

# Appendix A. Environmental Management Plan



# Environmental Management Plan

Gawara Baya Wind Farm

*Report prepared for: Windlab*



## Revision History

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## Abbreviations

AEMO	Australian Energy Market Operator
BBMP	Bird and Bat Management Plan
BOM	Bureau of Meteorology
BUS	Bird Utilisation Survey
CASA	Civil Aviation Safety Authority
CEMP	Construction Environmental Management Plan
CHMA	Cultural Heritage Management Agreement
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DES	Department of Environment and Science
ELA	Eco Logical Australia
EMP	Environmental Management Plan
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
ESC	Erosion and sediment control
GBP	Gugu Badhun People
HBTs	Hollow-bearing trees
HSE	Health, safety and environment
IECA	International Erosion Control Association
ILUA	Indigenous Land Use Agreement
LiDAR	Light Detection and Ranging
LGA	Local Government Area
MNES	Matters of National Environmental Significance
MSDS	Material Safety Data Sheet

NC Act/NCA	<i>Nature Conservation Act 1992</i>
PER	Public Environment Report
Planning Act	<i>Planning Act 2016</i>
PO	Performance Outcome
Qld	Queensland
QREZ	Queensland Renewable Energy Zone
RE	Regional Ecosystem
SWMS	Safe work methods statement
SPV	Special purpose vehicle
VM Act	<i>Vegetation Management Act 1999</i>
WTG	Wind turbine generators
WONS	Weeds of National Significance
Windlab	Windlab Developments Pty Ltd

# 1 Introduction

## 1.1 PROJECT BACKGROUND

Windlab Developments Pty Ltd (the proponent or Windlab) is proposing to build *Gawara Baya*<sup>1</sup>, a wind energy project on an active cattle property within Gugu Badhun Country, approximately 65 km south-west of Ingham in North Queensland (Figure 1-1). The site is within the Charters Towers Regional Council Local Government Area (LGA) on Lot 3198 on PH2177.

The proposed project will generate approximately 400 megawatts (MW) of renewable energy from up to 69 wind turbine generators (WTG). The project also comprises associated ancillary infrastructure including access tracks, laydowns, electrical reticulation, collector sub-stations, concrete batching plants and construction offices.

The location and design of Gawara Baya has been determined and refined through consideration of the location, quality and profile of the wind energy resource, proximity to existing energy transmission infrastructure, established use of the land for cattle grazing, and the proponent's ability to appropriately and responsibly manage local-scale impacts associated with the project.

Over more than three years, the proponent has adopted an iterative and collaborative design and development approach, integrating feedback from stakeholders to deliver a balanced project proposal.

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<sup>1</sup> Upper Burdekin Wind Farm has been renamed as Gawara Baya meaning 'wind song' in the language of the Gugu Badhun People – refer PER Section 1.6.2.2 for further information.

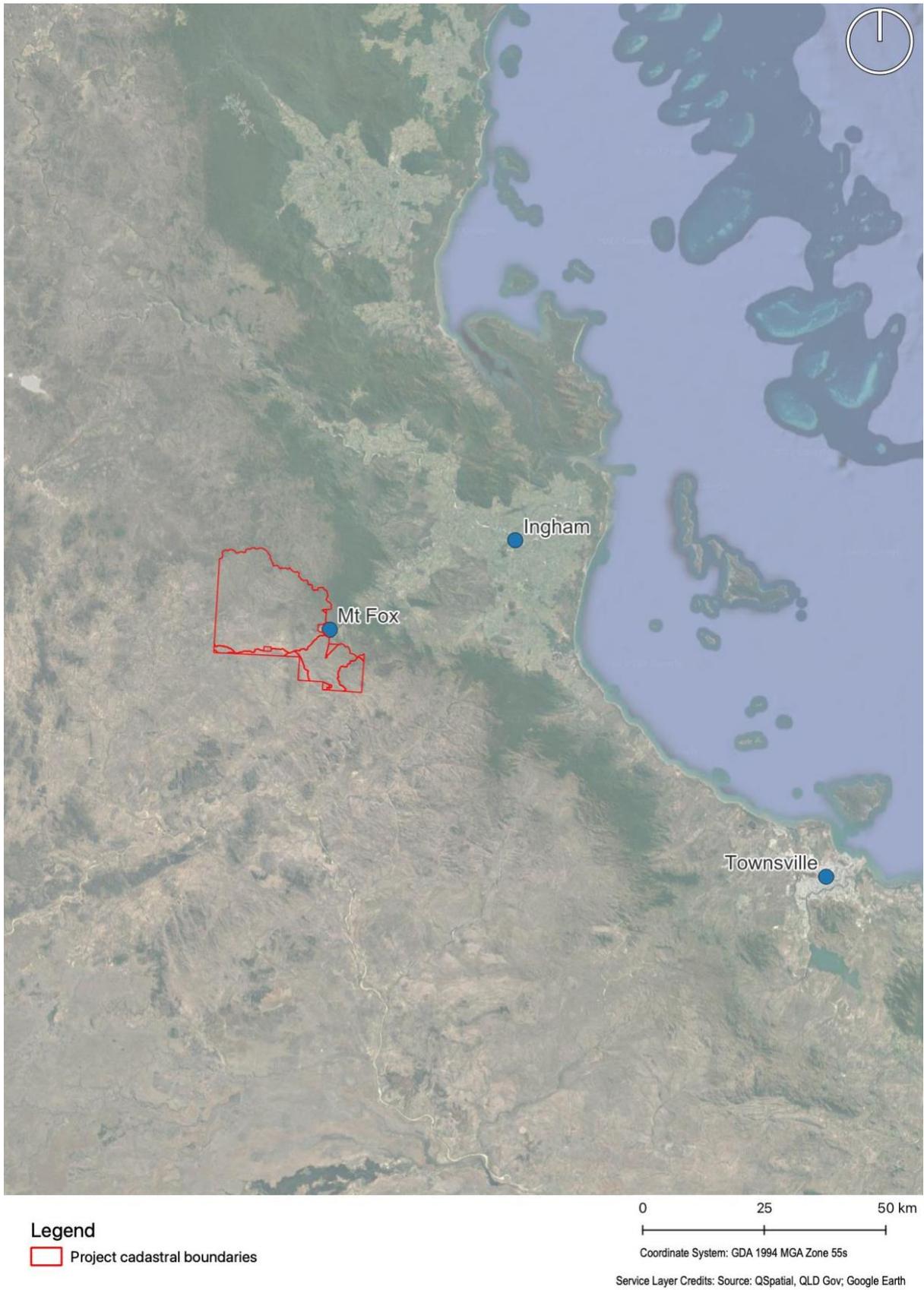


Figure 1-1: Project area location

## 1.2 THE PROPONENT

The proponent for the purposes of the application, assessment, and approval under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is Upper Burdekin Wind Farm Holdings Pty Ltd (the proponent), a wholly owned subsidiary of Windlab Pty Ltd.

## 1.3 STATUTORY ROLE OF THIS EMP

This Environmental Management Plan (EMP) has been developed to satisfy the requirements of both the Commonwealth and State frameworks and to establish suitable mitigation measures and controls to reduce impacts to both matters of national environmental significance (MNES) and matters of state environmental significance (MSES).

Windlab is currently seeking approval for Gawara Baya from the Commonwealth Minister for Environment under the EPBC Act and the State Assessment Referral Agency under the *Planning Act 2016* (Planning Act).

The proposal was referred under the EPBC Act and declared a controlled action on the 23<sup>rd</sup> November 2021. This was due to likely significant impacts on the following MNES protected under Part 3 of the EPBC Act:

1. Listed threatened species and ecological communities (s18 & s18A);
2. Listed migratory species (s20 & s20A);
3. The world heritage values of a World Heritage Property (s12 & s15A); and
4. The heritage values of a National Heritage Place (s15B & s15C).

The Proposed Action is to be assessed by Public Environment Report (PER) under Part 9 of the EPBC Act. The Commonwealth Department of Environment (the Department) has provided guidelines for a draft PER for GBWF.

The PER guidelines specify that an EMP is to be included in the PER. The EMP is to set out the framework for management, mitigation and monitoring of relevant impacts of the action, including the construction, operation, and decommissioning stages of the project. This EMP fulfils this requirement.

In accordance with the EPBC Act, the draft PER was on public display and open to comment from 20 February to 5pm on 3 April 2023. This EMP has also been updated to address and take account of the comments received both within the public comment period and outside of the comment period.<sup>2</sup>

The project is not currently approved under State legislation. Development approval under the Queensland Planning Act is being sought. Further, the project is being assessed against the *Vegetation Management Act 1999* for the proposed clearing of native vegetation. The EMP has been developed to be consistent with the requirements of the state framework (Fauna Management Plan and Vegetation Management Plan) and address impacts to MSES.

[PLACEHOLDER FOR COMMONWEALTH AND STATE APPROVAL CONDITIONS]

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<sup>2</sup> Overall, 282 comments were received within the public comment period, and another 50 were received outside of the public comment period.

## 1.4 OBJECTIVE

Implementation of the Gawara Baya in accordance with the EMP will assist the proponent in meeting their statutory and social environmental obligations. Where appropriate, this EMP requires the proponent to meet higher standards than those specified in relevant legislation, regulations and guidelines to help to achieve the proponent's commitment to environmentally responsible development.

The EMP's objective is to establish suitable controls to eliminate or minimise the risks to the environment to a level that is low, negligible or reduced to as low as reasonably practicable. The EMP further seeks to provide a framework for measuring environmental performance against legislative requirements and company policies and standards.

To achieve these overarching objectives, the EMP specifically aims to:

1. Inform Gawara Baya staff and contractors of their environmental obligations;
2. Provide site-specific environmental control procedures;
3. Provide rational and practical environmental guidelines for the construction and operation of the Gawara Baya, to ensure activities do not adversely affect environmental values and in particular threatened species;
4. Ensure that any potential environmental impacts arising from the construction and operation of the Gawara Baya are managed in accordance with legislative requirements;
5. Develop environmental guidelines for conducting staff induction and training.

## 1.5 SCOPE OF THIS EMP

This EMP has been developed to provide an overarching framework and the detailed management plans required for the Gawara Baya in order to meet statutory requirements and protect biodiversity values. This EMP addresses activities associated with the construction, operation and decommissioning of the Gawara Baya and should be read in conjunction with the following other key management documents:

- Bird and Bat Management Plan (BBMP), which details the environmental management requirements for managing impacts associated with collisions risk during the operational stage of the project. It also fulfils components of Performance Outcome (PO) 5 of State Code 23 – Wind Farm Development

A risk assessment for the Gawara Baya has been undertaken to support the development of the EMP and identify where key management controls are required for the project. The risk assessment identifies the potential impacts with a greater environmental risk, and consequently where environmental impact assessment and management should be focussed. The project activities that generated pre-mitigation risk ratings as 'intermediate' or above are addressed in the EMP. The risk assessment and risk register for the Gawara Baya are described in Section 5 and the full risk assessment register is provided in Appendix B.

