (Liberal National Party (LNP)) • State Member for Callide Bryson Head MP (LNP)
Media	Print and online media: • The Focus Magazine • The Gladstone Observer • The Courier Mail • CQ Today • Biloela Beacon • Theodore Community Link Newsletter Broadcast media (radio and TV): • ABC • 4CC • Hot FM • Triple M Central Queensland • Fresh FM • Win News • Channel 7 • Nine News

Source: CSEP 2024

A summary of the outcomes of engagement undertaken with these groups to date is described in **Table 5-3**.

5.2 CONSULTATION ACTIVITIES UNDERTAKEN

A variety of consultation activities have been carried out for the Project to-date. Stakeholder engagement undertaken by TED has provided Project feedback from local residents, local Councils, and the wider community, helping to determine the sentiment of those likely to be impacted by the Project.

Stakeholder engagement undertaken by TED to-date, has included:

- Meetings with landowners, near neighbours, the community and other interested parties;
- Meetings with and site visits by Traditional Owners;
- Letterbox drops to all homes within 10 kilometres (km) of the project;
- A newsletter to introduce the project and TED to the community;
- Two two-day community drop-in sessions attended by about 90 community and other key stakeholders;
- Formal presentations to Banana Shire Council;
- Regular 'shopfronts' at the Theodore Community Hall for two consecutive days; and
- A dedicated website that includes project information, news, updates and engagement opportunities.

The Community Engagement Drop-In Sessions were conducted in the towns of Theodore and Banana, with a turnout of approximately 90 attendees. The key takeaways and feedback from the sessions included the following:

- TED is to remain as the primary point of contact for stakeholders;
- One-on-one meetings to determine the most appropriate grid route connection will be essential.

Actions arising from the Community Engagement Drop-In Sessions included the following:

- TED to investigate a 'shopfront' to foster local relationships;
- The potential for TED to sponsor local events was highly desired by the community (refer to **Section 5.3**); and
- Future Community Engagement Sessions are to be conducted to foster community feedback.

5.3 COUNCIL CONSULTATION

TED have been undertaking regular briefing sessions for the Project with the Banana Shire Council since 2023. The Briefing Sessions centred on the Project location and outlined consultation undertaken to-date, and generally considered the following:

- Community input/benefit will be discussed with the local community in order to understand how a Community Benefit Fund would be most useful;
- TED is committed to seeking employment within the region where possible;
- Potential jobs generated during construction; and
- Potential jobs generated during operation.

5.4 FUTURE ENGAGEMENT

The Stakeholder Engagement Tools (SET) set out in **Table 5-2** have been developed as part of TED's commitment to genuine dialogue with stakeholders and will be employed as part of ongoing engagement with the community for the Project, including when engaging with the local community in relation to workforce accommodation opportunities and/or impacts.

TABLE 5-2 ENGAGEMENT TOOLS

Engagement Tool	Objective
Personal phone calls	• Personal phone calls will be a significant aspect of stakeholder engagement, particularly with those stakeholder groups most interested in a project. Direct phone calls are a deliberative engagement tool to facilitate immediate and direct conversations.
Meetings	• Personal meetings with individuals and sometimes groups will be a key avenue of personalised engagement. These may be one-on-one meetings with landowners or near neighbours, or meetings with a local community groups. Meetings provide an opportunity to educate, inform, and listen to issues and concerns.
Emails/letters	• Emails and letters will be used to provide notification of important information, such as works, surveys or other activities, or provide stakeholder-specific information and engagement.
Briefings	• Briefings will take place as and when required with representatives of stakeholder groups including local Councillors and Council executives, Members of Parliament and government departments. Briefings allow stakeholders to stay informed about a project's progress.
Door knocks	• Door knocks can be used to speak personally with neighbours within a pre-determined distance band of the Project. Direct outreach allows community members to engage and interact in their own environment.
Letterbox drops	• Letterbox drops provide the opportunity to directly contact residents and/or ratepayers within a certain geographical boundary depending on the delivery method employed. Letterbox drops can be used to distribute newsletters, flyers, FAQs, and other project information.
Shopfront (permanent or 'pop up')	• A shopfront in a project area can take on a variety of forms. It can be a fixed space that is open one or multiple days per fortnight. Another option is a temporary 'pop up' venue which could include a stall in a public space such as a Council office, shopping centre or public library. This option is usually more informal and may occur as a one-off or for shorter periods.

Engagement Tool	Objective
Drop-in sessions/ pop-ups	• Drop-in sessions provide an opportunity for stakeholders to meet with members of the Project team and Subject Matter Experts (SMEs) about the Project. Drop-in sessions are advertised in the local community and generally held over multiple days (often two consecutive days) in a local hall or halls. These drop-in sessions do not have a formal structure, but usually incorporate project poster and fact sheets, industry materials, and catering. Subject materials should be selected in response to the community's interests.
Attendance at community events	• This may include information stands at agricultural shows, sporting, and other events, providing a platform for community members to ask questions and provide feedback.
Workshops	• Workshops can create a space for stakeholders to discuss any questions or concerns with the Project team and/or SMEs, as well as positively contribute to the development of the Project by brainstorming ideas and community-led problem solving.
Focus groups	• Create an opportunity for key stakeholders, selected by the Project team, the project team, to provide detailed community feedback in a group setting, as well as raise project-related concerns, considerations, or issues with the TED team and/or SMEs.
Free call 1800 number	• A free call 1800 number, 1800 879 435, has been established for the Project.
Electronic direct mail (EDMs)	• EDMs will be an important part of communications and could be used to share information such as newsletters, flyers, invitations to upcoming events, fact sheets and more. A sign-up list will be made available on the Project website and at community events.
SMS notifications	• SMS notifications can be used for time critical notifications, such as works and deadlines for public submissions.
RWE website	• The RWE Renewables Australia Pty Ltd (RWE) website is live and can be found at www.au.rwe.com. This site contains information about RWE globally, RWE Renewables Australia and Australian projects, as well as links to Project-specific sites.
Project website	• A Project website has been established at theodorewindfarm.com.au and will be regularly updated to provide more information, as well as digital versions of Project collateral. The website URL is included on printed and digital collateral.
Media releases and advertisements	• Media releases will be prepared and shared with media outlets based on communications objectives throughout the Project timeline. Advertisements will be booked when required.
Project email address	• A Project-specific email address, theodorewindfarm@rwe.com has been created and will be used as a central point of obtaining community feedback.
Newsletters	• Project newsletters should be developed and distributed regularly. These should provide Project updates and be posted to all landowners within a pre-determined Project radius (suggested to be 10 kilometres from the Project boundary). They can also be delivered electronically.

Engagement Tool	Objective
Flyers	• Flyers can be used to promote information sessions or events. Flyers can reach community members who may not have access to digital communications or online platforms.
Information packs	• Information packs can include a combination of Project collateral, such as newsletters, fact sheets, maps, information on upcoming events, photo montages, independent third-party studies and more. These can be tailored to the specific needs of the community or individual stakeholders and can include information on topics of particular focus for the Project community. These could be posted to individuals as required or left at key locations, such as Council offices.
Surveys	• Surveys are a useful data collection tool to understand community issues, needs and preferences. Surveys can help gauge public opinion on a variety of topics, including framing of benefit sharing initiatives, the Project, and renewable energy in general.

Source: CSEP 2024

In addition, TED has committed to the following stakeholder engagement initiatives:

- **Community Engagement Committee (CEC):** It is TED's intention to establish a CEC, assuming there is interest from Theodore and surrounding communities to do so. The CEC's purpose would be to capture the voice and sentiments of the community, to help to inform the Project, and direct how TED engages with the community as well as the content of such engagement. The CEC will provide a tool to share information with the community and to build a sense of trust. It is anticipated the CEC would be established in 2025 and run beyond the Planning Phase, into construction, operations and potentially decommissioning.
- **Community Benefit Fund:** Development of a Community Benefit Fund of at least $500,000 per year ($17.5 million over the operation life of the Project).
- **Complaints Management:** Development and implementation of a Theodore Wind Farm Complaints and Grievance Management System (in accordance with the Australian Standard AS/NZS 10002:2014 – Guidelines for Complaint Management in Organisations). The TED Complaints Handling Procedure will ensure that complaints are dealt with in a timely and effective manner, and includes the below:
  - Stage One: Receiving
  - Stage Two: Responding
  - Stage Three: Managing
  - Stage Four: Closing, and
  - Stage Five: Continuous Improvement

  All instances are recorded within TED's internal SET, with the intent to archive, allocate, monitor, action, resolve, close and analyse all relevant enquiries. TED aims to resolve complaints within 10 working days. If this is not possible TED commits to continued engagement with the stakeholder.

5.5 SUMMARY OF KEY MATTERS RAISED DURING CONSULTATION

Throughout the stakeholder engagement activities carried out by TED, stakeholders identified a range of matters of importance to them and/or the local community or groups. These matters are identified in **Table 5-3**.

These key matters have helped to inform the scoping of the potential impacts and are captured in the socio-economic analysis contained in **Table 7-1**.

TABLE 5-3 KEY MATTERS RAISED BY STAKEHOLDERS

Key Matters Raised	Detail
Workforce Accommodation	Workforce accommodation during construction, and the impact on the local housing market, has been identified as a key concern. This is a particular topic of interest for the Theodore district community due to the significant number of mining camps and fly-in fly-out (FIFO) workers in the area around Moura. TED will work with Council and seek feedback from community on the potential ways to accommodate a workforce of up to 500 people at peak construction periods.
Grid Connection	Engagement on the potential grid connection is currently underway and will incorporate personal meetings with landowners that will potentially host infrastructure, as well as community information sessions. TED and Powerlink are working together to progress the grid connection community engagement.
Road Network	Oversize vehicles will be required for blades, towers and transformers. Additionally, local traffic flows may be disrupted during the construction phase. TED will work with the community to manage traffic impacts and gain local knowledge on existing road usage, including – for example – school bus routes, if the project proceeds to construction. A Preliminary Traffic Impact Assessment is included with the Development Application for the Project.
Aerial Operations	TED is aware of the existing aviation in the Theodore area, including aerial mustering. Initial studies have shown the proposed wind farm will have minimal impact on aviation in the area. The current indicative WTG layout also satisfies the aviation planning provisions of Banana Shire Council. This information will be shared in newsletters and fact sheets, at community drop-in sessions and other briefings/meetings as required. TED will share met mast locations with local pilots and aviation businesses on request, as well as WTG locations as the project progresses.
Noise	TED, as part of best practice, has completed background noise monitoring in the Project Area. The Project must have a 1.5 km buffer to dwellings, and all neighbouring dwellings are currently well in excess of this.
Biodiversity	TED will provide the community and stakeholders with information on biodiversity studies and findings, as well as committing to: • Avoiding areas of environmental significance wherever possible. (WTGs have been sited to avoid Queensland

Key Matters Raised	Detail
	Government identified matters of state environmental significance); • Pre-clearance surveys and micrositing of infrastructure; • Post-construction rehabilitation of disturbed areas not required for ongoing project operation; and • Ongoing monitoring and management of bird and bat impacts, including management resources that are able to adapt as required.
Fire Risk and Mitigation	TED has commenced liaison with fire services in the proposed Project Area and other emergency services stakeholders as part of the development process for the Project. Wind farm developments incorporate many fire mitigation measures, and these will be communicated with the community, as well as the benefits of access tracks as fire breaks in the event of a fire.
Visual Amenity	Photomontages undertaken from key points in and around the Project Area have shown minimal visual impact from most locations that will be seen by external stakeholders. These will be shared with the community.

Source: CSEP 2024

6. ECONOMIC ANALYSIS

The high-level potential economic impact of the Project on the Australian economy and regional employment can be summarised as outlined in **Table 6-1** and **Table 6-2**, respectively.

TABLE 6-1 IMPACT ON AUSTRALIAN ECONOMY

	Direct Economic Impact	**Indirect Economic Impact[4]**
Construction Phase		
Local	$0.5 billion	$0.835 billion
State	$0.425 billion	$0.710 billion
National	$0.290 billion	$0.485 billion
Operation Phase (nominal total over 30 years)[5]		
Local	$0.780 billion	$1.300 billion
State	$0.400 billion	$0.660 billion
National	$0.100 billion	$0.167 billion

TABLE 6-2 IMPACT ON REGIONAL EMPLOYMENT

	Number of Jobs
Construction Phase	
Local	100 FTEs
State	325 FTEs
National	75 FTEs
Operation Phase	
Local/State	25 FTEs
Additional Indirect Employment	
Unspecified	329 FTEs

[4] Gross Regional Product values assume an economic output multiplier of 1.67 can be applied to direct spend values to estimate the indirect and induced economic impacts of the renewable energy project ("NSW Renewable Energy Zone: Economic Impact Assessment," – ARENA). The economic output multiplier of 1.67 means that for every $1 million invested in the project, the total economic output in the region is expected to increase by $1.67 million.
[5] Interest adjustments related to discounts have not been applied, i.e., these are nominal figures. It is assumed that all operational costs are indexed to inflation (CPI).

The following sections describe the analysis undertaken to reach these values, along with underlying assumptions.

6.1 BASELINE ECONOMIC ACTIVITY AND "LOCAL" DEFINITION

6.1.1 BASELINE ECONOMIC ACTIVITY

To determine the potential economic impact of the Project, the counterfactual baseline case must be determined (i.e. what would the economic activity look like if the Project were not to proceed, and relatedly, is there any ***opportunity cost*** associated with the Project?).

The ***baseline economic case*** can be thought of as ***business-as-usual economic activity***, where the land is used for low intensity cattle grazing, as it is today (refer to **Section 1.2**).

No alternative project in the local area has been identified as potentially contributing to an opportunity cost. Accordingly, it can be concluded that there is no significant opportunity cost related to the development of the Project.

The baseline economic activity can be compared to the proposed economic activity (the Project), which is the development of a 1.152 GW wind farm which will be in operation for 30 years. Baseline employment figures are discussed in the AOR, provided in Appendix B.

6.1.2 "LOCAL" DEFINITION

For the purposes of the economic analysis, the term "Local" aligns with the defined Primary and Secondary AoIs described in **Section 3.1**. This includes the adjacent towns of Theodore, Banana, Moura, and Biloela, as well as the Banana Shire and Gladstone Region LGAs. Whilst Bundaberg and Rockhampton are port cities that may be relevant to the Project, they have been categorised as "State" and not "Local", for the purposes of estimating direct and indirect economic and employment impacts.

6.2 PROJECT ECONOMIC IMPACT

The potential economic impact of the Project is estimated using comparable wind farm projects in Queensland, with assumptions based on relevant renewable energy projects in the region, or information developed by organisations such as the Institute for Sustainable Futures for the Clean Energy Council. In several instances, where estimated values could not be extrapolated from RWE projects, assumptions have been made based on other relevant renewable energy projects in the region, or information developed by organisations such as the Institute for Sustainable Futures for the Clean Energy Council.

6.2.1 CONSTRUCTION PHASE

6.2.1.1 DIRECT IMPACT

Table 6-3 the initial estimates of the direct economic activity during the construction phase across the defined economic AoI.

TABLE 6-3 CONSTRUCTION PHASE DIRECT EXPENDITURE

Activity	Total Project Spend (AUD)	Local[6] Spend (AUD)	State Spend (AUD)	National Spend (AUD)
Project Management, landowner and other[7]	$39,040,000	$35,345,000	$3,325,500	$369,500
Qld State levy	$26,920,000	$0	$26,920,000	$0
CapEx - WTG supply and install[8]	$1,983,790,000	$0	$99,189,500	$99,189,500
CapEx – Balance of Plant[9]	$900,000,000	$450,000,000	$270,000,000	$180,000,000
Offsets[10]	$5,910,000	$2,955,000	$2,955,000	$0
Grid Connection CapEx[11]	$44,340,000	$11,085,000	$22,170,000	$11,085,000
Total ($ spend)	**$3,000,000,000**	**$499,385,000**	**$424,560,000**	**$290,644,000**
Total (% total spend)[12]		**16.6%**	**14.2%**	**9.7%**

It is important to note that worker accommodation costs have not been estimated. The procurement and/or construction of this accommodation, plus associated living expenses, will drive further downstream economic activity (in retail, health, hospitality and other industries), which is not captured in the above. Refer to the AOR, provided in Appendix B of this SEIA, for further information on accommodation options considered.

6.2.1.2 INDIRECT IMPACT

Gross Regional Product (GRP) values can be estimated at a high level using an economic output multiplier of 1.67, which can be applied to direct spend values to estimate the indirect and induced economic impacts of the renewable energy project ("NSW Renewable Energy Zone: Economic Impact Assessment," – ARENA). The economic output multiplier of 1.67 means that for every $1 million invested in the Project, the total economic output in the region is expected to increase by $1.67 million.

We have applied this multiplier for this preliminary analysis (refer to **Table 6-4**), however it is important to note that the use of such multipliers can be controversial, considering their intended use and the preliminary nature of all direct spend figures. An alternative source (IMF, 2021) provides a more conservative multiplier range of 1.1 – 1.5 for

[6] "Local" aligns with the defined Primary and Secondary AoIs defined in this SEIA.

[7] Inclusive of landowner payments and $500,000 p.a. Community Benefit Fund. It is likely that project management activities will be roughly evenly spread between the Primary and Secondary AoIs and other LGAs.

[8] It is estimated that 10% of the turbine supply and install expenditure will be made to Australian businesses (for road transport, some tower sections, crane and installation costs, and foundations reinforcement). A co-located Battery Energy Storage System (BESS) is also included in these costs.

[9] A large portion of the civil and electrical costs will be local in relation to plant and machinery hire, road construction, gravel and other materials. Assumed to be 30% of overall project costs.

[10] Assumed to be split evenly across local and state

[11] This also includes transmission line construction, which includes mainly state-based specialised skills, but also some local skills.

[12] Percentages do not add up to 100% - any unaccounted for expenditure in this table is allocated to overseas.

renewable projects. The most conservative approach would of course be to only consider direct-spends and not apply multipliers.

TABLE 6-4 ESTIMATE GRP DURING CONSTRUCTION PHASE

	Local (AUD)	State (AUD)	National (AUD)
GRP ($)	$835,000,000	$710,000,000	$485,000,000

Given the small population of nearby towns, it is expected that the workers who relocate to the area during the Construction and Operation Phases would provide a comparatively large boost the local economy through expenditure on local goods and services such as food, drinks, petrol, accommodation and medical care.

6.2.2 OPERATIONAL PHASE

6.2.2.1 DIRECT IMPACT

Table 6-5 shows the initial estimates of the direct economic activity during the Operational Phase across the defined economic AoI.

TABLE 6-5 OPERATIONAL PHASE DIRECT EXPENDITURE

Activity	Annual Project Spend (AUD)	Local Spend (AUD)	State Spend (AUD)	National Spend (AUD)
Council Rates[13]	$600,000	$600,000	$0	$0
OpEx[14]	$32,800,000	$20,050,000	$5,100,000	$2,550,000
Asset Management[15]	$4,000,000	$3,200,000	$0	$800,000
Offsets[16]	$230,000	$115,000	$115,000	$0
Grid Connection OpEx[17]	$10,000,000	$2,000,000	$8,000,000	$0
Total ($ spend)	**$47,630,000**	**$25,965,000**	**$13,215,000**	**$3,350,000**
Total (% total spend)		**54.5%**	**27.7%**	**7.0%**

[13] Please note this is an estimate.
[14] Mainly local costs for staff and maintenance requirements, but some cost attributable to Australian 'systems support' rather than just local personnel, and parts and material from overseas. Inclusive of landowner payments and $100,000 p.a. Community Benefit Fund.
[15] Mainly local costs, e.g., local contractors used for maintenance, but some cost attributable to non-local Australian-based systems support personnel.
[16] Assumed to be split evenly across local and state
[17] State spend is payable to the electricity operator covering the construction costs for the substation.

6.2.2.2 INDIRECT IMPACT

The economic output multiplier of 1.67 has been applied to the preliminary Operational Phase figures (refer to **Table 6-6**), however it is important to note that use of such multipliers can be controversial, considering their intended use and the preliminary nature of all direct spend figures. A more conservative multiplier range of 1.1 – 1.5 (IMF, 2021) could be used.

TABLE 6-6 ESTIMATE GRP DURING OPERATIONAL PHASE

	Local (AUD)	State (AUD)	National (AUD)
GRP ($)	$1,300,000,000	$660,000,000	$167,500,000

Similar to the construction phase, up to 50 workers will be employed during the Operational Phase, many of whom are likely to live in the local community and to spend some of their income with local businesses.

6.3 EMPLOYMENT IMPACTS

Alongside the economic benefits discussed in the previous Section, the Project is expected to directly generate up to 500 jobs during the peak of the Project's construction phase across local, state and federal levels.

6.3.1 DIRECT IMPACT

It is expected that up to 500 jobs will be created during the peak of the Project's construction phase. **Table 6-7** shows a breakdown summary of the estimated number of direct employment opportunities arising from this Project across Local, State, and wider Australian jurisdictions.

TABLE 6-7 SUMMARY OF THE DIRECT EMPLOYMENT OPPORTUNITIES ARISING FROM THE CONSTRUCTION PHASE OF THE PROJECT

Area	Number of Jobs	Employment Type	Description
Local[18]	100	Direct	Skilled labour (e.g. electricians), plant/machinery drivers, civil workers, metal workers, site maintenance and cleaning workers, and truck drivers.
State	325	Direct	Specialised workers such as transmission line construction, crane operators, over-dimensional truck drivers, project management, concrete batch plant operators, and IT and communication specialists.

[18] "Local" aligns with the defined Primary and Secondary AoIs defined in this SEIA.

Area	Number of Jobs	Employment Type	Description
Australia	75	Direct	Senior management, specialised workers, wind turbine specialists and other technical engineering specialists.

It is also anticipated that there will be around 25[19] ongoing full-time local (or possibly state-based) jobs associated with the Project's Operation over its 30-year life.

The direct employment estimates above can be compared to the employment factors developed by the UTS Institute for Sustainable Futures for the Clean Energy Council (UTS Institute for Sustainable Futures, 2020) outlined in **Table 6-8**. These employment factors estimate the number of Australian jobs created per MW based on a construction timeframe of three years. In total, the Clean Energy Council guidance suggests that 1,321 jobs will be created over the construction, development, manufacturing, operation and maintenance of the Project. This is more than the number of jobs estimated above, indicating that these initial estimates are sufficiently conservative.

TABLE 6-8 COMPARISON OF THE DIRECT EMPLOYMENT ESTIMATES WITH EMPLOYMENT FACTORS PROVIDED BY THE CLEAN ENERGY COUNCIL

Phase	Multiplier	Unit	Number of jobs
Construction and Development	2.84	Job-Years / MW	1,091
Manufacturing	0.38	Job-Years / MW	146
Operations and Maintenance	0.22	Jobs / MW	84
		Total	**1,321**

6.3.2 INDIRECT IMPACT

The indirect employment resulting from the construction, manufacturing and operation of this Project can be estimated using ratios derived from Nathani *et al.* (Breitschopf, B., C. Nathani and G. Resch, 2012). These ratios link the total direct employment opportunities identified in **Table 6-7** to indirect employment opportunities, based on the development of renewable energy technologies in selected countries. Each ratio produces a different number of employment opportunities. To estimate the total number of indirect jobs that could be created through the Project, we have identified the minimum, average and maximum number of indirect employment opportunities estimated using ratios applying to different countries, as shown in **Table 6-9**. These employment opportunities comprise all jobs created at the local, state and Australia-wide scale.

[19] Current estimates are for 15 to 50 ongoing FTEs associated with the project

TABLE 6-9 SUMMARY OF THE INDIRECT EMPLOYMENT OPPORTUNITIES ARISING FROM THE PROJECT IN OTHER COUNTRIES, INCLUDING CONSTRUCTION, MANUFACTURING AND OPERATION

Country	Ratio indirect over direct employment	Calculated indirect employment for Theodore Wind Farm
Canada	68%	340
Denmark	80%	400
France	64%	320
Germany	80%	400
Ireland	29%	145
Japan	116%	580
Netherlands	17%	85
Norway	70%	350
United Kingdom	68%	340
	Minimum	**85**
	Average	**329**
	Maximum	**580**

Using these ratios, it is estimated that the Project will indirectly produce around 329 jobs during the manufacturing, construction, and operation of the Project, lasting 30 years.

It is important to note that these ratios do not allow us to estimate how these jobs will be spread across the local, state, or Australian economy, or which will occur in the manufacturing, Construction and Operation Phases. However, assuming these indirect employment opportunities are spread in a similar way to the direct employment opportunities, we can expect that the majority of these jobs will be created during the construction phase, and predominantly within the state/local economy.

6.4 OTHER IMPACTS

6.4.1 POSITIVE IMPACTS

6.4.1.1 COMMUNITY IMPACTS

As discussed in **Section 4**, the Project aims to have specific positive economic outcomes for the local community. **Table 6-10** shows a summary of the type of funding allocated by TED directly for local purposes (and already announced).

TABLE 6-10 SUMMARY OF FUNDING PROGRAMS SPECIFICALLY ALLOCATED FOR THE LOCAL COMMUNITY

Type of Fund	Spend (AUD)	Project Phase	Description
Community Benefit Fund	$500,000 per year	Construction and operation - annually for *30 years*	The proposed CEC (refer to **Section 5.4**) may in future oversee this fund.
Sponsorship Fund	$100,000 per year	Design – annually until construction	Provided in accordance with RWE guidelines and targeting direct local benefits.

6.4.1.2 REDUCED ELECTRICITY COSTS AND GRID DECARBONISATION

Wind power, and renewable energy more broadly, is one of the cheapest forms of electricity to produce. The Project can be expected to put downward pressure on electricity prices, making electricity more affordable for the Queensland community and businesses.

The Project has the potential to annually generate enough renewable electricity to supply 500,000 households per year and reduce scope 2 greenhouse gas emissions by close to 2 million tonnes.

6.4.1.3 UPSKILLING OF THE LOCAL WORKFORCE

It is intended that TED will develop and implement Local Business and Industry Procurement Plan in order to seek local industry involvement in the Project (refer to **Section 7**), and will provide training and upskilling in accordance with the plan. If labour is sourced locally, then the development could contribute to skill building in the local workforce. Given the nature of the Project, local procurement could build skills in areas including earthworks; lift and shift; formwork; concreting; civil, mechanical engineering; electrical engineering; medium voltage and high voltage electricians; linesmen; site supervision; construction management; cranage; security and safety; and administration.

6.4.2 NEGATIVE IMPACTS

6.4.2.1 CHANGING TOURISM ACTIVITY

The Project is located near Isla Gorge National Park. This area is a tourist attraction, with several walking trails and campsites. There is some potential for the proposed development to affect the natural and cultural value of these National and State Parks and reduce tourism activity, however, as discussed in **Section 7**, this impact is likely low, and any impact would be mitigated and tracked. In some instances, wind farms have also been known to increase tourism, as an attraction in themselves (New Hampshire Site Evaluation Committee, 2013). However, this effect varies widely by jurisdiction and opinions specific to the region (Shannon, 2021) and (Lothian, 2020).

6.4.2.2 LAND USE CHANGE IMPACT

The Project Area[20] can currently sustain approximately 16,000 (Queensland Government Long Paddock Program, 2024) head of cattle, with an estimated sales value of around $20 million (Meat and Livestock Australia, 2024)[21], in August 2024. The typical slaughter age of beef cattle is around 18 months (Farm Transparency Project, 2024); therefore, the annual value of cattle grazing in the Project Area is estimated to be approximately $13 million.

It is anticipated that, while there may be some disruption to cattle grazing capacity during the Project's construction phase, the overall impact during its Operational Phase should be negligible, with livestock often grazing right up to the base of WTGs. If the ongoing impact is in the order of 1% (Australian National University, 2024), this would only disrupt maximum potential revenues from the land by around $100,000 - $200,000 per annum.

[20] Refer to the wind farm footprint comprised of nine lots on three properties, comprising approximately 46,830 ha, as described in **Section 1.2**.
[21] Emerald is the closest saleyard.

7. SOCIAL IMPACT ANALYSIS

As outlined in **Section 2.1**, the social impact analysis methodology has been based on the impact assessment methodologies included in the Queensland SIA Guideline (State Development, Manufacturing, Infrastructure and Planning 2018) and NSW SIA Guideline (NSW Department of Planning and Environment 2023).

Overall, the key drivers of social change that may affect communities in the Project AoI resulting from the Project relate to:

- procurement opportunities for local businesses and employment opportunities for the local workforce (including Theodore, Banana, Moura, Biloela and Gladstone);
- opportunities for diversification of income streams for the host landowners;
- financial benefits for local community economies, and the potential for indirect benefits such as workforce upskilling and increased localised spend;
- disruptions due to construction related activities (noise, dust, transportation of materials and workers, etc);
- amenity (e.g. visual) and other land use and landscape changes due to altered landscapes; and
- accommodation arrangements for construction workforce.

Technology to support renewable energy projects is continuously evolving and improving. Accordingly, following the 30-year operating life, components of the wind farm may be upgraded to prolong the life of operation, or the Project as a whole will be decommissioned and the land returned to the original land use. For the purposes of this social impact analysis, therefore, decommissioning has not been assessed. The potential social impacts associated with the decommissioning of the Project will be considered as part of a future Decommissioning Plan (or similar).

In analysing the potential impacts taken along in this assessment, ERM has considered the:

- Project Description, including the timing, duration and intensity of activities, where known (refer to **Section 1.2**);
- Key matters raised by stakeholders during the engagement process (refer to **Section 5.5**); and
- Outcomes from prior technical studies undertaken by TED.

The potential impacts have been analysed based on the likelihood of the impact occurring, the magnitude of the impact (degree of change caused by the impact) if it occurs, and the vulnerability of the impacted receptors (refer to **Section 2**).

Table 7-1 provides an overview of predicted impacts likely to be experienced by different stakeholder groups and outlines the pre-mitigation impact, mitigation measures/enhancement opportunities, and post-mitigation impact significance.

TABLE 7-1 SOCIAL IMPACT ANALYSIS

Impact Activity	Description of Impact	Project Phase[22]	Impacted Stakeholder/s	Pre-Mitigation Rating			Mitigation Measures / Enhancement Opportunities	Post-Mitigation Rating		
				Likelihood	Magnitude	Impact Significance		Residual Likelihood	Residual Magnitude	Residual Impact Significance
Employment and Procurement	The increased demand for labour creates direct and indirect employment opportunities for the local community. Early stakeholder engagement has not identified that employment has been raised by stakeholders, however, employment opportunities associated with the Project, especially identifying local job creation, will be a key Project benefit.	C, O	Landowners, Neighbours, Traditional Owners, Wider Community	Almost Certain	Positive	Positive	• Develop and implement a Workforce Management Plan to maximise local employment opportunities. • Develop and implement a Local Business and Industry Procurement Plan to maximise local and regional business (procurement) opportunities. • Develop hiring preferences with priority given to applicants from within the Project AoI, who have suitable skills to undertake the jobs required for the Project. • Host information sessions to engage with the community and local businesses who can provide inputs or services and other prospective contractors/subcontractors, regarding construction timing, workforce estimates and accommodation requirements. • Engage local media including radio, newspaper, and social media to advertise expressions of interest for employment or provision of services or materials. • Engage with the local employment agencies to identify access pathways for local workers. Assess the candidate pool to determine suitable labour, trade, or other employment for the Project. • Set up a dedicated employment opportunity platform on the Project's website in consultation and coordination with the EPC contractor. • Consult with the Banana Shire Council and Gladstone	Almost Certain	Positive	Positive
	Increased demand for labour for the Project creates skills shortages. Other businesses in the Project AoI cannot find the relevant skilled and unskilled employees they need to operate their businesses due to the presence of the Project. Additionally, there is the potential that skilled employees leave the Project AoI subsequent to the Construction of the Project to work on other projects.	C, O	Wider Community	Possible	Moderate	Medium		Possible	Moderate	Medium
	Increased demand for goods and services helps to stimulate the local economies through greater indirect spend. Businesses within the Project AoI benefit from increased economic activity associated with the construction and operation phase workforces, and the spend on materials and equipment for the Project.	C, O	Wider Community	Almost Certain	Positive	Positive		Almost Certain	Positive	Positive
	Increased demand for goods and services creates shortages within local communities. The increased demand for goods and services due to the Project leads to local supply shortages and price increases which may affect the ability for the wider community within the Project AoI to access and/or procure necessary goods and/or services.	C	Landowners, Neighbours, Traditional Owners, Wider Community	Possible	Moderate	Medium		Possible	Moderate	Medium

[22] Construction phase (C), operation phase (O)

Impact Activity	Description of Impact	Project Phase[22]	Impacted Stakeholder/s	Pre-Mitigation Rating			Mitigation Measures / Enhancement Opportunities	Post-Mitigation Rating		
				Likelihood	Magnitude	Impact Significance		Residual Likelihood	Residual Magnitude	Residual Impact Significance
	Opportunities to enhance the capacity of local businesses and supply chain through supply and/or service contracts.	C, O	Wider Community	Possible	Positive	Positive	Regional Council, as well as any Business Chambers to provide their members with relevant details such as Project construction timing, workforce estimates and accommodation requirements. • Development of Social Procurement Policy and platform which addresses the following: ◦ Provision of opportunities for local businesses to submit proposals and tenders and prioritise the use of goods and services that can be sourced locally and are competitive for price and quality. ◦ Encouraging subcontractors to employ local workers wherever possible and reasonable. ◦ Identification of positions where training would allow additional local workers and encourage local workers and businesses to undertake training to provide for specialist works. ◦ Collaboration with local trade/training organisations (such as TAFE) to promote job opportunities with the Project, in enough time to give local people enough notice to receive training in Project related skill sets, if desired. ◦ Informing non-local workers about local services, as well as shops, cafes, recreational facilities, etc. and make access easy.	Likely	Positive	Positive

Impact Activity	Description of Impact	Project Phase[22]	Impacted Stakeholder/s	Pre-Mitigation Rating			Mitigation Measures / Enhancement Opportunities	Post-Mitigation Rating		
				Likelihood	Magnitude	Impact Significance		Residual Likelihood	Residual Magnitude	Residual Impact Significance
Diversified Income Streams	Diversification of income streams for local host landowners. The host landowner will receive payments for hosting WTG infrastructure, diversifying the income streams that are available to them.	C, O	Host Landowner	Almost Certain	Positive	Positive	• Provide payments to host landowner as planned and explore opportunities to provide additional income streams (e.g. carrying out low risk maintenance activities).	Almost Certain	Positive	Positive
Benefits for Indigenous Economies	Financial benefits for local Aboriginal economies, and the potential for indirect benefits such as workforce upskilling and increased localised spend.	C, O	Traditional Owners	Possible	Positive	Positive	• Ensure the benefits generated from the development are spread fairly within the community, by identifying the needs of the community and addressing these through a range of targeted actions throughout the project's lifecycle, and by continuously engaging with the WWNAC. • Communicating job and business opportunities and skills training in a culturally appropriate manner	Almost Certain	Positive	Positive
Disruptions and Amenity	Disruptions to pastoral practices because of Project construction. Construction activities may limit access and cause temporary inconveniences for the operation of rural properties, such as stock movements, paddock access, etc.	C	Host Landowner	Likely	Minor	Medium	• Develop and implement a Construction Environment Management Plan (CEMP) informed by Project approval requirements to manage construction environmental impacts. • Develop and implement a Traffic Management Plan (TMP) informed by the Project approval requirements, and with input from the Local Councils (i.e. Banana Shire and Gladstone Regional Council). For example, this could include seeking to minimise light traffic as much as practicable for reasons of safety and minimising community impact, segregating traffic for light vehicles, heavy vehicles, and over-dimensional vehicles and road trains, and avoiding particular routes dependent upon school bus timetables. • Repair damage to Council roads and/or upgrade roads in	Possible	Minimal	Low
	Perceived impacts on livestock as a result of WTG operation. In particular, the potential impact on cattle due to noise, vibration, and/or blade throw.	O	Host Landowner, Nearby Neighbours	Likely	Minor	Medium		Unlikely	Minimal	Low
	Transportation of materials and equipment to the Project Area has the potential to cause road safety impacts for road users along the haulage routes from the Port of Gladstone. Oversize vehicles will be required for blades, towers and transformers. In addition, local traffic flow may be impacted during construction. Risk of traffic injury or in the worst case a fatality, resulting from increased vehicle movements during the transportation of goods and workers to and from the Project Area.	C	Landowners, Neighbours, Wider Community	Likely	Major	High		Possible	Major	High

Impact Activity	Description of Impact	Project Phase[22]	Impacted Stakeholder/s	Pre-Mitigation Rating			Mitigation Measures / Enhancement Opportunities	Post-Mitigation Rating		
				Likelihood	Magnitude	Impact Significance		Residual Likelihood	Residual Magnitude	Residual Impact Significance
	Daily life impacts, such as disruptions to school buses, mail deliveries, utilities, etc. arising from increased construction traffic and local road upgrades. Increased congestion (particularly If work occurs during peak hour times) may lead to frustration by road users and requirement for more frequent repairs.	C	Landowners, Neighbours, Wider Community	Likely	Moderate	High	line with good industry practice. These commitments will be outlined in the TMP. • Establish and implement an Environmental Management System (EMS) to manage operational environmental impacts, consistent with Project approval requirements. • Continue to proactively implement the CSEP (2024) and a complaint management and recording procedure. • Embed Project and specific key stakeholder updates within the CSEP (2024) and complaint management and recording procedure through the stakeholder management database, and ensure execution occurs in a timely fashion when impacts from construction activities are likely. • Include factual, scientific and publicly accessible information on sensitive topics such as the impact of wind farms on land values and health impacts on humans and animals from wind farm infrastructure in ongoing Project updates. • Implement all relevant management requirements from technical assessments, as required by Project Approvals, including mitigations relating to the Landscape and Visual Impact Assessment and Noise Impact Assessment, with particular emphasis on WTG operation, ancillary infrastructure, construction, and traffic. • Record tourism data associated with local tourism enterprises and tourism feedback via online platforms.	Possible	Minor	Medium
	Construction environmental impacts, including noise, vibration, dust, visual amenity. Various impacts resulting from construction activities, generally felt by people living in proximity to construction activities, such as degradation of air quality and health impacts as a result of increased generation of dust and particles from land clearing, and the use of heavy vehicles and equipment.	C	Landowners, Neighbours	Likely	Major	High		Possible	Moderate	Medium
	Perceived impacts on land values. Perceived potential impacts to neighbouring land values is common with opposition to wind farms but has not been raised by stakeholders to-date.	O	Neighbours, Wider Community	Possible	Moderate	Medium		Unlikely	Minimal	Low
	Altered landscape character, including visual amenity impacts. Changes to the character of the landscape will occur through the installation of Project infrastructure. Photomontages undertaken from key points in and around the Project Area have shown minimal visual impact from most locations viewed by external stakeholders.	O	Neighbours, Wider Community	Likely	Minimal	Low		Possible	Minimal	Low
	Perceived impacts on local tourism as a result of the Project proceeding.	O	Wider Community	Possible	Minimal	Low		Unlikely	Minimal	Low
	Perceived health impacts associated with operational noise.	O	Neighbours, Wider Community	Possible	Moderate	Medium		Unlikely	Minor	Low

Impact Activity	Description of Impact	Project Phase[22]	Impacted Stakeholder/s	Pre-Mitigation Rating			Mitigation Measures / Enhancement Opportunities	Post-Mitigation Rating		
				Likelihood	Magnitude	Impact Significance		Residual Likelihood	Residual Magnitude	Residual Impact Significance
	Altered landscapes have the potential to impact tangible and intangible Aboriginal heritage.	C, O	Traditional Owners	Possible	Major	High	• Implement cultural heritage management procedures, as relevant.	Unlikely	Major	Medium
Accommodation and Worker Influx[23]	Increased demand for short-term accommodation within the Primary AoI, which may reduce the accessibility for community members/tourists to purchase or rent accommodation options The Project has the potential to create shortages and increase cost of living pressures through increased rents of local accommodation. The CSEP (2024) has identified that the workforce accommodation during construction, and the impact on the local housing market, has been identified as a key concern.	C, O	Wider Community	Likely	Major	High	• Continue to proactively implement the CSEP (2024) and a complaint management and recording procedure. • Implement the AOR recommendations, including the associated management measures for accommodation: ◦ Explore available accommodation options around the Theodore, Moura, Banana and Biloela (i.e. Primary AoI). ◦ Host information sessions to engage with the community and local businesses who can provide inputs or services and other prospective contractors/subcontractors, regarding construction timing, workforce estimates and accommodation requirements. ◦ Investigate local and regional options to disseminate information to local accommodation operators and rental property owners, such as construction timing, workforce estimates and accommodation requirements. ◦ Preparation and implementation of a Workforce Management Plan. ◦ Preparation and implementation of a Code of Conduct applicable to all Project workers during the construction phase	Possible	Moderate	Medium
	Increased demand for services and recreational facilities within the various townships of the Primary AoI, which may place a strain on these services/facilities, and in doing so, reduce accessibility for community members.	C	Wider Community	Likely	Moderate	High		Possible	Moderate	Medium
	Generate potential opportunities for local accommodation providers to capitalise on the demand for short and long-term accommodation/housing stock.	C	Wider Community	Possible	Positive	Positive		Possible	Positive	Positive
	Increase in the demand for long-term housing stock which may contribute to housing market changes for local communities within the Project AoI and reduce housing affordability – in the event that long-term accommodation is to be used by the construction workforce.	C	Wider Community	Likely	Major	High		Unlikely	Minor	Low
	Reduced community cohesion as a result of potential ill-discipline of the construction workforce.	C	Landowners, Neighbours, Wider Community	Possible	Moderate	Medium		Possible	Minor	Medium

[23] Refer to TED AOR for further details

Impact Activity	Description of Impact	Project Phase[22]	Impacted Stakeholder/s	Pre-Mitigation Rating			Mitigation Measures / Enhancement Opportunities	Post-Mitigation Rating		
				Likelihood	Magnitude	Impact Significance		Residual Likelihood	Residual Magnitude	Residual Impact Significance
	This includes safety concerns and community friction due to the influx of temporary out of town workers.						◦ Preparation and implementation of a Workforce Housing and Accommodation Plan ◦ Preparation and implementation of a Local Business and Industry Procurement Plan ◦ Preparation and implementation of a Health and Community Well-Being Plan ◦ The on-site workforce accommodation facility should be designed in accordance with the Banana Shire Council Planning Scheme 2021 Development Design Code and have a Waste Management Plan in place. ◦ Host information sessions to engage with Banana Shire Council, the community and local businesses regarding construction timing, workforce estimates and accommodation requirements. ◦ Consult with the Banana Shire Council and Gladstone Regional Council to minimise pressure on local resources, and to address worker influx concerns during the construction phase. ◦ Contact the local accommodation operators to provide Project information such as construction timing, workforce estimates and accommodation requirements. ◦ Provide a register of local accommodation options and contact details to contractors and subcontractors. ◦ Maintain a register of local property owners who have expressed interest in offering dwellings for rent (if			
	Potential to cause congestion along the roads used by the community resulting from increased vehicle movements associated with the transportation of workers to and from the Project Area.	C	Wider Community	Possible	Moderate	Medium		Possible	Minor	Medium
	Risk of traffic-related injury, or in the worst case a fatality, resulting from increased vehicle movements during the transportation of workers to and from the Project Area	C	Wider Community	Possible	Major	High		Possible	Major	High
	Amenity impacts arising from the use of the accommodation (e.g. noise, visual, dust, etc.), which may potentially cause an impact on community health and wellbeing.	C	Landowners, Neighbours, Wider Community	Possible	Moderate	Medium		Possible	Minor	Medium
	Increased demand for goods and services has the potential to negatively impact the local community through creation of supply shortages.	C	Wider Community	Possible	Moderate			Possible	Minor	Medium

Impact Activity	Description of Impact	Project Phase[22]	Impacted Stakeholder/s	Pre-Mitigation Rating			Mitigation Measures / Enhancement Opportunities	Post-Mitigation Rating		
				Likelihood	Magnitude	Impact Significance		Residual Likelihood	Residual Magnitude	Residual Impact Significance
							this occurs in the future). Provide this register to contractors and subcontractors. ◦ Review workforce predictions every six months during construction to ensure that accommodation requirements are met in accordance with the objectives of this AOR. ◦ Identify any overlaps with peak demand periods for accommodation during the following six months and engage with key stakeholders. ◦ Maintain a register of local, regional and national workforce breakdown by company on site. ◦ Regularly consult with local property owners and accommodation providers to manage occupancy to maximise use of local accommodation, without preventing its use for major event and holiday purposes. ◦ Engage with other project developers to mitigate potential cumulative impacts which may put additional pressure on the area. ◦ Engage with local health care, social and emergency service providers to monitor the Project's use (if any) of these facilities.			
Stakeholder and Community	Impacts to community cohesion through divided opinions about the desirability of the Project in the community. Community cohesion is likely to be impacted at the level of relationships between individuals who support the Project and those who do not support the Project.	C, O	Landowners, Neighbours, Wider Community	Possible	Moderate	Medium	• Continue to proactively implement the CSEP (2024) and a complaint management and recording procedure (refer to **Section 5**). • Embed Project and specific key stakeholder updates within the CESP (2024) and complaint management and recording	Unlikely	Minor	Low

Impact Activity	Description of Impact	Project Phase[22]	Impacted Stakeholder/s	Pre-Mitigation Rating			Mitigation Measures / Enhancement Opportunities	Post-Mitigation Rating		
				Likelihood	Magnitude	Impact Significance		Residual Likelihood	Residual Magnitude	Residual Impact Significance
	Community engagement for the Project can be or become ineffective with stakeholders feeling as though they have not been heard or are unable to influence Project decisions and management outcomes.	C,O	Landowners, Neighbours, Wider Community	Possible	Moderate	Medium	procedure through the stakeholder management database, and ensure execution occurs in a timely fashion. • Establish a CEC, as intended by TED, assuming there is interest from Theodore and surrounding communities to do so (refer to **Section 5**).	Unlikely	Minor	Low

8. MONITORING FRAMEWORK AND REPORTING

This section provides an overview of the recommended monitoring framework for the social impact management measures to be put in place during the Construction and Operation Phases of the Project.

To achieve the post-mitigation impact significant ratings as outlined in **Table 7-1**, all social impact mitigations will need to be monitored in accordance with the framework outlined in **Table 8-1.**

The objectives of the social impact monitoring are to:

- Verify the predicted impacts and identify any other impacts that may arise;
- Verify that management measures are being implemented as planned;
- Assess the effectiveness of the management measures; and
- Provide data for any necessary regulatory reporting to the State Government or other internal compliance reporting.

Accordingly, **Table 8-1** identifies the following:

- **Impact Activity:** The relevant impact activity area identified in the social impact analysis (refer to **Section 7**).
- **Management Goals:** The overarching objective is to minimise the negative social impacts associated with the Project and enhance the positive impacts. As such, specific goals corresponding to the impacts identified have been provided. These can be used to determine whether the management measures have been effectively implemented.
- **Proposed Monitoring Activities**: The monitoring activities proposed will ensure that relevant data is collected (e.g. the performance indicators) during the various phases of the Project to ensure the effectiveness of the management measures.
- **Performance Indicators**: The indicators provide a mechanism to determine whether the goals have been met.
- **Monitoring Frequency**: Outlines the period for data collection.

8.1 REPORTING AND AUDITING

In addition to ongoing monitoring, regular audits should be undertaken by TED. These audits are to be conducted throughout the Construction and Operation Phases of the Project and will likely be informed by the outcomes of Project approvals.

Audit findings will be reviewed by TED, and where corrective actions are deemed necessary, specific actions (with designated responsibility and timing) will be developed by TED. The focus will be on achieving the objectives set out in **Table 8-1**, as well as continuous improvement in performance.

A summary of the audit findings is to be reported by TED on an annual basis. This will include an evaluation of the objectives set out in **Table 8-1** and any corrective actions that have been developed because of the audit process.

It is recommended that the predicted impacts and corresponding management measures (i.e. Project performance) be internally audited annually and externally audited once every three years. This timeframe may be extended or reduced based on the findings of ongoing audits.

8.2 ROLES AND RESPONSIBILITIES

TED will be principally responsible for implementation of the management measures and the monitoring activities carried out for the Project. However, there will be instances where data will need to be obtained from a third party, or implementation will require cooperation and involvement of others (e.g. contractors and relevant local stakeholders).

TABLE 8-1 PROPOSED MONITORING FRAMEWORK

Impact Activity	Management Goal	Proposed Monitoring Activity	Performance Indicator/s	Monitoring Frequency
Employment and Procurement	Maximise local employment during the construction phase	• Record local employment • Record employee retention rate • Record number of apprenticeships • Ensure major contractors report on local employment • Record the number of training programs undertaken	• Percentage of people from the Region employed by the Project (by TED and its contractors) • Number of training programs delivered • Number of apprenticeships provided	Quarterly
	Maximise local employment during the Operation Phase	• Record local employment • Record employee retention rate • Report on number of, and value of contracts with local and regional businesses	• Percentage of people from the Region employed by the Project • Percentage of local and regional businesses involved in the Project • Percentage of total value of relevant Project expenditure awarded to local and regional businesses	Annually
	Maximise local procurement	• Report on number of, and value of contracts with local and regional businesses	• Percentage of local and regional businesses involved in the Project • Percentage of total value of relevant Project expenditure awarded to local and regional businesses	Quarterly
Benefits for Indigenous Economies	Maximise financial benefits and job and business opportunities for local First Nations people	• Report on benefits provided • Record local Aboriginal people included in jobs and training programs	• Percentage of payments linked to local Aboriginal businesses • Percentage local Aboriginal persons included in jobs and training programs	Quarterly
Local Disruptions and Amenity	Minimise potential environmental and amenity impacts (i.e.	• Record queries and complaints received from stakeholders	• Number of complaints • Percentage of complaints satisfactorily addressed/resolved	Quarterly

Impact Activity	Management Goal	Proposed Monitoring Activity	Performance Indicator/s	Monitoring Frequency
	noise, vibration, dust) on community members			
	Minimise the impact on local tourism operations	• Record tourism data associated with local tourism enterprises (e.g. number of visitors/customers)	• Number of tourists to region • Tourist feedback received via online platforms (e.g. Trip Advisor)	Five yearly
	Avoid or minimise potential impacts on tangible and intangible Aboriginal cultural heritage.	• Record queries and complaints received from Aboriginal Communities and Traditional Owners	• Stakeholder feedback (qualitative) access to sufficient information on activities, impacts, and mitigation and management measures. • Number of complaints • Percentage of complaints satisfactorily addressed/resolved	Quarterly
Accommodation and Worker Influx	Minimise potential impacts on accommodation availability, community and emergency services, and community wellbeing.	• Record local employment • Record employee retention rate • Record changes to local residential vacancy rates and rent increases as a potential result from the project • Record number of admissions to regional health facilities resulting from project construction • Record medical treatment provided on-site, including number of visits and treatment provided related to Project construction • Record all Project interactions with local emergency services • Survey and record Project-induced interactions with local social services • Record random alcohol and drug testing results	• Percentage of people from the region employed by the Project • Residential vacancy rate • Number of admissions to regional health facilities related to project construction activities • Callouts to the Project Area or as a result of a Project-induced injury • Number of on-site medical visits caused by the Project • Type of medical treatment provided • Increased demand as a percentage for local social services • Percentage of positive alcohol and drug test results • Number of breaches of Code of Conduct • Percentage of complaints satisfactorily addressed/resolved	Quarterly

Impact Activity	Management Goal	Proposed Monitoring Activity	Performance Indicator/s	Monitoring Frequency

		• Record breaches of the Code of Conduct
		• Record complaints received from stakeholders in relation to workers accommodation and worker influx
		• Proposed monitoring activities specifically focused on on-site workforce accommodation:
		  ◦ Record number of workers accommodated on site
		  ◦ Waste records in relation to on-site workforce accommodation
		  ◦ Water records in relation to on-site workforce accommodation
			• Proposed indicators specifically focused on on-site workforce accommodation:
			  ◦ Number of workers accommodated on site per day
			  ◦ Waste streams, usage, disposal
			  ◦ Water usage in litres	

Stakeholder and Community	Minimise community angst and concern in relation to the Project to avoid negative impact to community cohesion.	• Record of engagement with stakeholders, including records of responses or feedback • Report on Community Benefit Program	• Stakeholder feedback (qualitative) access to sufficient information on activities, impacts, and mitigation and management measures. • Number of complaints • Percentage of complaints satisfactorily addressed/resolved • Percentage of payments to Community Benefit Fund linked to each identified stakeholder group	Quarterly

9. REFERENCES

Australian Bureau of Statistics 2024*a*, *2021 census community profiles – Gladstone,* Australian Bureau of Statistics, viewed 4 September 2024, <2021 Gladstone, Census All persons QuickStats | Australian Bureau of Statistics (abs.gov.au)>.

Australian Bureau of Statistics 2024*b*, *2021 census community profiles – Banana,* Australian Bureau of Statistics, viewed 4 September 2024*,* < 2021 Banana, Census All persons QuickStats | Australian Bureau of Statistics (abs.gov.au)>.

Australian Bureau of Statistics 2024*c*, *2021 census community profiles – Biloela,* Australian Bureau of Statistics, viewed 4 September 2024*,*< 2021 Biloela, Census All persons QuickStats | Australian Bureau of Statistics (abs.gov.au)>.

Australian Bureau of Statistics 2024*d*, *2021 census community profiles – SA130804152801,* Australian Bureau of Statistics, viewed 4 September 2024*,*< 2021 30804152801, Census All persons QuickStats | Australian Bureau of Statistics (abs.gov.au)>.

Australian Bureau of Statistics 2024*e*, *2021 census community profiles – Theodore,* Australian Bureau of Statistics, viewed 4 September 2024*,*<2021 Theodore (L), Census All persons QuickStats | Australian Bureau of Statistics (abs.gov.au)>.

Australian Bureau of Statistics 2024*f*, *2021 census community profiles – Moura,* Australian Bureau of Statistics, viewed 4 September 2024*,*<2021 Moura, Census All persons QuickStats | Australian Bureau of Statistics (abs.gov.au)>.

Australian Bureau of Statistics 2024*g*, 2021 census community profiles – 31902150815, Australia Bureau of Statistics, viewed 4 September 2024, <https://www.abs.gov.au/census/find-census-data/quickstats/2021/31902150815>.

Australian National University, 2024, *Land requirement for a 100% renewable (zero carbon) economy is 1200 km2*, viewed 29 July 2024, <https://cdn.theconversation.com/static_files/files/3234/Detailed_landuse_calculation.pdf?1714372255>.

Banana Shire Council, *Sandstone Wonders,* viewed 3 November 2023, <https://sandstonewonders.com/>.

Breitschopf, B., C. Nathani and G. Resch, 2012, *"Methodological Guidelines for Estimating the Employment Impacts of Using Renewable Energies for Electricity Generation", "EID-EMPLOY*, viewed 29 July 2024, <www.isi.fraunhofer.de/isi-media/docs/x/de/publikationen/EMPLOY-Guidelines.pdf>.

Farm Transparency Project, 2024, *Age of animals slaughtered,* viewed on 29 July 2024, <https://www.farmtransparency.org/kb/food/abattoirs/age-animals-slaughtered>.

International Monetary Fund (IMF), 2021, IMF Working Paper WP/21/87, *Building Back Better: How Big Are Green Spending Multipliers?* Prepared by Nicoletta Batini, Mario Di Serio, Matteo Fragetta, Giovanni Melina, and Anthony Waldron, viewed on 3 September 2024, <https://www.imf.org/en/Publications/WP/Issues/2021/03/19/Building-Back-Better-How-Big-Are-Green-Spending-Multipliers-50264>

Lothian, A, 2020, *A survey of the visual impact and community acceptance of wind farms in Australia*, viewed 29 July 2024, <https://www.tandfonline.com/doi/full/10.1080/07293682.2020.1819355?scroll=top&needAccess=true#abstract>.

Meat and Livestock Australia, 2024, *Cattle report export,* viewed 29 July 2024, <https://www.mla.com.au/prices-markets/cattlephysicalreport/>.

National Native Title Tribunal (NNTT), *Search for Registers and Applications,* viewed 4 December 2023, <http://www.nntt.gov.au/Pages/Home-Page.aspx>.

Native Land Digital, *Territories page for the Wuli-wuli*, viewed 4 December 2023, <https://native-land.ca/maps/territories/wuli-wuli/>.

New Hampshire Site Evaluation Committee, 2013, Evidence of Wind Farms as Tourism Draws, viewed 29 July 2024, <https://www.nhsec.nh.gov/projects/2013-02/documents/131212appendix_32.pdf>.

New South Wales (NSW) Department of Planning and Environment 2023, *Social Impact Assessment Guideline*, viewed 4 October 2023, <https://www.planningportal.nsw.gov.au/sites/default/files/documents/2023/GD1944%20SIA%20Guideline_NEW%20VI_14_02_23.pdf>

Queensland Government, 2024, *Long Paddock Program Forage Carry Reports*, viewed 29 July 2024, <https://www.mla.com.au/prices-markets/cattlephysicalreport/>.

Queensland Government State Development, Infrastructure, Local Government and Planning 2023, *Planning Guidance, State code 23: Wind Farm development,* viewed 4 October 2023, <https://planning.statedevelopment.qld.gov.au/__data/assets/pdf_file/0027/83178/for-consultation-draft-planning-guidance-state-code-23-wind-farm-development.pdf>.

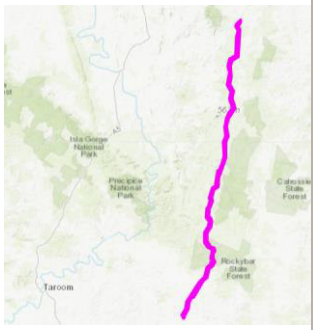
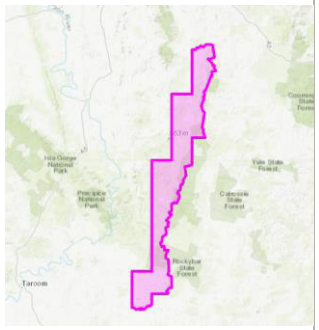
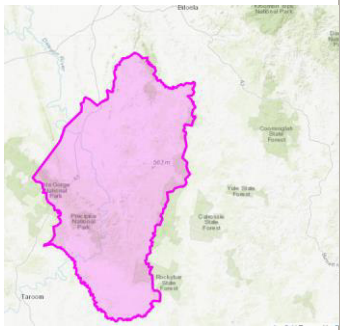
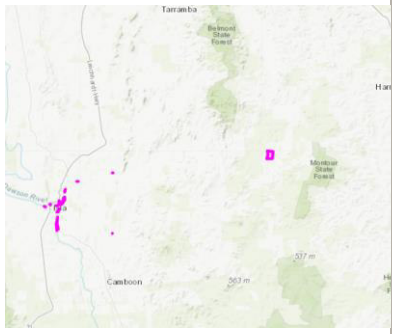
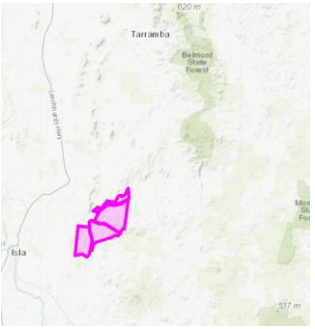
Queensland Department of Energy and Public Works 2022, *Queensland Energy and Jobs Plan, Queensland Government,* viewed 4 October 2023, <https://media.epw.qld.gov.au/files/Queensland_Energy_and_Jobs_Plan.pdf>.

Shannon, B, 2021*, Wind energy and tourism: Industry impacts and opportunities for 'wind farm tourism'.* Unpublished report compiled for C7EVEN Communications. Callaghan, NSW: School of Humanities and Social Science. The University of Newcastle, viewed on 29 July, <https://engie.com.au/sites/default/files/2022-09/Wind%20energy%20and%20tourism%20-%20Industry%20impacts%20and%20opportunities%20for%20%E2%80%98wind%20farm%20tourism%E2%80%99%2016112021.pdf>.

Theodore Wind Farm Community and Stakeholder Engagement Plan (CSEP), 8 April 2024.

UTS Institute for Sustainable Futures, 2020, *Renewable Energy Employment in Australia: Methodology*, viewed 29 July 2024, <https://assets.cleanenergycouncil.org.au/documents/resources/reports/Clean-Energy-at-Work/Clean-Energy-at-Work-survey-methodology.pdf>.

APPENDIX A RELEVANT INDIGENOUS LAND USE AGREEMENTS

ILUA Name	Australia Pacific LNG Pty Limited Wulli Wulli Djaku-nde and Jangerie Jangerie ILUA	Surat Gladstone Pipeline (SGP) Wulli Wulli People ILUA	Ergon Energy and Wulli Wulli People ILUA	Wulli Wulli People Revenue Sharing ILUA	Wulli Wulli People/Woolton ILUA
Tribunal file no.	QI2011/040	QI2009/049	QI2015/045	QI2018/008	QI2015/079
ILUA type	Area Agreement	Area Agreement	Area Agreement	Body Corporate	Area Agreement
Representative A/TSI body area(s)	Queensland South Native Title Services Ltd	Queensland South Native Title Services Ltd	Queensland South Native Title Services Ltd	Queensland South Native Title Services Ltd	Queensland South Native Title Services Ltd
Primary subject matter	Pipeline	Pipeline	Consultation protocol	Government	Pastoral
Other subject matter(s)	Petroleum/Gas	Gas	Access, Community, Energy	Extinguishment	Access
Date registered	09/12/2011	29/04/2010	29/01/2016	18/05/2018	29/01/2016
Map					
Source	Register of Indigenous Land Use Agreements Details (nntt.gov.au)	Register of Indigenous Land Use Agreements Details (nntt.gov.au)	Register of Indigenous Land Use Agreements Details (nntt.gov.au)	Register of Indigenous Land Use Agreements Details (nntt.gov.au)	Register of Indigenous Land Use Agreements Details (nntt.gov.au)

APPENDIX B THEODORE WIND FARM ACCOMMODATION OPTIONS REPORT

Accommodation Options Report

Theodore Wind Farm

PREPARED FOR

Theodore Energy Development Pty Ltd

DATE
5 September 2024

REFERENCE
0661706



DOCUMENT DETAILS

DOCUMENT TITLE	Accommodation Options Report
DOCUMENT SUBTITLE	Theodore Wind Farm
PROJECT NUMBER	0661706
Date	5 September 2024
Version	3.0
Author	Loucky Spit, Abbey Fitzroy
Client name	Theodore Energy Development Pty Ltd

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3.0	01	L. Spit	M. Rookwood	D. Dique	05.09.2024	Final

SIGNATURE PAGE

Accommodation Options Report

Theodore Wind Farm

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ACRONYMS AND ABBREVIATIONS

Acronyms	Description
ABS	Australian Bureau of Statistics
AoI	Area of Influence
AOR	Accommodation Options Report
CEC	Community Engagement Committee
CoC	Code of Conduct
CSEP	Community and Stakeholder Engagement Plan
DA	Development Approval
DIDO	Drive-In Drive-Out
DSDILGP	Department of State Development, Infrastructure, Local Government and Planning
EP Act	Environmental Protection Act 1994
EPBC Act	*Environmental Protection and Biodiversity Conservation Act 1999*
ERM	Environmental Resources Management Australia Pty Ltd
FIFO	Fly-In Fly-Out
Ha	Hectares
km	Kilometres
LGA	Local Government Area
LiDAR	Light Detection and Ranging
MCU	Material Change of Use
MW	Megawatt
NEPC Act	*National Environment Protection Council Act 1994*

Acronyms	Description
NEPM Regulation	National Environment Protection (Movement of Controlled Waste between States and Territories) Measure 1998
NSW	New South Wales
OpW	Operational Works
Planning Scheme	Banana Shire Planning Scheme 2021
QLD	Queensland
RAI	Rental Affordability Index
RWE	RWE Renewables Australia Pty Ltd
SA1	ABS Statistical Area 1
SDAP	State Development Assessment Provisions
SEIA	Socio-Economic Impact Analysis
SET	Stakeholder Engagement Tools
SIA	Social Impact Assessment
State Code 23	State Code 23: Wind Farm Development
TAFE	Technical and Further Education
TMP	Traffic Management Plan
UCL	Urban Centres and Localities
WHS Act	*Work Health and Safety Act 2011*
WMP	Waste Management Plan
WRR Act	*Waste Reduction and Recycling Act 2011*
WTG	Wind Turbine Generator

1. INTRODUCTION

1.1 BACKGROUND

Environmental Resources Management Australia Pty Ltd (ERM) has been engaged by Theodore Energy Development Pty Ltd (TED) to undertake a Construction Workers Accommodation Options Report (hereafter referred to as 'AOR' or 'Accommodation Options Report') for the proposed Theodore Wind Farm ('the Project').

The Project is located approximately 22 kilometres (km) east of the township of Theodore and approximately 50 km south-west of Biloela, over an area of approximately 46,830 hectares (ha). A map of the regional context of the Project Area is provided in **Figure 3-1** with key Project details outlined in **Figure 3-2**.

1.2 PURPOSE AND OBJECTIVE

The purpose of this AOR is to assess the Project's accommodation options, and how those may potentially have an impact on its surrounding communities, in accordance with the draft updates to State Code 23 and associated Planning Guidance, dated 07 August 2023 (refer to **Section 2**).

The scale and nature of wind farm developments necessitate multi-year construction timeframes and typically require a construction workforce beyond what is available in the local area. As such, this AOR will consider the timeline of the Project, as well as the expected number of workers to be employed during the construction and operation phases of the Project.

The AOR includes appropriate consideration of accommodation availability, focusing on any impacts to existing services or recreational facilities, and commuting distances to the Project. This assessment will be undertaken against the key matters included in the Queensland Social Impact Assessment (SIA) Guideline (2018) relating to community and stakeholder engagement, workforce management, and health and wellbeing.

Further, this AOR provides detail as to prior consultation and/or agreements with the local Council, assessment of positive and negative implications of using and/or supplementing accommodation options in existing communities and will provide an overview as to how an on-site workforce accommodation facility, including preliminary waste management plan and a proposed strategy for providing potable water, could be considered.

It is intended that this AOR will form part of the supporting documentation considered for the Socio-Economic Impact Analysis (SEIA) associated with the Project. As such, it is the SEIA that will explore the potential socio-economic impacts relevant to the Project and provide suitable management and/or enhancement measures.

1.3 DOCUMENT STRUCTURE

The remainder of the AOR is structured as follows:

- **Section 2** provides an overview of the legislative framework associated with the Project, including a brief description of State Code 23, and how each section within this report aligns with the requirements as stated in the Draft Planning Guidance document. It also provides a description of existing approvals directly relevant to the AOR.
- **Section 3** provides a description of the Project, including main Project components, location, an overview of the preliminary key dates for primary activities associated with the Project, and workforce estimates for each Project phase.
- **Section 4** provides an overview of the local and regional social and economic context.
- **Section 5** provides an overview of the Project's accommodation considerations, including the available existing short-term and long-term accommodation options in the region, as well as dates of major festivals and annual events, the local road network, and other developments in the area.
- **Section 6** provides an overview of community and stakeholder engagement activities undertaken to date, council consultation, and planned engagement proposed for future stages of the Project.
- **Section 7** provides a key matters assessment to present how each accommodation option may impact workforce management, housing and accommodation, local business and industry procurement, and health and wellbeing. This section ends with recommendations on the accommodation hierarchy.
- **Section 8** provides an overview of management measures developed to encourage and prioritise local employment and accommodation, as well as a preliminary waste management plan and commentary as to the supply of potable water supply.

1.4 LIMITATIONS

This AOR has been prepared using a combination of on publicly available information and Project-related detail provided by TED.

It is highlighted that the AOR seeks to identify and consider the impacts of workers accommodation facilities and the implications for existing townships and communities only and therefore should not be taken as a comprehensive legal assessment of the ability to use these options.

It is also noted that ERM's findings are accurate and complete only to the extent that information sourced, and/or provided to ERM, was itself accurate and complete.

Finally, ERM's findings reflect the current Project status. It is noted that a number of key decisions have not yet been made, such as the selection of contractors or suppliers. Once such decisions have been made the predicted impacts should be reviewed and updated accordingly.

2. LEGISLATIVE FRAMEWORK

2.1 PLANNING ACT 2016

The *Planning Act 2016* and associated Planning Regulation 2017, require a Development Approval (DA) for Material Change of Use (MCU) for a wind farm to be assessed in accordance with the State Development Assessment Provisions (SDAP) State Code 23: Wind Farm Development (State Code 23).

In accordance with State Code 23 (refer **Section 2.2**), the Project will be 'Code Assessable' with all turbines located a minimum 1.5 km from any non-host sensitive receptor. Operational Works (OpW) for Native Vegetation Clearing will be included in the Wind Farm DA, assessed by the Department of Resources, in accordance with State Code 16: Native Vegetation Clearing.

This AOR is to be submitted as an attachment to the DA to assist the Project in addressing the requirements of State Code 23 (refer to **Section 2.2**).

2.2 STATE CODE 23: WIND FARM DEVELOPMENT

The Queensland Government is delivering on a commitment to review the planning framework for renewables. On 07 August 2023, it introduced a draft update of State Code 23, which includes requirements aimed at ensuring that the impacts arising from the construction, operation and decommissioning of wind farms do not result in unacceptable adverse impacts on individuals, communities and the natural environment.

Amongst other things, compliance with the code ensures that workforce accommodation associated with the construction of a wind farm does not cause unacceptable adverse impacts on individuals and surrounding communities. In that respect, Performance Outcome (PO) 14 of the draft update to State Code 23 states:

> *On-site workforce accommodation of greater than 50 beds associated with the construction of the wind farm, does not result in adverse impacts on surrounding communities and townships.*

Based on current workforce predictions, TED is anticipating the creation of approximately 300 to 500 jobs during the construction phase and 15 to 50 jobs during the operation phase of the Project. One potential option for TED to cater for the workers employed during the construction phase is the development of an on-site accommodation facility with a capacity greater than 50 beds. Given this potential option for TED, an AOR is required to be prepared under the provisions of the draft Update to State Code 23.

This AOR has been designed in order to address the requirements of the draft updates to State Code 23, the associated Planning Guidance (Queensland State Development, Infrastructure, Local Government and Planning, 2023), as well as the Queensland Energy and Jobs Plan (Queensland Department of Energy and Public Works, 2022) and requisite components of the Queensland SIA Guideline (2018).

Table 2-1 provides an overview of the draft Planning Guidance 'Supporting Action' requirements for PO14 and where this is addressed within the AOR.

TABLE 2-1 ALIGNMENT WITH DRAFT PLANNING GUIDANCE 'SUPPORTING ACTION' REQUIREMENTS

PO14 'Supporting Action' Requirement	Reference in AOR
The expected number of construction workers to be accommodated during different phases of construction.	Refer to **Section 3.2**
The expected construction period for the wind farm.	Refer to **Section 3.1**
An assessment against selected key matters in the Queensland Government 'Social Impact Assessment Guideline' (Queensland Government 2018), including: • Community and stakeholder engagement – include details of the community and stakeholder engagement to be undertaken and details of the ongoing engagement proposed during construction.	Refer to **Section 6**
• Workforce management – include details of the workforce profile for the construction phases, including an analysis of the local and regional labour markets, an assessment of opportunities for local workers.	Refer to **Section 7.3** and **Section 4**
• Health and wellbeing – include an analysis of the availability and accessibility to healthcare and emergency services for the proposed construction workforce.	Refer to **Section 7.6**
Details of any consultation and/or agreements with the local government.	Refer to **Section 6.2**
An assessment of positive and negative implications of using and/or supplementing accommodation options in existing townships/communities. This analysis should explore the implications of all, or part, of the workers accommodation being located in exiting townships and should address: the availability of existing accommodation options; implications of commuting on local roads and implications of commuting distances and time from a workplace health and safety perspective;	Refer to **Section 5** and **Section 7**, with **Section 5.2** focused on commuting on local roads.
If the options analysis recommends on-site construction workers accommodation of greater than 50 beds, further details have to be provided to demonstrate how the facility can be suitability delivered and managed on the site. These details should include: • A preliminary waste management plan outlining: relevant legislative requirements and how these will be met; how all waste streams generated at the facility will be managed and particular details in relation to sewage treatment. If on-site sewage treatment is not proposed, details must be provided that demonstrate that relevant local governments have been consulted and are supportive of off-site sewage disposal options.	Refer to **Section 8.2**
• Proposed strategy for serving the facility with potable water. Specific details can be pursued following approval, but the lodged application needs to provide a level of confidence that, if approved, potable water can be viably supplied to the facility.	Refer to **Section 8.3**

2.3 BANANA SHIRE PLANNING SCHEME 2021

The Banana Shire Planning Scheme 2021 (the 'Planning Scheme') establishes the land use and development priorities for the Banana Shire Local Government Area (LGA) for the period of 2021 to 2026. The Planning Scheme has identified the following goals to ensure that development within the region is appropriate:

- A fair, orderly, and sustainable pattern of development;
- A strong sense of community identity;
- A viable, complex, and diverse economy;
- The enhancement of infrastructure to meet the needs of the community;
- The preservation of economic and environmental values in rural areas; and
- The protection of the natural environment, and the mitigation of both natural and human-made hazards.

The Banana Shire Council ('Council') as made commitments to meet the above goals through the development of strategic direction plans, as well as the creation of objectives and strategies which identify the key steps and resources required to achieve the vision.

Consideration of the Planning Scheme requirements will be given through the assessment process for the Project and addressed in the DA (refer to **Section 2.2**). While Council is not the Assessment Manager for the Project, Council has an important role to play for the Project as it:

- Plays an important role in supporting the economic, social and environmental wellbeing of its community;
- Remains a key stakeholder in TED's Community and Stakeholder Engagement Plan (CSEP);
- Will be consulted as part of the DA process directly by Department of State Development, Infrastructure, Local Government and Planning (DSDILGP); and
- Is the Assessment Manager for related approval requirements including the met mast, and construction approvals (e.g. civil and road works, temporary on-site accommodation facilities, temporary concrete batching etc.).

Under the Planning Scheme, on-site workforce accommodation for a renewable energy project is most commensurate with the 'Rural Workers' Accommodation' use, which is defined as:

> *The use of premises as accommodation, whether or not selfcontained, for employees of a rural use, if:*
>
> *(a) the premises, and the premises where the rural use is carried out, are owned by the same person, and*
>
> *(b) the employees are not nonresident workers*

Accordingly, the future development of on-site workforce accommodation will need to consider the relevant provisions of the Planning Scheme, including the Development

Design Code (Part 6 of the Planning Scheme). The provisions of the Development Design Code have been considered as part of this AOR, with a copy of the Code attached in Appendix A.

2.4 EXISTING APPROVALS

It is understood that there are no existing DAs associated with the Project. TED are currently in the process of obtaining the relevant primary approvals under the EPBC Act and *Planning Act 2016* for the Project.

3. PROJECT DESCRIPTION

TED is developing the Project approximately 22 km east of the township of Theodore, 50 km south-west of Biloela and 150 km south-west of Gladstone in the Banana Shire LGA, as shown in **Figure 3-1**.

The Project Area is comprised of nine lots on three properties, comprising approximately 46,830 ha. TED has signed agreements with all the Project landowners. Cattle grazing is the dominant land use in the Project Area, with largely cleared areas associated with lower slopes dominating the landscape.

The road network near the Project Area incorporates a range of local and state sealed and unsealed roads including Defence Road, Crowsdale-Camboon Road, and the Leichardt Highway. Access points will be created to facilitate entry into the site for construction and operation purposes and will stem from public roads.

The Project lies adjacent to and within the locality (10 km) of several state forests including Belmont State Forest to the east, Montour State Forest to the north and Trevethan State Forest to the south.

Key Project details include:

- **Wind Turbines –** up to 170 Wind Turbine Generators (WTGs) with a tip height of up to 270 m and a rotor diameter of up to 175 m.
- **Wind Monitoring –** temporary or permanent wind monitoring towers to be determined with Light Detection and Ranging (LiDARs) on site and met masts installed.
- **Ancillary Infrastructure** – including, but not limited to, access tracks, substations, overhead and underground electrical cabling, hardstands, and an operation and maintenance compound.
- **Operational Date –** target date of Quarter 4, 2027 for commercial operations to commence.
- **Battery Storage –**to co-locate with on-site substations.
- **Nearby dwellings –** No non-associated dwellings were identified 3.09 km of the nearest WTG associated with the Project. 11 non-associated dwellings have been identified within 3.09 km - 6.18 km of the proposed WTGs, and 6 non-associated dwellings have been identified within 6.18 km and the 10 km.
- **Homes Powered –** the Project proposes to power more than 500,000 homes.

Figure 3-2 shows key details of the Project, and **Figure 3-3** presents the Project's site boundaries.

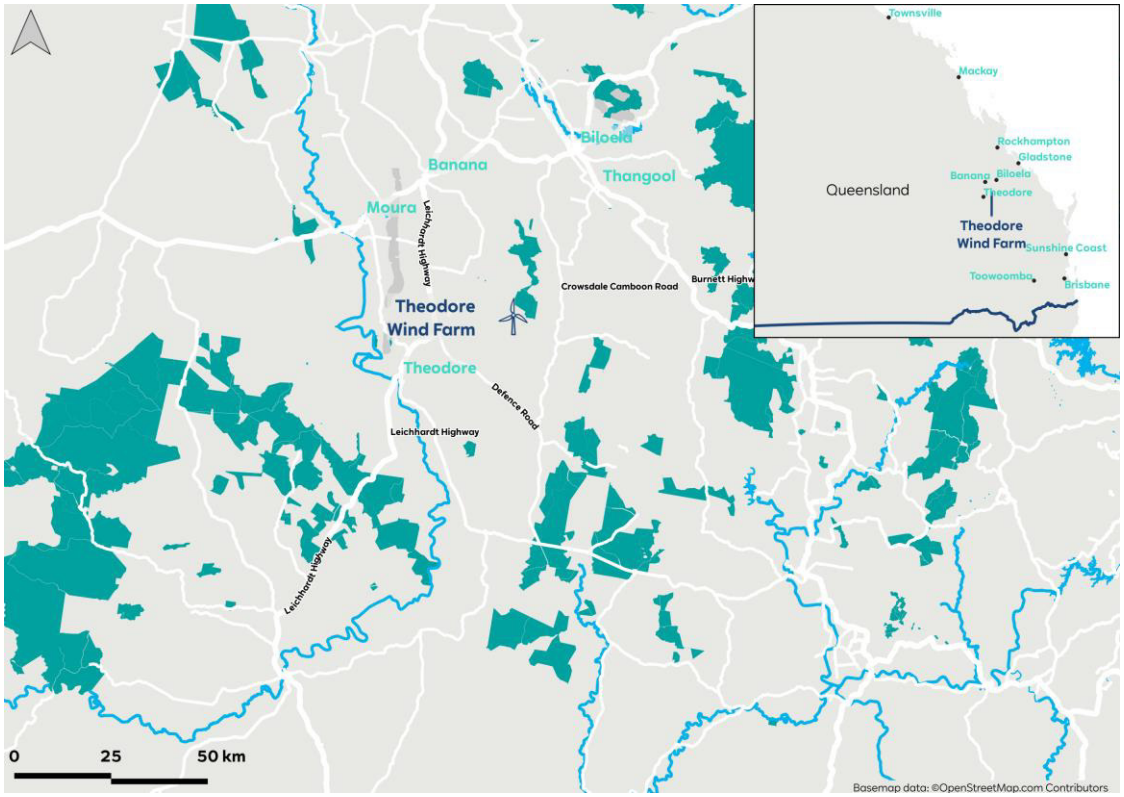


FIGURE 3-1 THEODORE WIND FARM REGIONAL CONTEXT

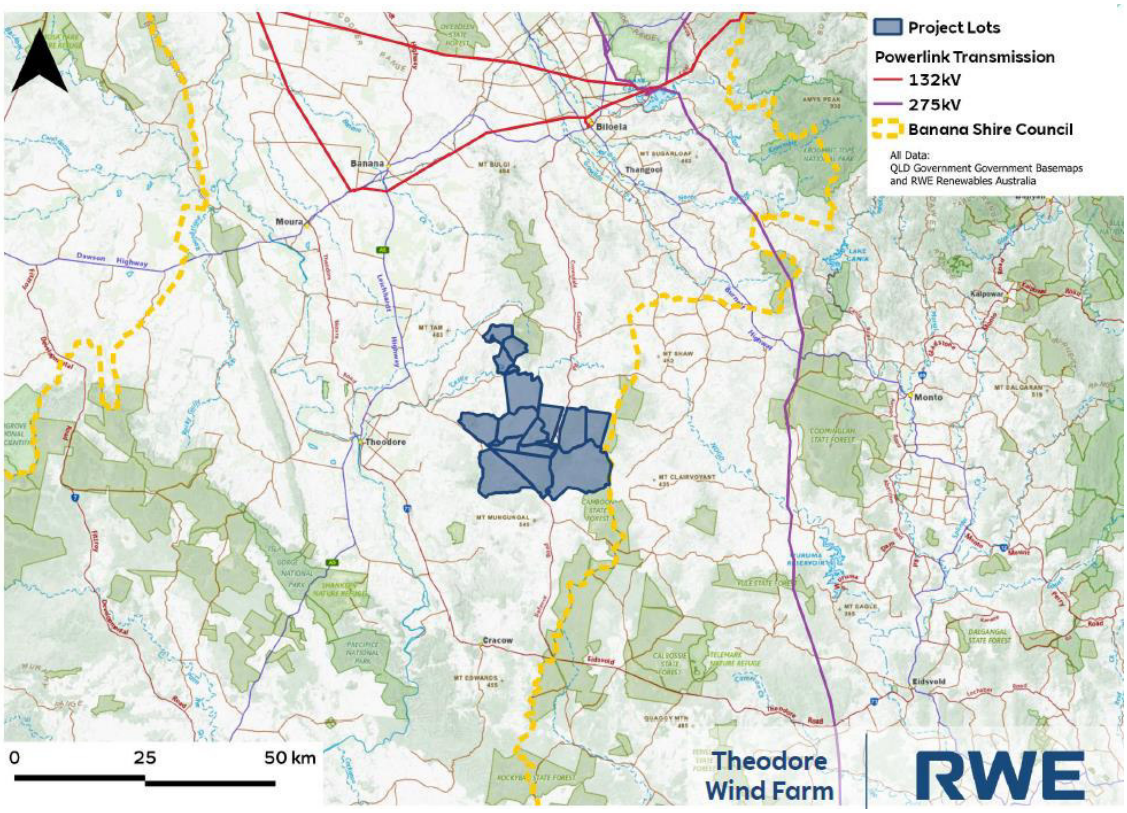


FIGURE 3-2 THEODORE WIND FARM KEY PROJECT DETAILS

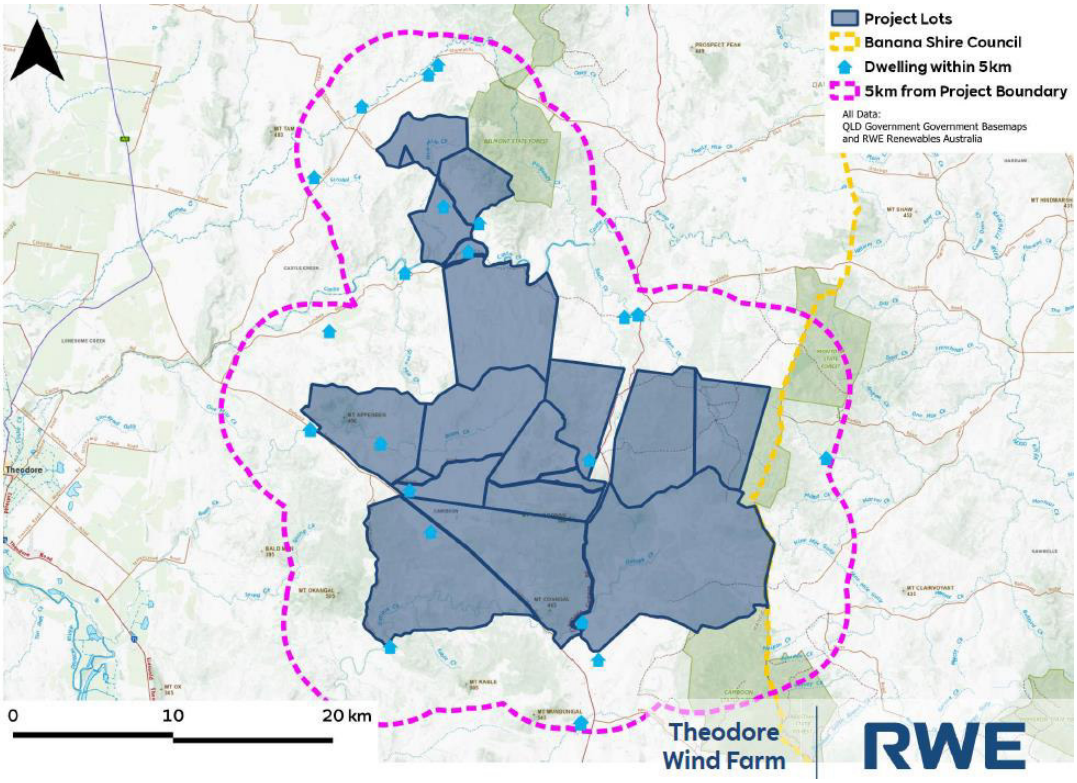


FIGURE 3-3 THEODORE WIND FARM SITE BOUNDARY

3.1 KEY PROJECT DATES AND PLANNING

Table 3-1 presents the preliminary key dates for the primary activities associated with the Project, including stakeholder engagement, approvals, infrastructure upgrades, and construction and operation commencement targets.