This EMP applies to all phases of the Gawara Baya; construction, operation, and decommissioning of the Gawara Baya.

## 1.6 STRUCTURE AND CONTENT OF THIS EMP

The EMP comprises:

- Background to the Gawara Baya and the purpose of this EMP
- A description of the Gawara Baya
- A summary of the environmental management, regulatory and compliance framework within which the Gawara Baya will operate (refer Section 3)
- A summary of the environmental values in the project area (refer Section 4)
- A summary of the risk assessment that has guided the EMP (refer Section 5, and detail in Appendix B)
- A series of management sub-plans describing:
  - measures to be applied to avoid and minimise the environmental impacts of construction, operation and decommissioning of the Gawara Baya
  - monitoring to track and assess management performance against targets
  - contingency measures to mitigate unavoidable or accidental impacts
- Construction sub-plans include:
  - Fauna management (refer Section 7.1)
  - Vegetation management sub-plan (refer Section 7.2)
  - Weed management (refer Section 7.3)
  - Bushfire (refer Section 7.4)
  - Soils and sediment (refer Section 7.5)
  - Noise (refer Section 7.6)
  - Air emissions – Dust (refer Section 7.7)
  - Surface water (refer Section 7.8)
  - Hazardous Materials and spills (refer Section 7.9)
  - Waste management (refer Section 7.10)
  - Feral predator management (refer Section 7.11)
  - Sharman’s rock wallaby (refer Section 7.12)
  - Northern greater glider (refer Section 7.13)
- Operational sub-plans include:
  - Operation environmental management (refer Section 8.1)
  - Weed management (refer Section 8.2)
  - Feral predator management (refer Section 8.3)
- A description of the overarching Environmental Management System which the proponent will apply to the project and contractors (refer Section 10)
- An injured animal protocol (refer Appendix A)
- A preliminary Rehabilitation Plan (refer Appendix C).

Detail of management measures to be activities undertaken during decommissioning is not provided within this EMP. At the appropriate time, a detailed decommissioning and rehabilitation plan will be prepared to guide these activities consistent with legislation, and best practice (refer Section 9).

## 2 Description of Project

### 2.1 PROJECT OBJECTIVES

The objectives of the project are to:

- Develop and deliver a world-class renewable energy generation asset to provide approximately 400MW of new clean energy to the NEM, eliminating more than 1.2 million tonnes of carbon from Australia's national energy generation profile every year
- Deliver an ecologically sustainable development that balances economic, ecological and social outcomes
- Avoid or reduce environmental and social impacts by applying leading practice management and responsible development approaches
- Comply with all relevant legislative requirements.

### 2.2 PROJECT LOCATION AND CURRENT LAND USE

The project is located on an active cattle property approximately 65 km south-west of Ingham in north Queensland. The project is within the Charters Towers Regional Council Local Government Area and occurs on Lot 3198 on PH2177. The land is currently used for cattle grazing, with limited pasture improvement or land clearing having occurred to date. The region and the project area has been used as pastoral grazing land for livestock for more than 100 years. The project area is being managed in line with requirements of an active cattle property, with pest and weed control limited to measures that support successful pastoral operations.

At a wider scale, the Gawara Baya is located within Queensland's Northern Renewable Energy Zone (QREZ), which is an area identified by the Australian Energy Market Operator (AEMO) as having good quality renewable resources and other characteristics suitable for renewable energy development. At the site scale, the location of Gawara Baya has been influenced by the presence of a significant wind resource located over a large agricultural property that is directly adjacent to existing electricity transmission infrastructure. Importantly, power generated from this wind resource is a good match for the north Queensland load profile, and no additional electricity transmission infrastructure needs to be developed in order to export power to the grid.

### 2.3 NOMENCLATURE USED IN THIS REPORT

#### 2.3.1 Project

The 'project' nomenclature used throughout this document refers to the construction, operation, and decommissioning of Gawara Baya. The project is the 'proposed action'.

Gawara Baya was previously referred to as the 'Upper Burdekin Wind Farm'. A number of the PER appendices refer to Upper Burdekin Wind Farm, the documents having been produced prior to the project's official naming by the Gugu Badhun People. References to the Upper Burdekin Wind Farm in this PER (ie. PER appendices) should be taken as references to Gawara Baya located on Kilclooney Station, Lot 3198 on Plan PH2177.

#### 2.3.2 Operational footprint

The project's final operational footprint will be approximately 147.9. ha (less than 0.3% of the host cattle property).

### 2.3.3 Development footprint

The development footprint nomenclature used throughout this document refers to the 616.5 ha of land (less than 1.2% of the host cattle property) that will be utilised to facilitate the infrastructure elements associated with the construction of the project. A significant proportion of this disturbance footprint will be temporary, with rehabilitation or progressive restoration of temporary construction areas commencing on completion of construction (refer Section 3.5.3 and the Environmental Management Plan (EMP) at Appendix A).

The disturbance footprint includes disturbance of any kind during the construction, operation, and decommissioning of the project, including to existing roads, tracks, pasture, and previously cleared areas, and is a subset of the project area. The development footprint occurs on one property, Kilclooney Station, Lot 3198 on Plan PH2177.

### 2.3.4 Project area

The project area nomenclature used throughout this document refers to the 29,038 ha of land that has been subject to a variety of studies and surveys undertaken in the preparation of the referral and PER. It occurs across two properties, Kilclooney Station, Lot 3198 on Plan PH2177, and Seaview Station Lot 2 on Plan SP 205224. The project area is equivalent to the 'survey area' (ie. has the same boundary).

The project development footprint is located within the Kilclooney Station portion of the 'project area'.

## 2.4 PROJECT OVERVIEW

The project includes the construction, operation, and decommissioning of the Gawara Baya. The development elements are presented in Table 2-1.

Table 2-1: Development elements

Development element	Temporary disturbance: ~construction area	Operational disturbance: ~operational area
<p>Up to 69 wind turbine generators (WTGs) including construction hardstand (incorporating blade laydown areas) and rotor lift clearance areas.</p> <ul style="list-style-type: none"> <li>• For the purposes of assessment under the EPBC Act, it has been assumed that the WTGs can have a hub height of up to 200 m and a blade length of up to 100 m.</li> <li>• WTGs are currently anticipated to either have a: <ul style="list-style-type: none"> <li>○ hub height of 140 m and a blade length of approximately 82 m; or</li> <li>○ hub height of 148 m and a blade length of approximately 81 m.</li> </ul> </li> </ul>	2 ha per turbine	0.8 ha per turbine

Internal access roads, including: <ul style="list-style-type: none"> <li>• light vehicle access tracks</li> <li>• WTG access tracks</li> </ul>	100 km in length 10 m wide <sup>3</sup> 45-50 m wide	100 km in length 6 m wide <sup>3</sup> 8 m wide
Site offices and accommodation (for up to 300 personal), including: <ul style="list-style-type: none"> <li>• permanent operation and maintenance facility</li> <li>• transportable temporary accommodation buildings, each room fully self-contained</li> <li>• central kitchen</li> <li>• dining areas</li> <li>• laundry</li> <li>• car park facilities</li> </ul>	11.3 ha total	1 ha
Construction infrastructure, including: <ul style="list-style-type: none"> <li>• up to three concrete batching plants; and</li> <li>• temporary laydown areas</li> </ul>	12.6 ha total	0 ha
Up to three permanent meteorological / wind monitoring masts	3.4 ha total	3.4 ha total
Electrical infrastructure, including: <ul style="list-style-type: none"> <li>• collector substations</li> <li>• switchyard</li> <li>• 33kV underground electrical reticulation<sup>4</sup></li> <li>• 33kV overhead electrical transmission line and corridor</li> <li>• 275kV overhead electrical transmission line and corridor.</li> </ul>	158.8 ha total	18.9 ha total

Rehabilitation or restoration of temporary construction areas will be undertaken upon construction completion.

The Proposed Action, here in referred to as the project, has a total development footprint of 616.51 ha. The development footprint is shown within Figure 2-1.

<sup>3</sup> 4m wide within Sharman's rock wallaby key habitat area.

<sup>4</sup> Where practical, the underground 33kV reticulation will be placed adjacent to access tracks either within the 275 kV overhead transmission line corridor or alongside WTG access roads. The reticulation areas will be progressively restored and revegetated during operation of the wind farm. For further detail, please refer to the EMP at Appendix A.

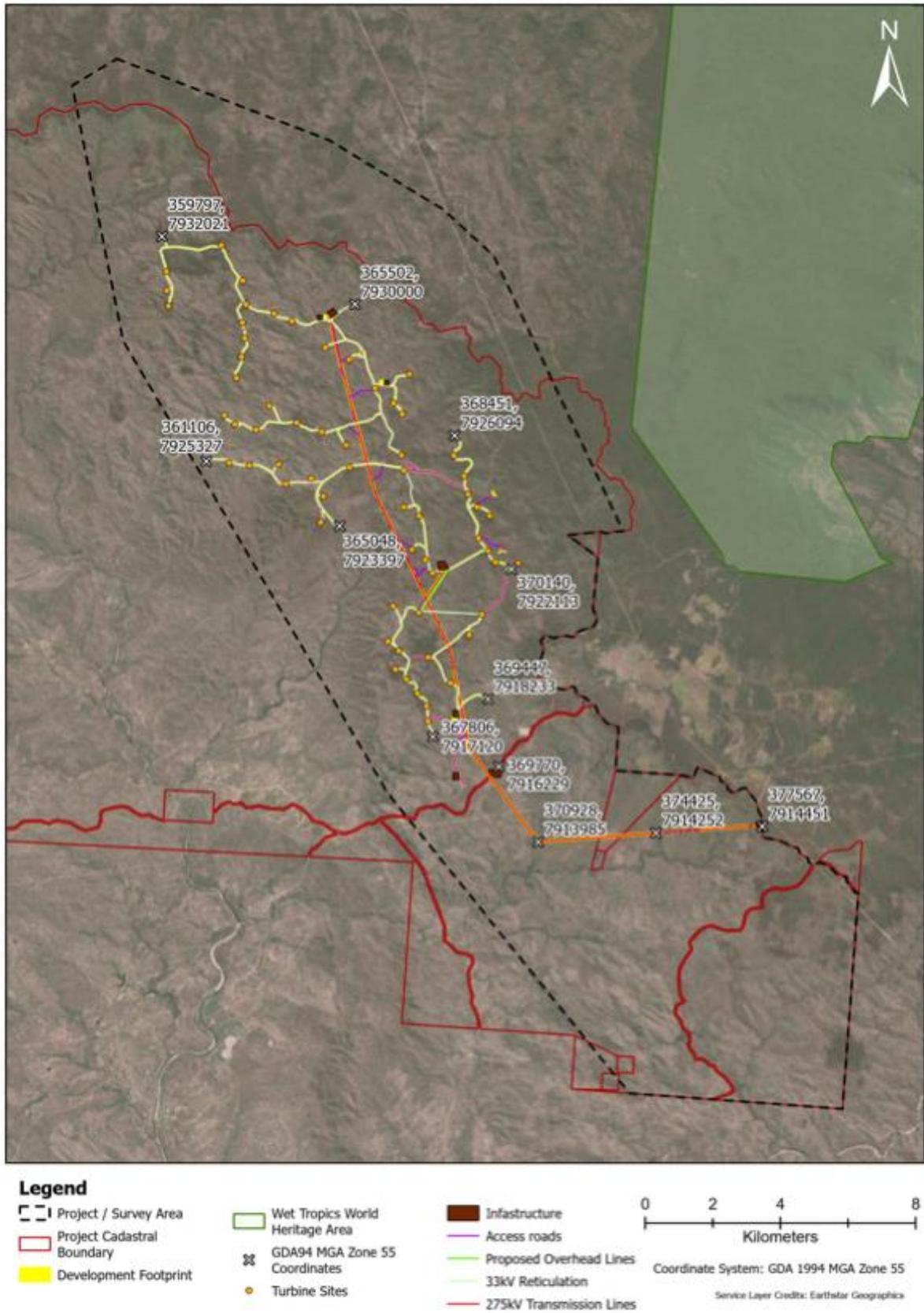


Figure 2-1: Development footprint

## 2.5 SCHEDULE

Construction of the project will be staged. The current program is provided in Table 2-2.