TABLE 3-1 THEODORE WIND FARM PRELIMINARY KEY DATES

Key Item	Date
Traditional Owner and Community Consultation	2023 -> Onwards
Engagement with Chambers of Commerce and Local Business	Q3 2024 -> Onwards
EPBC Submission	March 2024
Construction Commencement Target	Q1 2026
Commercial Operation Target	Targeting 2027 for initial operations

3.2 WORKFORCE GENERATION ESTIMATES

TED anticipates that there will be 300-500 jobs during the construction phase, and 15-50 permanent jobs during 30 years of operations, with ongoing economic benefit from the multiplier effect of a major project (CSEP 2024).

TED have also established the following milestones that will help to guide development:

- Community and stakeholder engagement commenced in August 2023, with the project team undertaking early consultation with landowners, Traditional Owners, Local Council, and the community.
- Engagement with Local Businesses is planned for Quarter 3, 2024 and will be ongoing.
- EPBC Submission and Approval Target is scheduled for Quarter 4, 2024 – Quarter 1, 2025.
- State DA Submission and Approval Target is scheduled for Quarter 4, 2024 – Quarter 2, 2025.

3.2.1 CONSTRUCTION

The Project's construction commencement target is scheduled for Q2 2026 and the total construction period is anticipated to be approximately 18 months.

The following types of labour and skills required align with the construction phase of the Project: project managers, civil engineers, electrical engineers, mechanical engineers, medium voltage and high voltage electricians, linesmen, construction workers, heavy equipment operators, technicians, safety experts, environmental experts, logistics and supply chain managers, surveyors, quality control inspectors, welders, cranage, local support staff.

The Project is committed to employing from the local region where possible, however is looking into construction working accommodation possibilities for those who are to be employed from outside of the local region.

The following actions are planned to encourage local employment: hiring mandates, partnerships, contracting.

3.2.2 OPERATION

The Commercial Operation Date is scheduled for after Quarter 4, 2027, with the operational lifespan of the Project to be in the order of 30 years. Throughout operations, a workforce of up to 50 FTEs will be required.

It is anticipated that the facility will require regular maintenance throughout its operational life. This will include, but is not limited to, the following ongoing tasks:

- Inspecting and repairing blades;
- Monitoring electrical systems;
- Ensuring proper lubrication of components;
- Inspecting tower structure for wear or corrosion; and
- Managing the braking system.

The operational workforce will also be responsible for ongoing monitoring of, amongst other things, the overall safety of the site, regular data analysis and software updates for efficient operation.

3.2.3 DECOMMISSIONING

At the end of life, the WTG towers and other above ground infrastructure will be removed, and the area rehabilitated in accordance with good practice at the time and where not required for ongoing grazing or agricultural uses.

A detailed Rehabilitation and Decommissioning Plan will be prepared during the early stages of operation as a part of the post-construction activities, and will include overarching principles for the decommissioning phase, to be reviewed prior to decommissioning of the proposed development.

4. SOCIAL AND ECONOMIC PROFILE

This section provides an overview of the socio-economic profile of the local and regional surroundings of the Project. The socio-economic profile of the Area of Influence (AoI) is described in detail in the SEIA.

For the purposes of this AOR, the Project AoI is comprised of a Primary AoI and Secondary AoI, with the Primary AoI comprising an area of 5 km from the site boundary, including Australian Bureau of Statistics (ABS) SA1 No. 30804152801, ABS SA1 No. 31902150815 and the Urban Centres and Localities (UCL) of Theodore, Moura, and Biloela. The Secondary AoI comprises the areas within the ABS LGA Boundaries including Banana Shire LGA and Gladstone Region LGA. **Figure 4-1** illustrates the Primary and Secondary AoIs for the Project, and provides an overview of the relevant ABS datasets, as presented in **Table 4-1**.

Both AoIs and the surrounding stakeholders who may be impacted as a result of the Project were determined based on potential interactions between the Project and the surrounding communities. For the AOR, this is particularly relevant in relation to the area's capacity to handle the Project's workforce and accommodation needs.

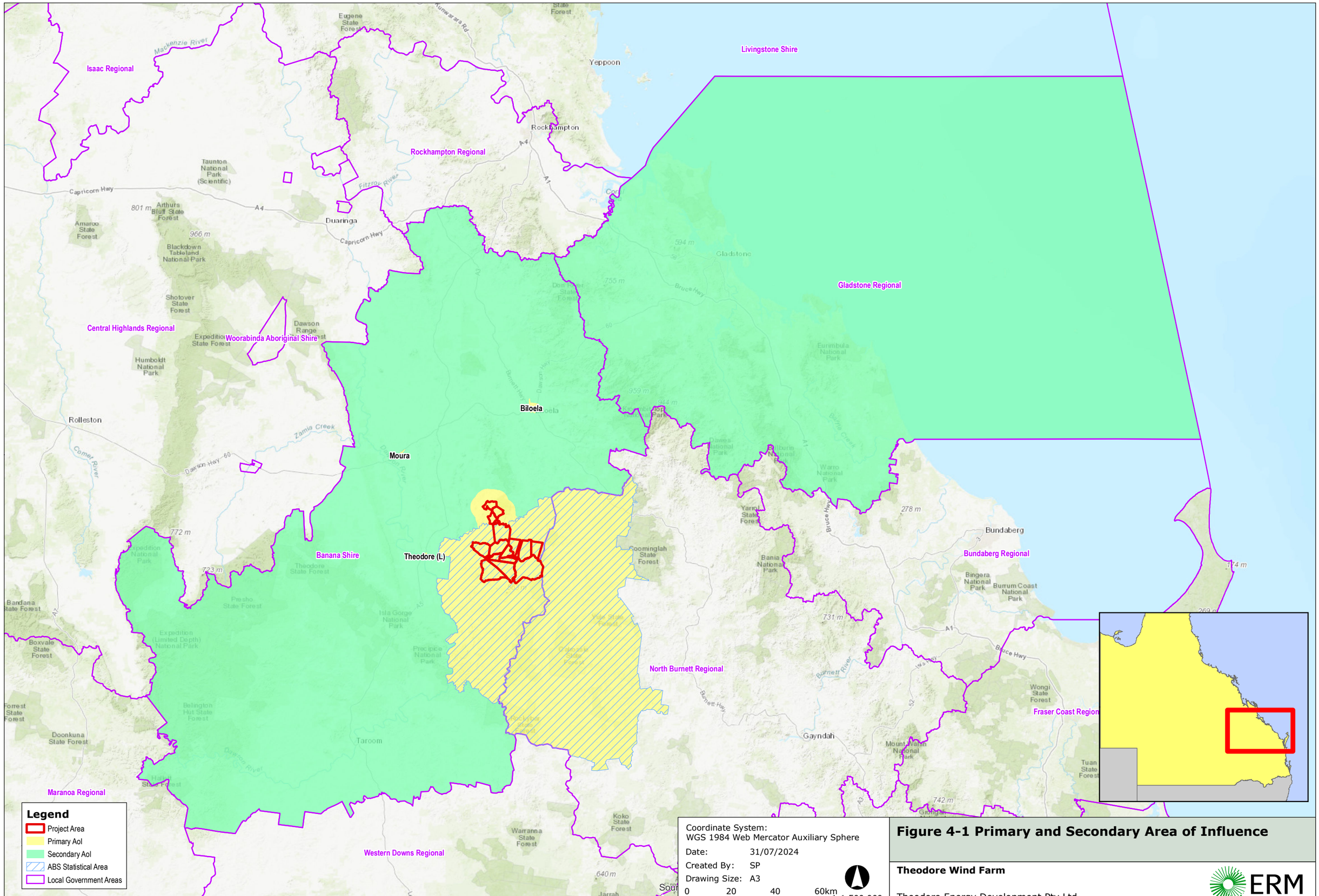
TABLE 4-1 SUMMARY OF RELEVANT ABS DATASETS

Location	2016 ABS Reference	2021 ABS Reference
SA1	SA13152801	SA130804152801
SA1	SA1 3150815	SA1 31902150815
Theodore (UCL)	UCL322123	UCL322120
Moura (UCL)	UCL315068	UCL315070
Biloela (UCL)	UCL314006	UCL314005
Banana Shire (LGA)	LGA30370	LGA30370
Gladstone Region (LGA)	LGA33360	LGA33360
QLD (State)	Area code 3 (State)	Area code 3 (State)

4.1 LOCAL PROFILE

The Project is located in an area noteworthy for its agriculture, in particular, beef cattle production. In addition, the local area supports dry land and irrigated cropping, horticulture, forestry, mining and resources, tourism and construction sectors.

The closest towns to the Project Area comprise of Theodore (approximately 25 km west, travel distance by road), Banana (approximately 49 km north, travel distance by road), Moura (approximately 58 km north-west, travel distance by road), and Biloela (approximately 94 km north-east, travel distance by road). These are all relatively small and rural communities, with Banana and Theodore mainly servicing rural activities, and Moura local coal mining activities. Compared to Theodore and Moura, Biloela is more densely populated and hosts a tourist centre.



Coordinate System:
WGS 1984 Web Mercator Auxiliary Sphere
Date: 31/07/2024
Created By: SP
Drawing Size: A3
0 20 40 60km
1:1,500,000

Figure 4-1 Primary and Secondary Area of Influence

Theodore Wind Farm

Theodore Energy Development Pty Ltd

ERM

0661076_AoI_G001_R3.mxd

Theodore lies on the eastern side of the Great Dividing Range, boasts a tropical character and lies 140 m above sea level. The population of Theodore as of 2021 is 451 people, with 15.1% identifying as Aboriginal and/or Torres Strait Islander. In 2021, Theodore's median age was recorded at 38 years with 20.2% of the population aged 14 and under, and 22.4% of the population aged 65 years and over. The top industry of employment was log saw-milling (8.2%), and the top occupation was labourers (19.3%) (ABS 2024*e*).

Banana's population as of 2021 is 348[1], with 7.8% identifying as Aboriginal and/or Torres Strait Islander. In 2021, Banana's median age was recorded at 40 years with 20.9% of the population aged 14 and under, and 15.2% of the population aged 65 years and over. The top industry of employment was Beef Cattle Farming (Specialised) (16.4%), and the top occupation was manager (30.4%) (ABS 2024*g*).

Moura recorded a population of 1,843 in 2021, with 8% of the population identifying as Aboriginal and/or Torres Strait Islander. The median age of Moura is 33 years old with 12.7% of the population aged 65 and over and 24.8% of the population aged under 14. Coal mining is pivotal to the town with the highest industry of employment at 26.6%, with Machinery Operators and Drivers the highest occupation at 24.6% (ABS 2024*f*)

Biloela is Banana Shire's largest town with a population of 5,667 (ABS 2023*c*) and is the main residential base for workers from the Callide Coal Mine (approximately 92 km from the Project Area) and Callide Power Station (approximately 87 km from the Project Area). The Callide Power Station produces approximately 20% of QLD's electricity (CSEP 2024). The highest industry of employment is coal mining (14.1%) with technicians and trades workers contributing for the top occupation (19.1%) (ABS 2021*c*). Only 27 km^2 of the Shire's 28,577 km^2 are urbanised, creating the need for unique, tailored communications and engagement strategies that may potentially leverage existing hubs, such as major employers, to access the community (CSEP 2024).

In 2021, SA1 (SA130804152801), which includes the Project Area, recorded a population of 192, with 2.6% identifying as Aboriginal and/or Torres Strait Islander. The population is spilt between 57% males and 43% females with a median age of 48 years, contrasting with the Queensland and Australian average of a median age of 38 years. 4.8% of the SA1 have a bachelor's degree level or above and 19.4% have a certificate level III. The top industry of employment is beef cattle farming (51.1%) with the top occupation being managers (42.4%) (ABS 2024*d*).

The second SA1 (SA131902150815), which is to the east of the Project Area, recorded a population of 183, with 2.2% identifying at Aboriginal and/or Torres Strait Islander. The population is split between 53.4% males and 46.6% females with a median age of 39 years. 4.8% of the population hold a Bachelor Degree level or above with 13.1% holding a certificate level III. Beef cattle farming was the top industry of employment (71.5%), followed by aged care residential services (2.4%). The top occupation for the SA1 was managers (54.5%) (ABS 2024*h).*

[1] As a result of the small size of the township of Banana, there is no Urban Centre and Locality available on ABS. Therefore, ABS Suburbs and Localities (SAL) for Banana has been used instead.

4.2 REGIONAL PROFILE

The Project Area is situated within the Banana Shire LGA, however there is potential for economic benefits from both the construction and operation phases to be experienced in the Gladstone Region LGA.

A snapshot of the key demographic statistics for the Banana Shire and Gladstone Region LGAs, compared with those of Queensland and Australia is provided in **Figure 4-2**. The information presented is based on the ABS 2021 Census information, with additional detail on the two LGAs provided in the following sections.

4.2.1 BANANA SHIRE LGA

The Banana Shire LGA is situated in central Queensland, Australia, 120 km west of the Port of Gladstone. The LGA boasts a blend of rural landscapes and national parks.

Between 2016 and 2021 the population of the Banana Shire LGA increased from 14,319 to 14,513 people (an increase of about 200 people). The population dynamics as of 2021, showed a 50/50 split of males and females, with a median age of 39, which is relatively typical for a rural area. The 2021 Census recorded 63.3% of the population in the labour force and 2.8% unemployed. The main occupations of usual residents[2] were managers (19.5%), and technicians and trades workers (15.5%) (ABS 2024*a*). The major industries throughout the area include beef cattle farming (12.7%), coal mining (12.2%), and meat processing (3.6%), and now more recently power generation (both renewable and non-renewable resources).

The Banana Shire LGA has extensive natural resources, with several major coal deposits (including in the Theodore area). Two gas transmission pipelines run through the Banana Shire, from the Surat and Bowen Basins to Gladstone. Coal mining is one of the Shire's major industries, as are power generation and farming enterprises including beef production and cropping (lucerne and cotton) (CSEP 2024).

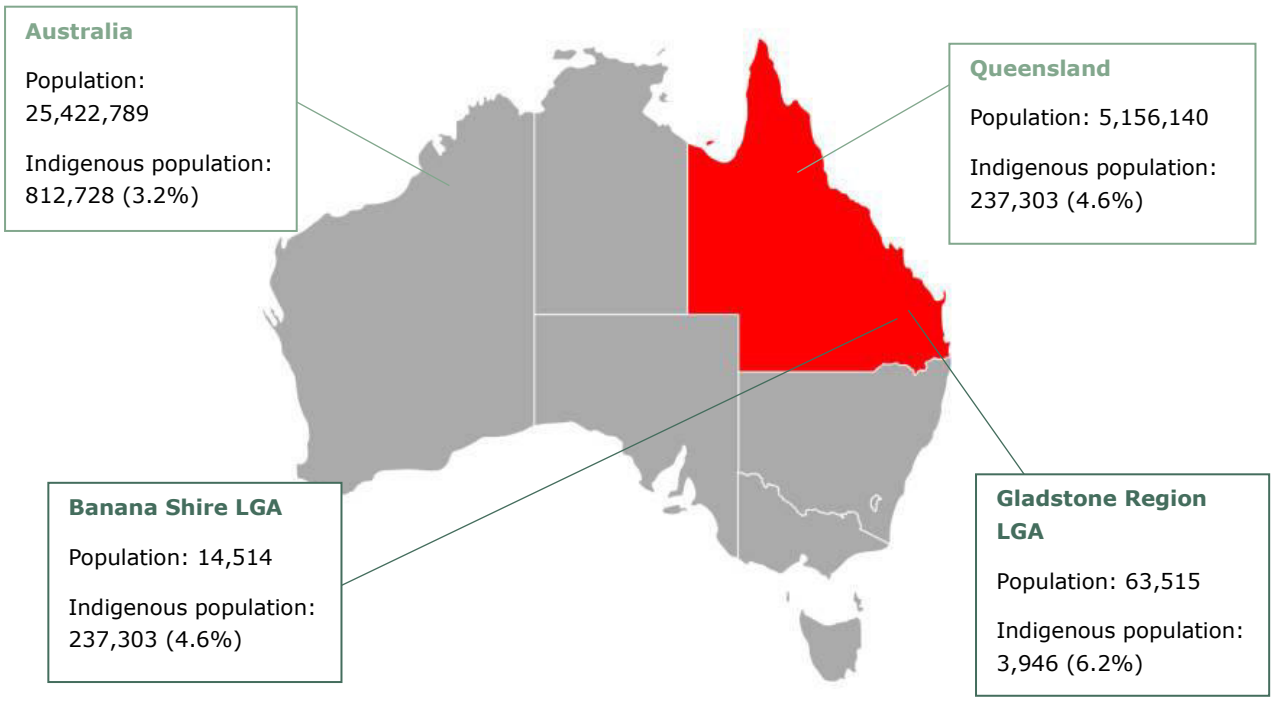
The Banana Shire LGA is serviced by six hospitals including Biloela Hospital, Moura Multipurpose Health Service, Theodore Multipurpose Health Service, Taroom Hospital, Baralaba Multipurpose Health Service and Wowan/Dululu Multi-Purpose Centre. Private practices exist throughout the LGA along with Medical Centres. Both Theodore and Moura Multipurpose Health Services are open 24/7 and their services include emergency, general medical and surgical. In addition, the township of Biloela has the options of Biloela Hospital, Biloela Medical Centre, Gladstone Hospital and Calliope Medical Centre as the closest health services.

4.2.2 GLADSTONE REGION LGA

Gladstone is a growing industrial city along the Queensland coastline, and the local airport is a gateway to industry and tourism. Gladstone Airport will be essential for non-local workers travelling to and from the Project Area.

[2] Usual residence refers to the address at which a person lives or intends to live for six months or more. However, the data is self-reported and sometimes, the address that is reported may be what respondents consider their 'usual address' rather than the technical definition.

Between 2016 and 2021, the Gladstone Region LGA saw a population increase from 61,640 to 63,515 people (1,875 additional people). Similar to the Banana Shire LGA, the population has a 50/50 gender split, with a median age of 38. There was a comparable percentage of workers in the labour force at 61.8%, though a higher percentage of the population unemployed at 7.4% (ABS 2024*b*). The main occupation of the residents were technicians and trades workers (20.6%) and professionals (14.4%). The major industries in the area include, aluminium smelting (5.7%), alumina production (3.6%) and other heavy and civil engineering construction (3.2%).



Source: ABS 2024*a*, ABS 2024*b*

FIGURE 4-2 POPULATION DEMOGRAPHIC SNAPSHOT (2021 CENSUS)

5. ACCOMMODATION CONSIDERATIONS

TED expects that a component of the Project's construction and operation workforce will not be sourced from local workers within the neighbouring Banana Shire and Gladstone Region LGAs, and as such will require accommodation within the either the Primary or Secondary AoI (described in the SEIA for the Project).

In order to determine the likelihood for an on-site accommodation facility to be required, the following has been considered:

- The availability of existing short-term and long-term accommodation options (refer to **Section 5.1**);
- The existing road network and the commuting requirements (refer to **Section 5.2**); and
- Other nearby large-scale developments, including renewable energy projects (refer to **Section 5.3**).

5.1 AVAILABILITY OF EXISTING ACCOMMODATION

This section presents an overview of housing and accommodation indicators relevant to dwelling tenure, occupancy, and accommodation availability.

The local and regional areas are characterised by a relatively high proportion of occupied dwellings as presented in **Table 5-1**. Based on the 2021 Census, the SA1 (SA130804152801) where the Project is located, and the SA1 (SA131902150815) to the east of the Project Area, both recorded the highest proportion of unoccupied dwellings (25% and 27.8%). However, both SA1s also include the smallest amount of total private dwellings at only 96 dwellings and 89 dwellings, relatively. Compared to the rest of the State, the whole AoI has a higher percentage of unoccupied private dwellings.

It should be noted that there are various factors that can contribute to unoccupancy, such as dwellings requiring maintenance, dwellings soon to be on the market for lease, or newly completed dwellings not yet occupied.

TABLE 5-1 PRIVATE DWELLING OCCUPANCY, 2021

Locality	Occupied Private Dwellings (%)	Unoccupied Private Dwellings (%)	Total Private Dwellings (no.)
Banana Shire LGA	81.6%	18.4%	7,200
Gladstone Region LGA	85.0%	15.0%	29,780
Theodore UCL	80.8%	15.8%	287
Moura UCL	78.6%	21.9%	1,000
Biloela UCL	85.2%	14.8%	2,714
SA130804152801	73.6%	25.0%	96

Locality	Occupied Private Dwellings (%)	Unoccupied Private Dwellings (%)	Total Private Dwellings (no.)
SA131902150815	64.4%	27.8%	89
Queensland	90.7%	9.3%	2,190,424

Source: ABS 2024, Census of Population and Housing: General Community Profile

As evidenced in **Table 5-2**, SA1 (SA130804152801), in which the Project is located, is characterised by relativity high levels of home ownership compared to the rest of the AoI. In general, the AoI has a higher percentage of homes that are owned outright or mortgaged, compared to people renting in the area. Compared to the State, the AoI also presents a significantly higher ownership of homes.

Most of the private dwellings in the AoI are rented either through a real estate agent or through 'other landlord type'. There are six real estate agencies in the Theodore, Moura, and Biloela UCLs. These include:

- Moura Real Estate;
- Elders Real Estate Theodore;
- First National Real Estate Biloela;
- Ray White Biloela;
- Hourn & Bishop QLD (property & livestock agents, Moura);
- Link Properties Australia (Moura).

TABLE 5-2 DWELLING TENURE, 2021

Locality	Owned Outright or with a Mortgage (no.)	Rented (no.)			
		Total Rented	Real Estate Agent	Social Housing[3]	Other Landlord Type (including Employer)[4]
Banana Shire LGA	3,032 (60.7%)	1,499 (30%)	555	215	268
Gladstone Region LGA	14,785 (63.8%)	7,731 (33.4%)	5,271	845	283
Theodore UCL	102 (52.6%)	80 (41.2%)	12	8	16
Moura UCL	308 (50.2%)	276 (45%)	145	39	56

[3] Includes state housing authority and community housing
[4] Includes Government and other employers

Locality	Owned Outright or with a Mortgage (no.)	Rented (no.)			
		Total Rented	Real Estate Agent	Social Housing[3]	Other Landlord Type (including Employer)[4]
Biloela UCL	1,131 (57.5%)	758 (38.5%)	354	147	115
SA130804152801	34 (64.1%)	13 (24.5%)	N/A	N/A	N/A
SA131902150815[5]	42 (72.4%)	6 (10.3%)	N/A	N/A	N/A
Queensland	543,285 (29.1%)	618,442 (33.1%)	409,207	61,277	36,412

Source: ABS 2024, Census of Population and Housing: General Community Profile

5.1.1 SHORT-TERM ACCOMMODATION

At the time of writing (September 2024), there are 31 commercially operated short-term accommodation options available across the Primary AoI and Banana Shire LGA.

These short-term accommodation options, along with their locations and capacity are outlined in **Table 5-3**. These accommodation options include workforce accommodation facilities, hotels and motels, Airbnb's, caravan parks and cabins.

It should be noted that the capacity of accommodation options including motels, hotels and cabins may change as a result of other large-scale projects in the AoI that are simultaneously competing for workforce accommodation (including renewables and mining companies). These large-scale projects are discussed in **Section 5.3**.

[5] Community Profiles are not available for SA1s in 2021.

TABLE 5-3 SHORT-TERM ACCOMMODATION IN THE AOI

Location	Short-Term Accommodation Provider	Description / Approximate Capacity
Biloela (1 hour from Theodore)	**Location:** Discovery Workstay Biloela **Accommodation Type:** Workforce accommodation facility	**Capacity:** Unknown (approximately 215 rooms) **Website:** https://www.discoveryworkstay.com.au/village/queensland/biloela **Address**: 1-31 Valentine Plains Road, Biloela
	Location: Biloela Apollo Motel **Accommodation Type:** Rooms, apartments and units	**Capacity:** Unknown **Website:** https://apollomotel.com.au/ **Address:** 36 Gladstone Rd, Biloela
	Location: Biloela Hotel **Accommodation Type:** Hotel	**Capacity:** Unknown **Website:** https://biloelahotel.com.au/ **Address:** 60 Callide St, Biloela
	Location: Biloela Centre Motel **Accommodation Type:** Motel	**Capacity:** Unknown **Website:** http://centre-motel.queenslandhotelmotel.com/en/ **Address:** 52 Grevillea St, Biloela
	Location: Biloela Country Motel **Accommodation Type:** Motel rooms and cabins	**Capacity:** Unknown **Website:** https://www.biloelacountryman.com.au/ **Address:** 75-83 Burnett Hwy, Biloela
	Location: Biloela Palms Motor Inn **Accommodation Type:** Motel	**Capacity:** 25 ground floor rooms to accommodate overnight travellers or longer stays, as well as corporate and group bookings. **Website:** https://www.biloelapalms.com.au/ **Address**: 69-71 Dawson Hwy, Biloela

Location	Short-Term Accommodation Provider	Description / Approximate Capacity
	Location: Biloela **Accommodation Type:** Two Airbnb's	**Capacity:** 2 and 4 people **Website:** N/A **Address:** N/A until booked
	Location: Callide Motor Inn **Accommodation Type:** Hotel	**Capacity:** Accommodation includes 18 executive rooms **Website:** https://www.callidemotorinn.au/ **Address:** 88-92 Callide St, Biloela
	Location: Hotel Settlers **Accommodation Type:** Hotel rooms, cabins	**Capacity:** Hotel features a wide range of rooms and cabins (number unknown) **Website:** https://www.hotelsettlers.com.au/ **Address:** 58 Dawson Hwy, Biloela
	Location: Raintree Motel Biloela **Accommodation Type:** Motel	**Capacity:** 22 units **Website:** https://www.raintreemotelbiloela.com.au/ **Address:** 2-4 Clark Dr, Biloela
	Location: Biloela Silo Motor Inn **Accommodation Type:** Motel	**Capacity:** 25 motel rooms **Website:** https://biloelasilomotorinn.com.au/ **Address:** 75 Dawson Hwy, Biloela
	Location: Sun Valley Motel **Accommodation Type:** Motel	**Capacity:** 28 rooms **Website:** http://sun-valley-motel.queenslandhotelmotel.com/en/ **Address:** 57-59 Dawson Highway, Biloela
	Location: The Haven Biloela **Accommodation Type:** Townhouses	**Capacity:** Executive self-contained serviced apartments (sleeps 5) **Website:** http://thehavenbiloela.com.au/ **Address:** 64 Kroombit St, Biloela

Location	Short-Term Accommodation Provider	Description / Approximate Capacity
Calliope (2 hours 10 mins from Theodore)	**Location:** Home Ground Villages (Calliope) **Accommodation Type:** Workforce accommodation facility	**Capacity:** 1392 rooms **Website:** https://www.homegroundvillages.com.au/accommodation-calliope/ **Address:** 101 Calliope River Road, Calliope
Banana (39 minutes from Theodore)	**Location:** Banana Hotel Motel **Accommodation Type:** Hotel	**Capacity:** 20 ensuite motel rooms **Website:** https://www.bananahotel.com.au/ **Address:** Dawson Highway, Banana
	Location: Banana Accommodation Village **Accommodation Type:** Workforce accommodation facility	**Capacity:** Unknown **Website:** https://bananaaccommodation.com/ **Address:** Lot 45 Barfield Road, Banana
Baralaba (1 hour 10 mins from Theodore)	**Location:** Baralaba Hotel **Accommodation Type:** Hotel	**Capacity:** Unknown **Website:** Unknown **Address:** 30 Stopford St, Baralaba QLD 4702
	Location: Myella Farm Stay **Accommodation Type:** Rural accommodation	**Capacity:** 17 double ensuite rooms **Website:** https://myella.weebly.com/ **Address:** 1591 Baralaba Rannes Rd, Kokotungo
Jambin (1 hour 10 from Theodore)	**Location:** Jambin Hotel **Accommodation Type:** Hotel	**Capacity:** Unknown **Website:** Unknown **Address:** Burnett Highway, Jambin
Thangool (1 hour 15 mins from Theodore)	**Location:** On Kariboe Cabins Apartment Thangool **Accommodation Type:** Rural apartments	**Capacity:** Unknown **Website:** http://on-kariboe.queenslandhotelmotel.com/en/ **Address:** 1 Parkers Lane, Thangool

Location	Short-Term Accommodation Provider	Description / Approximate Capacity
	Location: Hotel Thangool **Accommodation Type:** Hotel	**Capacity:** Unknown **Website:** Unknown **Address:** 55 Ramsay Rd, Thangool
Taroom (1 hour from Theodore)	**Location:** Taroom Caravan & Tourist Park **Accommodation Type:** Caravan Park	**Capacity:** Taroom Caravan Park offers a number of alternative accommodation types, including fully self-contained Cabins, Units and other accommodation to meet your specific requirements. **Website:** https://www.ozzyparks.com.au/locations/taroom-carvan-park/overview/ **Address:** 1 Short Street, Taroom
	Location: Country Rest Cabins **Accommodation Type:** Cabins	**Capacity:** Single, twin and family cabins (unknown capacity) **Website:** https://www.countryrestcabins.com.au/ **Address:** 23 Bridge Street, Taroom
	Location: Leichardt Hotel Motel **Accommodation Type:** Rural apartments/cabins	**Capacity:** 6 Standard rooms and 6 family rooms **Website:** https://leichhardttaroom.com.au/accommodation.html **Address:** Dawson Street, Taroom
	Location: Cattle Camp motel – Taroom **Accommodation Type:** Motel rooms and cabins	**Capacity:** Unknown (approximately 12 units) **Website:** https://bookings.centiumsoftware.com/QLD/Taroom/Cattle-Camp-Motel **Address:** 8 Taroom Street, Taroom
Theodore	**Location:** Hotel Theodore **Accommodation Type:** Suites, hotel and motel rooms, cabins	**Capacity:** 8 self-contained cabins, 11 ensuite motel rooms, 8 single suites **Website:** https://hoteltheodore.com.au/accommodation/ **Address:** 27 The Boulevard, Theodore

Location	Short-Term Accommodation Provider	Description / Approximate Capacity
Cracow (located 35 minutes from Theodore)	**Location:** Cracow Hotel **Accommodation Type:** Themed Hotel Rooms	**Capacity:** Unknown **Website:** Unknown **Address:** Third Ave and Tenth Ave, Cracow
	Location: Cracow Station **Accommodation Type:** Self-contained cabin at Cracow Station, a working cattle property, 10 minutes outside of Cracow	**Capacity:** One room **Website:** https://www.cracowstation.com/ **Address:** 1174 Cracow Sta, Cracow, Queensland
Moura (located 35 minutes from Theodore)	**Location:** Coal N Cattle Hotel Motel **Accommodation Type:** Motel rooms and cabins	**Capacity:** 60 rooms **Website:** http://coal-n-cattle-motel.queenslandhotelmotel.com/en/ **Address:** 63 Dawson Highway, Moura
	Location: Moura Meridian Motel **Accommodation Type:** Motel rooms	**Capacity:** 32 rooms **Website:** https://mourameridianmotel.com.au/ **Address:** 29 Dawson Highway, Moura
	Location: Moura Motel **Accommodation Type:** Motel rooms	**Capacity:** 22 deluxe rooms and 16 standard rooms **Website:** https://mouramotel.com.au/ **Address:** 65 Dawson Highway, Moura
	Location: Moura Accommodation Village & Caravan Park **Accommodation Type:** Rooms and cabins	**Capacity:** Unknown **Website:** https://mouraavcp.com.au/ **Address:** 95 Dawson Highway, Moura

5.1.1.1 FESTIVALS AND EVENTS

Table 5-4 presents the major festivals and events within the Primary AoI, as well as in Banana Shire LGA. The scale of the events and festivals is dependent on various factors occurring within the local area and wider region, however, they act as 'drawcards' for visitors and tourists within the Primary AoI.

The dates that the festivals and annual events occur is of importance when considering the short-term accommodation options identified previously in **Table 5-3**. In particular, if event timeframes overlap with construction periods the demand may outstrip the supply, impacting upon the ability for tourists or visitors to attend. Furthered assessment is provided in the Project SEIA in relation to this potential impact.

TABLE 5-4 MAJOR FESTIVALS AND ANNUAL EVENTS

Location	Event	Date (latest)	Details
Callide	Rotary Car, Ute and Bike Show	February 2023	Targeted to automobile admirers
Callide	Lake Callide Family Fishing Classic	October 2023	Family camping event at Lake Callide camping area
Callide	Callide Valley Agricultural Show	May 2024	Annual event, held at Biloela Showgrounds
Biloela	The Old Wheels in Motion Rally	July 2023	Targeted to automobile admirers
Biloela	Brigalow Arts Festival	Announced for October 2024	Annual open art exhibition, held at various locations
Biloela	Biloela Markets in the Park	Third Saturday of the month	Crafts market held near the Biloela Information Centre on Callide Street
Biloela	Biloela Auto Fest	Usually October, cancelled in 2023	Held at Biloela Showgrounds, organized by local Rotary. Unclear whether the event will resume in coming years
Biloela	Biloela Christmas Festival	Announced for November 2024	Held at Biloela Lions Park in late afternoon/early evening
Theodore	Bull's 'N' Barrels Bonanza	July 2024	Annual rodeo event held at Theodore Showgrounds
Theodore	Theodore Trail Ride	Announced for June 2025	Motorcycling dirt track event
Theodore	'Hooked on Theodore' Fishing Competition	October 2023	Weekend Fishing Competition at Dawson River
Theodore	Spindles and Spurs Campdraft	July 2024	Annual Campdraft event

Location	Event	Date (latest)	Details
Theodore	Theodore Centennial Celebration	July 2024	A series of events scheduled over 4 years, beginning in 2021 through to 2024

In addition to the various festivals within the region, there is the potential for other events within the Primary AoI to influence short-term accommodation availability. This includes the maintenance or "shut down" periods for the Callide Power Station. When these "shut down" events occur, they result in the temporary influx of workers to Biloela and surrounds for the period prior to, and during, the event. These events may last up to a few months, during which time the availability of accommodation in and around Biloela considerably diminishes.[6]

5.1.2 LONG-TERM ACCOMMODATION

Consideration of housing vacancy rates provide a window into the prospective long-term accommodation options available in the Primary AoI. SQM Research housing vacancy rate data draws on a combination of ABS data and online data from monitoring major property listing sites to provide a time-series analysis on a monthly and postcode scale (SQM Research 2024). SQM Research has tracked residential vacancy rates from 2006 through to 2024, on a postcode basis.

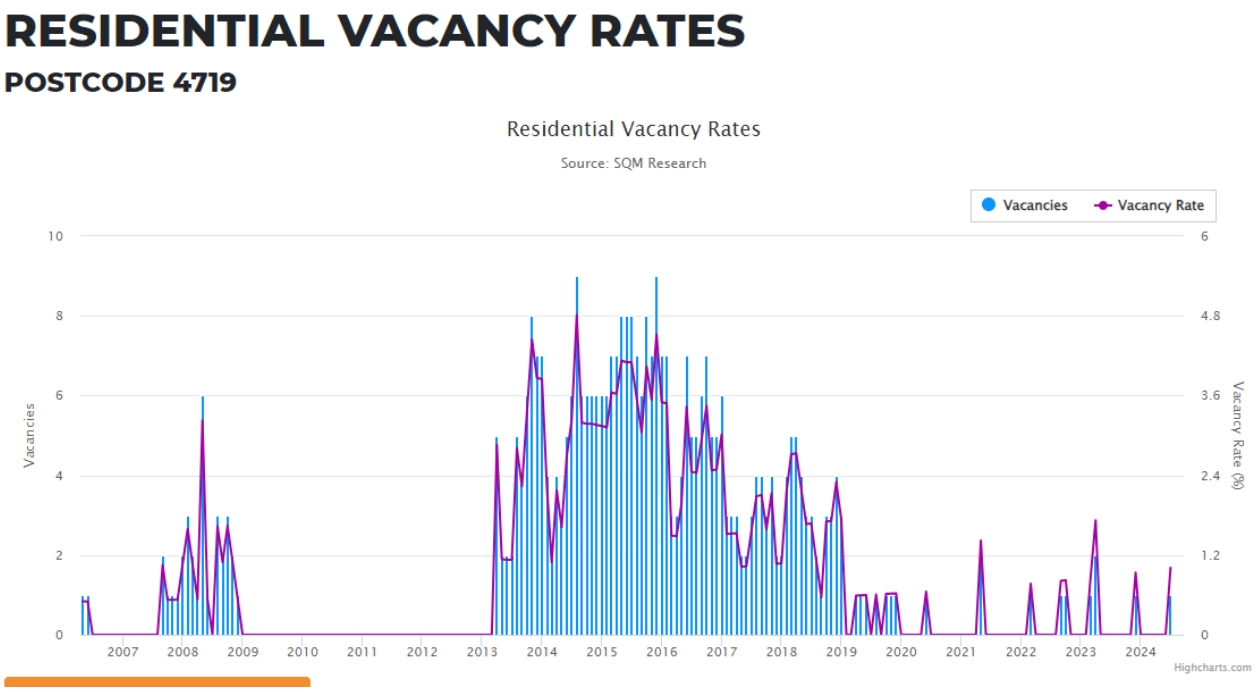
The postcodes of relevance to the Primary AoI for the Project area:

- Postcode 4719 (containing Theodore);
- Postcode 4718 (containing Moura); and
- Postcode 4715 (containing Biloela).

A review of housing vacancy data (SQM Research, 2024*a*) shows that postcode 4719 (containing Theodore) in August 2014 had the highest vacancy rate at 4.8%, while July 2024 showed the vacancy rate to be at 1.0% (refer to **Figure 5-1**). Postcode 4718 (containing Moura) had a peak vacancy rate of 16.2% in February 2016. By July 2024 the vacancy rate has dropped to 1.3% (refer to **Figure 5-2**) (SQM Research 2024*b*). Postcode 4715 (containing Biloela) had the highest vacancy rate in January 2017 at 7.5%, while July 2024 shows the vacancy rate to be at 0.0%.

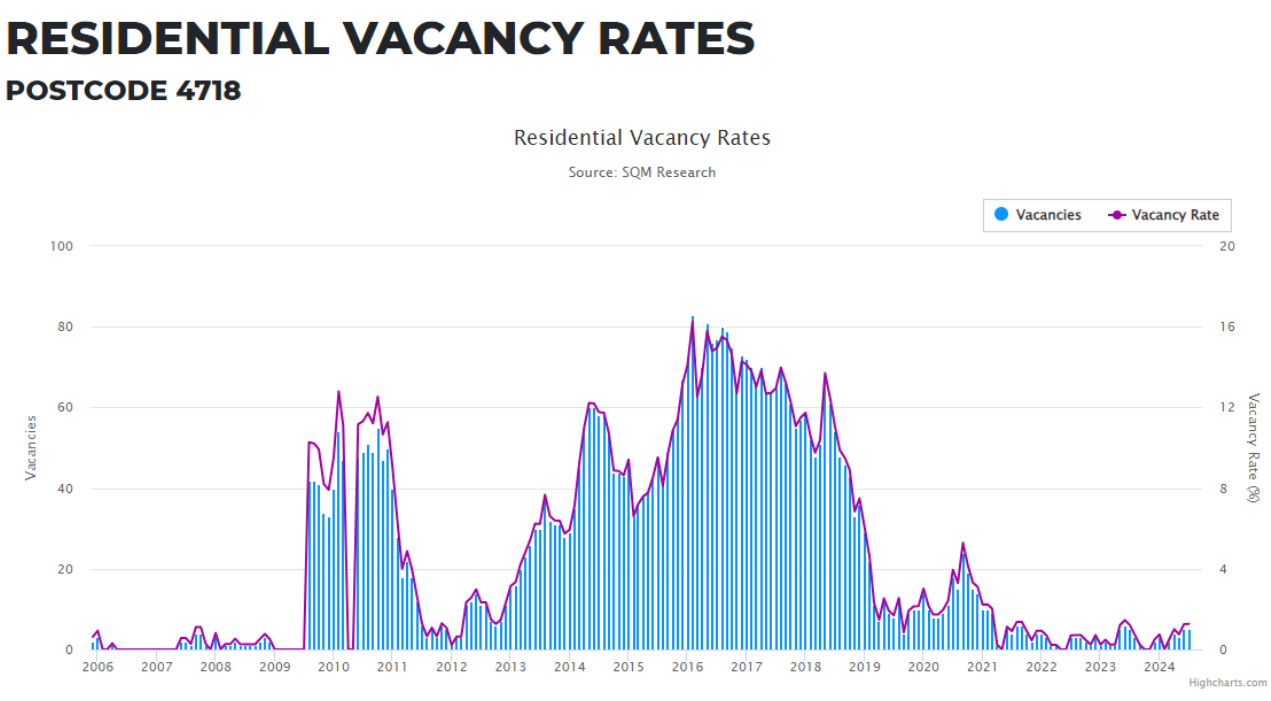
Regarding latest rental availability in the Primary AoI, at the time of writing in September 2024, Theodore (postcode 4719) had one rental property available, Moura (postcode 4718) had five rental properties available, and Biloela (postcode 4715) had no rental properties available.

[6] This information was confirmed through interviews with local authorities in 2022.



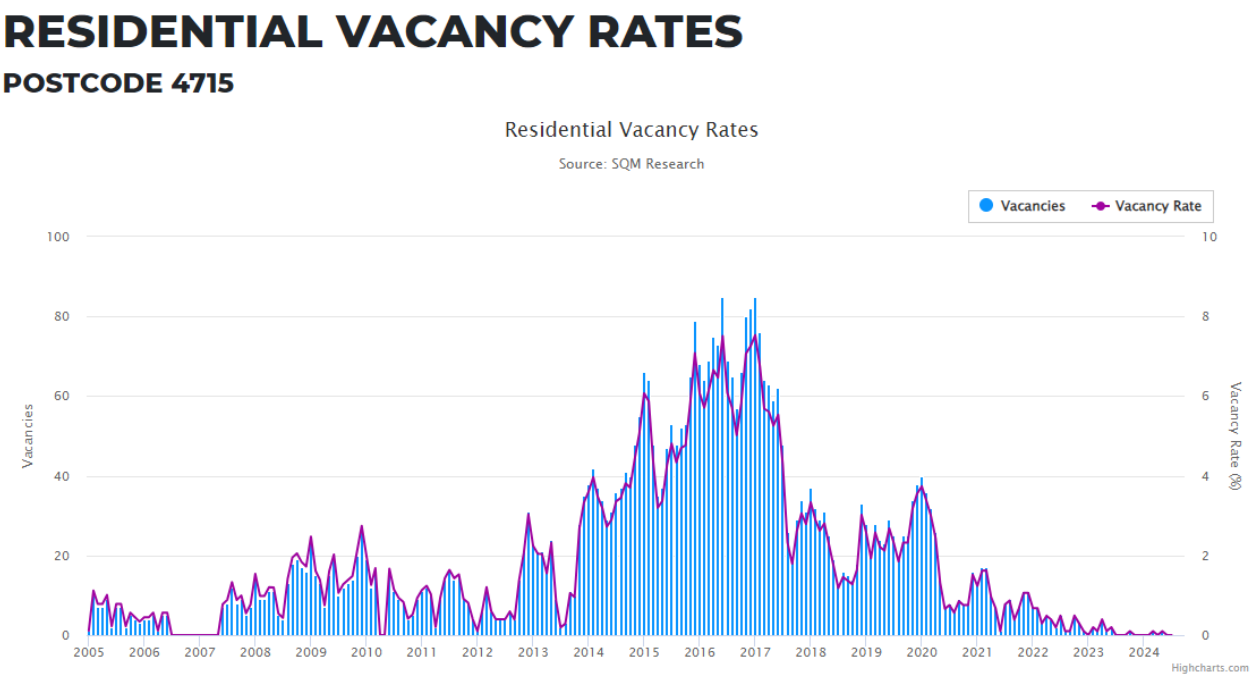
Source: SQM Research 2024*a*

FIGURE 5-1 THEODORE RESIDENTIAL VACANCY RATES



Source: SQM Research 2024*b*

FIGURE 5-2 MOURA RESIDENTIAL VACANCY RATES



Source: SQM Research 2024*c*

FIGURE 5-3 BILOELA RESIDENTIAL VACANCY RATES

At time of writing (September 2024), Moura Real Estate has a total of nine rental properties available, while Ray White Biloela has no rental property available. An overview of these listings is provided in **Table 5-5**. Based on this cursory review, it appears that there is a lack of potential rental properties available for rent within the Primary AoI. The other real estate companies mentioned in **Section 5.1** did not have any available accommodation at the time of writing.

TABLE 5-5 LONG-TERM RENTAL HOUSING AVAILABILITY

Location	Details
Moura	3 bedroom, one shower, one car, $350
Moura	3 bedroom, one shower, one car, $350
Moura	3 bedroom, one shower, two cars, $400
Moura	3 bedroom, one shower, two cars, $380
Moura	3 bedroom, one shower, one car, $400
Moura	3 bedroom, one shower, three cars, $390
Moura	3 bedroom, one shower, two cars, $320
Moura	3 bedroom, one shower, four cars, $410
Moura	2 bedroom, one shower, five cars, $439

With respect to the affordability of any rental properties that are on the market, SGS in partnership with National Shelter, Beyond Bank, and Brotherhood of St Laurence have published the Rental Affordability Index (RAI) since 2015 (SGS, 2024). The findings identify that in Quarter 2, 2023 the data for the towns of Theodore, Moura and Biloela within the Banana Shire LGA were unavailable. However, the two closest postcodes in Quarter 2, 2023 were identified as 'Acceptable' for rental affordability (postcode 4680) and 'Unaffordable' for rental affordability (postcode 4702).

5.2 COMMUTING ON LOCAL ROADS

The CSEP (2024) notes a range of matters of importance to them and/or the local community. Of importance, one key matter raised was the road network. The detail in the CSEP (2024) includes the following:

> *Work is underway on a transport route study which will investigate and identify appropriate routes to site for wind farm components. Oversize vehicles will be required for blades, towers and transformers. In parallel, a traffic impact assessment is also underway to ascertain traffic flows during construction and the impact this will have on the road network. TED will work with the community to manage traffic impacts and gain local knowledge on existing road usage, including – for example – school bus routes, if the project proceeds to construction.*

The key main roads in proximity to the Project, and relevant to this AOR as they will most likely be used as routes for commuting from and to the Project Area, are the following:

- **State Highway A5 (Leichhardt Highway):** a major transport route and State-controlled Road (i.e. managed by the Queensland Government) in Queensland. Of key importance to this AOR is its section of the Leichhardt Highway that runs between Theodore and Banana; and
- **State Route 60 (Dawson Highway):** a rural highway and (partially) State-controlled Road that connects Emerald with Gladstone. The route of the Dawson Highway passes through several small towns, rural areas, and bushland, with some sections of the route quite isolated. Of key importance to this AOR is the section of the highway that runs from Moura, through Banana and Biloela, to Gladstone.

The Queensland Road Crash Location data provided in **Table 5-6** shows that on these two highways within the areas defined as relevant to the AOR, one fatal accident and 83 non-fatal accidents (with at least one hospitalised person) occurred between 2018 and May 2023. Of these accidents, 76 (including the fatal accident) happened on the Dawson Highway, and eight on the Leichhardt Highway.

TABLE 5-6: CRASHES ALONG RELEVANT SECTIONS OF A5 AND STATE ROUTE 60

Crash Type	Year	Crash Reference Number	Road	Postcode
Fatal	2022	242422	Dawson Highway	4680
Hospitalised	2018	241612	Dawson Highway	4715
Hospitalised	2018	241618	Dawson Highway	4715
Hospitalised	2018	246367	Dawson Highway	4680

Crash Type	Year	Crash Reference Number	Road	Postcode
Hospitalised	2018	246374	Dawson Highway	4680
Hospitalised	2018	246381	Dawson Highway	4680
Hospitalised	2018	247972	Dawson Highway	4718
Hospitalised	2018	254377	Dawson Highway	4702
Hospitalised	2018	325906	Dawson Highway	4680
Hospitalised	2018	325908	Dawson Highway	4680
Hospitalised	2018	325909	Dawson Highway	4680
Hospitalised	2018	325933	Dawson Highway	4680
Hospitalised	2018	325935	Dawson Highway	4680
Hospitalised	2018	325938	Dawson Highway	4680
Hospitalised	2018	34305	Dawson Highway	4715
Hospitalised	2018	343053	Dawson Highway	4715
Hospitalised	2018	344957	Dawson Highway	4702
Hospitalised	2018	344958	Dawson Highway	4702
Hospitalised	2018	344961	Dawson Highway	4702
Hospitalised	2018	344963	Dawson Highway	4718
Hospitalised	2019	247978	Leichhardt Highway	4702
Hospitalised	2019	247980	Leichhardt Highway	4702
Hospitalised	2019	241623	Dawson Highway	4715
Hospitalised	2019	241634	Dawson Highway	4715
Hospitalised	2019	241639	Dawson Highway	4715
Hospitalised	2019	242381	Dawson Highway	4680
Hospitalised	2019	242382	Dawson Highway	4680
Hospitalised	2019	242383	Dawson Highway	4680
Hospitalised	2019	242383	Dawson Highway	4718
Hospitalised	2019	325968	Dawson Highway	4680
Hospitalised	2019	325983	Dawson Highway	4680
Hospitalised	2019	325993	Dawson Highway	4680
Hospitalised	2019	343057	Dawson Highway	4715
Hospitalised	2019	344967	Dawson Highway	4702
Hospitalised	2019	344965	Dawson Highway	4718
Hospitalised	2020	247985	Leichhardt Highway	4702
Hospitalised	2020	247986	Leichhardt Highway	4702
Hospitalised	2020	247987	Leichhardt Highway	4702
Hospitalised	2020	247988	Leichhardt Highway	4702
Hospitalised	2020	254944	Leichhardt Highway	4719
Hospitalised	2020	241655	Dawson Highway	4715

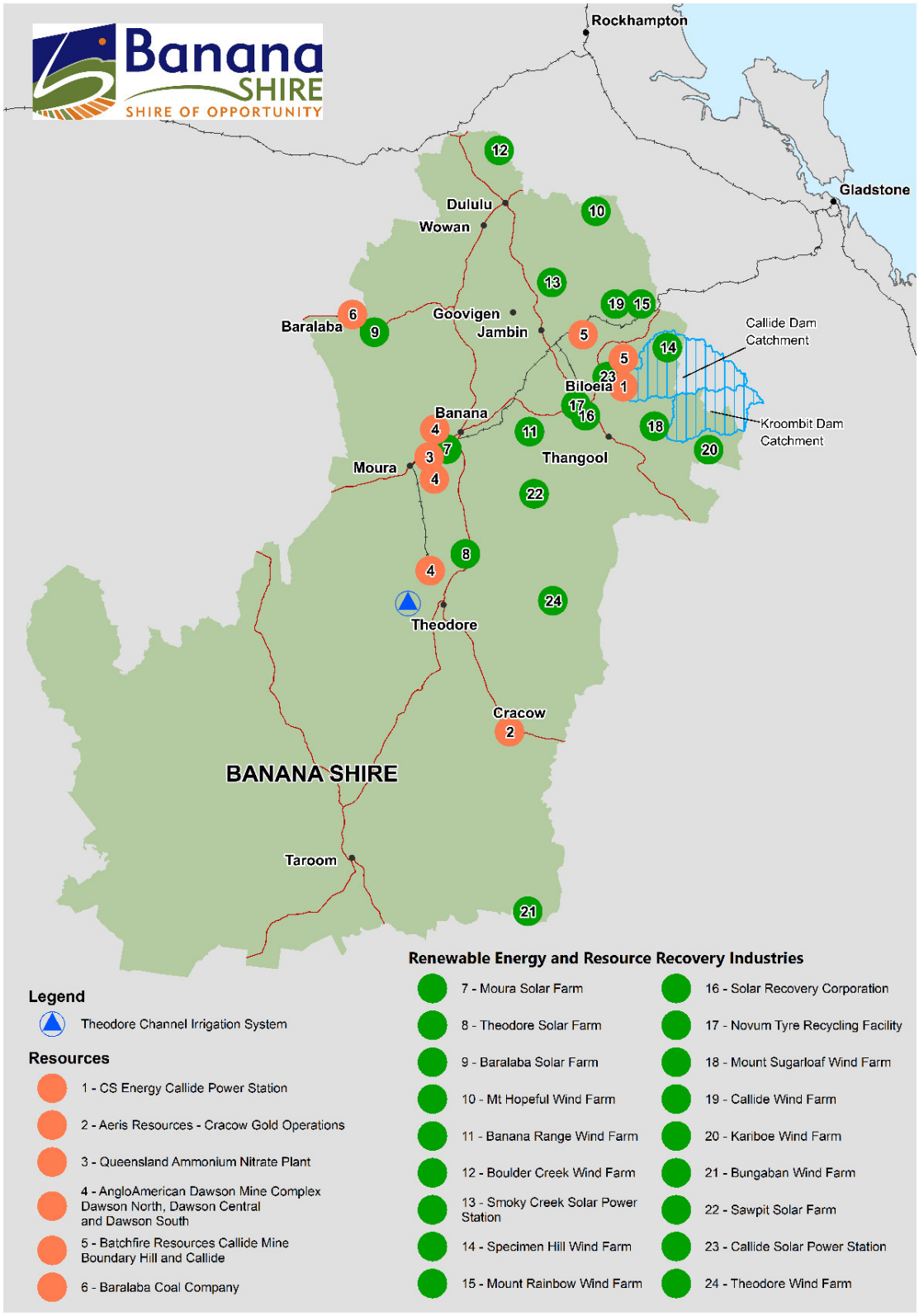
Crash Type	Year	Crash Reference Number	Road	Postcode
Hospitalised	2020	241657	Dawson Highway	4715
Hospitalised	2020	242401	Dawson Highway	4680
Hospitalised	2020	242404	Dawson Highway	4680
Hospitalised	2020	247983	Dawson Highway	4718
Hospitalised	2020	343059	Dawson Highway	4715
Hospitalised	2020	343061	Dawson Highway	4715
Hospitalised	2020	241648	Dawson Highway	4702
Hospitalised	2020	247984	Dawson Highway	4702
Hospitalised	2020	247990	Dawson Highway	4702
Hospitalised	2020	344970	Dawson Highway	4718
Hospitalised	2020	361177	Dawson Highway	4680
Hospitalised	2020	361211	Dawson Highway	4680
Hospitalised	2020	361213	Dawson Highway	4680
Hospitalised	2020	361224	Dawson Highway	4680
Hospitalised	2021	247995	Leichhardt Highway	4702
Hospitalised	2021	241660	Dawson Highway	4715
Hospitalised	2021	241673	Dawson Highway	4715
Hospitalised	2021	242414	Dawson Highway	4680
Hospitalised	2021	242415	Dawson Highway	4680
Hospitalised	2021	242416	Dawson Highway	4680
Hospitalised	2021	242417	Dawson Highway	4680
Hospitalised	2021	345318	Dawson Highway	4680
Hospitalised	2021	345326	Dawson Highway	4680
Hospitalised	2021	345332	Dawson Highway	4680
Hospitalised	2021	345335	Dawson Highway	4680
Hospitalised	2021	345353	Dawson Highway	4680
Hospitalised	2021	345359	Dawson Highway	4680
Hospitalised	2021	361232	Dawson Highway	4680
Hospitalised	2021	361236	Dawson Highway	4680
Hospitalised	2022	241679	Dawson Highway	4715
Hospitalised	2022	241682	Dawson Highway	4715
Hospitalised	2022	241683	Dawson Highway	4715
Hospitalised	2022	241684	Dawson Highway	4715
Hospitalised	2022	242429	Dawson Highway	4680
Hospitalised	2022	242434	Dawson Highway	4680
Hospitalised	2022	248002	Dawson Highway	4718
Hospitalised	2022	248004	Dawson Highway	4718

Crash Type	Year	Crash Reference Number	Road	Postcode
Hospitalised	2022	344976	Dawson Highway	4702
Hospitalised	2022	344978	Dawson Highway	4718
Hospitalised	2022	345367	Dawson Highway	4680
Hospitalised	2022	345395	Dawson Highway	4680
Hospitalised	2022	345400	Dawson Highway	4680
Hospitalised	2022	345432	Dawson Highway	4680

Source: Queensland Government Open Data Portal, Road Crash Locations, 2023

5.3 OTHER DEVELOPMENTS IN THE AREA

There are six resource and 17 renewable energy and resource recovery industries projects located in the vicinity of the Project within the Banana Shire LGA that have been identified as larger scale on the Banana Shire Council website (Banana Shire 2024*b*). These projects are depicted in **Figure 5-4**.



Source: Banana Shire 2024*b*

FIGURE 5-4 SURROUNDING RENEWABLE ENERGY PROJECTS IN BANANA LGA

Additionally, Queensland's eight coal-fired power stations are dotted across the southern corner of the state, from Rockhampton to the west of Toowoomba. The closest power stations to the Project include Callide B, Callide C, and Gladstone (closure date: 2023). Callide B and C subcritical power stations, close to Biloela, are owned by CS Energy, on behalf of the state government. Callide B was commissioned in 1988, and Callide C in 2001. The 740-megawatt Callide B is scheduled to close in 2028, and a closure date for the 840-megawatt Callide C has not yet been submitted. Both stations are fed by the nearby Callide Mine (ABC News 2023).

It should be noted that while the North Burnett Regional LGA is located to the east of the Project Area, and includes SA1 No. 31902150815, which is included within the Primary AoI of the Project (refer to the SEIA for further details), no (anticipated) developments within a radius of approximately 40 km from the Project Area were identified on the North Burnett Regional Council website.

5.3.1 OTHER DEVELOPMENTS' ACCOMMODATION REQUIREMENTS

In order to understand the additional pressure these prospective renewable and non-renewable projects can have on the communities, infrastructure and accommodation options available in the Primary AoI, understanding the likely construction period, approximate number of workers, and distance from the Project is key.

Accordingly, **Table 5-7** identifies this information, highlighting those which are located in the immediate vicinity of the Project and/or will overlap with the Project's construction phase.

TABLE 5-7 DEVELOPMENTS IN THE AREA

Development	**Development Details[7]**				**Approximate Distance from Project[8]**
	Anticipated Construction Period	***Approx. # of workers***	***Anticipated Start of Operation***	***Approx. # of workers***	
Renewable					
Specimen Hill Wind Farm	Q4 2023 – Q3 2026	250-350	After Q3 2026	15-30	69 km
Moura Solar Farm	Nov 2021 – Aug 2022	250	After Aug 2022	4	32 km
Theodore Solar Farm	Pending	Pending	Pending	Pending	12 km
Baralaba Solar Farm	Pending	Pending	Pending	Pending	72 km
Mount Hopeful Wind Farm	Q1/Q2 2024 – 2026	220+	After 2026	8-12	102 km

[7] Green = (partial) known overlap with Project's anticipated construction timeline (Quarter 2, 2026 – Quarter 4, 2027).
[8] Green = (partial) known overlap with Project's anticipated construction timeline AND within a radius of approximately 40 km from Project Area's boundary.

Development	Development Details[7]				Approximate Distance from Project[8]
	Anticipated Construction Period	***Approx. # of workers***	***Anticipated Start of Operation***	***Approx. # of workers***	
Banana Range Wind Farm	2024 - 2027	150-200	After 2027	10-15	30 km
Boulder Creek Wind Farm	Q1 2024 - 2026	250-350	After 2026	10-20	113 km
Smoky Creek Solar Power Station	Q1 2024 – Q3 2025	350	After Q3 2025	10	74 km
Mount Rainbow Wind Farm	Q4 2025 - Q2 2027	200-450	After Q2 2027	15	75 km
Calvale BESS Wind Farm	Unknown	Unknown	Unknown	Unknown	Unknown
Mount Sugarloaf Wind Farm (Thangool)	Dec 2026 – June 2029	250 – 500	After June 2029	15	35 km
Callide Wind Farm	Q1 2025- Q4 2026	280	After Q4 2026	30	73 km
Kariboe Wind Farm	Pending	400	Pending	40	55 km
Sawpit Solar Farm	2025 – 2026/2027	Pending	After 2026/2027	Pending	24 km
Solar Recovery Corporation	Unknown	Unknown	Unknown	Unknown	Unknown
Novum Tyre Recycling Facility	Completed	Unknown	After 2020	11-15	50 km
Bungaban Wind Farm	Q4 2025 - 2029	600 at peak	After 2029	10-15	70 km
Callide Solar Power Station	FY 2025/2026-FY 2027/2028	250	After 2028	6-10	64 km
Non-renewable					
CS Energy Callide Power Station	n/a	n/a	B = since 1988 (close in 2028) C = since 2001	246	87 km
Aeris Resources – Cracow Gold Operations	n/a	n/a	Since 2005	*	44 km

Development	Development Details[7]				Approximate Distance from Project[8]
	Anticipated Construction Period	***Approx. # of workers***	***Anticipated Start of Operation***	***Approx. # of workers***	
Queensland Ammonium Nitrate Plant	n/a	n/a	*	75	38 km
Batchfire Resources Callide Mine Boundary Hill and Callide	n/a	n/a	Since 1944	700 (includes all aspects of the mine)	92 km
Baralaba Coal Company	n/a	n/a	*	*	90 km
AngloAmerican Dawson Mine Complex	n/a	n/a	Since 1960s	660 *as of 2021 statement	36 km

**Information unavailable or limited for public consumption.*

As per **Table 5-7**, the following developments have a (partial) known overlap with Project's anticipated construction timeline, and are located within a radius of approximately 40 km from the Project:

- Banana Range Wind Farm;
- Mount Sugarloaf Wind Farm (Thangool);
- Sawpit Solar Farm; and
- AngloAmerican Dawson Mine Complex.

Accordingly, it is important that the potential cumulative impact associated with these projects is considered as part of the Key Matters Assessment in **Section 7**. It should be noted that it is currently unknown whether these developments will make use of an on-site workforce accommodation facility.

6. COMMUNITY AND STAKEHOLDER ENGAGEMENT

TED commenced stakeholder engagement for the Project in August 2023. This section summarises the engagement activities relevant to the AOR, and their associated engagement outcomes.

6.1 OVERVIEW OF ENGAGEMENT ACTIVITIES CONDUCTED

A variety of consultation activities have been carried out for the Project to-date. Stakeholder engagement undertaken by TED has included Project feedback from local residents, local Councils, and the wider community, helping to determine the sentiment of those likely to be impacted by the Project.

Stakeholder engagement undertaken by TED to-date, has included:

- Meetings with landowners, near neighbours, the community and other interested parties;
- Meetings with and site visits by Traditional Owners;
- Letterbox drops to all homes within 10 kilometres (km) of the project;
- A newsletter to introduce the project and TED to the community;
- Community drop-in sessions attended by about 90 community and other key stakeholders;
- Formal presentations to Banana Shire Council;
- Regular 'shopfronts' at the Theodore Community Hall for two consecutive days; and
- A dedicated website that includes project information, news, updates and engagement opportunities.

The Community Engagement Drop-In Sessions were conducted in the towns of Theodore and Banana, with a turnout of approximately 90 attendees. The key takeaways and feedback from the sessions included the following:

- TED is to remain as the primary point of contact for stakeholders;
- One-on-one meetings to determine the most appropriate grid route connection will be essential;

Actions arising from the Community Engagement Drop-In Sessions included the following:

- TED to investigate a 'shopfront' to foster local relationships;
- The potential for TED to sponsor local events was highly desired by the community; and
- Future Community Engagement Sessions are to be conducted to foster community feedback.

The CSEP (2024) notes that previous stakeholder engagement identified workforce accommodation during the construction phase of the Project as an area of concern, stating:

> *Workforce accommodation during construction, and the impact on the local housing market, has been identified as a key concern. This is a particular topic of interest for the Theodore district community due to the significant number of mining camps and fly-in fly-out (FIFO) workers in the area. RWE will work with Council and seek feedback from community on the potential ways to accommodate a workforce of up to 500 people at peak construction periods.*

6.2 COUNCIL CONSULTATION

TED have been undertaking regular briefing sessions for the Project with the Banana Shire Council since 2023. The briefing sessions centred on the Project location and outlined consultation undertaken to-date, and generally considered the following:

- Community input/benefit will be discussed with the local community in order to understand how a Community Benefit Fund would be most useful;
- TED is committed to seeking employment within the region where possible;
- Potential jobs generated during construction; and
- Potential jobs generated during operation.

6.3 FUTURE ENGAGEMENT

The Stakeholder Engagement Tools (SET) set out in **Table 6-1** has been developed as part of TED's commitment to genuine dialogue with stakeholders and will be employed as part of ongoing engagement with the community for the Project, including when engaging with the local community in relation to workforce accommodation opportunities and/or impacts.

TABLE 6-1 ENGAGEMENT TOOLS

Engagement Tool	Objective
Personal phone calls	• Personal phone calls will be a significant aspect of stakeholder engagement, particularly with those stakeholder groups most interested in a project. Direct phone calls are a deliberative engagement tool to facilitate immediate and direct conversations.
Meetings	• Personal meetings with individuals and sometimes groups will be a key avenue of personalised engagement. These may be one-on-one meetings with landowners or near neighbours, or meetings with a local community groups. Meetings provide an opportunity to educate, inform, and listen to issues and concerns.
Emails/letters	• Emails and letters will be used to provide notification of important information, such as works, surveys or other activities, or provide stakeholder-specific information and engagement.
Briefings	• Briefings will take place as and when required with representatives of stakeholder groups including local Councillors and Council executives, Members of Parliament and government departments. Briefings allow stakeholders to stay informed about a project's progress.
Door knocks	• Door knocks can be used to speak personally with neighbours within a pre-determined distance band of the Project. Direct outreach allows community members to engage and interact in their own environment.
Letterbox drops	• Letterbox drops provide the opportunity to directly contact residents and/or ratepayers within a certain geographical boundary depending on the delivery method employed. Letterbox drops can be used to distribute newsletters, flyers, FAQs, and other project information.
Shopfront (permanent or 'pop up')	• A shopfront in a project area can take on a variety of forms. It can be a fixed space that is open one or multiple days per fortnight. Another option is a temporary 'pop up' venue which could include a stall in a public space such as a Council office, shopping centre or public library. This option is usually more informal and may occur as a one-off or for shorter periods.

Engagement Tool	Objective
Drop-in sessions/ pop-ups	• Drop-in sessions provide an opportunity for stakeholders to meet with members of the Project team and Subject Matter Experts (SMEs) about the Project. Drop-in sessions are advertised in the local community and generally held over multiple days (often two consecutive days) in a local hall or halls. These drop-in sessions do not have a formal structure, but usually incorporate project poster and fact sheets, industry materials, and catering. Subject materials should be selected in response to the community's interests.
Attendance at community events	• This may include information stands at agricultural shows, sporting, and other events, providing a platform for community members to ask questions and provide feedback.
Workshops	• Workshops can create a space for stakeholders to discuss any questions or concerns with the Project team and/or SMEs, as well as positively contribute to the development of the Project by brainstorming ideas and community-led problem solving.
Focus groups	• Create an opportunity for key stakeholders, selected by the Project team, the project team, to provide detailed community feedback in a group setting, as well as raise project-related concerns, considerations, or issues with the TED team and/or SMEs.
Free call 1800 number	• A free call 1800 number, 1800 879 435, has been established for the Project.
Electronic direct mail (EDMs)	• EDMs will be an important part of communications and could be used to share information such as newsletters, flyers, invitations to upcoming events, fact sheets and more. A sign-up list will be made available on the Project website and at community events.
SMS notifications	• SMS notifications can be used for time critical notifications, such as works and deadlines for public submissions.
RWE website	• The RWE Renewables Australia Pty Ltd (RWE) website is live and can be found at www.au.rwe.com. This site contains information about RWE globally, RWE Renewables Australia and Australian projects, as well as links to Project-specific sites.
Project website	• A Project website has been established at theodorewindfarm.com.au and will be regularly updated to provide more information, as well as digital versions of Project collateral. The website URL is included on printed and digital collateral.
Media releases and advertisements	• Media releases will be prepared and shared with media outlets based on communications objectives throughout the Project timeline. Advertisements will be booked when required.
Project email address	• A Project-specific email address, theodorewindfarm@rwe.com has been created and will be used as a central point of obtaining community feedback.
Newsletters	• Project newsletters should be developed and distributed regularly. These should provide Project updates and be posted to all landowners within a pre-determined Project radius (suggested to be 10 kilometres from the Project boundary). They can also be delivered electronically.

Engagement Tool	Objective
Flyers	• Flyers can be used to promote information sessions or events. Flyers can reach community members who may not have access to digital communications or online platforms.
Information packs	• Information packs can include a combination of Project collateral, such as newsletters, fact sheets, maps, information on upcoming events, photo montages, independent third-party studies and more. These can be tailored to the specific needs of the community or individual stakeholders and can include information on topics of particular focus for the Project community. These could be posted to individuals as required or left at key locations, such as Council offices.
Surveys	• Surveys are a useful data collection tool to understand community issues, needs and preferences. Surveys can help gauge public opinion on a variety of topics, including framing of benefit sharing initiatives, the Project, and renewable energy in general.

Source: CSEP 2024

In addition, TED has committed to the following stakeholder engagement initiatives:

- **Community Engagement Committee (CEC):** It is TED's intention to establish a CEC, assuming there is interest from Theodore and surrounding communities to do so. The CEC's purpose would be to capture the voice and sentiments of the community, to help to inform the Project, and direct how TED engages with the community as well as the content of such engagement. The CEC will provide a tool to share information with the community and to build a sense of trust. It is anticipated the CEC would be established in 2025 and run beyond the Planning Phase, into construction, operations and potentially decommissioning.
- **Community Benefit Fund:** Development of a Community Benefit Fund of at least $500,000 per year ($17.5 million over the operation life of the Project).
- **Complaints Management:** Development and implementation of a Theodore Wind Farm Complaints and Grievance Management System (in accordance with the Australian Standard AS/NZS 10002:2014 – Guidelines for Complaint Management in Organisations). The TED Complaints Handling Procedure will ensure that complaints are dealt with in a timely and effective manner, and includes the below:
  - Stage One: Receiving
  - Stage Two: Responding
  - Stage Three: Managing
  - Stage Four: Closing, and
  - Stage Five: Continuous Improvement

  All instances are recorded within TED's internal SET, with the intent to archive, allocate, monitor, action, resolve, close and analyse all relevant enquiries. TED aims to resolve complaints within 10 working days. If this is not possible TED commits to continued engagement with the stakeholder.

7. KEY MATTERS ASSESSMENT

7.1 ASSESSMENT REFERENCE FRAMEWORK

As outlined in **Section 3.2**, the Project will employ a combination of local and non-local workers during its construction, operation and decommissioning phases, with the largest volume of workers employed during the construction phase (an estimated 300-500 FTEs). The potential to accommodate the non-local construction phase workers within the Primary AoI therefore forms the basis of the key matters assessment undertaken in this section.

Whilst there are a range of social impacts than may be experienced by local communities associated with a temporary worker influx into the Primary AoI, the significance of these impacts is dependent upon the size of the workforce, the extent to which accommodation demand exceeds the level of occupancy for existing accommodation, the movement of that workforce to and from the Project Area, and the pressure placed on infrastructure, services, and facilities. As such, the nature and location of the accommodation used to house workers is of vital importance to understanding the social impacts that may be experienced by the local communities within the Primary AoI.

In determining the most appropriate accommodation solution for the construction phase workforce, TED has adopted the following Accommodation Solution Principles:

1. Accommodation solutions are to minimise negative social and economic impacts to potentially impacted communities.
2. Potentially impacted communities are to be consulted on accommodation solutions prior to them being decided.
3. Accommodation solutions will contribute social and economic value to potentially impacted communities.

In order to meet the above principles and address the draft Planning Guidance 'Supporting Action' requirements (refer to **Table 2-1**), this section of the AOR provides an assessment of the potential social impacts related to worker influx during the construction phase, in the context of the various accommodation options available to TED – on-site workforce accommodation; short-term accommodation; and long-term housing stock.

The assessment has been conducted with reference to the key matters as outlined in the Queensland SIA Guideline (Queensland Government 2018), comprising:

- Workforce Management (refer to **Section 7.3**);
- Housing and Accommodation (refer to **Section 7.4**);
- Local Business and Industry Procurement (refer to **Section 7.5**); and
- Health and Community Wellbeing (refer to **Section 7.6**).

The impact assessment methodology used in this key matters assessment aligns with that of the SEIA for the Project and is outlined in **Section 7.2**.

In addition, it should be noted that the key matter for Community and Stakeholder Engagement has already been considered in **Section 6** of this AOR.

7.2 ASSESSMENT METHODOLOGY

This section describes how the level of significance of impacts were determined, and how they relate to the key matters assessed.

The social impacts were analysed to determine their level of significance based on the likelihood of an impact occurring, and the magnitude of impact, both positive and negative, and prior to the application of any mitigation or management measures.

The likelihood level refers to the probability of a social impact occurring as a result of the Project, while the magnitude is considered as a combination of the following characteristics:

- **Extent:** Who specifically is expected to be affected (directly, indirectly, and/or cumulatively), including any potential vulnerable people[9]? Which location(s) are affected (e.g. local, regional)?
- **Duration:** When is the social impact expected to occur? Will it be time-limited (e.g. over particular Project phases) or permanent?
- **Severity:** What is the likely scale or degree of change (e.g. mild, moderate, severe)?
- **Intensity:** How sensitive or vulnerable (or how adaptable or resilient) are affected people to the impact? How important are positive impacts to them? This might depend on the value they attach to the matter, whether it is rare or unique or replaceable, the extent to which it is tied to their identity, and their capacity to cope with or adapt to change.
- **Level of Concern or Interest:** How concerned or interested are people? Any perceived impacts are considered as impacts for this assessment, even when concerns may be disproportionate to findings from technical assessments of likelihood, duration and/or severity.

Baseline indicators were then used inform an understanding of the social impacts across five magnitude characteristics:

- **Transformational:** Substantial change experienced in community wellbeing, livelihood, infrastructure, services, health, and/or heritage values; permanent displacement or addition of at least 20% of a community.
- **Major:** Substantial deterioration or improvement to something that people value highly (e.g. their house or their health), either lasting for an indefinite time, or affecting many people in a widespread area.
- **Moderate:** Noticeable deterioration or improvement to something that people value highly, either lasting for an extensive time, or affecting a group of people.
- **Minor:** Mild deterioration or improvement, for a reasonably short time, for a small number of people who are generally adaptable and not vulnerable.
- **Minimal:** Little noticeable change experienced by people in the AoI.

[9] This may include people on low incomes; people living with disabilities, chronic medical conditions or in poor health requiring access to services; culturally and linguistically diverse communities; people who are homeless or in insecure housing; people who are unable to represent themselves; or other vulnerable people such as elderly people, children or single-parent households (Department of Planning, Housing and Infrastructure 2023)

The likelihood of an impact occurring along with its magnitude of impact combine to provide a rating of social impact significance, as described in **Table 7-1.**

Where a positive social impact is identified, it is designated as 'positive', despite the varying likelihood levels.

TABLE 7-1 SOCIAL IMPACT SIGNIFICANCE MATRIX

		Magnitude Level					
		1 Minimal	**2** Minor	**3** Moderate	**4** Major	**5** Transformational	**6** Positive
Likelihood Level	**A** Almost Certain	Medium	Medium	High	Very High	Very High	Positive
	B Likely	Low	Medium	High	High	Very High	
	C Possible	Low	Medium	Medium	High	High	
	D Unlikely	Low	Low	Medium	Medium	High	
	E Very Unlikely	Low	Low	Low	Medium	Medium	

7.3 WORKFORCE MANAGEMENT

The workforce management key matter relates to assessment and management of potential social impacts associated with the Project workforce, with the objective being to prioritise local recruitment, reduce FIFO workers, and support workforce health and wellbeing. The Project workforce includes employees of the Project, as well as personnel engaged by principal contractors and subcontractors.

Potential workforce management impacts relevant to population influx and accommodation may include:

- Increased demand for labour creates direct and indirect employment opportunities for the local community.
- Reduced community cohesion as a result of the potential ill-discipline of the construction workforce.
- Risk of traffic-related injury, or in the worst case a fatality, to workers or members of the local community, resulting from increased vehicle movements during the transportation of workers to and from the Project Area.

An assessment of these potential impacts relevant to the three accommodation options is provided in the following sections.

Regardless of the accommodation option, the following measures are recommended to be implemented by TED in relation to the workforce management key matter:

- Preparation and implementation of a **Workforce Management Plan**, developed in accordance with the Queensland SIA Guideline, and outlines:
  - Objectives and key performance indicators relevant to the workforce;
  - Shift arrangements for local, regional and FIFO/Drive-In Drive-Out (DIDO) workers;
  - Measures to enhance potential employment opportunities for local and regional communities, and to mitigate potential negative social impacts;

- Provisions to achieve a recruitment hierarchy that prioritises communities, as well as recruitment of workers from the local and regional communities, then recruitment of workers who will live in regional communities;
- Training and development initiatives to improve local and regional skills and capacity including, where relevant, initiatives for traditionally underrepresented groups; and
- Programs to support the physical and mental health and wellbeing of workers.

- Preparation and implementation of a **Code of Conduct** (CoC) applicable to all Project workers during the construction phase. The CoC will be required to align with TED's policies, and should include, amongst other things:
  - Principles of behaviour: Guideline for appropriate behaviour that apply to interactions of all workers whether at work or out of work.
  - Anti-harassment, bullying and discrimination: Sets out the provisions for appropriate conduct, and outlines potential consequences of breech to these provisions.
  - Occupational health and safety: Requires that all workers understand their obligations to comply with the relevant TED occupational health and safety procedures and legislative requirements.

7.3.1 ON-SITE WORKFORCE ACCOMMODATION OPTION

Key Project benefits perceived by the local community include local jobs, related training opportunities, and local economic benefits more generally (e.g. for local shops). TED anticipates that there will be 300 to 500 jobs created for the Project during the construction phase, with TED looking to provide opportunities to recruit workers locally within the Primary AoI and Secondary AoI for the Project. The use of an on-site workforce accommodation facility will be of greater importance for the Project if the number of FIFO/DIDO workers are to be greater than the number of employees recruited locally.

In addition, if TED was to develop an on-site workforce accommodation facility, the construction of the facility would necessitate the employment of a number of skilled and semi-skilled workers, in addition to those already employed for the construction of the wind farm. As with the general Project workforce, it is anticipated that TED would seek to provide opportunities to local workers in first instance, which will have a positive impact on the economy of the Primary AoI and Secondary AoI.

If an on-site workforce accommodation facility was to be used for the Project, most non-local workers would be housed away from the local communities within the AoI – Theodore, Moura, Banana, and Biloela. Locating workers away from the local township areas will reduce the contact between non-local workers and local communities, and thereby reduce the potential for negative impacts to be experienced by locals from inappropriate worker behaviour, and subsequently help to reduce the impact on community cohesion.

For worker / community interaction, the proper implementation of the CoC will assist in reducing this impact further through policies and processes that address alcohol and substance abuse, as well as respectful behaviour and guidelines for community interactions.

With respect to transportation, while FIFO/DIDO workers will still need to transit to and from the Project Area at the beginning and end of their shifts, the overall number of vehicle movements will be reduced with the on-site workforce accommodation facility option. This

reduction in vehicle movements will be due to the reduction in daily commutes as non-local workers will spend most of their time on-site, lessening the need to travel during morning and afternoon peak periods.

A summary of the workforce management key matter assessment, in relation to the on-site workforce accommodation option, is provided in **Table 7-2**.

TABLE 7-2 WORKFORCE MANAGEMENT: ON-SITE WORKFORCE ACCOMMODATION OPTION IMPACT ASSESSMENT

Potential Impact	Impact Significance Rating		
	Magnitude	Likelihood	Impact Significance
Increased demand for labour creates direct and indirect employment opportunities for the local community.	Positive	Almost Certain	**Positive**
Reduced community cohesion as a result of potential ill-discipline of the construction workforce.	Minor	Unlikely	**Low**
Risk of traffic-related injury, or in the worst case a fatality, resulting from increased vehicle movements during the transportation of workers to and from the Project Area	Major	Unlikely	**Medium**

7.3.2 SHORT-TERM ACCOMMODATION OPTION

If TED was to pursue a short-term accommodation solution the number of workers employed by the Project for the construction phase, whilst still being in the region of 300 to 500 persons, this would not include those engaged to construct and operate the on-site workforce accommodation facility. If the short-term accommodation options were used for the Project, workers will be housed within the various townships within the AoI, including Theodore, Moura, Banana, and Biloela. Accordingly, non-local workers would be housed near local members of the community in various types of accommodation typically frequented by tourists, such as motels, hotels, cabins, and caravan parks.

Given the close proximity of construction workers and community members, the potential for interaction is greater, and therefore the potential for negative experiences to result is increased. Whilst the CoC would be implemented, and apply to all members of the construction workforce, TED would have less control over worker living conditions, options for leisure outside working hours, and worker actions and behaviour, which making it more likely that instances of ill-discipline may occur within the various communities within the AoI.

If accommodation is dispersed throughout the AoI in various short-term accommodation options, the number of daily vehicle movements to and from the Project Area will also increase, particularly during peak periods. This increase in vehicle movements carries with it a greater risk of a traffic-related injury occurring to both a worker and the local community, as the result of an accident.

A summary of the workforce management key matter assessment, in relation to the short-term accommodation option, is provided in **Table 7-3**.

TABLE 7-3 WORKFORCE MANAGEMENT: SHORT-TERM ACCOMMODATION OPTION IMPACT ASSESSMENT

Potential Impact	Impact Significance Rating		
	Magnitude	Likelihood	Impact Significance
Increased demand for labour creates direct and indirect employment opportunities for the local community.	Positive	Almost Certain	**Positive**
Reduced community cohesion as a result of potential ill-discipline of the construction workforce.	Moderate	Possible	**Medium**
Risk of traffic-related injury, or in the worst case a fatality, resulting from increased vehicle movements during the transportation of workers to and from the Project Area	Major	Possible	**High**

7.3.3 LONG-TERM ACCOMMODATION OPTION

If long-term accommodation options were to be used for the Project, workers would likely be housed within the same townships of the AoI, as with the short-term option. Given the limited number of rental properties at the time of writing (September 2024), expectation would be that options within Biloela would be prioritised over the other communities.

Similarly, to the short-term accommodation option scenario, the use of long-term accommodation options would reduce the number of workers to be employed by the Project (as no on-site accommodation facility would be required), but the number employed for the construction phase would still remain in the region of 300 to 500 workers.

The use of existing long-term housing will, like the short-term accommodation scenario, result in the close proximity of construction workers and community members, which will have the potential to result in a greater number of negative experiences related to inappropriate worker behaviour. Furthermore, the dispersal of long-term rental accommodation throughout the AoI will require a greater number of daily vehicle movements to cater for workers travelling to and from the Project Area, which increases the risk of a traffic-related injury occurring.

A summary of the workforce management key matter assessment, in relation to the long-term accommodation option, is provided in **Table 7-4**.