*Table 2-2: Schedule of works*

Commencement	Completion	Activities
Q2 2020	Ongoing	Monitoring
Q2 2024	Q3 2024	Site establishment and mobilisation
Q2 2024	Q4 2025	Civil construction
Q1 2025	Q4 2026	Electrical construction
Q4 2025	Q4 2026	WTG delivery and construction
Q2 2025	Q4 2027	Commissioning and testing
Q1 2027	Ongoing	Operation

## 2.6 WIND FARM CONSTRUCTION

Details of the main components of Gawara Baya, including turbine layout and dimensions, access roads, temporary and permanent infrastructure are outlined in Table 2-3 below.

*Table 2-3: Details of Wind Farm Construction*

Construction element	Brief description
Turbine details	69 wind turbines with maximum dimensions including: <ul style="list-style-type: none"> <li>• tip height of 300 m,</li> <li>• hub-height of 200 m,</li> <li>• rotor diameter of 200 m.</li> </ul>
Turbine location	Refer to Figure 2-1 Micro-siting is likely to occur at some locations due to environmental and/or geotechnical constraints Micro-siting will follow the constraints outlined in the following sub-plans– Fauna Management (see refer Section 7.1), Vegetation Management (see refer Section 7.2), Sharman’s sub-plan (refer Section 7.12) and Norther greater glider sub-plan (refer Section 7.13)
Access roads	Existing roads/tracks will be used as a preference, with additional access tracks of up to 71 km of heavy vehicle access roads and 29 km of light vehicle access tracks constructed  During construction, heavy vehicle access tracks will be 8 m wide. An additional 42 m may be required for drainage, reticulation, earthworks and construction activities – therefore, the roads will have a maximum clearing width of 50 m. Light vehicle access tracks will be a maximum width of 10 m  Tracks will be unsealed  Appropriate drainage structures will be installed as required

Construction element	Brief description
Crossings	New access tracks will cross waterways Where possible, all crossings will comply with the Code 'Accepted development requirements for operational work that is constructing or raising waterway barrier works'.
Crane hardstand	For construction, each turbine will require a hardstand, blade laydown area and rotor lift clearance with a footprint of approximately 2 ha This includes temporary storage, fire and safety buffers Hardstands (of approximately 0.8 ha) will be retained during operational life of wind farm
Turbine erection	Turbine components will be stored in temporary laydown areas (3) prior to erection Cranes will be used to install the turbines Tower erection usually takes 3-5 days per turbine
On-site laydown and concrete batching	Temporary laydown areas (3) will be used for material stockpiles, temporary storage of turbine components, some onsite assembly and fabrication, vehicle parking and truck deliveries Temporary concrete batching plants (3) may erected to supply concrete for turbine foundation Footprint of laydown areas and concrete batching areas will be approximately 12.6 ha total Material stockpiles will be managed via construction of sediment basins, silt fences, dust suppression and appropriate siting to mitigate any risk of contamination
Turbine foundations	Turbine foundation type will depend on geotechnical studies Suitable foundations are dependent on substrate type (soils to rock)
Site facilities	During construction there will be a number of site facilities: An accommodation camp to house up to 450 personnel, including: <ul style="list-style-type: none"> <li>• Transportable accommodation buildings, each room fully self-contained</li> <li>• Central kitchen, dining hall (dry mess), outdoor dining area (dry mess), laundry, gym</li> <li>• Car park facilities, including provision for 4 coach buses</li> </ul> Up to two compounds for construction, operations and maintenance purposes will also be constructed. Construction site offices and accommodation will be approximately 10.3 ha and the permanent operation and maintenance facility will be approximately 1 ha. Operation hours of the site will be during business hours, Monday to Friday. 24 hr access will be available in case of emergency maintenance
Underground reticulation	Wind turbines will be connected by predominantly underground transmission lines Collection strings will be connected to two 275 kV site sub-stations Connection will be into the national grid through a generator substation to constructed by Powerlink
Sub-station	The underground cabling will meet up to site substations
Other construction requirements	
Workforce	Expected to generate up to 300 jobs in the region during the construction period

Construction element	Brief description
	<p>Exact number of staff on site each day will vary with construction stage and element</p> <p>Daily shift normally 12 hours ~ 6.30am – 6.30pm. Night-time work will be very limited</p> <p>Will be accommodated onsite in an accommodation camp</p>
Power	Diesel generators will provide power to work site
Waste	<p>Existing approved municipal landfill services would be used to dispose of non-hazardous waste</p> <p>Hazardous waste quantities expected to be small, and will be removed from site and disposed of at approved facilities</p>
Transport and logistics	<p>Components for the project would be manufactured at a variety of locations around Australia and overseas</p> <p>Components delivered to the project area, predominantly from the Port of Townsville, via road, using the existing highway and road network</p> <p>Project area will be accessed via Charters Towers. No heavy vehicles will be required to traverse the Wet Tropics World Heritage Area</p> <p>Minor upgrades along the transport route will be required and are the responsibility of the main transport contractor</p>
Lighting	<p>No night-time work on the project is envisaged and lighting would not be required</p> <p>Specific requirements for lighting may arise at sites only as a safety requirement and will be kept to a minimum</p> <p>No aviation lighting is proposed on the wind turbines, as CASA considers the wind farm development unlikely to be a hazard to aviation safety</p> <p>Placement and orientation of lighting will be away from sensitive fauna habitats</p>
Fuel and dangerous goods / hazardous materials	<p>Diesel fuel would be required for construction equipment, sourced from local service stations or from larger regional centres where practicable</p> <p>On site fuel storage tanks would be fully lined and bunded and comply with AS-1940 and AS-1692</p> <p>Dangerous goods storage would be in designated areas and comply with AS-1940, Queensland <i>Dangerous Goods Safety Management Act 2001</i> and associated codes</p>
Fire management, emergency and incident response	<p>No controlled burning proposed</p> <p>Fire ignition risk from welding and other hot works, and risk of fires can increase with spread of weed species which can increase fuel load.</p> <p>Risks are addressed within sub-plans below</p> <p>Water trucks will be on-site to implement fire response measures</p>

## 2.7 WIND FARM COMMISSIONING

Commissioning of the Gawara Baya would involve:

- Testing of components
- Energisation (powering-on) of the plant
- Performance testing of the operating plant

A commissioning team would coordinate and undertake the above activities and at completion, hand over responsibility to operational staff. Commissioning is expected to take 3 months.

## 2.8 WIND FARM OPERATION

The Gawara Baya will supply energy to the national electricity grid by connecting into the into the Powerlink Guybal Munjin Switchyard at Mount Fox. The wind farm and associated facilities would be operated and maintained in accordance with relevant Australian Standard and industry guidelines.

Windlab Asset Management expects to have at least one staff member based in Upper Burdekin on an ongoing basis to manage the project. In total, including the staff of the operations and maintenance contractor there will be up to approximately 12 staff permanently based at the Upper Burdekin facilities.

On-going maintenance requirements for the wind farm include:

- Vegetation maintenance along powerlines and roads and around turbines and substation on an annual basis, likely in the early dry season
- Vegetation maintenance along powerlines within SRW key habitat areas will require inspections on a more frequent basis (likely quarterly). Generally, necessary maintenance will be done on the spot (unless there is a risk to health and safety due to the proximity to high voltage equipment).
- Grading/rolling of access tracks and hardstands and laydown areas as needed
- Scheduled maintenance of each turbine and ancillary equipment
- Regular maintenance of the electrical works would be included in the above.

The project is proactively planning rehabilitation in consideration of key threatened species present on site. A Preliminary Rehabilitation Plan has been developed for the project; this is located at Appendix C.

Windlab considers the current Preliminary Rehabilitation Plan represents best practice in the renewables sector. However, a detailed Rehabilitation Plan will be prepared prior to construction.

## 2.9 WIND FARM DECOMMISSIONING

The Gawara Baya will be designed with an operational life of 30 years and will be designed fit for purpose. With refurbishment, the wind farm may have a much longer operational life.

At the appropriate time, areas disturbed as part of the permanent footprint will be rehabilitated and the wind farm decommissioned consistent with the requirements of legislation, Australian Standards and industry practices at the time, and the land agreement requirements and regulatory authorities. At the appropriate time, a detailed decommissioning and rehabilitation plan will be prepared to guide these activities.

## 3 Environmental Management Framework

### 3.1 WINDLAB POLICY AND COMMITMENTS

The proponent does not have an environmental policy and planning framework. However, in conducting its core business of project development it leverages the experience of its parent companies, including Windlab Developments.

Windlab and its partner companies have separately developed, constructed and operated renewable energy projects across a number of jurisdictions in Australia, Africa, Asia, Europe and the Americas. Both Windlab and its partner companies work towards positive environmental outcomes consistent with regulatory requirements applicable in the relevant jurisdiction.

The construction of the Gawara Baya will be undertaken by a reputable contractor with a proven track record in environmental performance on similar projects. As part of the selection process for the site contractor, the bidding contractors will be required to provide the details of their corporation's environmental policy and environment management system, along with supporting evidence of its environmental performance for the past three years. For any notifiable environmental incidents recorded during that period the contractor will be required to provide details of the incident, the investigation report and actions taken to prevent recurrence.

### 3.2 STRUCTURE AND RESPONSIBILITY

The proponent will hold overall responsibility for environmental management and ensure adequate resources are provided for the implementation of the EMP. All staff are responsible for the environmental performance of their activities and for reporting any environmental hazards and incidents. Environmental responsibilities for staff are contained within position descriptions, relevant procedures and work instructions. Overarching environmental roles are described in Table 3-1 below.