TABLE 7-4 WORKFORCE MANAGEMENT: LONG-TERM ACCOMMODATION OPTION IMPACT ASSESSMENT

Potential Impact	Impact Significance Rating		
	Magnitude	Likelihood	Impact Significance
Increased demand for labour creates direct and indirect employment opportunities for the local community.	Positive	Almost Certain	**Positive**
Reduced community cohesion as a result of potential ill-discipline of the construction workforce.	Moderate	Possible	**Medium**
Risk of traffic-related injury, or in the worst case a fatality, resulting from increased vehicle movements during the transportation of workers to and from the Project Area	Major	Possible	**High**

7.4 HOUSING AND ACCOMMODATION

The housing and accommodation key matter relates to the potential social impacts arising from housing and accommodation arrangements for the Project workforce, with the objectives being:

- To not contribute to significant affordability and availability impacts on housing and accommodation in local and regional communities; and
- To ensure that Project housing and accommodation arrangements are well planned, enhance worker wellbeing, and do not place an excessive burden on existing infrastructure, facilities and services used by local and regional communities.

Large construction projects have the potential to contribute to tight rental markets if sizeable construction workforces are brought into the area. This can increase the demand for short and long-term accommodation, which in turn can exacerbate accommodation shortages and cost of living pressures through increased rents in areas with low vacancy rates.

Accordingly, as the Project is anticipated to generate 300-500 jobs during the construction phase, it has the potential to:

- Increase the demand for short-term accommodation within the AoI, which may reduce the accessibility for community members/tourists to rent accommodation options;
- Generate potential opportunities for local accommodation providers to capitalise on the demand for short and long-term accommodation; and
- Increase in the demand for long-term housing stock which may contribute to housing market changes for local communities within the AoI and reduce housing affordability.

An assessment of these potential impacts relevant to the three accommodation options is provided in the following sections. It should be noted that an assessment of impacts relevant to existing infrastructure, facilities and services is provided in **Section 7.6**.

Regardless of the accommodation option, the following measures are recommended to be implemented by TED in relation to the housing and accommodation key matter:

- Preparation and implementation of a **Workforce Housing and Accommodation Plan**, developed in accordance with the Queensland SIA Guideline, and that outlines:
  - Objectives and key performance indicators;
  - Measures to enhance potential benefits for project workers and the community, and to mitigate potential negative social impacts; and
  - Policies regarding housing and accommodation support to be provided to project workers and their families who wish to live locally.

7.4.1 ON-SITE WORKFORCE ACCOMMODATION OPTION

Construction and occupancy of an on-site workforce accommodation facility is expected to have the least impact on the availability and affordability of housing within the Primary AoI, as the majority of workers employed would be housed in purpose-built accommodation. With most workers located within this purpose-built accommodation, TED will not have to compete with members of the local community for access to housing (both open market and rental), which could result in greater housing availability and/or affordability for the community.

Despite the reduced impact in relation to housing availability, this accommodation option would also limit potential benefits for local accommodation providers. With most of the 300 to 500 workers housed on-site, the demand for short-term or long-term housing options within the Primary AoI will be reduced, which will negatively impact the ability for accommodation providers or local residents to financially capitalise on an increase in demand for accommodation or existing housing stock. It is noted however that this may also have the secondary impact of generating negative sentiment between local community members involved and not involved in providing accommodation for the Project (i.e. those seen as taking advantage of potential Project benefits, that those who are not).

A summary of the housing and accommodation key matter assessment, in relation to the on-site workforce accommodation option, is provided in **Table 7-5.**

TABLE 7-5 HOUSING AND ACCOMMODATION: ON-SITE WORKFORCE ACCOMMODATION OPTION IMPACT ASSESSMENT

Potential Impact	Impact Significance Rating		
	Magnitude	Likelihood	Impact Significance
Increase the demand for short-term accommodation within the Primary AoI, which may reduce the accessibility for community members/tourists to purchase or rent accommodation options	Minor	Unlikely	**Low**
Generate potential opportunities for local accommodation providers to capitalise on the demand for short and long-term accommodation/housing stock.	Positive	Unlikely	**Positive**
Increase in the demand for long-term housing stock which may contribute to housing market changes for local	Minor	Unlikely	**Low**

Potential Impact	Impact Significance Rating		
	Magnitude	Likelihood	Impact Significance
communities within the AoI and reduce housing affordability.			

7.4.2 SHORT-TERM ACCOMMODATION OPTION

If workers during the construction phase are to use short-term accommodation options within the Primary AoI there is a greater potential that impacts will be experienced by the communities within the townships of Theodore, Banana, Moura, and Biloela.

Whilst short-term accommodation providers may financially benefit from the use of their accommodation facilities to house the construction workforce for the Project, the loss of short-term accommodation options has the potential to impact vulnerable groups within the Primary AoI, such as the elderly, those facing financial hardship, or those with lesser disposable incomes. The lack of available short-term housing may impact the ability for family and friends to stay close by to elderly familial relations during extended periods of visitation, which may result in reduced visitation and contribute to social isolation. Similarly, if there is a lack of affordable accommodation options to support short-term rentals this may reduce the accessibility for those more transient lifestyles from residing within the local area.

Furthermore, the positive economic impact on short-term accommodation will only be experienced during the construction phase of the Project. Once the Project transitions to the operation phase, accommodation providers may experience a loss of rental income (dependent upon future take-up rates of the short-term accommodation) and the community may be encumbered with an influx of available housing that could have negative consequence for housing/rental prices.

The reduction in short-term accommodation options within the Primary AoI would also have the potential to impact upon tourism operations (refer to **Section 5.1.1.1**) as the number of accommodation options available to support these ventures will be reduced. A reduction in tourist accommodation availabilities can lead to a loss of revenue for local businesses that heavily depend on the tourism sector. This loss of revenue may also result in those businesses struggling to cover operational costs, subsequently reducing their contribution to the local economy. Tourist ventures typically rely on a steady stream of visitors, and a decrease in accommodation options for travellers may threaten the viability and long-term sustainability of these businesses, and in doing so, negatively affect the social fabric of the community.

In addition, these impacts to housing/accommodation will be further exacerbated when considering the other developments within the Primary AoI. As stated in **Section 5.3**, there are at least four other projects with (partial) overlapping anticipated construction timeframes within a 40 km radius of the Project. Of these, the anticipated number of construction workers is known for two of these projects, with a combined total of more than 700 persons to be employed. It is currently unknown how many of these workers will be sourced locally, however given the limited short-term accommodation stock within the Primary AoI and Banana Shire LGA (31 commercially operated short-term accommodation options), the potential for impacts to be experienced by the local community is amplified.

A summary of the housing and accommodation key matter assessment, in relation to the short-term accommodation option, is provided in **Table 7-6.**

TABLE 7-6 HOUSING AND ACCOMMODATION: SHORT-TERM ACCOMMODATION OPTION IMPACT ASSESSMENT

Potential Impact	Impact Significance Rating		
	Magnitude	Likelihood	Impact Significance
Increase the demand for short and long-term accommodation within the Primary AoI, which may reduce the accessibility for community members/tourists to purchase or rent accommodation options	Major	Likely	**High**
Generate potential opportunities for local accommodation providers to capitalise on the demand for short and long-term accommodation/housing stock.	Positive	Almost Certain	**Positive**
Increase in the demand for long-term housing stock which may contribute to housing market changes for local communities within the AoI and reduce housing affordability.	Minor	Unlikely	**Low**

7.4.3 LONG-TERM ACCOMMODATION OPTION

If long-term accommodation options were to be used for the Project, workers would likely be housed within the same townships of the Primary AoI, as with the short-term option, but with greater emphasis on Biloela, given the higher potential for rental property availability.

Similarly, to the short-term accommodation option scenario, the impacts experienced by the local communities of these townships would be associated with the increased demand for accommodation via long-term housing stock. The increase in demand for long-term housing, while positively impacting those who are looking to sell their properties or leave the area, and will negatively impact housing availability and affordability for local residents and/or those seeking to relocate to the Primary AoI for non-Project related reasons.

A summary of the housing and accommodation key matter assessment, in relation to the long-term accommodation option, is provided in **Table 7-7.**

TABLE 7-7 HOUSING AND ACCOMMODATION: LONG-TERM ACCOMMODATION OPTION IMPACT ASSESSMENT

Potential Impact	Impact Significance Rating		
	Magnitude	Likelihood	Impact Significance
Increase the demand for short-term accommodation within the Primary AoI, which may reduce the accessibility for community members/tourists to purchase or rent accommodation options	Minor	Unlikely	**Low**

Potential Impact	Impact Significance Rating		
	Magnitude	Likelihood	Impact Significance
Generate potential opportunities for local accommodation providers to capitalise on the demand for short and long-term accommodation/housing stock.	Positive	Almost Certain	**Positive**
Increase in the demand for long-term housing stock which may contribute to housing market changes for local communities within the AoI and reduce housing affordability.	Major	Likely	**High**

7.5 LOCAL BUSINESS AND INDUSTRY PROCUREMENT

The local business and industry procurement key matter relates to assessment and management of potential social impacts associated with the procurement of goods and services for the Project. The objective of this key matter is to maximise opportunities for competitive and capable local businesses to provide goods and services to the Project, as well as reduce barriers to entry for local businesses where feasible.

Potential positive impacts relevant to construction phase workforce accommodation may be linked to opportunities to enhance the capacity of local businesses and supply chain through supply and/or service contracts. In addition, the increased demand for goods and services from the workforce will help to stimulate the local economies, and businesses within the Primary AoI may benefit from increased economic activity associated with the construction workforce and Project material requirements.

An assessment of these potential positive impacts relevant to the three accommodation options is provided in the following sections.

Regardless of the accommodation option, the following measures are recommended to be implemented by TED in relation to the local business and industry procurement key matter:

- Preparation and implementation of a **Local Business and Industry Procurement Plan**, developed in accordance with the Queensland SIA Guideline, which includes:
  - Objectives and key performance indicators;
  - Procurement strategies and initiatives for local and nearby regional suppliers, including Aboriginal and Torres Strait Islander owned businesses, and actions to facilitate participation;
  - Proposed policies and programs to build local and regional capacity and capability, and reduce barriers to entry;
  - Processes that embed the local business and industry procurement strategies into the contracting model for the project;
  - Measures to mitigate any potential negative social impacts on local industries (refer to **Table 8-1** for examples); and

- Details of any established industry guidelines or codes of practice which the proponent has committed to complying with.

7.5.1 ON-SITE WORKFORCE ACCOMMODATION OPTION

As noted in **Section 7.3.1**, if TED was to develop an on-site workforce accommodation facility, the construction of the facility would necessitate the employment of a number of skilled and semi-skilled workers, in addition to those employed for the construction of the wind farm. As with the general Project workforce, it is anticipated that TED would seek to provide opportunities to local workers and businesses in first instance which will have a positive impact on the economy of the Primary AoI and Secondary AoI.

The use of an on-site workforce accommodation facility will also necessitate the engagement of various material supply and service companies to facilitate ongoing operation and management of the facility for the period of construction. As such, there is the potential for local companies to be involved either through procurement or direct engagement, in aspects such as cleaning, catering, laundry, transportation, etc. The opportunity for local businesses to be involved will generate economic benefits for the AoI.

Despite the potential for procurement opportunities to be realised, the accommodation facility will have its own on-site amenities and will be physically distanced from the various townships within the Primary AoI. This physical distance, coupled with workforce management controls (refer to **Section 7.3.1**) will mean that workers are less likely to make use of local shops, cafes, recreational facilities, etc. in nearby townships, reducing the potential for economic benefits to be realised by these types of establishments.

A summary of the local business and industry procurement key matter assessment, in relation to the on-site workforce accommodation option, is provided in **Table 7-8.**

TABLE 7-8 LOCAL BUSINESS AND INDUSTRY PROCUREMENT: ON-SITE WORKFORCE ACCOMMODATION OPTION IMPACT ASSESSMENT

Potential Impact	Impact Significance Rating		
	Magnitude	Likelihood	Impact Significance
Opportunities to enhance the capacity of local businesses and supply chain through supply and/or service contracts.	Positive	Possible	**Positive**
Increased demand for goods and services helps to stimulate the local economies. Businesses within the Project AoI benefit from increased economic activity associated with the construction workforce and Project material requirements.	Positive	Possible	**Positive**

7.5.2 SHORT-TERM ACCOMMODATION OPTION

If TED was to pursue a short-term accommodation solution for the construction workforce, rather than an on-site workforce accommodation facility, the number of workers employed by the Project for the construction phase would be reduced, given that a facility would not be

required. Furthermore, options to support local supply chains through supplier and service company contracts would also be reduced given that no on-site accommodation facility is to be developed/operated.

Despite this however, there would still be flow-on economic benefits associated with the construction phase, such as increased demand for goods and services, warehousing/storage, transport/logistics, and administrative support. Opportunities for local business procurement would be available across these areas.

Additionally, if short-term accommodation is to be used, workers will be housed close to local shops, cafes, recreational facilities, etc. within each of the townships of the Primary AoI, increasing the potential for economic benefits to be realised by these types of establishments. It should be noted however, that the increased demand for goods and services has the potential to negatively impact the local community through creation of supply shortages.

A summary of the local business and industry procurement key matter assessment, in relation to the short-term accommodation option, is provided in **Table 7-9.**

TABLE 7-9 LOCAL BUSINESS AND INDUSTRY PROCUREMENT: SHORT-TERM ACCOMMODATION OPTION IMPACT ASSESSMENT

Potential Impact	Impact Significance Rating		
	Magnitude	Likelihood	Impact Significance
Opportunities to enhance the capacity of local businesses and supply chain through supply and/or service contracts.	Positive	Possible	**Positive**
Increased demand for goods and services helps to stimulate the local economies. Businesses within the Project AoI benefit from increased economic activity associated with the construction workforce and Project material requirements.	Positive	Likely	**Positive**
Increased demand for goods and services has the potential to negatively impact the local community through creation of supply shortages.	Moderate	Possible	**Medium**

7.5.3 LONG-TERM ACCOMMODATION OPTION

If TED was to pursue a long-term accommodation solution for the construction workforce, rather than an on-site workforce accommodation facility, the potential benefits will be similar to that of the short-term accommodation option.

Accordingly, whilst the number of workers employed by the Project for the construction phase would be reduced, and the extent of supplier and service company contracts limited, there will still be flow-on economic benefits associated with the construction phase, such as increased demand for goods and services, warehousing/storage, transport/logistics, and administrative support. Each of these areas will provide opportunities for local business procurement.

Furthermore, if long-term accommodation is to be used, workers will be located near local shops, cafes, recreational facilities, etc. within each of the townships of the Primary AoI, increasing the potential for economic benefits to be realised. It should be noted however, that the increased demand for goods and services has the potential to negatively impact the local community through creation of supply shortages.

A summary of the local business and industry procurement key matter assessment, in relation to the long-term workforce accommodation option, is provided in **Table 7-10.**

TABLE 7-10 LOCAL BUSINESS AND INDUSTRY PROCUREMENT: LONG-TERM ACCOMMODATION OPTION IMPACT ASSESSMENT

Potential Impact	Impact Significance Rating		
	Magnitude	Likelihood	Impact Significance
Opportunities to enhance the capacity of local businesses and supply chain through supply and/or service contracts.	Positive	Possible	**Positive**
Increased demand for goods and services helps to stimulate the local economies. Businesses within the Project AoI benefit from increased economic activity associated with the construction workforce and Project material requirements.	Positive	Likely	**Positive**
Increased demand for goods and services has the potential to negatively impact the local community through creation of supply shortages.	Moderate	Possible	**Medium**

7.6 HEALTH AND COMMUNITY WELLBEING

The health and community wellbeing key matter relates to the health and wellbeing of potentially impacted communities during the construction phase and includes physical and mental health, as well as social, cultural, and economic wellbeing.

The objective of the key matter is to ensure avoidance or mitigation of negative social impacts whilst capitalising on opportunities to improve the health and wellbeing of local and regional communities. As such, the Project should ensure that it does not adversely impact on the level of service to local and regional communities from existing social services, facilities and infrastructure.

As a result of the influx of 300 to 500 workers in the construction phase of the Project, there is the potential for the following impacts to be experienced:

- Increase the demand for medical, emergency, and social services and recreational facilities within the various townships of the AoI, which may place a strain on these services/facilities, and in doing so, reduce accessibility for community members;
- Potential to cause congestion along the roads used by the community resulting from increased vehicle movements associated with the transportation of workers to and from the Project Area; and

- Reduction in stakeholder amenity arising from the use of accommodation by workers (e.g. noise, visual, dust, etc.), which may potentially cause an impact on community health and wellbeing.

An assessment of these potential impacts relevant to the three accommodation options is provided in the following sections.

Regardless of the accommodation option, the following measures are recommended to be implemented by TED in relation to the health and community wellbeing key matter:

- Preparation and implementation of a **Health and Community Wellbeing Plan**, developed in accordance with the Queensland SIA Guideline, which includes:
  - Objectives and key performance indicators;
  - Measures to ensure that the level of service provided to the local community by existing social services, facilities and infrastructure is not reduced;
  - Measures to mitigate potential health and wellbeing impacts on local communities, and enhance potential benefits;
  - The level of on-site health services to be provided for workers;
  - Details of any workforce CoC to govern worker interactions with local communities;
  - Emergency response arrangements and management measures agreed with local emergency service providers, for incidents involving workers, both on and off the Project Area; and
  - Details of any community development programs to be implemented, and the outcomes to be achieved.

7.6.1 ON-SITE WORKFORCE ACCOMMODATION OPTION

If TED was to construct and operate an on-site workforce accommodation facility, the impact on local services and recreational facilities within the Primary AoI and Secondary AoI would be less than the other accommodation options, as TED would be able to manage worker wellbeing internally via amenities provided within the facility. Doing so will avoid and/or reduce pressure placed on existing external social infrastructure, facilities and services used by local and regional communities, such as medical clinics or recreational establishments.

With respect to the potential for congestion on the road network, while FIFO/DIDO workers will still need to transit to and from the Project Area at the beginning and end of their shifts, the overall number of vehicle movements along routes frequented by the local communities within the Primary AoI (refer to **Section 5.2**) will be reduced with the on-site workforce accommodation facility option. This reduction in vehicle movements will be due to the decrease in daily commutes, with non-local workers spending most of their time on-site, lessening the need to travel during morning and afternoon peak periods, and avoiding travel through township areas.

Dependent upon the location of the on-site workforce accommodation option within the Project Area there is the potential for negative impacts (such as noise, dust, and diminished visual amenity) to be experienced by surrounding landowners. In order to address these concerns, the on-site workforce accommodation facility should be designed in accordance with the Banana Shire Council Planning Scheme 2021 Development Design Code (refer to Appendix A), and with the appropriate Waste Management Plan in place (refer to **Section 8.2** for a

preliminary plan). In addition, the CoC developed and implemented for the Project (refer to **Section 7.3**) is recommended to remain in force throughout the entire period of operation to reduce the severity or extent of any potential amenity impact.

A summary of the health and community wellbeing key matter assessment, in relation to the on-site workforce accommodation option, is provided in **Table 7-11.**

TABLE 7-11 HEALTH AND COMMUNITY WELLBEING: ON-SITE WORKFORCE ACCOMMODATION OPTION IMPACT ASSESSMENT

Potential Impact	Impact Significance Rating		
	Magnitude	Likelihood	Impact Significance
Increase the demand for services and recreational facilities within the various townships of the Primary AoI, which may place a strain on these services/facilities, and in doing so, reduce accessibility for community members.	Minor	Unlikely	**Low**
Potential to cause congestion along the roads used by the community resulting from increased vehicle movements associated with the transportation of workers to and from the Project Area.	Minor	Unlikely	**Low**
Amenity impacts arising from the use of the accommodation (e.g. noise, visual, dust, etc.), which may potentially cause an impact on community health and wellbeing.	Moderate	Possible	**Medium**

7.6.2 SHORT-TERM ACCOMMODATION OPTION

If TED was to pursue the short-term accommodation option for the Project, it is anticipated that the pressure placed on local services and facilities would be higher than that of the on-site workforce accommodation. The reasoning for this determination is that there are already known challenges for rural-based services (e.g. medical clinics, emergency services, and social services), such as worker retention and accessibility, which are being managed by Local Councils and the State Government. As such, the influx of a large number of workers during the construction phase of the Project has the potential to place additional strain on these services, and in doing so, reduce accessibility further for community members within the Primary AoI. The impact of this reduced accessibility has the potential to impact vulnerable groups within community more seriously, including the elderly, youth, and Indigenous peoples.

As workers will be located within the various communities of the Primary AoI, the influx of workers during the construction phase has the potential to increase pressure on recreational facilities, with heightened demand for leisure activities placing a strain on resources and restricting access for members of the local community. This heightened demand may lead to overcrowding, extended wait times, and impact on recreational experiences, which may lead to a sense of frustration and dissatisfaction among the community, impacting the health and wellbeing of residents.

It should be noted however, that this impact is likely to be experienced differently within the Primary AoI. Some communities may be better able to cope with the influx of persons into their township. This enhanced ability to cope with population influx is largely based on either the size of the town (e.g. Biloela) or the existing financial and servicing arrangements apparent within the township (e.g. Moura's connection with the multiple mining operations).

Regardless, it is important to consider that the potential impacts to local services and facilities will be further exacerbated when considering the other developments within the Primary AoI. As stated in **Section 5.3**, there are at least four other projects with partially overlapping anticipated construction timeframes within a 40 km radius of the Project. Whilst it is unknown as to the number of workers to be employed by these projects, it is likely to be over 700 persons (refer to **Table 5-7**). If these projects all occur at once, the pressure on local services and facilities within the Primary AoI will be worsened.

The potential for this option to cause congestion on the road network within the AoI is also higher than that of the on-site workforce accommodation option. The rationale for this is that short-term accommodation options are dispersed throughout the Project AoI. As such, travel from the accommodation locations to the Project Area will be required on a twice daily basis, with routes likely taking workers through townships and along movement corridors during peak periods. This increase in vehicle movements increases the potential for congestion to occur within the Primary AoI, which will subsequently impact community wellbeing.

Amenity impacts arising from the use of short-term accommodation options within the Primary AoI are likely to be limited. Accommodation providers within the Primary AoI are primarily existing hotels, motels, caravan parks, and cabins, and therefore are already suitably located to manage amenity related impacts. In addition, the CoC developed and implemented for the Project (refer to **Section 7.3**) is recommended to remain in force throughout the entire period of operation to manage worker behaviour.

A summary of the health and community wellbeing key matter assessment, in relation to the short-term workforce accommodation option, is provided in **Table 7-12.**

TABLE 7-12 HEALTH AND COMMUNITY WELLBEING: SHORT-TERM ACCOMMODATION OPTION IMPACT ASSESSMENT

Potential Impact	Impact Significance Rating		
	Magnitude	**Likelihood**	**Impact Significance**
Increase the demand for services and recreational facilities within the various townships of the Primary AoI, which may place a strain on these services/facilities, and in doing so, reduce accessibility for community members.	Moderate	Likely	**High**
Potential to cause congestion along the roads used by the community resulting from increased vehicle movements associated with the transportation of workers to and from the Project Area.	Moderate	Possible	**Medium**

Potential Impact	Impact Significance Rating		
	Magnitude	Likelihood	Impact Significance
Amenity impacts arising from the use of the accommodation (e.g. noise, visual, dust, etc.), which may potentially cause an impact on community health and wellbeing.	Minor	Possible	**Medium**

7.6.3 LONG-TERM ACCOMMODATION OPTION

If TED was to pursue a long-term accommodation solution, the potential social impacts are likely to be similar to that of the short-term accommodation option.

Accordingly, the influx of construction phase workers will reduce local community accessibility to local township services (medical, emergency and social) and/or recreational facilities, which may have detrimental impact on community wellbeing.

The potential to cause congestion on the road network within the Primary AoI is similar to that of the short-term accommodation scenario in that travel from worker accommodation to the Project Area will be required on a twice daily basis, with routes likely taking workers through townships and along movement corridors during peak periods.

Amenity impacts arising from the use of long-term accommodation options within the Primary AoI are, like with the short-term accommodation option, likely to be limited. Accommodation will be in approved locations, zoned accordingly under the Planning Scheme. Furthermore, potential impacts linked to the ill-discipline of the workforce can be mitigated through a well-functioning CoC, developed and implemented for the Project (refer to **Section 7.3**).

A summary of the health and community wellbeing key matter assessment, in relation to the long-term accommodation option, is provided in **Table 7-13.**

TABLE 7-13 HEALTH AND COMMUNITY WELLBEING: LONG-TERM ACCOMMODATION OPTION IMPACT ASSESSMENT

Potential Impact	Impact Significance Rating		
	Magnitude	Likelihood	Impact Significance
Increase the demand for services and recreational facilities within the various townships of the Primary AoI, which may place a strain on these services/facilities, and in doing so, reduce accessibility for community members.	Moderate	Likely	**High**
Potential to cause congestion along the roads used by the community resulting from increased vehicle movements associated with the transportation of workers to and from the Project Area.	Moderate	Possible	**Medium**

Potential Impact	Impact Significance Rating		
	Magnitude	Likelihood	Impact Significance
Amenity impacts arising from the use of the accommodation (e.g. noise, visual, dust, etc.), which may potentially cause an impact on community health and wellbeing.	Minor	Possible	**Medium**

7.7 PRIORITISATION OF ACCOMMODATION OPTIONS

As per the outcomes of the key matters assessment conducted and in consideration of TED's Accommodation Solution Principles, the following is recommended with respect to the construction phase workforce accommodation for the Project:

- TED is to consider and consult on the accommodation priority hierarchy as denoted in **Table 7-14**; and
- TED is to encourage local employment as part of construction phase hiring practices, particularly for those located in the Primary AoI.

TABLE 7-14 PRIORITISATION OF ACCOMMODATION OPTIONS

Priority	Accommodation Option
1	**On-site workforce accommodation** – construction and operation of an on-site workforce accommodation facility within the Project Area to cater for the majority of workers anticipated to be employed during the construction phase.
2	**Short-term accommodation** – use of e.g. motels, hotels, cabins, caravan parks, and existing workforce accommodation facilities, within the Primary AoI and wider Banana Shire LGA. The intent will be to use the short-term accommodation either for contractors not associated with the main construction workforce, visiting TED employees, or for workforce overflow during peak construction periods.
3	**Long-term accommodation** – rental and/or purchase of existing housing stock within Theodore, Banana, Moura or Biloela is to be limited, and should only be considered where short-term accommodation options cannot be procured.

The prioritisation reflected in **Table 7-14** has been determined based on the following:

- The number of workers anticipated to be employed for the construction phase of the Project (i.e. between 300 and 500 workers);
- The limited number of short-term and long-term accommodation options available within the Primary AoI and wider Banana Shire LGA (i.e. 31 commercially operated short-term accommodation options);
- The extent of negative impacts likely to be experienced by the communities within the Primary AoI as a result of the using short-term and long-term accommodation option scenarios, comparative to that of the on-site workforce accommodation option; and

- The potential for cumulative impacts to impact communities as a result of the other developments within the vicinity of the Project and/or those which overlap with the Project's construction phase.

In particular, it is important to note that the recommendation provided is not an 'all-in-one' solution, but rather a prioritisation. Whilst the main recommendation is for TED to construct and operate an on-site accommodation facility that will house most of the Project's construction phase workforce, the utilisation of short-term accommodation options will allow for economic benefits to be experienced by local communities, provide flexibility for TED at times of peak construction, and reduce the exposure of local community stakeholders within the Primary AoI to some of the negative social impacts identified in the key matters assessment.

Prior to implementing these strategies however, TED is recommended to engage in further discussion with the owners/operators of the existing Banana Accommodation Village as well as the mining companies who operate within the vicinity of the Project (i.e. Anglo American). The potential to use existing accommodation villages and/or workers camps within the AoI of may also reduce the scale of the on-site workforce accommodation facility required for the Project, however this will be subject to future availability.

8. MANAGEMENT AND PRELIMINARY PLANNING

8.1 MANAGEMENT MEASUREMENTS

As per **Section 7.7** of this AOR, a prioritisation of accommodation options is recommended for the Project, with the majority of the construction workforce to be accommodated within an on-site workforce accommodation facility, with short-term accommodation options within the Primary AoI and Banana Shire LGA to be used on a limited basis.

Accordingly, in order to simultaneously minimise social impacts and maximise the social benefits for the local communities within the Primary AoI, a suite of management measures have been developed.

The management measures proposed in **Table 8-1** and **Table 8-2**, seek to provide an opportunity to encourage local employment (and thereby reduce the requirement for non-local FIFO/DIDO workers, and subsequently reduce the demand for accommodation) whilst minimising potential negative impacts for local accommodation owners within the Primary AoI.

TABLE 8-1 MANAGEMENT MEASURES: LOCAL EMPLOYMENT

No.	Management Measure	Timeline
1.	Host information sessions to engage with the community and local businesses who can provide inputs or services and other prospective contractors/subcontractors, regarding construction timing, workforce estimates and accommodation requirements.	Prior to construction
2.	Engage local media including radio, newspaper, and social media to advertise expressions of interest for employment or provision of services or materials.	Prior to construction
3	Engage with the local employment agencies to identify access pathways for local workers. Assess the candidate pool to determine suitable labour, trade, or other employment on the Project.	Prior to construction
4	Set up a dedicated employment opportunity platform on the Project's website [https://au.rwe.com/projects/theodore-wind-farm/] in consultation and coordination with the Engineering, Procurement, and Construction (EPC) contractor. Relevant worker details will then be shared with the main subcontractor(s) for direct engagement through their own employment processes.	Prior to construction and during construction
5	Consult with the Banana Shire Council and Gladstone Regional Council, as well as any Business Chambers to provide their members with relevant details such as Project construction timing, workforce estimates and accommodation requirements.	Prior to construction
6	In case of short-term accommodation, implement shuttle bus services where practical to enable local workforce in the respective locations to easily commute to the Project Area. These services may discontinue depending on demand.	Prior to construction and during construction
7	Provide opportunities for local businesses to submit proposals and tenders and prioritise the use of goods and services that can be sourced locally and are competitive for price and quality.	Prior to and during construction

No.	Management Measure	Timeline
8	Encourage subcontractors to employ local workers wherever possible and reasonable.	Prior to and during construction
9	Identify positions where training would allow additional local workers to join the workforce, and encourage local workers and businesses to undertake training to provide for specialist works.	Prior to and during construction
10	Collaborate with local trade/training organisations (such as TAFE) to promote job opportunities with the Project, with enough time to give local community members with enough notice to receive training in Project related skill sets, if desired.	Prior to construction
11	Inform non-local workers about shops, cafes, recreational facilities, etc. and make access easy.	During construction

TABLE 8-2 MANAGEMENT MEASURES: ACCOMMODATION

No.	Management Measure	Timeline
1	Explore available accommodation options around the Theodore, Banana, Moura, and Biloela (i.e. Primary AoI).	Prior to construction
2	Host information sessions to engage with the community and local businesses, in order to determine who can provide inputs or services and other prospective contractors or subcontractors, regarding construction timing, workforce estimates and accommodation requirements.	Prior to construction
3	Investigate local and regional community social media options to disseminate information to local accommodation operators and rental property owners, such as construction timing, workforce estimates and accommodation requirements.	Prior to construction
4	Preparation and implementation of a Workforce Management Plan.	Prior to construction
5	Preparation and implementation of a CoC applicable to all Project workers during the construction phase	Prior to construction
6	Preparation and implementation of a Workforce Housing and Accommodation Plan	Prior to construction
7	Preparation and implementation of a Local Business and Industry Procurement Plan	Prior to construction
8	Preparation and implementation of a Health and Community Wellbeing Plan, including on how to manage traffic injuries	Prior to construction
9	The on-site workforce accommodation facility should be designed in accordance with the Banana Shire Council Planning Scheme 2021 Development Design Code and have a Waste Management Plan in place.	Prior to construction
10	Host information sessions to engage with Banana Shire Council, the community and local businesses regarding construction timing, workforce estimates and accommodation requirements.	Prior to and during construction

No.	Management Measure	Timeline
11	Consult with the Banana Shire Council and Gladstone Regional Council to minimise pressure on local resources, and to address worker influx concerns during the construction phase.	Prior to and during construction
12	Contact the local accommodation operators to provide Project information such as construction timing, workforce estimates and accommodation requirements.	Prior to and during construction
13	Provide a register of local accommodation options and contact details to contractors and subcontractors.	Prior to and during construction
14	Maintain a register of local property owners who have expressed interest in offering dwellings for rent (if this occurs in the future). Provide this register to contractors and subcontractors.	Prior to and during construction
15	Review workforce predictions every six months during construction to ensure that accommodation requirements are met in accordance with the objectives of this AOR.	Prior to and during construction
16	Identify any overlaps with peak demand periods for accommodation during the following six months and engage with key stakeholders.	Prior to and during construction
17	Maintain a register of local, regional and national workforce breakdown by company on site.	Prior to and during construction
18	Regularly consult with local property owners and accommodation providers to manage occupancy to maximise use of local accommodation, without preventing its use for major event and holiday purposes.	Prior to and during construction
19	Engage with other Project developers to mitigate potential cumulative impacts which may put additional pressure on the area.	Prior to and during construction
20	Engage with local health care, social and emergency service providers to monitor the Project's use (if any) of these facilities.	Prior to and during construction

8.2 PRELIMINARY WASTE MANAGEMENT PLAN

As this AOR has recommended the use of an on-site workforce accommodation facility for the Project, a preliminary Waste Management Plan (WMP) has been developed.

The on-site workforce accommodation facility forms part of the Development Application for the wind farm as it is considered an ancillary use. It is intended that this preliminary WMP will be further developed into a WMP as part of post-approval works by TED or the EPC contractor in concert with the Department of Housing, Local Government, Planning and Local Works.

8.2.1 LEGISLATIVE REQUIREMENTS

8.2.1.1 ENVIRONMENTAL PROTECTION ACT 1994 (QLD)

The *Environmental Protection Act 1994* (EP Act) outlines the legal objectives and aims relevant to protect Queensland's environment in the context of development. Its subordinate regulation, the Environmental Protection Regulation 2019 (QLD) (the Environmental

Regulation), seeks to define and categorise waste, handling and storage processes, and management. The EP Act and Environmental Regulation also provide a range of tools to ensure objectives are met, including a licensing system for Environmentally Relevant Activities (ERAs) and environmental protection orders.

Under the EP Act, TED has a General Environmental Duty – such that TED must not carry out any activity that causes, or is likely to cause, environmental harm unless all reasonable and practical measures to prevent or minimise the harm have been taken.

Environmental Authorities (EAs) and associated ERAs may be required to carry out proposed works as part of the Project.

8.2.1.2 ESR/2015/1836 - DES APPLICATION REQUIREMENTS FOR ACTIVITIES WITH WASTE IMPACTS

Under the Environmental Regulation, a prescribed ERA may have to be applied for where a waste activity requires approval and monitoring by either Local Government or State Government due to its potential to impact the environment. This requires an EA to carry out the ERA. They relate to waste processing, burning, processing and reprocessing. As part of the Project an ERA may be required for the transport of regulated waste should these activities be undertaken by any TED designated operators.

8.2.1.3 WASTE REDUCTION AND RECYCLING ACT 2011 (QLD)

The *Waste Reduction and Recycling Act 2011* (WRR Act) establishes a framework for waste management and resource recovery practices in Qld. It also serves as a function for waste control, treatments and disposals facility obligations, end of waste frameworks and codes, issuing of licenses and waste tracking requirements. The Waste Reduction and Recycling Regulation 2011 (QLD) (the 'Waste Regulation') sits under the WRR Act and includes applicable fees under the WRR Act, waste categorisation, treatment of waste, management of used packaging materials, and planning and reporting requirements.

The WRR Act also outlines provisions for 'End of Waste' under Chapter 8, promoting resource recovery opportunities with the aim to transfer waste products into valued resources. The Act includes End of Waste codes and approvals for waste that can be approved as a resource if the department considers that it meets the specified criteria for its specific use. The Project could potentially benefit from these End of Waste Codes (e.g. for concrete) (Business Queensland, 2024).

8.2.1.4 NATIONAL WASTE POLICY 2018 (CWTH)

The National Waste Policy 2018 outlines a framework for collective action by business, governments, communities and individuals until 2030. The policy aims to respond to the challenges facing waste management and resource recovery in Australia, enabling shifts towards a circular economy particularly in waste management, and provides a framework for business to embrace innovation and develop technologies and create new opportunities. It also incorporates Australia's international obligations, supporting Australia's engagement in the United Nations' Sustainable Development Goal 12 on responsible construction and production.

The Project will utilise the National Waste Policy 2018 to assist in implementing waste management principles. These include:

- Avoiding waste;
- Improving resource recovery;
- Increasing the use of recycled materials; and
- Better management of material flows to benefit human and environmental health.

8.2.1.5 NATIONAL ENVIRONMENT PROTECTION COUNCIL ACT 1994 (CWTH)

The movement of controlled waste is also regulated by the National Environment Protection (Movement of Controlled Waste between States and Territories) Measure 1998 (Cwth) (the 'NEPM Regulation'), made under the *National Environment Protection Council Act 1994* (NEPC Act).

The NEPC Act, and in particular the NEPM Regulation, assist the Project in achieving the desired environmental outcomes so that controlled wastes are properly identified, transported, and otherwise handled in ways that are consistent with environmentally sound practices for the management of these wastes.

8.2.1.6 WORK HEALTH AND SAFETY ACT 2011 (QLD)

The *Work Health and Safety Act 2011* (WHS Act) and the associated regulation Work Health and Safety Regulation 2011 (Qld) (the 'WHS Regulation'), restricts the use of hazardous substances and dangerous goods.

TED is required to ensure that the relevant provisions of the Work Health and Safety Act 2011 are acted upon, as applicable, to the extent of employees/workers engaged during the pre-construction, construction and operation phases of the Project.

8.2.1.7 BANANA SHIRE WASTE MANAGEMENT MASTERPLAN

Banana Shire Council has identified waste management infrastructure as a strategic priority for the community. The purpose of the Banana Shire Waste Management Masterplan (Banana Shire 2024c) is to create a comprehensive plan of action for the next 15 years to provide the community with sustainable waste management services. Council provides kerbside collection of general waste in bins for all townships. In addition to this, there are eight Council-owned waste transfer stations and three landfills within the Shire.

The Project will align its waste strategy with the relevant local waste plans so that there is consistency with all levels of legislation.

Additionally, be referred to Appendix A for the Banana Shire Development Design Code, for which provisions have been considered.

8.2.2 WASTE STREAMS

For the WMP, the main waste streams identified for an on-site workforce accommodation facility are likely to comprise the following:

- Solid waste (food packaging, containers);
- Wastewater (from showers, toilets); and
- Hazardous waste (chemicals, used materials).

The Project may follow the principles of the waste hierarchy:

1. **Avoid and Reduce**

- Reducing waste by minimising scope of activities which create waste where possible;
- The purchasing and utilisation of products that are recycled, recyclable, repairable, refillable, re-usable or biodegradable;
- Developing and implementing systems to identify, quantify and monitor waste generation;
- Implementing office/administrative sustainability measures by making choices that pertain to sustainable energy and resource efficient goods and equipment;
- Ordering goods in bulk to minimise packaging waste and develop contract conditions and/or arrangements with suppliers to reduce the quantity of packaging materials supplied with building materials and return of packaging materials to the supplier;
- Arrangements made with suppliers to return any construction materials not used; and/or
- Training staff to avoid and reduce waste.

2. **Reuse**

- Beneficially reuse materials, and if required, utilise treatment to achieve compliance with environmental standards;
- Fostering conditions which facilitate the recovery of materials for reuse and segregation of materials for recycling;
- Reusing material where practicable;
- Training staff to identify opportunities to reuse materials.

3. **Recycle and Compost**

- Collection of materials and transport to recycling plants;
- Provision of recycling facilities for general rubbish, including glass, plastic, waste paper and metals, using colour coded bins;
- Composting materials where appropriate; and/or
- Segregation of waste materials by type to facilitate resource recovery efforts.

4. **Recovery**

- Recovery of fuel and energy where applicable;
- Recovery of fixtures such as lights and other electrical fittings, doors, toilets, windows, and sheds through sales and/or charity organisations; and/or
- Engaging external specialist consultants to identify opportunities for resource recovery.

8.2.3 ON-SITE STORAGE OF WASTE

General on-site storage of waste will conform to the following requirements:

- General waste and recyclables will be disposed of in containers or bins and collected on a regular basis;
- Facility areas will be free of litter and good standards of housekeeping will be maintained throughout construction. Regular inspections will be undertaken to ensure a high standard is maintained;
- Waste classified as 'regulated waste' will be securely handled and stored in accordance with the Project and legislative requirements;
- Waste fuel, oils and other hazardous chemicals will be stored in well ventilated, bunded areas prior to removal by licensed waste contractors.

8.2.4 SEWAGE TREATMENT

Subject to furthered engineering investigations, sewage infrastructure is to be connected to the existing network, where possible. If this is not possible, on-site sewage treatment will be required.

Wastewater generated through construction would include grey water and sewage from site amenities and washdown water used for vehicles and equipment. Management of these impacts will be outlined in the Operational Management Plan for surface and groundwater, particularly as this water could also include low levels of contaminants such as hydrocarbons/oils, diesel, detergents, cleaning fluids and sediment.

Stormwater, run-off from dust suppression and washdown water is likely to be generated from construction areas. This water would be captured in sediment control devices and construction retention ponds or tanks. Further detail in relation to sediment control devices will be included in an erosion and sediment control plan for the construction phase of the Project.

8.3 POTABLE WATER

Subject to furthered engineering investigations, potable water will be supplied to the on-site workforce accommodation facility either through connection to the existing water supply network, or through independent delivery of potable water via a service contractor.

TED will prepare a Potable Water Strategy for the on-site workforce accommodation facility. The key principles to be adopted are associated with efficient water use and management, and comprise:

- Compliance with local regulations;
- Protocols for sanitation, storage, and hygiene;
- Prioritisation of hydration for worker wellbeing (e.g. provide easily accessible water stations with clean containers; educate workers on water hygiene, etc.); and
- Contingency planning for emergencies and shortages.

9. REFERENCES

ABC News 2023, *Queensland has eight coal-fired power stations. What's their future? - ABC News,* viewed 4 September 2024, <https://www.abc.net.au/news/2022-06-12/queensland-coal-fired-power-stations/101143552>.

Australian Bureau of Statistics 2024*a*, *2021 census community profiles – Gladstone,* Australian Bureau of Statistics, viewed 4 September 2024, <2021 Gladstone, Census All persons QuickStats | Australian Bureau of Statistics (abs.gov.au)>.

Australian Bureau of Statistics 2024*b*, *2021 census community profiles – Banana,* Australian Bureau of Statistics, viewed 4 September 2024, <2021 Banana, Census All persons QuickStats | Australian Bureau of Statistics (abs.gov.au)>.

Australian Bureau of Statistics 2024*c*, *2021 census community profiles – Biloela,* Australian Bureau of Statistics, viewed 4 September 2024,<2021 Biloela, Census All persons QuickStats | Australian Bureau of Statistics (abs.gov.au)>.

Australian Bureau of Statistics 2024*d*, *2021 census community profiles – SA130804152801,* Australian Bureau of Statistics, viewed 4 September 2024,<2021 30804152801, Census All persons QuickStats | Australian Bureau of Statistics (abs.gov.au)>.

Australian Bureau of Statistics 2024*e*, *2021 census community profiles – Theodore,* Australian Bureau of Statistics, viewed 4 September 2024,<2021 Theodore (L), Census All persons QuickStats | Australian Bureau of Statistics (abs.gov.au)>.

Australian Bureau of Statistics 2024*f*, *2021 census community profiles – Moura,* Australian Bureau of Statistics, viewed 4 September 2024,<2021 Moura, Census All persons QuickStats | Australian Bureau of Statistics (abs.gov.au)>.

Australian Bureau of Statistics 2024*g*, *2021 census community profiles – Banana, Suburbs and Localities,* Australia Bureau of Statistics, viewed 4 September 2024, <2021 Banana, Census All persons QuickStats | Australian Bureau of Statistics (abs.gov.au)>.

Australian Bureau of Statistics 2024*h*, *2021 census community profiles – 31902150815,* Australia Bureau of Statistics, viewed 4 September 2024, <https://www.abs.gov.au/census/find-census-data/quickstats/2021/31902150815>.

Banana Shire 2024a, *Planning Scheme*, Banana Shire, viewed 4 September 2024, <https://www.banana.qld.gov.au/council-services/planning-and-development/planning-scheme>.

Banana Shire 2024b, *Renewable Energy Projects*, Banana Shire, viewed 4 September 2024, <https://www.banana.qld.gov.au/renewable-energy-projects>.

Banana Shire 2024c, *Waste Management Masterplan,* viewed 4 September 2024, <https://www.banana.qld.gov.au/homepage/317/waste-management-masterplan>.

Business Queensland, 2024, End of Waste Codes, viewed 4 September 2024, <https://www.business.qld.gov.au/running-business/environment/waste-management/regulated-waste/eow-codes>

Queensland Government Open Data Portal, Road Crash Locations January 2001 to 31 May 2023, viewed 14 December 2023, < https://www.data.qld.gov.au/dataset/crash-data-from-queensland-roads/resource/e88943c0-5968-4972-a15f-38e120d72ec0>

Queensland Government State Development, Infrastructure, Local Government and Planning 2023, *Planning Guidance, State code 23: Wind Farm development,* viewed 4 October 2023, <https://planning.statedevelopment.qld.gov.au/__data/assets/pdf_file/0027/83178/for-consultation-draft-planning-guidance-state-code-23-wind-farm-development.pdf>.

Queensland Department of Energy and Public Works 2022, *Queensland Energy and Jobs Plan, Queensland Government,* viewed 4 October 2023, <https://media.epw.qld.gov.au/files/Queensland_Energy_and_Jobs_Plan.pdf>.

TED Theodore Community & Stakeholder Engagement Plan (CSEP), 2023.

SGS Economics & Planning 2024*, Rental Affordability Index*, 4 September 2024, <https://sgsep.com.au/projects/rental-affordability-index>.

SQM Research 2024*a*, *Residential Vacancy Rates Theodore,* SQM Research, viewed 4 Sept 2024, <https://sqmresearch.com.au/graph_vacancy.php?postcode=4719&t=1>.

SQM Research 2024*b*, *Residential Vacancy Rates Moura,* SQM Research, viewed 4 October 2024, < https://sqmresearch.com.au/graph_vacancy.php?postcode=4718&t=1>.

SQM Research 2024c, *Residential Vacancy Rates Theodore,* SQM Research, viewed 4 Sept 2024, <https://sqmresearch.com.au/graph_vacancy.php?postcode=4715&t=1>.

APPENDIX A BANANA SHIRE PLANNING SCHEME: DEVELOPMENT DESIGN CODE

Table 6.2.3 For assessable development

Performance Outcomes
Rehabilitation
PO12 Disused storage tanks are decommissioned in accordance with current Australian Standards. and **PO13** Following cessation of the service station: (a) all disused buildings, enclosures and infrastructure are removed from the site; (b) contaminated soil is remediated or removed from the land;

6.3 Other Development Codes

6.3.1 Development Design Code

6.3.1.1 Application

This code applies to assessing a material change of use, reconfiguring a lot or operational works where the code is identified as an assessment benchmark in the Categories of Assessment Table. When using this code, reference should be made to Section 1.6.1.

6.3.1.2 Purpose

(1) The purpose of this code is to provide for:
- (a) the efficient supply of non-trunk development infrastructure that supports the intended use of the site, integrates with existing networks and maintains or enhances the environment, public safety and visual amenity;
- (b) the control of operational works;

(2) The purpose of the Code will be achieved through the following overall outcomes:
- (a) infrastructure services development in a cost-effective, safe, efficient and co-ordinated manner to a standard ordinarily expected in the locality;
- (b) development is planned, designed, constructed and operated to manage stormwater and wastewater in ways that protect environmental values and achieve water quality objectives;
- (c) safe and functional transport networks meet the reasonable demands generated by development;
- (d) development is serviced by a suitable standard of vehicle access, parking, servicing and manoeuvring areas that enhance streetscape appeal and character and discourage crime and anti-social behaviour;
- (e) landscaping enhances visual amenity, integrates the built and natural environments, maximises water efficiency, minimises soil loss, provides shade in large paved areas and does not adversely impact on infrastructure;
- (f) filling or excavation maintains the safety, amenity and health of the community and environment;
- (g) infrastructure responds to the environmental constraints and avoids or safely manages the adverse impacts of floodwaters to mitigate the effects of a natural hazard event;
- (h) generated waste is stored in an environmentally friendly and nuisance free manner;

6.3.1.3 Requirements for accepted development or assessment benchmarks

Table 6.3.1 For accepted development

Acceptable Outcomes
Filling and excavation
AO1.1 Earthworks do not result in any change beyond the property boundaries to: (a) the path of overland water flow or where floodwater enters or exits the property; and (b) the flow velocity of water off-site; and (c) the flooded area off-site; and (d) the flood height off-site; and **AO1.2** A retaining wall is set back at least half the height of the wall from any boundary of the site. and

Table 6.3.1 For accepted development

Acceptable Outcomes
AO1.3 Retaining walls over 1.5m are stepped a minimum depth of 0.75m for every 1.5m in height, and landscaped. and **AO1.4** The fill material comprises any of the following: (a) soil or earth; (b) rocks less than 150mm diameter; (c) sand; (d) gravel; or (e) other clean, inert material free of organic, putrescible or refuse material; and **AO1.5** Works occur in accordance with AS3798 Guidelines on Earthworks for Commercial and Residential Developments. and **AO1.6** Contaminated material is not used for filling purposes. and **AO1.7** There is no filling or excavation on land included on the Contaminated Land Register or Environmental Management Register under the *Environmental Protection Act 1994*. or **AO1.8** Filling or excavation on land included in the Contaminated Land Register or Environmental Management Register occurs in accordance with an approved site management plan or disposal permit issued under the *Environmental Protection Act 1994*. and **AO1.9** Dust emissions and other air emissions stay within the site boundaries in accordance with a management plan detailing measures such as: (a) water spraying of exposed areas (where in accordance with an erosion and sediment control plan); (b) placing of protective coverings or sealing of exposed earthworks; and (c) installation of wind barriers; and **AO1.10** Haul routes used for transportation of fill or excavated material to or from the site avoid land included in a Residential Zone where possible and are otherwise the most direct routes via the highest order roads. and **AO1.11** Filling or excavation operations occur only between 7am to 6pm Monday to Saturday.
Vehicular access and driveway crossovers
AO2.1 For a caretaker's accommodation, dual occupancy, dwelling house or home-based business a vehicular access and driveway crossover provides a single access to the property. and **AO2.2** In all circumstances, a vehicular access and driveway crossover: (a) is not on a bend in the road of more than 45 degrees; (b) is designed and constructed in accordance with the relevant sections of the CMDG; (c) is separated from an intersection by a minimum of 10m; (d) is separated from any street signage, street trees, power poles, street lights, manholes, stormwater gully pit transitions, or other Council asset by a minimum of 1m; (e) does not front a car parking bay or bus stop; (f) does not require any change to the level of the existing footpath or verge profiles; Note: Council approval is required for minor works on road reserves.
On-site parking and movement
AO3.1 The number of parking spaces provided for the use is consistent with Table 7.3.3 - Vehicle parking rates. and **AO3.2** Parking spaces comply with the requirements of AS/NZS 2890.1-2004. and **AO3.3** The development design allows service and collection vehicles to enter and exit in a forward gear with a maximum of 3 on-site manoeuvers. The use of staff car parking areas to accommodate internal manoeuvring is permissible.

Table 6.3.1 For accepted development

Acceptable Outcomes
Landscaping
AO4.1 Landscaping within 6m of an intersection has a maximum mature height of 500mm. and **AO4.2** Landscaping along all road frontages has either a maximum height of 0.5m or a minimum clear trunk height of 1.5m at maturity, except as required by AO4.1. and **AO4.3** Non-residential development that adjoins a sensitive land use or land in a residential zone provides a 3m wide landscaped buffer along all adjoining land boundaries. and **AO4.4** Landscaping is provided along the street frontage of car parking areas and includes one shade tree, or alternative shade structure, for every 8 parking spaces, distributed evenly throughout such areas. and **AO4.5** Landscaping is clear of any separation areas established by utility service providers. and **AO4.6** Plant species for landscaping include acceptable species identified in Schedule 5.3.
Street lighting and street signs
AO5.1 Street lighting is provided in accordance with the relevant parts of the CMDG. and **AO5.2** Street signs are provided for all new roads in accordance with the relevant parts of the CMDG.
Water supply infrastructure
If in a water supply area **AO6.1** The premises is connected to the reticulated water supply system in accordance with Table 7.3.4 - Provision of Infrastructure. and **AO6.2** The design and construction of the water distribution network is in accordance with the relevant parts of the CMDG. and **AO6.3** The installation of water meters occurs in accordance with the relevant parts of the CMDG. **If outside a water supply area** **AO6.4** The premises connect to an on-site water supply with a minimum capacity of 45kL that meets the accepted quality for drinking water. and **AO6.5** A separate storage system that permanently holds a minimum of 5,000L (e.g. dam, swimming pool, or water tank) is located within 50m of new buildings, exclusively for firefighting purposes.
Sewerage infrastructure
If in a reticulated sewerage area **AO7.1** The premises connect to the Council's reticulated sewerage system in accordance with Table 7.3.4 - Provision of Infrastructure. and **AO7.2** The design and construction of the reticulated sewerage system is in accordance with the relevant parts of the CMDG. **If outside a reticulated sewerage area** **AO7.3** The provision of on-site sewerage facilities is in compliance with: (a) the Plumbing and Drainage Act 2002; (b) the Queensland Plumbing and Wastewater Code; and (c) AS/NZS 1547:2000 On-site domestic Wastewater Management;
Stormwater drainage
AO8.1 Stormwater and irrigation runoff diverts to a wet retention and sedimentation pond that: (a) provides permanent retention for first flush capture equivalent to the amount of runoff occurring during a 1%AEP storm event over a period equal to the time of concentration plus five minutes; (b) provides a permanent retention component for first flush capture of suspended matter; (c) retains for a period of not less than 24 hours; and **AO8.2** Uses and associated works are confined to areas outside overland flow paths and natural drainage features.

Table 6.3.1 For accepted development

Acceptable Outcomes
and **AO8.3** The provision of stormwater drainage, including inter-allotment drainage and subsurface drainage is in accordance with the *CMDG* and the *Queensland Urban Drainage Manual (QUDM).* *and* **AO8.4** There is no increase in the volume, frequency, duration and velocity of stormwater at the premises boundaries. and **AO8.5** Overland flow paths cater for the water from a 1 per cent AEP storm event. and **AO8.6** Stormwater flows are directed away from areas of exposed soil. and **AO8.7** Soil exposure and construction works are staged to minimise the area of exposed soil at any one time. and **AO8.8** Exposed soil areas are effectively stabilised preceding any predicted rainfall, before the removal of sediment control controls and at the completion of construction. and **AO8.9** Where involving exposure of soil of more than 2,500m^2: (a) prepare a sediment and erosion control plan for Council approval; and (b) implement the requirements of the approved plan; and **AO8.10** All discharged waters are free from gross pollutants, litter, oils or chemical contaminants.
Waste
AO9.1 On-site waste storage areas are: (a) located no closer than 5m to any site boundary; (b) segregated from the site's stormwater drainage; (c) provided with an impervious base that is drained to an approved waste disposal system; (d) provided with a dedicated hose cock; and (e) enclosed on 3 sides to a minimum height of 0.2m above the height of the waste bins; and **AO9.2** All organic food waste is composted or provided to a facility specifically dedicated to the transformation of organic waste to energy. and **AO9.3** Vegetation that is removed to accommodate the development is mulched on-site. and **AO9.4** No waste is to be burned on the development site. and **AO9.5** Non-organic waste that is recyclable is separated and disposed of to an approved facility or provider. and **AO9.6** Trade waste discharge to Council's reticulated sewerage system is in accordance with Council's adopted Trade Waste Policy. and **AO9.7** Contaminants, including contaminated water, are not directly or indirectly released from the premises except as approved by an administering authority.

Table 6.3.2 For assessable development

Performance Outcomes
Vehicular access and driveway crossovers
PO1 Access arrangements protect the efficient functioning of the transport network and provide safe access to development in direct response to the demonstrated demand of the development. and **PO2** There is no damage to or interference with the location, function or access to any utility infrastructure.

Table 6.3.2 For assessable development

Performance Outcomes
Filling and excavation
PO3 Any off-site impact from earthworks is minimised and acceptable having regard to: (a) the environment in which the earthworks are located; (b) the measures proposed to mitigate any off-site impact; (c) any compensation measures for an impact that are proposed by the applicant; and **PO4** The earthworks are safe and stable and **PO5** Community safety is ensured in the event that Category 3 earthworks fail. and **PO6** Retaining walls protect the visual amenity of development on adjoining premises. and **PO7** Fill material provides support for the proposed development in accordance with certified geotechnical engineering requirements. and **PO8** Filling or excavation does not result in the contamination of land or water bodies, wetlands and waterways. and **PO9** Filling or excavation does not cause environmental nuisance impacts.
Roads
PO10 Road infrastructure is: (a) of a width and standard as detailed in Table 6.3.4 - Provision of Infrastructure; or (b) of a width and standard as detailed in an infrastructure agreement; and (c) designed and constructed in accordance with the relevant part of the CMDG;
On-site parking and movement
PO11 The development provides car parking spaces to accommodate the demonstrated demand generated by the use. and **PO12** The site provides safe and convenient movement areas for pedestrians and persons in wheelchairs. and **PO13** The movement of vehicles on to and from the site does not create a traffic hazard. and **PO14** Vehicle parking areas protect the character of surrounding development.
Landscaping
PO15 Landscaping does not interfere with motorists' sightlines. and **PO16** Landscaping provides buffering and screening, shades activity areas and allows casual surveillance of the street. and **PO17** Landscaped areas with species selected to suit the streetscape are provided adjacent to all road frontages (excluding crossover and pedestrian access). and **PO18** Landscaping provides shading for the majority of spaces in outdoor parking areas. and **PO19** Landscaping does not pose a potential risk to the ongoing operation of public infrastructure. **PO20** Plant species used in landscaping are suited to the local climate and proposed purpose and do not increase the risk of pest species infestation. Editor's Note: Schedule 5.3 provides assistance in the selection of suitable species. and **PO21** Existing native vegetation that already contribute to these requirements are retained where their removal is not required to site the use.
Street lighting and street signs
PO22 If reconfiguring a lot –street lighting is provided to meet public safety needs in compliance with Australian best practice standards, methodology and design.

Table 6.3.2 For assessable development

Performance Outcomes
and **PO23** If reconfiguring a lot – street signage identifies street names in compliance with Australian best practice standards, methodology and design.
Water supply infrastructure
If in a water supply area **PO24** The reticulated water supply has sufficient capacity and water quality to meet the development demand for potable use, operational use and emergency purposes without interfering with supply to existing development. and **PO25** The installation and location of water meters allows lawful access by the relevant authority. **If outside a water supply area** **PO26** A water supply is provided to meet the development demand of the intended use.
Sewerage infrastructure
If in a reticulated sewerage area **PO27** The reticulated sewerage has sufficient capacity to meet the development demand of the proposed use without interfering with supply to existing development. **In all circumstances** **PO28** The disposal of effluent and other wastewater protects public health and safety and the environment.
Developments accessed by common private title
PO29 Development is located on streets where fire hydrants are provided at no more than: (a) 90m intervals for non-residential streets; or (b) 120m intervals for residential streets; and (c) at each street intersection; or **PO30** Development provides internal fire hydrants at intervals no less than as identified in PO29. and **PO31** Fire hydrants are identified by reflective blue road surface markers or reflective marker posts. and **PO32** Road access minimum clearances of 3.5m width and 4.8m height are provided.
Stormwater drainage
PO33 Stormwater drainage: (a) detains, collects, reuses or otherwise manages stormwater without adversely affecting upstream or downstream premises; (b) directs stormwater to one or more legal points of discharge or to downstream properties, subject to the consent of the affected landowners; (c) protects the efficiency of downstream drainage; (d) protects and maintains environmental values and quality of downstream water by removing or reducing sediment, nutrients and other pollutants; and **PO34** Development has no significant impact on the concentration or discharge rate of surface water flows from a development site. and **PO35** Works effectively control onsite erosion and the release of sediment or sediment-laden stormwater from the site. and **PO36** Works do not result in an increased risk to people and property from the effects of stormwater drainage or containment structure failure.
Parks
PO37 The design and construction of parks and park infrastructure is in accordance with current Australian standards. and **PO38** No land is dedicated open space recreation parkland that is subject to inundation during a 2% AEP rainfall event.

Table 6.3.2 For assessable development

Performance Outcomes
Waste
PO39 Waste generated by the development is collected and stored in a manner that: (a) prevents the intrusion of vermin; (b) does not create an odour nuisance; (c) contains all litter and refuse; (d) is kept clean; (e) screens the storage area and waste receptacles from view from external to the site; (f) does not result in any contamination of the environment; and **PO40** The development utilises waste management systems that promote recycling, reuse and reduction of waste being disposed of to landfill. and **PO41** The discharge of trade waste protects: (a) the health and safety of people working in and around the sewerage system; (b) receiving environments from harmful substances; (c) the sewerage treatment plants and sewage systems from damage from harmful substances; (d) assists treatment plants to process sewage and produce recycled water and bio-solids of a guaranteed quality;

Table 6.3.3 Vehicle parking rates

Development	Parking space rate	Service vehicle provision
Agriculture supplies store	1 per 25m² GFA	1 AV
Animal keeping	1 per employee plus 5 additional	1 SRV
Aquaculture, Intensive animal industry, Intensive horticulture, Renewable energy facility	1 per employee	No rate specified
Bulk landscape supplies	1 per 200m² of total use area with a minimum of 5 spaces	1 HRV
Caretaker's residence	1	Nil
Car wash	1 per 2 wash bays	No rate specified
Cemetery	30 plus one 1 per 2 employees	Nil
Child care centre	1 per 5 children	Nil
Club	No rate specified	1 SRV
Community care centre	No rate specified	Nil
Community residence	2	Nil
Community use, Food and drink outlet, Function facility, Hotel	1 per 20m² GFA	1 SRV
Dual occupancy, Dwelling house	2 per dwelling; may be provided in tandem	Nil
Dwelling unit	1 per 1 or 2 bedroom unit; 2 for each unit of 3 or more bedrooms	Nil
Educational establishment	Pick-up/drop-off (2minutes max) – 20% of short term supply Short-term (15 minutes max) – 1 per 15 students Long-term (staff/visitor) – 0.7 per staff member Preparatory/special education – 1 per 8-10 students	1 SRV
Emergency services	No rate specified	No rate specified
Environment facility	No rate specified	No rate specified
Extractive industry	No rate specified	No rate specified
Funeral parlour, Place of worship	0.3 per each square metre of GFA	1 SRV
Garden centre, Wholesale nursery	1 per 100m^2 of use area open to the public	1 HRV

Table 6.3.3 Vehicle parking rates

Development	Parking space rate	Service vehicle provision
Hardware and trade supplies	1 per 50m² GFA	Up to 500m² GFA – 1 HRV; 500m² – 1,999m² GFA – 1 AV; otherwise – no rate specified
Health care service	5 for each practitioner	1 ambulance space if more than 2 practitioners
High impact industry, Low impact industry, Medium impact industry, Service industry, Special industry	1 space per employee plus one 1 per 100m^2 GFA	Up to 500m² GFA – 1 HRV; 500m² – 1,999m² GFA – 1 AV; otherwise – no rate specified
Home-based business	1 per non-resident employee plus 1 customer space	Nil
Hospital	1 per 4 beds, plus 1 per 2 employees, plus 1 per staff doctor	1 ambulance space
Indoor sport and recreation	No rate specified	No rate specified
Market	8 per 100m^2 of stall area (excluding access paths)	Nil
Motor sport facility	No rate specified	No rate specified
Multiple dwelling	1 per 1 and 2 bedroom dwelling, 2 for each dwelling with 3 or more bedrooms and 1 visitor space for every 5 dwelling of developments of 5 or more dwellings	1 SRV where more than 10 units
Nature-based tourism	1 per cabin/site plus 1 per manager	Nil
Office, Sales office	1 space per 30m^2 GFA	No rate specified
Outdoor sales	1 space per 150m^2 of total use area	No rate specified
Outdoor sport and recreation	No rate specified	No rate specified
Relocatable home park, Retirement facility	1 per dwelling unit site, plus 1 visitor space for every 5 dwelling unit sites where development contains 5 or more dwelling sites	No rate specified
Residential care facility	1 space per 10 beds, plus 1 visitor space per 2 beds, plus 1 per 2 employees	No rate specified
Rooming accommodation	0.5 per bedroom, plus 0.25 visitor spaces per bedroom, plus 1 per manager	Nil
Rural industry, Winery	2 spaces plus 1 space per 100m^2 of GFA	No rate specified
Rural workers' accommodation	No rate specified	No rate specified
Service station	2 plus one 1 space per 25m^2 GFA	1 AV
Shop	1 space per 20m^2 total use area	Up to 500m² GFA – 1 HRV; 500m² – 1,999m² GFA – 1 AV; otherwise – no rate specified
Shopping centre, Showroom	1 space per 50m^2 total use area	Up to 500m² GFA – 1 HRV; 500m² – 1,999m² GFA – 1 AV; otherwise – no rate specified
Short-term accommodation	1 space per unit plus 50% of the requirement for each ancillary use	1 SRV
Theatre	2 per 5 seats	No rate specified
Tourist park	1 per dwelling unit site, plus 1 visitor space for every 10 dwelling unit sites	1 SRV

Table 6.3.3 Vehicle parking rates

Development	Parking space rate	Service vehicle provision
Transport depot	No rate specified	No rate specified
Veterinary services	5 per practitioner	1 SRV
Warehouse	1 per 200m² of total use area	1 HRV
Wholesale nursery		
Winery		

Table 6.3.4 Provision of infrastructure

Zone	Roads			Off-street car parking	Water reticulation	Sewerage reticulation
	Width	Kerb & channel	Seal	Seal		
General Residential	Refer to CMDG	Yes	Yes	Yes	Yes	Yes
Centre		Yes	Yes	Yes	Yes	Yes
Recreation & Open Space		No	No	Yes	No, except for Banana, Baralaba and Thangool	No
Environmental Management & Conservation	Refer to the Rural Design Criteria in the CMDG	No	Refer to the Rural Design Criteria in the CMDG	No	No	No
Industry	Refer to CMDG	Yes	Yes	Yes	Yes	Yes
Special Industry		Yes	Yes	Yes	As per surrounding development	
Community Facilities		As per surrounding development				
Mixed Use	Refer to the Urban Design Criteria in the CMDG	Yes	Yes	Yes	Yes	Yes
Rural	Refer to CMDG	No	Refer to CMDG	No	No	No
Rural Residential		Yes	Yes	Yes	As per surrounding development	
Township		Yes	Yes	Yes	No, except for Banana, Baralaba and Thangool	No

6.3.2 Reconfiguring a Lot Code

6.3.2.1 Application

This code applies to assessing reconfiguring a lot where the code is identified as an assessment benchmark in the Categories of Assessment Table. When using this code, reference should be made to Section 1.6.1.

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APPENDIX J PER MAPPING - TO BE COMPLETED FOLLOWING ADEQUACY REVIEW

Instructions

1. Save this spreadsheet somewhere on your computer/network.

2. Enable Editing if required.

3. Fill in the **Data Template.**
- All fields in red text are mandatory.

4. Fill in the **Metadata Template.**
- All red cells are mandatory - typing within a red cell then clicking t
- The binary Yes / No is set to 'false' as default

Revison history
v2 23/3/2021 published as an xlsx file
macros removed - columns S-U contain drop drop list functions that
additonal fields added to cater for :

survey start and end dates
referral id and SPRAT id if known
basis of record

:he Enter key reverts the fill colour to 'No Fill'.

: replace them - do not delete

NOTE: Fields in red are Mandatory Fields - all others are desirable but not mandatory.

FIELD	Referral_	X	Y	SOURCE_DATU	PRECISION	YEAR STA
DESCRIPTION	EPBC referral number	Longitude (Decimal degrees)	Latitude (decimal degrees)	Map datum used for the latitude and	Spatial precision in metres	Year of record or survey
DATA FORMAT	Text (15)	Double (11,8) i.e. 8 decimal places	Double(11,8)	Text	Integer	Integer (4)
	2024/09842	150.4566661	-24.89806751	GDS84	~50 m	2023
	2024/09842	150.4574656	-24.8952638	GDS84	~50 m	2023
	2024/09842	150.4576366	-24.89331608	GDS84	~50 m	2023
	2024/09842	150.4551031	-24.89633797	GDS84	~50 m	2023
	2024/09842	150.5155812	-24.9094395	GDS84	~50 m	2023
	2024/09842	150.5178431	-24.9107417	GDS84	~50 m	2023
	2024/09842	150.5289551	-25.02360043	GDS84	~50 m	2023
	2024/09842	150.5254527	-25.0197128	GDS84	~50 m	2023
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	2024/09842	150.5267292	-25.02081918	GDS84	~50 m	2023
	2024/09842	150.5271283	-25.02091726	GDS84	~50 m	2023
	2024/09842	150.4582479	-24.89387472	GDS84	~50 m	2023
	2024/09842	150.4565088	-24.89546103	GDS84	~50 m	2023
	2024/09842	150.353984	-24.776083	GDS84	~50 m	2024
	2024/09842	150.533873	-24.935772	GDS84	~50 m	2024
	2024/09842	150.51804	-24.916101	GDS84	~50 m	2024
	2024/09842	150.517782	-24.915488	GDS84	~50 m	2024
	2024/09842	150.518699	-24.914861	GDS84	~50 m	2024
	2024/09842	150.518925	-24.914939	GDS84	~50 m	2024
	2024/09842	150.51878	-24.914398	GDS84	~50 m	2024

	2024/09842	150.517498	-25.00793	GDS84	~50 m	2024
	2024/09842	150.516124	-25.008771	GDS84	~50 m	2024
	2024/09842	150.516976	-25.007223	GDS84	~50 m	2024
	2024/09842	150.3557651	-24.82400918	GDS84	~50 m	2023
	2024/09842	150.2746808	-24.918487	GDS84	~50 m	2023
	2024/09842	150.5285766	-25.02608226	GDS84	~50 m	2023
	2024/09842	150.5137196	-24.90882884	GDS84	~50 m	2023
	2024/09842	150.5039837	-25.01211853	GDS84	~50 m	2023
	2024/09842	150.526939	-25.010638	GDS84	~50 m	2024
	2024/09842	150.348513	-24.776649	GDS84	~50 m	2023
	2024/09842	150.341625	-24.778195	GDS85	~50 m	2023
	2024/09842	150.360575	-24.986942	GDS86	~50 m	2023
	2024/09842	150.406724	-25.028166	GDS87	~50 m	2023
	2024/09842	150.380716	-25.014445	GDS88	~50 m	2022

MONT	DAY S	YEAR END	MONTH E	DAY END	LOCALITY	ORDER	FAMILY
Month of recor	Day of recor	Year of survey end in	Month of survey	Day of survey end	Location where taxon was recorded	Taxon order name (where available)	Taxon family name (where available)
Integer (2)	Integer (2)	Integer (4)	Integer (2)	Integer (2)	Text (500)	Text	Text
6	5	2023	6	5	Theodore, Shire of Banana, QLD	Diprotodontia	Pseudocheiridae
6	5	2023	6	5	Theodore, Shire of Banana, QLD	Diprotodontia	Pseudocheiridae
6	5	2023	6	9	Theodore, Shire of Banana, QLD	Diprotodontia	Pseudocheiridae
6	5	2023	6	5	Theodore, Shire of Banana, QLD	Diprotodontia	Pseudocheiridae
6	6	2023	6	6	Theodore, Shire of Banana, QLD	Diprotodontia	Pseudocheiridae
6	6	2023	6	6	Theodore, Shire of Banana, QLD	Diprotodontia	Pseudocheiridae
6	5	2023	6	9	Theodore, Shire of Banana, QLD	Diprotodontia	Pseudocheiridae
6	5	2023	6	9	Theodore, Shire of Banana, QLD	Diprotodontia	Pseudocheiridae
6	5	2023	6	9	Theodore, Shire of Banana, QLD	Diprotodontia	Pseudocheiridae
6	5	2023	6	9	Theodore, Shire of Banana, QLD	Diprotodontia	Pseudocheiridae
6	5	2023	6	9	Theodore, Shire of Banana, QLD	Diprotodontia	Pseudocheiridae
6	5	2023	6	5	Theodore, Shire of Banana, QLD	Diprotodontia	Pseudocheiridae
6	5	2023	6	5	Theodore, Shire of Banana, QLD	Diprotodontia	Pseudocheiridae
9	23	2024	9	28	Theodore, Shire of Banana, QLD	Diprotodontia	Pseudocheiridae
9	23	2024	9	28	Theodore, Shire of Banana, QLD	Diprotodontia	Pseudocheiridae
9	23	2024	9	28	Theodore, Shire of Banana, QLD	Diprotodontia	Pseudocheiridae
9	23	2024	9	28	Theodore, Shire of Banana, QLD	Diprotodontia	Pseudocheiridae
9	23	2024	9	28	Theodore, Shire of Banana, QLD	Diprotodontia	Pseudocheiridae
9	23	2024	9	28	Theodore, Shire of Banana, QLD	Diprotodontia	Pseudocheiridae
9	23	2024	9	28	Theodore, Shire of Banana, QLD	Diprotodontia	Pseudocheiridae

9	23	2024	9	28	Theodore, Shire of Banana, QLD	Diprotodontia	Pseudocheiridae
9	23	2024	9	28	Theodore, Shire of Banana, QLD	Diprotodontia	Pseudocheiridae
9	23	2024	9	28	Theodore, Shire of Banana, QLD	Diprotodontia	Pseudocheiridae
12	4	2023	12	8	Theodore, Shire of Banana, QLD	Columbiformes	Columbidae
9	25	2023	10	13	Theodore, Shire of Banana, QLD	Columbiformes	Columbidae
3	27	2023	3	31	Theodore, Shire of Banana, QLD	Diprotodontia	Phascolarctidae
6	5	2023	6	9	Theodore, Shire of Banana, QLD	Diprotodontia	Phascolarctidae
6	5	2023	6	9	Theodore, Shire of Banana, QLD	Diprotodontia	Phascolarctidae
9	23	2024	9	28	Theodore, Shire of Banana, QLD	Diprotodontia	Phascolarctidae
3	27	2023	3	31	Theodore, Shire of Banana, QLD	Chiroptera	Vespertilionidae
2	13	2023	2	17	Theodore, Shire of Banana, QLD	Chiroptera	Vespertilionidae
2	13	2023	2	17	Theodore, Shire of Banana, QLD	Chiroptera	Vespertilionidae
2	13	2023	2	17	Theodore, Shire of Banana, QLD	Chiroptera	Vespertilionidae
10	17	2022	10	22	Theodore, Shire of Banana, QLD	Chiroptera	Vespertilionidae

SPRAT_ID	SCIENTIFIC_N	COMMON NA	SOURCE INS	SITE / VISIT IDENTIFIER	INSTITU
SPRAT TAXON_ID that matches	Scientific name (Genus	Common name for the species	Enter the name of the institution	Unique visit/survey number	Your specim en/rec
Integer (10)	Text	Text	Text	Text	Text
254	*Petauroides vo*	Greater glider	ERM	June2023	
254	*Petauroides vo*	Greater glider	ERM	June2023	
254	*Petauroides vo*	Greater glider	ERM	June2023	
254	*Petauroides vo*	Greater glider	ERM	June2023	
254	*Petauroides vo*	Greater glider	ERM	June2023	
254	*Petauroides vo*	Greater glider	ERM	June2023	
254	*Petauroides vo*	Greater glider	ERM	June2023	
254	*Petauroides vo*	Greater glider	ERM	June2023	
254	*Petauroides vo*	Greater glider	ERM	June2023	
254	*Petauroides vo*	Greater glider	ERM	June2023	
254	*Petauroides vo*	Greater glider	ERM	June2023	
254	*Petauroides vo*	Greater glider	ERM	June2023	
254	*Petauroides vo*	Greater glider	ERM	June2023	
254	*Petauroides vo*	Greater glider	ERM	Sep2024	
254	*Petauroides vo*	Greater glider	ERM	Sep2024	
254	*Petauroides vo*	Greater glider	ERM	Sep2024	
254	*Petauroides vo*	Greater glider	ERM	Sep2024	
254	*Petauroides vo*	Greater glider	ERM	Sep2024	
254	*Petauroides vo*	Greater glider	ERM	Sep2024	

254	*Petauroides vo*	Greater glider	ERM	Sep2024	
254	*Petauroides vo*	Greater glider	ERM	Sep2024	
254	*Petauroides vo*	Greater glider	ERM	Sep2024	
64440	*Geophaps scrip*	Squatter pigeon (southern)	ERM	June2023	
64440	*Geophaps scrip*	Squatter pigeon (southern)	ERM	June2023	
85104	*Phascolarctos c*	Koala	ERM	June2023	
85104	*Phascolarctos c*	Koala	ERM	June2023	
85104	*Phascolarctos c*	Koala	ERM	June2023	
85104	*Phascolarctos c*	Koala	ERM	Sep2024	
183	*Chalinolobus d*	Large-eared pied bat	ERM	March2023	
183	*Chalinolobus d*	Large-eared pied bat	ERM	Feb2023	
183	*Chalinolobus d*	Large-eared pied bat	ERM	Feb2023	
183	*Chalinolobus d*	Large-eared pied bat	ERM	Feb2023	
183	*Chalinolobus d*	Large-eared pied bat	ERM	Oct2022	

HABITAT
Habitat/vegetation/ecosystem type
Text
grassland and cleared areas
Riparian woodland and open forest dominated by Eucalyptus tereticornis often associated with stream channels
Eucalypt woodland and open forest dominated by Eucalyptus crebra with a grassy understorey +/- E. populnea +/- C. tessellaris +/- E. tereticornis +/- C. erythrophloia +/- E. melanophloia +/- C. citriodora.
Riparian woodland and open forest dominated by Eucalyptus tereticornis often associated with stream channels
Riparian woodland and open forest dominated by Eucalyptus tereticornis often associated with stream channels
Riparian woodland and open forest dominated by Eucalyptus tereticornis often associated with stream
Eucalypt woodland and open forest dominated by Eucalyptus crebra with a grassy understorey +/- E. populnea +/- C. tessellaris +/- E. tereticornis +/- C. erythrophloia +/- E. melanophloia +/- C. citriodora.
Eucalypt woodland and open forest dominated by Eucalyptus crebra with a grassy understorey +/- E. populnea +/- C. tessellaris +/- E. tereticornis +/- C. erythrophloia +/- E. melanophloia +/- C. citriodora.
Riparian woodland and open forest dominated by Eucalyptus tereticornis often associated with stream
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Riparian woodland and open forest dominated by Eucalyptus tereticornis often associated with stream
Eucalypt woodland and open forest dominated by Eucalyptus crebra with a grassy understorey +/- E. populnea +/- C. tessellaris +/- E. tereticornis +/- C. erythrophloia +/- E. melanophloia +/- C. citriodora.
Riparian woodland and open forest dominated by Eucalyptus tereticornis often associated with stream
Riparian woodland and open forest dominated by Eucalyptus tereticornis often associated with stream
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Eucalypt woodland and open forest dominated by Eucalyptus crebra with a grassy understorey +/- E. populnea +/- C. tessellaris +/- E. tereticornis +/- C. erythrophloia +/- E. melanophloia +/- C. citriodora.
Riparian woodland and open forest dominated by Eucalyptus tereticornis often associated with stream channels
grassland and cleared areas
grassland and cleared areas
Eucalypt woodland and open forest dominated by Eucalyptus crebra with a grassy understorey +/- E. populnea +/- C. tessellaris +/- E. tereticornis +/- C. erythrophloia +/- E. melanophloia +/- C. citriodora.
Riparian woodland and open forest dominated by Eucalyptus tereticornis often associated with stream channels
grassland and cleared areas
Riparian woodland and open forest dominated by Eucalyptus tereticornis often associated with stream channels
grassland and cleared areas
grassland and cleared areas
Brigalow woodland dominated by Acacia harpophylla +/- Casuarina spp.
Eucalypt woodland and open forest dominated by Eucalyptus crebra with a grassy understorey +/- E. populnea +/- C. tessellaris +/- E. tereticornis +/- C. erythrophloia +/- E. melanophloia +/- C. citriodora.
Riparian woodland and open forest dominated by Eucalyptus tereticornis often associated with stream channels

LANDFC	SLOP	ASPE	ABUNDAN	PRESEN	CORE S	BASIS OF RECORD	RECORD TYPE
Positio n in landsca	Degr ees from	Deg rees from	Number of taxa counted	Recordi ng of an Absenc	Wheth er the site is	The way the species was detected: e.g.sighting , heard call,	The type of record: Survey, Incidental,
Text	Text	Text	Integer	Boolean	Text	Text	Text
			1			Sighting	Incidental
			1			Sighting	Incidental
			2			Sighting	Incidental
			1			Sighting	Incidental
			1			Sighting	Incidental
channels			1			Sighting	Incidental
			1			Sighting	Incidental
			1			Sighting	Incidental
channels			1			Sighting	Incidental
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			1			Sighting	Incidental
			1			Sighting	Incidental
			1			Sighting	Incidental
			2			Sighting	Incidental
			1			Sighting	Incidental
			1			Evidence - scats	Incidental
			1			Evidence - tree scratches	SAT survey
			1			Evidence - koala signs prese	SAT survey
			1			Heard bellowing	Incidental
			1			Echolocation analyses - detected as Probable	Anabat survey
			1			Echolocation analyses - detected as Probable	Anabat survey
			1			Echolocation analyses - detected as Probable	Anabat survey
			1			Echolocation analyses - detected as Probable	Anabat survey
			1			Echolocation analyses - detected as Probable	Anabat survey

VOUCHER SPECIMEN	COMMENTS
Cross reference to Institution and number of voucher specimen, use	Any special comments, including on weather,
Text	Text
n/a	
n/a	
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1. DATASET TITLE

1.1 Title

2. PROJECT INFORMATION

2.1 Referral ID

2.2 Project Title

2.3 Please provide a brief summary of the project which led to the establishment of the dataset. (Succinctly give a background to the project and describe the project's aims and objectives)

2.4 Is the project described above part of a larger research activity?

3. DATASET DESCRIPTION

3.1 Please provide a summary of the dataset. (Briefly describe the method of data collection and types of data or variables/attributes observed/measured/recorded.)

3.2 What is the version number of the dataset? (use 1.0 for first submission, then 2.0 when adding a subsequent year to a time-series dataset, etc)

3.3 Is information about the dataset already available in another publicly accessible repository?

3.4 How many study locations does the dataset comprise?

3.4.1 Does the dataset contain repeat visits to the study locations?

3.5 Please provide some keywords that you believe will enhance the datasets discoverability

4. DATASET CONTENT

4.1 What areas of ecological research best describe your dataset?

4.2 What type of 'threats and pressures' (or anthropogenic disturbance) themes does the dataset contain?

(click cells for dependant drop-down)

4.3 What are the potential threat impacts that the dataset contains? (choose one each from Timing, Scope and Severity)

Timing

Scope

Severity

4.4 What types of conservation actions / themes does the dataset contain?

5. SPATIAL COVERAGE

5.1 What is the scale of study of this dataset?

5.2 Please describe the geographical extent that your dataset covers. (description of the spatial coverage, in terms of the whole or part of the Park, but also including landscapes or geographic regions covered)

5.3 What IBRA (Interim Biogeographical Regionalisation of Australia) Region(s) is the dataset located in?

6. DATES

6.1 What were the start and end dates of data collection for this dataset (First and Last Visits)

7. DATASET SPECIES

7.1 Does your dataset contain observations/measurements of plants?

7.2 Please specify broader plant group(s) which could include the plant species covered by your dataset.

7.3 Does your dataset contain animal observations/measurements?

7.4 Please specify broader animal group(s) which could include the animal species covered by your dataset.

8. ENVIRONMENTAL FEATURES

8.1 Select one or more environmental/landscape features whether recorded in the dataset or associated with the dataset.

(may need to scroll up to see attributes in sub-feature)

9. ASSOCIATED/SUPPLEMENTARY MATERIALS

9.1 Identify the type of the associated/supplementary material? (E.g. field manuals, scientific papers, etc)

9.2 What is the name or title of the associated material (Provide correct reference/citation for material)

9.3 If a persistent identifier uniquely describes the associated/supplementary material, please choose the type of identifier

9.4 What is the persistent identifier of the associated material?

10. DATA COLLECTION METHODS

10.1 Please select a sampling design that best describes how your data collection approach was established.

10.2 What sampling techniques best describe the ones you used to collect the data?

Fauna Sampling

10.2

Flora Sampling

10.3 What types of measurements or observations does the dataset include?

10.4 What attributes were measured or observed and included in the dataset?

10.5 Please provide a description of the methods used to collect the data.

What is the name of the method used to collect data?