The proponent intends to engage a Construction Contractor to build the project and individual contractors will be engaged for specific components of the build as required. Ensuring that the contractors understand and adhere to the environmental controls established for the project will be critical to achieving the performance objectives and targets established in the EMP. Adherence will be achieved by:

- Clearly identifying the respective responsibilities of the proponent and the Construction Contractor for the controls within each sub-plan included in the EMP
- Requiring, reviewing and approving the Construction Contractor's Construction Environmental Management Plan (CEMP) to ensure that the controls implemented by the Constructor through the CEMP are consistent with and support the overarching EMP for the project
- Ensuring clear line responsibility and supervision between proponent and the Construction Contractor
- Clearly identifying the environmental responsibilities for proponent staff and the Construction Contractor within position descriptions, relevant procedures and work instructions. The overarching roles of the Construction Contractor are set out in Table 3-1.
- Requiring the Construction Contractor to conduct regular inspections and record keeping against compliance with the EMP, coupled with proponent auditing of these arrangements.

Table 3-1: Key environmental responsibilities (note that one person may hold multiple roles)

Position title	Environmental Responsibilities
Directors of Windlab Developments Pty Ltd	<ul style="list-style-type: none"> <li>• Hold overall responsibility for environmental management</li> <li>• Review, understand, approve and support implementation of the EMP</li> <li>• Ensure adequate resources are provided for the implementation of the EMP</li> </ul>
Head of Windlab Asset Management	<ul style="list-style-type: none"> <li>• Ensure that environmental obligations are embedded into design, systems and processes for satisfying compliance and due diligence requirements</li> <li>• Ensure that proposed project additions and alterations obtain all necessary environmental approvals</li> <li>• Management of environmental emergencies</li> <li>• Oversee completion of emergency response exercises annually</li> <li>• Assess emergency response capabilities</li> <li>• Remediation of any contaminated sites (if applicable)</li> </ul>
Construction Manager (Windlab) and Construction Contractor	<ul style="list-style-type: none"> <li>• Conduct adequate project planning to ensure that construction may meet all design and schedule requirements specified within this plan</li> <li>• Ensure that the relevant environmental requirements are implemented and complied with in the design and construction of minor projects</li> <li>• Ensure that environmental approval processes are embedded within project construction systems</li> <li>• Ensure all necessary environmental approvals relevant to the project and area of responsibility are obtained</li> <li>• Ensure that project specific obligations/commitments are captured within the CEMP, and effectively implemented</li> <li>• Ensure that any ongoing obligations/commitments upon the completion of construction are identified, documented and handed over via the project handover process to operations staff</li> <li>• Ensure incident reporting protocols are followed and that the construction personnel report Events/Hazards and near misses</li> <li>• Respond to environmental incidents as required</li> </ul>
Construction Contractor	<ul style="list-style-type: none"> <li>• Facilitate day to day compliance with this plan</li> <li>• Ensure all construction personnel are aware of their obligations under this plan</li> <li>• Conduct regular inspections against compliance with this plan</li> <li>• Report on and respond to environmental non-compliances and events</li> <li>• Coordinate emergency response plan</li> </ul>
Compliance Manager (Windlab)	<ul style="list-style-type: none"> <li>• Monitor implementation of and compliance with this EMP and environmental risk assessment recommendations</li> <li>• Facilitate and monitor EMP Reviews</li> <li>• Review audits reports and monitor completion of required corrective actions</li> <li>• Report significant environmental non-compliances with EMP and legislation internally to the Executive Management Team and externally to regulatory authorities, as required</li> <li>• Ensure all environmental obligations are recorded and are kept current</li> </ul>
Senior Advisor Environment (Gawara Baya)	<ul style="list-style-type: none"> <li>• Identify changes during construction and update the EMP to address and manage any new environmental risks</li> <li>• Provide assistance and/or advice regarding implementation of the EMP and any other environmental management concern</li> <li>• Liaise with government agencies regarding environmental issues</li> </ul>

Position title	Environmental Responsibilities
	<ul style="list-style-type: none"> <li>• Assess environmental incidents to determine regulatory reporting requirements</li> <li>• Undertake planned external reporting</li> </ul>
Community Liaison Manager (Gawara Baya/Windlab)	<ul style="list-style-type: none"> <li>• Liaise with landholders, traditional owners, community representatives, contractors, councils, planning and local government authorities as well as utilities and infrastructure owners on land management and environmental matters as required</li> </ul>
Technical and Development Advisor (Gawara Baya/Windlab)	<ul style="list-style-type: none"> <li>• Facilitate the maintenance, implementation and ongoing improvement of training and induction programs</li> </ul>
HSE Manager (Construction contractor)	<ul style="list-style-type: none"> <li>• Responsible for investigating unexpected accidents, establishing their causes, and recommending preventive measures to avoid future occurrences</li> <li>• Responsible for ensuring that workplace equipment and tools meet industry standards</li> </ul>
All personnel	<ul style="list-style-type: none"> <li>• Read, understand and implement the control measures detailed within the CEMP, as appropriate</li> <li>• Report all observed non-compliances to a supervisor</li> <li>• Report all observed incidents, hazards and near misses</li> <li>• Continually seek to identify areas for improvement of environmental management and report these to the Senior Advisor Environment</li> </ul>

## 4 Summary of Environmental Values

### 4.1 PHYSICAL ENVIRONMENT

#### 4.1.1 Bioregion

The project area lies within two bioregions in north Queensland, the Wet Tropics (Bioregion 7) and the Einasleigh Uplands (Bioregion 9). Within the Wet Tropics portion, the project area occurs in the Paluma-Seaview subregion. The project area occurs across two subregions in the Einasleigh Uplands Bioregion: Herberton-Wairuna and Broken River.

The Wet Tropics bioregion is diverse, with vegetation ranging from rainforest, sclerophyll forests and woodlands to shrublands, heathlands and mangroves. The Einasleigh Uplands consists of rugged hills and ranges, dissected plateaus and alluvial and sand plains, ranging from 410 to 790 m above sea level. Vegetation is dominated by eucalypt woodlands.

#### 4.1.2 Climate

The Wet Tropics Bioregion receives very high rainfall, most of which falls over summer (the wet season). Mean annual rainfall ranges from approximately 4,000 mm along the coast to approximately 1,200 mm inland. The Einasleigh Uplands also receives most of its rainfall over the summer months. However, the mean annual rainfall is much lower than the Wet Tropics Bioregion, ranging from approximately 730 mm to 1,000 mm annually.

The nearest Bureau of Meteorology weather station to the project area is the Ingham Composite (032078), located close to the coast approximately 40 km to the north-west of the project area. A summary of climate statistics for this station is provided in Table 4-1 (BOM 2022a). The nearest rainfall gauge to the project area is Michael Creek Alert (032186), where the mean annual rainfall is 1,318.5 mm (BOM 2022b).

Table 4-1: Climate summary for Ingham Composite

Statistic	Average
Annual maximum temperature (°C)	29.3
Annual minimum temperature (°C)	19.0
Annual rainfall (mm)	2,180.1

#### 4.1.3 Soils, Geography, Topography

Twelve surface rock types occur in the project area, with granite being the dominant rock which forms more than half of the project area. Overall, rock formations across the project area are a combination of composite unit (dominantly stratified), intrusive unit and stratified unit (including volcanic and metamorphic). The most wide-spread rock type are:

- Granitoid
  - Cream to pink, medium to coarse-grained, predominantly equigranular biotite granite
  - Cream to grey, fine to medium-grained, seriate to abundantly porphyritic biotite granite; minor biotite-hornblende granite
- Sedimentary Rock

- Feldspathic to lithofeldspathic arenite and mudstone local polymictic conglomerate with limestone clasts, allochthonous limestone blocks
- Colluvium
  - Clay, silt, sand, gravel and soil; colluvial and residual deposits (generally on older land surfaces)
- Dioritoid
  - Grey, medium-grained, equigranular hornblende-biotite quartz diorite; some granodiorite and minor gabbro

Soils derived from project area geologies mapped at 1:2M (ASRIS, 2021) are tenosols (55% of the project area), kandosols (29.7%) and dermosols (15.2%); however, project area surveys detected the likely presence also of ferrosols in areas ground-truthed as land zone 8.

The topography varies from steep, deeply dissected hills with prominent granite tors in the north and east of the project area, to more gentle and less incised foothills in the west and areas of reasonably level ground in the south.

#### 4.1.4 Hydrology

The project area is traversed by numerous watercourses comprised of both minor drainage lines (stream order one) through to major watercourses (stream order five). The largest watercourse traversing the project area is Michael Creek (stream order five). The project area lies within two separate drainage basins, Burdekin Basin (associated with the Einasleigh Uplands) and Herbert Basin (associated with the Wet Tropics). The development footprint lies wholly within the Burdekin Basin.

## 4.2 BIOLOGICAL ENVIRONMENT

### 4.2.1 Vegetation

The project area is dominated by woodlands to open forests which are largely made up of various mixes of *Eucalyptus* and *Corymbia* species in remnant condition. Shrub layers of these woodlands are highly variable in density and dominated by *Acacia* species, ground layers are dominated by grasses. The Eastern portion of the project area contains prominent granite tors and rock pavements, and areas of *Melaleuca* swamp. Well-developed riparian woodland communities with *Casuarina cunninghamii* and *Melaleuca* species are present along major watercourses. Small areas of species rich vine thicket and simple notophyll vine forest are also present within the project area. Refer Vegetation Management sub-plan Section 7.2 for further information.

No flora species, listed as threatened under the EPBC Act or *Nature Conservation Act 1992* (Qld) (NC Act), have been located within the development footprint, or within the project area (refer Vegetation Management sub-plan Section 7.2).

### 4.2.2 Weeds

A number of weed species were recorded across the project area. Most are limited in extent and/or occur in low density (refer Weed management sub-plan Section 7.3).

### 4.2.3 Threatened and Migratory Fauna

The project area has habitat values for a range of native bird, reptile, and mammal species. Open forests and woodlands dominate the project area and provide habitat for woodland birds. Hollow bearing trees of various sizes throughout the project area provide habitat for various arboreal mammals and microbats, including the threatened northern greater glider. Boulders provide habitat

for various mammals and reptile species, including Sharman's rock-wallaby. Refer Fauna Management sub-plan Section 7.1 for further information.

#### 4.2.4 Introduced Fauna

Eight introduced fauna species have been observed within the project area. Of these, the following are of special concern due to known impacts on native fauna:

- Wild dogs (*Canis familiaris*)
- Cats (*Felis catus*)
- Cane toads (*Bufo marinus*)
- Pigs (*Sus scrofa*).

Refer Feral predator sub-plan (Section 7.11) for further information.