Please describe the method used to collect the data. (The specific and detailed methods for sampling and data collection at each point/plot – as if you were writing up methods for a journal article. Include equipment used. If multiple procedures were followed, outline each procedure separately. For example you may have separate procedures for site/station set up; species counts/observations; vegetation assessment; etc)

If the method has changed over the period of the project, please describe how and when the method has changed.

10.6 What other information was collected as a part of the dataset for further identification, analysis and/or record keeping?

11. DATASET CONTACT

11.1 Contact details

Title:

Name:

Position / Role:

Telephone:

Email:

Postal Address:

11.7 For which organisation does the dataset contact work?

12. DATASET AUTHORS

12.1 Author's Initials

12.2 Author's Surname or Organisation

12.3 Author's Affiliation

13. DATASET CONDITIONS OF USE

13.1 What type of open access license is applicable to the dataset?

13.2 Where other non-author contributors to the dataset should be acknowledged, please provide a corresponding statement. (Add details of anyone involved in the research that you would like to credit.)

13.3 Where the dataset is under embargo, please provide the final date of the embargo.

13.4 Dataset Custodians(s)

Select the organisation(s) considered to have legal custodianship of the dataset (i.e. intellectual property rights of the dataset)?

Custodian organisation type?

14. DATASET MANAGEMENT

14.1 What is the activity status of the dataset?

14.2 What curation activities have been applied to the dataset?

14.2.1 Where the dataset has been curated in a way which is not part of the above list, please specify such curation activities.

14.3 When was the dataset last updated or curated?

15. DATA FILE SUBMISSION

Submission Data File:

File Type:

File Description (Please describe the types of data associated with this data file(s) (including tables, tabs, columns, measurements), an overview of the data file types and their format. If you have submitted an MS Excel file and have inserted a "Readme" tab as part of the file, make a note of this in the File Description.)

File Format:

Format Version:

EPBC Act listed species observat

Theodore Energy Development Pty Lt
township of Theodore, 50 km west of

☐ Yes/No No = False

The species observations dataset cor
includes any observations made durir
point is collected using ARC GIS Fiel
and scientific name of the species ob

☐ Yes/No

☑ Yes/No

Wind Farm

Biodiversity Inventory

Type Additional (if required)

Threat 1

IUCN Main — 2. Agriculture & aquaculture

IUCN Sub — 2.3. Livestock farming & ranching

IUCN Sub 2 (if required)

Ongoing

Affects the majority of the population

Causing or likely to cause fluctuations

Action 1

IUCN Main

IUCN Sub

IUCN Sub 2 (if required)

Landscape

This dataset covers the area in which

Brigalow Belt South Biogeographic Re

Type Additional

Start Date

End Date

☐ Yes/No

Type Additional

☑ Yes/No

	Group 1
Broad Animal Group	Birds
Group	Pigeons, Doves
Sub-Group (if required)	

	Feature 1
Environmental/Landscape Features	Native Vegetation
Sub-Feature	Eucalypt Woodlands
Type	
Sub-Type	

Derived Spatial Layers

Opportunistic Sampling

Visual Surveys

Type Additional

None

Type Additional

Derived - Count Data

Type Additional

Abundance/Cover

Type Additional

Seasonal field surveys were undertak
the field surveys was based on Comm
habitats and their condition, and co
those s
Field surveys were required to sampl
the nine field investigations and desk
and sampling within vegetat
Species observations with

EPBC Act listed species that were o
abun

BUS' involve 20-minute fix point surv
by the Band Model (Band, 2000).
Onshore Wind Farms – interim guida
sea
Each fixed-point survey site was loc
finders used to determine distances.
of prey) and large flocks of birds. Thi

There are two distinct seasons in nor
a total of 218 BUS across 24-month

Microbat surveys were conducted t
detectors (Anabats) placed throug
throughout the Study Area over the

Dr

Enter Date (dd/mm/yyyy)

ENTER DATA BELOW

Mandatory fields are red

tions within the Theodore Wind Farm Study Area, recorded across 9 survey efforts between 2022-2024

2024/09842

Theodore Wind Farm

:d proposes to develope the Theodore Wind Farm (the Proposed Action) approximately 22 km east of the
f Biloela and 150 km south-west of Gladstone, in the Banana Shire Council Local Government Area. The

FALSE

ıtains all observations of threatened and/or migratory species observed during the field survey periods. This
ıg specific survey methodology and any incidental observations. A threatend/migratory species observation
ld Maps to accurately record the location of the observation. Additional information includes: the common
served, the number of individuals observed at that location, whether the species is threatened or migratory,

1

FALSE

One

TRUE

, Koala, Greater Glider, Southern, squatter pigeon, Large-eared pied bat, Theodore

Biodiversity Inventory

Threat 2 Threat 3 Threat 4

ɛ & other problematic species, genes & diseases

Invasive non-native/alien species/diseases

Ongoing

Affects the majority of the population (50-90%)

Causing or likely to cause fluctuations

Action 2 Action 3 Action 4

Landscape

ı the proposed Theodore Wind Farm is located, being 46,830 ha, approximately 22 km east of Theodore and 50 km south of Biloela.

Brigalow Belt South Biogeographic Region

Start Date (17/10/2022)
End Date (28/09/2024)

FALSE

TRUE

Group 2	Group 3	Group 4
Mammals	Mammals	
Marsupials	Placentals	
Gliders, Ringtails	Native Bats	

Feature 2	Feature 3	Feature 4
Native Vegetation	Native Vegetation	None
Eucalypt Open Forests	Acacia Forests and Woodlands	

Derived Spatial Layers

Opportunistic Sampling

Visual Surveys

None

Derived - Count Data

Abundance/Cover

Observations during field surveys and incidental observations

ken over nine separate survey events from October 2022 to September 2024. The methodology adopted for
nonwealth survey guidelines and focused on describing the vegetation communities present, flora and fauna
mpleting targeted surveys for listed threatened species identified within the PMST report, and particularly
pecies and fauna groups vulnerable to wind farm impacts (i.e., birds and bats).
e planned areas of disturbance, including areas subject to direct and indirect impacts. The information from
ktop studies provide a robust description of the ecological values of the Study Area, with sufficient coverage
:ion communities and potential habitats to meet required Commonwealth survey effort guidelines.
nin this dataset were collected from five methodlogies conducted during this field survey period.

Incedental sightings:

bserved outside of the schedualed field surveys were recorded as incedental sightings. The species name,
dance, location and threatend status were recorded with a photo if possible.

Bird Utlisation Surveys (BUS):

eys to provide data based on the species present and their height, speed and direction of flight as stipulated
As surveys commenced in October 2022, the BUS survey design was implemented with reference to the
ance on bird and bat management (DAWE, 2021), which required BUSs to be completed over each relevant
ason over a minimum of 24 months prior to commissioning of a wind farm.
:ated to provide a search radius of at least 100 m for small birds and up to 800 m for large birds with range
Searches primarily focused on birds most likely to be affected by the Proposed Action, such as raptors (birds
is technical requirement for BUS' is outlined in AusWind's Report, Wind Farms and Birds: Interim Standards
for Risk Assessment (AusWEA, 2006).
thern Queensland and surveys have included our survey periods in the wet season and four in the dry, with
n period to inform the species use across the Study Area as part of the risk assessment for threatened birds
with the potential to be impacted by turbine strike.

Bat Surveys

o determine the presence/absence of bats within and surrounding the Study Area, with four ultrasonic bat
ghout the relevant properties in the Study Area. The four Anabat devices were placed in 10 total locations
e October 2022, February, March and June 2023 field surveys. Anabats were not deployed during the June

No other information additional to the above is collected

Dr
David Dique
Lead Partner
0432 251 592
David.dique@erm.com
Level 9, 260 Queen Street, Brisbane QLD 4000
Environmental Resources Management Australia Pty Ltd (ERM)

D.D
ERM
ERM

NA

NA

NA

RWE Renewables Europe & Australia

Private

Table in MS Excel as required by DCCEEW

Notes

These columns control the

Do not delete

g1

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drop down lists

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c1		c3	
	#N/A		#N/A
	#N/A		#N/A

c2 c4

#N/A #N/A

#N/A #N/A

g3

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APPENDIX L COMMUNITY ENGAGEMENT REPORT



Community Engagement Report

Theodore Wind Farm

Prepared for: RWE Renewables Australia Pty Ltd

Date: 14/05/2025

Document information

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Attexo Group Pty Ltd 2025
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Executive Summary

Overview

Theodore Energy Development Pty Ltd (TED) is a wholly owned subsidiary of RWE Renewables Europe & Australia (RWE). TED proposes to develop, construct and operate the Theodore Wind Farm on land located approximately 22 km east of Theodore in the Banana Shire Council (BSC) local government area. The Project is approximately 46,830 ha in size, consisting of nine lots on three private properties. The total development footprint has a maximum area of approximately 1,900 ha, which is about 4% of the Project area.

In September 2024, RWE submitted the development application for the Theodore Wind Farm to the State Assessment and Referral Agency (SARA). The Deputy Premier and Minister for Planning issued a direction notice on 16 January 2025 to suspend the assessment of the application for four months to allow the Planning Minister to consider the assessment framework. Since that time, State code 23 has been updated and now includes further requirements relating to social impacts and community and stakeholder engagement.

Although the Project is subject to the previous version of State code 23 (v3.1), this report has been prepared to address the updated requirements in State code 23 (v3.2). Specifically, this report provides information to demonstrate RWE's compliance with the new Performance Outcome (PO) 26 – *Impacts on communities and individuals are identified, addressed and mitigated to avoid any adverse impacts*. In accordance with the Planning guideline for State code 23: Wind farm development, this report includes:

- a profile of the Theodore community and analysis of key stakeholders and Project Area of Influence (see Figure 2.1)
- details of all pre-lodgement engagement activities undertaken
- a summary of the nature of stakeholder feedback and issues raised during engagement activities
- details of how feedback and issues have been or will be addressed
- copies of documents evidencing outcomes from engagement activities, including with BSC.

Key findings

RWE delivered a comprehensive stakeholder and community engagement program consistent with the new requirements set out in the updated State code 23 (v3.2). RWE's approach to community and stakeholder engagement is underpinned by the principles of honesty, respect, adaptability, consistency and consideration.

RWE has demonstrated these principles by adapting community engagement activities to meet the community's needs and being transparent about potential project impacts. For example, RWE:

- Worked closely with Banana Shire Council from the outset of project development to inform project design, workforce accommodation plans, and to provide long-term housing benefits to the wider community, with Council a strong supporter of the project, evidenced by their letter of support.
- Increased the duration of community drop-in sessions to all day events to provide people in the community with greater opportunity to attend.
- Provided technical reports to the community, addressing queries and questions about potential impacts and management measures.
- Proactively engaged with directly impacted stakeholders on aerial mustering, workforce accommodation, noise, traffic and local procurement to identify issues, opportunities and management measures.
- Engaged early with Wulli Wulli people to guide project design and applied the avoidance principle to cultural heritage management.
- Received positive feedback from the community and a representative of the Federal Member of Parliament regarding their approach to community engagement.

- Provided $100,000 of social investment to grassroots community organisations, with an ongoing public commitment to $100,000 in community funds per year of development, and $500,000 per year during construction and lifetime operations.
- Established a complaints channel both via email and toll-free number as a platform for the community to resolve issues. To date no formal complaints have been received.

The community is largely supportive of the Project. Queries received from the community about the Project related to noise, visual amenity, local housing, biodiversity, cultural heritage, and traffic. These issues have been or will be addressed in relevant technical assessments and management plans submitted as part of the development application. Several matters require ongoing stakeholder and community engagement including workforce accommodation, construction traffic, potential demands on council infrastructure, services and materials. Agreements are currently in development with key stakeholders regarding potential project impacts and benefits, including a memorandum of understanding (MOU) and infrastructure agreement with BSC.

Potential benefits were also identified in consultation with key stakeholders. Potential benefits include but are not limited to:

- upskilling Wulli Wulli people to work on Project construction
- supporting local businesses through procurement opportunities
- improving telecommunications, and meeting community needs through the sponsorship fund and legacy projects
- project benefit programs and plans are being or will be developed in consultation with key stakeholders, including Shared Benefits and Project Services Agreement with the Wulli Wulli Nation Aboriginal Corporation (WWNAC)
- Local Participation Plan and Indigenous Participation Plan with local and regional councils and chambers of commerce, and a community benefit fund with the local community.

RWE has developed a proposed forward engagement plan with actions linked to monitoring mechanisms to guide the resolution of key matters and development of agreements, plans and programs for the Project.

Conclusion

RWE's comprehensive community and stakeholder engagement program has identified potential project impacts and benefits and provided a platform to address and mitigate potential impacts to avoid adverse impacts on the community. Their proactive and transparent engagement approach has resulted in zero complaints to date.

RWE has designed the Project to avoid and mitigate adverse impacts on the community and is developing agreements, programs and plans in consultation with stakeholders to ensure potential impacts during construction and operation are in the first instance avoided. If identified and impacts are unavoidable, RWE's forward program will establish mechanisms to manage and mitigate these impacts and to realise potential benefits that deliver practical social value.

1. Introduction

1.1 Background

Theodore Energy Development Pty Ltd (TED) is a wholly owned subsidiary of RWE Renewables Europe & Australia (RWE). TED proposes to develop, construct and operate the Theodore Wind Farm on land located approximately 22 km east of Theodore in the Banana Shire Council Local Government Area. The Project is approximately 46,830 ha in size, consisting of nine lots on three private properties. The total development footprint has a maximum area of approximately 1,900 ha, which is about 4% of the Project area.

In September 2024, RWE submitted the development application for the Theodore Wind Farm to the State Assessment and Referral Agency (SARA). The Deputy Premier and Minister for Planning issued a direction notice on 16 January 2025 to suspend the assessment of the application for four months to allow the Planning Minister to consider the assessment framework. Since that time, State code 23 has been updated and now includes further requirements relating to social impacts and community and stakeholder engagement.

1.2 Purpose and scope of the report

The purpose of this report is to demonstrate that RWE has met the requirements of the updated State Code 23 (v3.2), specifically Performance Outcome (PO) 26 – *Impacts on communities and individuals are identified, addressed and mitigated to avoid any adverse impacts*.

In accordance with the Planning guideline for State code 23: Wind farm development, all wind farm applications need to prepare and submit a Community Engagement Report.

This report presents a summary of information provided in the Project's Community and Stakeholder Engagement Plan, reports prepared for the Project's development application and information provided by RWE regarding community and stakeholder engagement undertaken for the Project to date.

1.3 Structure of the report

The report outlines the following:

- Section 2 – Community profile
- Section 3 – Stakeholder engagement, including:
  - analysis of key stakeholders
  - details of all pre-lodgement engagement activities undertaken
- Section 4 – Stakeholder feedback, including:
  - the nature of stakeholder feedback and issues raised during engagement activities
  - how feedback and issues have been or will be addressed
  - any documents evidencing outcomes from engagement activities.
- Section 5 – Complaint and investigation response plan
- Section 6 – Proposed forward engagement plan
- Section 7 – Conclusion
- Section 8 – References.

1.4 Methodology

The methodology for preparing this report involved the following steps:

- reviewed plans and reports prepared for the Project and identified gaps requiring further engagement

- liaised with RWE to confirm outcomes of engagement and status of engagement activities undertaken since the development application was submitted
- built on information from plans and reports prepared for the Project to present a comprehensive summary of engagement activities, outcomes of engagement and responses to engagement
- prepared a proposed forward engagement plan including planned engagement activities, and activities to address gaps and resolve Project matters with key stakeholders.

2. Community profile

The information in this section is based on the community context from the Theodore Wind Farm Community & Stakeholder Engagement Plan (v4) prepared by Premier Strategy in December 2024.

2.1 Project site context

The proposed Theodore Wind Farm site is in Central Queensland, about 22 km east of Theodore and 40 km south-west of Biloela (Figure 2.1). RWE has agreements in place with all the project landowners.

The site is used for cattle grazing. Due to the land use much of the site has been cleared of native woodland and forest vegetation, with scattered vegetation in some areas.

The road network near the site incorporates a range of local and state sealed and unsealed roads including Defence Road, Crowsdale-Camboon Road, and the Leichardt Highway. Additional infrastructure on the site and in the surrounding regions includes farm residences and agricultural infrastructure, unsealed tracks, fencing, outbuildings, dams, private roads and sheds.

The Social and Economic Impact Assessment, which was submitted as part of the development application, identified a Primary and Secondary area of influence (AoI) (Figure 2.1). The Primary AoI consists of the Project Site and an area 5 km from the site boundary, including the Urban Centres and Localities (UCL) of Theodore, Banana, Moura, and Biloela (Figure 2.1). The Secondary AoI consists of the Local Government Areas of the Banana Shire LGA and Gladstone Region LGA (Figure 2.1). For context, the surrounding local government areas of Rockhampton, Livingstone, Isaac, Central Highlands, Woorabinda Aboriginal Shire, Bundaberg, North Burnet, and Western Downs are included in Figure 2.1.



- Cities and Towns
- Project Area
- Primary Area of Influence
- Secondary Area of Influence
- Local Government Area

THEODORE WIND FARM
Project Area of Influence

Figure 2.1

N

0 km 50

GDA2020 MGA Zone 56

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REVIEWED: SS | **DRAWN:** JT | **SCALE (A3):** 1:1,500,000 | **DATE:** 25/03/2025 | **DWG No:** RWE-003-001[A]

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Data Source:Earthstar Geographics, © State of Queensland (Department of Resources) 2023; Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community, Esri, USGS

2.2 Other renewable developments in the area

There are several other proposed renewable energy projects in the Central and Southern Queensland Renewable Energy Zones. The closest neighbouring development to the Theodore Wind Farm is EDF Renewables Australia's Banana Range Wind Farm, which is a proposed 38 wind turbine development located north of Theodore, near the regions of Biloela and Banana. To the north-east of the Theodore Wind Farm is BayWa r.e.'s proposed Kariboe Wind Farm, a proposed 170 wind turbine and battery storage development, located between Biloela and Monto. Both projects fall within the Banana Shire Council's local government area.

To the south of the Theodore Wind Farm and located in both the Banana Shire and Western Downs Regional Council area is Windlab's Bungaban Renewable Energy Farm, which is a proposed wind, solar and battery project. Nearby also in the Western Downs Regional Council area is Cubico Sustainable Investments' proposed Middle Creek Energy Hub – a wind, solar and battery project.

2.3 Theodore community

In 2021, Theodore had a population of 451 people (Australian Bureau of Statistics, 2021). Just above 15 per cent of Theodore's population identified as Aboriginal or Torres Strait Islander.

Theodore has a strong sense of community, evidenced by the high number of community-operated services and facilities. For example, until recently the Theodore Hotel was the only pub in Queensland owned by an entire community (Banana Shire Council 2023). While the town's economy is closely linked to coal mining, Theodore does not identify as a mining town, unlike nearby Moura and Biloela. Beef cattle farming, log sawmilling, cotton and grain growing are other key industries for the town.

Major towns in the area are:

- Theodore (about 22 kilometres to the west of the site)
- Cracow (about 35 kilometres to the south)
- Banana (about 60 kilometres to the north-west)
- Moura (about 60 kilometres to the north-west)
- Biloela (about 60 kilometres to the north-east)
- Monto (about 75 kilometres to the east)
- Gladstone (about 150 kilometres to the north-east)
- Rockhampton (about 150 kilometres to the north).

2.4 Banana Shire

Banana Shire is in Central Queensland, 120 km west and 200 km south-west of the cities of Gladstone and Rockhampton and has a population of 14,513 (ABS 2021). The area has extensive natural resources, with several major coal deposits (including in the Theodore area). Two gas transmission pipelines run through the shire from the Surat and Bowen Basins to Gladstone.

Coal mining is one of the shire's major industries, as are power generation and farming enterprises including beef production and cropping (lucerne and cotton).

Biloela is the shire's largest town, with a population of 5,371. It is the main residential base for workers from the Callide Coal Mine and Callide power station. The Callide power station produces about 20 per cent of Queensland's electricity. Only 27 km^2 of the shire's 28,577 km^2 are urbanised, creating the need for communications and engagement strategies that could target existing hubs, such as major employers, to access the community.

Data from the 2021 Census shows an approximate 50/50 split of males and females in the Banana Shire, with a median age of 39. These statistics are typical for a rural area.

2.5 First Nations People and Traditional Owners

The traditional owners of the land, waterways, and skies within the region are the Wulli Wulli people.

Other First Nations people who are not Traditional Owners likely reside in the local community, however at this stage have not made themselves known to RWE. RWE will continue to engage directly with the Wulli Wulli Nation Aboriginal Corporation (WWNAC) and will be guided by them regarding who their appropriate community representatives are. They will also remain aware and open to engagement with other non-Wulli Wulli First Nations people who may want to discuss matters of importance to them about the project.

The WWNAC was founded in 2015 as the Registered Native Title Body Corporate for the Wulli Wulli people. The Corporation is responsible for looking after the native title rights and interests of the Wulli Wulli people, as recognised by the Federal Court of Australia and is a key stakeholder in this project.

The judgment that recognised the Wulli Wulli people's native title rights and interests referenced historical, linguistic, anthropological and archaeological evidence, noting a commonality throughout the evidence in respect of matters including, respect for elders and old people, the importance of family, bush tucker and bush medicine, hunting and gathering, spirits and totems, relationships within the family and relationship of the Wulli Wulli people with their Country (AIATSIS, 2015).

The Theodore region is of particular interest to the Wulli Wulli people, particularly the Project site, as it is located partially on Camboon Station. Camboon Station is recognised as a place that is "*located in the heart of this country*" and was a place "*of gathering – where traditional law and customs were learned – and where many Wulli Wulli people were also employed*" (State Library Queensland, 2021).

3. Stakeholder engagement

3.1 Approach to stakeholder engagement

RWE's overarching approach to stakeholder engagement is focused on delivering best practice engagement founded on the principles of honesty, respect, adaptability, consistency and consideration, described in Figure 3.1.

Figure 3.1: RWE's guiding principles for stakeholder engagement

Honesty

- RWE builds relationships with local communities based on trust, respect, and inclusion, by acting with integrity and honesty, engaging in genuine dialogue and relevant communication with all parties and ensuring they provide information as soon as they can.

Respect

- RWE respect the communities and stakeholders where our projects are based and understand they are passionate about their homes, communities and areas where they live, work and socialise. RWE also bring empathy and understanding to engagement.

Adapability

- RWE's approach involves collaboration with communities and incorporates multiple methods of engagement that can adapt to stakeholders' particular needs. This fluid approach allows RWE to be inclusive by identifying and categorising stakeholders according to their requirements, which informs their approach to each engagement. RWE can then provide multiple channels of engagement to make it easy for them to obtain project information and be involved.

Consistency

- RWE's engagement is ongoing and focuses on consistently keeping our stakeholders informed and engaged through all stages of the project lifecycle.

Consideration

- Consultation with communities and key stakeholders is always used to shape projects where possible. Feedback is key to ensuring projects are developed with a solid knowledge of the area, its residents and social fabric. RWE also ensure the benefits generated from the development are spread fairly within the community, by identifying the needs of the community and addressing them.

RWE is guided by consultation with host communities and key stakeholders to shape their Projects. Feedback is key to ensuring Projects are developed with a solid knowledge of the area, its residents and social fabric. RWE also ensures the benefits generated from the Project are shared equitably within the community, by identifying the needs of the community and addressing them.

RWE's stakeholder engagement activities are informed by the following industry guidelines, engagement frameworks, and relevant contextual documents:

- RWE's Australian Community and Stakeholder Engagement Framework
- The International Association for Public Participation's (IAP2) public participation spectrum
- Clean Energy Council's Community Engagement Guidelines for the Australian Wind Industry
- Clean Energy Council's Guide to Benefit Sharing Options for Renewable Energy Projects.

- Australian Institute of Aboriginal and Torres Strait Islander Studies (AIATSIS) Guidance on Engaging with Traditional Owners
- Queensland Government Renewable Energy Zone Roadmap (Mach 2024)
- Queensland Local Energy Partnerships Plan (October 2023)
- Banana Shire Council Planning Scheme (2021).

3.1.1 Stakeholder engagement objectives

- Clearly define and communicate the approach to engagement, including when, how, and what information will be provided
- Clearly communicate the opportunities for stakeholders to participate in the Project development
- Report on and share the outcomes and findings of the engagement activities, including what was heard, and where the community has influenced decision making on the project
- Promote opportunities for community interest, co-design and participation in benefit sharing initiatives including, where possible, community-led decision making
- Meet and, where possible, exceed requirements for community and stakeholder engagement as set out in statutory and regulatory processes for project development
- Explore opportunities for innovation in engagement, in response to community and stakeholder preferences and the social and local context of the region
- Seek opportunities to collaborate with other renewable energy developers, government and other key stakeholders to develop and implement large-scale, sustainable community-led shared benefits initiatives.

3.2 Community and stakeholder engagement plans

RWE has a community and stakeholder engagement plan (CSEP) and a First Nations Engagement and Communications Plan (FNECP) for the Project (Appendix D), which are routinely updated to reflect changing circumstances, community feedback, and ongoing improvements in the community engagement approach.

The CSEP and FNECP guided engagement with the broader community and key stakeholders, and with First Nations stakeholders, respectively for the Project. They each include:

- an analysis of project stakeholders
- a description of engagement tools and methods to be used
- a high-level risk assessment
- communication protocols including recording engagement activities, managing complaints and reporting.

Relevant information from the CSEP and FNECP is presented below and supplemented with information about engagement activities undertaken, including the outcomes of engagement and how RWE has or proposes to address feedback received from stakeholders.

3.3 Project stakeholders

Project stakeholders were identified by considering the groups or individuals within the Project region that could be either directly or indirectly impacted by the Project. These stakeholders are listed in Table 3.1.

Table 3.1: Project stakeholders

Stakeholder group	Details
Landowners	Landowners hosting project infrastructure for the proposed Theodore Wind Farm.

Stakeholder group	Details
Fenceline Neighbours	Fenceline neighbours are identified as neighbours that share a fence line or property boundary with the host landowner(s)/project site.
Near Neighbours	Neighbours with a dwelling within 10 kms of the proposed Theodore Wind Farm site boundary.
Traditional Owners and First Nations people	• Wulli Wulli People • Wulli Wulli Nation Aboriginal Corporation RNTBC • Wulli Wulli Ranger program • Wulli Wulli Elders Group
Opponents (no active opponents identified)	Individuals and organised groups actively opposed to the proposal in proximity to the proposed project area.
Wider Community	Residents of the local geographic area hosting the proposed project, as well as local interest groups not defined in any previous categories, including: • Residents outside of the boundary determined for neighbours • Aged care and healthcare organisations • Business organisations, including but not limited to farmer associations, local progress associations, chambers of commerce or local business structures • Churches and faith-based organisations • Conservation and environmental organisations • Local climate action and sustainability groups • Not-for-profit organisations • Primary, secondary, or tertiary educational institutions • Recreational groups and clubs.
Local Government	Councillors and staff employed by the Banana Shire Council, including but not limited to: • Mayor Cr Neville Ferrier • Deputy Mayor Cr Terri Boyce • Cr Adam Burling • Cr Ashley Jensen • Cr Phillip Casey • Cr Kerrith Bailey • Cr Brooke Leo • CEO Tom Upton • Other executive staff Gladstone Regional Council
Infrastructure owners / operators	• Australia Pacific LNG Pty Limited • Bureau of Meteorology • Geoscience Australia • Telstra • Optus
Aviation Industry	• Airservices Australia • Department of Defence

Stakeholder group	Details
	• IDS Australia (Procedure designer for Theodore Airport instrument flight procedures) • Queensland Royal Flying Doctor Services
Industry Bodies	• Clean Energy Council (CEC) • Re-Alliance • Gladstone Ports Corporation • Stanwell Corporation • Barfield Road Producers Group
Government Agencies	• Federal Department of Climate Change, Energy, the Environment and Water (DCCEEW) • State Assessment and Referral Agency (SARA) • Queensland Department of Environment, Technology, Science and Innovation (DETSI) • Queensland Department of Resources • Queensland Department of Transport and Main Roads (TMR) • Australian Energy Infrastructure Commissioner
Emergency services	• Queensland Fire Department (QFD) • Camboon Rural Fire Brigade • Moura Rural Fire Brigade • Rural Fire Service Gladstone • Queensland Ambulance Service • Queensland Police Services
State and Federal Members of Parliament (MPs)	• Federal Member for Flynn Colin Boyce MP (LNP) • State Member for Callide Bryson Head MP (LNP)
Media	Print and online media: • The Focus Magazine • The Gladstone Observer • The Courier Mail • CQ Today • Biloela Beacon Broadcast media (radio and TV): • ABC 4CC • Hot FM • Triple M Central Queensland • Fresh FM • Win News • Channel 7 • Nine News

Adapted from RWE (2024).

3.4 Stakeholders and engagement activities

RWE proactively engaged with stakeholders on the Project. Engagement commenced in 2021, despite the Project first becoming public in August 2023. The next round of community drop-in sessions is scheduled for May, June and July 2025.

RWE's stakeholder engagement has been varied and multi-faceted, with multiple methods of engagement that were adapted to stakeholders' needs. For example, engagement activities have included working from local cafes and visiting community groups and organisations at their places of operation. RWE actively welcomes the community to get in touch with the Project team via the Project website, email, or free call line.

A summary of engagement activities undertaken with Banana Shire Council, WWNAC and the community is provided graphically below.

Banana Shire Council

2022 engagement commenced

5 briefings held with Council

Key matters discussed

- Project updates
- Community engagement
- Transport route options
- Workforce accommodation
- Technical assessments
- Local benefits and procurement
- Emergency management
- Fairness to host landholders

WWNAC

Early 2023 engagement commenced

7 meetings & workshops

2 site visits

Geotechnical inspections and reconnaissance **4 weeks**

Community



RWE has also undertaken the following engagement activities for the Project:

- Approved $100,000 in community sponsorship funding
- Press release about RWE signing an MOU with Stanwell Corporation
- Met with Gladstone Regional Council local procurement team aligning programs
- Meetings with Powerlink to collaborate on the preferred transmission corridor
- Discussions with proponents of nearby projects to identify and minimise cumulative impacts.

Engagement with key stakeholders was also undertaken to inform technical assessments prepared for the development application. These engagement activities included emails to and meetings with key stakeholders seeking feedback on the proposed Project design in relation to potential impacts on traffic and transport, aviation, and electromagnetic interference. Feedback informed changes to the Project design and proposed mitigation measures, as outlined in Section 4.3.

4. Stakeholder feedback

RWE has had strong community attendance and participation at the drop-in sessions (100+ attendees across various sessions) and received positive feedback about their community and stakeholder engagement activities.

The community is generally pleased with the consultative approach RWE has taken and is highly appreciative of the technical information readily disseminated about the Project. Members of the community noted that other developers in the region could use RWE's approach as a benchmark to community and stakeholder engagement. Members of the community also noted their appreciation that the people who work on the project day-to-day are the primary point of contact, which is not typical for other developers.

An officer from the Federal Member's office attended one of the drop-in sessions and shared with RWE that she was impressed by the information and level of detail RWE provided in the session about the Project and appreciated that all queries were answered.

> *The community is pleased by RWE's experience and commitment to the region rather than commitment to do the bare minimum.*

This section provides a summary of stakeholder feedback on the Project and the actions RWE has taken or will take to address key matters. It includes a summary of key themes raised in consultation, an outline of documents evidencing the outcomes of engagement (documents are included in Appendix A), and a matrix linking RWE's actions and plans to specific feedback received from stakeholders.

4.1 Summary of key themes raised in consultation

Table 4.1 includes a summary of the key themes raised in consultation.

Table 4.1: Key consultation themes

Theme	Description
Workforce accommodation	Stakeholders expressed an interest in understanding the Project's workforce accommodation arrangements for construction and if there would be an impact on the local housing market. This is a particular topic of interest for the Theodore community due to the significant number of mining camps and FIFO workers in the area.
Grid connection	The community was generally not supportive of the proposed multiple grid route options and had expressed concerns about transmission lines crossing strategic cropping land. It is noted that Powerlink is responsible for the grid connection engagement with landowners and community as part of the Theodore Wind Farm Connection Project.[1]
Road network	Stakeholders expressed concerns about potential impacts on the road network and traffic safety during construction. The community also raised concerns about potential impacts on school bus routes.
Aerial operations	Graziers in the local area use helicopter mustering as part of their grazing operations. Some graziers queried if the Project would impact on their ability to muster using helicopters.
Noise	Stakeholders expressed concerns about potential noise impacts on nearby sensitive land uses, including residential dwellings.

[1] Powerlink (2025) Theodore Wind Farm Connection Project, Powerlink website, accessed 4 March 2025.

Theme	Description
Biodiversity	Stakeholders expressed concerns about the potential impacts of the Project on matters of state environmental significance and matters of national environmental significance.
Fire risk and mitigation	The local Rural Fire Services (RFS) Brigades indicated that they would like to see firebreaks incorporated into the Project design. Their preference is that the Project actively manages and mitigates bushfire risk.
Visual amenity	Stakeholders queried the potential impacts of the Project on the landscape.
Wind farm preference	Generally, the local community expressed a preference for wind farms over solar farms. In their experience, solar proponents have not properly engaged with or considered the community in project design or layout. The community also feels that solar farms take up high quality agricultural land (cropping) whereas wind farms can coexist with grazing.
Local employment and procurement	There is a lack of interest from locals in working on the wind farm, however there is interest from local businesses to provide services and supplies for construction and operation of workforce accommodation and wind farm development.

Adapted from ERM (2024)

4.2 Evidence of engagement

Documents evidencing outcomes from engagement activities are included in Appendix A and include the following:

- Correspondence from stakeholders potentially affected by the Project's electromagnetic interference
- Letter of support from Banana Shire Council
- Sponsorship fund outcomes
- Letters sent to all homes within 10 km of the Project
- Pre-lodgement meeting minutes with SARA
- Press release regarding Memorandum of Understanding with Stanwell to investigate and assess energy offtakes and potential equity investment in the proposed Theodore Wind Farm.
- These documents confirm the engagement RWE has undertaken with stakeholders and demonstrates resolution of or actions to resolve key matters.
- Further evidence of engagement is provided in Appendix B relating to information provided to key stakeholders about the Project including:
- Awareness Notice to aviators
- Community newsletters
- Flyer inviting stakeholders to community drop-in sessions
- Invitation and participation in Co-existence Queensland Community Leaders Council 26 and 27 March 2025 in Biloela.

4.3 RWE's responses to stakeholder feedback

This section provides a summary of the outcomes of engagement undertaken with stakeholder groups. The feedback received from stakeholders and the actions RWE has taken or plans to take in response to feedback are presented by stakeholder group in Table 4.2 to Table 4.5 below.

4.3.1 Traditional Owners

Table 4.2: RWE's responses to feedback from Traditional Owners

What we heard from Traditional Owners	RWE's actions
Community and stakeholder engagement	
Ensure meaningful engagement with the Wulli Wulli Nation Aboriginal Corporation (WWNAC) across the Project's lifecycle.	• An Implementation Committee comprising of WWNAC and RWE members will meet at agreed frequency over the life of the Project, ensuring ongoing input, a forum to explore new opportunities and drive matters to resolution. • The primary approach to cultural heritage management is the avoidance principle whereby the Project will, in the first instance, seek to avoid harm to Aboriginal cultural heritage by modifying Project design and layout. This process has already come into effect with WWNAC inspecting a total of 164 early works locations across the Project and 14 requiring adjustments due to cultural sensitivities that were identified. • The WWNAC were proactively engaged in site review and agreed the locations of proposed met masts and monitoring of excavations for agreed locations. • Regarding Cultural Heritage management and Project layout, the Cultural Heritage Management Plan (CHMP), which is reaching agreement, requires a complete survey of the proposed Project footprint and a report on the cultural heritage identified. RWE has structured the timing of the engagement and agreement making such that the findings of the Cultural Heritage survey can be used to inform final design and layout. RWE will engage with WWNAC about findings, management measures and ways in which the Project can be designed and constructed taking account of and minimising impacts on Wulli Wulli Cultural Heritage. • The WWNAC First Nations Engagement and Communications Plan is a working document, and it will guide engagement with WWNAC across the project life cycle.
Workforce management	
Upskilling of Wulli Wulli people to be job ready and participate in the Project and other development projects in the region. Support and facilitate Wulli Wulli people's participation in the project in skilled roles.	• RWE has been collaborating with WWNAC in the development of a Shared Benefits and Project Services Agreement. The following initiatives are currently under consideration: • Funding a Project officer to manage the identification of Wulli Wulli people who may wish to seek employment during construction – role will be to provide details to RWE and Principal Contractor the details and experience of Wulli Wulli people.

What we heard from Traditional Owners	RWE's actions
	• Building into the required Indigenous Participation Plans of each major contractor to RWE, the requirement to actively use the information on interested and available Wulli Wulli people to maximise employment opportunities. • Funding ongoing annual Apprenticeship scheme – up to 4 completed apprenticeship programs over the life of the Project. • Providing an education fund to meet the cost of tuition of Wulli Wulli people – each year a Wulli Wulli person will be selected and funded the value of tuition (typically 3–4-year undergraduate degrees). Where lesser cost education i.e., vocational or TAFE, more people may have costs of tuition met by RWE. • A traineeship program which will provide funding up to an annual cap to enable Wulli Wulli people to undertake training such as: - White card - First aid training - Machinery operator/heavy vehicle training - Mental health training - 4-wheel drive training.
Local business and industry procurement	
Build capacity to allow WWNAC to provide rehabilitation services to the Project as part of their Caring for Country and ranger programs.	A service contract with the Wulli Wulli Rangers is proposed where they will be paid fee for service rates to undertake work on the Project in areas such as: • Erosion and sedimentation control devices and structures install and maintenance. • Weed spraying and weed infestation inspections and recording. • Daily and weekly site environmental management plan compliance checking. • Seed collection (if required). • Fauna spotter catcher. • Revegetation and rehabilitation.
Health and community wellbeing	

What we heard from Traditional Owners	RWE's actions
Upskilling of Wulli Wulli People for cultural heritage surveys and record keeping.	• A program is proposed to supply hardware and software to WWNAC to assist with spatial data capture and management by Wulli Wulli people when on country managing cultural heritage sites and surveys.
Expansion of ranger program – opportunities to undertake Caring for Country works such as cleaning waterways, conducting cultural burns, undertaking work on significant sites, sediment and erosion control and weed management.	• A proposed Ranger Program funding package which will see a pool of new Wulli Wulli Rangers trained and accredited to the National Indigenous Australians Agency (NIAA) standards.
Wulli Wulli people want to return to Country, for special occasions and events but costs for some people are a challenge.	• A proposed program to provide funding each year for 10 years to enable WWNAC to assist members returning to 'Country' for events via meeting the costs of: - Improved attendance at annual general meetings (AGM). - AGM venue hire. - Bus travel for members from Brisbane region to 'on country' events including Elders funerals and AGM. - Reasonable costs of an annual 'Elders meeting' which may be held day before AGM.
Develop material to allow WWNAC to introduce themselves and their Country to proponents.	• It is proposed funding to support WWNAC to develop high quality awareness material via video and Powerpoint which can tell the story of Wulli Wulli people and showcase their connection to country. The produced material will be able to be used for cultural awareness purposes for the Project and be used by WWNAC for broader processes, including presentation to other project proponents in Wulli Wulli country.
Artwork, signage and naming – To recognise and acknowledge that projects are being developed on Wulli Wulli Country and respecting their status as the Traditional Owners for the area.	• RWE will work with WWNAC to co-design an artwork initiative that respects their status as the Traditional Owners for the area.
Community fund managed by a charitable trust.	• In collaboration with WWNAC co-design a Community Benefit Fund which will be managed via WWNAC Charitable Trust. RWE will make annual indexed payments which will be calculated on the final installed MW capacity of the project.
WWNAC to establish own office to operate its own business and be its own Service Provider.	• A funding program is proposed to assist WWNAC with office and operational costs. Examples of costs which can be met by this program include: - Software subscriptions e.g., Office 365 and accounting packages such as Xero or Quick Books.

What we heard from Traditional Owners	RWE's actions
	- Rates for an owned office. - Rent for a non-owned office. - Insurance of WWNAC – PL and contents. - Accounting fees for annual returns. - Other office related costs by agreement.
Impacts to cultural sites, both tangible and intangible, need to be appropriately managed	• All cultural heritage will be managed in accordance with the early works agreements and subsequent CHMP. Both these agreements provide processes for Wulli Wulli to assess locations prior to proposed Project works and make recommendations based on the nature of any cultural heritage values that may be present. • Any locations which are deemed to be sensitive or need to be avoided will be reviewed and be part of ongoing discussions with WWNAC as part of the detailed design phase. • Spatial information provided to WWNAC to review Project layout and any intersection with areas that may hold cultural values.
Impacts to environmental areas within Wulli Wulli Country need to be appropriately managed	• Information sharing of the design map, Environmental Assessment Report and rehabilitation information. • Ongoing engagement and consultation with WWNAC regarding the shared benefits and opportunities including ranger programs and service work packages.
Wulli Wulli people shared negative experiences with other development proponents	• RWE is committed to consistent and meaningful engagement with WWNAC under the terms of the current early works agreement and subsequent CHMP. • Ongoing engagement and consultation with WWNAC regarding the shared benefits package and understanding the aspirations of WWNAC.
Need confirmation of timing of works and WWNAC resourcing	• RWE is committed to working with WWNAC and within the terms of the early works agreement and subsequent CHMP to ensure adequate notice and time is allocated to complete survey works.
Limited number of experienced WWNAC resources for surveys and investigations	• RWE delivered on the commitment to fund a training workshop for nominated WWNAC representatives (workshop completed on 7 and 8 November 2024), covering stone tool identification, field work methods and GIS/GPS training.

4.3.2 Local Government

Table 4.3: RWE's responses to feedback from local government

What we heard from BSC	RWE's actions
Community and stakeholder engagement	
BSC expressed a strong interest in our community and stakeholder engagement approach	• The Project's community and stakeholder engagement approach is guided by RWE's Community Engagement Policy and is anchored by following principles honesty, respect, adaptability, consistency and consideration. • We work closely with BSC to ensure our community and stakeholder engagement methodology is fit for purpose for their community. • To date we have had five formal briefings with BSC where we have provided our community and stakeholder engagement approach regarding local benefits, procurement, workforce accommodation, transport routes, emergency management, and fairness to host landowners.
Workforce management/Local business and industry procurement	
BSC expressed a strong desire for workers to move to the region, although recognises the project needs skilled workers and RWE likely needs to bring workers from outside the region.	• RWE is developing a local participation plan and Indigenous participation plan in collaboration with our contractors with a focus on: • Prioritising hiring local workers, wherever practical. • Determining appropriate roles that can be targeted to local workers. • Investigating training and education opportunities to build skills locally for operation.
BSC appreciates that an on-site workforce accommodation facility is likely to achieve the best outcomes for the community and the Project. The local area is accustomed to FIFO workforces in the area from when the APLNG pipeline was constructed.	• RWE has engaged with the community and BSC and confirmed that the preferred solution is an onsite camp to minimize the impact on local infrastructure. • RWE will continue working with stakeholders to ensure potential impacts of the on-site camp on the local community are minimised, and potential benefits for the community are realised. • RWE proposes that the camp will be designed to be largely self-sufficient, incorporating its own: – Water supply

What we heard from BSC	RWE's actions
	– Wastewater treatment – Electricity – Communications – Catering services – Recreational facilities – Health and safety provisions – Transport shuttle services.
Local procurement to align with BSC Procurement Policy	• RWE is developing a local participation plan and Indigenous participation plan in collaboration with our contractors with a focus on providing opportunities for local suppliers. These plans will be developed in accordance with: • BSC Procurement Policy • Queensland Local Energy Partnerships Plan • Queensland Charter for Local Content • As part of executing the local participation plan and Indigenous participation plans, RWE in collaboration with our contractors will: - Conduct market sounding to identify local suppliers - Hold workshops with local suppliers - Hold 'Meet the buyer' events - How 'How to tender' workshops.
Housing and accommodation	
BSC expressed an interest in more housing development in the region.	• RWE has committed to working with BSC to assess housing needs in Theodore or other local towns for the operational phase and are currently negotiating a MOU. • RWE is entering into an agreement with Council that will address several matters including housing.
BSC plans to develop a 700-bed workforce accommodation facility in Biloela that could be used by RWE's workforce.	• RWE's health and safety assessments have found that an on-site temporary camp is the optimal option for workforce and community safety.

What we heard from BSC	RWE's actions
	• There is an opportunity for RWE to utilise the proposed facility as an overflow option for the on-site temporary camp.
BSC's preferred solution is to situate the workforce accommodation on-site to minimise the impacts on local infrastructure and services. This was reinforced at a meeting with BSC on December 3, 2025, where consensus was reached in favour of the on-site workforce accommodation facility.	• RWE proposed to develop an on-site workforce accommodation facility.
Health and community wellbeing	
BSC expects local roads that will be utilised during the construction phase will be upgraded and/or maintained in accordance with Council's specifications. BSC has plans to upgrade the dilapidated Six Mile Creek bridge, which is located along the construction route.	• RWE is entering into an agreement with Council regarding road upgrades. • The agreement will include upgrades to the bridge so it can accommodate heavy vehicles. • Local roads used by the Project such as Defence Road will be upgraded and/or maintained according to relevant specifications (e.g. unsealed roads).

4.3.3 Landowners, neighbours and wider community

Table 4.4: RWE's responses to feedback from landowners, neighbours and wider community

What we heard from landowners, neighbours and wider community	RWE's actions
Community and stakeholder engagement	
Community happy with the level of engagement and information provided. Technical information being readily disseminated was highly appreciated. Community pleased by RWE's experience and commitment to the region rather than commitment to do the bare minimum.	• The Project's CSEP is guided by RWE's Community Engagement Policy and is anchored by the following principles: honesty, respect, adaptability, consistency and consideration. • RWE continues to engage with the community, adapting engagement activities in response to stakeholder feedback. For example, RWE adapted the duration of their community engagement events to include weekdays and weekends to offer residents the opportunity to provide feedback and increased the duration of community drop-in sessions to all day events. • In consultation with the community, BSC and State Government, RWE will assess the approach to using shopfronts during the construction phase.

What we heard from landowners, neighbours and wider community	RWE's actions
Workforce management	
Queries about Project impacts on traffic and road safety, including impacts on school bus routes.	• Construction workers will be bussed between the on-site workforce accommodation facility and airport to minimise local traffic. • A preliminary route assessment report has been prepared for the Project, which investigated and identified appropriate routes to the site for wind farm components. Oversized vehicles will be required for blades, towers, and transformers. • A preliminary traffic impact assessment report was developed to determine potential impacts of construction traffic on the road network. RWE has shared the results with the community and will continue to work with the community to manage traffic impacts and gain local knowledge on existing road usage. • RWE is considering measures to minimise impacts, including scheduling construction traffic outside of school pick up and drop off times.
There is limited available workforce locally for the Project and low unemployment rates make it difficult to source construction workers locally. To illustrate this issue, Parkside Theodore Green Mill relies on workers from outside the region because they can't hire local workers.	• RWE is collaborating with local and surrounding councils and chambers of commerce to identify local jobs opportunities and measures to support the local and regional economy. • RWE is preparing a Local Participation Plan and Indigenous Participation Plan that will seek to support local businesses and sustain local employment.
Local business and industry procurement	
Local businesses are keen to supply to the Project.	• RWE undertook a social procurement roadshow to identify local and regional workforce skills and suppliers with: - Banana Shire Council - Theodore Chamber of Commerce - Biloela Chamber of commerce - Gladstone Chamber of Commerce and Industry - Gladstone Regional Council - Rockhampton Regional Council - Western Downs Regional Council

What we heard from landowners, neighbours and wider community	RWE's actions
	- North Burnett Regional Council. - RWE is preparing a Local Participation Plan and Indigenous Participation Plan.
Housing and accommodation	
The Theodore community does not want 400 construction workers staying in town. They will overwhelm the township and impact on capacity of services and infrastructure.	• RWE's preference is to develop a temporary on-site camp to house most of the construction workers. • RWE has committed to working with BSC to assess housing needs in Theodore or other local towns for the operational phase. RWE and BSC are currently negotiating a MOU. • RWE's health and safety assessments have found that a temporary on-site camp is the optimal option for workforce and community safety.
Queries about potential impacts on the local housing market during construction.	• RWE will develop an on-site workforce accommodation facility to house most of the construction workforce. • Local short-term accommodation will be used for RWE management and overflow workforce in peak periods. • RWE is working with BSC to assess housing needs in Theodore or other local towns for the operational phase.
Short-term accommodation in the local area mostly services agricultural/energy sector workers rather than tourists. Most tourists use caravans.	• While most workers will be housed in the temporary on-site camp, RWE will also use local short-term accommodation for management staff and for overflow workforce during peak construction periods. This will be economically beneficial for local businesses.
Health and community wellbeing	
Theodore is very community-focussed. A lot of community services are community-owned and run. For example, until recently the pub was the only community-owned pub in Queensland.	• RWE acknowledges and embraces the 100-year long Theodore community's strong community focus. • Engagement activities and the community sponsorship fund seek to support the community's values. • RWE has implemented a sponsorship fund for the proposed Theodore Wind Farm, which is currently open for applications and will remain active throughout the planning and approvals process. More than $30,000 has been approved to date.

What we heard from landowners, neighbours and wider community	RWE's actions
	• In line with our development approach, community philosophy and industry best practice, RWE will establish a Community Benefit Fund of at least $500,000 per year – equating to about $17.5 million across the approximate 35-year operational life of the wind farm – once the project moves into the construction phase.
Potential impact on surrounding sensitive receptors.	• Project site was set back to minimise potential impacts to surrounding landowners.
The Theodore Multipurpose Health Service has limited capacity and is underutilised. For example, the maternity ward recently closed.	• RWE seek to have first responders on site, to avoid creating demand for local emergency services. • RWE commits to the on-site camp being self-sufficient with respect to health and emergency services, to avoid creating demand for local health and emergency services. For example, RWE is considering measures such as providing access to a medical professional and/or telehealth on-site.
Telecommunication blackspots were identified as an issue for the local community and for construction of the wind farm.	• RWE is assessing telecommunications solutions for construction including opportunities to improve telecommunications infrastructure/coverage for the community. • There is an ongoing workstream with a telecommunications company and construction contractor regarding installing a permanent or temporary communication solution. • Considering options for using satellite internet providers, although it would have limited ability to cater for 400 construction workers. • Construction site communications will primarily be UHF.
The local community has preference for wind farms over solar. Their experience and/or perception is that some solar proponents don't properly engage and consider the community in project design and layout. In addition, solar farms take up high quality agricultural land (cropping) whereas wind farms coexist with grazing. Anecdotally, solar farms affect rainfall patterns in the region.	• The Project's community and stakeholder engagement approach is guided by RWE's Community Engagement Policy and is anchored by the following principles: honesty, respect, adaptability, consistency and consideration. • RWE will continue proactively engaging with the community to build strong relationships and supporting their needs through the community sponsorship and benefits fund.
Landholders in the vicinity of the Project are known to practice helicopter mustering, which could be affected by the wind farm.	• RWE proactively provided Awareness Notices about met mast locations to landholders and local pilots who practice helicopter mustering and sought details

What we heard from landowners, neighbours and wider community	RWE's actions
	of others in the community who do the same and provided the Awareness Notices to them too. • Met mast locations are also shared with AirServices Australia for inclusion on navigational charts.
Landholders and neighbours (who make up the local RFS Brigades) would like to see firebreaks as part of the Project.	• Firebreaks and asset protection zones will be applied. • The area to be cleared for WTG foundations and supporting infrastructure will act as a firebreak. • A detailed Bushfire Management Plan will be prepared and implemented to treat residual landscape bushfire risk. • RWE will continue to liaise with fire and other emergency services as part of the Project development process.
The community had queries on visual and landscape amenity.	• A landscape and visual impact assessment has been completed with photomontages from points around the Project site confirming minimal visual impact from publicly accessible locations. • Due to the modified nature of the surrounding area, the existing landscape can incorporate the Project with a relatively low degree of visual impact.
The community raised concerns about potential impacts on biodiversity.	• The Project is designed to avoid and mitigate potential impacts on environmentally sensitive sites. • RWE will provide the community and stakeholders with biodiversity studies and findings. • RWE has prepared a Draft Offset Management Plan (OMP) that presents the Theodore Wind Farm proposed offsets for the likely impacts to Matters of National Environmental Significance (MNES), developed in accordance with the EPBC Act Environmental Offsets Policy (the Offsets Policy) and the Proposed Action-specific requirements.
A neighbour raised concerns about potential noise impacts from the Project.	• RWE undertook background noise monitoring at the neighbour's property, identified that wind turbines would be located more than 10 km from the dwelling and have continued to engage with the neighbour. No further concerns have been raised.

What we heard from landowners, neighbours and wider community	RWE's actions
	• A noise impact assessment has been undertaken for the Project and confirms that the allowable noise levels and separation distances required for wind turbine generators by State code 23 and the State Development Assessment Provisions at all sensitive land uses can be achieved. The battery energy storage systems and transformers can also achieve the consolidated requirements of the Environmental Protection (Noise) Policy 2019 to ensure no adverse impacts on sensitive land uses (including dwellings). • RWE is committed to establishing a neighbour's benefit package in accordance with industry best practice.
Queries about potential construction traffic impacts including how transporting components, materials and workers will impact local roads.	• OSOM loads will be carefully controlled to avoid peak periods and will be limited in frequency by specialist haulage vehicle availability, pilots, and escorts. • Construction materials may be sourced from local suppliers, where possible. • Workers will be bussed to the site from the airport to minimise traffic on local roads.
Members of the community expressed concerns with multiple options for the grid connection route. General sentiment is that transmission across cropping land is not preferred.	• RWE recognised that OHTL connection can have a significant impact on communities. • Prior to the launch of Powerlink's TWF Connection Project, RWE had proactively consulted with the six landholders for the transmission corridor. This was instrumental in building relationships. • In designing the preferred route, RWE integrated community feedback. The preferred route responds to community concerns by minimising impacts to strategic cropping land, biodiversity values and dwellings. The preferred route also avoids impacting landholders who are not already hosting wind farm infrastructure for either the Project or another proposed wind farm nearby. • RWE and PLQ delivered joint engagement activities for the Project and the TWF Connection Project including shopfronts in Banana and Theodore. • Community engagement for the TWF Connection Project was delivered by Powerlink.

4.3.4 Other project stakeholders

RWE received feedback from other project stakeholders including accommodation providers, industry bodies, government agencies, and State and Federal Members of Parliament. This feedback and RWE's actions are summarised in Table 4.5.

Table 4.5: RWE's responses to stakeholder feedback

What we heard from other project stakeholders	RWE's actions
Local short-term accommodation providers are interested in accommodating the Project's workforce.	• RWE is currently engaging with local short-term accommodation providers to confirm availability during construction to accommodate RWE's management staff and overflow workforce in peak periods.
• Queensland Government Departments: - Department of State Development, Infrastructure, Local Government and Planning (DSDILGP) - State Assessment and Referral Agency (SARA) - Department of Environment, Technology, Science and Innovation (DETSI) - Department of Resources - Department of Transport and Main Roads (TMR)	• RWE has been working proactively with DSDILGP to ensure they are aligning with the recent changes in Wind Code 23 https://www.planning.qld.gov.au/__data/assets/pdf_file/0033/96594/planning-guidance-state-code-23-wind-farm-development.pdf with a focus on the following performance outcomes: - PO26 Meeting performance outcomes: Community impact - PO16, PO17, & PO23 Workforce Accommodation and Infrastructure Report
- Department of Climate Change, Energy, the Environment and Water (DCCEEW)	- RWE has been proactively engaging with DCCEEW in accordance with our obligation under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC). The Australian Government on 7 March 2025 listed the Theodore Wind Farm National Priority List of Renewable Energy Projects (https://www.dcceew.gov.au/energy/renewable/priority-list), which are important for Australia's renewable energy transition. The Australian Government is working with jurisdictions and RWE to accelerate environment assessments.
Australia Pacific LNG Pty Limited has approximately five (5) pipeline crossings in proximity to the Project Site.	• RWE entering into an agreement with Australia Pacific LNG Pty Limited for the pipeline crossings.
The Bureau of Meteorology has indicated the Project has a significant impact on their radar services. Multiple scans of their Taroom radar are impacted by the Project, affecting their ability to provide comprehensive meteorological and	• RWE is awaiting further details from BOM regarding potential mitigation options. This matter is ongoing.

What we heard from other project stakeholders	RWE's actions
emergency services notifications. They will be conducting a risk assessment and will discuss potential mitigation options with RWE.	
Geoscience Australia, Telstra and Optus confirmed the Project will not impact on their services.	• No response required.
Federal Member Electorate officer attended community engagement drop-in sessions in Theodore and Banana. Provided positive feedback about the information and level of detail RWE provided.	• RWE to continue implementing CSEP and proactively engage with all levels of Government.

5. Complaint and investigation response plan

RWE believes effective and responsive communication is essential for continual development of strong community relations. RWE has a Complaints and Enquiries Handling Policy (Appendix D), which is accessible on the Project website[2] and summarised below.

The primary objectives of RWE's Complaints Management Policy are to:

- create an environment where feedback is welcomed and valued
- provide a clear and consistent process for fair and transparent management of complaints and enquiries
- ensure complaints and enquiries are addressed and resolved in a timely and effective manner.
- In handling complaints and enquiries, RWE will:
- manage personal and private information in accordance with the Australian *Privacy Act 1988*
- ensure fair treatment for all individuals who provide feedback or lodge complaints
- address complaints and enquiries objectively and without bias
- clearly communicate timing and process for complaints resolution.

RWE commits to the principles of accessibility, responsiveness, fairness, consideration, a customer-focused approach, confidentiality, and continual improvement regarding the management of complaints and enquiries under the Policy, which has the following steps:

- Stage One: Receiving
- Stage Two: Acknowledging
- Stage Three: Validating
- Stage Four: Investigating
- Stage Five: Resolving
- Stage Six: Closing.

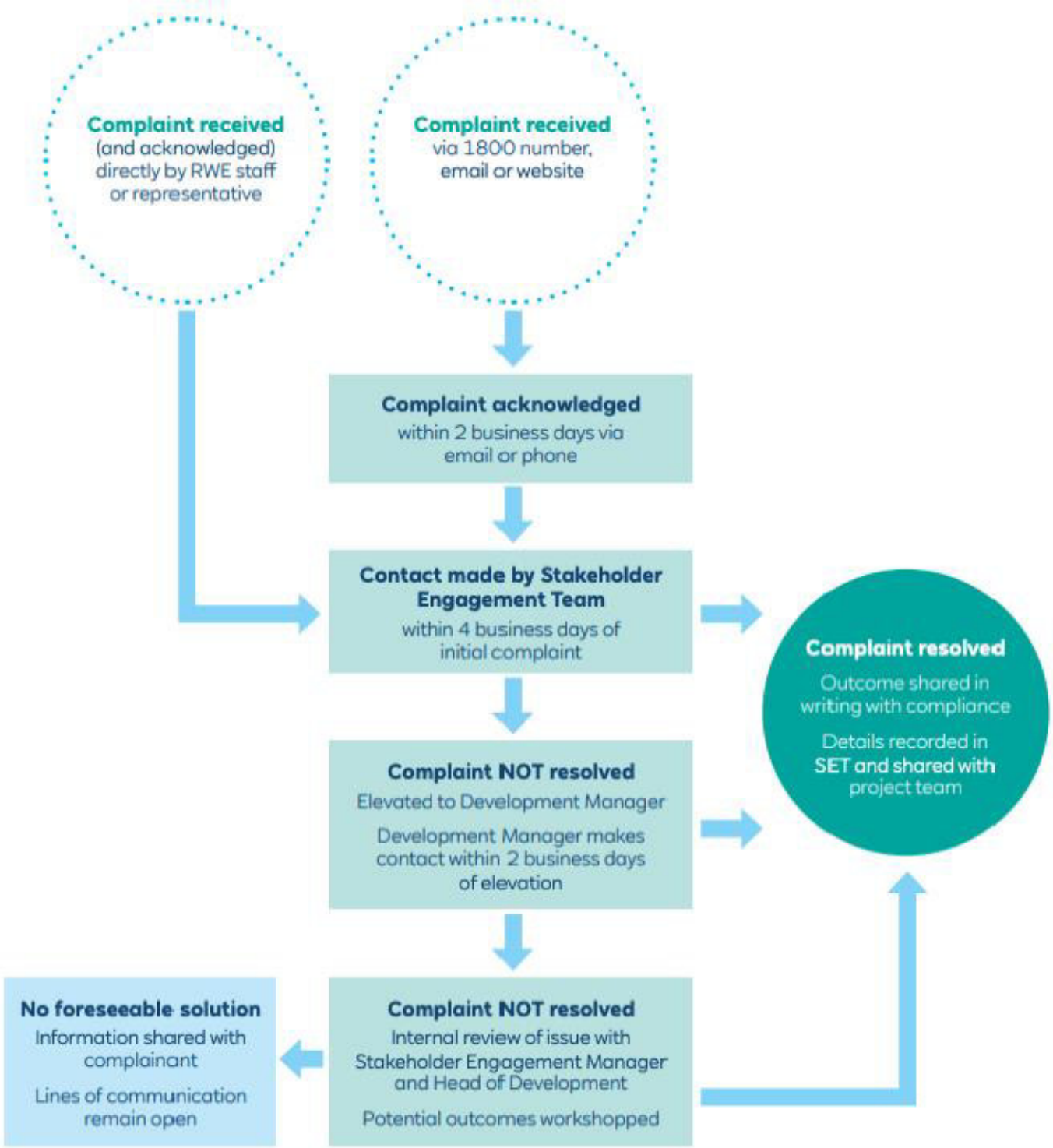
Complaints can be made in-person with a staff member or contractor, via written correspondence (email, post or website) or via phone call to the Project's 1800 number.

All instances are recorded within RWE's internal Stakeholder Engagement Tool (SET), with the intent to archive, allocate, monitor, action, resolve, close and analyse all relevant enquiries. RWE aims to resolve complaints within 10 working days. If this is not possible RWE commits to continued engagement with the stakeholder.

The process is illustrated in Figure 5.1 below.

[2] RWE (2025) RWE Renewables Australia Complaints and Enquiries Handling Policy, RWE website, accessed 4 March 2025.

Figure 5.1: Complaints management flowchart



6. Proposed forward engagement plan

RWE has continued to engage with the community and stakeholders on the Project since the development application was submitted. Table 6.1 presents the proposed engagement activities to resolve key matters, deliver benefits to the community and stakeholders, and continue consulting with the community and key stakeholders regarding the Project.

Table 6.1 Proposed forward engagement plan

Stakeholders	Key mitigation/management actions	Status	Broad Key Performance Indicators	Monitoring Mechanism
Community and Stakeholder Engagement				
• Host landholders • Theodore community • Fenceline Neighbours • Near Neighbours • Banana Shire Council • Local, State and Federal Members • The wider Banana Shire Council local government area community • Chambers of commerce • Federal and State Government agencies	• Ongoing implementation of the Project's CSEP • Commenced early engagement with key stakeholders in 2021 and announce the project publicly in Q3 2023 (engagement ongoing). • Forward engagement program (in development) • Utilisation of RWE's custom-built stakeholder engagement platform Stakeholder Engagement Tool (SET) to track stakeholder interactions, feedback, and concerns to maintain positive relationships (ongoing).	• Ongoing • In progress	• Strategy is developed and executed in accordance with the project schedule. • Community and stakeholders' level of confidence and fairness in engagement approach • Strengthened relationships with stakeholders and community • Level of acceptance of project across the social area of influence • Number of and frequency of interactions with stakeholder/community members • A clear line of sight between decision/action and	• SET Governance Framework • Stakeholder and Communication Plans level of alignment with best practice standards and compliance with regulatory obligations

Stakeholders	Key mitigation/management actions	Status	Broad Key Performance Indicators	Monitoring Mechanism
			stakeholder/communities' input • Community members level of participation and satisfaction with engagement approach • % of reach among communities' regarding project information across the social area of influence.	
• Host landholders • Theodore community • Fenceline Neighbours • Near Neighbours • The wider Banana Shire Council local government area community	• Develop and implement Complaint Investigation and Response Plan (CIRP) (completed) • In accordance with PO26 established: - a toll-free telephone number (1800 879 435) and email for complaints - how contact details will be communicated to the public - a process of investigation to resolve complaints - a requirement that all complaints will be recorded in an incident register	• Completed and ongoing • Completed	• Level of convenience for stakeholders and community to lodge a complaint. • Number of complaints recorded in stakeholder management system. • Number of complaints resolved in a timely manner. • Complainant level of satisfaction with complaint process and resolution.	• Stakeholder Engagement Tool • RWE Complaints Policy

Stakeholders	Key mitigation/management actions	Status	Broad Key Performance Indicators	Monitoring Mechanism
	- a requirement to summarise complaints, investigations and responses.			
Local community	Establishment of a Community Engagement Committee (in development)	• In development	• Established in accordance with the project schedule. • Adequate and diversity of representation of impacted stakeholders. • Number of meetings held. • Members level of participation and satisfaction with its operations. • Extent to the group's input has informed decision making.	Community Engagement Committee Terms of Reference
	Continue delivering drop-in sessions to share information with the community about the Project and provide an avenue for feedback.	• Ongoing	• Community remains informed about the Project • The nature of stakeholder feedback and issues raised during engagement activities • Outline how feedback and issues have been or will be addressed	• Stakeholder and Communication Plan • Stakeholder Engagement Tool • Stakeholder engagement report
Traditional Owners and Wulli Wulli Peoples	Cultural Heritage Management Plan (CHMP) meetings (multiple meetings)	• Upcoming	• Developed under Part 7 of the *Aboriginal Cultural Heritage Act 2003*.	WWNAC

Stakeholders	Key mitigation/management actions	Status	Broad Key Performance Indicators	Monitoring Mechanism
			• Number of meetings held with Wulli Wulli people and the WWNAC. • Wulli Wulli people and the WWNAC are satisfied with the CHMP. • All cultural heritage will be managed in accordance with the early works agreements and subsequent CHMP	
	• Develop and implement First Nations Engagement and Communications Plan (Implementation ongoing) • Ensure WWNAC are continually consulted and engaged in the Project's lifecycle (ongoing)	• Ongoing	• Meet objective outlined in the First Nations Engagement and Communications Plan • Strengthened relationships with WWNAC • WWNAC's level of participation and satisfaction with engagement approach	• SET Governance Framework • First Nations Engagement and Communication Plan's level of alignment with best practice standards and compliance with regulatory obligations
• Gladstone Regional Council • Rockhampton Regional Council • Western Downs Regional Council • North Burnett Regional Council.	Engage with local councils and various chambers of commerce to keep them updated on the Project and discuss issues such as route assessment.	• Ongoing	• Councils and chambers are well informed of the Project • Councils and chambers updated at Project milestones or Project changes • Gladstone Regional Council provide input into route assessment	• SET Governance Framework • Stakeholder and Communication Plans level of alignment with best practice standards and compliance with regulatory obligations

Stakeholders	Key mitigation/management actions	Status	Broad Key Performance Indicators	Monitoring Mechanism
• Theodore Chamber of Commerce • Biloela Chamber of Commerce • Gladstone Chamber of Commerce and Industry				
Housing and Accommodation				
Accommodation providers	Engage with local short-term accommodation providers to confirm availability and capacity during construction to cater for peak construction workforce and specialist consultants (in development)	• In development	Identify and quantify the number of short-term accommodation facilities and rooms available at the expected time of construction.	• SET Governance Framework • Local participation framework • Workforce management framework
Local business and industry procurement				
Local businesses	Engage with local businesses to explore opportunities for procurement services for development and operation of the on-site workforce accommodation and construction of wind farm and associated infrastructure (in development).	• In development	Number of local businesses identified.	• Local participation framework • Indigenous participation framework • Local and Indigenous participation plans level of alignment with best practice standards and compliance with regulatory obligations
• Banana Shire Council • Theodore Chamber of Commerce	Develop and implement a Local Participation Plan and Indigenous Participation Plan. (in development)	• In development	• Number of local/regional businesses contracted to provide goods and/or services to the Project.	• Local participation framework • Indigenous participation framework

Stakeholders	Key mitigation/management actions	Status	Broad Key Performance Indicators	Monitoring Mechanism
• Biloela Chamber of commerce • Gladstone Chamber of Commerce and Industry • Gladstone Regional Council • Rockhampton Regional Council • Western Downs Regional Council • North Burnett Regional Council • Local business • WWNAC			• Value of contract with local/regional businesses to provide goods and/or services to the Project.	• Local and Indigenous participation plans level of alignment with best practice standards and compliance with regulatory obligations
Health and community wellbeing				
Banana Shire Council	Finalise MoU and infrastructure agreement. (ongoing)	• Ongoing	• Signed MoU and Infrastructure Agreement	• MOU and Infrastructure Agreement framework
	Preliminary discussions availability and capacity of infrastructure, services, and construction materials potentially including potable water, waste facilities, etc. (ongoing)	• Ongoing	• Availability, capacity and quantity of infrastructure, services, and construction materials confirmed. • If required, reach an agreement with BSC regarding sharing infrastructure, services and materials.	• SET Governance Framework • Stakeholder and Communication Plans level of alignment with best practice standards and compliance with regulatory obligations
WWNAC	Develop and implement the Shared Benefits and Project	• Ongoing	• Shared Benefits and Project Services package	• Shared Benefits and Project Services Agreement framework

Stakeholders	Key mitigation/management actions	Status	Broad Key Performance Indicators	Monitoring Mechanism
	Services package including (ongoing): • Cultural heritage upskilling and record keeping • Expansion of the Ranger program • Return to Country program • WWNAC introduction media package • Co-designed artwork • Co-designed community benefit fund • Establishment of business operations.		developed and implemented. • Number of Wulli Wulli people upskilled in cultural heritage identification, management and record keeping. • Number of new Wulli Wulli Rangers trained and accredited to NIAA standards. • Number of attendees supported to Return to Country. • WWNAC introduction media package completed. • Artwork co-designed. • Community benefit fund co-designed and implemented. • Business operations established.	
Landowners, fenceline neighbour, near neighbours and wider community	Implement the community sponsorship fund (ongoing).	• Ongoing	• Number of applications received • Number of successful applications • Value of sponsorships disbursed	• Community sponsorship governance framework

Stakeholders	Key mitigation/management actions	Status	Broad Key Performance Indicators	Monitoring Mechanism
	Develop and implement the community benefit fund (in progress).	• Ongoing	• Develop the community benefit fund.	• Community benefit fund governance framework
	Develop and implement neighbours benefit package (in development).	• In development	• Develop the neighbours benefit package. • Number of neighbours receiving benefits. • Value of benefits disbursed.	• Neighbours benefit package governance framework
	Discuss opportunities to access water with host landowners (in development).	• In development	• Opportunities to access water are identified and documented.	SET Governance Framework
Health and emergency services	Develop Bushfire Management Plan in consultation with RFS and Queensland Fire Department (QFD) (in development).	• In development	• RFS and QFD endorse the BMP.	• BMP monitoring framework.
Infrastructure and material suppliers	Engage with local construction material suppliers and quarry owners to understand availability and capacity of local construction materials (in development).	• In development	• Availability and capacity of local construction materials are quantified.	• SET Governance Framework • Stakeholder and Communication Plans level of alignment with best practice standards and compliance with regulatory obligations
Telecommunication providers	Engage with telecommunication providers to discuss telecommunication infrastructure opportunities (in development).	• In development	• Telecommunication infrastructure opportunities are identified and documented.	• OHS framework

Stakeholders	Key mitigation/management actions	Status	Broad Key Performance Indicators	Monitoring Mechanism
Australia Pacific LNG Pty Limited	Finalise agreement with Australia Pacific LNG Pty Limited for the pipeline crossings (in progress).	• In development	• Signed pipeline crossing agreement between RWE and Australia Pacific LNG Pty Limited.	SET Governance Framework
BoM	Follow up with the Bureau of Meteorology (BoM) regarding potential mitigation options for impacts on the Taroom radar (ongoing).	• Ongoing	• Mitigations agreed and implemented.	SET Governance Framework Agreement with BoM.
Aviation	Share met mast and WTG locations, as the project progresses, with local pilots, aviation businesses, and AirServices Australia for inclusion on navigational charts (ongoing).	• Ongoing	Met mast and WTG locations are shared with all local pilots, aviation businesses, and AirServices Australia.	SET Governance Framework

7. Conclusion

RWE delivered a comprehensive stakeholder and community engagement program consistent with the new requirements set out in the updated State code 23 (v3.2). RWE's approach to community and stakeholder engagement is underpinned by the principles of honesty, respect, adaptability, consistency and consideration.

RWE has demonstrated these principles by adapting community engagement activities to meet the community's needs and being transparent about potential project impacts. For example, RWE:

- Increased the duration of community drop-in sessions to all day events to provide people in the community with greater opportunity to attend.
- Provided technical reports to the community, addressing queries and questions about potential impacts and management measures.
- Proactively engaged with directly impacted stakeholders on aerial mustering, workforce accommodation, noise, traffic and local procurement to identify issues, opportunities and management measures.
- Early engagement with Wulli Wulli people to guide project design and applied the avoidance principle to cultural heritage management.
- Received positive feedback from the community and a representative of the Federal Member regarding their approach to community engagement.
- Provided $100,000 of social investment to grassroots community organisations
- Established a complaints channel both via email and toll-free number as a platform for the community to resolve issues. To date no formal complaints have been received.

The community is largely supportive of the Project. Queries received from the community about the Project related to noise, visual amenity, local housing, biodiversity, cultural heritage, and traffic. These issues have been or will be addressed in relevant technical assessments and management plans submitted as part of the development application. Several matters require ongoing stakeholder and community engagement including workforce accommodation, construction traffic, potential demands on council infrastructure, services and materials. Agreements are currently in development with key stakeholders regarding potential project impacts and benefits, including a memorandum of understanding (MOU) and infrastructure agreement with BSC.

Potential benefits were also identified in consultation with key stakeholders. Potential benefits include but are not limited to:

- upskilling Wulli Wulli people to work on Project construction,
- supporting local businesses through procurement opportunities,
- improving telecommunications, and meeting community needs through the sponsorship fund and legacy projects.
- project benefit programs and plans are being or will be developed in consultation with key stakeholders, including Shared Benefits and Project Services Agreement with the Wulli Wulli Nation Aboriginal Corporation (WWNAC)
- Local Participation Plan and Indigenous Participation Plan with local and regional councils and chambers of commerce, and a community benefit fund with the local community.

RWE has developed a proposed forward engagement plan with actions linked to monitoring mechanisms to guide the resolution of key matters and development of agreements, plans and programs for the Project.

RWE has and continues to engage meaningfully with key stakeholders and the broader community regarding the Theodore Wind Farm. Importantly, RWE has considered feedback from stakeholders and the community about the Project and the potential impacts and opportunities and responded through:

- **Project design –** changes to the Project design to minimise impacts, including:

  - incorporating fire breaks and committing to developing a Bushfire Management Plan to manage bushfire risk
  - locating WTGs, BESS and transformers away from dwellings and other sensitive land uses to appropriately manage potential noise impacts.
- **Community and stakeholder engagement –** adapting community engagement activities to meet the community's needs, including:
  - establishing an Implementation Committee with the WWNAC
  - adapting the duration of community engagement events to include weekdays and weekends
  - increasing the duration of community drop-in sessions to all day events.
  - providing technical reports and Project information to community members.
- **Workforce management** – managing potential workforce impacts on the community and maximising local employment opportunities, including:
  - accommodating most of the construction workforce in a temporary on-site camp to avoid impacting the local housing market
  - bussing workers to and from the airport to the site to minimise local traffic impacts
  - providing health and emergency services on-site to avoid creating demand for local health and emergency services
  - collaborating with WWNAC to develop a Shared Benefits and Project Services Agreement.
- **Housing and accommodation –** managing potential Project impacts on local housing and accommodation, including:
  - committing to engage with local short-term accommodation providers regarding accommodating RWE management and overflow workforce during peak construction periods
  - entering into an agreement with BSC that includes assessing housing needs for the operational phase of the Project in Theodore and nearby towns.
- **Local business and industry procurement** – investigating opportunities to maximise local benefits, including:
  - commencing consultation with local and regional councils and chambers of commerce to identify opportunities
  - developing a Local Participation Plan and Indigenous Participation Plan
  - entering a service contract with Wulli Wulli Rangers to undertake specific work programs for the Project.
- **Community health and wellbeing** – collaborating with BSC and supporting the community's needs, including:
  - entering into agreements with BSC regarding infrastructure maintenance and upgrades
  - supporting the WWNAC's needs and aspirations through a variety of programs
  - implementing a community sponsorship fund to support the community value and needs
  - committing to develop a neighbourhood benefit scheme
  - developing a community benefit fund in collaboration with the local community.

RWE's comprehensive community and stakeholder engagement program has identified potential project impacts and benefits and provided a platform to address and mitigate potential impacts to avoid adverse impacts on the community. Their proactive and transparent engagement approach has resulted in zero complaints to date.

RWE has designed the Project to avoid and mitigate adverse impacts on the community and is developing agreements, programs and plans in consultation with key stakeholders to ensure potential impacts during construction and operation are in the first instance avoided. If identified and emerging impacts are unavoidable RWE's forward program will establish mechanisms to manage/mitigate these and establish mechanism to realise potential benefits that deliver practical social value.

8. References

ABS (Australian Bureau of Statistics) (2021) 2021 Census Data.

AIATSIS (Australian Institute of Aboriginal and Torres Strait Islander Studies) (2015) *What's new in native title* – April 2015, AIATSIS website, accessed 11 March 2025.

ERM (2024) Socio-Economic Impact Analysis, Theodore Wind Farm, v4.

RWE (2024) Community & Stakeholder Engagement Plan, Theodore Wind Farm, v4.

RWE (2024) First Nations Engagement and Communications Plan, Theodore Wind Farm, v1.

RWE (2025) Theodore Wind Farm, RWE website, accessed 4 March 2025.

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Appendix A

Outcomes of engagement

RWE

Press release

RWE and Stanwell sign Memorandum of Understanding for two renewable energy projects in Queensland, Australia

Essen/Brisbane, 30 August 2023

RWE and Stanwell Corporation have signed a Memorandum of Understanding (MoU) to deliver two Queensland onshore wind projects with a combined capacity of up to 1.8 gigawatts (GW).

Under the MoU, Stanwell will investigate and assess energy offtakes and potential equity investment in RWE's Theodore Wind Farm, a project of up to 1,100 megawatts (MW) under development near Biloela, and a second wind farm of up to 720 MW in early-stage development in southern Queensland. According to current plans, the two projects could be completed and start operations by 2029, subject to securing the necessary permits, grid connection and final investment decisions. The proposed Theodore Wind Farm is expected to generate enough electricity to power 410,000 homes, as well as create more than 500 jobs during peak construction periods and up to 50 ongoing jobs during the project's 35-year operations.

Markus Krebber, CEO of RWE AG: "RWE is excited to be partnering with Stanwell on these two major projects and assisting Queensland to achieve their renewable energy ambitions. RWE sees Australia as a very attractive renewable energy growth market and we are looking forward to working on developing the proposed Theodore Wind Farm. We are committed to increasing our presence in the Australian market, and the signing of this memorandum of understanding with Stanwell for Theodore, and another of our Queensland projects, is a demonstration of this commitment."

Michael O'Rourke, CEO of Stanwell: "We are thrilled to partner with RWE on two such significant projects. An additional 1.8 GW of clean energy by 2029 represents a major boost in our rapidly growing portfolio of renewable energy projects. This is a win-win agreement for the energy industry, Queensland and our commercial and industrial customers who want clean, reliable, and affordable energy to power their businesses. And it strengthens Queensland's position to deliver on the targets set out in the Queensland Energy and Jobs Plan, bringing more investment and jobs into our regional communities."

RWE Renewables Europe & Australia GmbH | Group Corporate Communications & Public Affairs | RWE Platz 4 | 45141 Essen | Germany
T +49 201 5179-5008 | communications@rwe.com | www.rwe.com/press

The agreement envisages the offtake of renewable electricity by Stanwell and the potential equity involvement of Stanwell in the projects.

RWE is one of the world's leading producers of renewable energy and operates a global portfolio of about 16 GW of renewable energy projects comprising onshore and offshore wind, solar and battery storage. The company is vigorously driving forward the expansion of its renewables portfolio and investing globally more than 50 billion euros (the equivalent of 85 billion Australian dollars) in growing its green portfolio by 2030. Currently RWE has more than 70 renewable energy projects in 12 countries under construction all over the world, totalling over 7 gigawatts.

Australia is one of RWE's focus markets, where it has been present for 10 years. In 2018, RWE started its first renewable energy project on the continent with the construction and subsequent operation of the Limondale solar farm in Balranald, New South Wales. With an installed capacity of 249 MWac, the large-scale solar farm consists of 872,000 panels and covers an area of 770 hectares. Full commercial operation started in 2021. In May 2023, RWE was successful in AEMO Services inaugural competitive tender for generation and long duration storage infrastructure and has been awarded a Long-Term Energy Service Agreement (LTESA) to deliver and operate Australia's first eight-hour battery.

RWE Renewables Australia is working on developing utility-scale wind, solar and battery projects in Queensland and other states. The company has an exciting pipeline of projects and a growing team of more than 45 people, backed by the experience of the 5,300 people strong team of RWE dedicated to onshore wind, solar, battery and offshore across the European, North American and Asia Pacific regions.

Stanwell Corporation is a major provider of electricity and energy solutions to Queensland, the National Electricity Market and large energy users throughout Australia. Stanwell's portfolio includes more than 3,000 MW of renewable energy under contract, in construction or development.

For further enquiries:

Vera Bücker
Head of Media Relations
International & Finance
T +49 201 162 251 7329
E vera buecker@rwe.com

RWE
RWE is leading the way to a green energy world. With an extensive investment and growth strategy, the company will expand its powerful, green generation capacity to 50 gigawatts internationally by 2030. RWE is globally investing more than €50 billion gross for this purpose in this decade. The portfolio is based on offshore and onshore wind, solar, hydropower, hydrogen, batteries, biomass, and gas. RWE Supply & Trading provides tailored energy solutions for large customers. RWE has locations in the attractive markets of Europe, North America, and the Asia-Pacific region. The company wants to phase out coal by 2030. RWE employs around 19,000 people worldwide and has a clear target: to get to net zero by 2040. On its way there, the company has set itself ambitious targets for all activities that cause greenhouse gas emissions. The Science Based Targets initiative has confirmed that these emission reduction targets are in line with the Paris Agreement. Very much in the spirit of the company's purpose: Our energy for a sustainable life.

Forward-looking statements

This press release contains forward-looking statements. These statements reflect the current views, expectations, and assumptions of management, and are based on information currently available to management. Forward-looking statements do not guarantee the occurrence of future results and developments and are subject to known and unknown risks and uncertainties. Actual future results and developments may deviate materially from the expectations and assumptions expressed in this document due to various factors. These factors primarily include changes in the general economic and competitive environment. Furthermore, developments on financial markets and changes in currency exchange rates as well as changes in national and international laws, in particular in respect of fiscal regulation, and other factors influence the company's future results and developments. Neither the company nor any of its affiliates undertakes to update the statements contained in this press release.