#### 4.2.5 Bushfires

The project area has been subject to a number of bushfires of the past decade<sup>5</sup>. Qld government State Planning Policy Interactive mapping identifies the majority of the project area as a Bushfire Prone Area - Medium Potential Intensity Bushfire Intensity, with numerous smaller areas of High and Very Potential Bushfire Intensity.

#### 4.2.6 Protected Areas

The project area lies to the west of the Wet Tropics of Queensland World Heritage Area (Wet Tropics); the separation distance is approximately 5 km between the Wet Tropics and the closest part of the development footprint. The project area is adjacent to part of Lannercost State Forest and Girringun National Park (Mount Fox section). It is also approximately 1.7 km from the main section of Girringun National Park, and 23 km from Paluma National Park and Paluma State Forest (to the east). These protected areas hold a significant amount of remnant vegetation within the landscape.

#### 4.2.7 Connectivity

The project area is predominantly covered by remnant vegetation and contains large tracts of well-connected native vegetation. The combined area of Range View Nature Reserve, Lannercost State Forest and Girringun National Park (part of the Wet Tropics World Heritage Area located approximately 5 km east of development footprint at its closest point) provides an important wildlife corridor within the regional landscape. The project area is broadly connected to surrounding landscapes and vegetation by a state-mapped remnant corridor (state regional ecosystem mapping v13), which is situated in a north to south alignment throughout the project area.

### 4.3 SOCIAL ENVIRONMENT

#### 4.3.1 Gugu Badhun People

On 22 March 2005 the Gugu Badhun People were awarded Native Title over the land on which the project will occur. The Gawara Baya proposed development area is wholly contained within the Gugu Badhun Native Title Determination and within leasehold Lot 3198 on Crown Plan PH2177.

In February 2022, Windlab and the Gugu Badhun People executed an Indigenous Land Use Agreement (ILUA) and Ancillary Agreement for the project. The ILUA formalised Windlab's commitments to

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<sup>5</sup> <https://firenorth.org.au/nafi3>

supporting Cultural Heritage, active land management and practices by Traditional Owners. A Cultural Heritage Management Agreement (CHMA) was executed on 9 June 2020, providing for an agreed framework for surveys, monitoring, and mitigation measures.

The ILUA is the culmination of three years' in-depth collaboration and consultation with the Gugu Badhun People, and establishes a strong framework supporting the delivery of meaningful environmental protection, employment, education and training, and enterprise outcomes for Traditional Owners for the life of the Project. In this way, the partnership with the Gugu Badhun ensure Traditional Owners have opportunities to shape the direction of renewable energy developments on Country.

As part of the ILUA a Liaison Officer from the Gugu Badhun People will be employed post-approval to assist in the delivery of cultural heritage training and to ensure the Gugu Badhun People are kept updated on the progression of the project. The Liaison Officer position will facilitate communications between Windlab and Gugu Badhun People to ensure robust ongoing communication and engagement throughout the life of the project.

Additionally, in May 2023, the Gugu Badhun People officially named the project in language meaning 'Wind Song' and will design artwork for three of the project's turbine towers.

The Gugu Badhun provided input on the project layout throughout the development process, and the proponent commits to continuing to consult and partner with the Gugu Badhun throughout the life of the project.

#### 4.3.2 Current Land Use

As stated above, at Section 2.2, the project area is a 51,824 ha working property currently used for commercial cattle grazing. Limited pasture improvement or land clearing having occurred to date. The project area is being managed consistent with an operating pastoral enterprise with limited pest and weed control being undertaken.

#### 4.3.3 Mt Fox Community

The proponent has adopted a bespoke and targeted consultation and engagement program by recognising the broad regional stakeholder base, tailored to the varied interests and opportunities identified by stakeholders during early consultation. Stakeholder groups that participated in early consultation and project engagement program included Landholder, Traditional Owners, Mount Fox community, Local Government Area officials, regional economic development organisations, and conservation and activist groups.

The primary objective for the consultation and engagement program was to establish strategic relationships for the life of the project, share pertinent project information and provide genuine opportunities for stakeholders to participate in the development process by providing feedback on the project design, management initiatives, options and alternatives. Close-loop communication was key throughout the consultation process, with continuous feedback provided to stakeholders around how their input had informed project decisions and initiatives as well as ongoing engagement and communication activities.

Further details of the consultation and engagement that has occurred for the project can be found in the Consultation and Engagement Report at Appendix C to the PER and at Attachment 5 to the response to SARA's Further Advice Notice dated 3 April 2023.

## 5 Risk Assessment

### 5.1 METHOD

A risk assessment for the project was undertaken to identify the potential impacts with a greater environmental risk and where assessment and management controls should be focussed. Through undertaking a risk assessment, proposed measures can be evaluated as to their expected or predicted effectiveness.

The risk assessment was undertaken using a systematic risk-based approach based on international best practice standards, including:

- AS/NZS ISO 31000:2009: Risk management - Principles and Guidelines (Standard).
- HB 158:2010: Delivering assurance based on ISO 31000:2009 Risk management – Principles and Guidelines (Handbook).
- HB 203:2012: Managing environment-related risk (Handbook).
- HB 436:2004: Risk Management Guidelines Companion to AS/NZS 4360:2004 (Handbook).

The risk assessment is depicted conceptually in Figure 5-1.

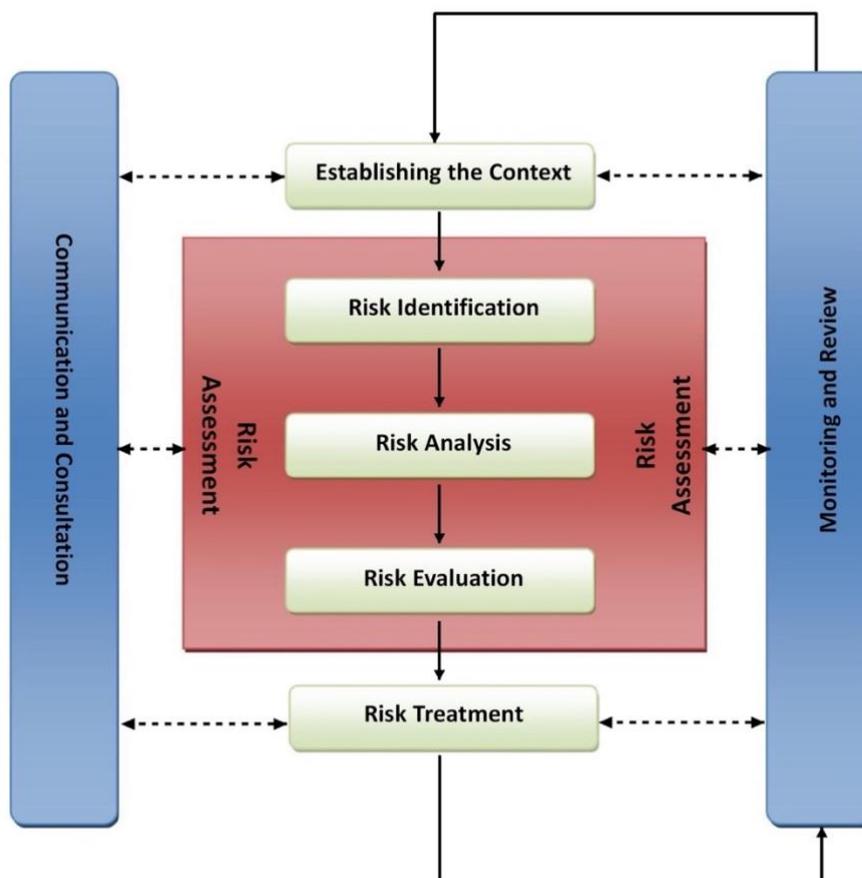


Figure 5-1: Risk assessment process

The risk assessments were conducted collaboratively between the consultants (2rog Consulting) and Windlab to identify the objectives, scope and risk criteria for the project.

The scope of the risk assessment included all activities directly related to the construction, operation and decommissioning of the project. Environmental activities<sup>6</sup> relevant to the project and considered in the risk assessment were:

- Vegetation clearing
- Excavation
- Vehicle movements
- Fire ignition
- Spills and leaks
- Dust emissions
- Light emissions
- Noise and vibration emissions
- Changes to water surface hydrology (including sedimentation and erosion)
- Weed and pest incursion
- Waste deposition
- Physical presence of infrastructure
- Increased human presence (including waste and domestic pets).

The risk ratings were determined for each combination of environmental receptor and project activity, using the definitions of consequence and likelihood detailed in Appendix B and applying the risk matrix (Table 5-1).

Table 5-1: Risk matrix

		Consequence	1	2	3	4	5
			Trivial	Minor	Severe	Major	Catastrophic
Likelihood	A	Almost Certain	Low	Intermediate	High	Extreme	Extreme
	B	Likely	Low	Low	Intermediate	High	Extreme
	C	Possible	Negligible	Low	Intermediate	High	High
	D	Unlikely	Negligible	Negligible	Low	Intermediate	High
	E	Rare	Negligible	Negligible	Negligible	Low	Intermediate

<sup>6</sup> Risks from turbine blades, collision and barotrauma, are addressed within the Bird and Bat Management Plan.

Inherent risk ratings were determined with the assumption that minimum standards would be met without the implementation of additional management controls or risk assessment. Minimum standards would include compliance with legislative and corporate requirements or with operating practices commonly used for construction and operation of wind farm in Australia. Knowledge of the likely occurrence of flora and fauna species (particularly threatened species) was addressed in the initial (pre-mitigation) risk assessment.

Management controls relevant to each inherent risk were identified, applying the management response criteria (Table 5-2) and particularly focussing on those inherent risks rated as 'intermediate' and above. Standard controls employed by the proponent in their other operations were applied initially to determine initial residual risk ratings. These ratings were further informed by impact analysis and specific project controls developed within the EMP. The ratings were revised iteratively to reduce the residual risks to as low as reasonably possible.

*Table 5-2: Risk rating, risk class and associated risk management response*

Rating	Risk management response
Extreme	Risks that significantly exceed the risk acceptance threshold and need urgent and immediate attention. Modify the threat, likelihood or consequence so that the risk is reduced to 'Intermediate' or lower.
High	Risks that exceed the risk acceptance threshold and require proactive management. Modify the threat, likelihood or consequence so that the risk is reduced to 'Intermediate' or lower.
Intermediate	Risks that lie on the risk acceptance threshold and require active monitoring. The implementation of additional measures could be used to reduce the risk further. Modify the threat, the likelihood or consequence to reduce the risk to 'Low' or 'Negligible' if practicable
Low	Determine the management plan for the threat to prevent occurrence and monitor changes that could affect the classification.
Negligible	Review at the next review interval Manage by routine procedures – reassess at the next review

Further details of the risk assessment methodology, and the mitigated and unmitigated risk rankings are provided in a risk register at Appendix B.

## 5.2 OUTCOMES

Outcomes of the risk assessment are provided in Appendix B. Inherent risks were highest for vegetation clearing and bushfire. Vegetation clearing has the potential to result in severe consequences for threatened species if left unmanaged. Unmanaged vegetation clearing can result in over clearing, soil erosion and sedimentation of waterways, injury and mortality to fauna, and significant degradation of habitat. If bushfires start and cannot be contained, they are likely to have widespread regional effects, due to the large areas of remnant vegetation surrounding the project area.

With the application of the management controls, the residual risk of impacts from potential impacts from bushfire was reduced to low. However, vegetation clearance retained a residual risk of intermediate for terrestrial fauna. As per Table 5-2 above, this means they lie on the risk acceptance threshold and require active monitoring.

These impacts are considered to have intermediate residual risk because:

- Even with the application of appropriate controls, terrestrial fauna habitats may be disturbed, lost and/or degraded via vegetation clearance
- Pre-clearance searches of threatened species habitats may not be 100% effective in removing animals from the clearing area prior to impacts.

These outcomes have been factored into the relevant sub-plans below. Extra vigilance and awareness of these risks is required by all staff working on the project.

## 6 'S.M.A.R.T' Principle

All proposed mitigation and management measures have been drafted to meet the 'S.M.A.R.T' principle:

- S – Specific
- M – Measurable
- A – Achievable
- R – Relevant
- T – Time-bound

This ensures that management objectives are clear and effective. The EMP has been broken down into sub-plans to specifically address each of the environmental values and potential impacts identified by the risk assessment. Control measures have been explicitly set out in each sub-plan specific to each activity or impact. Where species are directly impacted, species specific mitigation measures have been outlined. Sub-plans have been broken down to include management and mitigation measures for different stages of the development. This ensures that the EMP objectives remain relevant throughout the project timeline.

Each sub-plan has set management objectives which are outlined in the relevant sections below. These objectives have set targets and associated measurement criteria so that the performance of the management plan can be assessed.

An adaptive management approach will be taken to ensure that management objectives are achieved. This involves ongoing evaluation of this EMP against project performance criteria, environmental policies, objectives and targets, and will allow for continuous improvement of this management plan and an overall improvement in outcomes for native vegetation and native fauna. This plan will be reviewed periodically and updated where necessary, to incorporate best practice mitigation measures as the wind farm industry develops in Australia, and more relevantly in far-north Queensland where the project area is located.

The review process will enable:

- Identification of areas for improvement
- Investigation into non-conformances or deficiencies
- Implement corrective actions to address non-conformances or deficiencies
- Investigation into the effectiveness of previous corrective actions
- Document procedural changes.

As part of the adaptive management approach, each sub-plan has detailed monitoring and reporting requirements. These are time-specific, identify the person responsible for monitoring and recording, and are set out to measure the success of management actions and identify the need for corrective actions to be implemented. For each of these sub-plans measurable triggers are set out to accompany monitoring and recording requirements. Corrective actions and contingencies have been specified for each of these triggers to ensure that management objectives remain on target.

## 7 Environmental Management – Construction

The environmental management strategy for the construction phase of the Gawara Baya project includes a series of management sub-plans.

Additionally, a preliminary Rehabilitation Plan has been prepared for the project to identify rehabilitation and restoration activities for key threatened species present on site. The Rehabilitation Plan is located at Appendix C.

### 7.1 FAUNA MANAGEMENT SUB-PLAN

#### 7.1.1 Overview of ecological surveys

Numerous ecological investigations and surveys of the project area have been undertaken over a period of several years. An overview of surveys undertaken, and their primary purpose is outlined in Table 7-1. Ecological investigations are discussed in detail in:

- the PER at Section 2: Existing Environment and MNES. Ecological survey reports are also provided as Appendices E to G of the PER.
- the development application at Appendix I Ecological Impact Report, Section 2: Existing Environment. Ecological survey reports are also provided as Appendices A to D of the Ecological Impact Report.

These reports also include fauna habitat mapping and locations where species have been recorded where relevant.

Table 7-1: Overview of field surveys

Date	Survey	Purpose
September 2019 (late dry/early wet season)  July 2020 (dry season)	Baseline field survey of project area	Gather baseline information on ecological value to inform design and environmental impact assessment. Surveys involved: <ul style="list-style-type: none"> <li>• Desktop investigation (identify Commonwealth and State ecological values potentially present)</li> <li>• Targeted fauna surveys</li> <li>• Targeted flora and vegetation community surveys</li> <li>• General habitat assessments</li> </ul>
October 2019	LiDAR assessment	To refine constraints mapping and inform targeted field survey for July 2020 early dry season survey
March – May 2022 (wet season)	Additional baseline field survey focusing on impact area	Additional baseline studies in impact area including: <ul style="list-style-type: none"> <li>• Contemporary desktop investigation prior to field survey</li> <li>• Targeted searches for threatened flora</li> <li>• Vegetation community and RE surveys</li> <li>• Targeted habitat assessments</li> <li>• Targeted fauna surveys</li> </ul>
March / April 2022 (wet season)	Bird Utilisation Survey (BUS) White-throated needletail survey	Focussed on gathering site-specific data to inform Bird and Bat Management Plan and bird and bat risk assessment. Surveys timed to occur during peak

Date	Survey	Purpose
	Red goshawk survey Roaming bird survey Microbat survey	migratory bird movement patterns (white-throated needletail and fork-tailed swift). Survey design informed by results of previous ecological studies.
May 2022	BioCondition Survey	BioCondition surveys within development footprint to inform offsets planning and calculations
August / September 2022	Bird Utilisation Survey (BUS) Red goshawk survey Roaming bird survey Microbat survey Masked owl survey	Focused on gathering site-specific data to inform Bird and Bat Management Plan and bird and bat risk assessment.
December 2022 and February/March 2023	Bird Utilisation Survey (BUS) White-throated needletail roosting Microbat survey	
Early-mid January 2023	Preliminary magnificent brood frog (MBF) habitat survey	Reconnaissance to round-truth MBF mapped habitat
Late January/early February 2023	MBF surveys	Targeted field surveys for MBF in potential habitat

Table 7-2 outlines species listed as threatened or migratory under the EPBC Act or NC Act are known or have the potential to occur within the Gawara Baya project area, based on the findings of the ecological surveys.

Table 7-2: Threatened and migratory fauna species potentially occurring in the project area

Species	NC Act Conservation Status	EPBC Act Conservation status	Presence in project area
<b>Marsupials</b>			
Sharman's rock-wallaby	Vulnerable	Vulnerable	Known
Koala	Endangered	Endangered <sup>7</sup>	Known
Northern greater glider	Vulnerable	Vulnerable	Known
<b>Flying-foxes</b>			
Spectacled flying-fox	Endangered	Endangered	Known
Grey-headed flying-fox	Least concern	Vulnerable	Potential
<b>Microbats</b>			
Greater large-eared horseshoe bat	Vulnerable	Vulnerable	Known
Bare-rumped sheathtail bat	Endangered	Vulnerable	Known

<sup>7</sup> Vulnerable at the time of Referral

Species	NC Act Conservation Status	EPBC Act Conservation status	Presence in project area
Diadem leaf-nosed bat	Near Threatened	Not listed	Known
<b>Reptiles</b>			
Atherton delma	Near Threatened	Vulnerable	Potential to occur in the project area
<b>Amphibians</b>			
Magnificent brood frog	Vulnerable	Vulnerable	Known to occur in project area. Not recorded within or near to development footprint
<b>Birds</b>			
Red goshawk	Endangered	Vulnerable	Known
Masked owl	Vulnerable	Vulnerable	Known
White-throated needletail	Vulnerable	Vulnerable Migratory	Known
Southern cassowary	Endangered	Endangered	Potential to occur in project area
Glossy black cockatoo	Vulnerable	Not listed	Potential to occur
<b>Migratory species</b>			
Fork-tailed swift	Special Least Concern	Migratory	Known
Latham's snipe	Special Least Concern	Migratory	Potential to occur in the project area, unlikely to occur in development footprint
Oriental cuckoo	Special Least Concern	Migratory	Known
Barn swallow	Special Least Concern	Migratory	Potential
Black-faced monarch	Special Least Concern	Migratory	Potential to occur in the project area, unlikely to occur in development footprint
Spectacled monarch	Special Least Concern	Migratory	Known
Satin flycatcher	Special Least Concern	Migratory	Known
Rufous fantail	Special Least Concern	Migratory	Known
Eastern osprey	Special Least Concern	Migratory	Known

### 7.1.2 Fauna assemblages

A total of 52 fauna species were recorded in the project area (ELA 2020, 2022; NA 2022a, 2022b, 2022c, E2M 2023). The potential threats to these species by the proposed wind farm development differ between species, depending on their behaviour and habitat. Fauna assemblages are provided in Table 7-3.

*Table 7-3: Fauna assemblages within the Gawara Baya project area*

Assemblage	Observations
Terrestrial mammals	Sixteen species identified, including several small mammal species, eight macropod species and one monotreme. Conservation significant terrestrial mammals that were recorded included the threatened Sharman's rock wallaby and the special least-concern short-beaked echidna.
Arboreal mammals	Six arboreal mammals were detected, including the threatened species Koala and northern greater glider.
Reptiles	Twelve reptile species were observed on an incidental basis and included lizards, snakes and turtles.
Amphibians	Six amphibian species were observed throughout the survey area.
Pest fauna	Eight exotic fauna species were observed throughout the survey area. A high presence of feral predators such as cats and dogs were detected on remote cameras, with wild dogs also detected in acoustic recordings.

### 7.1.3 Fauna habitat

Eight broad habitat types were identified within the development footprint (ELA 2022) including:

- Riparian forest (hollow bearing trees, watering point and aquatic habitat, koala habitat)
- Very open woodland on metamorphic rock (koala habitat, infrequent hollow-bearing trees)
- Very open woodland on basalt plains and low hills (koala habitat, infrequent hollow-bearing trees)
- Open woodland to open forest on granite, basalt and tertiary surfaces (boulders and crevices, koala and northern greater glider food trees, large hollows, fruiting species)
- Open forest to woodlands on uplands (*Allocasuarina sp.* stands, dense understorey, boulders)
- Rock pavement (stacked boulders, crevices)
- Open forest with *Allocasuarina spp.* (stands of allocasuarina, denning habitat).

Five additional broad habitat types were identified during within the broader project area. However, these areas were found not to exist within the development footprint. These broad habitat types are:

- Floodplain
- Tussock grassland
- Simple or notophyll vine forest (rainforest) (fruiting trees, water source and aquatic habitat)
- Vine thicket (dense vegetation and rock crevices, fruiting trees)
- Melaleuca swamps (aquatic habitat, arboreal foraging habitat).

### 7.1.4 Potential impacts

Construction activities have the potential to impact on fauna through:

- Clearing and earthworks for construction, including in sensitive habitats (e.g. denning, roosting and foraging habitats)
- Open trench excavations for underground cabling
- Increased vehicle movement associated with construction of the wind farm
- Fire ignition
- Introduction and spread of weeds and pest species
- Spills of hydrocarbons, hazardous materials or wastewater discharges
- Pollution of waterways from sediment run-off
- Noise, dust and vibration impacts.