Data Protection

The personal data processed in connection with the press releases will be processed in compliance with the legal data protection requirements. If you are not interested in continuing to receive the press release, please inform us at Datenschutz-kommunikation@rwe.com. Your data will then be deleted and you will not receive any further press releases from us in this regard. If you have any questions about our data protection policy or the exercise of your rights under the GDPR, please contact datenschutz@rwe.com.

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Queensland Government

SARA reference: 2303-33770 SPL
Applicant reference: 0661076

26 April 2023

RWE Renewables Australia
Level 9, 260 Queen Street
BRISBANE CITY QLD 4000
michael.rookwood@erm.com

Attention: Michael Rookwood

Dear Michael,

Pre-lodgement advice – Theodore Wind Farm

I refer to the pre-lodgement meeting held on 12 April 2023 in which you sought advice from the State Assessment and Referral Agency (SARA) regarding the proposed development at the above address. This notice provides advice on aspects of the proposal that are of relevance to SARA.

SARA's understanding of the project

RWE propose to construct a wind farm within eight lots, near the township of Theodore in Queensland. The proposed Project is approximately 43,700 ha in size and is located approximately 25 km east of the township of Theodore Development of a wind farm and associated infrastructure. Clearing of native vegetation is also proposed to facilitate the development of the wind farm.

Supporting information
The advice in this letter is based on the following documentation that was submitted with the pre-lodgement request or tabled at the pre-lodgement meeting.

Drawing/report title	Prepared by	Date
Theodore properties 20220815.kmz	ERM	15 March 2023
Theodore Wind Farm prelodgement presentation	RWE and ERM	12 April 2023

Pre-lodgement meeting record

Meeting date	12 April 2023
Meeting location	Level 12, 1 William Street Brisbane
Meeting chair	Lucy Stenzel

Wind Farms Team
Level 13, 1 William Street, Brisbane
PO Box 15009 CITY EAST QLD 4002

Meeting attendees	Refer to Attachment 1

Pre-lodgement advice

The following advice outlines the aspects of the proposal that are of relevance to SARA.

SARA's jurisdiction and fees	
1.	The application will require lodgement to SARA under the following provisions of the Planning Regulation 2017: • Schedule 10, Part 3, Division 2, Item 5 – operational work that is the clearing of native vegetation • Part 4, Division 2, Section 21, Item 2.bi – material change of use for a wind farm. SARA would be the assessment manager for the proposed application.
Key matters and action items	
2.	**Development ancillary to the wind farm** To ensure a wholistic assessment, all aspects of the wind farm should be assessed. On site accommodation is considered ancillary to the wind farm. The wind farm team recommends consideration of the following aspects of works accommodation to ensure they are appropriately developed, and impacts are managed: • Infrastructure / services • Amenity (acoustics, location) • Open space / recreation Any quarry, concrete batching plant or other such use required to support the project would require a separate development application. Development applications for such uses are usually assessable by the local government against its planning scheme, with SARA involved as a referral agency.
3.	**General items** Wind Farms Team have identified the following for consideration: • A second prelodgement meeting is recommended once a project layout and number of turbines is confirmed • Landowner consents provided in accordance with the requirements of the *Planning Act 2016* and should have regard for subsequent minor change applications • Whether there are any land uses, beyond the general purpose of a road, in road reserves, and ensuring landowner's consent from the relevant road manager is provided • Planning report and site plan(s) should clearly demonstrate location of turbines to sensitive land uses • Ensure development application includes detailed MCU plans showing the full extent of temporary and permanent disturbance areas (including any micrositing areas) for all site infrastructure including (but not limited to) turbine pads, meteorological mast areas, substations, construction areas and access roads. Specifically, the MCU plans should identify: o the proposed project footprint, including: ▯ the total area of disturbance ▯ all temporary and permanent disturbance footprints ▯ any micrositing areas o turbine locations o indicative locations of other infrastructure including (but not limited to) BESS, substation, construction camp and any other linear infrastructure. • Transmission lines external to the project site are not "ancillary" to the wind farm, however internal distribution lines are ancillary. May need to consider alternative

	approvals if connecting externally (i.e. Infrastructure Designation or through other Powerlink process) • Rehabilitation, including general principles and cross sections for temporary disturbed areas to be rehabilitated, with a particular in areas of essential habitat. • Ensure supporting reports consider local road impacts (not just State-controlled roads) • consider general impacts, including bushfire protection, during construction and operation • Preliminary management plans to be submitted with DA for assessment, noting the Wind Farms Team generally does not approve plans via conditions. • Outline the proposed rehabilitation approaches under different conditions through a rehabilitation plan that addresses the following: o site-wide rehabilitation principles that addresses the full range of scenarios which may include (but are not limited to) narrow tracks, wide tracks, battered tracks, watercourse track crossings, specific habitat track crossings, turbine pads and transmission corridors o provision of a cross-section for each scenario o consideration of principles both during the construction and operational phases of development o consideration of species-specific requirements across the site • It is recommended that temporary meteorological (MET) masts (if applicable) are obtained in isolation through local government, rather than through the wind farm development application, to avoid having to enact upon the conditions of the wind farm decision notice (which includes a vegetation management plan) • Where necessary, provide a general description and concept of waterway barrier works, particularly those that are assessable development. While these are typically lodged separately, this approach is recommended to ensure the general location and design of such crossings can be supported in the future • Any development application that proposes access onto a State-controlled road is also taken to be an application under Section 62 of the *Transport Infrastructure Act 1994*. Details of the intersection design will be need provided demonstrating suitable sight lines etc. It is recommend liaising with a suitably qualified traffic and transport consultant regarding this aspect • Any development application that proposes infrastructure over a State-controlled road (such as overhead powerlines) will require a separate approval from the Department of Transport and Main Roads pursuant to Section 50 of the *Transport Infrastructure Act 1994* • It is highly recommend engaging with the local government to accommodate any broad concerns they have, noting that the Wind Farms Team will seek their advice during the development assessment process.

This advice outlines aspects of the proposed development that are relevant to SARA's jurisdiction. This advice is provided in good faith and is:

- based on the material and information provided to SARA
- current at the time of issue
- not applicable if the proposal is changed from that which formed the basis of this advice.

The advice in this letter does not constitute an approval or an endorsement that SARA supports the development proposal. Additional information may be required to allow SARA to properly assess the development proposal after a formal application has been lodged.

For further information please contact Dean Jones, A/Manager, on 07 3244 9322 or via email windfarms@dsdilgp.qld.gov.au who will be pleased to assist.

Yours sincerely



Dean Jones
A/Manager

enc Attachment 1 – Pre-lodgement meeting attendance record

Development details	
Proposal:	MCU for Wind Farm Operational works for clearing of native vegetation
Street address:	806 Hamiltons Road, Camboon; 130 Hamiltons Road, Camboon; 7647 Crowsdale Camboon Road, Camboon; Coates Road, Castle Creek; Lyndale Road, Camboon; 880 Coates Road, Castle Creek; Coates Road, Castle Creek; 6364 Crowsdale Camboon Road, Camboon
Real property description:	11DW446, 18DW550, 19DW551, 1RP617748, 20SP100500, 2RP617749, 4SP131475, 8DW2
SARA role:	Assessment manager
Assessment Manager:	Wind Farm Team
Assessment criteria:	State Development Assessment Provisions (SDAP): State code 16 and State code 23
Existing use:	Agricultural

Attachment 1 — Pre-lodgement meeting attendance record

Meeting attendees:

Name	Position	Organisation
Lucy Stenzel	Principal Planner	DSDILGP
Dean Jones	A/Manager	DSDILGP
Michael Rookwood	Principal Town and Environmental Planner	ERM
David Dique	Office Managing Partner	ERM
Heidi Creighton (MS Teams)	Senior Development Manager	RWE
Matthew Walker	Senior Development Officer	RWE

Council Chambers
62 Valentine Plains Road
Valentine Plains
Biloela Qld 4715

All Correspondence to
Chief Executive Officer
PO Box 412
Biloela Qld 4715

Phone 07 4992 9500
Fax 07 4992 3493
enquiries@banana.qld.gov.au
www.banana.qld.gov.au
ABN 85 946 116 646

Your Reference:
Our Reference: NF:CW:jma (ID.93626)
Contact:

20 March 2025

RWE Renewables Australia
ATTN: Ms Heidi Creighton
Head of Theodore Energy Park
Suite 5, Level 9
350 Collins Street
MELBOURNE VIC 3000

Dear Heidi

Re: Support for planning application to Queensland Government

Banana Shire Council strongly supports RWE Renewables Australia's planning application to the Queensland Government for Theodore Wind Farm.

Banana Shire will host significant infrastructure and renewable energy project investment over the next 10 to 15 years. The area is already the subject of the State's first Renewable Energy Zone (REZ) Readiness Assessment and housing implications is one of the key pillars of that assessment.

RWE Renewables Australia, through the Theodore Wind Farm project, has shown consistent and proactive collaboration with Banana Shire Council and the local community. RWE Renewables Australia is demonstrating ongoing commitment to implementation of the Banana Shire Major Projects Housing Demand & Levy Policy and the wider community through establishment of a Memorandum of Understanding

Without adequate accommodation for the workforce needed to complete and operate these projects, the timelines and success of these developments are at risk, adding further strain to an already limited housing supply.

The high-level concepts proposed for the Memorandum of Understanding between RWE Renewables Australia and Banana Shire Council include:

- RWE commits to working together with the Banana Shire Council to ensure long term housing benefits to the communities surrounding the Theodore Wind Farm through provision of permanent accommodation in a nearby town. RWE commits to providing at least 10 permanent dwellings.

- RWE will commit to working with the Banana Shire Council to providing regular updates on operational staff predictions. Banana Shire Council

and RWE will work together to ensure that the location of the proposed housing optimises for: Local community outcomes, appropriate locality to site for operational staff, planning and council services provision, and community support.

- Banana Shire Council will undertake review of town plans and planning overlays to help steer the best locations for the proposed dwellings.

- RWE commits to continuing to work together to ensure that the proposed onsite accommodation camp is optimised for community, council, and worker outcomes while facilitating efficient construction

Banana Shire Council appreciates the time, energy and value with which RWE Renewables Australia has approached and progressed project development of Theodore Wind Energy Park and associated worker accommodation and housing actions.

Banana Shire Council anticipates that this letter will positively support RWE Renewables Australia's project proposition and planning application with the Queensland Government.

Should you require any further assistance, please do not hesitate to contact my office on 07 4992 9500.

Yours sincerely

Cr Neville Ferrier
MAYOR – BANANA SHIRE COUNCIL

Sponsorship fund now open

RWE Renewables Australia has implemented a sponsorship fund for the proposed Theodore Wind Farm, which is currently open for applications and will remain active throughout the planning and approvals process. More than $30,000 has been approved to date. If you would like to apply for sponsorship please download our application form here.

Sponsorship distributed to date includes:

$5,000	Theodore Junior Roosters Rugby League Club
$5,000	Theodore Centenary Celebrations
$5,000	Theodore State School P&C
$5,000	Camboon Campdraft
$5,000	Theodore Show
$3,000	Theodore Musuem
$3,000	Bulls N Barrels Bonanza
$3,000	Moura Marlins

Attexo

Appendix B

Evidence of engagement

Theodore
Wind Farm

160m Meteorological Mast – Awareness Notice

RWE are in the process of constructing Meteorological Monitoring Masts for the proposed Theodore Wind Farm. Details include:

- 160.45m above ground level (527ft above ground level)
- Red and White Aviation painting
- Marker balls on outermost guy wires for visibility
- Lighting for night time visibility
- Further notices will be provided for when additional masts are constructed

First Mast Erected (THE003)

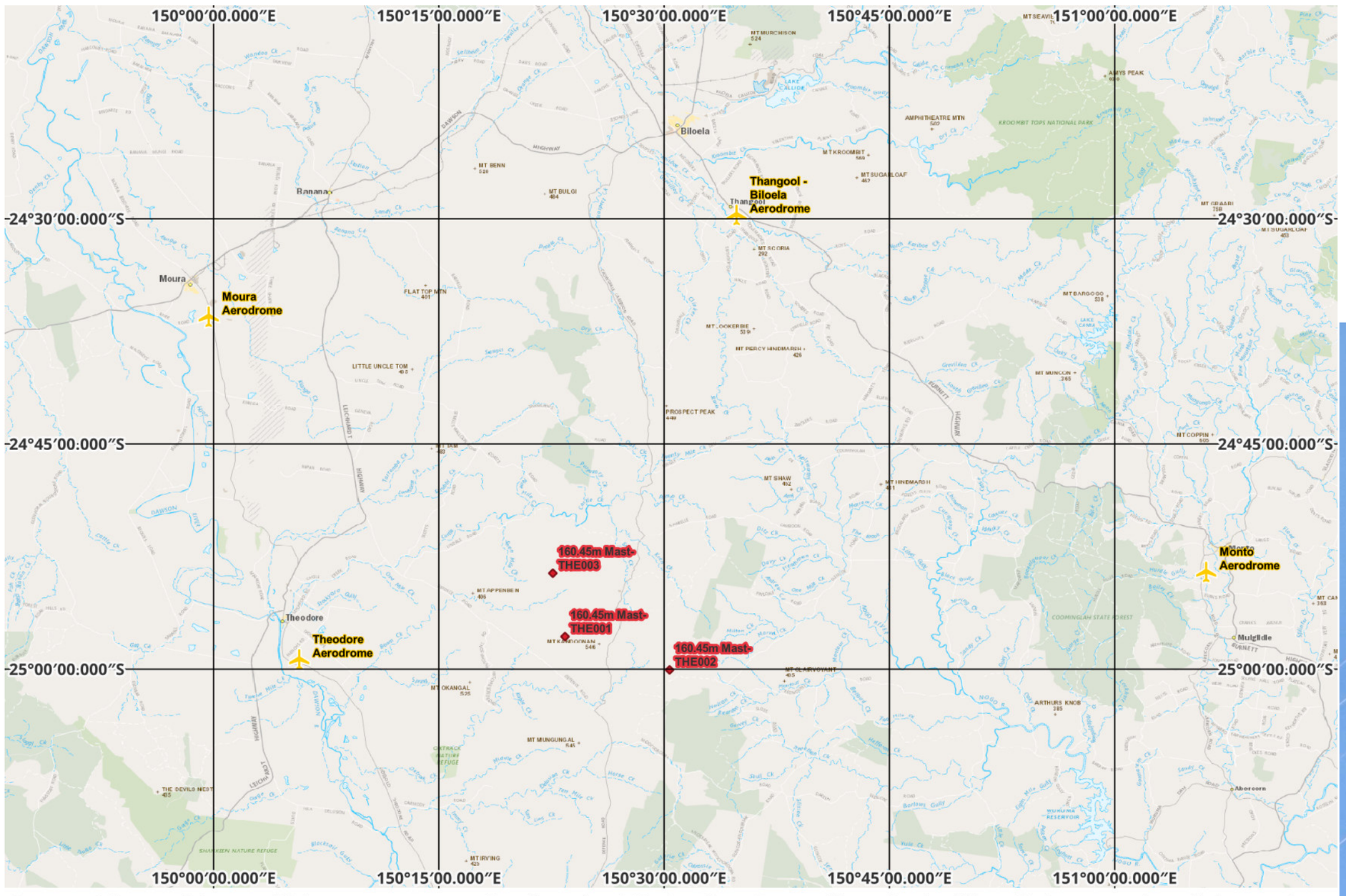
- **24°53'36.4"S 150°22'34.9"E**
- **North of Hamiltons Road, Camboon, QLD,4719**

Second Mast Erected (THE001)

- **24°57'32.4"S 150°23'19.3"E**
- **South of Hamiltons Road, Camboon, QLD,4719**

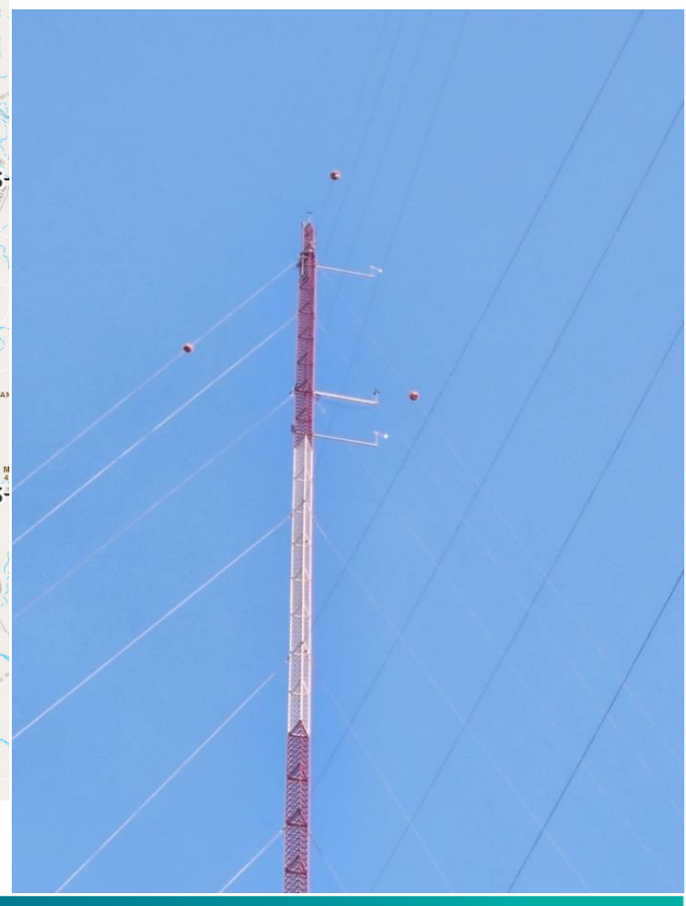
Third Mast Erected (THE002)

- **25°00'03.5"S 150°30'21.7"E**
- **Near Crowsdale Camboon Road, Camboon QLD 4719**



Coordinates in WGS84 Coordinate System. All locatoins should be verified on appropriate aviation mapping.
RWE has notified locations to Airservices Australia and CASA

QR Code to Google Maps locations



1800 879 435
theodorewindfarm@rwe.com
au.rwe.com

Theodore
Wind Farm

RWE

Introducing the Theodore Wind Farm

RWE Renewables Australia is working on developing a renewable energy project near Theodore.

The project is in the early stages of development and we are seeking your feedback on the proposal.

Community drop-in sessions

We invite you to drop in to the Theodore and Banana community halls to speak with project team members and technical specialists about the proposed project and view information on a variety of topics, including biodiversity, landscape and visual, fire mitigation, wind farms and agriculture and more.

Please drop in to see us at:

Theodore

- Friday, August 25, 2023
- RSL Hall, 30 The Boulevard, Theodore
- 2pm-8pm

Banana

- Saturday, August 26, 2023
- Sutherland Hall, 32 Bowen Street, Banana
- 9am-3pm



At a glance

TURBINES
About 160

BATTERY STORAGE
Yes

HEIGHT
Up to 260m

LOCATION
About 30 kilometres north-east of Theodore and 40 kilometres south-west of Biloela

SIZE
About 46,000 hectares

INSTALLED CAPACITY
About 1,100 megawatts (MW)

HOMES POWERED
More than 410,000 – the equivalent of powering all private dwellings in the Banana Shire about 57 times, or the city of Rockhampton close to 15 times

PROJECT STATUS
Development – undertaking studies, preparing potential layouts, seeking community opinion

PROPOSED CONNECTION
Working with Powerlink to determine best connection point

OPERATION
Targeting 2027 for initial operations

For further information please contact us at:
T: 03 9600 2698
E: theodorewindfarm@rwe.com
au.rwe.com

Theodore Wind Farm | RWE



Theodore Wind Farm

Newsletter
Edition 3, March 2025

Photomontage of view from Defence Road

RWE Renewables Australia is continuing to work on developing a wind farm project near Theodore, in the Banana Shire, about 22 kilometres east of Theodore and 50 kilometres south-west of Biloela.

The Development Application (DA) for the proposed project was submitted to the state government in September last year. In January the government issued a four-month pause on consideration of the Project's DA. RWE remains confident in the quality and compliance of our submission and we are actively working with the Queensland Minister and the Department of State Development, Infrastructure and Planning to provide further detail on the project. We believe the proposed Theodore Wind Farm is a quality project and will continue to develop and invest in the project in line with our current timeframes.

Our sponsorship fund remains open and we continue to be committed to ongoing engagement. We are regularly out and about in your community, meeting with individuals and organisations. We invite community groups and eligible organisations who may benefit from our existing $100,000 per annum sponsorship fund to make contact so we can support your community.

We have Community drop-in sessions scheduled for later this month, and open café sessions in May, June and July. We invite you to stay engaged by liaising with the project team directly or via these opportunities, which are outlined in more detail on page four of this newsletter. We value your input and look forward to continuing to work together to ensure the proposed Theodore Wind Farm delivers lasting benefits to your community.

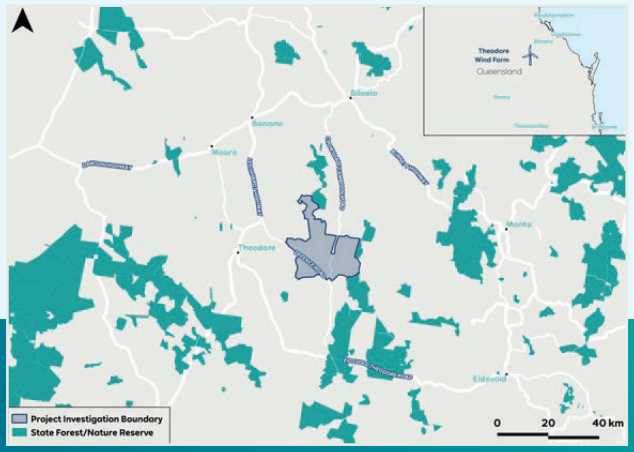
Kind regards,

Matt Walker
Development Manager –Theodore Wind Farm

RWE Renewables Australia respectfully acknowledges the Wulli Wulli people, the Traditional Owners of the lands where the Theodore Wind Farm is proposed, and pay our respect to their Elders, past, present and emerging.

At a glance

- Up to 170 *wind turbines* with a tip height of up to 270m
- *Located* about 22km east of Theodore, 50km south-west of Biloela and 150km south-west of Gladstone. The area is predominantly used for cattle grazing
- Site investigation area of about *46,000* hectares, with an expected operating footprint of less than 3% of this land
- *Installed capacity* of about 1,100 megawatts (MW)
- About *500,000 Queensland homes powered*
- *Project status:* Planning and approvals
- Start of *construction* planned for 2026
  Estimated 3-4 year construction period
- Targeting 2027 for initial *operations*
  Expected to be fully operational in 2029



Find out more

1800 879 435

theodorewindfarm@rwe.com

Drop into an open cafe session:
see back page of this newsletter

Scan the QR code to
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What we've heard from you

Frequently asked questions and answers

Will local businesses and employees be engaged during development?

RWE is committed to prioritising the use of regional Queensland businesses and employees when practical for the project and local community. If the project is approved, construction is expected to take up to four years and require a workforce of up to 500 people at peak periods. In addition to this construction workforce, there will be substantial additional economic benefits for the local area. As the project progresses throughout the planning and approvals phase, we will create a register on the Theodore Wind Farm project site to enable expressions of interest for provision of goods and/or services and provide further information on how you can be involved. We are currently going through the process of developing local and Indigenous procurement plans. We will also hold supplier specific information sessions at a later date, where interested goods and service providers will be able to meet with our construction contractors.

How will RWE manage accommodation for construction workers?

RWE has identified the need to provide accommodation for workers involved in the construction, operation and decommissioning of the proposed Theodore Wind Farm. Up to 500 workers will be required during peak construction periods, and some of these workers will be sourced from outside the Banana Shire Local Government Area.

RWE commissioned a study into potential accommodation options and is now working with Banana Shire Council on the best options for accommodating the workforce. To date the preferred option under discussion is primarily on-site camp during construction along with utilisation of local accommodation providers.

RWE has also committed to working with council to develop in-town permanent accommodation. The format, location and quantity is yet to be determined.

We will share further information as it becomes available.

Will the wind turbines generate noise?

Wind farm developments generate noise, like many other built and natural environments. Wind farms in Queensland must currently comply with the noise guidelines in State code 23: wind farm development. This code provides two acoustic assessment criteria: one for host landholders and a second for dwellings not involved in the project. The project must have a 1.5 kilometre buffer to dwellings, and all neighbouring dwellings are well beyond this distance. Although not required due to the project's distance from dwellings, RWE has conducted background noise monitoring and modelling at 11 host and non-host sites at and near the area as part of our commitment to best practice.

What impact will the wind farm have on aviation in the area?

Aviation is an important consideration when developing a wind farm. RWE is aware of the existing aviation in the Theodore area, including aerial mustering. An aviation impact assessment has been completed and indicates the proposed wind farm will have minimal impact on aviation in the area. The current indicative turbine layout also satisfies the aviation planning provisions of Banana Shire Council. The proposed project is more than 20 kilometres from Theodore Airport and initial studies have indicated the wind farm would not compromise the safety of existing airports and associated navigation and communication facilities. If the wind farm is constructed, we will work with the project's landowners to plan when turbines will need to be turned off for aerial mustering. RWE will share met mast and turbine locations with local pilots and aviation businesses on request, as the project progresses.

What is RWE doing to minimise and offset biodiversity impacts?

RWE has undertaken significant flora and fauna studies as part of the project and these reports are available on the SARA and EPBC portals. RWE is committed to conducting best practice assessment of the environment. As part of this we have:

- Completed more than two years of ecological site surveys across a range of seasons
- Prepared draft post construction rehabilitation plans that were submitted as part of the DA, and will be refined through the planning process
- Committed to end of life decommissioning.

Has a landscape and visual assessment been undertaken?

A landscape and visual impact assessment has been completed with photomontages from points around the Project site showing minimal visual impact from publicly accessible locations. Photomontages have been shared at our community drop-in sessions and will be available at future sessions. These photomontages are also viewable as part of the DA application on the SARA portal: www.planning.qld.gov.au/planning-framework/state-assessment-and-referral-agency/sara-application-material.

Photomontage of view from Defence Road





Our sponsorship fund

We are proud that our sponsorship fund of $100,000 per calendar year during the planning and approvals phase of the project has already contributed close to $100,000 to local community groups and organisations.

Apply for Community Sponsorship

If you are part of a community or non-profit group, we want to hear from you. We are meeting with community groups to understand their needs and welcome your feedback.

If your group could benefit from sponsorship, please contact the team to arrange a meeting on:

1800 879 435

theodorewindfarm@rwe.com

Almost

$100K already allocated

Sponsorship distributed to date includes:

$55,000	Theodore State School Multipurpose Courts
$5,097	Theodore Council on the Ageing
$5,000	Theodore Junior Roosters Rugby League Club
$5,000	Theodore Show
$5,000	Theodore Centenary Celebrations
$5,000	Theodore State School P&C
$5,000	Camboon Campdraft
$3,000	Moura Marlins Swimming Club
$3,000	Theodore Museum
$3,000	Bulls N Barrels Bonanza

How to apply

If you would like to apply for sponsorship, scan the QR code and download the application form from the website, or visit **au.rwe.com/projects/theodore-wind-farm**.

Have your say on the Community Benefit Fund

RWE will establish a Community Benefit Fund of at least $500,000 per year – equating to about $17.5 million across the operational life of the wind farm – once the project moves into the construction phase.

This fund will be administered by a local community committee, that will be responsible for deciding how the money is spent.

In other communities, funds have supported initiatives including new uniforms for sporting clubs, through to medical equipment for rural hospitals.

We want to hear your suggestions about how this fund can make a positive difference to your community.

To have your say, contact the team or drop into an open cafe session, as outlined on the back page of this newsletter.

Engaging with you

If you are a community group, business or other organisation who would like a project briefing or meeting, please reach out to us on 1800 879 435 or email theodorewindfarm@rwe.com. Alternatively, please call in to see us at our community drop-in and open café sessions, as detailed below.

Throughout 2023 and 2024, in addition to personal meetings, briefings and other communications we held:

4 community drop-in sessions

with technical exerts available to provide expert insights

Held across two consecutive days at Theodore and Banana in August 2023 and February 2024.

More sessions planned for 2025.

8 shopfronts

where team members were on hand to answer questions and share information

Held at the Theodore RSL Hall during March, April, May and June 2024.

4 open café sessions

where people could drop in for a coffee and learn more about the project

Held at Theodore in October and November 2024.

More sessions scheduled for 2025.

Join us!

Community drop-in sessions

Would you like to know more about the proposed Theodore Wind Farm? We are holding community drop-in sessions in March and invite you to drop in to see us at:

BANANA
Sutherland Hall
32 Bowen St. Banana
Saturday, 29 March 2025 8am to 4pm

THEODORE
RSL Hall
30 The Boulevard, Theodore
Friday, 28 March 2025 8am to 4pm

Wind farm open café sessions

Call into an open café session in Theodore, where you can chat with our team members over a coffee and learn more about the proposed Theodore Wind Farm.

Tuesday, 13 May
12:30pm to 4.30pm
Theodore Home & Garden Cafe

Wednesday, 14 May
8:30am to 12 noon
Castle Creek Cafe

Tuesday, 10 June
12:30pm to 4.30pm
Theodore Home & Garden Cafe

Wednesday, 11 June
8:30am to 12 noon
Castle Creek Cafe

Tuesday, 8 July
12:30pm to 4.30pm
Theodore Home & Garden Cafe

Wednesday, 9 July
8:30am to 12 noon
Castle Creek Cafe

Find out more

1800 879 435

theodorewindfarm@rwe.com

Drop into an open cafe session:
see back page of this newsletter

Scan the QR code to
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Theodore
Wind Farm

RWE



Proposed Theodore Wind Farm

Community Drop-in Sessions 28 and 29 March, 2025

Information booklet

1800 879 435

theodorewindfarm@rwe.com

theodorewindfarm.com.au

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At a glance

About
500,000
homes powered

The equivalent of powering all private dwellings in the Banana Shire close to 70 times, or the city of Rockhampton more than 15 times

Up to
170
wind turbines

Height up to
270 metres

About
1100 MW
installed capacity

Battery energy storage

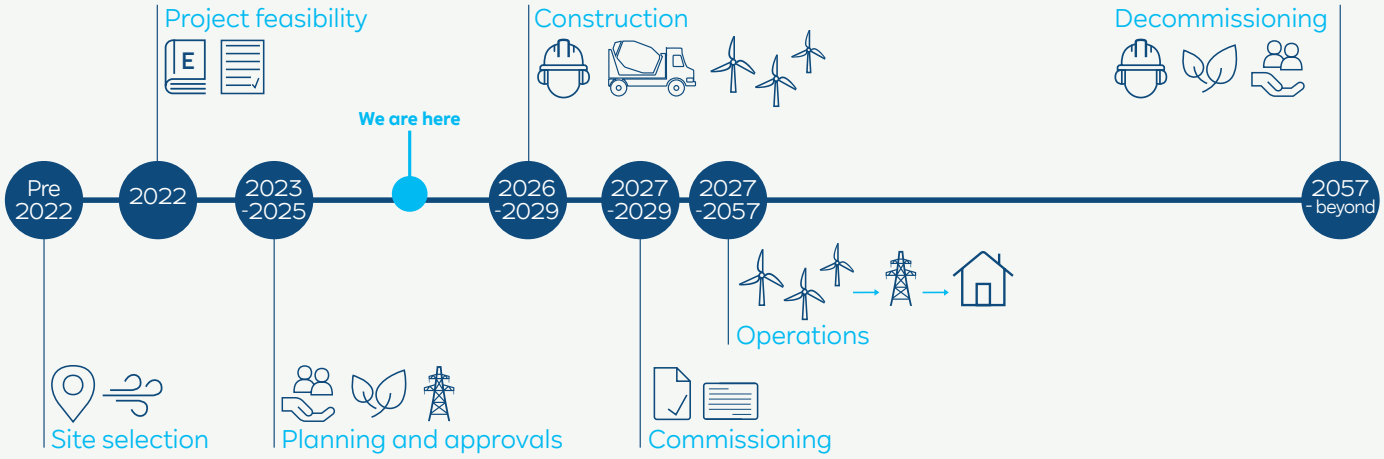
Located about
22 KM
east of Theodore and 50 kms south-west of Biloela

Local Government Area
LGA
Banana Shire Council

Close to
46,000 ha
investigation area
with the project footprint expected to occupy less than 3 per cent of this area

Targeting
2027
initial operations

Estimated project timeline



Theodore Wind Farm | RWE

Project benefits



Employment

- Up to 50 ongoing jobs for the 35-year operation of the wind farm
- Up to 500 jobs at peak construction periods
- Support local supply chains through increased demand for goods and services, including hospitality, trades and other suppliers



Community

- Community Benefit Fund of at least $500k per year, to begin when construction commences and operate for the 35-year operational lifespan of the project
- Sponsorship fund during project development with almost $100k already allocated to local community groups and organisations



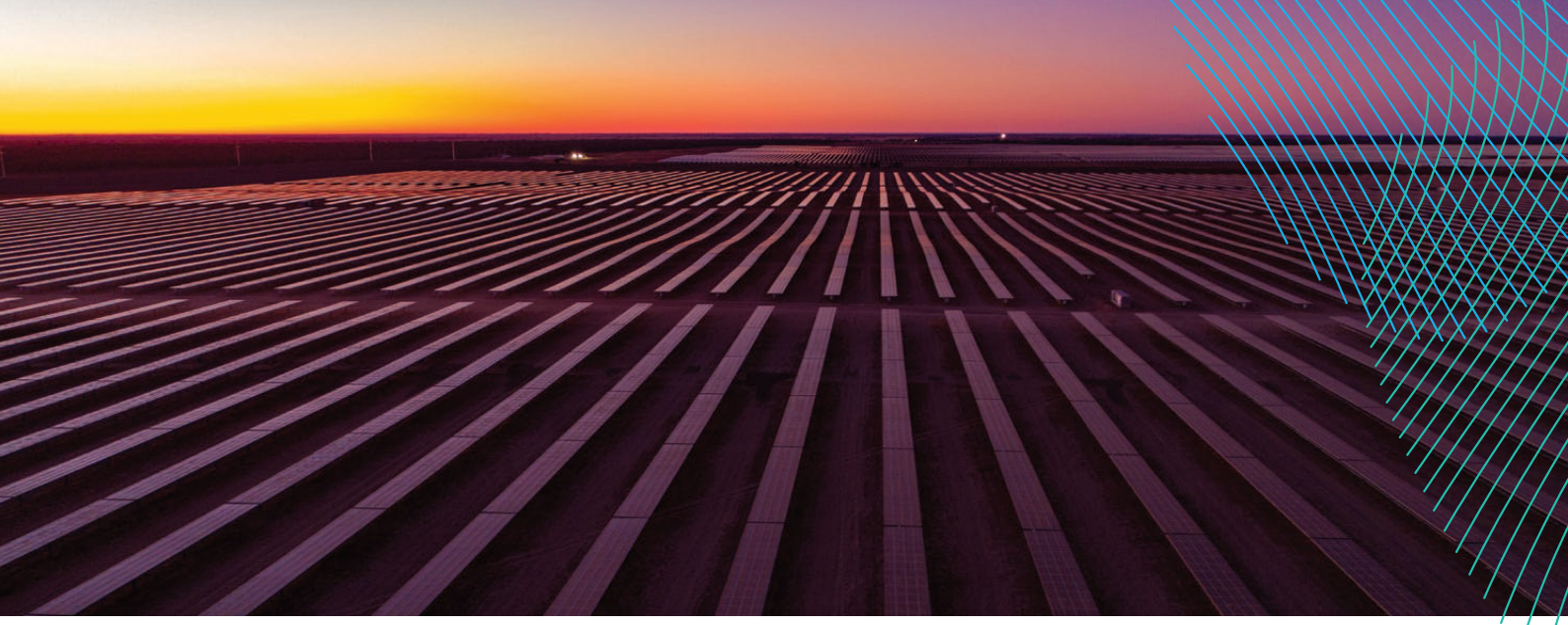
Economic

- Ongoing economic stimulus in the region, across the project's 35 years of operation
- Community Benefit Fund to be delivered over the operational life of the wind farm
- Rates payments to the Banana Shire Council
- Sponsorship fund during the development of the project
- Sponsorship fund of $100k p.a. currently operational



Environmental

- Proposed to generate enough electricity to power 500,000 homes - the equivalent of powering all private dwellings in the Banana Shire close to 70 times, or the city of Rockhampton more than 15 times
- Help provide electricity security for Queenslanders



About RWE

RWE is one of the world's leading producers of renewable energy and operates a global portfolio of about 19 gigawatts (GW) of renewable wind, solar and battery storage projects.

In addition, there are various renewable energy projects under construction in multiple countries throughout the world, totalling about 12 GW.

The RWE Group has been present in Australia since 2013. In 2018 it began construction of one of the country's largest solar farms – the 249 megawatt (MW) Limondale Solar Farm in New South Wales (NSW) and has been operating it ever since.

RWE is now developing an exciting portfolio of wind, solar and battery storage projects across Australia. Our growing team of about 80 people – largely based in Victoria and Queensland – is backed by the experience of RWE Renewables' 5,300 strong team across the European, North American, and Asia Pacific regions.

We have a planned gross investment in Australia of $6 billion, to develop up to 3 GW of onshore wind, solar and battery projects across multiple states.

Our Limondale project is one of the country's largest solar farms. We have built a strong relationship with the Balranald community and were chosen to deliver and operate Australia's first eight-hour battery within the existing project site through New South Wales' first Long-Term Energy Service Agreements tender process. This project is currently under construction and commissioning is planned for late 2025.

Global portfolio of about

19 GW

A further 12 GW of global renewable energy projects under construction

RWE has a strong focus on working with and making positive contributions to the communities where our projects are based, as well as being a key driver of Australia's energy transition.

We are committed to fostering transparent and lasting relationships with stakeholders, with particular consideration for local communities and landowners. Our business model is to develop, own and operate renewable energy projects and we look forward to working with your community.

Find out more about our Australian projects at **au.rwe.com**

A wind farm's lifecycle

Developing a wind farm in Australia requires extensive studies, assessments and engagement with stakeholders before submitting a planning application, which is tailored to the relevant state's planning process. This infographic outlines the stages of a wind farm, from site selection to decommissioning.

1 Site selection

Generally 6-18 months

Factors that need to be considered when selecting a site include:

- Wind resource
- Grid connection (distance and connection point)
- Population density

2 Project feasibility

Generally 6-18 months

This incorporates:

- Wind monitoring to determine strength and the site's viability
- Consideration of social and environmental factors
- Developer meetings with potential host landowners to inform and sign land use contracts
- Initial studies

The project generally becomes public knowledge during this stage or the next.



3 Planning and approvals

Can be up to several years

Extensive studies, reports, and community and stakeholder feedback help shape the project that is submitted to the required planning authorities. If approvals are received, RWE will seek goods and services providers, and create job opportunities.

4 Construction

Dependent on the project size, but usually 18 months to 3 years

Larger wind farms (more than 60 turbines) may be built in stages. Turbines are often operational once constructed, even if construction of the overall project is ongoing. Community updates continue in this stage and benefit sharing programs are finalised or sometimes become operational.

5 Commissioning and operations

A wind farm can operate between 25 and 35 years

Commissioning begins when the first turbines are built and continues until all turbines are operational – delivering clean, green power. A community benefit fund, administered by a community committee, and a permanent workforce are implemented during operations.

6 Decommissioning

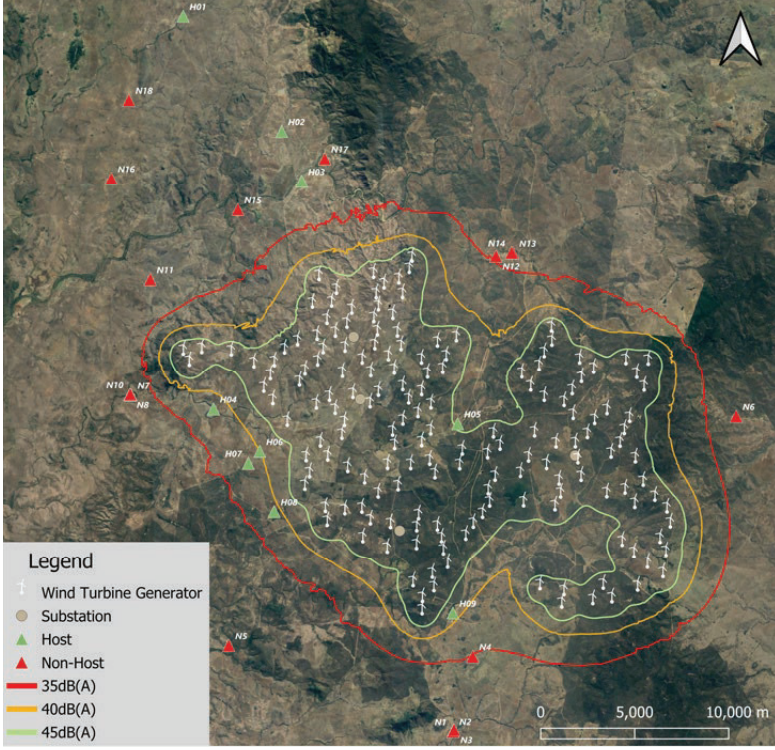
Several months to years, depending on the project size

Options at the end of a wind farm's life include:

- Remove infrastructure and return land to prior state or a state desired by the landowner (this is RWE's responsibility)
- Extend the operating lifespan through the relevant planning pathway
- Incorporate modern wind farm technology

Noise Impact Assessment

The Noise Impact Assessment for the proposed Theodore Wind Farm models the potential noise levels from 170 wind turbines, battery storage systems and transformers and compares them to government regulations.



What regulations are in place for noise from wind farms?

Queensland's State Code 23 requires wind farms to be designed in a way that ensures acceptable noise levels for everyone – both host and non-host landholders.

The proposed project is assessed for noise impacts under the Banana Shire Council Planning Scheme 2021 and the relevant State Development Assessment Provisions.

What type of noise is generated by wind farms?

Wind farms generate two types of noise:

- **Aerodynamic**, which is the sound of turbine blades moving through the air.
- **Mechanical**, which is the sound generated from the turbine's mechanics.

What did the noise assessment involve?

Specialist consultants Echo Acoustics measured the existing noise in the environment using precise instruments over time to establish baseline noise levels. They then compared these with the predicted noise from the proposed facility to assess the impact on nearby residential areas, ensuring it meets government regulations.

What did the noise assessment conclude?

The noise assessment found that the proposed Theodore Wind Farm will be within the required noise levels and separation distances for wind turbines. The layout ensures that the nearest non-host homes are more than twice the required distance from the proposed turbine locations.

What noise is allowed under the guidelines?

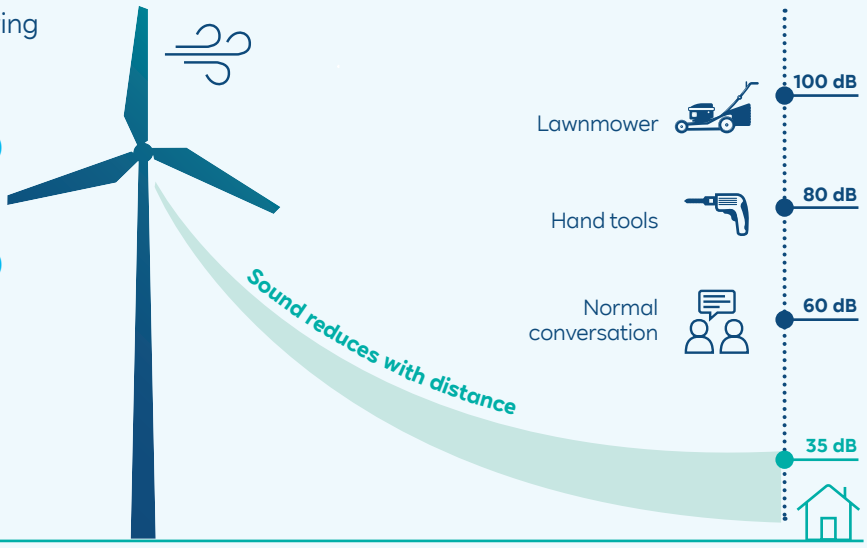
State Code 23 version 3.1sets the following noise limits for wind turbines:

Host landholders:
45 dB(A) or background noise + 5 dB(A)

All other dwellings:
35 dB(A) or background noise + 5 dB(A)

The wind farm noise limit at non-participating dwellings is 35 dB(A), or +5 dB(A) above ambient levels, whichever is higher.

Decibel levels of sound comparable to a wind turbine





Socio-economic Impact Analysis

The socio-economic impact analysis for the proposed Theodore Wind Farm provides an overview of the social and economic context of the communities around the proposed project and establishes a baseline. This means the impact of the proposed project can be successfully monitored over time, and any social, economic, and demographic changes can be evaluated and measured.

How was this analysis undertaken?

The assessment was undertaken in line with state guidelines to document the existing social and economic environments of the Area of Influence (AoI).

The report:

- Found there were two AoIs; a primary and secondary area. The primary area is the project area and immediate surrounds; the secondary AoI is the Banana Shire and Gladstone Region LGAs.
- Identified nearby areas that are likely to experience social impacts.
- Collected baseline data from the Australian Bureau of Statistics and Queensland government.
- Incorporated stakeholder input.
- Reviewed local and state planning policies and project information.

After analysis, further community consultation will occur and consideration be given to managing or reducing negative impacts.

What were the key learnings?

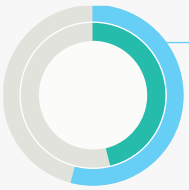
Community profile

In the Banana Shire and Gladstone LGAs the median age is 38, similar to Queensland's average. The Indigenous population is 4.6% in Banana Shire and 6.2% in Gladstone, close to Queensland's 4.6%. However, Theodore and Moura have higher Indigenous populations at 15.1% and 8%, respectively. Additionally, there are slightly more males than females in the local government areas more broadly.

Economic and employment profile

Banana Shire

Full time employment



65.4%

against a Qld average of 55.9%

Top employment industry



Beef cattle farming

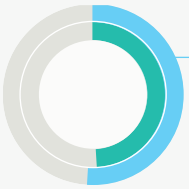
Household income 2016-2021



Higher compared to the state and nationally

Gladstone Region

Full time employment



58.1%

against a Qld average of 55.9%

Top employment industry



Aluminium smelting

Household income 2016-2021



Lower compared to the state and nationally

There is a higher percentage of technicians, trades workers, labourers and machinery operators in the Banana Shire and Gladstone Region LGAs than Queensland as a state. This means the local population has a range of skills that can be drawn on for the proposed project's construction. Some additional training might be required, however, this will benefit the community overall.

Accommodation considerations

The report analysed existing accommodation options and a workforce accommodation strategy is being prepared. Please refer to the workforce accommodation poster for further information.

Social infrastructure

Social infrastructure includes recreational facilities, community organisations, schools, and health and emergency services. The report also identified the area's recreation and community facilities, health services, schools and other education facilities.

What happens with this information?

This information helps shape the Project development by allowing RWE to better understand project risks, positively impact communities, and effectively contribute to social and economic development.



Natural Hazard Risk Assessment

The Natural Hazard Risk Assessment for the proposed Theodore Wind Farm explores the potential bushfire impacts to people, property, economic activity and the environment, and addresses them within the relevant regulations.

How was this assessment done?

The assessment incorporated detailed desktop analysis of fire, weather and fuel in the proposed project area, and then used advanced modelling and data analysis to complete radiant heat flux modelling. Radiant heat flux modelling measures how much heat is transferred; in the context of wind farms, it specifies the minimum distances between the structures and vegetation that is required to reduce the risk of fire damage.

What are the bushfire risks associated with the proposed project?

State Planning Policy area mapping shows that the proposed wind farm site and surrounding areas have medium to high potential bushfire intensity, with very high intensity in rugged terrain.

The fire season is from August to January, and peaks in October. It is influenced by rainfall — wet years lead to higher fuel loads, while dry years reduce them.

How will bushfire risks be managed?

The Radiant Heat Flux modelling determines safe distances between critical wind farm infrastructure and bushfire-prone vegetation. These distances must be at least 20 metres. The development area is large enough to include these safety zones.

We will work with the CFA to determine where best to place water tanks for firefighting.

Wind farm turbines are also constructed from non-flammable exterior materials and are highly unlikely to be ignited.

In regards to the wind turbines, the assessment recommended the following measures:

- Minimum fire breaks around key infrastructure, generally 20m around BESS, switchboards, substations, static water supply, on site accommodation
- Turbines will be at least 300 metres apart
- Each turbine will have an automatic shut-down system, and be able to be disconnected from the power supply in the event of fire
- Nacelles will include automatic fire detection, alarm and fire suppression systems
- The Civil Aviation Safety Authority (CASA) will be notified of any masts and turbines of 110m or more above ground
- All guy wires and monitoring masts will be clearly marked, even when not required by CASA.



Aviation Impact Assessment

This Aviation Impact Assessment (AIA) examines possible aviation impacts from the proposed Theodore Wind Farm and provides safety advice for the construction and operation of the project, in line with air safety rules in Australia. It also includes an Aviation Impact Statement (AIS) that evaluates current aviation operations and suggests ways to reduce risks.

What aviation sites are impacted by the proposed Theodore Wind Farm?

There are two certified airports in the Banana Shire: Theodore Airport (YTRD) and Thangool Airport (YTNG). Both are within 60 km of the proposed Theodore Wind Farm. Therefore, the impact assessment includes the air space, air routes, and circling areas of these airports, as well as navigation, radar, and communication facilities. It also considers obstacle marking and lighting for the wind turbines and any impacts on aerial firefighting.

Who has been consulted?

Airservices Australia and the Civil Aviation Safety Authority (CASA) have been consulted on the minimum requirements for wind turbines.

There will be ongoing engagement with Airservices Australia and CASA, as well as local and regional aircraft operators, landowners and aerial agricultural operators, to continue reviewing and updating the risk assessment.

What do I need to know from the AIA?

The height of the wind turbines and related structures like meteorological masts and transmission lines won't affect the safety of the existing airports or their navigation, radar, and communication systems. However, at Theodore Airport, minor changes to airspace and some air routes are needed to keep safe altitudes, including raising the minimum sector altitude (MSA). No changes are required at Thangool Airport.

What about lighting or markings for the wind turbines?

A safety risk assessment found that obstacle lighting for wind turbines and transmission lines isn't needed to keep aircraft safe. However, CASA might still require obstacle lighting, and we are working closely together to ensure the proposed project meets aviation safety standards.

The wind turbines will be painted white, like most in Australia. No extra markings are needed.



Electromagnetic Interference Assessment

The Electromagnetic Interference (EMI) Assessment looks at the potential impact of the proposed Theodore Wind Farm on telecommunication services and if there is a need for any mitigation measures.

What is electromagnetic interference (EMI)?

EMI is interference in an electrical circuit from an outside source. It can affect electronics like mobile phones, radios, satellites, and wireless services. The towers, blades and generators of a wind turbine can block some EMI signals.

How was the EMI assessment undertaken?

Specialist consultants Middleton Group used desktop studies and engaged with key stakeholders including Australia Pacific LNG, Bureau of Meteorology (BoM), Geoscience Australia, Telstra, and Optus. An assessment was undertaken of the potential impact of the proposed Theodore Wind Farm on their services, as well as radio communications within 150km of the site. These were identified using the Australian Communications and Media Authority (ACMA) database.

What was the conclusion of the EMI assessment?

The assessment concluded that the proposed Theodore Wind Farm is unlikely to significantly impact existing telecommunication services. However, BoM has noted that some of its Taroom weather radar scans might be affected. BoM will conduct a risk assessment, and we will work closely with BoM to develop a solution.



Landscape and Visual Impact Assessment

Photomontage of view from Defence Road

The Landscape and Visual Impact Assessment (LVIA) evaluates how the turbines and infrastructure incorporated in the proposed Theodore Wind Farm might affect the area's landscape and views.

How was the LVIA prepared?

Field work was completed in 2023 to document the landscape and its current visual appearance. This was then assessed within relevant guidelines and regulations, and measures were suggested to reduce any visual impacts from the proposed project.

What are the key conclusions of the LVIA?

The proposed project will have very little visual impact on the landscape. Mapping shows that the wind turbines can be seen from the north and south in areas close to the project. In areas north-east that are further than about 6.18 km, up to 56 wind turbines can be seen. Natural landscape features in the area such as ridgelines, hills and vegetation, limit views of wind turbines that are further than 6.18 km.

Most wind turbines could be visible along Defence Road and Crowsdale-Camboon Road. They would not be visible from surrounding towns due to the distance.

What type of infrastructure will the proposed project have and have these been assessed for their visual impact in the LVIA?

Infrastructure includes the following and all have been assessed in the LVIA:

- Up to 170 wind turbines with an anticipated maximum tip height of 270 m above the average ground height
- Access roads and tracks
- Underground and overhead electricity cabling
- Substations
- Battery energy storage systems (BESS)
- An operations and maintenance facility.

Are there photomontages?

Yes. Photomontages have been prepared from five locations (varying in distance and direction) and represent a worst-case scenario. Photomontages are available at community sessions and are within the DA package.

How are viewpoints impacted by the infrastructure and how will this be managed?

The proposed project can be seen from surrounding areas because of its size and height, however, because it is in an isolated area, the visual impact is very minimal.

Mitigation measures will still be put in place to help the infrastructure more effectively blend into the landscape. This includes:

- Considering the wind farm's layout, including infrastructure design, colour and material
- Aligning access roads and tracks with existing roads and tracks where possible
- Planting boundary screens
- Minimising vegetation loss
- Avoiding unnecessary lighting and signage.

Public viewpoints

Of the 26 public viewpoints assessed, 17 were rated as having very low visual impact and 9 as low.

Houses

No non-host houses are within 3.09 km of the nearest wind turbine, but 11 are between 3.09 km and 6.18 km, with eight having low and three having moderate visual impact. There are six non-host dwellings between 6.18 and 10 kilometres of the nearest turbine. Mitigation measures like screen planting can reduce these impacts.

What is shadow flicker and what is the impact?

Shadow flickers are caused by the moving shadows as the rotating blades of the wind turbines pass in front of the sun. No non-associated houses are affected. Two associated houses might experience shadow flicker, but vegetation and their distance from the proposed project would likely minimise this.



Ecological Assessment Report

The Ecological Assessment Report for the proposed Theodore Wind Farm provides an overview of the environment in and around the proposed project area, so the project can be designed to avoid and minimise impacts on vegetation and habitats for threatened species.

How was the ecological assessment done?

Specialist consultants ERM reviewed public databases and conducted field surveys across the properties proposed to host project infrastructure. These properties make up the approximate 47,000-hectare study area. The surveys were undertaken from October 2022 to September 2024 to understand the area's ecology (animal and plant species and habitat) and potential impacts on threatened species.

How is the landscape characterised?

The report found that almost half of the study area has been cleared for pastoral use. It is typically dominated by native and exotic grass, environmental and invasive weeds, as well as sparse native vegetation.

There are areas that contain mature woody vegetation, including open eucalypt forest, trees and shrubs adjacent to streams, and small isolated areas of dry rainforest and scrub.

What did the ecological assessment find?

The study area has a range of landscape features, including steep ridgelines, flat alluvial plains and streams and creeks. Specific regulations and protections may apply during the construction of the proposed project and further consents will be obtained if required. The assessment found:

Habitat types

Six main habitat types:

- Grasslands and cultivated agricultural land (22,700 hectares)
- Eucalypt woodland and open forest (21,700 hectares)
- Brigalow woodlands (330 hectares)
- Riparian woodlands (vegetation that grows near streams and creeks) (1730 hectares)
- Vine forest/ thickets and dry rainforest (230 hectares)
- Waterbodies and drainage features (56 hectares).

These habitats support foraging, breeding, roosting and movement for species (including threatened species) that are present or may be present in the area.



Animal species

Four Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) threatened species are known or likely to be in the area:

- Koala
- Squatter pigeon (southern)
- Greater glider (southern and central)
- Large-eared pied-bat.

One EPBC Act migratory species is likely to be in the area:

- Satin flycatcher.

Ecological communities

Two EPBC Act listed Threatened Ecological Communities (TEC) were also found:

- Brigalow woodlands and forest
- Poplar Box Grassy Woodland on Alluvial Plains.

The presence or likely presence of listed species and communities means several steps will be taken to ensure their protection and minimise the impact of the proposed project.

What are the impacts of the proposed project?

In general, potential impacts during construction relate to habitat loss, disturbance and degradation.

The four EPBC Act listed species — squatter pigeon (southern), koala, greater glider (southern and central) and large-eared pied-bat, are likely or have the potential to be significantly impacted by the construction of the proposed wind farm.

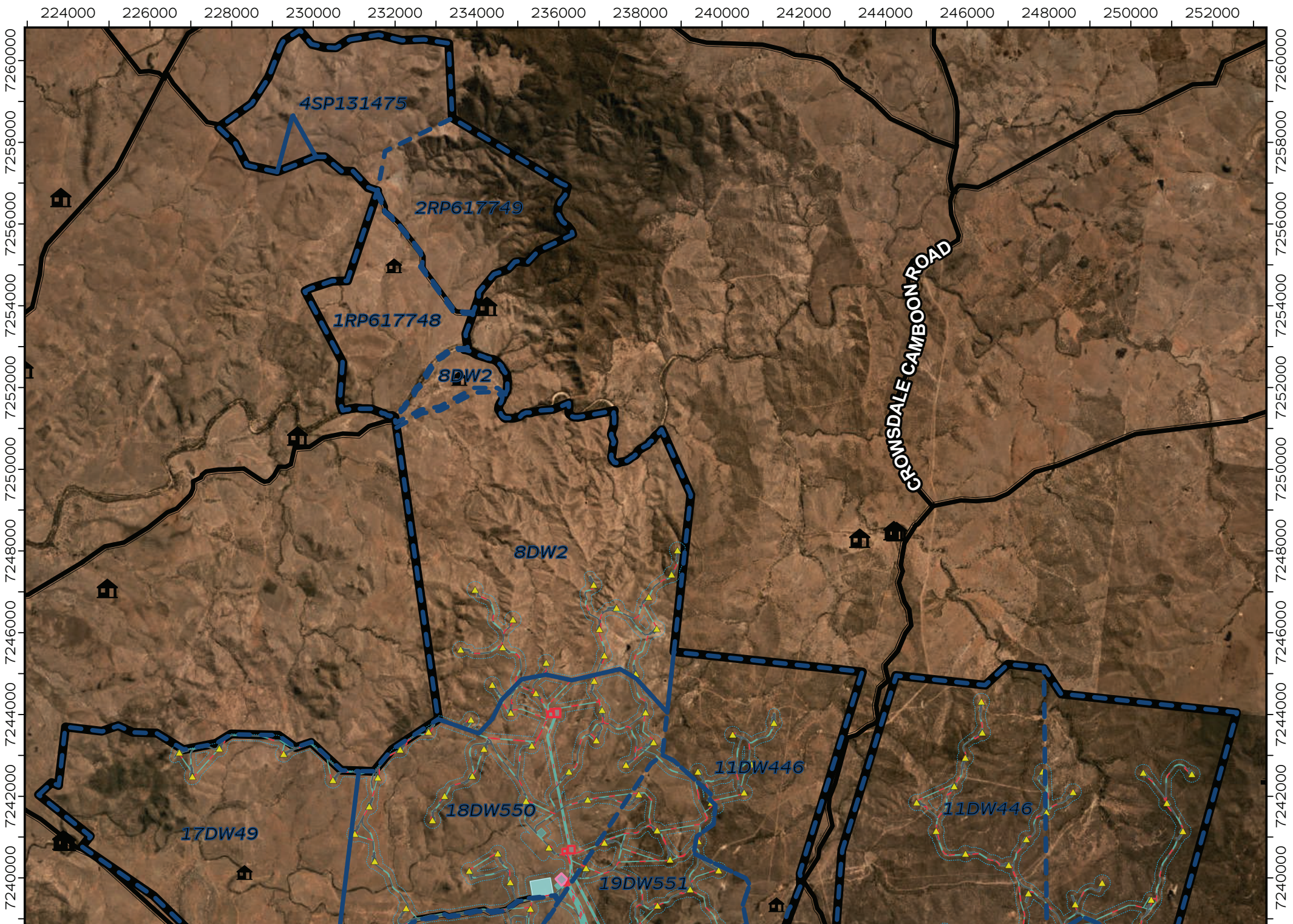
Two EPBC Act listed TECs, Brigalow and Poplar Box Grassy Woodland on Alluvial Plains, are also likely to be significantly impacted.

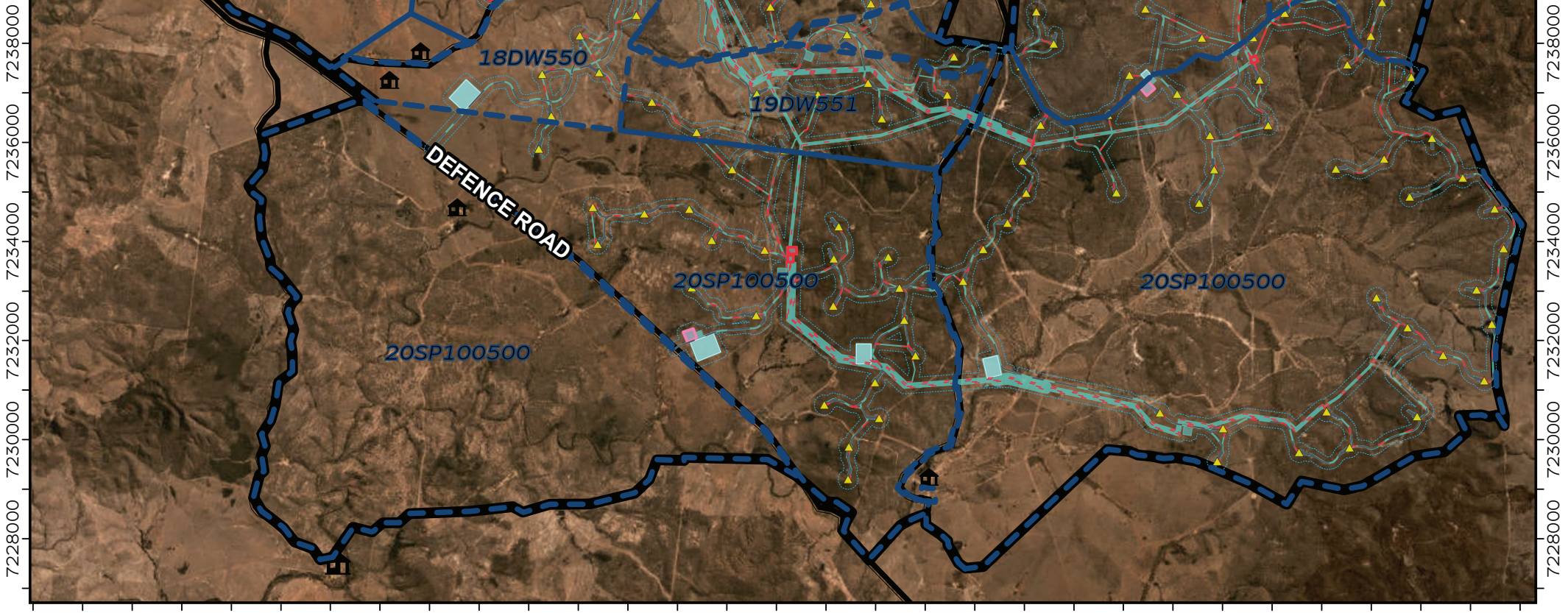
There will also likely be an ongoing impact to listed threatened species, protected vegetation, and vegetation that overlaps with streams and other watercourses once the proposed wind farm is in operation. This includes the possibility of bird and bat strikes with operational wind turbines.

How will these impacts be managed?

The layout of the proposed wind farm (including turbines, access tracks and other infrastructure) will be carefully planned around local plant and animal habitat, with additional surveys to take place to further optimise the placement of infrastructure.

Where significant impacts cannot be avoided, we will work to improve the existing habitat of threatened species in accordance with the EPBC Act.


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2RP617749
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8DW2
8DW2
CROWSDALE CAMBOON ROAD
11DW446
18DW550
11DW446
17DW49
19DW551



Legend

- Study Area
- Project Lots
- Wind Turbine Generator
- Disturbance Footprint
- Micro Siting Buffer
- Tracks/Turning Bays/ WTG Hardstands
- Electrical Reticulation
- O&M Compound
- Construction Site Compound
- Laydown Area
- Substation/BESS
- Concrete Batching Plant
- Dwellings

RWE

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Theodore Energy Development Pty Ltd: Theodore Wind Farm

Proposed Footprint Overview

0 5 Km

N

CRS: GDA2020 MGA Zone 56
Produced By: MW
Reviewed By: JP
26/09/2024



Bird and Bat Management Plan (BBMP)

The Bird and Bat Management Plan for the proposed Theodore Wind Farm identifies potential impacts on birds and bats in the area, identifies species of concern and establishes mitigation measures to help minimise and manage potential impacts.

What does this Bird and Bat Management Plan consider?

The plan considers the risk to threatened and migratory birds and bats using survey data, historical records and ecological studies. It explores how the construction and operation of the wind farm might impact these species and suggests ways to reduce the impact.

What are the main causes of impact from a wind farm?

1. **Direct mortality:** Birds and bats may collide with wind turbine blades. This can result in mortality.
2. **Bird utilisation of study area:** Water and foraging resources near wind turbines can attract birds and bats, increasing collision risks and potential injuries or deaths. Nesting may also occur near turbines.
3. **Lighting:** Lights on turbines and buildings can attract prey species for birds and bats, leading to increased bird and bat activity near the infrastructure, and therefore increasing the potential for collisions.

Which birds and bats were identified to be at risk in the proposed project area?

The plan evaluates the risk for each threatened or migratory species that is known, potentially present, or likely to be in the area. It also assesses the potential risk for species that fly at typical rotor swept areas (the area covered by the rotating blades of a wind turbine).

A total of 127 species were identified, including two listed under the Australian Environment Protection and Biodiversity Conservation (EPBC) Act, as shown in the table in the next column. Although the large-eared pied bat was not recorded during the assessment, it is likely to be present in this area and is therefore included in our management plan.

What is the likely impact?

Species	EPBC Act status	Impact
Squatter pigeon (southern)	Vulnerable	Significant impact to nearly 4 per cent of mapped foraging, roosting and breeding habitat during construction.
Satin flycatcher	Migratory	Unlikely to result in any significant impact; 1 per cent of habitat will be disturbed during construction. Species does not fly at collision risk height.
Large-eared pied bat	Endangered	Potential to result in a significant impact to 4.1 per cent of foraging habitat. Low risk of collision.

How will habitat impacts be offset?

An Offset Management Strategy (OMS) is currently being prepared according to the EPBC Act Environmental Offsets Policy.

What were the results of the collision risk assessment?

Five listed threatened species and 21 non-listed species were conservatively assessed as having a low risk of collision. One listed threatened species, the white-throated needletail, was assessed as a moderate risk.

All other listed bird and bat species were considered to have 'negligible' risk of impact from collision with wind turbines.



Preliminary Vegetation and Fauna Management Plan (VFMP)

Preliminary Vegetation and Fauna Management Plan (VFMP) describes how impacts on vegetation and fauna will be minimised and managed during the construction and operation of the proposed Theodore Wind Farm. This plan supports the Ecology Impact Assessment.

What is the biggest impact to vegetation and fauna?

The main impact on plant and animal life in the project area is likely to result from clearing and grading during construction of the proposed wind farm. Impacts could include:

- Mortality or harm to animals
- Dust impacts
- Noise and light impacts
- An increase in animal pests and weeds.

How will this be managed?

The wind farm layout has been designed to avoid vegetation and habitat whenever possible. Where avoidance is not possible, work is undertaken to minimise disturbance through ongoing, detailed design.

If clearing of regulated vegetation is required, this would be undertaken in line with the EPBC and DA planning approvals and conditions.

What other avoidance measures could be implemented during construction?

- Implement the Vegetation and Fauna Management Plan (VFMP).
- Mark approved clearance zones to prevent over-clearing.
- Minimise the impact on mature trees through careful placement of wind turbines.
- Have a qualified fauna spotter check for animals and important habitats before clearing. If found, the fauna spotter will take steps to avoid or minimise impacts.



Preliminary Construction Environmental Management Plan

The Preliminary Construction Environmental Management Plan (CEMP) for the proposed Theodore Wind Farm provides an overview of the key infrastructure required, outlines the project's potential impacts, and provides baseline management and mitigation measures for the proposed project.

It is supported by individual management plans for vegetation and fauna; bird and bat; stormwater; ecological and traffic impact.

What factors were considered when designing the project?

The proposed project's design considers a variety of factors, including the environment, wind resources, constructability, landowners, Traditional Owners and the transmission network. We will continue to refine the project through detailed design to reduce ecological impacts.

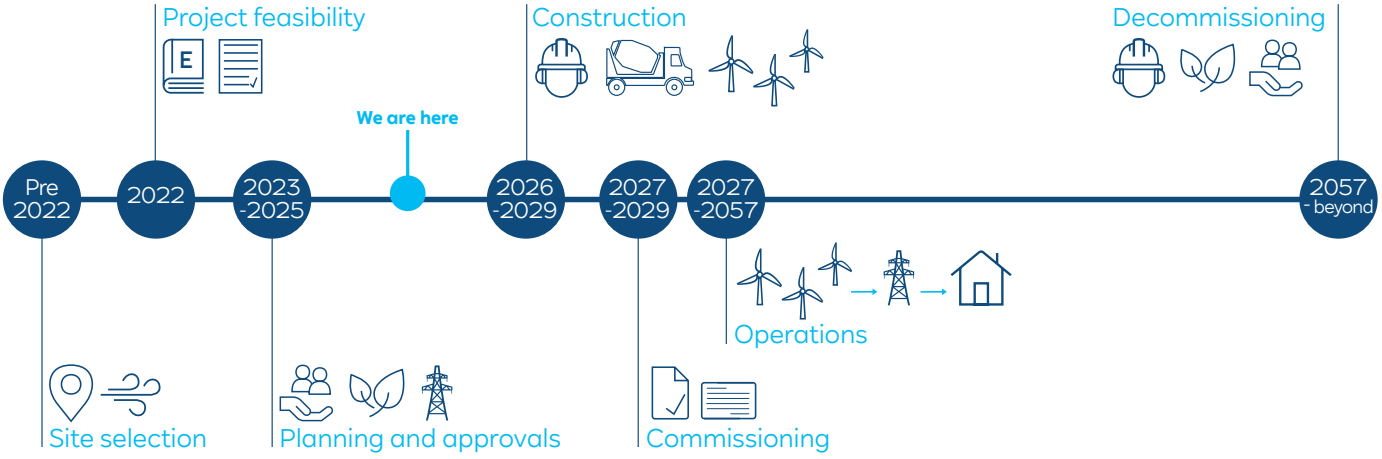
Will existing land use be affected?

Host properties can continue agricultural, farming and other land management activities largely unaffected throughout the construction and life of the proposed project.

When will construction take place?

The project is currently in the planning and approvals stage. We are targeting construction to commence in 2026.

Estimated project timeline





What infrastructure is proposed?

The preliminary layout (which will be refined) incorporates:

- WTG foundations and hardstand areas
- Turbine foundations and hardstand areas
- Temporary infrastructure such as concrete batching plants, laydown areas
- Temporary construction offices and parking and on-site accommodation
- Access tracks and electrical reticulation
- Switching stations and substations
- Battery Energy Storage Systems (BESS)
- Temporary and Permanent meteorological masts
- Permanent operations and maintenance facilities, with a variety of associated site facilities, and
- Storage laydowns around the proposed site.

How will the wind turbines be constructed?

Each wind turbine will have a concrete foundation, with its size depending on the turbine model, ground conditions and drainage design.

A hardstand area up to 2.67 hectares may be set up for each wind turbine. This area will be used to store equipment and assemble the turbine.

What will construction work include?

Subject to geotechnical (ground) conditions, the following works are expected to be undertaken:

- Erection of turbines
- Cut and fill earthworks, including excavations, blasting, hammering, compacting and crushing
- Cabling works, including trenching
- Vegetation clearing
- Construction of site compounds, camps and facilities
- An on-site borrow pit to source as much of the construction material as possible
- Temporary lighting and motion activated lighting where necessary.

What are the proposed construction hours?

The general construction hours will be refined prior to construction, but would be within the following parameters:

- Monday to Sunday 7 am to 7 pm
- Public holidays as required.

On occasion, work outside of these times may be needed to take advantage of favourable weather conditions, for emergency work or safety issues. Any night work will be minimised.

Will you be employing locals?

Between 300 and 500 staff will be employed during peak construction, including local workers, contractors, and manufacturers based on qualifications and local policies. It is anticipated some of these will be from the local area.

Will there be an increase in traffic?

Yes, there will be an increase in traffic on Defence Road during the construction phases of the proposed project. Please see the Traffic Impact Assessment fact sheet for further information.

What about water supply?

A water sourcing strategy will be developed so water used during the construction phase does not cause issues to adjacent landholders or other stakeholders.

Theodore
Wind Farm

Preliminary Route Assessment

The preliminary route assessment report for the proposed Theodore Wind Farm considers how the largest components of the proposed project can be transported from the Port of Gladstone to the site. Please also see the Preliminary Traffic Impact Assessment poster.

What is covered in the preliminary route assessment?

The preliminary route assessment report explores different ways to transport wind turbine parts from the Port of Gladstone to their destination in the proposed project area. It:

- Identifies transport issues, intersections and interchanges where traffic or haulage may be hindered by over-size/over-mass (OSOM) vehicles.
- Suggests solutions to streamline the movement of OSOM vehicles which will be hauling the components.

How was the preliminary route assessment undertaken?

It incorporated desktop analysis, driving of the potential routes, and completed assessments on the turns and manoeuvres OSOM vehicles may need to make.

The report also considered Queensland government and local council requirements, traffic and road conditions, noting that different routes may be used to transport different components.

What were the key conclusions?

As the report modelled wind turbine blades measuring up to 84.6 metres, two main routes were identified.

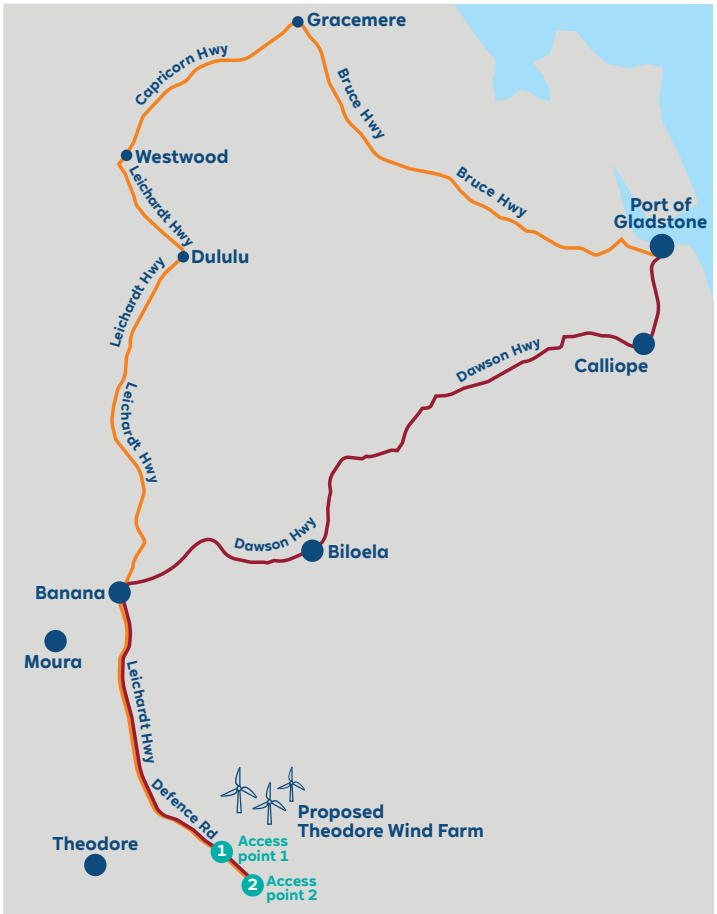
What are the recommended routes?

Main routes identified

1. **Project Transport Route 1 (PTR1):** Uses Bruce Highway, Capricorn Highway, and Leichhardt Highway.
2. **Project Transport Route 2 (PTR2):** This alternative route uses Dawson Highway and joins PTR1 at Leichhardt Highway.

What are the approximate route distances?

Route	Origin	Via	Distance (approx.)
PTR 1	Gladstone Port (Auckland Point)	Gladstone, Mount Larcom, Gracemere, Westwood, Dululu, Banana	300 km
PTR2	Gladstone Port (Auckland Point)	Gladstone, Mount Larcom, Calliope, Biloela, Banana	242 km



What happens next?

Theodore Wind Farm is working actively with the Department of Transport and Main Road and Council to ensure that any necessary permits and impacts are understood and undertaken in advance of project construction.



Preliminary Traffic Impact Assessment

The preliminary traffic impact assessment report for the proposed Theodore Wind Farm helps us understand the potential impact of construction traffic on traffic flows and the road network. It complements the route assessment report by providing an overview of potential traffic issues and solutions.

How was the traffic impact assessment report completed?

The report was undertaken by specialist consultants Cambray Consulting. It examined the existing transport network and potential access points to the proposed site for construction traffic, including haulage and worker movements.

It also evaluated the Defence Road and Leichhardt Highway intersection for traffic impact, vehicle types, and possible road upgrades, and considered alternative access within the local road network.

Where and how will the proposed project site be accessed?

More information on the proposed project transport routes for Over-size and Over-mass (OSOM) vehicles can be found in the Preliminary Route Assessment poster.

What about over size, over mass (OSOM) loads?

These will be carefully controlled to avoid peak periods, and will be limited in frequency based on specialist haulage vehicle availability, pilots, and escorts.

What else do I need to know?

- The majority of traffic is planned to come south along the Leichardt Highway onto Defence Road with access to the proposed project site via Defence Road.
- The current intersection configuration with the Leichardt Highway is adequate for peak construction traffic However, upgrades may be necessary for OSOM movements.
- Crowsdale-Camboon Road is not currently planned to handle through traffic for construction. Construction traffic will have to cross Crowsdale-Camboon Road to move between parts of the site.
- Sight distances at the proposed site entrances meet Austroads standards.

The construction phase is expected to last about 48 months. Once completed, the proposed project will operate seven days a week, 365 days a year with up to about 20 light vehicles accessing the site each day. There will also be a weekly refuse collection during operations as well as regular deliveries for site needs and general maintenance.

Theodore Wind Farm | RWE



Cultural heritage

RWE is committed to preserving heritage and working with Traditional Owners in the development, operation and decommissioning of our projects.

We engage with Traditional Owners, along with heritage specialists and archaeologists, to deepen our understanding of the project site and its cultural significance. RWE will seek to avoid and minimise any impacts to cultural heritage through the design of the project, in collaboration with the Traditional Owners.

During the development of the project, RWE has been working closely with Wulli Wulli Nation Aboriginal Corporation to building a strong relationship to create a lasting connection between the project and the Traditional Owners.

Since the last community drop-in session, RWE has executed an Early Works Agreement and is in discussions around executing a Cultural Heritage Management Plan. Additionally, RWE is looking to finalise cultural heritage surveys within the project boundary.



Accommodation Options Report and Workforce Accommodation Plan

The proposed Theodore Wind Farm will require up to 500 workers during peak construction periods. While we will endeavour to employ locally when we can, some of these workers will come from outside the region. The Accommodation Options Report explores potential options to accommodate the workforce for required during construction. A Workforce Accommodation Plan is also being developed.

What engagement has RWE undertaken regarding accommodation?

To identify the best solution for accommodating the workforce we have been consulting closely with Banana Shire Council and other stakeholders, listening to their feedback and ensuring it is considered as part of the report.

What is the Workforce Accommodation Plan?

The plan maps out the implementation of the Accommodation Options Report. It details an **on-site accommodation camp** for the majority of workers. The planned camp would incorporate about 400 beds with self-sufficiency for power and wastewater.

What about when the workforce exceeds 400?

Local accommodation providers will be used for overflow of workers beyond the capacity of the camp. Local accommodation providers will likely also be used for some consultants and short-term visitors.

Why has on-site accommodation been identified as the preferred option?

- Consultation with council and local community members has highlighted this as the preferred option
- Analysis of accommodation availability in local towns
- Capacity of local towns to provide services to the large number of workers without negatively impacting the community
- Local road safety (on-site accommodation reduces the number of potential vehicles on the road)
- Worker safety; workers will have maximum work durations due to fatigue.

Will there be opportunities for local businesses?

RWE is looking into options to involve local businesses in on-site accommodation camps and/or to bring workers to town to ensure that towns benefit. As part of our local procurement planning we will be opening up enquiries for local businesses later in 2025.

Is the Workforce Accommodation Plan completed?

No – it is still exploring all accommodation options. It will be available to all stakeholders once completed.

Theodore Wind Farm | RWE



Decommissioning

At the end of a project's life, RWE is responsible for restoring the project land to a standard agreed between us (as the project owner and operator) and the relevant landowner to allow agricultural operations to continue.

Decommissioning can take various forms, including infrastructure removal or repowering. The latter mainly consists of partially or totally replacing the old turbines with new models using the latest technology.

RWE will also implement a security commitment, or a bond, for the project. This security is for the landowners and will be enough to cover decommissioning of infrastructure for each property.

The decommissioning process and agreement with landowners will be finalised prior to construction and will be included in the landowner lease.

RWE tests world's first recyclable wind turbine blades

At the end of a project's life, many wind turbine components (such as the tower and nacelle components) are recycled.

However, we are paving the way for full recyclability of wind turbines through our pilot of Siemens Gamesa's recyclable blades at a wind farm off the coast of Germany.

Until now, the composite materials used in wind turbine blades have been more challenging to recycle because a resin system binds all components together.

In its recyclable blade, Siemens Gamesa is using a new resin type with a chemical structure that makes it possible to efficiently separate the resin from other components.



Supporting your community

What are the needs of your community?

In line with our development approach, community philosophy and industry best practice, RWE will establish a **Community Benefit Fund** for the Theodore Wind Farm, if the project proceeds to construction.

The fund will operate for the expected 30-year lifetime of the project and will incorporate at least $500,000 per year – $17.5 million for the operational life of the wind farm – and will be administered by a community committee.

How do you think the fund should be spent?

- Education support?
- Community group funding?
- Infrastructure upgrades?
- Other?



Sponsorship fund

We are proud that our sponsorship fund of $100,000 per calendar year during the planning and approvals phase of the project has already contributed close to $100,000 to local community groups and organisations.

If you are part of a community or non-profit group, we want to hear from you. We are meeting with community groups to understand their needs and welcome your feedback.

If your group could benefit from sponsorship, please contact the team to arrange a meeting on:

1800 879 435

theodorewindfarm@rwe.com

Almost

$100K already allocated

Sponsorship distributed to date includes:

$55,000	Theodore State School Multipurpose Courts
$5,097	Theodore Council on the Ageing
$5,000	Theodore Junior Roosters Rugby League Club
$5,000	Theodore Show
$5,000	Theodore Centenary Celebrations
$5,000	Theodore State School P&C
$5,000	Camboon Campdraft
$3,000	Moura Marlins Swimming Club
$3,000	Theodore Museum
$3,000	Bulls N Barrels Bonanza

How to apply

If you would like to apply for sponsorship, scan the QR code and download the application form from the website, or visit **theodorewindfarm.com.au**.



Notes

Notes

Notes

For further information please contact us at:
T: 1800 879 435
E: theodorewindfarm@rwe.com

theodorewindfarm.com.au

Theodore
Wind Farm

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Theodore Wind Farm

Newsletter
Edition 1, February 2024



RWE

At a glance

TURBINES
Up to 170

BATTERY STORAGE
Yes

HEIGHT
Up to 270m

LOCATION
About 22 kilometres north-east of Theodore and 50 kilometres south-west of Biloela

SITE INVESTIGATION AREA
About 46,000 hectares, with an expected operating footprint of less than 3% of this land

INSTALLED CAPACITY
About 1100 megawatts (MW)

HOMES POWERED
More than 410,000 – the equivalent of powering all private dwellings in the Banana Shire about 57 times, or the city of Rockhampton close to 15 times

PROJECT STATUS
Studies being finalised, planning to submit the first instalment of the Development Application

PROPOSED CONNECTION
Continuing to work with Powerlink to determine best connection point

OPERATION
Targeting 2027 for initial operations

Project update

RWE Renewables Australia is preparing to submit the Development Application for the proposed Theodore Wind Farm and is seeking your feedback on the proposal.