Construction activities may result in the following impacts on terrestrial fauna, arboreal fauna that require some movement along the ground, and avifauna that rely on cover from dense understorey:

- Direct loss, degradation or fragmentation of fauna habitat (refer Table 7-4 for Broad habitats to be cleared)
- Fauna injury or mortality from vehicle strike or entrapment
- Introduction or spread of weeds or pest species.

Table 7-4: Extent of broad habitat types within development footprint (ha)

Broad Habitat Type	Broad Habitat (ha) in the Survey Area	Broad Habitat (ha) in Development Footprint
Floodplain	48.24	3.51
Open forest to woodlands on uploads	3981.58	16.57
Open forest with Allocuarina spp. Dominant or co-dominant in the canopy	124.16	0.77
Open woodlands on basalt plains	1356.99	62.26
Open woodlands on open forest on granite or Tertiary surfaces	19115.16	461.45
Riparian forest	620.54	4.29
Rock pavement	437.12	0
Simple or notophyll vine forest	2.61	0
Tussock grassland	3.83	0
Very open woodland on metamorphics and low hills	3336.11	55.68
Vine thicket	6.65	0
Woodland on lateritised surface	125.21	9.79
Melaleuca swamps	2.7	0

### 7.1.5 Management objectives

Environmental targets and performance indicators have been prescribed in line with fauna and habitat management objectives for the project and are identified in Table 7-5.

Table 7-5: Terrestrial fauna performance management

Issue	Objective	Target	Measurement Criteria
Direct fauna impacts	To minimise the direct impacts on fauna through impacts with vehicles, entrapment in excavation works, or extraordinary exposure to predators.	<ul style="list-style-type: none"> <li>No deaths of conservation significant fauna<sup>8</sup> as a consequence of construction activities.</li> </ul>	<ul style="list-style-type: none"> <li>Environmental Incident Reports for fauna encounters.</li> <li>Daily fauna clearance reports (whilst works occurring in habitat areas).</li> <li>No incidents of vehicle speeds exceeded on access roads.</li> </ul>

<sup>8</sup> Fauna listed as threatened or migratory under the NC Act or EPBC Act

Issue	Objective	Target	Measurement Criteria
Fauna habitat decline	To minimise the temporary and permanent reduction or degradation of existing fauna habitat.	<ul style="list-style-type: none"> <li>Total area of threatened fauna habitat cleared by completion of construction shall not exceed areas approved within the EPBC Act and State approval conditions</li> <li>There will be no ongoing decline in condition of surrounding habitat areas during construction.</li> </ul>	<ul style="list-style-type: none"> <li>All activities undertaken within the boundaries of the approved project area and limits of the native vegetation clearing permits and EPBC approval.</li> <li>Conformance with the conditions of the native vegetation clearing permit and EPBC approval.</li> </ul>

### 7.1.6 Management measures

A range of control measures to reduce the potential for impacts on terrestrial fauna and fauna habitat are provided in Table 7-6.

*Table 7-6: Measures that will be implemented to avoid and manage impacts from construction and activities*

Parameter	Control measures	Responsibility
General	<ul style="list-style-type: none"> <li>All staff will attend site inductions prior to commencing works and daily toolbox talks. The site inductions and Toolbox talks will include environmental requirements, notices and special attention areas. All environmental requirements, risks and measures will also be reflected in the relevant safe work methods statement (SWMS)</li> <li>Smoking will be prohibited on site.</li> </ul>	Construction contractor
Feral predators	<ul style="list-style-type: none"> <li>Pets including dogs will be prohibited on site</li> <li>Feeding of wild dogs and feral cats is prohibited</li> <li>Manage pits and trenches to prevent entrapment (refer Open trench excavations, refer below).</li> <li>Refer Feral predator control sub-plan Section 7.11</li> </ul>	Construction contractor
Habitat loss	<ul style="list-style-type: none"> <li>Access tracks to be aligned with existing cleared areas where possible</li> <li>Micro-siting of infrastructure will prioritise the use of already cleared or disturbed areas, in preference of vegetated areas</li> <li>To reduce impacts to threatened species by retaining vegetation and/or canopy cover, the proposed 275kV overhead transmission line will be constructed by: <ul style="list-style-type: none"> <li>selectively placing transmission line towers in less vegetated areas or in areas of lower ecological value;</li> <li>utilising taller towers so that the existing canopy can be retained where feasible in Sharman's rock wallaby key breeding habitat, subject to detailed design;</li> <li>reducing vegetation clearing where feasible, subject to detailed design;</li> <li>maintaining vegetation (including canopy trees) where the transmission line crosses a major riparian zone (e.g., Douglas Creek and Michael Creek), subject to detailed design.</li> </ul> </li> </ul>	Construction contractor

Parameter	Control measures	Responsibility
	<ul style="list-style-type: none"> <li>• For additional information, see section 7.1.7</li> <li>• Vegetation clearing is only permitted in approved areas and within approved disturbance limits</li> <li>• The extent of vegetation clearing will be clearly marked on construction plans and in the field prior to clearing commencing to ensure only approved vegetation is cleared</li> <li>• No go zones and areas of high conservation significance will be marked with high visibility fencing or flagging. Identification of such areas, will be undertaken by a suitably qualified ecologist or fauna spotter-catcher</li> <li>• If works occur outside the approved area, an incident investigation will be undertaken as soon as possible, and appropriate controls instated in response</li> </ul>	
Fencing	<ul style="list-style-type: none"> <li>• Where possible, fencing shall be erected to align with the Tree Protection Zones of trees to be retained (refer AS 4970-2009 <i>Protection of Trees on Development Sites</i>)</li> <li>• Vehicle movement and storage of machinery to be excluded from Tree Protection Zones of vegetation to be retained</li> <li>• Any fencing or flagging material must be maintained in good condition and replaced as soon as practical if damaged/removed to reduce the potential for accidental clearing</li> <li>• All fencing must be fauna friendly<sup>9</sup> unless specifically erected to exclude fauna from trenches/pits etc</li> </ul>	Construction contractor
Watercourses	<ul style="list-style-type: none"> <li>• Where infrastructure must cross waterways, areas of existing disturbance (i.e. existing tracks) have been selected. Where this is not practical, vegetation clearing will be minimised as much as practicable (targeting 10 – 20 m clearing widths) and large habitat trees will be preferentially retained</li> <li>• Refer Soils and Sediment sub-plan (Section 7.5), install culverts early in construction period at major waterway crossings, and drainage pipes at all minor water crossings to maintain natural flow.</li> <li>• Construction areas will be stabilised as soon as practicable after installation and restored in accordance with the Rehabilitation Plan at Appendix C.</li> </ul>	Construction contractor
Vegetation clearing	<ul style="list-style-type: none"> <li>• Clearing boundaries to be identified on plan and GIS data provide to contractors</li> <li>• Fauna spotter-catchers and/or suitably qualified ecologist (inc. qualified koala spotter) will be present during all clearing. This will involve pre-clearance searching of key habitat areas (e.g. hollow bearing trees, rock piles, large logs) prior to clearing and relocating any fauna to a suitable and safe relocation area</li> <li>• Wherever possible, key fauna habitat features will be retained including hollow bearing trees (especially in habitat for northern greater glider, masked owl, and greater large-eared horseshoe bat habitat) and logs and coarse woody debris (as close to felling location as possible, without presenting a safety or fire risk)</li> <li>• Sequential clearing of native vegetation to minimise impacts to native fauna species during clearing process. This includes clearing towards adjacent habitats to encourage movement to these areas</li> </ul>	Construction contractor

<sup>9</sup> Does not inhibit the movement of wildlife. Refer <http://www.lfwseq.org.au/wp-content/uploads/2017/02/Wildlife-Friendly-Fencing-and-Netting.pdf>

Parameter	Control measures	Responsibility
	<p>and retaining large, canopy trees until second phase. The procedure will be outlined in the Construction Environmental Management Plan (CEMP)</p> <ul style="list-style-type: none"> <li>• Cleared vegetation (including topsoil) must not be located within the dripline of retained trees, pushed up or stored against fences/flagging or within 50 m of waterways</li> <li>• Any cleared vegetation stockpiled for more than 24 hours should be inspected for sheltering fauna, by fauna spotter prior to moving and/or mulching</li> <li>• Delay disturbance of ground covers (grasses, fallen leaves, and mulches) until the last practical moment</li> </ul>	
Temporary clearing	<ul style="list-style-type: none"> <li>• Revegetation of temporary construction areas will be undertaken sequentially and as soon as possible after the completion of works (refer Rehabilitation plan)</li> </ul>	
Vehicle movement and operation of machinery	<ul style="list-style-type: none"> <li>• All machinery will be inspected daily prior to use for sheltering fauna</li> <li>• Access tracks will be appropriately designed to cater for the size of vehicle required</li> <li>• Unauthorised off-road driving will be prohibited</li> <li>• Speed limits will be imposed on all vehicles travelling on internal access tracks to minimise the risk of fauna strike</li> <li>• Where there is an identified occupied Sharman's rock wallaby rock cluster within 500m of construction activities, construction will be scheduled outside of dusk hours where practical to minimise disturbance to the wallaby and other foraging fauna species. Please refer to Section 7.1.7 for further information. <sup>10</sup></li> <li>• Roadkill will be dragged at least 10 m sideways, away from the edge of the track where possible to prevent vehicle strike of birds (or other fauna) that feed on the roadkill</li> <li>• All injured wildlife will be managed using the injured fauna protocol (see Appendix A: Injured animal Protocol)</li> </ul>	Construction contractor
Open trench excavations	<ul style="list-style-type: none"> <li>• Trench excavations will be backfilled as soon as possible</li> <li>• Trench excavations will be fenced to prevent fauna entry</li> <li>• Fauna spotter catchers will inspect trenches a minimum of twice daily (more on hot days) and release any fauna that are trapped in a safe and suitable relocation area</li> <li>• Open excavations will contain fauna escape structures – such as fauna ladders, ramps or benching dug into the side of the excavation, and shelters (e.g., hessian sacks) for fauna that cannot self-disperse out of the excavation</li> <li>• Trench covers will be used during rainfall periods to minimise the risk of pooling water attracting cane toad breeding.</li> </ul>	Construction contractor
Habitat disturbance via light, noise and vibration	<ul style="list-style-type: none"> <li>• Site lighting will be kept to the minimum required for safety (incl. security). Placement and orientation of lighting will be away from sensitive fauna habitats</li> <li>• Direction of lighting beams will be downwards or shields/baffles used to minimise light spill into habitat area</li> <li>• All vehicles must comply with maintenance schedules and standard operational requirements to minimise noise impacts</li> <li>• All vehicles and machinery will be switched off when not in use</li> </ul>	Construction contractor

<sup>10</sup> Being approximately 4pm – 4:30pm. Please note that some activities will recommence after dark (at approximately 9pm)..