After more than 12 months of studies across a variety of subjects, we expect to submit the first component of the Development Application – the Relevant Purpose Determination – at the end of the month. This follows engagement with landowners, neighbours, Traditional Owners, Council, community members, government organisations and other stakeholders, as well as the completion of all major rounds of ecology and other surveys required for planning.

We are planning to complete the process and submit the final component of the Development Application to the State Government in the coming months.

You will see in our At A Glance section the number of turbines in the proposed layout has been increased from 160 to up to 170.

While we expect the number of constructed turbines (if the project is approved) to be no more than 160, the Development Application includes the increased number of 170 for the following reasons:

1. As with most wind farm proposals, some turbines will likely be unable to be constructed due to external factors or planning limitations.
2. Incorporating additional turbines during the development process means these locations have been considered in the studies undertaken for the Development Application, including environmental, visual and noise, so appropriate consideration can be given to all potential turbine locations.

The proposed wind farm layout will be available for viewing at our upcoming community drop-in sessions at the **Banana Sutherland Hall on Friday 16 February** and the **Theodore RSL Hall on Saturday 17 February,** as well as updates on the assessments undertaken to date.

If you are unable to attend the community drop-in sessions but would like further information please don't hesitate to reach out via **1800 879 435** or **theodorewindfarm@rwe.com**. Updates are also available on our project website, **theodorewindfarm.com.au**.

Heidi Creighton & Matt Walker
Theodore Wind Farm



The planning process

The first step in the Queensland Government's planning process, the Relevant Purpose Determination, includes submission of the proposed site layout and initial planning documentation.

The complete Development Application is expected to be submitted in the coming months and will include the detailed assessments that have been undertaken (listed below). These also include the results of the noise monitoring undertaken at nine locations within and around the project boundary across a six-week period, and an Accommodation Options Report to assess the impact of housing workers during construction and operation.

We will also be submitting a referral under the Federal Government's Environment Protection and Biodiversity Conservation (EPBC) Act in the coming months.

Further information on the planning processes will be available at our Community Drop-in Sessions.

Project assessments

- Landscape and visual impact
- Traffic impact
- Transport route
- Aviation impact
- Electromagnetic interference
- Noise
- Erosion and stormwater
- Accommodation options
- Social and economic impact
- Baseline ecology

Speak with us

We value your feedback and are committed to listening and responding to your questions about the Theodore Wind Farm.

If you have any questions or comments, please call 1800 879 435 or email theodorewindfarm@rwe.com

You can also visit our website at theodorewindfarm.com.au





Community benefit fund

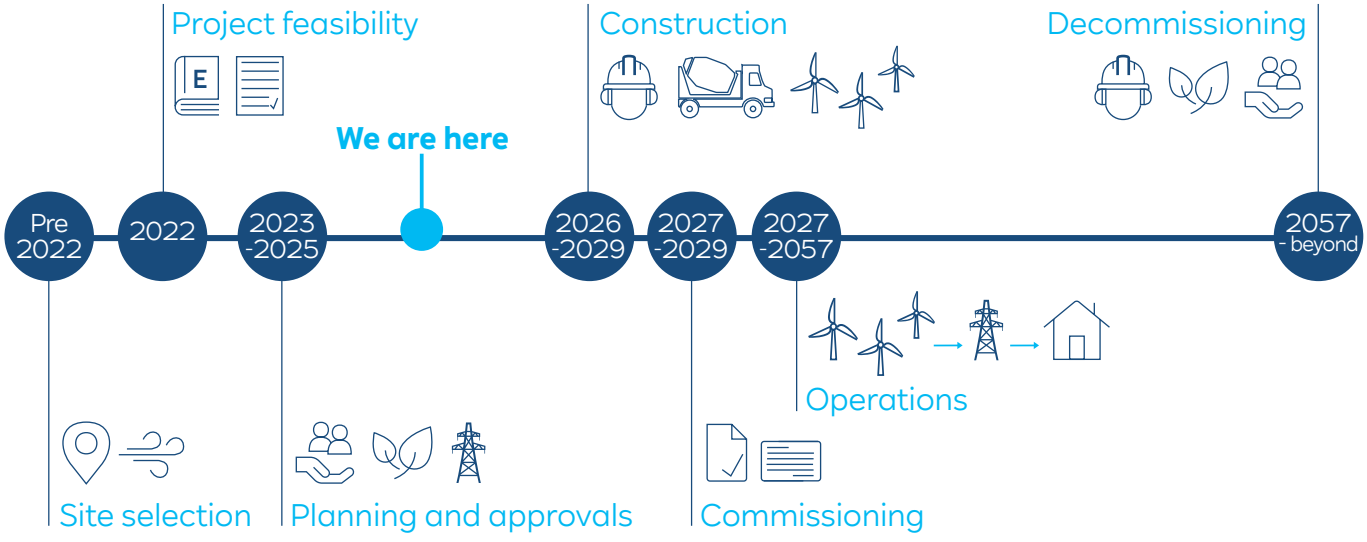
What are the biggest needs in the Theodore community?

At RWE we are passionate about supporting the communities where our projects are based and have committed to a **Community Benefit Fund of at least $500,000 per year,** which will contribute a minimum of $17.5 million into the local community throughout the operational life of the wind farm.

How should this be distributed? What structure should a fund have? We want to hear from you!

Visit us at our Community Drop-in Sessions and let us know how you think we should support your community, call us at 1800 879 435 or email theodorewindfarm@rwe.com.

Estimated project timeline



Community Drop-In Sessions

Would you like to know more about the proposed Theodore Wind Farm?

We are holding Community Drop-in Sessions in February and invite you to call in to say hello, view the proposed project layout, learn more about the studies that have been undertaken as part of the Development Application process and provide suggestions for our Community Benefit Fund.

We look forward to receiving your feedback on the proposal.



Please drop in to see us at:

Banana

- Friday, 16 February, 2024
- Sutherland Hall,
  32 Bowen Street, Banana
- 2pm-6.30pm

Theodore

- Saturday, 17 February, 2024
- RSL Hall,
  30 The Boulevard, Theodore
- 8.30am-3pm

Theodore shopfront

RWE will soon have a monthly presence in Theodore! We are currently searching for a shopfront to rent and will be working from the Theodore RSL Hall on a regular basis while we establish a permanent space.



If you know of an available space please contact us!

Theodore RSL Hall

- 30 The Boulevard, Theodore

Opening hours:

MARCH:

- Wednesday 13 March, 1.30pm-5.30pm
- Thursday 14 March, 7.30am-12.30pm

APRIL:

- Wednesday 10 April, 1.30pm-5.30pm
- Thursday 11 April, 7.30am-12.30pm

MAY:

- Wednesday 15 May, 1.30pm-5.30pm
- Thursday 16 May, 7.30am-12.30pm

JUNE:

- Wednesday 12 June, 1.30pm-5.30pm
- Thursday 13 June, 7.30am-12.30pm

And other times by appointment.

For further information please contact us at:
T: 1800 879 435
E: theodorewindfarm@rwe.com
theodorewindfarm.com.au

Theodore Wind Farm

Newsletter
Edition 2, September 2024



RWE Renewables Australia has submitted the development application (DA) for the proposed Theodore Wind Farm, in the Banana Shire, to the Queensland Government.

The submission to the State Assessment and Referral Agency (SARA) incorporates the detailed studies and investigations undertaken by independent experts over the past two years. You can read more about these studies in this newsletter. The DA will be open for public comment after submission. We will provide further details on dates via our project website, as soon as they become available.

At a federal level, the project has been determined as a 'controlled action' under the *Environment Protection Authority Act 1999* (EPBC Act), meaning further assessment is needed. This process is underway.

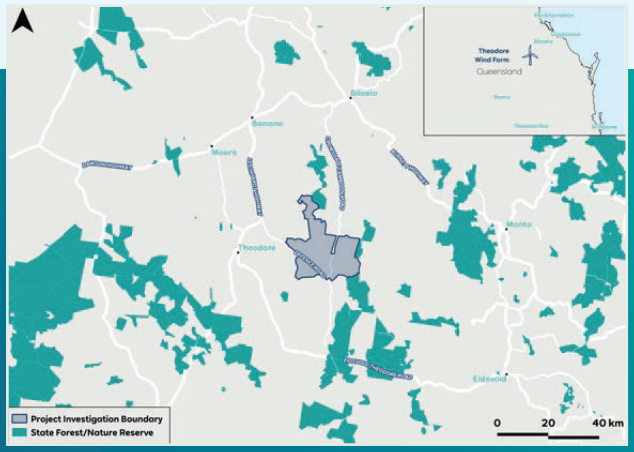
We have remained engaged with the community throughout the planning and approvals process and thank you for your feedback on the project to date. We invite you to stay engaged by liaising with the project team directly or via the opportunities outlined in this newsletter, or commenting on the DA through SARA. We value your input and look forward to continuing to work together to ensure the proposed Theodore Wind Farm delivers lasting benefits to your community.

Best regards,

Matt Walker
Theodore Wind Farm, Project Lead

At a glance

- Up to 170 **wind turbines** with a tip height of up to 270m
- **Located** about 22km east of Theodore, 50km south-west of Biloela and 150km south-west of Gladstone. The area is predominantly used for cattle grazing
- Site investigation area of about **46,000** hectares, with an expected operating footprint of less than 3% of this land
- **Installed capacity** of about 1,100 megawatts (MW)
- About **500,000 Queensland homes powered**
- **Project status:** Planning and approvals
- Start of **construction** planned for 2026
  Estimated 3-4 year construction period
- Targeting 2027 for initial **operations**
  Expected to be fully operational in 2029



RWE Renewables Australia respectfully acknowledges the Wulli Wulli people, the Traditional Owners of the lands where the Theodore Wind Farm is proposed, and pay our respect to their Elders, past, present and emerging.

Find out more

1800 879 435

theodorewindfarm@rwe.com

Drop into an open cafe session:
see back page of this newsletter

Scan the QR code to
Join our mailing list

Theodore Wind Farm | RWE

au.rwe.com/projects/theodore-wind-farm



Supporting your community

Apply for Community Sponsorship

We have established a sponsorship fund of $100,000 per calendar year to support community groups and events in the Theodore area during the planning and approvals phase of the project.

We welcome funding submissions from not-for-profit organisations including sporting and recreational clubs, charities, community volunteer groups, parent groups, playgroups, environmental organisations, aged and/or disability support, event organising committees, community-led development groups and business chambers.

If you are part of a community or non-profit group, we want to hear from you. We are meeting with community groups to understand their needs and welcome your feedback.

If your group could benefit from sponsorship, please contact the team to arrange a meeting on:

1800 879 435

theodorewindfarm@rwe.com

More than

$25K already allocated

Sponsorship distributed to date includes:

$5,000	Theodore Junior Roosters Rugby League Club
$5,000	Theodore Centenary Celebrations
$5,000	Theodore State School P&C
$5,000	Camboon Campdraft
$3,000	Theodore Museum
$3,000	Bulls N Barrels Bonanza

How to apply

If you would like to apply for sponsorship, scan the QR code and download the application form from the website, or visit **au.rwe.com/projects/theodore-wind-farm**.

Have your say on the Community Benefit Fund

RWE will establish a Community Benefit Fund of at least $500,000 per year – equating to about $17.5 million across the operational life of the wind farm – once the project moves into the construction phase.

This fund will be administered by a local community committee, who will be responsible for deciding how the money is spent.

In other communities, funds have supported initiatives including new uniforms for sporting clubs, through to medical equipment for rural hospitals.

We want to hear your suggestions about how this fund can make a positive difference to your community.

To have your say, contact the team or drop into an open cafe session, as outlined on the back page of this newsletter.



Delivering benefits
A snapshot

Community contributions

- $100,000 per year in community sponsorship during the planning and approvals phase of the project.
- Community Benefit Fund of at least $500,000 per year commencing at the construction phase ($17.5 million over the wind farm's operational life) to support local projects and improve community connections.
- Unused funds from community sponsorship program will be rolled over to the Community Benefit Fund.

Economic impact

- Ongoing economic stimulus for the region across the proposed project's 35 years of operation.
- Up to 50 permanent jobs during the wind farm's operations.
- Up to 500 jobs at peak construction periods.
- Support for local supply chains including hospitality, trades and other suppliers.
- Rates payments to Banana Shire Council.

Energy and infrastructure

- Proposed generation of electricity to power about 500,000 homes - equivalent to powering all private dwellings in the Banana Shire 57 times or the city of Rockhampton close to 15 times.
- Significant contribution to Queensland's Renewable Energy Targets (70% by 2032, 80% by 2035).
- Enhanced electricity security for Queenslanders.

Theodore Wind Farm | RWE

An update on the wind farm's status

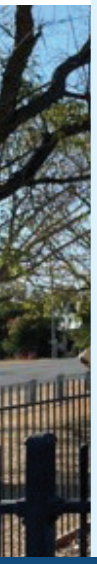
Independent subject matter experts have been conducting detailed studies and investigations on various topics since 2022.

These studies include:

- Site Access and Route Assessment
- Post-Construction Rehabilitation Plan
- Environmental Assessment Report
- Stormwater Assessment
- Natural Hazard Risk Assessment
- Bird and Bat Management Plan
- Aviation Impact Assessment
- Accommodation Options Report
- Vegetation and Fauna Management Plan
- Landscape and Visual Impact Assessment
- Socio-Economic Impact Analysis
- Erosion Risk Assessment
- Electromagnetic Interference Assessment
- Traffic Impact Assessment
- Noise Impact Assessment
- Construction Management Plan

- **The studies have been included in the development application* (DA) to the Queensland Government's State Assessment and Referral Agency (SARA)** to be assessed against State code 23: Wind farm development. Banana Shire Council will be asked to provide all relevant secondary consents (minor planning amendments) such as road upgrades or construction workforce accommodation as the project progresses. The DA will soon be open for public comment.
- An Ecological Assessment Report (EAR) was included in the application to the Federal Government in March 2024 under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act). The EPBC referral was open for public comment for two weeks in June, and in July it was determined that **the project is a controlled action**. This means further assessment is needed under the EPBC Act. This process is underway. You can view the Theodore submission via the EPBC Act Public Portal at **epbcpublicportal.awe.gov.au**.

*The planning documentation refers to Theodore Energy Development Pty Ltd (TED) as the 'client name'. TED is a subsidiary of RWE RENEWABLES EUROPE & AUSTRALIA GMBH.





Join us!

Wind farm open cafe sessions

Tuesday, 15 October
12:30pm to 4.30pm
at Theodore Home & Garden Cafe

Wednesday, 16 October
8:30am to 12 noon
at Castle Creek Cafe

Monday, 18 November
12:30pm to 4.30pm
Theodore Home & Garden Cafe

Tuesday, 19 November
8:30am to 12 noon
at Castle Creek Cafe

Planning progress

Queensland Government

Site selection, initial concept and preliminary investigations

Pre-lodgement meeting with State Assessment and Referral Agency (SARA)

Studies and assessments prescribed by SARA State code 23

Application and assessments lodged with SARA

SARA will refer development application to regulatory stakeholders

(such as Council and government departments) for review and input.

During this stage, if required, SARA will request more information and responses.

Assessment

Decision of development application by SARA

Federal Government

Referral to the Department of Climate Change, Energy, the Environment and Water (DCCEEW) for review under the federal *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

DCCEEW reviews referral and decision from Minister

→ **Controlled action**
Further assessment is required. This may include survey work.

→ **Not a controlled action - particular manner**
Development must be undertaken according to the particular manner in the decision notice.

→ **Not a controlled action**
Development must be undertaken as described in the referral.

Submission of further information

Referral placed on public exhibition for comment.

Government assessment

Minister's decision

Find out more

1800 879 435

theodorewindfarm@rwe.com

Drop into an open cafe session:
see back page of this newsletter

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RWE
Renewables Australia

For more information about RWE Renewables Australia, scan the QR code or visit **au.rwe.com**

Engaging with you

Thank you to everyone in the community who has engaged with us to date. Your feedback is vital in shaping our ongoing assessments and decision-making processes. We look forward to continuing our collaboration as the proposed wind farm progresses.

- We have been discussing the project and seeking feedback from various stakeholders including landholders, neighbours, individuals, councils, community groups and organisations.
- This includes engagement with the Native Title Holders of the proposed wind farm site, the Wulli Wulli Nation Aboriginal Corporation, in relation to a Cultural Heritage Management Plan (CHMP).
- We have held a series of community drop-in sessions in the Theodore and Banana communities during 2023 and 2024. The sessions were opportunities for the community to speak with the project team and technical specialists about the proposed project and view information on a variety of topics. The topics included biodiversity, landscape and visual, traffic and transportation, wind farms and agriculture, and more. If you missed out on attending the sessions please contact us via phone or email for further information.
- The community had the opportunity to review the project details and have its say during the Federal Government's public exhibition of the proposal under the *Environment Protection and Biodiversity Conservation Act* (EPBC Act) in June 2024.

Other engagement opportunities

We are meeting with community groups to understand their needs in relation to funding opportunities, as outlined on the previous page of this newsletter, and gain their perspective on the community's needs. If your group could benefit, please call or email the team on **1800 879 435** or email **theodorewindfarm@rwe.com** to arrange a meeting and provide feedback.

We will continue to engage with other key project stakeholders across various methods. This includes continued engagement with the Wulli Wulli Nation Aboriginal Corporation in relation to a CHMP.

We will also be engaging with local businesses and service providers in 2025 as part of our commitment to engaging local goods and services where possible.

Join us!

Theodore Wind Farm | RWE

Wind farm open cafe sessions

Drop in to an open cafe session in the township of Theodore and chat with our team to learn more about the project.

We look forward to welcoming you at the below dates, times and locations:

Tuesday, 15 October 2024
from 12:30pm to 4.30pm
at Theodore Home & Garden Cafe

Wednesday, 16 October 2024
from 8:30am to 12 noon
at Castle Creek Cafe

Monday, 18 November 2024
from 12:30pm to 4.30pm
Theodore Home & Garden Cafe

Tuesday, 19 November 2024
from 8:30am to 12 noon
at Castle Creek Cafe

Name:
Address
Date:

RWE Renewables Australia Pty Ltd
Suite 5, Level 9
350 Collins Street
Melbourne, VIC 3000
Australia
+61 (0) 3 9600 2698
www.rwe.com
ABN 72 626 156 894
ACN 626 156 894

Subject

Dear <name>,

RWE Renewables Australia is working on developing a renewable energy project near Theodore, in the Banana Shire.

The proposed project would incorporate a wind farm with about 160 turbines and a battery storage facility. Located about 31 kilometres north-east of Theodore and 41 kilometres south-west of Biloela, the site consists of 46,000 hectares of land across three land holdings. We are also exploring the possibility of a solar farm within the project boundary.

The area is predominantly modified farmland used for cattle grazing, which can continue if the wind farm proceeds. The project would connect into the Powerlink network, with studies underway to determine the best location to connect. As part of the initial feasibility stage, we have been undertaking wind monitoring at the proposed project site for more than 12 months and engaging with landholders who would host the proposed turbines. We have also undertaken a number of studies including ecology, landscape and visual assessment, transport and cultural heritage surveys.

Our company has extensive experience in the renewable energy sector. Founded in Essen, Germany, in 1898, RWE has embraced the energy transition and is helping shape the sustainable future of the world's power supply.

We have more than 18,000 employees throughout Europe, North America and the Asia Pacific region and joined the Australian market in 2018 with the construction of the 249MW Limondale Solar Farm in New South Wales. RWE Renewables Australia is currently developing an exciting portfolio of onshore wind, solar and battery storage projects across Australia. Our growing team of more than 40 people are located across the eastern seaboard of Australia and are progressing numerous renewable energy projects across various states.

This letter marks the first step in our broader community engagement, where we are reaching out to you as a neighbour of the proposed project. We would like to meet with you to talk through the proposed project, answer any queries you may have and step through the process of developing a wind farm.

We will be contacting you to set up a time for a personal meeting, which we will schedule at your convenience. We look forward to discussing the wind farm proposal with you in person.

Yours faithfully

Heidi Creighton
RWE Renewables Australia
M: +61 (0) 458 008 774
E: heidi.creighton@rwe.com

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Appendix C

Engagement with WWNAC

Table C.1: Engagement activities with WWNAC

Date	First Nations Community	Method of Communication	Details
Early 2023	Wulli Wulli People via Wulli Wulli Nation Aboriginal Corporation (WWNAC) RNTBC plus legal and technical advisors	Meeting	Initial engagement and introductory meeting. Project overview. Understanding of how WWNAC wish to be engaged and communication protocols.
Sept 2023	WWNAC representatives including Elders and technical advisor	Site visit	Site visit to review and agree the locations of proposed met masts. To visit other parts of the Project area that may be of interest to the Wulli Wulli People.
Oct 2023	WWNAC plus legal and technical advisors	Meeting	Finalisation and signing of early works agreement.
Late 2023	WWNAC representatives	Site visit	Monitoring of agreed met mast locations.
10 October 2024	As above	Meeting	Meeting to discuss arrangements for geotechnical inspections and monitoring. Discussion of Wulli Wulli aspirations and capacity
Oct 2024	As above	Email/mail correspondence	Sending of community newsletter as per meeting commitment. Sending copy of Environmental Assessment Report as per meeting commitment. Provide examples of rehabilitation works. Copy of design map posted to WWNAC office. Provide company portal and weblinks to access reports and information. Provide geospatial information and data for review.
31 October 2024	As above	Meeting	Meeting to discuss arrangements for geotechnical inspections and monitoring. Planning for the RWE funded training of more Wulli Wulli cultural field officers

Date	First Nations Community	Method of Communication	Details
			RWE provides feedback and seeks further clarification of benefits areas of interests from WWNAC
7 and 8 Nov 2024	WWNAC nominated persons for cultural training which also involved senior RWE representatives	Workshop	Classroom and fieldwork training on artefact identification and site recording, use of GPS and field methods, delivered by WWNAC's technical advisor (Everick).
18 Nov to 14 Dec 2024	Representatives nominated by WWNAC accompanied by their technical advisors.	Geotechnical inspections and reconnaissance	Avoidance surveys and reconnaissance for early works including Geotech 4 weeks in total.
18 Nov to 14 Dec 2024	As above	Geotechnical inspections and reconnaissance	Monitoring of geotechnical works. 4 weeks in total.
5 Dec 2024	WWNAC and legal and technical advisors	Meeting	Negotiation of remaining CHMP clauses. Briefing new WWNAC Director, recap and progress review of geotechnical work. Tabling term sheet offer of Shared Benefits and Project Services Agreement.
3 March 2025	WWNAC Representatives	Meeting	Meeting with the WWNAC representatives and RWE held in Brisbane

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Appendix D

Engagement policies and plans

RWE

Community Engagement Policy

December 2023

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Foreword

At RWE, we believe that community engagement is an important aspect of our business activities. We are committed to implementing effective mitigation measures and where possible creating positive and lasting impacts in the communities in which we operate. We believe that active involvement and collaboration with local communities is essential to achieving this goal. It is crucial to RWE that all projects endeavour to achieve strong community relations and positive long-standing impacts - this is something that the company is dedicated to, which has led to the prioritisation of community engagement as a key strategic initiative within our overarching sustainability strategy.

As one of the largest renewable energy companies globally, we are at the forefront of the energy transition, planning to invest more than €55 billion gross by 2030 in renewable and low-carbon technologies to combat climate change. We are working towards an ambitious target of achieving climate neutrality by 2040, having aligned our emissions reduction trajectory with a 1.5°C compliant pathway. Inspired by the United Nations Sustainable Development Goals (SDGs), we aim to grow our assets sustainably, ensuring that our business activities maximize positive impact while minimizing potential adverse effects on communities, wildlife and ecosystems.

Working across diverse global regions underscores the significance of community engagement. Recognizing this importance, we have introduced specialized community engagement and stakeholder management roles. These roles exemplify our commitment to fostering focused interactions with communities. Our aim is to comprehend potential impacts thoroughly, employ suitable and effective minimization and mitigation measures, and, wherever feasible, establish positive and long-standing impacts within the communities in which we operate. These initiatives are designed to ensure our projects align with local contexts and cultures, promoting mutual understanding and sustainable growth.

1 Purpose

This Community Engagement Policy expresses our commitment to actively listen to communities, integrate local knowledge, and cultivate meaningful partnerships. To ensure this, the document describes an internal RWE framework developed to integrate community engagement into our business activities. As a company with ambitious growth goals, we acknowledge there may be durations of unavoidable impact on local communities and stakeholders. It is essential to recognize that although the infrastructure necessary for all forms of our business activities support public interest, they inherently bring localized effects on surrounding communities and the environment. Therefore, RWE is committed to following recognised mitigation hierarchy, first avoiding and then, as far as reasonably possible, minimising and compensating/offsetting any relevant negative impacts which may occur. By adhering to this Community Engagement Policy, we aim to be a trusted partner and a good neighbour, contributing to the well-being and sustainable development of the communities in which we operate.

We at RWE understand Community Engagement as a continuous process, with the long-term goal of creating shared value in the communities in which we operate. Relevant Community Engagement activities include initiatives to build trust and constructive relationships through e.g., active listening, considering local knowledge and expectations in decision making and transparent communication. We consider this to be an important prerequisite to become or maintain the position of preferred developer based on the community's choice.

RWE considers communities in and near to the areas in which we operate as a group of stakeholders, including but not limited to residents, local businesses, other sea users, elected officials, regulators, educational institutions and civic as well as non-profit organizations which are potentially impacted by our activities and which impact RWE in return. We aim to consult with stakeholders so that we can better understand potential impacts and identify how appropriate amendments to project design and decision-making process can be considered to

minimise impacts and maximise the potential for positive outcomes for local communities as far as reasonably possible throughout every life cycle stage. Specific stakeholder groups may vary by business activity, country and legal requirements.

2 Our principles

As a responsible energy company, we take pride in our role as a good neighbour, cultivating positive relationships, and fostering shared value. This commitment is embodied by every business unit and employee at RWE, who are dedicated to upholding the following principles.

Our principles for having a positive impact on the communities in which we operate:

- **Transparency:** We prioritize transparency by consistently maintaining open and clear communication with the community regarding our business operations, plans, and potential impacts. We engage with communities and stakeholders throughout the entire lifecycle phase to build relationships and incorporate minimisation and mitigation measures, as well as value-creation initiatives into our decision-making processes.
- **Long-term intention:** Our approach is to build a strong partnership with communities throughout the lifecycle of our activities. We continuously assess and seek to improve the social and environmental impact of our operations. We aim for long-term contributions to the well-being of the community e.g. by supporting local initiatives, charities, and social programs.
- **Co-creating positive impact:** We focus on co-creating positive impact through collaboration with our stakeholders to understand their concerns as well as where efforts in identifying positive impacts would be most valued and impactful. We guide behaviours and decisions toward beneficial outcomes while respecting individual choices and autonomy whenever reasonable. Our approach involves enhancing our

positive impact with the ambition that our actions and initiatives are optimized to generate beneficial effects to communities.

- **Cultural sensitivity**: We prioritize cultural sensitivity and diversity by actively engaging with communities to understand and integrate their cultural values and practices into our business activities, demonstrating our commitment to preserving and promoting cultural heritage.
- **RWE's dedication to indigenous peoples**: RWE is dedicated to respecting the legal, constitutional, and regulatory rights of Indigenous Peoples. The company is committed to fostering meaningful relationships with Indigenous Peoples and collaborating on sustainable initiatives and economic development opportunities that align with their cultural values and priorities.
- **Mitigation of negative impacts:** We adhere to the mitigation hierarchy principles of avoiding, minimizing, mitigating/offsetting[1] strategies to effectively address and reduce adverse consequences.

3 Ongoing developments

We are proud of the progress we have made in our community engagement efforts at RWE. We have undertaken numerous initiatives to engage with our communities, many of which can be found on our website and in our sustainability report. In addition, we have published an internal community engagement framework that serves as a guideline for our employees and helps to ensure the successful implementation of our community engagement policy. We believe that these efforts are critical to building strong, long-lasting relationships with our communities, and we remain committed to continuing to engage with our communities in a meaningful and impactful way.

[1] IFC Performance Standards on Environmental and Social Sustainability (2012), p. 6

4 Responsibilities

At RWE, we take our commitment to community engagement seriously. As part of this commitment, our Director for Strategy & Sustainability of RWE AG is responsible for overseeing the development and implementation of our community engagement efforts.

This policy applies to RWE AG and its operating companies. As every country, business activity and site have its own conditions, the principles are implemented in accordance with the respective country and project-specific conditions and in compliance with regulations.

This policy shall also apply, to the extent relevant, to new joint ventures formed, temporary joint ventures and other equivalent associations, if RWE assumes the management thereof. We communicate about our community engagement activities on our website and in our annual sustainability reporting.

This policy was initially approved by the Board of Directors on December 13, 2023 and will be regularly updated as necessary.

Dr. Markus Krebber	**Dr. Michael Müller**	**Katja van Doren**
CEO, RWE AG	CFO, RWE AG	CHO, RWE AG
		

RWE Aktiengesellschaft
RWE Platz 1
45141 Essen
www.rwe.com



Theodore Wind Farm

First Nations Engagement and Communications Plan

Acknowledgement of Traditional Owners

RWE Renewables Australia acknowledge the Traditional Custodians of all of these lands and waters upon which we work, live, and play. We particularly acknowledge the Wulli Wulli people who are the Traditional Custodians of the lands proposed for the Theodore Wind Farm. We recognise that for many thousands of years, the Traditional Custodians of this Country cared for and lived harmoniously with this place, and we pay our respects to Elders past, present, and emerging.

RWE Renewables Australia is committed to a just, equitable, and reconciled Australia and recognises that we all have a role to play in achieving this vision.

Document control

The following table outlines any revisions made to this document.

Project Title	Theodore Wind Farm
Project Number	
Project File Name	V1_Theodore First Nations Engagement and Communications Plan

Table 1 Document Revision Register

Version	Date of Issue	Prepared By	Reviewed By	Approved By	Issued By
Version 1	16/12/2024	**Attexo Group**			

Periodic evaluation and reviews of this First Nations Engagement and Communications Plan will ensure that the Plan is routinely updated and informed to reflect changing circumstances, community feedback, and ongoing improvements in RWE's community engagement approach.

This will ensure that RWE's communication and engagement remain:

- Relevant to the Project's evolving needs, issues, and outcomes.
- Responsive and tailored to the needs of First Nations Communities.
- At the leading edge of industry and global best practice.

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List of abbreviations

The following table outlines any abbreviations used throughout this document.

Table 2 Abbreviation Reference List

Abbreviation	Meaning
ABS	Australian Bureau of Statistics
AC	Alternating Current
AEA	Access and Exclusivity Agreement
APPs	Australian Privacy Principles
CEC	Clean Energy Council
CHMP	Cultural Heritage Management Plan
CMA	Catchment Management Authority
CRG	Community Reference Group
CSEF	Community & Stakeholder Engagement Framework
CSEP	Community & Stakeholder Engagement Plan
DCCEEW	Department of Climate Change, Energy, the Environment, and Water
DES	Department of Environment and Science
DELWP	Department of Environment, Land, Water, and Planning
FZ	Farm Zone
GW	Gigawatt: Equal to 1,000,000,000 watts
ha	Hectare: Equal to 10,000 square metres
IAP2	International Association for Public Participation
km(s)	Kilometre(s)
kV	Kilovolt: Equal to 1,000 volts

LGA	Local Government Area
m^2	Square metres
MP	Member of Parliament
MW	Megawatts: Equal to 1,000,000 watts
NEM	National Electricity Market
NGO	Non-Government Organisation
PV	Photovoltaic
QFES	Queensland Fire and Emergency Services
RACI Matrix	Responsibility Assignment Matrix
RAP	Registered Aboriginal Party
SARA	State Assessment and Referral Agency
SME	Subject Matter Expert
TMR	Department of Transport and Main Roads
WTG	Wind Turbine Generator

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Introduction

This First Nations Engagement and Communications Plan addresses the approach to First Nations engagement for the Theodore Wind Farm and BESS Project (the Project). This plan:

- Describes the Theodore Wind Farm and BESS Project, the proponent and the First Nations Community where the project is situated.
- Outlines the approach to First Nations community engagement.
- Identifies the objectives of engagement.
- Highlights the guiding principles.
- Identifies the key stakeholders and their interests.
- Details past engagement activities and proposed future activities.
- Establishes the project's complaints handling policy and processes.

As with any development, the proposed Project is expected to evolve over time when new information is obtained as part of specialist studies and as First Nations Community engagement progresses.

This document will be periodically revised by RWE and tracked as part of the Document Information found at the start of this document.

Acknowledgement of Traditional Owners

Aboriginal and Torres Strait Islander peoples' rights and interests in land are formally recognised over approximately 50 per cent of Australia's land area and recent statistics show that approximately 43 per cent of renewable energy infrastructure is proposed to be sited on First Nations land (Clean Energy Council & KPMG, 2024). It is important to understand that, regardless of tenure, First Nations peoples have occupied and cared for Country for over 65,000 years and they have an unbroken custodianship with the land and waters.

RWE Renewables Australia respectfully acknowledges the Wulli Wulli people, the Traditional Owners of the lands and waters where the Theodore Wind Farm BESS Project is proposed. RWE Renewables Australia recognises and acknowledges the Wulli Wulli people's continuing connection to lands, waters and communities and acknowledges their long journey to having their native title rights recognised

RWE Renewables Australia is committed to forging strong relationships with the Wulli Wulli people, First Nations Communities and stakeholders and recognises their unique perspectives and aspirations. RWE Renewables Australia is committed to a just, equitable,

and reconciled Australia and recognises that we all have a role to play in achieving this vision.

RWE Renewables Australia

RWE is one of the world's leading producers of renewable energy and operates a global portfolio of about 17 GW of renewable wind, solar and battery storage projects. In addition, there more than 100 renewable energy projects under construction in 12 countries worldwide, totally more than 8 GW.

The RWE Group entered the Australian market in 2018 with the construction and subsequent operation of the one of the country's largest solar farms, the 249 MW Limondale Solar Farm, located in New South Wales' South West Renewable Energy Zone.

Project Overview

The Theodore Wind Farm Project incorporates multiple components including a wind farm, Battery Energy Storage System (BESS) and possibly a solar farm (the Project).

The Project is in the Banana Shire Council local government area (LGA), approximately 22 kilometres (km) east of Theodore, in the localities of Camboon and Castle Creek.

Construction for the Project is scheduled to commence in 2026 and finish in 2029, requiring up to 500 workers. Commissioning and operations are expected to occur from 2027 through to 2057. It is anticipated that between 15 and 50 operational workers will be required. Figure 2.1 provides the proposed project timeline.

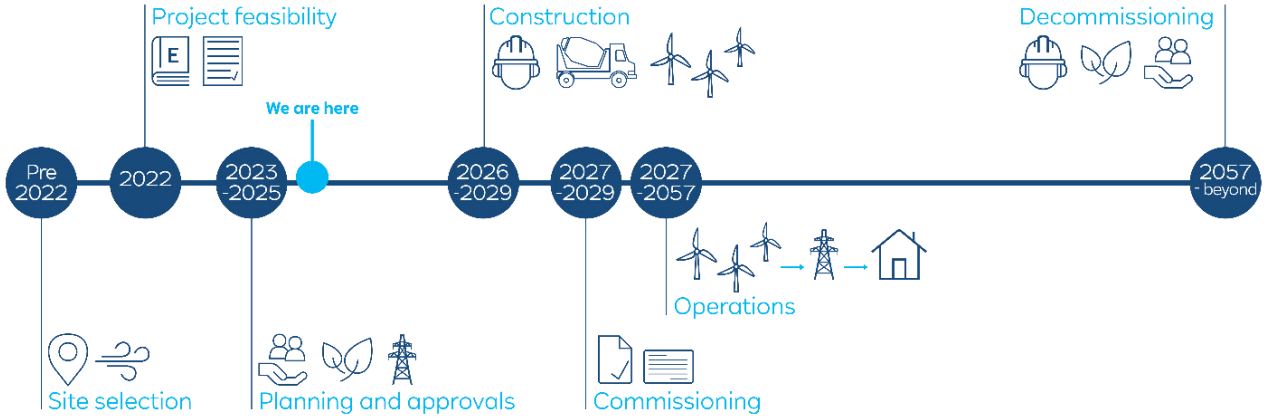
The Project will require a Development Application (DA) from the Banana Shire Council as well as Federal Government approval under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act). A referral under section 68 of the EPBC Act was lodged on with the Department of Climate Change, Energy, the Environment and Water (DCCEEW). DCCEEW determined that the proposed action is a controlled action noting the proposed action is likely to have significant impacts on the following matters protected by the EPBC Act:

- The world heritage values of a declared World Heritage property.
- The national heritage values of a National Heritage place.
- Listed threatened species and communities.
- Listed migratory species.

- The environment in the Great Barrier Reef Marine Park.

DCCEEW also determined that the proposed action would be assessed by Public Environment Report (PER) which will include a public consultation phase.

Figure 1 Proposed project timeline (Wind Farm and BESS)



Project infrastructure description

Initial investigations suggest the Project may consist of the following:

- Battery Energy Storage System.
- Hardstands/crane pads at each WTG location.
- All weather gravel internal access tracks to provide access for WTG installation and Project works.
- Access points to facilitate entry onto the site for construction and operation purposes and will stem from public roads.
- At least three Wind Monitoring Masts to collect and validate wind resource data.
- Underground (and overhead if needed) electrical reticulation cabling will be installed, allowing connection between the WTGs and the substations.
- Substations.
- Operations and maintenance buildings to host the site office and associated amenities as well as storage and maintenance sheds and parking.

Installed on an as needs basis, the following temporary infrastructure has also been proposed as part of the Project:

- Construction compounds to host site office and associated amenities as well as laydown areas, construction staff car parking, tool and maintenance storage sheds and truck parking.
- Concrete batching plant(s) may be erected to supply concrete for the WTG and permanent building foundations.
- Borrow pit(s) and/or ancillary onsite quarries for the construction of access tracks.
- Dams and/or bores may be constructed to supply adequate water during the construction of the Project.

First Nations Community

At a Commonwealth and State level respectively, the *Native Title Act 1993* (NT Act) and *Aboriginal Cultural Heritage Act 2003* (ACH Act), determine who an Aboriginal party is and therefore who proponents must consult with in regard to the Traditional Owners for the area where a project is situated.

For the purposes of this plan and as per the statutory requirements, the Wulli Wulli People, via the Wulli Wulli Nation Aboriginal Corporation (WWNAC) Registered Native Title Body Corporate (RNTBC) are recognised as the Traditional Owners and the First Nations Community for the Project. Other First Nations people who are not Traditional Owners may reside in the community, however at this stage have not made themselves known to RWE. RWE will continue to engage directly with the WWNAC and will be guided by WWNAC in regard to who their appate community representatives are, while remaining aware and open to engagement with other non Wulli Wulli First Nations people who may want to discuss matters of importance to them about the project.

The Project is located within the localities of Camboon and Castle Creek, on the traditional lands of the Wulli Wulli people. In 2015, the Wulli Wulli peoples' native title rights and interests were recognised across approximately 5,432 square kilometres of land, comprising two towns, two national parks and numerous pastoral properties. The judgement referenced historical, linguistic, anthropological and archaeological evidence, noting a commonality throughout the evidence in respect of matters including, respect for elders and old people, the importance of family, bush tucker and bush medicine, hunting and gathering, spirits and totems, relationships within the family and relationship of the Wulli Wulli people with their Country (AIATSIS, 2015).

In the broader central Queensland region, Wulli Wulli Country is bordered by the Gaangalu Nation People to the north, the Bailai, Gurang, Gooreng Gooreng, Taribelang Bunda People in the east, the Auburn Hawkwood People (previously Wulli Wulli People #2) in the south, Iman to the southwest and the Wadja People to the northwest. It is important to note that

the project is wholly located within the lands of the Wulli Wulli People and there is no intersection of project works within these other claim areas.

In 2021, the Banana Shire LGA (ABS area code: LGA30370) had a total population of 14,513 people with 737 (approximately 5%) of those identifying as Aboriginal and/or Torres Strait Islander (ABS, 2021).

The results of the desktop research into the First Nations Community for the Project are provided in the table below.

Table 3 First Nations Community for the Project Area

Party	Details	Role	Proximity to Project
Wulli Wulli Nation Aboriginal Corporation RNTBC	Registered Native Title Body Corporate for the Wulli Wulli People native title holders	Registered Native Title Body Corporate (RNTBC) manages native title and is the first point of contact for proponents wishing to undertake activities on Wulli Wulli Country covered by the native title determination	Within Project
Wulli Wulli People	Those determined to hold native title in the determination *Anderson on behalf of the Wulli Wulli People v State of Queensland (QUD6006/2000)*	Represented by the Wulli Wulli Nation Aboriginal Corporation RNTBC	Within Project

Cultural Heritage

The ACH Act requires anyone who carries out a land use activity to exercise a duty of care with respect to the protection of Aboriginal cultural heritage and identifies the Aboriginal party for an area that must be consulted with respect to Aboriginal cultural heritage. The Wulli Wulli People are the Aboriginal party for the Project area and are represented by WWNAC.

The 'duty of care' means land users must take all reasonable and practicable measures to ensure their activity does not harm Aboriginal cultural heritage.

The duty of care applies to any activity where Aboriginal cultural heritage is located, including Aboriginal cultural heritage located on freehold land and regardless of whether or not it has been identified or recorded in a database.

The cultural heritage duty of care can be met by acting:

- In compliance with gazetted cultural heritage duty of care guidelines.
- Under an approved Cultural Heritage Management Plan (CHMP) developed under Part 7 of the ACH Act.
- Under a native title agreement or another agreement with an Aboriginal party that addresses cultural heritage.
- In compliance with native title protection conditions (for low-impact mineral exploration), but only if the conditions address cultural heritage.

RWE Renewables Australia has entered into 'another agreement' with the WWNAC for the purposes of undertaking early works for the project, and negotiations of a whole of project life CHMP are substantially advanced and expected to be concluded early 2025.

Under the terms of the early works agreement, avoidance surveys and reconnaissance site visits have been undertaken to facilitate access to Country for the Wulli Wulli People as well as to assess locations for proposed geotechnical works. Geotechnical works have been adjusted as required at the direction of the Wulli Wulli People to avoid any areas of cultural interest or sensitivity. Details are included in the table below.

Once the CHMP is in place, the entirety of the proposed project footprint and nearby environs will be the subject of a detailed cultural heritage survey and subsequent technical report.

Table 4 Summary of Avoidance Surveys

Number of locations assessed with no constraints	80
Number of locations requiring monitoring	70
Number of locations adjusted due to cultural sensitivity	14
Number of locations not yet assessed	12
Total number of locations	176

Engagement Approach

RWE Renewables Australia recognises that engaging with First Nations Communities requires an understanding of the diversity of beliefs, customs, traditions, social structures, cultural practices and histories of the communities in which projects are located.

To date RWE has focussed on engagement with the recognised Traditional Owners of the Project footprint the Wulli Wulli via WWNAC.

Australian law recognises that Aboriginal people have rights and interests in the land and sea under their traditional law and customs, that they are Traditional Owners. This First Nations Engagement and Communications Plan has been developed to support engagement with First Nations communities through the approvals process and is based on the principles of Free, Prior and Informed Consent (FPIC), that recognises the critical decision-making role of Traditional Owners. The Plan will be updated for construction and operations once all project approvals have been secured.

The Plan is underpinned by the overarching principles outlined in the *Leading Practice Principles: First Nations and Renewable Energy Projects* and *the Interim Engaging with First Nations People and Communities on Assessment and Approvals under the Environment Protection and Biodiversity Conservation Act 1999.*

Throughout engagement with WWNAC, RWE has ensured that WWNAC have been supported by legal advisors and technical advisors (archaeology and anthropology) of their choosing, RWE has and will continue to ensure WWNAC are supported and advised and will continue to meet the costs of this advice.

Guiding Principles

The following guiding principles are based on the *Leading Practice Principles: First Nations and Renewable Energy Projects*, the *Interim Engaging with First Nations People and Communities on Assessment and Approvals under the Environment Protection and Biodiversity Conservation Act 1999* and the International Association for Public Participation's (IAP2) Public Participation Spectrum.

The Leading Practice Principles outlines First Nations expectations for the renewable energy sector and details the key considerations for First Nations engagement at each stage of the project lifecycle. The principles include:

- Engage respectfully
- Prioritise clear, accessible and accurate information
- Ensure cultural heritage is protected
- Protect Country and environment
- Be a good neighbour
- Ensure economic benefits are shared
- Provide social benefits for community
- Embed land stewardship
- Ensure cultural competency
- Implement, monitor and report back

The Interim Engaging with First Nations People and Communities outlines DCCEEW's expectations for proponents regarding respectful and effective engagement with First Nations People and Communities as part of the environment referral, assessment and approval process under Chapter 4 of the EPBC Act. Broadly, DCCEEW considers that respectful and effective engagement includes (but may not be limited to):

- Ensuring cultural safety
- Building and maintaining trust
- Engaging early and often
- Negotiating suitable timeframes
- Negotiating suitable submission formats

The IAP2's Public Participation Spectrum provides a framework for selecting the appropriate style of engagement and activities relevant to a stakeholder and the project development stage.

Figure 2 IAP2 Spectrum for Public Participation

Increasing impact on the decisions

	INFORM	CONSULT	INVOLVE	COLLABORATE	EMPOWER
PUBLIC PARTICIPATION GOAL	To provide the public with balanced and objective information to assist them in understanding the problem, alternatives, opportunities and/or solutions	To obtain public feedback on analysis, alternatives and/or decisions	To work directly with the public throughout the process to ensure that public concerns and aspirations are consistently understood and considered	To partner with the public in each aspect of the decision including the development of alternatives and the identification of the preferred solution	To place final decision making in the hands of the public
PROMISE TO THE PUBLIC	We will keep you informed	We will keep you informed, listen to and acknowledge concerns and aspirations, and provide feedback on how public input influenced the decision	We will work with you to ensure your concerns and aspirations are directly reflected in the alternatives developed and provide feedback on how the public input influenced the decision	We will look to you for advice and innovation in formulating solutions and incorporate your advice and recommendations into the decisions to the maximum extent possible	We will implement what you decide
RWE'S COMMITMENTNT	Early engagement with WWNAC on the proposal, benefits and early socialisation of project	Raising awareness of the project to WWNAC and continuing to build relationships, continue to communicate	Build support and sustained interest in the project through consistent engagement opportunities WWNAC to provide input	Build on participation and relationships with WWNAC on planning future stages of the project. Share decision making on shared benefits and long term and sustainable initiatives	Implement benefit sharing initiatives that are co-designed and tailored to WWNAC, with decisions for investment in these initiatives

	timelines and milestones	the wider project benefits and establishing a robust inquiry and complaints management procedures and sharing these with WWNAC	into the planning and design process, enabling multiple opportunities to seek WWNAC input and adjust the project design in response to feedback, where feasible	from WWNAC. Investment in recruitment of local WWNAC workforce and procurement of local goods and services, purchasing from WWNAC community suppliers where possible	determined by WWNAC representatives

Engagement Objectives

RWE Renewables Australia recognises and values the unique relationship that First Nations peoples and communities have to care for Country and recognises their right to be fully engaged in projects and activities that may impact them. The following engagement objectives have been informed and developed through consultation with the First Nations Community and are based on their previous experience with other proponents:

- Engage directly with First Nations Communities early in the program and clearly communicate the approach to engagement, including when, how and what information will be provided.
- Clearly communicate the opportunities for First Nations Communities to participate in the project.
- Report on and share the outcomes of engagement activities, including what was heard, and where the First Nations Community has influenced decision making on the project.
- Explore opportunities for innovative engagement, in response to First Nations Community preferences and the social context of the region.
- Ensure cultural safety for the First Nations Community through the protection and respect of their cultural identity and the wants and needs of the community.
- Build and maintain a relationship with the First Nations Community based on trust, acting with integrity and engage in a way that is respectful, ethical honest and fair.

Engagement to Date

First Nations Community engagement commenced in early 2023, with RWE undertaking early consultation with the Wulli Wulli Nation Aboriginal Corporation RNTBC as the

Aboriginal party for the project area. Engagement has included consultation on cultural heritage requirements for the project and agreement making, shared benefits negotiations, site visits for the Board and Elders and cultural heritage surveys for early project works. A summary of the engagement to date is included in the table below.

Table 5 Summary of First Nations Community Engagement

Date	First Nations Community	Method of Communication	Details
Early 2023	Wulli Wulli People via Wulli Wulli Nation Aboriginal Corporation RNTBC plus legal and technical advisors	Meeting	• Initial engagement and introductory meeting. • Project overview. • Understanding of how WWNAC wish to be engaged and communication protocols.
Sep 2023	WWNAC representatives including Elders and technical advisor	Site visit	• Site visit to review and agree the locations of proposed met masts. • To visit other parts of the Project area that may be of interest to the Wulli Wulli People.
Oct 2023	WWNAC plus legal and technical advisors	Meeting	• Finalisation and signing of early works agreement.
Late 2023	WWNAC representatives	Site visit	• Monitoring of agreed met mast locations.
10th October 2024	As above	Meeting	• Meeting to discuss arrangements for geotechnical inspections and monitoring. • Discussion of Wulli Wulli aspirations and capacity

Date	First Nations Community	Method of Communication	Details
Oct 2024	As above	Email/mail correspondence	• Sending of community newsletter as per meeting commitment. • Sending copy of Environmental Assessment Report as per meeting commitment. • Provide examples of rehabilitation works. • Copy of design map posted to WWNAC office. • Provide company portal and weblinks to access reports and information. • Provide geospatial information and data for review.
31st October 2024	As above	Meeting	• Meeting to discuss arrangements for geotechnical inspections and monitoring. • Planning for the RWE funded training of more Wulli Wulli cultural field officers • RWE provides feedback and seeks further clarification of benefits areas of interests from WWNAC
7th and 8th Nov 2024	WWNAC nominated persons for cultural training which also involved senior RWE representatives	Workshop	• Classroom and fieldwork training on artefact identification and site recording, use of GPS and field methods, delivered by

Date	First Nations Community	Method of Communication	Details
			WWNAC's technical advisor (Everick).
18th Nov ongoing through Dec 2024	Representatives nominated by WWNAC accompanied by their technical advisors.	Geotechnical inspections and reconnaissance	• Avoidance surveys and reconnaissance for early works including Geotech • 15 weeks in total.
18th Nov ongoing through Dec 2024	As above	Geotechnical inspections and reconnaissance	• Monitoring of geotechnical works. • 15 weeks in total.
5th Dec 2024	WWNAC and legal and technical advisors	Meeting	• Negotiation of remaining CHMP clauses. • Briefing new WWNAC Director, recap and progress review of geotechnical work. • Tabling term sheet offer of Shared Benefits and Project Services Agreement.

Site Selection

RWE has been engaging with WWNAC since early 2023. During the course of engagement, the site and proposed Project layout has been presented to WWNAC along with the Environmental Assessment Report detailing the proposed Project's environmental impacts and constraints.

RWE has undertaken regular meetings with WWNAC and also concluded an early works agreement for geotechnical investigations which includes the provision for up to 15 weeks of site investigations and monitoring for geotechnical works.

During the course of this early engagement and preliminary agreement setting, the Project layout is still ongoing and will be refined through the detailed design phase. This is being developed in consultation with WWNAC through the processes in the early works agreement and subsequent CHMP.

These processes are based on the avoidance principle whereby the Project will, in the first instance, seek to avoid harm to Aboriginal cultural heritage by modifying Project design and layout. This process has already come into effect during the site investigations for the geotechnical works with 14 of the total 176 locations requiring adjustment due to cultural sensitivity.

WWNAC have been consulted on the site selection and will continue to be involved in the ongoing Project layout and detailed design phase. RWE will continue to seek and where possible, implement their feedback into the detailed design.

Summary of First Nations Concerns

Early engagement with the WWNAC identified the potential areas of concern outlined below. The Project team will continue to engage with WWNAC and monitor sentiment on these issues and proactively manage any other areas of concern that may emerge as the Project progresses.

Table 6 First Nations Community Concerns for the Project

Concern	Detail	RWE Response
Impacts to cultural sites, both tangible and intangible	WWNAC noted that Story Lines and Song Lines exist within the Project area and that the project had the potential to impact on areas of cultural sensitivity.	All cultural heritage will be managed in accordance with the early works agreements and subsequent CHMP. Both these agreements provide processes for Wulli Wulli to assess locations prior to proposed Project works and make recommendations based on the nature of any cultural heritage values that may be present. Any locations which are deemed to be sensitive or need to be avoided will be reviewed and be part of ongoing discussions with WWNAC as part of the detailed design phase.

Concern	Detail	RWE Response
		Spatial information provided to WWNAC to review Project layout and any intersection with areas that may hold cultural values.
Impacts to environmental areas within Wulli Wulli Country	WWNAC noted that they want to be involved in the active management of protecting environmental areas within Wulli Wulli Country.	Information sharing of the design map, Environmental Assessment Report and rehabilitation information. Ongoing engagement and consultation with WWNAC in regard to the shared benefits and opportunities including ranger programs and service work packages.
Prior experience with development proponents	WWNAC have had prior negative experiences with development proponents which has caused a break down in relationships.	RWE is committed to consistent and meaningful engagement with WWNAC under the terms of the current early works agreement and subsequent CHMP. Ongoing engagement and consultation with WWNAC in regard to the shared benefits package and understanding the aspirations of WWNAC.
Timing of works and WWNAC resourcing	WWNAC notes that notice is required, and time provided to undertake surveys to record what is on Country.	RWE is committed to working with WWNAC and within the terms of the early works agreement and subsequent CHMP to ensure adequate notice and time is allocated to complete survey works.
Limited number of experienced WWNAC resources for surveys and investigations	Due to the size of the proposed Project and the scale of the work programs, WWNAC noted that while they wanted to facilitate the work for RWE, WWNAC representatives required	RWE delivered on the commitment to fund a training workshop for nominated WWNAC representatives (workshop completed on 7th & 8th November 2024), covering stone tool identification, field work methods and GIS/GPS training.

Concern	Detail	RWE Response
	training to expand their workforce.	

Future Engagement

RWE is committed to ongoing engagement with WWNAC throughout the Project lifecycle. The next steps for engagement include ongoing consultation and negotiation of the CHMP, Shared Benefits, Project Services Agreement along with cultural heritage surveys, reporting and mitigation. These are summarised in the table below.

Table 7 Summary of Future Engagement

Task	Steps	Timeframe
CHMP meetings (multiple meetings)	Continue engagement with WWNAC and schedule meetings based on availability and capacity	Likely to conclude CHMP meetings and finalise CHMP early 2025
Cultural heritage surveys for whole of Project (multiple visits)	• Notice issued under CHMP for survey • Conduct survey • Report developed, reviewed and agreed • Implement mitigation measures	Due to the scope and scale of the survey, it could take more than 12 months to finalise
Shared Benefits and Project Services Package meetings (multiple meetings)	Continue engagement with WWNAC and schedule meetings based on availability and capacity	Ongoing

Task	Steps	Timeframe
Training Workshops	Discuss capacity requirements with WWNAC and deliver based on availability and Project need	Ongoing

Proposed Project Impacts

Early engagement with WWNAC has identified potential impacts that the Project may have to WWNAC as a community and to their Country. Working with WWNAC RWE has developed a number of approaches that aim to minimise and offset impacts where possible. Consultation regarding impacts will be ongoing throughout the life of the Project and these impacts and approaches to mitigate them, may change over time.

Table 8 Project Impacts

Impact	Proposed Approach	Details
Impacts to cultural heritage both tangible and intangible through Project works	• Early works agreement • CHMP	All cultural heritage will be managed in accordance with the early works agreement which has been developed with WWNAC and the subsequent CHMP. These documents are negotiated agreements between WWNAC and RWE and consider both tangible and intangible cultural heritage and set out agreed processes to manage impacts.
Impacts to the environment and broader Wulli Wulli Country through Project works	• Information sharing • Utilisation of Wulli Wulli rangers for land management services	RWE shared Environmental Assessment Report to enable Wulli Wulli to understand Project scope and proposed impacts. Shared Benefits and Project Services Agreement provides opportunity for Wulli Wulli rangers to undertake 'On Country' services for

Impact	Proposed Approach	Details
		the Project, enabling and facilitating Wulli Wulli to Care for Country.
Impact on availability and capacity of WWNAC due to Project needs and timeframes	• Capacity building • Training	Shared Benefits and Project Services Agreement provides support and opportunity for Wulli Wulli people to undertake training identified by WWNAC. This ensures training is provided in an appropriate manner and is fit for purpose based on the needs of WWNAC.
Impact on WWNAC staff through consultation fatigue and burn out	• Capacity building • Informed engagement	RWE will continue to be directed by WWNAC on the schedule of engagement and ensure, where possible, meetings are held in locations that are convenient for WWNAC to attend. Shared Benefits and Project Services Agreement provides support and opportunity for Wulli Wulli people to undertake training identified by WWNAC.

Key First Nations Stakeholders

The table below identifies the key First Nation Stakeholders that will be engaged throughout the project. This table will be modified in response to feedback from the First Nations Community.

Stakeholder analysis is a key part of mapping communications and community engagement. This enables developers to identify key First Nations Groups, and their stakeholder needs to deliver comprehensive and focussed engagement.

In categorising Fist Nations Stakeholders, RWE considers the impact that the proposed development will have, either directly or indirectly, on groups or individuals within the project region. Within the context of the proposed development the categorisation exists as follows:

Table 9 First Nations Stakeholder category list

Stakeholder Category	Description	Engagement Activities
Wulli Wulli People	Those determined to hold native title in the determination *Anderson on behalf of the Wulli Wulli People v State of Queensland (QUD6006/2000)*	• Engaged through the Wulli Wulli Nation Aboriginal Corporation RNTBC – see below for engagement activities.
Wulli Wulli Nation Aboriginal Corporation RNTBC	Registered Native Title Body Corporate for the Wulli Wulli People native title holders	• Meetings • Project updates • Site visits and surveys • Invitation to co-design Indigenous Participation/Procurement Plans • Input into detailed design Invitations and involvement in community events

Stakeholder Category	Description	Engagement Activities
Wulli Wulli Ranger program	Made up of Wulli Wulli people including two rangers plus seniors.	• Engagement coordinated through Wulli Wulli Nation Aboriginal Corporation RNTBC.
Wulli Wulli Elders Group	An advisory group to assist Directors in cultural considerations and engagement with families /community	• Post the election of Elders Group, representatives will be invited to participate in meetings RWE holds with WWNAC directors and advisors

Engagement tools and methods

The First Nations Community engagement tools set out in the table below have been developed in consultation with the WWNAC and as part of RWE's commitment to genuine dialogue with WWNAC.

To facilitate appropriate, relevant and meaningful opportunities for WWNAC to have input into the Project, we will develop action plans that will guide the consultation process for each major project milestone. It is not anticipated that each of the below engagement/communication tools will be used across all Project milestones, and some may not be sed at all; our approach will depend on the ongoing consultation with WWNAC and their preferences and the purposes of each activity.

Table 10 First Nations Community Engagement Tools and Objectives

Engagement/ Communications Tool	Description	Timing	Purpose	Desired outcome
Meetings	Meetings with WWNAC and their legal and technical advisors will be a key avenue of personalised engagement. Meetings provide an opportunity to inform and listen to issues and concerns as well as to negotiate outcomes	All project phases.	• To establish a relationship and build trust and confidence at the start of and during the engagement process. • To help share factual and informed information about the project among individuals and stakeholder networks. • To understand existing concerns and perspectives. • To gain feedback on the engagement reach and gather information about communication and engagement preferences.	• WWNAC are informed and engaged early. • Establish a connection and build trust and confidence in the engagement process early on. • Information around current concerns and ideas to be shared with the project team to inform the development of the project and mitigate risk. • Satisfy regulatory and legislative requirements around consultation with WWNAC.

Engagement/ Communications Tool	Description	Timing	Purpose	Desired outcome
			• To obtain stakeholder opinions and intel on consultation and engagement approaches undertaken by nearby, similar energy projects. • To understand sentiment towards renewable energy projects. • To establish negotiables/non-negotiables and explain how community feedback can influence the project.	
Emails/letters	Emails and letters will be used to provide notification of important information, such as works, other activities, or provide stakeholder-specific information and engagement.	Development phase through to commissioning phase.	• To create a formal engagement mechanism that can be utilised with all stakeholder groups. • Letters can also be adopted for engagement with stakeholders who do not have access to email or SMS.	• Communication with WWNAC at key milestones or to ensure that key information is received.
Shopfront (permanent or pop up)	A shopfront in a project area can take on a variety of forms. It can be a fixed space that is open one or multiple days per fortnight. Another option is a temporary 'pop up' venue which could include a stall in a public	Construction phase.	• A central in-town location that hosts project information and establishes a consistent connection between the project team and the community.	• Demonstrate depth and breadth of consultation. • An informed community is less likely to spread/hold on to misinformation/disinformation. • Continued brand awareness and trust being built within the community.

Engagement/ Communications Tool	Description	Timing	Purpose	Desired outcome
	space such as a Council office, shopping centre or public library. This option is usually more informal and may occur as a one-off or for shorter periods.		• Can act as a central meeting space for focus groups and community feedback sessions. • An education space to share knowledge and engage the community in on-ground works through digital technologies that they may not have access to due to low or no internet access.	• Build social licence as a developer demonstrating a commitment to strong and varied consultation.
Drop-in sessions/ pop-ups	Drop-in sessions provide an opportunity for stakeholders to meet with members of the project team and Subject Matter Experts (SMEs) about the project. Drop-in sessions are advertised in the local community and generally held over multiple days (often two consecutive days) in a local hall or halls. These drop-in sessions do not have a formal structure, but usually incorporate project poster and fact sheets, industry materials, and catering. Subject materials should be selected in	Development / pre-construction phases.	• To allow direct interactions with community members and the distribution of project collateral designed to inform, educate, and drive feedback through the project website. • Deliver up-to-date information about the project. • Serves as a tool to identify risks, including evidence of misinformation and disinformation campaigns. • Establishes an on-ground connection between the project team and the community.	• Demonstrate depth and breadth of consultation. • An informed community is less likely to spread/hold on to misinformation/disinformation. • Continued brand awareness and trust being built within the community. • Build social licence as a developer demonstrating a commitment to strong and varied consultation.

Engagement/ Communications Tool	Description	Timing	Purpose	Desired outcome
	response to the community's interests.			
Attendance at community events	This may include information stands at agricultural shows, sporting, and other events, providing a platform for community members to ask questions and provide feedback.	Development phase through to commissioning phase.	• Deliver up-to-date information about the project. • Serves as a tool to identify risks arising, including evidence of misinformation and disinformation campaigns. • Establishes an on-ground connection between the project team and the community.	• Demonstrate depth and breadth of consultation. • An informed community is less likely to spread/hold on to misinformation/disinformation. • Continued brand awareness and trust being built within the community. • Build social licence as a developer demonstrating a commitment to strong and varied consultation.
Site tours and visits	This does not need to be limited to the actual project site. Site tours could occur at other projects throughout the planning and approvals and construction stages to familiarise stakeholders with an operating renewable energy project.	All project phases.	• Increasing transparency and visibility of the project site. • Start to build an understanding of visual amenity impacts and turbine layouts.	• A greater understanding of proposed land use and visual amenity. • Continued relationship building with the community and key stakeholders.
Workshops	Workshops can create a space for stakeholders to discuss any questions or concerns with the project team and/or SMEs, as well	Development / pre-construction phases.	• Provides opportunities for the project team to provide information and workshop solutions with targeted groups of stakeholders.	• Early and ongoing risk identification and mitigation • The co-development of solutions between the project team and community members.

Engagement/ Communications Tool	Description	Timing	Purpose	Desired outcome
	as positively contribute to the development of the project by brainstorming ideas and community-led problem solving.			
Focus groups	Create an opportunity for key stakeholders, selected by the project team, to provide detailed community feedback in a group setting, as well as raise project-related concerns, considerations, or issues with the RWE team and/or SMEs.	Development / pre-construction phases.	• Focus groups will enable deeper discussion and gather important data, which will inform risk levels and community sentiment around key elements of the project. • To understand community sentiment. • To test project messaging/ engagement methods/future benefit sharing options.	• Early and ongoing risk identification and mitigation. • The co-development of solutions between the project team and community members.
Free call 1800 number	A free call 1800 number, 1800 879 435, has been established for the project.	All project phases.	• To provide all stakeholders with a toll-free number to engage with the project team.	• Removal of communication barriers for stakeholders that do not have access to the internet and would like to obtain project information or ask questions.
Engagement tools – digital communication				
Electronic direct mail (EDMs)	EDM campaigns are founded on a database of subscribers – in this case	Developmen t phase through to	• EDMs will be an important part of communications and could be used to share information	• To inform development of the project and community benefit

Engagement/ Communications Tool	Description	Timing	Purpose	Desired outcome
	from interested project stakeholders. A sign-up list will be made available on the project website and at community events.	commissioning phase.	such as newsletters, flyers, invitations to upcoming events, fact sheets and more.	opportunities that reflect the aspirations of the community.
SMS notifications	SMS notifications can be used for time-critical notifications, such as works and deadlines for public submissions.	Development phase through to commissioning phase.	• To provide affected stakeholders and neighbours with a fast and efficient way to receive important information/ updates.	• The delivery of real-time project updates/information.
RWE website	The RWE Australia website is now live and can be found at www.au.rwe.com. This site contains information about RWE globally, RWE Renewables Australia and Australian projects, as well as links to project-specific sites.	All project phases.	• To provide all stakeholders with overarching information about RWE and its Australian profile.	• To provide stakeholders with additional information on RWE. • To provide stakeholders with an additional mechanism to contact RWE.
Project website	A project website has been established at theodorewindfarm.com.au and will be regularly updated to provide more information, as well as digital versions of project	All project phases.	• To provide a central online information source that is accessible to many stakeholders and community members • To provide links to engagement opportunities	• Well informed stakeholders and community members who can access online information and provide feedback to inform discussion and reduce the impact of false information.

Engagement/ Communications Tool	Description	Timing	Purpose	Desired outcome
	collateral. The website URL is included on printed and digital collateral.		including online survey, webform submissions and project email address.	
Project email address	A project-specific email address, theodorewindfarm@rwe.com has been created and will be used as a central point of obtaining community feedback.	All project phases.	• To enable an easy enquiry process and feedback loop in relation to the project. • Feedback received will be shared with the project team for consideration in the development of the project.	• Easy feedback loops for those who wish to provide responses to the engagement process. • To inform development of the project and community benefit opportunities that reflect the aspirations of the community.
Engagement tool – printed communication/materials				
Newsletters	Project newsletters should be developed and distributed regularly, with a suggested timeframe of every three months. These should provide project updates and be posted to all landowners within a pre-determined project radius (suggested to be 10 kms from the project boundary). They can also be delivered electronically. Newsletters will also be uploaded to the project website.	Development phase through to decommissioning phase.	• An easily accessible 'teaser' delivered directly to mailboxes to inform residents about the project and consultation process. This activity will ensure those with low-or-no access to the internet are informed and included in the communications and engagement opportunity. • A call to action to become informed and participate in the engagement process.	• Improve engagement rates by keeping the project at top of mind and sharing accessible links and information about engagement opportunities.

Engagement/ Communications Tool	Description	Timing	Purpose	Desired outcome
			• Provide contact details for the Project Communications and/or Development team.	
Fact sheets/posters	Fact sheets will be topic-specific and could include subjects such as: farming, environment, community, fire mitigation and response, health and more. Posters used at community drop-in sessions will likely incorporate information contained in fact sheets. Material developed in this category will also be uploaded to the project website.	Development phase through to commissioning phase.	• To provide clear, concise, and accurate project information that can be downloaded as needed to inform discussions/ engagement activities.	• Easily accessible and succinct information to deliver facts to inform discussion and reduce the impact of false information.
Frequently Asked Questions (FAQs)	Frequently Asked Questions (FAQs) can be used to focus on a particular topic or a range of topics in one document. These can be developed in response to queries raised by the community and stakeholders throughout the engagement process.	Development phase through to operations phase.	• To provide additional information to commonly asked questions in an easy-to-follow format to inform discussion.	• A better-informed community who may be seeking answers to similar questions, to inform discussion and reduce the impact of false information.

Engagement/ Communications Tool	Description	Timing	Purpose	Desired outcome
	Material developed in this category will also be uploaded to the project website.			
Flyers	Flyers can be used to promote information sessions or events. Flyers can reach community members who may not have access to digital communications or online platforms.	Development phase through to commissioning phase.	• To provide clear, concise and accurate project information that can be downloaded as needed to inform discussion.	• Easily accessible and succinct information to deliver facts to inform discussion and reduce the impact of false information.
Information packs	Information packs can include a combination of project collateral, such as newsletters, fact sheets, maps, information on upcoming events, photo montages, independent third-party studies and more. These can be tailored to the specific needs of the community or individual stakeholders and can include information on topics of particular focus for the project community. These	All project phases.	• To ensure that stakeholders have access to all of the relevant project information required in simple pack.	• Well informed stakeholders and community members with access to key project information that can be taken away for further consideration. Packs will assist with building stakeholder's knowledge and understanding of the project, will inform discussions, and reduce the impact of false information.

Engagement/ Communications Tool	Description	Timing	Purpose	Desired outcome
	could be posted to individuals as required or left at key locations, such as Council offices.			
Engagement Tool – Community Committees				
Engagement Committee	In line with industry best practice, RWE is committed to establishing a Engagement Committee (EC) to capture the voice and sentiments of the community, to help inform the project, how RWE engages and the content of engagement. A EC also provides a tool to share factual information with the community and – if used and populated effectively – can be a powerful means of creating trust.	Commence 2024 and continue on an ongoing basis (frequency tbc)	• Acting as a conduit in order to ensure that important, project-related information is made available to the community and other stakeholders • Assisting with prioritising and administering benefits within the community • Encouraging the development of, and participation in, community partnerships and initiatives, and • Facilitating communication between RWE and the community.	• Community is involved in some of the decision-making aspects of the Project • Community can advise on engagement preferences, best practice approach facilitate wide reaching opportunities for community information, knowledge sharing and interest in the Project • Key issues and concerns raised by community can be resolved successfully, by using community insights and recommendations to address from a local perspective.

Communication protocols

Records Management

RWE has a custom-built stakeholder engagement platform called Stakeholder Engagement Tool (SET), which has been designed to document and manage stakeholder interactions, including individual and group meetings, briefings, phone calls and information sessions.

The tool records engagements, including sentiment and feedback raised from stakeholders. At a practical level, it requires the manual input of engagement activities. Complex or more detailed engagement activities may necessitate written recording of details which will then be uploaded to SET.

The tool is also able to record commitments made by RWE, as well as items for follow up and allocate engagement tasks to team members for follow up.

All data inputted into SET is kept in line with RWE's privacy policy. We have technical and organisational measures in place to ensure we observe relevant legislation at all times and the collection, management and use of personal information is in accordance with the Australian Privacy Act 1988, the Australian Privacy Principles and related legislation and regulation (Australian Privacy Law). RWE Renewables Australia is part of the RWE Group, a group of companies with RWE AG as their ultimate parent company. RWE AG is ultimately responsible for setting the policies for the RWE Group, and so we also comply with the RWE General Data Privacy Policy and other group directives relating to data protection and privacy.

Complaints management

RWE believes effective and responsive communication is essential for continual development of strong community relations.

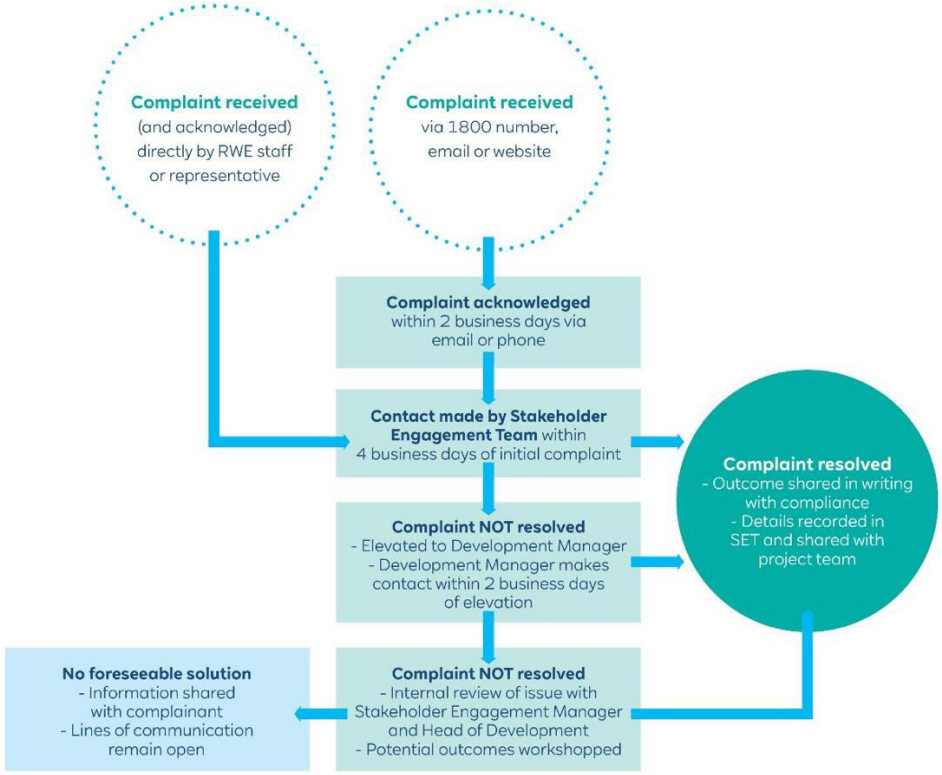
The complaints and grievance management system that will be implemented by the proposed Theodore Wind Farm is in accordance with the Australian Standard AS/NZS 10002:2014 – Guidelines for Complaint Management in Organisations. The RWE Complaints Handling Procedure ensures that complaints are dealt with in a timely and effective manner, and has been outlined below:

- Stage One: Receiving
- Stage Two: Responding
- Stage Three: Managing

- Stage Four: Closing
- Stage Five: Continuous Improvement

All instances are recorded within RWE's internal SET, with the intent to archive, allocate, monitor, action, resolve, close and analyse all relevant enquiries. RWE aims to resolve complaints within 10 working days. If this is not possible RWE commits to continued engagement with the stakeholder.

Figure 2Complaints management flowchart



Dispute Resolution

Specific to the relationship between RWE and WWNAC is the dispute resolution process included in the early works agreement, noting that a similar process will also be included in the CHMP.

The dispute resolution process applies only to disputes that occur as a result of the implementation of the relevant agreement but set out a series of steps to resolve the dispute.

1. RWE or WWNAC claim that a dispute has arisen under the agreement, the party claiming the dispute gives notice to the other party setting out the full details of the dispute.
2. Parties meet as soon as possible after receipt of notice and make reasonable efforts to resolve dispute within 3 days.
3. If the dispute cannot be resolved within 3 days of receiving the notice any party can refer the matter to mediation.
4. Mediator is to be a person agreed between the parties or if this cannot be agreed the mediator will be appointed by the Queensland Chapter of the Resolution Institute.
5. If the dispute is not resolved within 10 days of appointing a mediator, either party may request the dispute be referred to a suitably qualified and independent expert for determination.
6. Parties must agree on the person to be appointed expert or where they cannot agree, the expert will be a person who is nominated by the Chairperson of the Queensland Chapter of the Resolution Institute.
7. Parties will be bound by the determination of the expert.

Reporting

RWE is committed to establishing procedures and policies which ensure a robust and regular framework for internal reporting and monitoring. This Plan will be incorporated into the relevant induction materials for new employees, while existing employees will be provided with copies of the document.

Internal communication pathways will be utilised to ensure that all concerns, grievances, and learnings are effectively communicated to all employees relevant to the Project. These communication techniques include, but are not limited to:

- Frequent communication email updates.
- Historical activity summaries presented during team meetings, which are scheduled to coincide with regular reporting intervals.
- Summary of planned future activities scheduled prior to the upcoming reporting period.

References

- Aboriginal Cultural Heritage Act 2003
- Australian Bureau of Statistics – 2021 Census Data
- Australian Institute of Aboriginal and Torres Strait Islander Studies
- Australian Standard AS/NZS 10002:2014 – Guidelines for Complaint Management in Organisations
- Australian Privacy Principles
- Best Practise Community Engagement in Wind Development
- Best Practise Guidelines for Implementation of Wind Energy Projects in Australia (AusWind, December 2006)
- Clean Energy Council's (CECs) Guide to Benefit Sharing Options for Renewable Energy Projects
- Community Planning Toolkit
- Cultural Heritage Management Plan Guidelines
- Leading Practice Principles: First Nations and Renewable Energy Projects
- IAP2 Public Participation Toolbox
- Interim Engaging with First Nations People and Communities on Assessments and Approvals under the Environment Protection and Biodiversity Conservation Act 1999
- Privacy Act 1988
- RWE's Corporate Australian Community Engagement Framework
- Stakeholder Engagement: A Good Practice Handbook for Companies Doing Business in Emerging Markets, IFC, May 2007
- The International Association for Public Participation (IAP2) Framework
- The International Association for Public Participation (IAP2) Toolkit
- Torres Strait Islander Cultural Heritage Act 2003



Theodore Wind Farm

Community & Stakeholder Engagement Plan

Acknowledgement of Traditional Owners

RWE Renewables Australia acknowledge the Traditional Custodians of all of these lands and waters upon which we work, live, and play. We particularly acknowledge the Wulli Wulli people who are the Traditional Custodians of the lands proposed for the Theodore Wind Farm. We recognise that for many thousands of years, the Traditional Custodians of this Country cared for and lived harmoniously with this place, and we pay our respects to Elders past, present, and emerging.

RWE Renewables Australia is committed to a just, equitable, and reconciled Australia and recognises that we all have a role to play in achieving this vision.

Document control

The following table outlines any revisions made to this document.

Project Title	Theodore Wind Farm
Project Number	
Project File Name	V3_Theodore Community and Stakeholder Engagement Plan

Table 1 Document Revision Register

Version	Date of Issue	Prepared By	Reviewed By	Approved By	Issued By
Version 3	8/4/2024	**Premier Strategy**	Premier Strategy	Tanya Waterson	
Version 4	18/12/2024	RWE	RWE	Tanya Waterson	

Periodic evaluation and reviews of this CSEP will ensure that the Plan is routinely updated and informed to reflect changing circumstances, community feedback, and ongoing improvements in RWE's community engagement approach.

This will ensure that RWE's communication and engagement remain:

- Relevant to the Project's evolving needs, issues, and outcomes.
- Responsive and tailored to the needs of key stakeholders and the local community.
- At the leading edge of industry and global best practice.

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List of abbreviations

The following table outlines any abbreviations used throughout this document.

Table 2 Abbreviation Reference List

Abbreviation	Meaning
ABS	Australian Bureau of Statistics
AC	Alternating Current
AEA	Access and Exclusivity Agreement
APPs	Australian Privacy Principles
CEC	Clean Energy Council
CHMP	Cultural Heritage Management Plan
CMA	Catchment Management Authority
CRG	Community Reference Group
CSEF	Community & Stakeholder Engagement Framework
CSEP	Community & Stakeholder Engagement Plan
DCCEEW	Department of Climate Change, Energy, the Environment, and Water
DES	Department of Environment and Science
DELWP	Department of Environment, Land, Water, and Planning
FZ	Farm Zone
GW	Gigawatt: Equal to 1,000,000,000 watts
ha	Hectare: Equal to 10,000 square metres
IAP2	International Association for Public Participation
km(s)	Kilometre(s)
kV	Kilovolt: Equal to 1,000 volts

LGA	Local Government Area
m^2	Square metres
MP	Member of Parliament
MW	Megawatts: Equal to 1,000,000 watts
NEM	National Electricity Market
NGO	Non-Government Organisation
PV	Photovoltaic
QFES	Queensland Fire and Emergency Services
RACI Matrix	Responsibility Assignment Matrix
RAP	Registered Aboriginal Party
SARA	State Assessment and Referral Agency
SME	Subject Matter Expert
TMR	Department of Transport and Main Roads
WTG	Wind Turbine Generator

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Document purpose

This Community & Stakeholder Engagement Plan (CSEP) has been developed to establish the overarching guidelines, principles, objectives and approach to delivering stakeholder engagement as the Theodore Wind Farm project progresses through the planning and approvals stage to operations and beyond.

It identifies the tools and methods that will be used to engage with stakeholders during all stages of the project lifecycle, and the considerations applied when determining the most suitable approach for individual stakeholders and stakeholder groups.

It sets the foundation for a robust community engagement process that meets our engagement principles of honesty, respect, adaptability, consistency, and consideration. These engagement principles will be applied by RWE to deliver best practice engagement.

To guide the consultation and engagement activities to support major project milestones, separate action plans will be developed. Action plans will prescribe the activities, timing, stakeholders, and engagement tools and tactics to drive project and consultation outcomes for each milestone.

The aim of this CSEP document is to;

- Detail an inclusive, thorough, and transparent strategy for the disclosure of project information.
- Outline the overarching objectives, principles, and consultation and engagement tools to engage stakeholders across the project lifecycle.
- Establish a grievance process to ensure that appropriate measures are taken to respond to any concerns arising from stakeholder groups.
- Identify key stakeholders with an interest in the project, and determine appropriate engagement techniques and mechanisms, and
- Proactively engage and collaborate with all stakeholder groups.

As with any wind farm development, the proposed Theodore project is expected to evolve over time when new information is obtained as part of specialist studies and as our community and stakeholder engagement progresses.

This document will be periodically revised by RWE's Communications and Community Engagement Manager and tracked as part of the Document Revision Register found in the Document History and Status section of this CSEP.

Project overview

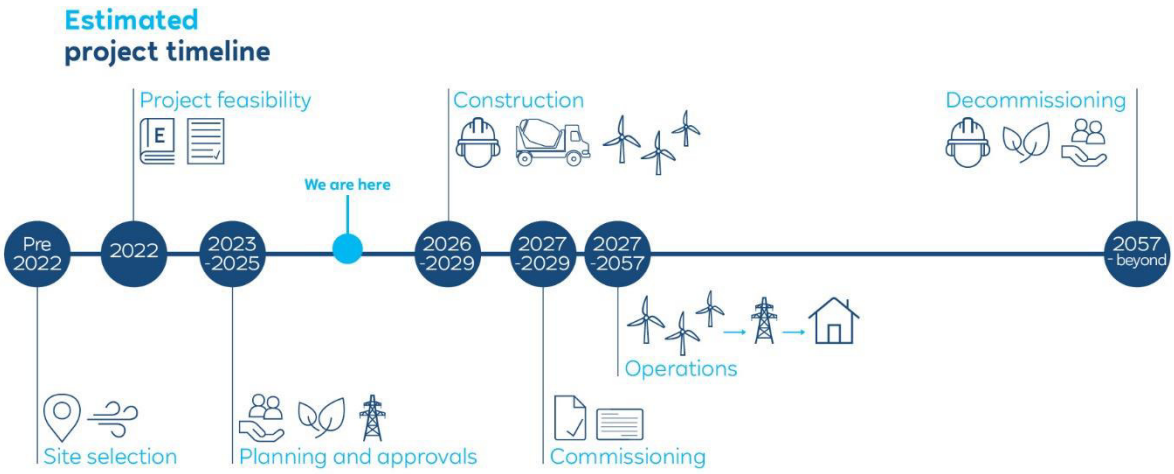
RWE is one of the world's leading producers of renewable energy and operates a global portfolio of about 17 GW of renewable wind, solar and battery storage projects. In addition, there are more than 100 renewable energy projects under construction in 12 countries throughout the world, totalling more than 8 GW.

The RWE Group entered the Australian market in 2018 with the construction and subsequent operation of one of the country's largest solar farms – the 249 MW Limondale Solar Farm, located in New South Wales' (NSW) South West Renewable Energy Zone.

RWE is proposing to develop and construct a wind farm in Central Queensland (QLD) about 30 kms from Theodore, a rural town on the Dawson River. The project is known as the Theodore Wind Farm and incorporates a site investigation area of about 46,000 ha of private land. The project is owned by RWE Renewables Australia Pty Ltd., a subsidiary of RWE AG.

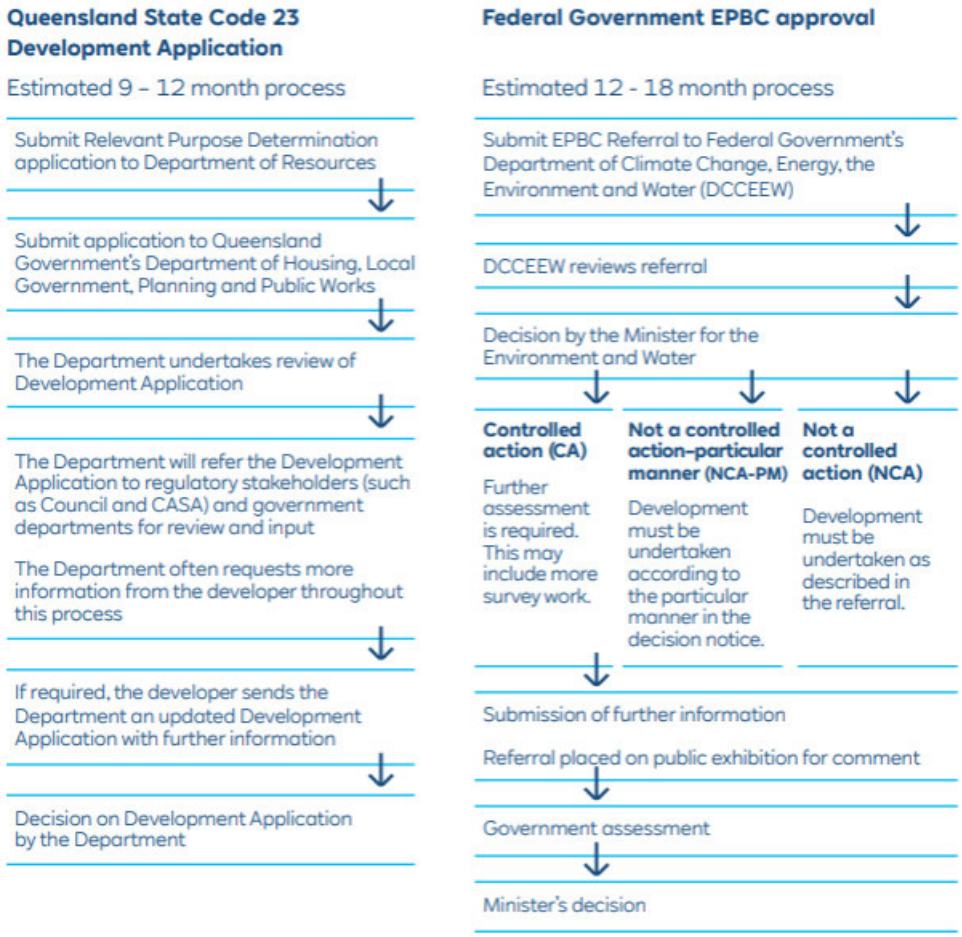
The Theodore Wind Farm is currently in the planning and approvals stage of development. Future key milestones and timeframes for the project are subject to change, based on the outcomes of environmental and technical studies and government approval processes.

Figure 1 Proposed project timeline



The approvals process

The Theodore Wind Farm project will need to obtain Development Approval (DA) from the Banana Shire Council as well as Federal Government approval under the *Environment Protection and Biodiversity Conservation Act 1999* (aka EPBC approval).



Project infrastructure description

Initial investigations suggest the project may consist of up to 170 Wind Turbine Generators (WTGs), a number which could change as studies identify project constraints, or if grid restrictions are removed. The WTGs will be constructed from tubular steel or concrete sectional towers and will support a nacelle as well as a rotor assembly consisting of a hub and three blades.

While a specific turbine model and tip height have not yet been determined, the hub height of the candidate turbines is 150-170 meters (measured from the ground to the middle of the turbine's rotor), with a rotor diameter of up to 172 metres, and tip height of up to 270 metres. Turbine model selection will be subject to a competitive tendering process which will occur in sync with the planning process. The model selected will be within the envelope provided by the planning permit.

Permanent Site Infrastructure

In addition to the WTGs, the following permanent infrastructure has been proposed as part of the Theodore Wind Farm:

- Hardstands/crane pads at each WTG location, which will be installed to provide a stable foundation for cranes to erect and install the WTG and associated components. The size of these is being refined and is dependent on the location of each WTG.
- All-weather gravel internal access tracks to provide access for WTG installation and ongoing operation and maintenance. These are expected to be at least 5 metres wide and provide an allowance for drainage and erosion management as required.
- Access points will be created to facilitate entry into the site for construction and operation purposes and will stem from public roads. RWE will upgrade local roads at access points, local intersections and along road sections as required and in line with Council requirements.
- Three Wind Monitoring Masts have been erected to collect and validate wind resource data, including information relating to direction and speed. These masts will be 160 metres tall with appropriate aviation markings.
- Underground (and overhead where needed) electrical reticulation cabling will be installed, allowing connection between the WTGs and the substations.
- Substations with a footprint of up to 10 ha will be installed allowing the underground reticulation cabling to connect to the overhead transmission lines as outlined above.
- Operations and maintenance building(s) with a footprint of about 1.5 hectares will host the site office and associated amenities, as well as storage and maintenance sheds and staff car parking.

Temporary Site Infrastructure

Installed on an as-needed basis, the following temporary infrastructure has also been proposed as part of the Theodore Wind Farm:

- Construction compound(s) with a footprint of about 1.5 hectares will host the site office and associated amenities, as well as component laydown areas, construction staff car parking, tool and material storage sheds, and truck parking.
- Concrete batch plant(s) may be erected to supply concrete for the WTG and permanent building foundations. Precise locations and footprints will be determined as part of the detailed design phase. Borrow pit(s) and/or ancillary onsite quarries may be excavated to source material for the construction of onsite access tracks. Precise locations and footprints will be determined as part of the detailed design phase.
- Dams and/or bores may be constructed to supply adequate water during the construction of the wind farm, including but not limited to track dust minimisation, soil compaction and firefighting.

All infrastructure and equipment listed in the above sections will be transported to the proposed site along major roads and highways from nearby ports during the construction phase.

Engagement to date (at December 18 2024)

The proposed Project became public in 2023, but engagement with some stakeholders began in 2021. Engagement activities to date include:

- Meetings with landowners, near neighbours, the community and other interested parties
- Meetings with and site visits by Traditional Owners
- Letterbox drops to all homes within 10 kilometres (km) of the project
- Two newsletters and multiple flyers
- Two two-day community drop-in sessions attended by about 90 community and other key stakeholders
- Formal presentations to Banana Shire Council
- Monthly 'shopfronts' at the Theodore Community Hall for two consecutive days over four months
- Community survey with three responses
- Four chatty café sessions, two consecutive days during two months (four in total)
- A dedicated website that includes project information, news, updates and engagement opportunities.

Summary of community and stakeholder concerns

Early engagement has identified the potential areas of concern outlined in Table 3. The project team will monitor community and stakeholder sentiment on these issues, and proactively manage other emerging areas of concern as the project progresses. A key part of our commitment to transparent and open communication is providing community and stakeholders with factual and timely information, and where possible, collaborating with them to find solutions to concerns and/or issues.

Table 3 Consultation Themes

Workforce accommodation	Workforce accommodation during construction, and the impact on the local housing market, has been identified as a key concern. This is a particular topic of interest for the Theodore district community due to the significant number of mining camps and FIFO workers in the area. RWE will work with Council and seek feedback from the community on the potential ways to accommodate a workforce of up to 500 people at peak construction periods.
Grid connection	Powerlink is responsible for the grid connection engagement with landowners and community as part of the Theodore Wind Farm Connection Project Theodore Wind Farm Connection Project | Powerlink
Road network	A transport route study has been undertaken which investigated and identify appropriate routes to the site for wind farm components. Oversized vehicles will be required for blades, towers, and transformers. In parallel, a traffic impact assessment is also underway to ascertain traffic flows during construction and the impact this will have on the road network. RWE has shared the results with the community and will continue to work with the community to manage traffic impacts and gain local knowledge on existing road usage, including – for example – school bus routes, if the project proceeds to construction.

Aerial operations	RWE is aware of the existing aviation in the Theodore area, including aerial mustering. Studies have shown the proposed wind farm will have minimal impact on aviation in the area. The current indicative turbine layout also satisfies the aviation planning provisions of the Banana Shire Council. This information will be shared in newsletters and fact sheets, at community drop-in sessions and other briefings/meetings as required. RWE will share met mast locations with local pilots and aviation businesses on request, as well as turbine locations as the project progresses.
Noise	RWE, as part of best practice, has undertaken background noise monitoring in the project area even though it is not required to do so due to the distance from the site to the dwellings. The project must have a 1.5 kilometre buffer to dwellings, and all neighbouring dwellings are currently well in excess of this.
Biodiversity	RWE has provided the community and stakeholders with information on biodiversity studies and findings, as well as commited to: • Avoiding areas of environmental significance wherever possible. (Turbines have been sited to avoid Queensland government-identified matters of state environmental significance) • Pre-clearance surveys and micro-siting of infrastructure • Post-construction rehabilitation of disturbed areas not required for ongoing project operation • Ongoing monitoring and management of bird and bat impacts, including management resources that can adapt as required.
Fire risk and mitigation	RWE will continue to liaise with fire services in the proposed project area and other emergency services stakeholders as part of the development process of the proposed Theodore Wind Farm. Wind farm developments incorporate many fire mitigation measures, and these will be communicated with the community, as well as the benefits of access tracks as fire breaks in the event of a fire.
Visual amenity	Photomontages undertaken from key points in and around the project site have shown minimal visual impact from most locations that will be seen by external stakeholders. These have been shared with the community.

Community and Stakeholder Engagement Strategy

Engagement Key Principles and Objectives

This plan aligns with RWEs overarching approach to stakeholder engagement which focuses on delivering best practice engagement that is founded on the principles of honesty, respect, adaptability, consistency and consideration.

1. **Honesty**
   We build relationships with local communities based on trust, respect, and inclusion, by acting with integrity and honesty, engaging in genuine dialogue and relevant communication with all parties and ensuring we provide information as soon as we can.
2. **Respect**
   We respect the communities and stakeholders where our projects are based and understand they are passionate about their homes, communities and areas where they live, work and socialise. We also bring empathy and understanding to engagement.
3. **Adaptability**
   Our approach involves collaboration with communities and incorporates multiple methods of engagement that can adapt to stakeholders' particular needs. This fluid approach allows us to be inclusive by identifying and categorising stakeholders according to their requirements, which informs our approach to each engagement. We can then provide multiple channels of engagement to make it easy for them to obtain project information and be involved.
4. **Consistency**
   Our engagement is ongoing and focuses on consistently keeping our stakeholders informed and engaged through all stages of the project lifecycle.
5. **Consideration**
   Consultation with communities and key stakeholders is always used to shape projects where possible. Feedback is key to ensuring projects are developed with a solid knowledge of the area, its residents and social fabric. We also ensure the benefits generated from the development are spread fairly within the community, by identifying the needs of the community and addressing them.

Engagement objectives

- Clearly define and communicate the approach to engagement, including when, how, and what information will be provided

- Clearly communicate the opportunities for stakeholders to participate in the Project development
- Report on and share the outcomes and findings of the engagement activities, including what was heard, and where the community has influenced decision making on the project
- Promote opportunities for community interest, co-design and participation in benefit sharing initiatives, including, where possible community-led decision making
- Meet, and where possible, exceed requirements for community and stakeholder engagement as set out in statutory and regulatory processes for project development
- Explore opportunities for innovation in engagement, in response to community and stakeholder preferences and the social and local context of the region
- Consider opportunities to collaborate with other renewable energy developers, government and other key stakeholders to develop and implement large-scale, sustainable community-led shared benefits initiatives.

Industry guidelines and engagement frameworks

This CSEP has been developed to deliver a best practice approach that has been informed by the values and principles in the following industry guidelines and engagement frameworks.

- RWE's Australian Community and Stakeholder Engagement Framework (Appendix A).
- The International Association for Public Participation's (IAP2) public participation spectrum
- Clean Energy Council's Community Engagement Guidelines for the Australian Wind Industry
- Clean Energy Council's Guide to Benefit Sharing Options for Renewable Energy Projects.
- Australian Institute of Aboriginal and Torres Strait Islander Studies (AIATSIS) Guidance on Engaging with Traditional Owners
- Queensland Government Renewable Energy Zone Roadmap (Mach 2024)
- Queensland Local Energy Partnerships Plan (October 2023)
- Banana Shire Council Planning Scheme (2021).

International Association for Public Participation (IAP2) Quality Assurance Standard

The Quality Assurance Standard was endorsed by the IAP2 Federation in May 2015 and is recognised as the International Standard for Public Participation practice.

Designed to respond to market requirements for evidence that effective community and stakeholder engagement has been delivered, the standard supports the delivery of the IAP2 spectrum of public participation which aims to move engagement from one of inform, consult, or involve to more actively **collaborating** and **empowering** stakeholders and local communities.

Figure 2 below below outlines RWEs commitment to community consultation and engagement, and how we intend to facilitate public participation across the project lifecycle.

Figure 2 IAP2 Spectrum for Public Participation

Increasing impact on the decisions

	INFORM	CONSULT	INVOLVE	COLLABORATE	EMPOWER
PUBLIC PARTICIPATION GOAL	To provide the public with balanced and objective information to assist them in understanding the problem, alternatives, opportunities and/or solutions	To obtain public feedback on analysis, alternatives and/or decisions	To work directly with the public throughout the process to ensure that public concerns and aspirations are consistently understood and considered	To partner with the public in each aspect of the decision including the development of alternatives and the identification of the preferred solution	To place final decision making in the hands of the public
PROMISE TO THE PUBLIC	We will keep you informed	We will keep you informed, listen to and acknowledge concerns and aspirations, and provide feedback on how public input influenced the decision	We will work with you to ensure your concerns and aspirations are directly reflected in the alternatives developed and provide feedback on how the public input influenced the decision	We will look to you for advice and innovation in formulating solutions and incorporate your advice and recommendations into the decisions to the maximum extent possible	We will implement what you decide
RWE'S COMMI	Early engagement with key stakeholders,	Raising awareness of the project to the wider	Build support and sustained interest in the project through	Build on participation and relationships with the community and stakeholders on	Implement benefit sharing initiatives that are tailored to

	host landowners, fence-line neighbours and Traditional Owners on the proposal, benefits and early socialisation of project timelines and milestones.	community and continuing to build stakeholder and community relationships, continuing to communicate the wider project benefits and establishing robust inquiry and complaints management procedures and sharing these with the community	targeted and consistent opportunities for the community and stakeholders to provide input into the planning and design process, enabling multiple opportunities to seek community input and adjust the project design in response to feedback, where feasible.	planning future stages of the project. Share decision making on shared benefits and long-term and sustainable initiatives from stakeholders and community. Investment in recruitment of local workforce and procurement of local goods and services, including purchasing from Traditional Owner suppliers and underrepresented groups where possible.	the region, with decisions for investment in these initiatives determined by community representatives.

Clean Energy Council's (CEC) Community Engagement Guidelines for the Australian Wind Industry

These CEC Guidelines aim to help the industry strengthen and maintain its social licence to operate in communities located near wind farms. It sets out the community engagement principles, methods and frameworks specific to the wind industry. These principles, methods and frameworks underpin the Guidelines' recommended approach to community engagement. It also identified the specific community engagement actions developers can implement at each stage of the wind farm lifecycle to improve communication, ease and address community concerns, and improve the likelihood of project success.

Clean Energy Council's (CEC) Guide to Benefit Sharing Options for Renewable Energy Projects

The CEC's Guide to Benefit Sharing Options for Renewable Energy Projects provides a comprehensive study of the various community benefit sharing options available to the proponents of large-scale renewable energy projects.

Featuring a number of detailed case studies on the benefit sharing strategies employed at existing projects, the guide serves as a practical tool to assist project proponents, financiers, policy makers and communities in understanding the range of benefit sharing methods available.

Australian Institute of Aboriginal and Torres Strait Islander Studies (AIATSIS) Guidance on Engaging with Traditional Owners

All Australians, including government departments, agencies, councils, land and resource managers, developers, and tourism operators, should be aware that Traditional Owners have legal rights and interests across their Country. Consideration must be given to Traditional Owner rights and interests at the earliest stages of all new projects and activities. The AIATSIS Guidance on Engaging with Traditional Owners outlines key engagement principals for engaging with Traditional Owners.

Queensland Government Renewable Energy Zone Roadmap (Mach 2024)

The roadmap is the Queensland Government's framework for connecting around 22GW of renewable energy to the grid. It identifies 12 potential renewable energy zones (REZs) across Queensland. REZs are areas that help coordinate the development of clean energy infrastructure delivering better outcomes for Queensland communities and industries. The roadmap was developed in line with the Queensland Energy and Jobs Plan and will help meet targets of:

- 50% renewable energy by 2030
- 70% renewable energy by 2032
- 80% renewable energy by 2035.

Queensland Local Energy Partnerships Plan (October 2023)

Through the Queensland Energy and Jobs Plan (the plan) the QLD Government has committed to partnering with communities to realise the benefits and opportunities created by the energy transformation. We have considered the seven principles for energy transformation as set out in the Local Energy Partnerships Plan including:

- Driving genuine and ongoing engagement
- Share benefits with communities
- Buy local, build local
- Increase jobs and secure work
- Preserve Queensland's environment
- Empower First Nations people
- Build local capacity.

Community Context

Project site context

The proposed Theodore Wind Farm site is located in Central QLD, about 30 kms east of Theodore and 40 kms south-west of Biloela. RWE has signed agreements with all the project landowners.

The site is currently used for cattle grazing. Due to the land use much of the site has been cleared of native woodland and forest vegetation, with scattered vegetation in some areas.

The road network near the site incorporates a range of local and state sealed and unsealed roads including Defence Road, Crowsdale-Camboon Road, and the Leichardt Highway. Additional infrastructure on the site and in the surrounding regions includes farm residences and agricultural infrastructure, dirt tracks, fencing, outbuildings, dams, private roads and sheds.

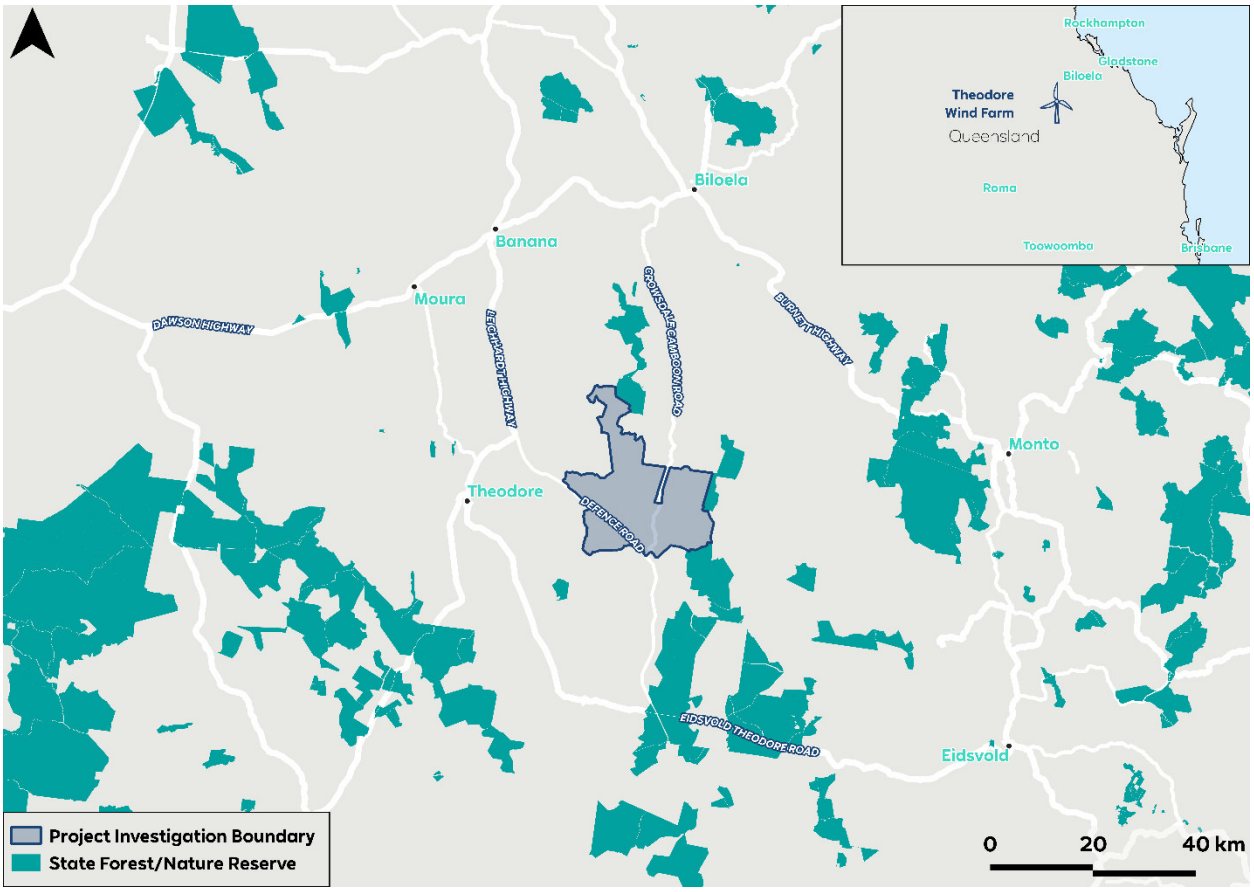
Other renewable developments in the area

There are several other proposed renewable energy projects in the Central and Southern Queensland Renewable Energy Zones. The closest neighbouring development to the Theodore Wind Farm is the Banana Range Wind Farm, which is a proposed 38 wind turbine development located north of Theodore, near the regions of Biloela and Banana. To the north-east of the Theodore Wind Farm is the proposed Kariboe Wind Farm, a proposed 170 wind turbine and battery storage development, located between Biloela and Monto. Both of these projects fall within the Banana Shire Council.

To the south of the Theodore Wind Farm and located in both the Banana Shire and Western Downs Regional Council area is the Bungaban Renewable Energy Farm, which is a proposed wind, solar and battery project.

RWE will seek out opportunities to collaborate with other renewable energy developers in the region and the Banana Shire Council to address community concerns, where feasible, and explore opportunities to create sustainable and large-scale legacy community benefit sharing initiatives.

Figure 3 Location of the Theodore Wind Farm



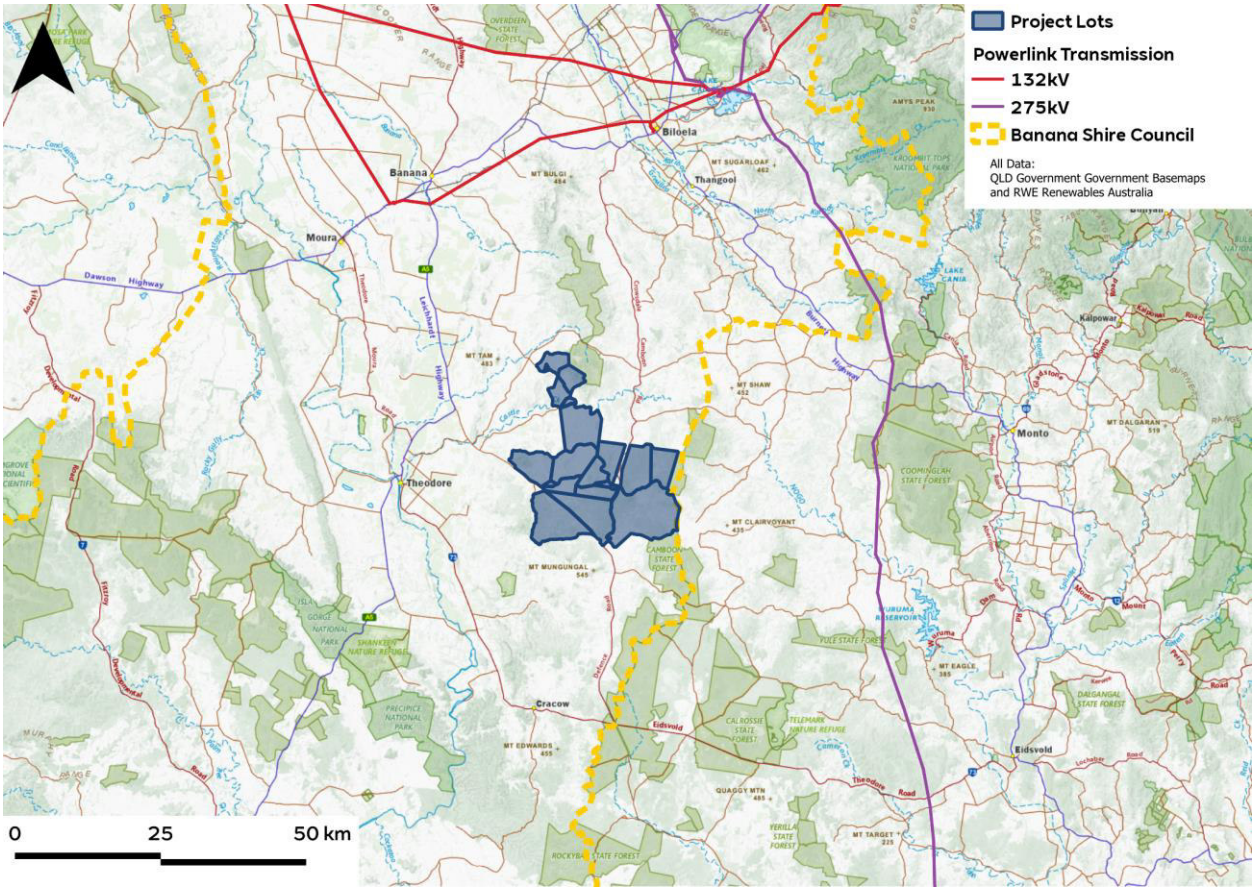
Theodore Community Profile

The proposed Theodore Wind Farm sits within the Banana Shire Council in Central QLD. The Banana Shire incorporates an area of more than 28,550 kilometres, with a population of 14,513 (Australian Bureau of Statistics, 2021). Just above 5 per cent of the Banana Shire population identify as Indigenous or Torres Strait Islander.

Major towns in the area are:

- Theodore (about 22 kilometres to the west of the site)
- Cracow (about 35 kilometres to the south)
- Banana (about 60 kilometres to the north-west)
- Moura (about 60 kilometres to the north-west)
- Biloela (about 60 kilometres to the north-east)
- Monto (about 75 kilometres to the east)
- Gladstone (about 150 kilometres to the north-east)
- Rockhampton (about 150 kilometres to the north)

Figure 4 Local government areas adjacent to Theodore Wind Farm



Banana Shire Community Profile

Banana Shire is located in Central QLD, 120 km west and 200 km south-west of the cities of Gladstone and Rockhampton and has a population of 14,513. The area has extensive natural resources, with several major coal deposits (including in the Theodore area). Two gas transmission pipelines run through the shire, from the Surat and Bowen Basins to Gladstone.

Coal mining is one of the shire's major industries, as are power generation and farming enterprises including beef production and cropping (lucerne and cotton).

Biloela is the shire's largest town, with a population of 5,371. It is the main residential base for workers from the Callide Coal Mine and Callide power station. The Callide power station produces about 20 per cent of QLD's electricity. Only 27 of the shire's 28,577 square kilometres are urbanised, creating the need for communications and engagement

strategies that could target existing hubs such as major employers to access the community.

Data from the 2021 Census shows an approximate 50/50 split of males and females in the Banana Shire, with a median age of 39. These statistics are fairly typical for a rural area.

Banana Shire Planning Scheme 2021

Banana Shire Council has identified the following goals to ensure that appropriate development occurs within the region between 2021 and 2026:

- A fair, orderly, and sustainable pattern of development
- A strong sense of community identity
- A viable, complex, and diverse economy
- The enhancement of infrastructure to meet the needs of the community
- The preservation of economic and environmental values in rural areas; and
- The protection of the natural environment, and the mitigation of both natural and human-made hazards.

The Council has made commitments to meet the above goals through the development of strategic direction plans, as well as the creation of objectives and strategies that identify the key steps and resources required to achieve the vision.

The proposed Theodore Wind Farm diversifies the economy of the region while creating renewable energy to support Queensland's Renewable Energy Zone Roadmap supply.

Renewable Energy Zone (REZ) Roadmap

First Nations People and Traditional Owners

The traditional owners of the land, waterways, and skies within the region are the Wulli Wulli people.

The Wulli Wulli Nation Aboriginal Corporation (WWNAC) was founded in 2015 as the Registered Native Title Body Corporate for the Wulli Wulli people. The Corporation is responsible for looking after the rights and interests of the Wulli Wulli people and will be a key stakeholder in this project.

Key Stakeholders

The table below identifies the key stakeholder groups that will be engaged throughout the Project. This table will be modified in response to feedback and as additional stakeholders are identified.

Stakeholder analysis is a key part of mapping communications and community engagement. This enables developers to identify key groups and their stakeholder needs to deliver comprehensive and focused engagement.

In categorising project stakeholders, RWE considers the impact that the proposed development will have, either directly or indirectly, on groups or individuals within the project region. Within the context of Theodore, the categorisation exists as follows:

Table 4 Stakeholder category list

Stakeholder category	Details	Objectives	Engagement activities
Landowners (3)	Landowners hosting project infrastructure for the proposed Theodore Wind Farm.	Ongoing communication and discussions as the Project progresses. Contribution to the Project's progress, ability to provide local knowledge, advice, and input. Involvement in the development and delivery of a community benefit-sharing scheme.	• One-on-one meetings • Landholder updates • Letterbox drops • Project updates • Invitations and involvement in community events.
Fenceline Neighbours	Fenceline neighbours are identified as neighbours that share a fence line or property boundary with the host landowner(s)/project site.	Ongoing communication and discussions as the Project progresses. Contribution to the Project's progress, ability to provide local knowledge, advice, and input. Involvement in the development and delivery of a community benefit-	• One-on-one meetings • Landholder updates • Letterbox drops • Project updates • Invitations and involvement in community events.

Stakeholder category	Details	Objectives	Engagement activities
		sharing scheme. Individual negotiations regarding neighbour benefit payments.	
Near Neighbours	Neighbours with a dwelling within 10 kms of the proposed Theodore Wind Farm site boundary.	To create and maintain a close connection with neighbours that live within 10km radius of the wind farm. To keep neighbours informed about the Project from early in the planning phase and provide opportunities to raise issues and provide feedback. To ensure that neighbours share in the benefits of the Project.	• One-on-one meetings • Landholder updates • Letterbox drops • Project updates • Invitations and involvement in community events.
Traditional Owners	Local Aboriginal elders, representatives, and organisations, specifically the Wulli Wulli people and the Wulli Wulli Nation Aboriginal Corporation (WWNAC).	Engaging with local Indigenous groups beyond planning requirements such as Cultural Heritage Management Plans.	• One-on-one meetings • Letters at key milestones • Project updates • Invitations and involvement in community events • Invitation to co-design Indigenous participation/ procurement plans • Website content and 1800 number.
Opponents (no active opponents identified)	Individuals and organised groups actively opposed to the proposal in proximity to the proposed project area.	To be accessible, help to address concerns proactively, and to have a best practice complaints system in place.	• Website content and 1800 number • Complaints process implemented and transparent

Stakeholder category	Details	Objectives	Engagement activities
Wider Community	Residents of the local geographic area hosting the proposed project, as well as local interest groups not defined in any previous categories, including: • Residents outside of the boundary determined for neighbours • Aged care and healthcare organisations • Business organisations, including but not limited to farmer associations, local progress associations, chambers of commerce or local business structures • Churches and faith-based organisations • Conservation and environmental organisations • Local climate action and sustainability groups • Not-for-profit organisations • Primary, secondary, or tertiary educational institutions • Recreational groups and clubs.	To provide information and raise awareness of the Project so local community groups can update their members.	• Project updates • Invitations and involvement in community events • Website content and 1800 number.

Stakeholder category	Details	Objectives	Engagement activities
Local Government	Councillors and staff employed by the Banana Shire Council, including but not limited to: • Mayor Cr Neville Ferrier • Deputy Mayor Cr Terri Boyce • Cr Adam Burling • Cr Ashley Jensen • Cr Phillip Casey • Cr Kerrith Bailey • Cr Brooke Leo • CEO Tom Upton • Other executive staff Gladstone Regional Council	To ensure a positive and collaborative relationship with the LGA that can support the long-term goals of the local community.	• Council briefings • Updates at key milestones • Project updates • Community information sessions • Invitations and involvement in community events.
Industry Bodies	• Clean Energy Council (CEC) • Re-Alliance • Queensland Fire and Emergency Services (QFES) • Gladstone Ports Corporation • Camboon Rural Fire Brigade • Moura Rural Fire Brigade • Rural Fire Service Gladstone	To strengthen RWE's community and stakeholder engagement by collaborating with relevant industry bodies. This includes identifying key industry stakeholders, establishing productive relationships, and leveraging industry expertise to inform engagement initiatives and develop mutual understanding and support. This also ensures RWE complies with industry requirements.	• One-on-one meetings • Updates at key milestones • Project updates • Invitations and involvement in community events and the planning and application process.
Government Agencies	• Federal Department of Climate Change, Energy, the	To strengthen RWE's community and stakeholder engagement by	• One-on-one meetings • Updates at key milestones

Stakeholder category	Details	Objectives	Engagement activities
	Environment, and Water (DCCEEW) • State Assessment and Referral Agency (SARA) • Queensland Department of Environment and Science (DES) • Queensland Department of Resources • Queensland Department of Transport and Main Roads (TMR) • Australian Energy Infrastructure Commissioner	collaborating with relevant industry bodies. This includes identifying key industry stakeholders, establishing productive relationships, and leveraging industry expertise to inform engagement initiatives and develop mutual understanding and support. This also ensures RWE complies with industry requirements.	• Project updates • Invitations and involvement in community events and the planning and application process.
State and Federal Members of Parliament (MPs)	• Federal Member for Flynn Colin Boyce MP (LNP) • State Member for Callide Bryson Head MP (LNP)	To ensure the local member is updated on the project and its progress.	• In person Project Briefings • Updates at key milestones
Media	Print and online media: • The Focus Magazine • The Gladstone Observer • The Courier Mail • CQ Today • Biloela Beacon Broadcast media (radio and TV):	Provide opportunities for the community to be keep up date with the project, key milestones and events.	• Media releases • Interviews • Editorials • Advertising campaigns including project announcements • Invitations/adverts to events

Stakeholder category	Details	Objectives	Engagement activities
	• ABC • 4CC • Hot FM • Triple M Central Queensland • Fresh FM • Win News • Channel 7 • Nine News		• Media statements

Engagement tools and methods

The stakeholder engagement tools set out in the below table have been developed as part of RWE's commitment to genuine dialogue with the community and stakeholders. To facilitate relevant and meaningful opportunities for stakeholder input into the Project, we will develop action plans that will guide the consultation approach for each major project milestone. It is not anticipated that each of the below engagement/communication tools will be used across all project milestones and some may not be used at all; our approach will depend on the communication preferences of stakeholders, the purpose of each activity and how we can meet – and where possible exceed – the expectations of community engagement and requirements as set out by the responsible authority.

Table 5 Engagement tools and objectives

Engagement/ Communications Tool	Description	Timing	Purpose	Desired outcome
Personal phone calls	Personal phone calls will be a significant aspect of stakeholder engagement, particularly with stakeholder groups most interested in the project. Direct phone calls are a deliberative engagement tool to facilitate immediate and direct conversations.	Site selection/ confirmation through to commissionin g phase.	• To establish a relationship and build trust and confidence at the start of and during the engagement process by being able to liaise with a direct contact.	• To build rapport with stakeholders and to provide them with a direct line to project staff.
Meetings	Personal meetings with individuals and sometimes groups will be a key avenue of personalised engagement. These may be one-on-one meetings with landowners or near neighbours, or group meetings with a local community group. Meetings provide an opportunity to educate and inform, and listen to issues and concerns.	All project phases.	• To establish a relationship and build trust and confidence at the start of and during the engagement process. • To help share factual and informed information about the project among individuals and stakeholder networks. • To understand existing concerns and perspectives. • To gain feedback on the engagement reach and gather information about communication and engagement preferences. • To obtain stakeholder opinions and intel on consultation and engagement approaches	• Key stakeholders are informed and engaged early. • Establish a connection and build trust and confidence in the engagement process early on. • Information around current concerns and ideas to be shared with the project team to inform the development of the project and mitigate risk. • Satisfy regulatory and legislative requirements around consultation with communities.

Engagement/ Communications Tool	Description	Timing	Purpose	Desired outcome
			undertaken by nearby, similar energy projects. • To understand community sentiment towards renewable energy projects. • To establish negotiables/non-negotiables and explain how community feedback can influence the project.	
Emails/letters	Emails and letters will be used to provide notification of important information, such as works, surveys or other activities, or provide stakeholder-specific information and engagement.	Development phase through to commissioning phase.	• To create a formal engagement mechanism that can be utilised with all stakeholder groups. • Letters can also be adopted for engagement with stakeholders who do not have access to email or SMS.	• Communication with all stakeholder groups at key milestones or to ensure that key information is received.
Briefings	Briefings will take place as and when required with representatives of stakeholder groups including local Councillors and Council executives, Members of Parliament and government departments. Briefings allow stakeholders to stay informed about the project's progress.	Development phase through to the commissioning phase.	• To provide up-to-date information about the project and consultation process with an opportunity to ask the project team specific questions. • To provide a briefing pack containing all key project information that government stakeholders can confidently	• Key government stakeholders are informed and engaged early. • Establish a connection and build trust and confidence in the engagement process early on. • Gain a robust understanding of current community concerns and feedback/ideas to be shared with the project team to inform the development of the project and mitigate risk throughout.

Engagement/ Communications Tool	Description	Timing	Purpose	Desired outcome
			relay to the media or constituent enquiries. • To help build trusted relationships. • To understand existing concerns and community perspectives. • To establish negotiables/non-negotiables and explain how community feedback will influence the project.	
Door knocks	Door knocks can be used to speak personally with neighbours within a pre-determined distance band of the project. Direct outreach allows community members to engage and interact in their environment.	Site selection through to construction phase.	• To establish face-to-face engagement with key affected landholders and neighbours. • To help build trusted relationships. • To build brand recognition and an understanding of who RWE is.	• Increased engagement with directly affected and neighbouring stakeholders.
Letterbox drops	Letterbox drops provide the opportunity to directly contact residents and/or ratepayers within a certain geographical boundary depending on the delivery method employed. RWE is hand-delivering correspondence to dwellings	All project phases.	• To provide stakeholders within a specific location with hard copy information of an upcoming milestone or engagement opportunity.	• Demonstrate depth and breadth of consultation. • Removal of communication barriers for stakeholders that do not have access to the internet.

Engagement/ Communications Tool	Description	Timing	Purpose	Desired outcome
	within 10kms of the project. Letterbox drops can be used to distribute newsletters, flyers, FAQs, and other project information.			
Shopfront (permanent or pop up)	A shopfront in a project area can take on a variety of forms. It can be a fixed space that is open one or multiple days per fortnight. Another option is a temporary 'pop up' venue which could include a stall in a public space such as a Council office, shopping centre or public library. This option is usually more informal and may occur as a one-off or for shorter periods.	Construction phase.	• A central in-town location that hosts project information and establishes a consistent connection between the project team and the community. • Can act as a central meeting space for focus groups and community feedback sessions. • An education space to share knowledge and engage the community in on-ground works through digital technologies that they may not have access to due to low or no internet access.	• Demonstrate depth and breadth of consultation. • An informed community is less likely to spread/hold on to misinformation/disinformation. • Continued brand awareness and trust being built within the community. • Build social licence as a developer demonstrating a commitment to strong and varied consultation.
Drop-in sessions/ pop-ups	Drop-in sessions provide an opportunity for stakeholders to meet with members of the project team and Subject Matter Experts (SMEs) about the project. Drop-in sessions are advertised in the local	Development / pre-construction phases.	• To allow direct interactions with community members and the distribution of project collateral designed to inform, educate, and drive feedback through the project website.	• Demonstrate depth and breadth of consultation. • An informed community is less likely to spread/hold on to misinformation/disinformation.

Engagement/ Communications Tool	Description	Timing	Purpose	Desired outcome
	community and generally held over multiple days (often two consecutive days) in a local hall or halls. These drop-in sessions do not have a formal structure, but usually incorporate project poster and fact sheets, industry materials, and catering. Subject materials should be selected in response to the community's interests.		• Deliver up-to-date information about the project. • Allow myths to be debunked. • Serves as a tool to identify risks, including evidence of misinformation and disinformation campaigns. • Establishes an on-ground connection between the project team and the community.	• Continued brand awareness and trust being built within the community. • Build social licence as a developer demonstrating a commitment to strong and varied consultation.
Attendance at community events	This may include information stands at agricultural shows, sporting, and other events, providing a platform for community members to ask questions and provide feedback.	Development phase through to commissioning phase.	• Deliver up-to-date information about the project. • Allow myths to be debunked. • Serves as a tool to identify risks arising, including evidence of misinformation and disinformation campaigns. • Establishes an on-ground connection between the project team and the community.	• Demonstrate depth and breadth of consultation. • An informed community is less likely to spread/hold on to misinformation/disinformation. • Continued brand awareness and trust being built within the community. • Build social licence as a developer demonstrating a commitment to strong and varied consultation.
Site tours and visits	This does not need to be limited to the actual project site. Site tours could occur at other projects throughout	All project phases.	• Allow myths to be debunked by increasing transparency and visibility of the project site.	• A greater understanding of proposed land use and visual amenity.

Engagement/ Communications Tool	Description	Timing	Purpose	Desired outcome
	the planning and approvals and construction stages to familiarise stakeholders with an operating renewable energy project.		• Start to build an understanding of visual amenity impacts and turbine layouts.	• Continued myths debunked and greater informed stakeholders. • Continued relationship building with the community and key stakeholders.
Workshops	Workshops can create a space for stakeholders to discuss any questions or concerns with the project team and/or SMEs, as well as positively contribute to the development of the project by brainstorming ideas and community-led problem solving.	Development / pre-construction phases.	• Provides opportunities for the project team to provide information and workshop solutions with targeted groups of stakeholders.	• Early and ongoing risk identification and mitigation • The co-development of solutions between the project team and community members.
Focus groups	Create an opportunity for key stakeholders, selected by the project team, to provide detailed community feedback in a group setting, as well as raise project-related concerns, considerations, or issues with the RWE team and/or SMEs.	Development / pre-construction phases.	• Focus groups will enable deeper discussion and gather important data, which will inform risk levels and community sentiment around key elements of the project. • To understand community sentiment. • To test project messaging/ engagement methods/future benefit sharing options.	• Early and ongoing risk identification and mitigation. • The co-development of solutions between the project team and community members.

Engagement/ Communications Tool	Description	Timing	Purpose	Desired outcome
Interviews	Interviews create a one-on-one opportunity for key stakeholders, selected by the project team, to provide an insight into individual concerns and considerations, or to work through issues unique to them. An expected outcome would be the co-development of solutions to issues raised in the interview.	Development / pre-construction phases.	• Provides stakeholders with one-on-one access to the project team. • Provides the project team with opportunities to further investigate issues raised by community members/gain further insights.	• Early and ongoing risk identification and mitigation. • The co-development of solutions between the project team and community members.
Free call 1800 number	A free call 1800 number, 1800 879 435, has been established for the project.	All project phases.	• To provide all stakeholders with a toll-free number to engage with the project team.	• Removal of communication barriers for stakeholders that do not have access to the internet and would like to obtain project information or ask questions.
Engagement tools – digital communication				
Electronic direct mail (EDMs)	EDM campaigns are founded on a database of subscribers – in this case from interested project stakeholders. A sign-up list will be made available on the project	Development phase through to commissioning phase.	• EDMs will be an important part of communications and could be used to share information such as newsletters, flyers, invitations to upcoming events, fact sheets and more.	• To inform development of the project and community benefit opportunities that reflect the aspirations of the community.

Engagement/ Communications Tool	Description	Timing	Purpose	Desired outcome
	website and at community events.			
SMS notifications	SMS notifications can be used for time-critical notifications, such as works and deadlines for public submissions.	Development phase through to commissioning phase.	• To provide affected stakeholders and neighbours with a fast and efficient way to receive important information/ updates.	• The delivery of real-time project updates/information.
RWE website	The RWE Australia website is now live and can be found at www.au.rwe.com. This site contains information about RWE globally, RWE Renewables Australia and Australian projects, as well as links to project-specific sites.	All project phases.	• To provide all stakeholders with overarching information about RWE and its Australian profile.	• To provide stakeholders with additional information on RWE. • To provide stakeholders with an additional mechanism to contact RWE.
Project website	A project website has been established at theodorewindfarm.com.au and will be regularly updated to provide more information, as well as digital versions of project collateral. The website URL is included on printed and digital collateral.	All project phases.	• To provide a central online information source that is accessible to many stakeholders and community members • To provide links to engagement opportunities including online survey, webform submissions and project email address.	• Well informed stakeholders and community members who can access online information and provide feedback to inform discussion and reduce the impact of false information.

Engagement/ Communications Tool	Description	Timing	Purpose	Desired outcome

Media releases and advertisements	Media releases will be prepared and shared with media outlets based on communications objectives throughout the project timeline. Advertisements will be booked when required.	All project phases.	• To provide factual information to a broad audience early in the process, including a call to action.
			• To establish contact with relevant journalists and encourage them to contact RWE with further questions, ensuring a direct line to a source of factual information.
			• To positively position RWE's commitment to
			  ○ the environment
			  ○ climate and renewable energy
			  ○ consultation with Traditional Owners and non-indigenous communities
			  ○ the community
				• Increase opportunity for factual and balanced information in the local media which can then help to further inform the local community and encourage engagement buy-in.
				• Establishment of strong relationships with journalists, including:
				  ○ provision of a media briefing pack
				  ○ agreement on a schedule of media articles/announcements (where practical).
				• Influence positive commentary about the project and RWE.
				• Satisfy regulatory and legislative requirements around consultation with communities.

Social media	Social media may or may not be used.	All project phases.	• To provide timely and factual information to a broad audience including upcoming engagement opportunities.	• Increase opportunities for factual and balanced information on social media which may also counteract any misinformation being posted by opposition groups.
Project email address	A project-specific email address, theodorewindfarm@rwe.c	All project phases.	• To enable an easy enquiry process and feedback loop in relation to the project.	• Easy feedback loops for those who wish to provide responses to the engagement process.

Engagement/ Communications Tool	Description	Timing	Purpose	Desired outcome
	om has been created and will be used as a central point of obtaining community feedback.		• Feedback received will be shared with the project team for consideration in the development of the project.	• To inform development of the project and community benefit opportunities that reflect the aspirations of the community.
Engagement tool – printed communication/materials				
Newsletters	Project newsletters should be developed and distributed regularly, with a suggested timeframe of every three months. These should provide project updates and be posted to all landowners within a pre-determined project radius (suggested to be 10 kms from the project boundary). They can also be delivered electronically. Newsletters will also be uploaded to the project website.	Development phase through to decommissioning phase.	• An easily accessible 'teaser' delivered directly to mailboxes to inform residents about the project and consultation process. This activity will ensure those with low-or-no access to the internet are informed and included in the communications and engagement opportunity. • A call to action to become informed and participate in the engagement process. • Provide contact details for the Project Communications and/or Development team.	• Improve engagement rates by keeping the project at top of mind and sharing accessible links and information about engagement opportunities.
Fact sheets/posters	Fact sheets will be topic-specific and could include subjects such as: farming, environment, community, fire mitigation and	Development phase through to commissioning phase.	• To provide clear, concise, and accurate project information that can be downloaded as needed to inform discussions/ engagement activities.	• Easily accessible and succinct information to deliver facts to inform discussion and reduce the impact of false information.

Engagement/ Communications Tool	Description	Timing	Purpose	Desired outcome
	response, health and more. Posters used at community drop-in sessions will likely incorporate information contained in fact sheets. Material developed in this category will also be uploaded to the project website.			
Frequently Asked Questions (FAQs)	Frequently Asked Questions (FAQs) can be used to focus on a particular topic or a range of topics in one document. These can be developed in response to queries raised by the community and stakeholders throughout the engagement process. Material developed in this category will also be uploaded to the project website.	Development phase through to operations phase.	• To provide additional information to commonly asked questions in an easy-to-follow format to inform discussion.	• A better-informed community who may be seeking answers to similar questions, to inform discussion and reduce the impact of false information.
Flyers	Flyers can be used to promote information sessions or events. Flyers can reach community	Development phase through to	• To provide clear, concise and accurate project information that can be downloaded as needed to inform discussion.	• Easily accessible and succinct information to deliver facts to inform discussion and reduce the impact of false information.

Engagement/ Communications Tool	Description	Timing	Purpose	Desired outcome
	members who may not have access to digital communications or online platforms.	commissioning phase.		
Information packs	Information packs can include a combination of project collateral, such as newsletters, fact sheets, maps, information on upcoming events, photo montages, independent third-party studies and more. These can be tailored to the specific needs of the community or individual stakeholders and can include information on topics of particular focus for the project community. These could be posted to individuals as required or left at key locations, such as Council offices.	All project phases.	• To ensure that stakeholders have access to all of the relevant project information required in simple pack.	• Well informed stakeholders and community members with access to key project information that can be taken away for further consideration. Packs will assist with building stakeholder's knowledge and understanding of the project, will inform discussions, and reduce the impact of false information.
Business and Sorry we missed you cards	'Sorry we missed you' cards can be printed and left at residences to inform the resident that	Development phase through to	• To alert affected stakeholders of RWE's attempt to engage and to provide them with a call to action.	• Clear information on how to reach RWE to set up future meetings/engagements.

Engagement/ Communications Tool	Description	Timing	Purpose	Desired outcome
	RWE has attempted to contact them. Traditional business cards will also be printed to share with stakeholders who may not use contacts on mobile phones.	commissioning phase.		
Surveys	Surveys are a useful data collection tool to understand community issues, needs and preferences. Surveys can help gauge public opinion on a variety of topics, including framing of benefit sharing initiatives, the project, and renewable energy in general.	Development/ pre-construction phases.	• To gain insight from highly engaged members of the community about their current perceptions of their local area and concerns /opportunities arising from planned developments in the area. • To focus respondent thinking on current challenges and perceived opportunities for community, economic and social development in the region. • To understand the aspects of the region that are highly valued in the community to inform key messaging and early risk mitigation.	• Valuable feedback about what community benefits might be most appropriate/favoured. • Assist in the early identification of risk and formation of key messaging.
Engagement Tool – Community Committees				

Engagement/ Communications Tool	Description	Timing	Purpose	Desired outcome
Community Engagement Committee	In line with industry best practice, RWE is committed to establishing a Community Engagement Committee (CEC) to capture the voice and sentiments of the community, to help inform the project, how RWE engages and the content of engagement. A CEC also provides a tool to share factual information with the community and – if used and populated effectively – can be a powerful means of creating trust.	Commence 2024 and continue on an ongoing basis (frequency tbc)	• Acting as a conduit in order to ensure that important, project-related information is made available to the community and other stakeholders • Assisting with prioritising and administering benefits within the community • Encouraging the development of, and participation in, community partnerships and initiatives, and • Facilitating communication between RWE and the community.	• Community is involved in some of the decision-making aspects of the Project • Community can advise on engagement preferences, best practice approach facilitate wide reaching opportunities for community information, knowledge sharing and interest in the Project • Key issues and concerns raised by community can be resolved successfully, by using community insights and recommendations to address from a local perspective

Potential risks

A summary of potential high-level risks and proposed management strategies are outlined in 6 below.

Table 6 Potential CSE Risks and Mitigations

Subject	Risk / Issue / Concern	Potential management strategy / project response
Mistrust in the consultation process	Stakeholder concerns that the consultation process is 'merely for show' and is not genuine.	• Clear messaging on how stakeholder feedback has been and will continue to be used going forward (transparency). • All team members to show genuine interest in stakeholder feedback and always capture feedback irrespective of sentiment.
Active 'anti' campaign commenced against RWE and/or the Project proposal	Engagement and communications focus on vocal minorities (including anti-renewable groups) taking focus away from the broader engagement process.	• Structured and transparent early engagement. • Consistent approach to engagement and communications. • Promotion of consultation with broad stakeholder groups, with varied interests. • Structured and responsive (rather than reactive) issues management. • Positive media strategy.
	Unsupportive community and/ or the activation of community/ landholder protest groups.	• Structured and transparent early engagement. • Consistent approach to engagement and communications, including Project benefits targeted at the local community. • Development of a local procurement strategy. • Structured and responsive (rather than reactive) issues management.
Negative media interest	The media takes a negative interest in the Project and launches an	• Structured media strategy to address media issues. • Clear media protocols for management of media enquiries.

Subject	Risk / Issue / Concern	Potential management strategy / project response
	active campaign with a negative focus.	• Transparent, open, ongoing communications to external stakeholders. • Ongoing appropriate issues management.
Project impact concerns	Cultural heritage	• Ongoing engagement and collaboration with key stakeholders, including Aboriginal groups and other heritage knowledge holders. • Develop clear messaging on how cultural heritage assessments are conducted and the process that occurs if an artifact or place of significance is identified and confirmed.
	Construction impacts	• Consulting with the local community to include construction impacts. • Development of a construction impact management and mitigation strategy addressing potential construction impact including traffic, noise, and air quality. • Development of an emergency response plan.
	Environment, flora and fauna	• Ongoing engagement and community involvement in identifying key areas of flora or fauna importance. • Develop clear messaging on how ecology surveys are conducted and what happens if specific flora or fauna are identified and confirmed.

Communication protocols

Records Management

RWE has a custom-built stakeholder engagement platform called Stakeholder Engagement Tool (SET), which has been designed to document and manage stakeholder interactions, including individual and group meetings, briefings, phone calls and information sessions.

The tool records engagements, including sentiment and feedback raised from stakeholders. At a practical level, it requires the manual input of engagement activities. Complex or more detailed engagement activities may necessitate written recording of details which will then be uploaded to SET.

The tool is also able to record commitments made by RWE, as well as items for follow up and allocate engagement tasks to team members for follow up.

All data inputted into SET is kept in line with RWE's privacy policy. We have technical and organisational measures in place to ensure we observe relevant legislation at all times and the collection, management and use of personal information is in accordance with the Australian Privacy Act 1988, the Australian Privacy Principles and related legislation and regulation (Australian Privacy Law). RWE Renewables Australia is part of the RWE Group, a group of companies with RWE AG as their ultimate parent company. RWE AG is ultimately responsible for setting the policies for the RWE Group, and so we also comply with the RWE General Data Privacy Policy and other group directives relating to data protection and privacy.

Complaints management

RWE believes effective and responsive communication is essential for continual development of strong community relations.

The primary objectives of RWE's Complaints Management Policy are to:

- create an environment where feedback is welcomed and valued
- provide a clear and consistent process for fair and transparent management of complaints and enquiries
- ensure complaints and enquiries are addressed and resolved in a timely and effective manner.

In handling complaints and enquiries, RWE will:

- manage personal and private information in accordance with the Australian Privacy Act (1988)

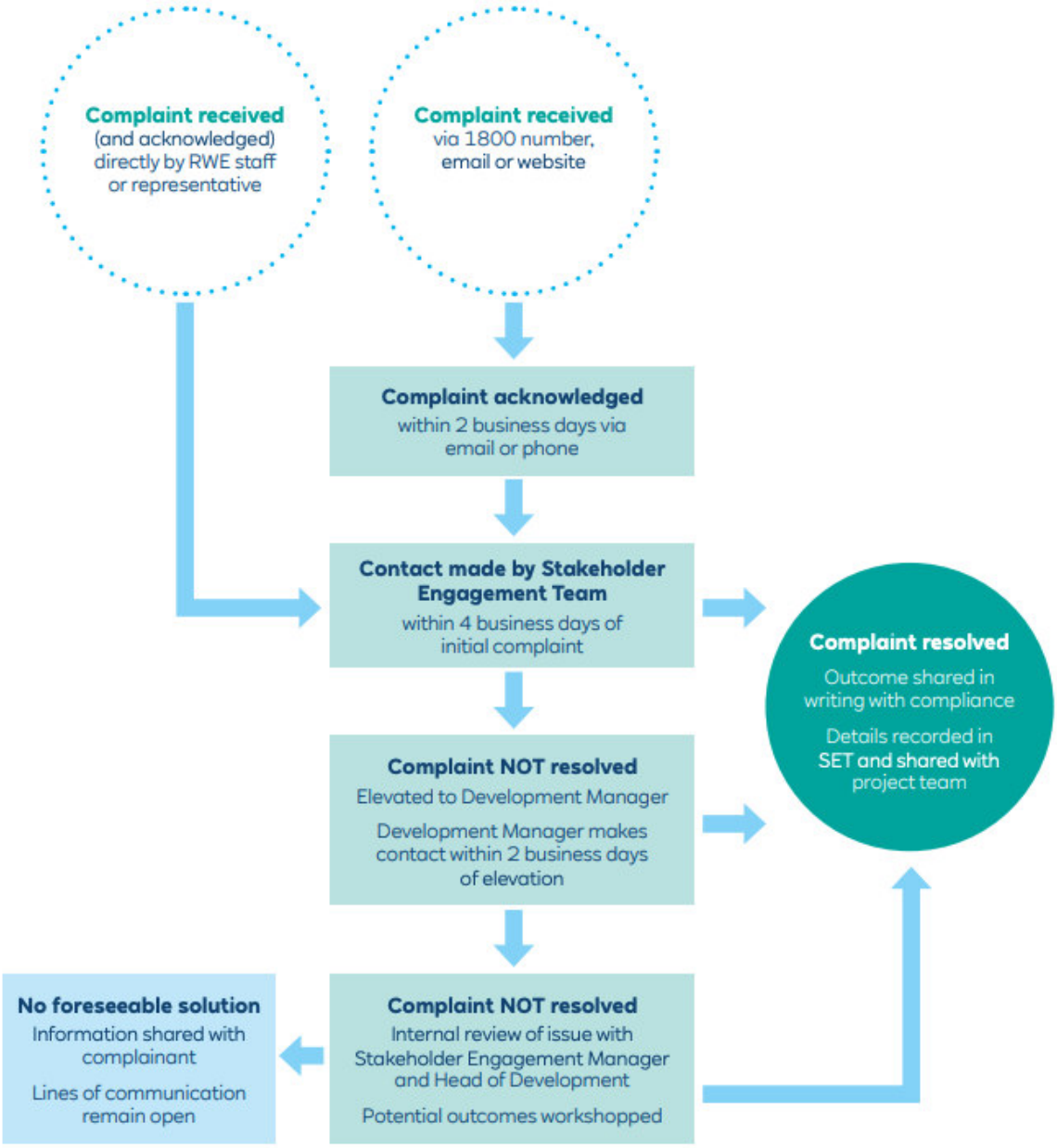
- ensure fair treatment for all individuals who provide feedback or lodge complaints
- address complaints and enquiries objectively and without bias
- clearly communicate timing and process for complaints resolution.

RWE commits to the principles of accessibility, responsiveness, fairness, consideration, a customer-focused approach, confidentiality, and continual improvement regarding the management of complaints and enquiries under the Policy, which has the following steps:

- Stage One: Receiving
- Stage Two: Acknowledging
- Stage Three: Validating
- Stage Four: Investigating
- Stage Five: Resolving
- Stage Six: Closing

All instances are recorded within RWE's internal SET, with the intent to archive, allocate, monitor, action, resolve, close and analyse all relevant enquiries. RWE aims to resolve complaints within 10 working days. If this is not possible RWE commits to continued engagement with the stakeholder.

Figure 6 2 Complaints management flowchart



Reporting

RWE is committed to establishing procedures and policies which ensure a robust and regular framework for internal reporting and monitoring. This CSEP is shared with new employees, while existing employees involved with the Theodore project have access to and are across the document.

Internal communication pathways will be utilised to ensure that all concerns, grievances, and learnings are effectively communicated to all employees relevant to Theodore Wind Farm. These communication techniques include, but are not limited to:

- Frequent communication email updates;
- Historical activity summaries presented during team meetings, which are scheduled to coincide with regular reporting intervals; and
- Summary of planned future activities scheduled prior to the upcoming reporting period.

References

- Aboriginal Cultural Heritage Act 2003
- Australian Bureau of Statistics – 2021 Census Data
- Australian Standard AS/NZS 10002:2014 – Guidelines for Complaint Management in Organisations
- Australian Privacy Principles
- Best Practise Community Engagement in Wind Development
- Best Practise Guidelines for Implementation of Wind Energy Projects in Australia (AusWind, December 2006)
- Biosecurity Act 2015, www.legislation.gov.au
- Clean Energy Council's (CECs) Guide to Benefit Sharing Options for Renewable Energy Projects
- Community Engagement Guidelines for the Australian Wind Industry
- Community Planning Toolkit
- Cultural Heritage Management Plan Guidelines
- IAP2 Public Participation Toolbox
- Privacy Act 1988
- RWE's Corporate Australian Community Engagement Framework
- Stakeholder Engagement: A Good Practice Handbook for Companies Doing Business in Emerging Markets, IFC, May 2007
- The International Association for Public Participation (IAP2) Framework
- The International Association for Public Participation (IAP2) Toolkit
- Torres Strait Islander Cultural Heritage Act 2003

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APPENDIX M WORKFORCE ACCOMODATION AND INFRASTRUCURE REPORT



Workforce accommodation and infrastructure report

Theodore Wind Farm

Prepared for: RWE Renewables Australia Pty Ltd

Date: 14/05/2025

Document information

Document	Workforce accommodation and infrastructure report
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Reviewed by	Steven Tarte

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Rev	Date	Details	Authorisation	
			Name/position	Signature
0	14-05-2025	Final for client	Steven Tarte, Principal Consultant – Approvals	

Prepared for:
RWE Renewables Australia Pty Ltd

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Attexo Group Pty Ltd 2025
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Executive Summary

Overview

Theodore Energy Development Pty Ltd (TED) is a wholly owned subsidiary of RWE Renewables Europe & Australia (RWE). TED proposes to develop, construct and operate the Theodore Wind Farm on land located approximately 22 km east of Theodore in the Banana Shire Council Local Government Area.

In September 2024, RWE submitted the development application for the Theodore Wind Farm to the State Assessment and Referral Agency (SARA). The Deputy Premier and Minister for Planning issued a direction notice on 16 January 2025 to pause the assessment of the application. Since that time, State Code 23 has been updated and now includes further requirements relating to workforce accommodation and infrastructure impacts.

This report presents a summary of preferred workforce accommodation options based on the Socio-economic impact analysis report submitted to the State Assessment and Referral Agency (SARA), and an analysis of infrastructure and service demands generated through the construction phase of the Project. This Report also assesses the potential impacts of the operational phase.

This Report demonstrates compliance with the updated State Code 23 (v3.2) and Performance Outcome (PO) 16 and 17 – *On-site and off-site workforce accommodation associated with the construction of the wind farm, does not result in adverse impacts on surrounding communities and townships, such as overburdening services and community facilities*, and PO23 – *The impacts of the development on infrastructure and services including social infrastructure, communications networks and essential infrastructure are identified, and measures to manage, mitigate and remediate any impacts are undertaken*.

Key findings

The Project will have about a 35-year operational life, employing between 15-50 permanent workers. Construction is anticipated to commence in 2026, taking approximately 18 months to complete. Construction will require between 300-500 workers.

RWE's workforce accommodation strategy for the construction phase comprises using:

- An on-site camp with around 400 beds to accommodate most of the construction workforce. The camp will be largely self-sufficient incorporating its own temporary infrastructure and services.
- Short-term accommodation, such as hotels, motels and other existing camps, located within a safe travel distance to the Project area (i.e., less than an hour drive) to accommodate a small proportion of the construction workforce. Visiting RWE employees, contractors not associated with the main construction workforce, and workforce overflow during peak construction periods would stay at local short-term accommodation.

The on-site camp will be temporary for construction only and will be designed to be largely self-sufficient and will not require connections to Council infrastructure such as water supply or wastewater treatment. Health and safety provisions including medical services will also be made available for workers at the on-site camp. Workers will be transported by shuttle bus between airports and the Project site.

Construction of the Project will need access to infrastructure, services and material including:

- local roads
- potable and non-potable water
- waste management including sewage treatment
- base materials for constructing access tracks, turbine foundations, etc
- communications – investigating opportunities
- electricity.

Potential impacts associated with workforce accommodation

Using an on-site camp ensures that potential adverse social impacts associated with a large influx of FIFO/DIDO workers staying in Theodore and nearby towns will be avoided. Potential positive social impacts will be realised through a small proportion of the construction workforce staying in town at short-term accommodation. Workers staying in town will contribute to the local economy and support community cohesion.

Potential workforce demands on social infrastructure and services will be minimised through providing health and medical care on-site. A private emergency services contractor will also be engaged to ensure that any emergencies that occur on-site will minimise local emergency services capacity away from the community.

The Project will not impact on the local housing market, as workers who do not already reside in Theodore or nearby towns will stay at short-term accommodation while on shift. The Project will not create additional demand for rental housing or houses for sale.

RWE supports BSC's Major Projects Housing Demand & Levy Policy and has committed to provide permanent accommodation in a town near to the Project. These houses would be delivered during the operational phase of the Project, increasing housing availability in the local area.

Potential impacts on infrastructure

The Project's potential impacts on infrastructure include increase demand in water, materials and landfill capacity, reducing the community's access to health and emergency services, and reducing road safety. There is also an opportunity to improve communication services locally.

RWE's workforce accommodation strategy and the associated services to be provided at the on-site camp for construction workers will mitigate the potential adverse impacts on the community. The on-site camp is to be self-sufficient, ensuring construction and operation of the camp does not create additional demand for local community services and infrastructure.

Further, RWE's principal contractors will develop local procurement plans that will prioritise source materials for the Project locally. These plans will carefully consider the capacity and capability of local suppliers to minimise disruptions to existing supply chains. To inform the plan, RWE will undertake a study to quantify the availability of materials required for the Project and in consultation with Council and other key stakeholders to determine the potential impact on Council services and the community. The objective of the study is to ensure that the Project does not result in a significant impact on infrastructure, services and availability of materials for the local community.

RWE has commenced negotiations with BSC to develop an MOU and infrastructure agreement for the Project, which will address potential impacts on Council-owned infrastructure. RWE will also consult with other infrastructure providers regarding the Project's needs, as relevant.

Conclusion

RWE's workforce accommodation strategy, proposed management measures and commitments to the community:

- ensure that using the on-site camp does not result in adverse impacts on surrounding communities and townships, such as overburdening services and community facilities (PO16)
- ensure that using off-site accommodation (short-term accommodation) does not result in adverse impacts on surrounding communities and townships, such as overburdening services, housing supply and community facilities (PO17).

RWE's approach to delivering the Project ensures that the Project's potential impacts on infrastructure and services including social infrastructure, communications networks and essential infrastructure are identified, and measures to manage, mitigate and remediate any impacts are undertaken:

- Prior to commencement of any development, or
- Prior to additional demand being placed on infrastructure and services.

1. Introduction

1.1 Background

Theodore Energy Development Pty Ltd (TED), a wholly owned subsidiary of RWE Renewables Europe & Australia (RWE) proposes to develop and construct the Theodore Wind Farm in Central Queensland about 22 km east of Theodore, a rural town on the Dawson River. The Project is approximately 46,830 ha in size, consisting of nine lots on three private properties. The total development footprint has a maximum area of approximately 1,900 ha, which is about 4% of the Project area.

In September 2024, RWE submitted the development application for the Theodore Wind Farm to the State Assessment and Referral Agency (SARA). The Deputy Premier and Minister for Planning issued a direction notice on 16 January 2025 to pause the assessment of the application. Since that time, State Code 23 has been updated and now includes further requirements relating to workforce accommodation impacts and infrastructure.

1.2 Purpose and scope of the report

The purpose of this report is to demonstrate that RWE has met the requirements of the updated State Code 23 (v3.2), specifically Performance Outcome (PO) 16, 17, and 23.

While the POs are particularly concerned with potential impacts during the construction phase of the Project, this assessment has also considered the potential impacts during the operational phase.

In accordance with the Planning guideline for State code 23: Wind farm development, all wind farm applications need to be accompanied by a Workforce Accommodation and Infrastructure Report.

This report presents a summary of preferred workforce accommodation options based on the existing report submitted to SARA, and an analysis of infrastructure and service demands generated through the construction phase of the Project.

1.3 Structure of the report

This report outlines the following:

- Section **2** – Methodology
- Section **3** – Project description
- Section **4** – Regulatory framework
- Section **5** – Social baseline
- Section **6** – Stakeholder engagement
- Section **7** – Impact assessment and mitigation
- Section **9** – Conclusion
- Section **10** – References.

This report addresses the relevant information outlined in the State Code 23 Planning Guideline that is required to demonstrate compliance with PO16, PO17 and PO23. Table 1.1 outlines the location within the report where each item is addressed.

Table 1.1: PO16, PO17 and PO23 information requirements cross-references

Report section	Relevant aspects of State Code 23 POs	
	PO16 and PO17	**PO23**
Section **2** – Methodology	• Methodology and workforce accommodation options considered	-
Section **3** – Project description	• Expected construction period for the wind farm • Expected number and profile of workforce for construction and operational phases • Details of proposed workforce accommodation strategy	Infrastructure, materials and services required during construction
Section **5** – Social baseline	-	Identify existing capacity of essential infrastructure, social infrastructure, materials and services
Section **6** – Stakeholder engagement	• Details of consultation and/or agreements with local government regarding workforce accommodation strategy	• Provide details of any agreements and/or engagement with infrastructure providers, service providers and local government
Section **7** – Impact assessment and mitigation	• Assessment of positive and negative implications of using and/or supplementing accommodation options in existing townships/communities • Demonstrate how the proposed workforce strategy complies with PO16 and/or PO17.	• Determine where proposed construction workforce would adversely impact on social infrastructure and services • Recommend measures and strategies to respond to identified impacts on social infrastructure and services.

2. Methodology

This report builds on the Accommodation Options Report (2024a) and Socio-Economic Impact Analysis (2024b) prepared for the Project's development application under the *Planning Act 2016*.

The methodology for preparing this report involved the following steps:

2.1 Workforce accommodation strategy assessment

The assessment of potential social impacts of the workforce accommodation strategy involved the following steps:

1. reviewed and revised the existing Construction Workforce Accommodation Options Report
2. detailed the proposed workforce accommodation strategy, including proposed on-site and/or off-site accommodation
3. detailed consultation and/or agreements with Banana Shire Council regarding the proposed strategy
4. workforce accommodation options considered
5. assessment of positive and negative implications of using and/or supplementing accommodation options in existing townships/communities
6. analysis of local and regional labour markets and an assessment of opportunities for local workers
7. explore the implications of all, or part, of the workers accommodation being in exiting townships and addressed:
    a. the availability of existing accommodation options
    b. implications of commuting on local roads and implications of commuting distances and times from a workplace health and safety perspective.

2.2 Infrastructure assessment

The assessment of potential social impacts of the Project's construction on essential and social infrastructure involved the following steps:

1. identified essential and social infrastructure required to be utilised
2. identified availability and capacity of materials and services required during construction and where mitigation and remediation measures are required
3. identified social infrastructure and services likely to be required to support the construction workforce
4. documented the existing capacity of relevant social infrastructure and services in potentially affected towns and nearby communities
5. determined areas where the proposed construction workforce would adversely impact on existing social infrastructure and services
6. recommend measures and remediation strategies to respond to identified impacts on social infrastructure and services to achieve compliance with PO23
7. provide details of any agreements and/or engagement with any infrastructure providers, service providers and local governments that are relevant to demonstrating compliance with PO23.

In addition, the Workforce Accommodation and Infrastructure Report has drawn on guidance set out in the Queensland Government 'Social Impact Assessment Guideline' (March 2018) and 'Supplementary material for assessing and managing the social impacts of projects under the Coordinator-General's Social Impact Assessment Guideline' (28 November 2023).

3. Project description

The Theodore Wind Farm site is located in Central Queensland about 22 km east of Theodore and 50 km south-west of Biloela and 150 km south-west of Gladstone in the Banana Shire Council (BSC) local government area (LGA), as shown in Figure 3.1.

The Project Area is comprised of nine lots on three properties, covering approximately 46,830 ha. RWE has signed agreements with all the Project landowners. Cattle grazing is the dominant land use in the Project Area, with largely cleared areas associated with lower slopes dominating the landscape.

The road network near the site incorporates various local and state sealed and unsealed roads including Defence Road, Crowsdale-Camboon Road, and the Leichardt Highway. Access points will be created to facilitate entry into the site for construction and operation purposes and will stem from public roads. Additional infrastructure on the site and in the surrounding regions includes farm residences and agricultural infrastructure, dirt tracks, fencing, outbuildings, dams, private roads and sheds.

The Project lies adjacent to and within the locality (10 km) of several state forests including Belmont State Forest to the east, Montour State Forest to the north and Trevethan State Forest to the south.

Key Project details include:

- **Wind Turbines –** up to 170 Wind Turbine Generators (WTGs) with a tip height of up to 270 m and a rotor diameter of up to 175 m.
- **Wind Monitoring –** temporary or permanent wind monitoring towers to be determined with Light Detection and Ranging (LiDARs) on site and met masts installed.
- **Ancillary Infrastructure** – including, but not limited to, access tracks, substations, overhead and underground electrical cabling, hardstands, and an operation and maintenance compound.
- **Battery Storage –** to co-locate with on-site substations.

The Project will have an operational lifespan of about 35 years. Construction is anticipated to commence in 2026 with operation commencing in 2027.



- Cities and Towns
- Project Area
- Primary Area of Influence
- Secondary Area of Influence
- Local Government Area

THEODORE WIND FARM
Project Area of Influence

Figure 2.1

N

0 km 50

GDA2020 MGA Zone 56

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REVIEWED: SS | **DRAWN:** JT | **SCALE (A3):** 1:1,500,000 | **DATE:** 25/03/2025 | **DWG No:** RWE-003-001[A]

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Data Source:Earthstar Geographics, © State of Queensland (Department of Resources) 2023; Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community, Esri, USGS

3.1 Workforce profile

3.1.1 Construction

Construction is anticipated to commence in 2026 and take approximately 18 months to complete. It will require between 300-500 workers. The construction workforce requires the following skills and expertise:

- project managers
- civil engineers
- electrical engineers
- mechanical engineers
- medium voltage and high voltage electricians
- linesmen
- construction workers
- heavy equipment operators
- technicians
- safety experts
- environmental experts
- logistics and supply chain managers
- surveyors
- quality control inspectors
- welders
- cranage
- local support staff.

The project is designed to create sustainable local employment opportunities while supporting the growth of Queensland's renewable energy workforce. We are committed to hiring locally, upskilling workers, and fostering diversity in alignment with the Australian Skills Guarantee (ASG) and broader workforce development initiatives.

RWE commits to encourage local employment through developing and implementing local procurement plans with a focus on:

- Supplier Development:
  - Training workshops to help local businesses in Central Queensland to meet industry standards and tender for future renewable energy projects.
- Regional Economic Development:
  - Prioritising procurement from regional businesses in Central Queensland, ensuring economic benefits flow to local communities.
  - Engaging with small-to-medium enterprises (SMEs) in Central Queensland to integrate them into the supply chain.
- Collaborative Industry Partnerships:
- RWE is an active member of the Clean Energy Council, Clean Energy Investor Group, Queensland Renewable Energy Council, and the German-Australian Chamber of Commerce. Our involvement in these associations is driven by a desire to build strong networks across the entire supply chain and to collaborate with a broad range of organisations in advancing local workforce development.

3.1.2 Operation

Operation is anticipated to commence in 2027 and last about 35 years. It will require between 15-50 permanent workers.

The wind farm will require regular maintenance throughout its operational life. This will include, but is not limited to, the following ongoing tasks:

- inspecting and repairing blades
- monitoring electrical systems
- ensuring proper lubrication of components
- inspecting tower structure for wear or corrosion
- managing the braking system.

The operational workforce will also be responsible for ongoing monitoring of, amongst other things, the overall safety of the site, regular data analysis and software updates for efficient operation.

3.2 Workforce accommodation strategy

3.2.1 Construction

RWE proposes to use an on-site workforce accommodation facility (camp) and local short-term accommodation for the construction workforce. RWE engaged with the community and BSC regarding construction workforce accommodation, and the preferred solution is an on-site camp to minimise impact on the community and local infrastructure. BSC has provided a letter of support for the Project (Appendix A) and RWE is currently negotiating a memorandum of understanding (MOU) with BSC for the Project that covers workforce accommodation.

The on-site camp will be temporary for construction only and will have around 400 beds. The camp will be designed to be largely self-sufficient incorporating its own:

- Water supply
- Wastewater treatment
- Electricity
- Communications including Wi-Fi access
- Catering services
- Recreational facilities
- Health and safety provisions including medical services
- Transport shuttle services.

Short-term accommodation, such as hotels, motels, and other existing camps, located within a safe travel distance to the Project Area (i.e., less than an hour drive) will be used to accommodate a small proportion of the construction workforce. The intent is that visiting RWE employees, contractors not associated with the main construction workforce, and workforce overflow during peak construction periods would stay at local short-term accommodation. RWE is in discussions with the owners of the Banana Accommodation Village about using their facility to accommodate workers during construction.

3.2.2 Operation

It is expected that a proportion of the operational workforce will reside locally. RWE strongly encourages locally based workforce during operational phase. It is acknowledged some operational workers may be employed on a fly-in, fly-out (FIFO) or drive-in, drive-out (DIDO) arrangement. FIFO/DIDO workers are likely to be employed to undertake maintenance, which is typically short-term. FIFO/DIDO workers will stay at short-term accommodation at towns within a safe driving distance to Project Area.

RWE is exploring housing options in townships within an hour's drive to the Project Area to accommodate the operation workforce.

RWE has committed to working with BSC to assess housing needs in Theodore or other local towns for the operational phase. RWE is currently negotiating an MOU with BSC that will address several matters including housing.

3.3 Infrastructure requirements

RWE is developing local procurement plans that will prioritise sourcing materials and services locally. These plans will carefully consider the capacity and capability of local suppliers to minimise disruptions to existing supply chains and other users of materials.

The Project needs to use the following infrastructure, services and materials for construction:

- local roads

- potable and non-potable water
- waste management including sewage treatment
- base materials for constructing access tracks, turbine foundations, etc
- communications – investigating opportunities
- electricity.

4. Regulatory Framework

4.1 Planning Act 2016

On 3 February 2025, the State Government amended the Planning Regulation 2017 requiring all wind farm development applications submitted against State Code 23 to be impact assessable. State Code 23 was also amended with additional performance outcomes to be addressed relating to social impact assessment, community and Local Government consultation, impacts to community infrastructure, impacts to agricultural land and decommissioning as follows:

- new PO17 requires applicants to demonstrate how they will manage off-site workforce accommodation impacts to surrounding communities and townships (this is in addition to PO16 which requires assessment of an on-site workforce accommodation). A Workforce Accommodation and Infrastructure Report is required regardless of the proposed workforce accommodation solution (off or on site).
- new PO23 requires applicants to demonstrate the proposed development can manage, mitigate and remediate impacts on infrastructure and services, including social infrastructure, communications networks and essential infrastructure. The response to PO23 would be captured in the Workforce Accommodation and Infrastructure Report.
- new PO26 requires applicants to demonstrate that the proposal avoids adverse impacts on communities. A Community Engagement Report is required to address the requirements of PO26.

The DA for the Project was properly made (subject to SARA confirmation) in September 2024. State Code 23 (v3.1) applied to the properly made application. The Deputy Premier and Minister for Planning issued a direction notice on 16 January 2025 to pause the assessment of the application. State Code 23 was shortly thereafter updated.

This Workforce Accommodation and Infrastructure Report has been prepared to address PO16, PO17 and PO23 of the new State Code 23 (v3.2).

On 1 May 2025, the Queensland Government announced additional reforms to the Planning Act through the introduction of the Planning (Social Impact and Community Benefit) and Other Legislation Amendment Bill 2025. From June 2025, all wind farm development applications must include a social impact assessment prepared in line with the draft Social Impact Assessment Guideline (May 2025) and a community benefit agreement endorsed by the relevant local government.

4.2 Banana Shire Planning Scheme 2021

The Banana Shire Planning Scheme 2021 (the 'Planning Scheme') establishes the land use and development priorities for the Banana Shire Local Government Area (LGA) for the period of 2021 to 2026. The Planning Scheme has identified the following goals to ensure that development within the region is appropriate:

- a fair, orderly, and sustainable pattern of development
- a strong sense of community identity
- a viable, complex, and diverse economy
- the enhancement of infrastructure to meet the needs of the community
- the preservation of economic and environmental values in rural areas
- the protection of the natural environment, and the mitigation of both natural and human-made hazards.

The Banana Shire Council ('Council') has made commitments to meet the above goals through the development of strategic direction plans, as well as the creation of objectives and strategies which identify the key steps and resources required to achieve the vision.

Consideration of the Planning Scheme requirements will be given through the assessment process for the Project and addressed in the DA.

While Council is not the Assessment Manager for the Project, they have an important role to play for the Project for the following reasons:

- supports the economic, social and environmental wellbeing of its community
- remains a key stakeholder in RWE's Community and Stakeholder Engagement Plan (CSEP)
- will be consulted as part of the DA process directly by Department of State Development, Infrastructure, Local Government and Planning (DSDILGP)
- is the Assessment Manager for related approval requirements including the met mast, and construction related approvals (e.g. civil and road works, temporary on-site accommodation facilities, temporary concrete batching, operational works, etc.).

Under the Planning Scheme, on-site workforce accommodation for a renewable energy project is most commensurate with the 'Rural Workers' Accommodation' use, which is defined as:

The use of premises as accommodation, whether or not self-contained, for employees of a rural use, if:

(a) the premises, and the premises where the rural use is carried out, are owned by the same person, and

(b) the employees are not non-resident workers

Accordingly, the future development of on-site camp will need to consider the relevant provisions of the Planning Scheme, including the Development Design Code (Part 6 of the Planning Scheme).

4.3 Social Impact Assessment Guideline

The updated State Code 23 (v3.2) states the preparation of the Workforce Accommodation and Infrastructure Report should draw on the Queensland Government's Social Impact Assessment Guideline (v2) (May 2025) (SIA Guideline) and the Supplementary material for assessing and managing the social impacts of projects under the Coordinator-General's Social Impact Assessment Guideline (Supplementary material).

The SIA Guideline and Supplementary material outline the details that must be included in an SIA including identification and assessment of potential impacts, as well as their management and monitoring.

The SIA is to address the following key matters:

- Community and stakeholder engagement
- Workforce management
- Housing and accommodation
- Local business and industry procurement
- Health and community well-being.

The Supplementary material provides addition guidance and general requirements for the SIA process including objectives, principles, who to engage and how to engage, and how to consider each matter regarding each phase of the SIA process.

This Workforce Accommodation and Infrastructure Report draws on the SIA Guideline and Supplementary material by addressing each of the key matters in all phases of the SIA process.

5. Social baseline

The Project area of influence (AOI) (Figure 3.1) comprises a Primary AOI and Secondary AOI. The AOIs are comprised of the following:

- Primary AOI:
  - ABS SA1 No. 30804152801
  - ABS SA1 No. 31902150815
  - Urban Centres and Localities (UCL) of Theodore, Banana, Moura, and Biloela
- Secondary AOI:
  - Banana Shire LGA
  - Gladstone Region LGA.

State level data for Queensland and national data for Australia is used in this baseline to provide comparative socio-economic context.

5.1 Project site context

The proposed Theodore Wind Farm site is in Central Queensland, about 22 km east of Theodore and 40 km south-west of Biloela (Figure 3.1). RWE has agreements in place with all the project landowners.

The site is used for cattle grazing. Due to the land use much of the site has been cleared of native woodland and forest vegetation, with scattered vegetation in some areas.

The road network near the site incorporates a range of local and state sealed and unsealed roads including Defence Road, Crowsdale-Camboon Road, and the Leichardt Highway. Additional infrastructure on the site and in the surrounding regions includes farm residences and agricultural infrastructure, unsealed tracks, fencing, outbuildings, dams, private roads and sheds.

The Social and Economic Impact Assessment, which was submitted as part of the development application, identified a Primary and Secondary area of influence (AoI) (Figure 3.1). The Primary AoI consists of the Project Site and an area 5 km from the site boundary, including the Urban Centres and Localities (UCL) of Theodore, Banana, Moura, and Biloela (Figure 3.1). The Secondary AoI consists of the Local Government Areas of the Banana Shire LGA and Gladstone Region LGA (Figure 3.1). For context, the surrounding local government areas of Rockhampton, Livingstone, Isaac, Central Highlands, Woorabinda Aboriginal Shire, Bundaberg, North Burnet, and Western Downs are included in Figure 3.1.

Major towns in the area are:

- Theodore (about 22 kilometres to the west of the site)
- Cracow (about 35 kilometres to the south)
- Banana (about 60 kilometres to the north-west)
- Moura (about 60 kilometres to the north-west)
- Biloela (about 60 kilometres to the north-east)
- Monto (about 75 kilometres to the east)
- Gladstone (about 150 kilometres to the north-east)
- Rockhampton (about 150 kilometres to the north).

No non-host dwellings were identified 3.09 km of the nearest wind turbine generators (WTG) associated with the Project. Eleven (11) non-host dwellings have been identified within 3.09 km to 6.18 km of the proposed WTGs, and six (6) non-associated dwellings have been identified within 6.18 km and 10 km.

5.2 Theodore community

In 2021, Theodore had a population of 451 people (Australian Bureau of Statistics, 2021). Just above 15 per cent of Theodore's population identified as Aboriginal or Torres Strait Islander Peoples.

Theodore has a strong sense of community, evidenced by the high number of community-operated services and facilities. For example, until recently the Theodore Hotel was the only pub in Queensland owned by an entire community (Banana Shire Council 2023). While the town's economy is closely linked to coal mining, Theodore does not identify as a mining town, unlike nearby Moura and Biloela. Beef cattle farming, log sawmilling, cotton and grain growing are other key industries for the town.

5.3 Banana Shire

Banana Shire is in Central Queensland, 120 km west and 200 km south-west of the cities of Gladstone and Rockhampton and has a population of 14,513 (ABS 2021). The area has extensive natural resources, with several major coal deposits (including in the Theodore area). Two gas transmission pipelines run through the shire from the Surat and Bowen Basins to Gladstone.

Coal mining is one of the shire's major industries, as are power generation and farming enterprises including beef production and cropping (lucerne and cotton).

Biloela is the shire's largest town, with a population of 5,371. It is the main residential base for workers from the Callide Coal Mine and Callide power station. The Callide power station produces about 20 per cent of Queensland's electricity. Only 27 km^2 of the shire's 28,577 km^2 are urbanised, creating the need for communications and engagement strategies that could target existing hubs, such as major employers, to access the community.

Data from the 2021 Census shows an approximate 50/50 split of males and females in the Banana Shire, with a median age of 39. These statistics are typical for a rural area.

Short-term accommodation within a safe travel distance to Project Area is mostly used by agricultural/energy sector workers rather than tourists. Most tourists in the region use caravans. The TWF construction workforce use of short-term accommodation in proximity to Project Area therefore will not negatively impact tourists accessing the region.

5.4 First Nations People and Traditional Owners

The traditional owners of the land, waterways, and skies within the region are the Wulli Wulli people.

Other First Nations people who are not Traditional Owners likely reside in the local community, however at this stage have not made themselves known to RWE. RWE will continue to engage directly with the Wulli Wulli Nation Aboriginal Corporation (WWNAC) and will be guided by them regarding who their appropriate community representatives are. They will also remain aware and open to engagement with other non-Wulli Wulli First Nations people who may want to discuss matters of importance to them about the project.

The WWNAC was founded in 2015 as the Registered Native Title Body Corporate for the Wulli Wulli people. The Corporation is responsible for looking after the native title rights and interests of the Wulli Wulli people, as recognised by the Federal Court of Australia and is a key stakeholder in this project.

The judgment that recognised the Wulli Wulli people's native title rights and interests referenced historical, linguistic, anthropological and archaeological evidence, noting a commonality throughout the evidence in respect of matters including, respect for elders and old people, the importance of family, bush tucker and bush medicine, hunting and gathering, spirits and totems, relationships within the family and relationship of the Wulli Wulli people with their Country (AIATSIS, 2015).

The Theodore region is of particular interest to the Wulli Wulli people, particularly the Project site, as it is located partially on Camboon Station. Camboon Station is recognised as a place that is "*located in the heart of this country*" and was a place "*of gathering – where traditional law and customs were learned – and where many Wulli Wulli people were also employed*" (State Library Queensland, 2021).

5.5 Population profile

A snapshot of the population profile and dwelling and household composition for the area of influence compared to Queensland and Australia is provided in Table 5.1 and Table 5.7. The information presented is based on the ABS 2021 Census data.

The median age across the area of influence ranges from 33 years (Moura) to 48 years (SA1 30804152801 – incorporated Cracow and the Project Area) at an average of 39 years, comparable to Queensland and Australia (Table 5.1). The Indigenous population ranges across the Primary AOI from 2.2% (SA1 31902150815) to 15.1% (Theodore Urban Centre) at an average of 6.2%, which is greater than Queensland (4.6%) and Australia (3.2%).

Table 5.1: Population profile

Location	Population	Median age	Indigenous Pop. (%)	Males (%)	Female (%)
SA1 30804152801	192	48	2.6	57.0	43.0
SA1 31902150815	183	39	2.2	53.40	46.6
Theodore urban centre	451	38	15.1	46.6	53.4
Moura urban centre	1,843	33	8.0	53.7	46.3
Biloela urban centre	5,667	36	4.8	50.1	49.9
Banana Shire LGA	14,514	38	4.6	51.4	48.6
Gladstone Region LGA	63,515	38	6.2	50.7	49.3
Queensland	5,156,138	38	4.6	49.3	50.7
Australia	25,422,788	38	3.2	49.3	50.7

5.5.1 Population change

From 2013 to 2023, Banana LGA saw a slight population decrease of 29 people (-0.2%). Gladstone Regional LGA experienced a population increase of 4,677 people (7.0%). See Table 5.2 for details of population change.

Table 5.2: Estimated resident population, 2013 to 2023

Location	2013	2018	2023	Change	%
Banana LGA	14,948	14,525	14,919	-29	-0.2
Gladstone LGA	62,158	63,077	66,835	4,677	7.0
Queensland	4,652,824	5,006,623	5,460,420	807,596	14.8

5.5.2 Projected population

From 2026 to 2046, Banana LGA's population is projected to decrease by 380 people (-2.7%), while Gladstone LGA's population is expected to increase by 11,049 people (14.1%). See Table 5.3 for details of projected population.

Table 5.3: Population projection, 2026-2046

LGA	2026	2031	2036	2041	2046	Change	%
Banana	14,530	14,416	14,331	14,249	14,150	-380	-2.7
Gladstone	67,236	70,151	73,021	75,753	78,285	11,049	14.1

5.6 Socio-economic profile

Table 5.4 summarises the employment rates across the Banana Shire and Gladstone Region LGAs and compares these to the Queensland and Australian employment rates. The 2021 Census data shows, 61.6% of Queensland's population is engaged in the labour force, with 55.9% working full-time. In the Banana Shire and Gladstone Region LGAs, this rate was higher at 65.4% and 58.1% of people working full-time, respectively. The highest percentage of unemployed persons was in the Gladstone Region LGA which recorded 7.4% of people unemployed, and the lowest being in the Banana Shire LGA which recorded 4.0% of people unemployed. The percentage of people 'away from work' has increased across the board between 2016 and 2021 (ERM 2024b).

Table 5.4: Employment rates

Employment status	Census year	Banana Shire LGA	Gladstone Regional LGA	Queensland	Australia
Full-time work	2021	65.4%	58.1%	55.8%	55.9%
	2016	66.0%	58.3%	57.7%	57.7%
Part time work	2021	24.2%	28.0%	30.5%	31.2%
	2016	23.8%	25.5%	29.9%	30.4%
Away from work	2021	7.7%	6.5%	8.3%	7.8%
	2016	6.2%	5.1%	4.8%	5.0%
Unemployed	2021	2.8%	7.4%	5.4%	5.1%
	2016	4.0%	11.1%	7.6%	6.9%

Adapted from ERM 2024b

The 2021 Census data show 61.6% of Queensland's population is engaged in the labour force, with 55.9% working full-time. In the Banana Shire and Gladstone Region LGAs, this rate was higher at 65.4% and 58.1% of people working full-time, respectively. The highest percentage of unemployed persons was in the Gladstone Region LGA which recorded 7.4% of people unemployed, and the lowest being in the Banana Shire LGA which recorded 4.0% of people unemployed. However, in the September quarter 2024, the unemployment rate in Banana Shire (2.9%) and Gladstone Region (5.4%). With a low unemployment rate in Banana Shire LGA, this may increase the difficulty of employing local. LGAs declined (Jobs and Skills Australia, 2025). The percentage of people 'away from work' has increased across the board between 2016 and 2021 (Australian Bureau of Statistics, 2024a; Australian Bureau of Statistics, 2024b).

Table 5.5 summarises the most common employment types in Banana Shire and Gladstone Region LGAs. There is a higher percentage of technicians and trades workers, labourers and machinery operators/drivers in the Banana Shire and Gladstone Region LGAs compared to Queensland. This data shows that the population around the Project Area has a range of necessary skills that can be drawn upon for the workforce and construction of the Project (Australian Bureau of Statistics, 2024a; Australian Bureau of Statistics, 2024b).

Table 5.5: Occupation of employment

Occupation	Banana Shire LGA	Gladstone Region LGA	Queensland	Australia
Managers	19.5%	9.3%	12.5%	13.7%
Technicians and trades workers	15.5%	20.6%	13.7%	12.9%
Machinery operator or driver	14.6%	12.2%	6.8%	6.3%
Labourers	14.3%	12.4%	10.1%	9.0%
Professionals	10.6%	14.4%	21.4%	24.0%

Occupation	Banana Shire LGA	Gladstone Region LGA	Queensland	Australia
Clerical and administrative worker	9.3%	10.2%	12.7%	12.7%
Community and Personal Service Workers	7.6%	10.8%	12.3%	11.5%
Sales worker	6.2%	8.0%	8.7%	8.2%

The top industry in the Banana Shire LGA is Beef Cattle Farming (Specialised) (12.7%) and in Gladstone Region LGA is Aluminium Smelting (5.7%) (Table 5.6). This contrasts with the top industry of employment in Queensland more broadly, being Primary Education (2.5%) (Australian Bureau of Statistics, 2024a; Australian Bureau of Statistics, 2024b). The type of industries prevalent in both the Banana Shire and Gladstone Region LGAs appear to be beneficial to RWE given the various skills available within a relatively short geographic distance that could be of use in the construction of the Project. For instance, 2.9% of those employed in the Banana Shire LGA are already involved in Fossil Fuel Electricity Generation and therefore may have potentially transferrable skillsets. Further upskilling of the local workforce may be required however, if the Project is to engage a local workforce, this may deliver skills-based benefits to the local area (Australian Bureau of Statistics, 2024a; Australian Bureau of Statistics, 2024b).

Table 5.6: Industry of employment

Industry	Banana Shire LGA	Gladstone Region LGA	Queensland	Australia
Beef Cattle Farming	12.7%	-	0.7%	0.4%
Coal Mining	12.2%	-	1.1%	0.4%
Meat Processing	3.6%	-	0.5%	0.3%
Local Government Administration	3.5%	-	1.4%	1.3%
Fossil Fuel Electricity Generation	2.9%	-	0.1%	0.1%
Aluminium Smelting	-	5.7%	0.1%	0.0%
Alumina Production	-	3.6%	0.0%	0.0%
Other Heavy and Civil Engineering Construction	-	3.2%	0.6%	0.6%
Primary education	-	3.1%	2.5%	2.2%
Supermarket and Grocery Stores	-	2.8%	2.5%	2.5%

Socio-Economic Indexes for Areas (SEIFA) summarises the socio-economic characteristics of regions. It ranks areas, providing a mechanism to consider the differences in socio-economic factors between regions such as neighbouring suburbs or regional towns (Department of Infrastructure, Transport, Regional Development, Communications and the Arts, 2025).

In 2021, Banana LGA had more relative advantage at decile 7[1], compared to other areas in Queensland (Figure 5.1). Gladstone LGA and SA1 30804152801 are both in the middle range at decile 5. SA1 31902150815 and Biloela urban centre are slightly below the middle range at decile 4. Theodore and Moura urban centres have the lowest rankings at decile 2, indicating a lower position within Queensland (Figure 5.1).

[1] 1 – most disadvantaged, and 10 – most advantaged.

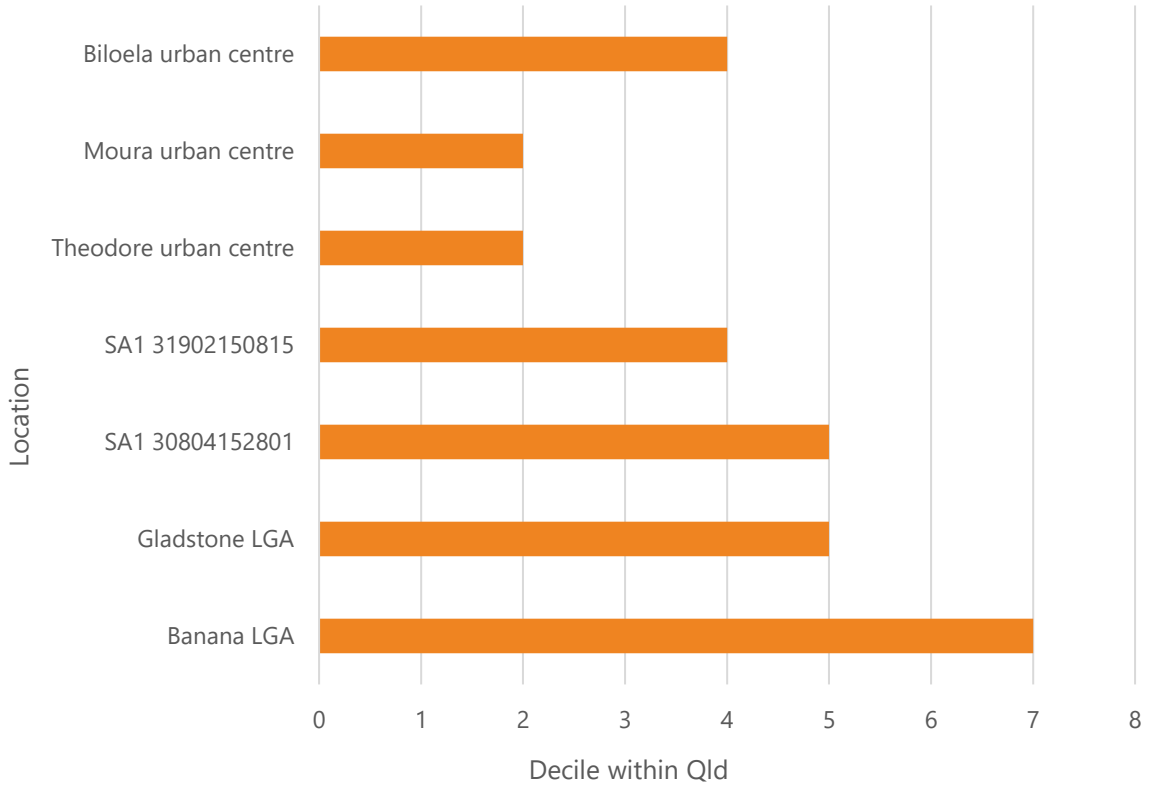


Figure 5.1: Index of Relative Socio-economic Advantage and Disadvantage, 2021

5.7 Housing and accommodation

This section describes housing and accommodation in the local and regional study areas.

5.7.1 Occupancy

While most dwellings across the Primary and Secondary AOIs are occupied, there are on average 17.5% dwellings unoccupied across the main urban centres of Theodore, Moura and Biloela. This is relative to the proportion of unoccupied dwellings in the Secondary AOI; however, it is almost double that of Queensland (9.3%) (Table 5.7). The greater proportion of unoccupied dwellings in the Primary and Secondary AOIs, suggest minimal need to incentivise new home construction, however anecdotally, most unoccupied homes are uninhabitable due to their current state or are undesirable due to their location. They are also disproportionately located in areas where there are limited jobs, for example in small towns such as Cracow (Banana Shire Council, 2024).

5.7.2 Housing tenure

The rates of dwelling ownership (outright or mortgaged) in the main urban centres of Theodore (52.6%), Moura (50.2%) and Biloela (57.5%) are lower compared to Queensland (63.5%) and Australia (66.0%) (Table 5.7). Whereas the rates of dwellings that are rented are higher in the main urban centres (>38.5%) compared to the Secondary AOI (minimum 30% in Banana Shire LGA) and Queensland (33.1%). Lower rates of home ownership and higher rates of renters compared to the Queensland average could indicate relative economic disadvantage, inaccessible housing or a transient population. Property prices could be unaffordable for locals or there could be a large proportion of people who live in the region short-term for work, e.g. seasonal farm labourers, FIFO workers, etc.

Notwithstanding the above, the rental vacancy rate in the Banana Shire is very tight and is likely to continue to be, considering the increased demand that will come from new projects. This suggests a need to either construct new build-to-rent homes or convert existing vacant homes to rental stock (Banana Shire Council, 2024).

5.7.3 Household composition

The rates of family households are generally lower in the Primary AOI (59.2%-69%) compared to the Secondary AOI (70.5%-71.3%) and rest of Queensland (71%) and Australia (70.5%) (Table 5.7). However, SA1 31902150815 is an anomaly in the Primary AOI. It has a significantly higher proportion of family households (87.7%) and a significantly lower proportion of single occupant households (12.3%). Apart from SA1 31902150815, the household composition of the Primary AOI reflects the urban areas where smaller housing units such as apartments, which are more suitable for single occupants, occur.

Table 5.7: Dwelling and household composition

Location	Dwelling Occupied (%)	Dwelling unoccupied (%)	Dwelling owned outright (%)	Dwelling mortgaged (%)	Dwelling Rented (%)	Household composition families (%)	Household composition singles (%)	Household composition group (%)
SA1 30804152801	73.6	25.0	52.8	11.3	24.5	59.2	40.8	0.0
SA1 31902150815	64.4	27.8	44.8	27.6	10.3	87.7	12.3	0.0
Theodore urban centre	80.8	15.8	28.9	23.7	41.2	59.6	38.8	1.6
Moura urban centre	78.6	21.9	25.1	25.1	45.0	65.8	31.3	2.9
Biloela urban centre	85.2	14.8	25.0	32.5	38.5	69.0	27.0	4.1
Banana Shire LGA	81.6	18.4	33.1	27.6	30.0	70.5	26.8	2.7
Gladstone Region LGA	85.0	15.0	27.3	36.5	33.4	71.3	25.6	3.1
Queensland	90.7	9.3	29.1	34.4	33.1	71.0	24.7	4.3
Australia	89.9	10.1	31.0	35.0	30.6	70.5	25.6	3.9

5.7.4 Vacant land

There are numerous parcels available for new housing development in the main centres and other settlements (Table 5.8). The Banana Shire Local Housing Action Plan identifies that there is significant demand for land in Biloela, Moura and Taroom, however housing development in the region has been slow in the region due to a lack of material and trades workers to build new homes (Banana Shire Council, 2024). BSC is focussed on attracting housing investment to deliver more social and affordable homes (Banana Shire Council, 2024).

Table 5.8: Vacant land

Location	Total Lots	Zoning	Number of lots	Ownership Details
Biloela	59	General Residential	59	10 owned by State Government
Moura	86	General Residential	86	44 owned by State Government
Taroom	33	General Residential	33	Not specified
Other	169	General Residential	30 in Theodore	11 owned by Council 59 owned by State Government
		Township	139 in smaller settlements	

5.7.5 Short-term accommodation

In September 2024, there were 30 commercially operated short-term accommodation providers in proximity to the Project Area.

The short-term accommodation providers, along with their locations and capacity are outlined in Table 5.9. These include workforce accommodation facilities, hotels and motels, Airbnb's, caravan parks and cabins.

The capacity of accommodation options may change overtime due to other large-scale projects in the region (including renewables and mining companies) competing for workforce accommodation.

Accommodating renewable energy workers in the region is a key focus in BSC's Local Housing Action Plan (BSC, 2024). BSC is advocating for State support to undertake a needs assessment and develop policy options for temporary worker's accommodation.

Table 5.9: Short-term accommodation in proximity to the project area

Location	Short-Term Accommodation Provider	Description / Approximate Capacity
Biloela (1 hour from Theodore)	Location: Discovery Workstay Biloela Accommodation Type: Workforce accommodation facility	Capacity: Unknown (approximately 215 rooms)
	Location: Biloela Apollo Motel Accommodation Type: Rooms, apartments and units	Capacity: Unknown
	Location: Biloela Hotel Accommodation Type: Hotel	Capacity: Unknown
	Location: Biloela Centre Motel Accommodation Type: Motel	Capacity: Unknown
	Location: Biloela Country Motel Accommodation Type: Motel rooms and cabins	Capacity: Unknown

Location	Short-Term Accommodation Provider	Description / Approximate Capacity
	Location: Biloela Palms Motor Inn Accommodation Type: Motel	Capacity: 25 ground floor rooms to accommodate overnight travellers or longer stays, as well as corporate and group bookings.
	Location: Biloela Accommodation Type: Two Airbnb's	Capacity: 2 and 4 people
	Location: Callide Motor Inn Accommodation Type: Hotel	Capacity: Accommodation includes 18 executive rooms
	Location: Hotel Settlers Accommodation Type: Hotel rooms, cabins	Capacity: Hotel features a wide range of rooms and cabins (number unknown)
	Location: Raintree Motel Biloela Accommodation Type: Motel	Capacity: 22 units
	Location: Biloela Silo Motor Inn Accommodation Type: Motel	Capacity: 25 motel rooms
	Location: Sun Valley Motel Accommodation Type: Motel	Capacity: 28 rooms
Banana (39 minutes from Theodore)	Location: Banana Hotel Motel Accommodation Type: Hotel	Capacity: 20 ensuite motel rooms
	Location: Banana Accommodation Village Accommodation Type: Workforce accommodation facility	Capacity: Unknown
Baralaba (1 hour 10 mins from Theodore)	Location: Baralaba Hotel Accommodation Type: Hotel	Capacity: Unknown
	Location: Myella Farm Stay Accommodation Type: Rural accommodation	Capacity: 17 double ensuite rooms
Jambin (1 hour 10 from Theodore)	Location: Jambin Hotel Accommodation Type: Hotel	Capacity: Unknown
Thangool (1 hour 15 mins from Theodore)	Location: On Kariboe Cabins Apartment Thangool Accommodation Type: Rural apartments	Capacity: Unknown
	Location: Hotel Thangool Accommodation Type: Hotel	Capacity: Unknown
Taroom (1 hour from Theodore)	Location: Taroom Caravan & Tourist Park Accommodation Type: Caravan Park	Capacity: Taroom Caravan Park offers several alternative accommodation types, including fully self-contained Cabins, Units and other accommodation to meet your specific requirements.

Location	Short-Term Accommodation Provider	Description / Approximate Capacity
	Location: Country Rest Cabins Accommodation Type: Cabins	Capacity: Single, twin and family cabins (unknown capacity)
	Location: Leichardt Hotel Motel Accommodation Type: Rural apartments/cabins	Capacity: 6 Standard rooms and 6 family rooms
	Location: Cattle Camp motel – Taroom Accommodation Type: Motel rooms and cabins	Capacity: Unknown (approximately 12 units)
Theodore	Location: Hotel Theodore Accommodation Type: Suites, hotel and motel rooms, cabins	Capacity: 8 self-contained cabins, 11 ensuite motel rooms, 8 single suites
Cracow (located 35 minutes from Theodore)	Location: Cracow Hotel Accommodation Type: Themed Hotel Rooms	Capacity: Unknown
	Location: Cracow Station Accommodation Type: Self-contained cabin at Cracow Station, a working cattle property, 10 minutes outside of Cracow	Capacity: One room
Moura (located 35 minutes from Theodore)	Location: Coal N Cattle Hotel Motel Accommodation Type: Motel rooms and cabins	Capacity: 60 rooms
	Location: Moura Meridian Motel Accommodation Type: Motel rooms	Capacity: 32 rooms
	Location: Moura Motel Accommodation Type: Motel rooms	Capacity: 22 deluxe rooms and 16 standard rooms
	Location: Moura Accommodation Village & Caravan Park Accommodation Type: Rooms and cabins	Capacity: Unknown

(ERM, 2024a)

5.8 Infrastructure

5.8.1 Essential infrastructure

5.8.1.1 Water supply

BSC operates 11 water supply schemes including Banana, Baralaba, Biloela, Callide Dam, Cracow (trickle feed system), Goovigen, Moura, Taroom, Thangool, Theodore and Wowan (BSC, 2025).

5.8.1.2 Waste services

There are 8 waste transfer stations and three landfills across the Banana Shire region.

Commercial (non-household) waste is charged as per Council's Waste Management Disposal Fees if it cannot be recycled. Recycling of commercial waste is free; however, load size limits may apply.

Commercial waste is only accepted for disposal at Trap Gully Landfill, 142 Forestry Road, Biloela, approximately one hour and 30 minutes from the Project area.

5.8.1.3 Sewage

BSC has four sewerage treatment plants – Biloela, Moura, Theodore and Taroom.

5.8.1.4 Communications

Mobile phone coverage (4G only) via the Telstra and Vodafone networks is available in Theodore but may not be available at the Project site.

5.8.1.5 Transport

The closest airport to the Project Area is Theodore Airport, located 7.6 km south of Theodore along Eidsvold-Theodore Road. The next closest airport is in Biloela (Thangool) which is located 11 km south from Biloela town centre on the A1 highway. Gladstone Airport (located approximately 211 km from the Project Area) also services the region with the most services non-stop to or from Brisbane Airport.

Roads proposed to be used to access the Project area are listed in Table 5.10.

Table 5.10: Potential project routes

Route 1	Route 2
Macfarlane Road (GRC)*	
Mark Fenton Drive (GRC)*	
Gladstone Port Access Road (181)	
Gladstone Mount Larcom Road (183)	
Bruce Highway 10E (Benaraby – Rockhampton)	Bruce Highway 10E (Benaraby – Rockhampton)
Capricorn Highway (Rockhampton – Duaringa)	Dawson Highway 46A (Gladstone – Biloela)
Leichardt Highway (26A) (Westwood – Taroom)	
Defence Road (BRC)*	

*Council roads

5.8.2 Social infrastructure and services

Key social infrastructure and services in the region relating to health, ambulance, fire and police services are listed in Table 5.11. The capacity of these services is typical for regional Queensland.

Community members in Theodore, Banana and Moura may need to travel to larger centres for access to higher-order medical services.

Table 5.11: Health and emergency services

Town	Health and ambulance	Fire	Police
Theodore	• Theodore Ambulance Station • Theodore Multipurpose Health Service (including the	• Theodore Fire Brigade	• Theodore Police Station

Town	Health and ambulance	Fire	Police
	University of Queensland Medical School) (24/7 including emergency, general medical and surgical facilities)		
Banana	• Banana District Community Health	• Banana Rural Fire Brigade	N/A
Moura	• Moura Ambulance Station • Moura Multipurpose Health Service (24/7 including emergency, general medical and surgical facilities)	• Moura Fire Brigade	• Moura Police Station
Biloela	• Biloela Hospital • Biloela Medical Centre • Queensland Ambulance Service – Biloela	• Biloela Fire Brigade • Prospect Creek Rural Fire Brigade Dakenba Rural Fire Brigade • Orange Creek Rural Fire Brigade • Valentine Plains Rural Fire Brigade	• Biloela Police Station
Taroom	• Taroom Hospital • Queensland Ambulance Service - Taroom	• Taroom Fire Brigade	• Taroom Police Station

6. Stakeholder engagement

6.1 Approach to stakeholder engagement

RWE's overarching approach to stakeholder engagement is focused on delivering best practice engagement founded on the principles of honesty, respect, adaptability, consistency and consideration, described in Figure 6.1.

Figure 6.1: RWE's guiding principles for stakeholder engagement

Honesty

- RWE builds relationships with local communities based on trust, respect, and inclusion, by acting with integrity and honesty, engaging in genuine dialogue and relevant communication with all parties and ensuring they provide information as soon as they can.

Respect

- RWE respect the communities and stakeholders where our projects are based and understand they are passionate about their homes, communities and areas where they live, work and socialise. RWE also bring empathy and understanding to engagement.

Adapability

- RWE's approach involves collaboration with communities and incorporates multiple methods of engagement that can adapt to stakeholders' particular needs. This fluid approach allows RWE to be inclusive by identifying and categorising stakeholders according to their requirements, which informs their approach to each engagement. RWE can then provide multiple channels of engagement to make it easy for them to obtain project information and be involved.

Consistency

- RWE's engagement is ongoing and focuses on consistently keeping our stakeholders informed and engaged through all stages of the project lifecycle.

Consideration

- Consultation with communities and key stakeholders is always used to shape projects where possible. Feedback is key to ensuring projects are developed with a solid knowledge of the area, its residents and social fabric. RWE also ensure the benefits generated from the development are spread fairly within the community, by identifying the needs of the community and addressing them.

RWE is guided by consultation with host communities and key stakeholders to shape their Projects. Feedback is key to ensuring Projects are developed with a solid knowledge of the area, its residents and social fabric. RWE also ensures the benefits generated from the Project are shared equitably within the community, by identifying the needs of the community and addressing them.

RWE's stakeholder engagement activities are informed by the following industry guidelines, engagement frameworks, and relevant contextual documents:

- RWE's Australian Community and Stakeholder Engagement Framework
- The International Association for Public Participation's (IAP2) public participation spectrum
- Clean Energy Council's Community Engagement Guidelines for the Australian Wind Industry
- Clean Energy Council's Guide to Benefit Sharing Options for Renewable Energy Projects.

- Australian Institute of Aboriginal and Torres Strait Islander Studies (AIATSIS) Guidance on Engaging with Traditional Owners
- Queensland Government Renewable Energy Zone Roadmap (Mach 2024)
- Queensland Local Energy Partnerships Plan (October 2023)
- Banana Shire Council Planning Scheme (2021).

6.2 Community and stakeholder engagement plans

RWE has a community and stakeholder engagement plan (CSEP) and a First Nations Engagement and Communications Plan (FNECP) for the Project, which are routinely updated to reflect changing circumstances, community feedback, and ongoing improvements in the community engagement approach.

The CSEP and FNECP guided engagement with the broader community and key stakeholders, and with First Nations stakeholders, respectively for the Project. They each include:

- an analysis of project stakeholders
- a description of engagement tools and methods to be used
- a high-level risk assessment
- communication protocols including recording engagement activities, managing complaints and reporting.

Relevant information from the CSEP and FNECP is presented below and supplemented with information about engagement activities undertaken, including the outcomes of engagement and how RWE has or proposes to address feedback received from stakeholders.

6.3 Project stakeholders

Project stakeholders were identified by considering the groups or individuals within the Project region that could be either directly or indirectly impacted by the Project. These stakeholders are listed in Table 6.1.

Table 6.1: Project stakeholders

Stakeholder group	Details
Landowners	Landowners hosting project infrastructure for the proposed Theodore Wind Farm.
Fenceline Neighbours	Fenceline neighbours are identified as neighbours that share a fence line or property boundary with the host landowner(s)/project site.
Near Neighbours	Neighbours with a dwelling within 10 kms of the proposed Theodore Wind Farm site boundary.
Traditional Owners and First Nations people	• Wulli Wulli People • Wulli Wulli Nation Aboriginal Corporation RNTBC • Wulli Wulli Ranger program • Wulli Wulli Elders Group
Opponents (no active opponents identified)	Individuals and organised groups actively opposed to the proposal in proximity to the proposed project area.
Wider Community	Residents of the local geographic area hosting the proposed project, as well as local interest groups not defined in any previous categories, including: • Residents outside of the boundary determined for neighbours • Aged care and healthcare organisations

Stakeholder group	Details
	• Business organisations, including but not limited to farmer associations, local progress associations, chambers of commerce or local business structures • Churches and faith-based organisations • Conservation and environmental organisations • Local climate action and sustainability groups • Not-for-profit organisations • Primary, secondary, or tertiary educational institutions • Recreational groups and clubs.
Local Government	Councillors and staff employed by the Banana Shire Council, including but not limited to: • Mayor Cr Neville Ferrier • Deputy Mayor Cr Terri Boyce • Cr Adam Burling • Cr Ashley Jensen • Cr Phillip Casey • Cr Kerrith Bailey • Cr Brooke Leo • CEO Tom Upton • Other executive staff • Gladstone Regional Council
Infrastructure owners / operators	• Australia Pacific LNG Pty Limited • Bureau of Meteorology • Geoscience Australia • Telstra • Optus
Aviation Industry	• Airservices Australia • Department of Defence • IDS Australia (Procedure designer for Theodore Airport instrument flight procedures) • Queensland Royal Flying Doctor Services
Industry Bodies	• Clean Energy Council (CEC) • Re-Alliance • Gladstone Ports Corporation • Stanwell Corporation • Barfield Road Producers Group
Government Agencies	• Federal Department of Climate Change, Energy, the Environment and Water (DCCEEW) • State Assessment and Referral Agency (SARA) • Queensland Department of Environment, Technology, Science and Innovation (DETSI) • Queensland Department of Resources • Queensland Department of Transport and Main Roads (TMR)

Stakeholder group	Details	
	• Australian Energy Infrastructure Commissioner	
Emergency services	• Queensland Fire Department (QFD) • Camboon Rural Fire Brigade • Moura Rural Fire Brigade • Rural Fire Service Gladstone • Queensland Ambulance Service • Queensland Police Services	
State and Federal Members of Parliament (MPs)	• Federal Member for Flynn Colin Boyce MP (LNP) • State Member for Callide Bryson Head MP (LNP)	
Media	Print and online media: • The Focus Magazine • The Gladstone Observer • The Courier Mail • CQ Today • Biloela Beacon	Broadcast media (radio and TV): • ABC 4CC • Hot FM • Triple M Central Queensland • Fresh FM • Win News • Channel 7 • Nine News

Adapted from RWE (2024).

6.4 Stakeholders and engagement activities

RWE proactively engaged with stakeholders on the Project. Engagement commenced in 2022, despite the Project first becoming public in August 2023. The next round of community drop-in sessions is scheduled for May, June and July 2025.

RWE's stakeholder engagement has been varied and multi-faceted, with multiple methods of engagement that were adapted to stakeholders' needs. For example, engagement activities have included working from local cafes and visiting community groups and organisations at their places of operation. RWE actively welcomes the community to get in touch with the Project team via the Project website, email, or free call line.

A summary of engagement activities undertaken with Banana Shire Council, WWNAC and the community is provided graphically below.

Banana Shire Council

2022 engagement commenced

5 briefings held with Council

Key matters discussed

- Project updates
- Community engagement
- Transport route options
- Workforce accommodation
- Technical assessments
- Local benefits and procurement
- Emergency management
- Fairness to host landholders

WWNAC

Early 2023 engagement commenced

7 meetings & workshops

2 site visits

Geotechnical inspections and reconnaissance **4 weeks**

Community

100+ attendees at various sessions

Community drop-in sessions **2 x 2-day**

0 Complaints received

4 Café sessions

'shopfronts' **8**

Average website visits per month **366**

Comprehensive booklets **2**

2 Project newsletters and other promotional flyers

2 Letterbox drops

RWE has also undertaken the following engagement activities for the Project:

- Approved $100,000 in community sponsorship funding
- Press release about RWE signing an MOU with Stanwell Corporation
- Met with Gladstone Regional Council local procurement team aligning programs
- Meetings with Powerlink to collaborate on the preferred transmission corridor
- Discussions with proponents of nearby projects to identify and minimise cumulative impacts.

Engagement with key stakeholders was also undertaken to inform technical assessments prepared for the Project's development application. These engagement activities included emails to and meetings with key stakeholders seeking feedback on the proposed Project design in relation to potential impacts on traffic and transport, aviation, and electromagnetic interference.

6.5 Outcomes of engagement

Table 6.2 includes a summary of the key themes raised in consultation. Feedback received from stakeholders has been considered in this assessment and informed the development of the workforce accommodation strategy.

The Community Engagement Report outlines the actions RWE has taken or will take to address key matters raised in stakeholder feedback on the Project. The Report includes a summary of key themes raised in consultation, an outline of documents evidencing the outcomes of engagement, and a matrix linking RWE's actions and plans to specific feedback received from stakeholders.

BSC has provided a letter of support for the Project (Appendix A) and RWE is currently negotiating an MOU with BSC that covers matters including workforce accommodation and infrastructure.

Table 6.2: Key consultation themes

Theme	Description
Workforce accommodation	Stakeholders expressed an interest in understanding the Project's workforce accommodation arrangements for construction and if there would be an impact on the local housing market. This is a particular topic of interest for the Theodore community due to the significant number of mining camps and FIFO workers in the area.
Grid connection	The community was generally not supportive of the proposed multiple grid route options and had expressed concerns about transmission lines crossing strategic cropping land. It is noted that Powerlink is responsible for the grid connection engagement with landowners and community as part of the Theodore Wind Farm Connection Project.[2]
Road network	Stakeholders expressed concerns about potential impacts on the road network and traffic safety during construction. The community also raised concerns about potential impacts on school bus routes.
Aerial operations	Graziers in the local area use helicopter mustering as part of their grazing operations. Some graziers queried if the Project would impact on their ability to muster using helicopters.
Noise	Stakeholders expressed concerns about potential noise impacts on nearby sensitive land uses, including residential dwellings.
Biodiversity	Stakeholders expressed concerns about the potential impacts of the Project on matters of state environmental significance and matters of national environmental significance.
Fire risk and mitigation	The local Rural Fire Services (RFS) Brigades indicated that they would like to see firebreaks incorporated into the Project design. Their preference is that the Project actively manages and mitigates bushfire risk.
Visual amenity	Stakeholders queried the potential impacts of the Project on the landscape.
Wind farm preference	Generally, the local community expressed a preference for wind farms over solar farms. In their experience, solar proponents have not properly engaged with or considered the community in project design or layout. The community also feels that solar farms take up high quality agricultural land (cropping) whereas wind farms can coexist with grazing.

[2] Powerlink (2025) Theodore Wind Farm Connection Project, Powerlink website, accessed 4 March 2025.

Theme	Description
Local employment and procurement	There is a lack of interest from locals in working on the wind farm, however there is interest from local businesses to provide services and supplies for construction and operation of workforce accommodation and wind farm development.

7. Impact assessment and mitigation

The Socio-Economic Impact Analysis Report (ERM, 2024b) provides an assessment of the potential positive and negative social impacts of the Project on the area of interest. The following sections draw out and expand on the assessment of potential social impacts associated with the workforce accommodation strategy and potential social impacts of the Project on essential and social infrastructure.

7.1 Workforce accommodation

The Accommodation Options Report (ERM, 2024a) provides a comprehensive assessment of the potential positive and negative social implications of accommodating the construction workforce in:

- An on-site camp
- Short-term accommodation
- Long-term accommodation.

The assessment informed the workforce accommodation strategy (Section 3.2) for the Project, which seeks to minimise potential social impacts and maximise potential social benefits during both construction and operation.

This section provides a summary of the potential positive and negative impacts associated with using on-site and off-site workforce accommodation as per the workforce accommodation strategy. It also outlines the proposed mitigation and enhancement measures for each impact.

The assessment is informed by stakeholder feedback. Key issues and proposed mitigations raised during engagement activities are considered in the assessment.

The potential impacts are organised under the key matters outlined in the SIA Guidelines (2018):

- Workforce management
- Housing and accommodation
- Local business and industry procurement
- Health and community wellbeing.

7.1.1 On-site workforce accommodation

The on-site camp will only be used during construction. Table 6.1 describes the potential social impacts and social benefits of using the on-site camp and outlines measures to mitigate impacts or enhance benefits

Table 7.1: Impact and mitigation – On-site workforce accommodation

Potential impact of using the on-site camp	Mitigation or enhancement measure
Workforce Management	
Construction and operation of the on-site camp will create direct and indirect employment opportunities for the local community.	• A Local Procurement Plan and Indigenous Procurement Plan are being developed and will be implemented for construction and operation. These plans will be developed in accordance with: – BSC Procurement Policy – Queensland Local Energy Partnerships Plan – Queensland Charter for Local Content. • Provide opportunities for local businesses to submit proposals and tenders and prioritise the use of goods and services that can be sourced locally and are competitive for price and quality. • Encourage subcontractors to employ local workers wherever possible and reasonable. • Develop processes that embed local business and industry procurement strategies into the Project's contracting model. • Engage with the local employment agencies to identify access pathways for local workers. Assess the candidate pool to determine suitable labour, trade, or other employment on the Project. • Set up a dedicated employment opportunity platform on the Project's website in consultation and coordination with the Engineering, Procurement, and Construction (EPC) contractor. • Identify positions where training would allow additional local workers to join the workforce and encourage local workers and businesses to undertake training to provide for specialist works. • Collaborate with local trade/training organisations (such as TAFE) to promote job opportunities with the Project, with enough time to give local community members with enough notice to receive training in Project related skill sets, if desired.
Locating most of the workforce away from nearby townships reduces potential conflicts between residents and disruption to community cohesion.	• The camp will be designed to be largely self-sufficient incorporating its own communications, catering services, recreational facilities, health and safety provisions, and transport shuttle services ensuring workers do not need to visit town for supplies, services or amenities.
Workers would be prohibited from going to town while on shift, limiting their access to activities, facilities and amenities that can support mental health, e.g. social events, gyms and swimming pools, cafes and pubs.	• The camp will be designed to be largely self-sufficient incorporating its own communications, catering services, recreational facilities, health and safety provisions ensuring workers have access to activities, facilities and amenities that can support mental health.

Potential impact of using the on-site camp	Mitigation or enhancement measure
Housing and Accommodation	
Housing availability and affordability will be unaffected by the construction workforce staying at the on-site camp.	• Staying at the on-site camp will be a condition of employment for construction workers. • Workers will be prohibited from renting accommodation in town during construction, unless they are looking to move to the town permanently.
Local Business and Industry Procurement	
Operation and management of the on-site camp will provide opportunities for contracting local businesses to provide goods and services.	• A Local Procurement Plan and Indigenous Procurement Plan are being developed and will be implemented for construction and operation. These plans will be developed in accordance with: – BSC Procurement Policy – Queensland Local Energy Partnerships Plan – Queensland Charter for Local Content. • Conduct market sounding to identify local suppliers. • Host information sessions with the community, local businesses, and prospective contractors/subcontractors about construction timing, workforce estimates, and accommodation needs. • Engage local media including radio, newspaper, and social media to advertise expressions of interest for employment or provision of services or materials. • Consult with BSC, GRC and chambers of commerce to provide their communities and members with relevant details such as Project construction timing, workforce estimates and accommodation requirements. • Provide opportunities for local businesses to submit proposals and tenders and prioritise the use of goods and services that can be sourced locally and are competitive for price and quality. • Encourage subcontractors to employ local workers wherever possible and reasonable – targets will be developed as part of the procurement plans. • Develop processes that embed local business and industry procurement strategies into the Project's contracting model.
Health and Community Wellbeing	
The camp could create additional demand for Council resources such as waste management facilities, potable	• Design on-site workforce accommodation facility in accordance with the Banana Shire Council Planning Scheme 2021 Development Design Code and have a Waste Management Plan in place.

Potential impact of using the on-site camp	Mitigation or enhancement measure
water supplies, etc. Demand negatively impacts the capacity and delivery of services for the community.	• The camp will be designed to be largely self-sufficient incorporating its own water supply, wastewater treatment, electricity, communications.
Workers based on-site are less likely to make use of local businesses in nearby townships, therefore reducing the potential for economic benefits to be realised.	• Operation of the camp will require local goods and services such as catering, laundry, landscaping, etc that will be procured from the local area, where possible. These will provide economic benefits to the local area without the potential negative impacts of an influx of workers staying in town. • While most of the workers will be located on-site, a small proportion (contractors, visiting RWE employees, overflow workers during peak construction periods) will use short-term accommodation in nearby townships. The workers staying off-site will economically benefit local accommodation providers and other businesses such as shops and cafes.
The Theodore Multipurpose Health Service has limited capacity to service demand from construction workers for health and medical services.	• The on-site camp will be self-sufficient with respect to health and emergency services, to minimise demand for local health and emergency services. For example, RWE is considering measures such as providing access to a medical professional and/or telehealth on-site
Increased vehicle movements travelling to and from the site at roster changeovers may increase the risk of traffic accidents, damage to roads, and traffic congestion.	• FIFO workers will be bussed to and from the site at the beginning and the end of their rosters, reducing vehicle movements at peak periods. • Avoiding heavy vehicle movements on school bus routes and during school bus times • DIDO workers will need to comply with the Code of Conduct (CoC) and safe driving standards and policies to manage potential traffic related impacts.

7.1.2 Off-site workforce accommodation

Off-site accommodation to be used during construction comprises short-term accommodation, such as hotels, motels, and other existing camps, located within a safe travel distance to the Project Area (i.e., less than an hour's drive). Only a small proportion of the construction workforce would use this accommodation. The intent is that visiting RWE employees, contractors not associated with the main construction workforce, and workforce overflow during peak construction periods would stay at local short-term accommodation.

During operation, a proportion of operational workers are expected to already reside in the local area. It is possible, that some operational workers may move to the local area to work on the Project. It is expected that they would live in permanent housing in Theodore or another nearby town.

Table 7.2: Impact and mitigation – Off-site workforce accommodation

Phase	Potential impact of using off-site accommodation	Mitigation or enhancement measure
Workforce Management		
Construction	Workers staying in town may display anti-social behaviour causing negative community interactions.	• All workers will be required complete onsite inductions and must comply with the Code of Conduct (CoC). The CoC will align with RWE's workforce policies including expectations for appropriate behaviour. • RWE's Complaints and Enquiries Handling Process will be available to the local community to lodge complaints about workforce behaviour.
Construction	The number of workers staying in town could dominate the local community, creating tensions in the community disrupting community cohesion.	• Only a relatively small number of workers would stay in town at any one time. Most of the construction workforce would stay at the on-site camp. • The number of workers staying in town would be limited by the capacity of accommodation available to cater for the Project. • Engage with BSC, the community and local businesses regarding construction timing, workforce estimates and accommodation requirements. • Workers will be required to comply with the CoC. The CoC will align with RWE's policies, and will include, amongst other aspects: - Principles of behaviour: Guideline for appropriate behaviour that apply to interactions of all workers whether at work or out of work. - Anti-harassment, bullying and discrimination: Sets out the provisions for appropriate conduct, and outlines potential consequences of breech to these provisions. - Occupational health and safety: Requires that all workers understand their obligations to comply with the relevant RWE occupational health and safety procedures and legislative requirements.
Construction	Workers based off-site may find it difficult to gain access to TWF.	• RWE will implement a shuttle bus services where practical to transport workers between town and the Project site. This will also reduce the number of vehicles on the road, reducing the risk of traffic impacts.
Housing and Accommodation		

Phase	Potential impact of using off-site accommodation	Mitigation or enhancement measure
Construction	Use of short-term accommodation may reduce the amount available for tourists and visitors, which could lead to loss of revenue for tourism operators. This may be exacerbated by other proposed developments in the region with anticipated overlapping construction timeframes.	• Regularly consult with local accommodation providers to manage occupancy to maximise use of local accommodation, without preventing its use for major event and holiday purposes. • A small proportion of the construction workforce will use short-term accommodation. Only visiting RWE employees, contractors not associated with the main construction workforce, and workforce overflow during peak construction periods would stay at local short-term accommodation. • RWE will prepare and implement a Workforce Housing and Accommodation Plan which will outline: - objectives and key performance indicators - measures to enhance potential benefits for project workers and the community and to mitigate potential negative social impacts - policies regarding housing and accommodation support to be provided to project workers and their families who wish to live locally. • Explore available accommodation options around the Theodore, Banana, Moura, and Biloela to be able to accommodate workers in other towns during peak visitor periods. • Contact the local accommodation operators and chambers of commerce to provide Project information such as construction timing, workforce estimates and accommodation requirements. • Identify any overlaps with peak demand periods for accommodation and engage with local accommodation operators to develop measures to manage potential cumulative impacts. • Review workforce predictions every six months during construction to ensure that accommodation requirements can be met. • Engage with other Project developers to mitigate potential cumulative impacts which may put additional pressure on the area.
Operation	Use of rental properties by full-time, locally based management staff may reduce the amount of rental accommodation available for locals.	• Maintain a register of local property owners who have expressed an interest in offering dwellings for rent (if this occurs in the future). Provide this register to contractors and subcontractors.

Phase	Potential impact of using off-site accommodation	Mitigation or enhancement measure
	This could negatively impact housing availability and affordability for residents and those seeking to relocate to the region for non-Project related reasons. This may disproportionately affect financially vulnerable groups in the community.	• RWE has committed to working with BSC to assess housing needs in Theodore or other local towns for the operational phase. RWE is currently negotiating an MOU with BSC that will address several matters including housing. • RWE commits to working together with BSC to ensure long term housing benefits to communities surrounding the Project through providing permanent accommodation in a nearby town.
Local Business and Industry Procurement		
Construction / Operation	Use of short- and long-term accommodation will directly support local businesses (accommodation providers).	• A Local Procurement Plan and Indigenous Procurement Plan are being developed and will be implemented for construction and operation. These plans will be developed in accordance with: – BSC Procurement Policy – Queensland Local Energy Partnerships Plan – Queensland Charter for Local Content. • Regularly consult with local property owners and accommodation providers to manage occupancy to maximise use of local accommodation, without preventing its use for major event and holiday purposes.
Construction / Operation	Use of short- and long-term accommodation will increase demand for local accommodation services, potentially generating opportunities for local businesses to capitalise on the demand by increasing accommodation stock and services.	• Regularly consult with local property owners and accommodation providers to manage occupancy to maximise use of local accommodation, without preventing its use for major event and holiday purposes. • Provide a register of local accommodation options and contact details to contractors and subcontractors. • RWE is exploring housing options in townships within an hour's drive to the Project Area to accommodate the operation workforce. • RWE has committed to working with BSC to assess housing needs in Theodore or other local towns for the operational phase. RWE is currently negotiating an MOU with BSC that will address several matters including housing.
Health and Community Wellbeing		

Phase	Potential impact of using off-site accommodation	Mitigation or enhancement measure
Construction	Workers staying in town may increase demand for local goods potentially creating supply shortages for residents and visitors.	• Proactively engage with BSC, chambers of commerce and local businesses to provide Project information such as construction timing, workforce estimates and accommodation requirements to allow them to prepare for additional demand. • Regularly consult with local accommodation providers to manage occupancy to maximise use of local accommodation, without preventing its use for major event and holiday purposes and ensuring visitors are not negatively impacted.
Construction	Workers staying in town may increase the number of vehicle movements within the region which may cause traffic accidents, congestion, and greater damage to roads.	Construction workers will be transported from their place of accommodation to construction site via a bus where practical to reduce the number of vehicles on the road network and associated impacts such as traffic accidents and traffic congestion.
Construction / Operation	Use of existing short-term accommodation may have economic benefits for local businesses such as cafes and shops through workers patronising local businesses while in town. This in turn supports local employment and the local economy.	• A Local Procurement Plan and Indigenous Procurement Plan are being developed and will be implemented for construction and operation. These plans will be developed in accordance with: – BSC Procurement Policy – Queensland Local Energy Partnerships Plan – Queensland Charter for Local Content. • Regularly consult with local property owners and accommodation providers to manage occupancy to maximise use of local accommodation, without preventing its use for major event and holiday purposes. • Preparation and implementation of a CoC applicable to all Project workers during the construction phase.
Construction / Operation	Workers staying in town may increase demand for local community services and facilities, reducing accessibility for the community. This issue may be exacerbated by other proposed large-scale developments occurring in the region around the same time as construction of TWF.	• Workers will be required to use health services provided at the on-site camp to minimise demand for local health services. • Engage with local healthcare, social and emergency service providers to monitor the Project's use (if any) of these facilities. • Preparation and implementation of social impact and value measures, developed in accordance with the Queensland SIA Guideline, which includes: – objectives and key performance indicators

Phase	Potential impact of using off-site accommodation	Mitigation or enhancement measure
		– measures to ensure that the level of service provided to the local community by existing social services, facilities and infrastructure is not reduced – measures to mitigate potential health and wellbeing impacts on local communities, and enhance potential benefits – the level of on-site health services to be provided for workers – details of any workforce CoC to govern worker interactions with local communities – emergency response arrangements and management measures agreed with local emergency service providers, for incidents involving workers, both on and off the Project Area – details of any community development programs to be implemented, and the outcomes to be achieved.

7.2 Infrastructure

This section provides an assessment of the potential positive and adverse impacts of the Project on essential and social infrastructure in the area. It also outlines the proposed mitigation and enhancement measures for each impact.

RWE will enter into infrastructure agreements with BSC and, if required, with TMR regarding impacts on Council or TMR-owned infrastructure, as relevant. The infrastructure agreements will define the extent of infrastructure upgrades required, timing for upgrades and associated costs.

Table 7.3: Impact and mitigation – Infrastructure

Phase	Potential impact	Mitigation or enhancement measure
Construction	The volume of water required during construction would increase demand for the town's water supply, potentially creating water shortages for the community.	• RWE is investing opportunities to reduce water consumption looking at non-water solutions to control dust. • RWE is exploring the opportunity to use on-site bore water. If the tests are unfavourable, RWE may liaise with surrounding landowners regarding access to water. • If needed, RWE would truck water to site.
Construction	Using bore water from on-site sources could reduce groundwater pressure and/or flows for other users in the broader area.	• RWE is exploring the opportunity to use on-site bore water. If the tests are unfavourable, RWE may liaise with surrounding landowners regarding access to water. • If needed, RWE would truck water to site. • RWE is investing opportunities to reduce water consumption looking at non-water solutions to control dust.
Construction	The volume of potable water required to operate the on-site camp would increase demand for the town's water supply, potentially creating water shortages for the community.	• RWE will engage with BSC to ensure any potable water supply for the on-site camp does not create water shortage for the community. • RWE will prepare a Potable Water Strategy for the on-site camp. The principles to be adopted are associated with efficient water use and management, and comprise of: – compliance with local regulations – protocols for sanitation, storage, and hygiene – prioritisation of hydration for worker wellbeing (e.g. provide easily accessible water stations with clean containers; educate workers on water hygiene, etc.) – contingency planning for emergencies and shortages.
Construction	Connecting the on-site to the electricity grid would require additional transmission infrastructure, which, depending on the alignment could require a new easement over properties that are not part of the wind farm. This could mean that more landholders would be affected.	• The on-site camp will not be connected to the grid; therefore, no additional landholders would be impacted. • The on-site camp would be powered using its own generation sources.

Phase	Potential impact	Mitigation or enhancement measure
Construction	An increase in traffic volumes and movements on local and regional roads during construction could create traffic congestion, negatively impact traffic safety, cause road damage, emit dust. Communities would be affected by traffic, potential road accidents, and reduced air quality. Traffic volumes could increase during construction as result of workers commuting to and from the site and transporting project components and construction material.	• Construction workers will be bussed to the on-site camp from the airport to minimise traffic on local and regional roads. • A traffic impact assessment and preliminary route assessment have been undertaken for the Project. These assessments will be updated prior to construction to manage all potential impacts associated with the project. • Relevant permits and agreements with transport infrastructure managers will be secured prior to construction. These include an OSOM permit from the TMR and an infrastructure agreement with BSC and potentially GRC. • A traffic management plan and road use management plan will be developed prior to construction. They will outline measures for traffic control, block out periods such as peak traffic and school pick and drop off times, processes for providing notices to the community and measures to manage noise and dust.
Construction	Septic waste and greywater generated from the on-site camp and construction activities, e.g. washdown water used for vehicles and equipment, could contaminate water and soil, potentially creating public health risks, affecting community amenity of the area and potentially contaminating water resources.	• RWE will engage with BSC to confirm if Council's wastewater treatment facilities can accommodate the volume of septic waste and greywater generated from the on-site camp without compromising services to the community. • No on-site sewage treatment is proposed. • Stormwater, run-off from dust suppression and washdown water will be captured in sediment control devices and construction retention ponds or tanks. Further detail in relation to sediment control devices will be included in an erosion and sediment control plan for the construction phase of the Project. • Wastewater management will be outlined in the Operational Management Plan.
Construction	The volume of waste produced by the Project during construction would increase demand for the Trap Gully landfill, potentially reducing the	• A waste management hierarchy will be implemented in accordance with the *Waste Reduction and Recycling Act 2011*, consisting of elimination, reduction, re-use of materials, recycling and disposal.

Phase	Potential impact	Mitigation or enhancement measure
	capacity of the landfill and limiting the planned lifespan of the facility for community use.	• The approach to waste management during construction is to ensure waste generation is minimised to the greatest extent practicable. • Where waste cannot be avoided, waste materials will be segregated by type where appropriate for the waste management methods available for collection and removal (for processing or disposal) by licensed contractors. • A preliminary Waste Management Plan (WMP) has been developed for the on-site workforce accommodation facility. The preliminary WMP will be further developed into a WMP as part of post-approval works by RWE or the Engineering, Procurement, and Construction (EPC) contractor.
Construction	A health outbreak could occur at the on-site camp, such as a gastrointestinal illness, respiratory illness, etc, requiring health and potentially emergency medical care. This could increase demand for local health and emergency services, potentially reducing access and availability for the local community.	• A private emergency service provider will be contracted to manage emergencies on-site to avoid adding pressure to local services. • A medical professional will be available on-site 24/7. • The Workforce Management Plan will include measures to manage potential health outbreaks including ensuring hygiene and cleanliness, appropriate sanitation, proper food storage and handling, etc.
Construction / Operation	Emergencies could occur on-site during construction or operation. Emergencies could involve workers such as accidents on-site or put other people at risk such as an uncontained facility fire. Emergency events would increase demand for local emergency services including the Rural Fire Service, Queensland Police Service (QPS), Queensland Fire Department (QFD) and Queensland Ambulance Service (QAS). On-site emergencies could draw these emergency services away from other towns reducing the availability of those services, even temporarily from those communities.	• A private emergency service provider will be contracted to manage emergencies on-site to avoid adding pressure to local services. • The private emergency service provider will be deployed to assist with local community emergencies to supplement local services, when required. • RWE employees who are appropriately trained will also be deployed to assist with local emergencies, when required.
Construction / Operation	An accidental fire could occur on-site during construction or operation, potentially becoming uncontained spreading outside the Project area putting host properties and nearby properties at risk.	• The Project design includes firebreaks to manage the risk of an accidental fire from spreading. • A private emergency service provider will be contracted to manage emergencies on-site to avoid adding pressure to local services.

Phase	Potential impact	Mitigation or enhancement measure
		• Appropriate firefighting equipment and water sources will be available on-site to manage accidental fires. • The construction environment management plan and operational management plan will contain measures to manage accidental fires and bushfires on-site.
Construction / Operation	Telecommunication coverage in the Project area is unreliable. There is an opportunity for the Project to provide a legacy benefit for the community by improving telecommunication coverage.	• RWE is assessing permanent and temporary communication solutions for the Project, including assessing opportunities to improve telecommunications infrastructure / coverage for the community.
Operation	Wind turbines could interfere with communication networks, radars, trigonometrical stations and GPS and broadcast signals. Interference could negatively affect signal strength and quality affecting performance and service delivery for users.	• The Project has been designed to avoid impacting these services. An electromagnetic interference assessment was undertaken and confirms that the Project will have no material impact on these services. • RWE is assessing permanent and temporary communication solutions for the Project, including assessing opportunities to improve telecommunications infrastructure / coverage for the community.
Operation	Wind turbines could interfere with the Bureau of Meteorology's (BOM) Taroom radar, potentially impacting the ability of the radar to detect and predict weather events. This could in turn affect BOM's ability to provide accurate weather forecasts and severe weather warnings.	• RWE is working with BOM to understand the potential impacts of the Project on the Taroom radar and develop appropriate measures to appropriately mitigate any impacts to ensure BOM's services are not significantly affected.
Operation	Wind turbines would create an obstacle for aircraft operating in the area, potentially creating an aviation safety risk. Landholders in the broader area are known to use helicopter mustering.	• RWE proactively engaged with nearby landholders to provide details of met mast locations. • RWE has also provided details of met mast locations to other local pilots, aviation businesses, and AirServices Australia for inclusion on navigation charts. • RWE will also provide these stakeholders with details of wind turbines ahead of construction commencing.

8. Proposed forward engagement plan

RWE has continued to engage with the community and stakeholders on the Project since the development application was submitted. Table 8.1 presents the proposed engagement activities to resolve key matters relating to workforce accommodation and infrastructure needs, deliver benefits to the community and stakeholders, and continue consulting with the community and key stakeholders regarding the Project.

Table 8.1 Proposed forward engagement plan

Stakeholders	Key mitigation/management actions	Status	Broad Key Performance Indicators	Monitoring Mechanism
• Gladstone Regional Council • Rockhampton Regional Council • Western Downs Regional Council • North Burnett Regional Council • Theodore Chamber of Commerce • Biloela Chamber of Commerce • Gladstone Chamber of Commerce and Industry	Engage with councils and chambers of commerce to keep them updated on the Project and discuss issues such as route assessment.	Ongoing	• Councils and chambers are well informed of the Project • Councils and chambers updated at Project milestones or Project changes • Gladstone Regional Council provide input into route assessment	• SET Governance Framework • Stakeholder and Communication Plans level of alignment with best practice standards and compliance with regulatory obligations
Accommodation providers	Engage with local short-term accommodation providers to confirm availability and capacity during construction to cater for peak construction workforce and specialist consultants	In development	• Identify and quantify the number of short-term accommodation facilities and rooms available at the expected time of construction.	• SET Governance Framework • Local participation framework • Workforce management framework
Local businesses	Engage with local businesses to explore opportunities for procurement services for development and operation of the on-site workforce accommodation and construction of wind farm and associated infrastructure.	In development	• Number of local businesses identified	• Local participation framework • Indigenous participation framework • Local and Indigenous participation plans level of alignment with best practice standards and compliance with regulatory obligations

• Banana Shire Council • Theodore Chamber of Commerce • Biloela Chamber of commerce • Gladstone Chamber of Commerce and Industry • Gladstone Regional Council • Rockhampton Regional Council • Western Downs Regional Council • North Burnett Regional Council • Local business • WWNAC	Develop and implement a Local Participation Plan and Indigenous Participation Plan.	In development	• Number of local/regional businesses contracted to provide goods and/or services to the Project • Value of contract with local/regional businesses to provide goods and/or services to the Project	• Local participation framework • Indigenous participation framework • Local and Indigenous participation plans level of alignment with best practice standards and compliance with regulatory obligations
Banana Shire Council	Finalise MoU and infrastructure agreement	Ongoing	• Signed MoU and Infrastructure Agreement	• MOU and Infrastructure Agreement framework
	Preliminary discussions availability and capacity of infrastructure, services, and construction materials potentially including potable water, waste facilities, etc.	Ongoing	• Availability, capacity and quantity of infrastructure, services, and construction materials confirmed. • If required, reach an agreement with BSC regarding sharing infrastructure, services and materials.	• SET Governance Framework • Stakeholder and Communication Plans level of alignment with best practice standards and compliance with regulatory obligations
Landowners, fenceline neighbour, near	Implement the community sponsorship fund	Ongoing	• Number of applications received	• Community sponsorship governance framework

neighbours and wider community			• Number of successful applications • Value of sponsorships disbursed	
	Develop and implement the community benefit fund	Ongoing	• Develop the community benefit fund.	• Community benefit fund governance framework
	Develop and implement neighbours benefit package	In development	• Develop the neighbours benefit package. • Number of neighbours receiving benefits. • Value of benefits disbursed.	• Neighbours benefit package governance framework
	Discuss opportunities to access water with host landowners.	In development	• Opportunities to access water are identified and documented.	• SET Governance Framework
Health and emergency services	Develop Bushfire Management Plan in consultation with RFS and Queensland Fire Department (QFD).	In development	• RFS and QFD endorse the BMP.	• BMP monitoring framework.
Infrastructure and material suppliers	Engage with local construction material suppliers and quarry owners to understand availability and capacity of local construction materials.	In development	• Availability and capacity of local construction materials are quantified.	• SET Governance Framework • Stakeholder and Communication Plans level of alignment with best practice standards and compliance with regulatory obligations
Telecommunication providers	Engage with telecommunication providers to discuss telecommunication infrastructure opportunities.	In development	• Telecommunication infrastructure opportunities are identified and documented	• OHS framework
Australia Pacific LNG Pty Limited	Finalise agreement with Australia Pacific LNG Pty Limited for the pipeline crossings.	In development	• Signed pipeline crossing agreement between RWE and Australia Pacific LNG Pty Limited	• SET Governance Framework
BoM	Follow up with the Bureau of Meteorology (BoM) regarding potential mitigation options for impacts on the Taroom radar.	Ongoing	• Mitigations agreed and implemented.	• SET Governance Framework • Agreement with BoM.

Aviation	Share met mast and WTG locations, as the project progresses, with local pilots, aviation businesses, and AirServices Australia for inclusion on navigational charts.	Ongoing	• Met mast and WTG locations are shared with all local pilots, aviation businesses, and AirServices Australia.	• SET Governance Framework

9. Summary and conclusion

9.1 Workforce accommodation

9.1.1 Construction

RWE's workforce accommodation strategy for the construction phase comprises using:

- An on-site camp with around 400 beds to accommodate most of the construction workforce. The camp will be largely self-sufficient incorporating its own temporary infrastructure and services.
- Short-term accommodation, such as hotels, motels and other existing camps, located within a safe travel distance to the Project area (i.e., less than an hour drive) to accommodate a small proportion of the construction workforce. Visiting RWE employees, contractors not associated with the main construction workforce, and workforce overflow during peak construction periods would stay at local short-term accommodation.

Using an on-site camp ensures that potential negative social impacts associated with a large influx of FIFO/DIDO workers staying in Theodore and nearby towns will be avoided. Potential positive social impacts will be realised through a small proportion of the construction workforce staying in town at short-term accommodation. Workers staying in town will contribute to the local economy and support community cohesion.

Potential workforce demands on social infrastructure and services will be minimised through providing health and medical care on-site. A private emergency services contractor will also be engaged to ensure that any emergencies that occur on-site will not draw local emergency services capacity away from the community.

The Project will not impact on the local housing market, as workers who do not already reside in Theodore or nearby towns will stay at short-term accommodation while on shift. The Project will not create additional demand for rental housing or houses for sale.

RWE supports BSC's Major Projects Housing Demand & Levy Policy and has committed to provide permanent accommodation in a town near to the Project. These houses would be delivered during the operational phase of the Project, increasing housing availability in the local area.

RWE's workforce accommodation strategy, proposed management measures and commitments to the community:

- ensure that using the on-site camp does not result in adverse impacts on surrounding communities and townships, such as overburdening services and community facilities (PO16)
- ensure that using off-site accommodation (short-term accommodation) does not result in adverse impacts on surrounding communities and townships, such as overburdening services, housing supply and community facilities (PO17).

9.1.2 Operation

A proportion of the operational workforce is expected to reside locally. RWE will give preference to locals for operational opportunities. However, it is acknowledged some operational workers may be employed on a FIFO or DIDO arrangement and will likely to be employed to undertake maintenance, which is typically short-term. FIFO/DIDO workers will stay at short-term accommodation at towns within a safe driving distance to Project Area.

For the operational phase, RWE, in consultation with BSC, is committed to funding the construction of new housing in Theodore or other nearby towns, where practical. RWE is committed to work with BSC to assess housing needs for the operational phase and is currently negotiating an MOU with BSC that will address several matters including housing.

9.2 Infrastructure

RWE has commenced negotiations with BSC to develop an MOU and infrastructure agreement for the Project, which will address potential impacts on Council-owned infrastructure. RWE will also consult with other infrastructure providers regarding the Project's needs, as relevant.

Further, a traffic impact assessment has been undertaken, and a road use management plan will be developed in addition to securing permits from TMR for any upgrades required for State-controlled roads. An infrastructure agreement with TMR will also be developed, if required.

RWE will also develop local procurement plans that will prioritise source materials for the Project locally. These plans will carefully consider the capacity and capability of local suppliers to minimise disruptions to existing supply chains. To inform the plan, RWE will undertake a study to quantify the availability of materials required for the Project and in consultation with Council and other key stakeholders determine the potential impact on Council and the community. The objective of the study is to ensure that the Project does not result in a significant impact on infrastructure, services and availability of materials for the local community.

RWE's approach to delivering the Project ensures that the Project's potential impacts on infrastructure and services including social infrastructure, communications networks and essential infrastructure are identified, and measures to manage, mitigate and remediate any impacts are undertaken:

- Prior to commencement of any development, or
- Prior to additional demand being placed on infrastructure and services.

10. References

BSC (2024) Banana Shire Local Housing Action Plan – adopted 24 August 2024.

BSC (2025) Banana Shire Council website, accessed 3 April 2025.

ERM (2024a) Accommodation Options Report, Appendix B - Socio-Economic Impact Analysis, Theodore Wind Farm, v3.0.

ERM (2024b) Socio-Economic Impact Analysis, Theodore Wind Farm, v4.

RWE (2024) Community & Stakeholder Engagement Plan, Theodore Wind Farm, v4.

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Appendix A

Letter of support

Council Chambers
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Biloela Qld 4715

All Correspondence to
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ABN 85 946 116 646

Your Reference:
Our Reference: NF:CW:jma (ID.93626)
Contact:

20 March 2025

RWE Renewables Australia
ATTN: Ms Heidi Creighton
Head of Theodore Energy Park
Suite 5, Level 9
350 Collins Street
MELBOURNE VIC 3000

Dear Heidi

Re: Support for planning application to Queensland Government

Banana Shire Council strongly supports RWE Renewables Australia's planning application to the Queensland Government for Theodore Wind Farm.

Banana Shire will host significant infrastructure and renewable energy project investment over the next 10 to 15 years. The area is already the subject of the State's first Renewable Energy Zone (REZ) Readiness Assessment and housing implications is one of the key pillars of that assessment.

RWE Renewables Australia, through the Theodore Wind Farm project, has shown consistent and proactive collaboration with Banana Shire Council and the local community. RWE Renewables Australia is demonstrating ongoing commitment to implementation of the Banana Shire Major Projects Housing Demand & Levy Policy and the wider community through establishment of a Memorandum of Understanding

Without adequate accommodation for the workforce needed to complete and operate these projects, the timelines and success of these developments are at risk, adding further strain to an already limited housing supply.

The high-level concepts proposed for the Memorandum of Understanding between RWE Renewables Australia and Banana Shire Council include:

- RWE commits to working together with the Banana Shire Council to ensure long term housing benefits to the communities surrounding the Theodore Wind Farm through provision of permanent accommodation in a nearby town. RWE commits to providing at least 10 permanent dwellings.

- RWE will commit to working with the Banana Shire Council to providing regular updates on operational staff predictions. Banana Shire Council

and RWE will work together to ensure that the location of the proposed housing optimises for: Local community outcomes, appropriate locality to site for operational staff, planning and council services provision, and community support.

- Banana Shire Council will undertake review of town plans and planning overlays to help steer the best locations for the proposed dwellings.

- RWE commits to continuing to work together to ensure that the proposed onsite accommodation camp is optimised for community, council, and worker outcomes while facilitating efficient construction

Banana Shire Council appreciates the time, energy and value with which RWE Renewables Australia has approached and progressed project development of Theodore Wind Energy Park and associated worker accommodation and housing actions.

Banana Shire Council anticipates that this letter will positively support RWE Renewables Australia's project proposition and planning application with the Queensland Government.

Should you require any further assistance, please do not hesitate to contact my office on 07 4992 9500.

Yours sincerely

Cr Neville Ferrier
MAYOR – BANANA SHIRE COUNCIL

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Appendix B

Commitments register

Key Matter	Commitment	Stakeholders	Phase
Community and stakeholder engagement	Continue to engage directly with the WWNAC.	WWNAC	Ongoing
All	Maintain and update the CSEP and FNECP to reflect changing circumstances, community feedback and ongoing improvements in the community engagement approach.	All	Construction/Operation
Housing and Accommodation	Design on-site workforce accommodation in accordance with the BSC Planning Scheme 2021 Development Design Code, including provision of a Waste Management Plan.	BSC Contractors and subcontractors	Pre-construction
Housing and Accommodation	Design on-site workforce accommodation to be largely self-sufficient, incorporating its own water supply, wastewater treatment, electricity, communications.	Workforce Contractors and subcontractors	Pre-construction
Local Business and Industry Procurement	Procure goods and services for the on-site camp from the local area where possible, such as catering, laundry, landscaping, etc.	Local businesses	Construction
Workforce Management	Bus FIFO workers to and from the site at the beginning and end of their rosters.	Workforce	Construction
Workforce Management	Prepare and implement a Code of Conduct for DIDO workers to maintain safe driving standards.	Workforce	Pre-construction/ Construction/ Operation
Community and stakeholder engagement	Proactively engage with BSC, chambers of commerce and local businesses to provide Project information such as construction timing, workforce estimates and accommodation requirements to allow them to prepare for additional demand.	BSC Local businesses	Ongoing
Workforce Management	Prepare and implement a Code of Conduct applicable to all Project workers during the construction phase.	Workforce	Pre-construction/Construction
Health and Community Wellbeing	Develop and implement the community sponsorship fund, community benefit fund and neighbours benefit package.	Landowners Fenceline neighbours Near neighbours Wider community	Pre-construction/Construction/Operation
Health and Community Wellbeing	Prepare and implement a Health and Community Wellbeing Plan.	Workforce	Pre-construction/Construction/Operation
Community and stakeholder engagement	Engage with local healthcare, social and emergency service providers to monitor the Project's use (if any) of these facilities.	Local healthcare, social and emergency service providers	Construction/Operation
Workforce Management	Implement conditions of employment to ensure construction workers stay at the on-site camp.	Workforce	Construction
Housing and Accommodation	Prepare and implement a Workforce Housing and Accommodation Plan.	Workforce BSC Local accommodation operators	Pre-construction/Construction/Operation
Housing and Accommodation	Explore available accommodation options around the Theodore, Banana, Moura, and Biloela to be able to accommodate workers in other towns during peak visitor periods.	Local accommodation operators	Pre-construction
Housing and Accommodation	Contact the local accommodation operators and chambers of commerce to provide Project information such as construction timing, workforce estimates and accommodation requirements.	Local accommodation operators	Pre-construction/Construction/Operation
Housing and Accommodation	Identify any overlaps with peak demand periods for accommodation and engage with local accommodation operators to develop measures to manage potential cumulative impacts.	Local accommodation operators	Pre-construction/Construction/Operation
Housing and Accommodation	Review workforce predictions every six months during construction to ensure that accommodation requirements can be met.	Workforce BSC Local accommodation operators	Pre-construction/construction
Community and stakeholder engagement	Engage with other Project developers to mitigate potential cumulative impacts which may put additional pressure on the area.	Other Project developers	Pre-construction/Construction

Key Matter	Commitment	Stakeholders	Phase
Housing and Accommodation	Regularly consult with local property owners and accommodation providers to manage occupancy to maximise use of local accommodation, without preventing its use for major event and holiday purposes.	Local accommodation operators	Pre-construction/Construction/Operation
Housing and Accommodation	Proactively work with BSC to assess housing needs in Theodore or other local towns for the operational phase of the Project.	BSC	Pre-construction/Construction/Operation
Housing and Accommodation	Work together with BSC to ensure long term housing benefits to communities surrounding the Project through providing permanent accommodation in a nearby town.	BSC	Pre-construction/Construction/Operation
Housing and Accommodation	Provide at least 10 permanent dwellings in Theodore or other local towns.	BSC	Operation
Community and stakeholder engagement	Engage with Councils and chambers of commerce to keep them updated on the Project and discuss issues such as route assessment.	Relevant local Councils	Ongoing
Infrastructure	Develop Bushfire Management Plan in consultation with Rural Fire Services and Queensland Fire Department.	Rural Fire Services Queensland Fire Department	Pre-construction
Infrastructure	Reduce water consumption, including investigating non-water solutions to control dust.	Workforce Project contractors and subcontractors	Pre-construction
Infrastructure	Utilise on-site bore water as far as practicable.	Workforce Project contractors and subcontractors	Construction
Community and stakeholder engagement	Engage with BSC to ensure any potable water supply for the on-site camp does not create water shortage for the community.	BSC	Pre-construction
Infrastructure	Prepare a Potable Water Strategy for the on-site camp, including principles associated with efficient water use and management.	Workforce BSC	Pre-construction
Infrastructure	Avoid impacts to landholder power supply by powering the on-site camp off-grid via hybrid diesel-solar/battery systems.	Workforce Nearby landholders	Construction
Infrastructure	Update Project Traffic Impact Assessment and Preliminary Route Assessment prior to construction to manage all potential impacts.	Relevant local Councils Department of Transport and Main Roads	Pre-construction
Infrastructure	Secure relevant permits and agreements with transport infrastructure managers prior to construction.	Relevant local Councils Department of Transport and Main Roads	Pre-construction
Infrastructure	Develop a Traffic Management Plan and Road Use Management Plan prior to construction.	Relevant local Councils Department of Transport and Main Roads	Pre-construction
Community and stakeholder engagement	Engage with BSC to confirm if Council's wastewater treatment facilities can accommodate the volume of septic waste and greywater generated from the on-site camp without compromising services to the community.	BSC	Pre-construction
Infrastructure	Store septic waste within raw sewerage holding tanks and periodically pump out to dispose of raw efluent at an off-site wastewater treatment plant.	Workforce BSC	Construction
Infrastructure	Develop an Erosion and Sediment Control Plan prior to construction, including measures for management of stormwater, run-off from dust suppression and washdown water.	Workforce BSC	Pre-construction
Housing and Accommodation	Develop an Operational Management Plan for the on-site camp, including provisions for wastewater management.	Workforce BSC	Pre-construction/Construction
Infrastructure	Implement a waste management hierarchy in accordance with the *Waste Reduction and Recycling Act 2011*, consisting of elimination, reduction, re-use of materials, recycling and disposal.	Workforce BSC	Construction
Infrastructure	Minimise waste generation to the greatest extent practicable.	Workforce BSC	Construction
Infrastructure	Segregate all waste materials where appropriate for the waste management methods available for collection and removal (for processing or disposal) by licensed contractors.	Workforce BSC	Construction
Infrastructure	Further develop preliminary Waste Management Plan for the on-site camp.	Workforce BSC	Pre-construction

Key Matter	Commitment	Stakeholders	Phase
Community and stakeholder engagement	Provide local pilots, aviation businesses, AirServices Australia and nearby landholders with details of wind turbines ahead of construction commencing.	Local pilots Aviation businesses AirServices Australia Nearby landholders	Pre-construction
Infrastructure	Finalise agreement with Australia Pacific LNG Pty Limited for the pipeline crossings.	Australia Pacific LNG Pty Limited	Pre-construction
Health and Community Wellbeing	Contract a private emergency service provider to manage emergencies on-site to avoid adding pressure to local services.	Workforce	Pre-construction/Construction/Operation
Workforce Management	Ensure a medical professional is available at the on-site camp 24/7.	Workforce	Construction/Operation
Infrastructure	Provide appropriate fire-fighting equipment and water sources on-site to manage accidental fires.	Rural Fire Services Queensland Fire Department	Construction/Operation
Health and Community Wellbeing	Ensure Construction Environment Management Plan and Operational Management Plan include measures to manage accidential fires and bushfires on-site.	Rural Fire Services Queensland Fire Department	Pre-construction/Construction/Operation
Infrastructure	Develop appropriate measures to appropriately mitigate any impacts to the BoM's services, including the Taroom radar.	BoM	Pre-construction
Infrastructure	Identify permanent and temporary communications solutions for the Project, including opportunities to improve telecommunications infrastructure/coverage for the community.	Telecommunication providers Local community	Pre-construction
Community and stakeholder engagement	Engage with telecommunication providers to discuss telecommunication infrastructure opportunities.	Telecommunication providers	Pre-construction
Community and stakeholder engagement	Proactively engage with nearby landholders to provide details of met mast locations.	Nearby landholders	Pre-construction
Local Business and Industry Procurement	Undertake a study to quantify the availability of materials required for the Project, including engagement with local suppliers and quarries.	BSC Local suppliers and businesses	Pre-construction
Local Business and Industry Procurement	Develop a Memorandum of Understanding and infrastructure agreement with Banana Shire Council.	BSC	Pre-construction
Local Business and Industry Procurement	Encourage local employment via hiring mandates, partnerships and contracting.	Local community Contractors and subcontractors	Construction
Local Business and Industry Procurement	Conduct market sounding to identify local suppliers.	Local businesses	Pre-construction
Local Business and Industry Procurement	Host information sessions with the community, local businesses, and prospective contractors/subcontractors about construction timing, workforce estimates, and accommodation needs.	Local community Local businesses Contractors and subcontractors	Pre-construction
Community and stakeholder engagement	Engage local media including radio, newspaper, and social media to advertise expressions of interest for employment or provision of services or materials.	Local media Local community Local businesses Contractors and subcontractors	Pre-construction
Local Business and Industry Procurement	Consult with BSC, GRC and chambers of commerce to provide their communities and members with relevant details such as Project construction timing, workforce estimates and accommodation requirements.	Relevant local Councils	Pre-construction
Local Business and Industry Procurement	Provide opportunities for local businesses to submit proposals and tenders and prioritise the use of goods and services that can be sourced locally and are competitive for price and quality.	Local businesses Contractors and subcontractors	Pre-construction
Local Business and Industry Procurement	Develop processes that embed local business and industry procurement strategies into the Project’s contracting model.	Local businesses Contractors and subcontractors	Construction
Local Business and Industry Procurement	Develop a Local Procurement Plan and Indigenous Procurement Plan that will prioritise local sourcing of material.	BSC Local suppliers and businesses	Pre-construction
Local Business and Industry Procurement	Provide a register of local accommodation options and contact details to contractors and subcontractors.	Local accommodation operators Project contractors and subcontractors	Pre-construction
Workforce Management	Provide opportunities for local businesses to submit proposals and tenders and prioritise the use of goods and services that can be sourced locally and are competitive for price and quality.	Local businesses Contractors and subcontractors	Pre-construction

Key Matter	Commitment	Stakeholders	Phase
Workforce Management	Encourage subcontractors to employ local workers wherever possible and reasonable.	Local businesses Contractors and subcontractors	Construction
Workforce Management	Develop processes that embed local business and industry procurement strategies into the Project's contracting model.	Local businesses	Pre-construction
Workforce Management	Set up a dedicated employment opportunity platform on the Project's website in consultation and coordination with the Engineering, Procurement, and Construction (EPC) contractor.	Local community Local businesses Contractors and subcontractors	Pre-construction
Workforce Management	Prepare and implement a Code of Conduct for workers staying off-site in accordance with RWE's workforce policies.	Workforce	Pre-construction/ Construction/ Operation
Workforce Management	Make RWE's Complaints and Enquiries Handling Process available to the local community to lodge complaints about workforce behaviour.	Local community	Ongoing
Workforce Management	Minimise the number of workers staying in town at any one time.	Local accommodation operators BSC Workforce	Construction
Community and stakeholder engagement	Engage with BSC, the community and local businesses regarding construction timing, workforce estimates and accommodation requirements.	BSC Local communities Local businesses and suppliers	Pre-construction
Workforce Management	Implement a shuttle bus service where practical to transport workers staying off-site between town and the Project site.	Workforce	Construction
Community and stakeholder engagement	Engage with the local employment agencies to identify access pathways for local workers. Assess the candidate pool to determine suitable labour, trade, or other employment on the Project.	Local employment agencies Local community Contractors and subcontractors	Pre-construction
Workforce Management	Identify positions where training would allow additional local workers to join the workforce and encourage local workers and businesses to undertake training to provide for specialist works.	Local trade/training organisations Local community	Pre-construction
Workforce Management	Collaborate with local trade/training organisations (such as TAFE) to promote job opportunities with the Project, with enough time to give local community members with enough notice to receive training in Project related skill sets, if desired.	Local trade/training organisations Local community	Pre-construction

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