Parameter	Control measures	Responsibility
	<ul style="list-style-type: none"> <li>Major machinery movement will be limited to daytime hours (as far as practical) to avoid disturbance to nocturnal species</li> <li>High intensity construction activities (eg. clearing and excavation) will be scheduled to occur during daylight hours to minimise disturbance to foraging species.</li> </ul>	
Habitat degradation from compaction, dust, run-off & sedimentation, spills, weeds	<ul style="list-style-type: none"> <li>The Site-specific Erosion and Sediment Control Plan will be developed and implemented (refer Soils and Sediment sub-plan)</li> <li>The Hazardous Materials Spill Response Management sub-plan will be implemented</li> <li>The Site-specific Weed Management Plan will be developed and implemented (refer Weed Management sub-plan)</li> <li>All vehicles will stay on designated tracks</li> <li>Dust suppression will be undertaken as required</li> <li>Weather conditions will be monitored and temporary controls implemented during extreme events. This may include ceasing construction during adverse weather conditions that have the potential to significantly increase risks from dust, runoff or sedimentation (refer Soils and Sediment sub-plan)</li> <li>The duration of instream works will be minimised as far as possible to reduce the potential for sedimentation</li> </ul>	Construction contractor
Fire	<ul style="list-style-type: none"> <li>Smoking will be prohibited on site</li> <li>No hot works when fire bans are in effect</li> <li>If controlled burns or other fire management is required, the ecological requirements of relevant species will be considered, including Sharman's rock-wallaby, northern greater glider, koala, red goshawk, masked owl</li> <li>Implement Site specific Bushfire management and mitigation plan (refer Bushfire sub-plan Section 7.4).</li> </ul>	Construction contractor

### 7.1.7 Species specific mitigation measures

A number of species-specific management measures will also be implemented in addition to measures outlined in section 7.1.6. Species specific management measures are outlined in Table 7-7 below.

Table 7-7: Species specific mitigation measures

Species	Mitigation Measure
Sharman's rock-wallaby	<ul style="list-style-type: none"> <li>To reduce impacts to the Sharman's Rock Wallaby, the proposed transmission line will be constructed by: <ul style="list-style-type: none"> <li>selectively placing transmission line towers in already cleared areas or in areas of lower ecological value (i.e., on either side of the Sharman's Rock Wallaby key breeding habitat);</li> <li>utilising taller towers so that the existing canopy can be retained where possible; and</li> <li>clearing only the minimum required for safe operations within Sharman's rock wallaby key breeding habitat (being a 4 m access track and turbine construction pad).</li> </ul> </li> <li>Where there is an identified occupied Sharman's rock wallaby rock cluster within 500m of construction activities, construction will be scheduled outside of dusk hours where practical to minimise disturbance to SRW and other foraging fauna species.</li> </ul>

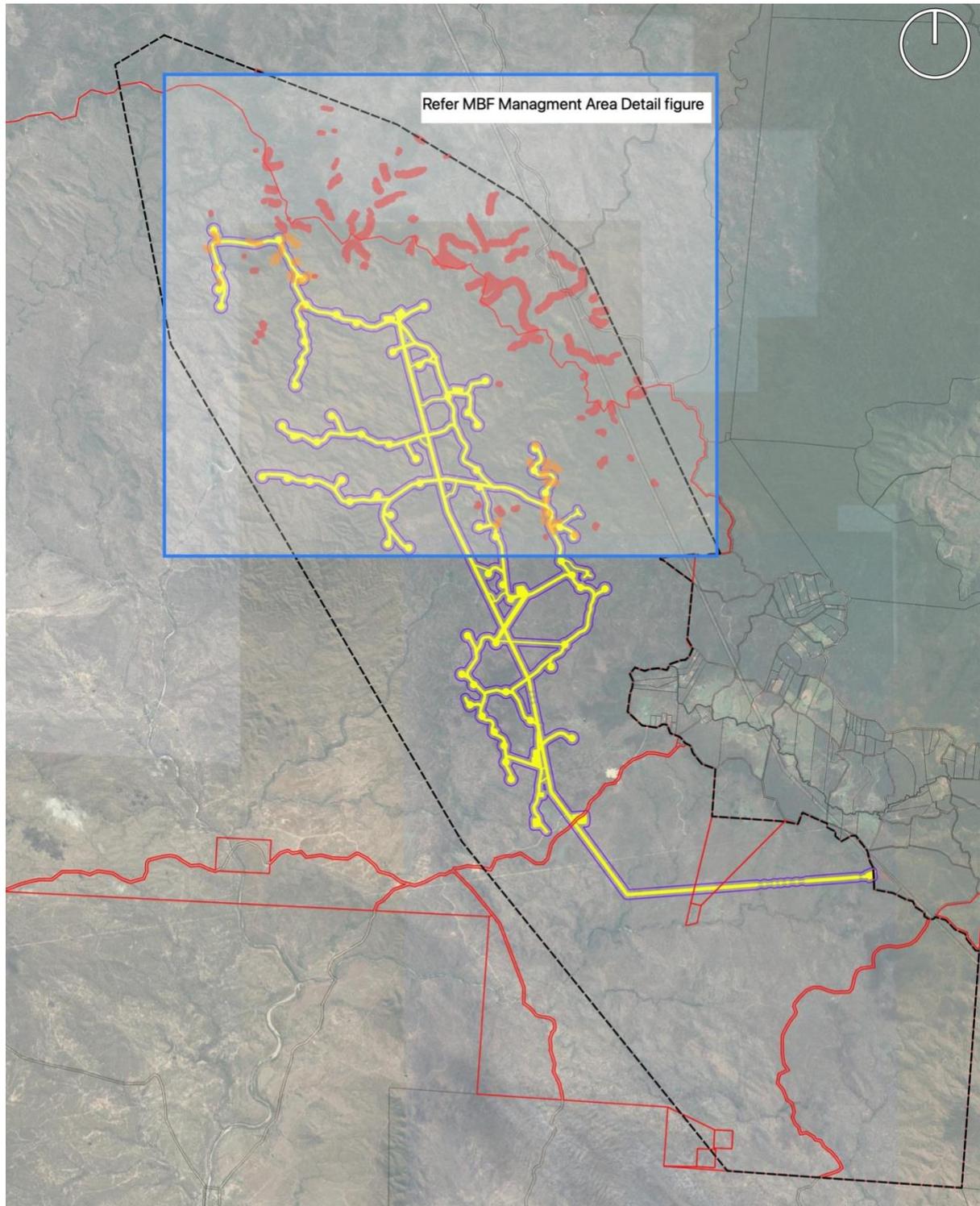
Species	Mitigation Measure
	<ul style="list-style-type: none"> <li>○ Specifically: <ul style="list-style-type: none"> <li>▪ Works at a WTG location within 500m of occupied rock clusters will be scheduled outside of dusk (foraging) hours where practical.</li> <li>▪ Travel will be avoided on the section of an access track should it sit within 500m of an occupied rock cluster where practical. Should travel be necessary along that section of road, travel speeds will be reduced to 5-10km / hr.</li> </ul> </li> <li>● For further measures, refer to the Sharman's rock wallaby sub-plan at Section 7.12</li> </ul>
Koala	<ul style="list-style-type: none"> <li>● Undertake a monitoring and control program for feral predators (cat/dog) across disturbance areas particularly and riparian zones (refer to the Feral predator control sub-plan, at Section 7.11)</li> </ul>
Northern greater glider	<ul style="list-style-type: none"> <li>● Pre-clearance surveys to be undertaken within potential habitat (refer habitat mapping Section 7.13) to identify the presence of den trees which may support the species. These trees will be clearly marked, and GPS locations recorded. Pre-clearance surveys will be completed no more than 48 hours prior to clearing commencing</li> <li>● Conduct staged and sequential clearing within potential habitat, including: <ul style="list-style-type: none"> <li>○ Retaining den trees to second phase of clearing to provide opportunity for arboreal fauna to self-vacate, and</li> <li>○ maximise connectivity</li> </ul> </li> <li>● Trees with large hollows (as identified by a fauna spotter catcher) will be cleared using the "slow drop" technique to minimise any likely injury to gliders residing in the hollow.</li> <li>● Where den trees cannot be avoided, install three northern greater glider nest boxes for every den tree removed within the immediate vicinity</li> <li>● The use of barbed wire will be prohibited unless otherwise required by legislation or specific industry standards (e.g. relating to sub-station security)</li> <li>● Refer to Section 7.13 Northern greater glider sub-plan for additional management including installation of glider poles</li> <li>● Undertake detailed design to determine whether taller transmission towers (~45 m high) can be utilised to string the transmission line above the canopy line in greater glider foraging and denning/shelter habitat (refer Figure 7-8) in order to reduce tree lopping in key areas to maintain the canopy and habitat connectivity</li> <li>● Undertake detailed design will be conducted to determine whether reduced clearance corridors can be implemented in areas of key greater glider habitat to retain as much habitat connectivity as possible</li> <li>● Endeavour to maintain all vegetation (including canopy trees) where the transmission line crosses a major riparian zone (e.g., Douglas Creek and Michael Creek)</li> <li>● Undertake a monitoring and control program for feral predators (cat) across disturbance areas and particularly within known glider locations (refer Feral predator control sub-plan Section 7.11).</li> </ul>
Flying-foxes	<ul style="list-style-type: none"> <li>● No flying-fox roosting camps are known to be present, however congregations or roosts will be confirmed in accordance with the 'Interim policy for determining when a flying-fox congregation is regarded as a flying-fox roost under section 88C of the <i>Nature Conservation Act 1992</i>'<sup>11</sup></li> <li>● If a camp is confirmed, stop work, reassess impact, and develop site-specific management plan, or ensure development footprint/disturbing activities do not encroach camp or surrounds (within 200 m of camp)</li> <li>● The use of barbed wire will be prohibited unless otherwise required by legislation or specific industry standards (e.g. relating to sub-station security)</li> </ul>

<sup>11</sup> NCS/2021/5677, Version 2.00, 29 July 2021 located at <  
[https://www.qld.gov.au/\\_\\_data/assets/pdf\\_file/0011/221024/op-wl-ff-roost-definition.pdf](https://www.qld.gov.au/__data/assets/pdf_file/0011/221024/op-wl-ff-roost-definition.pdf)>.

Species	Mitigation Measure
Bare-rumped sheath-tail bat	<ul style="list-style-type: none"> <li>• Minimise impacts to potential roost habitat including creek banks and rock piles</li> <li>• The use of barbed wire will be prohibited unless otherwise required by legislation or specific industry standards (e.g. relating to sub-station security)</li> </ul>
Greater large-eared horseshoe bat	<ul style="list-style-type: none"> <li>• Minimise removal of large trees with basal hollows in greater large-eared horseshoe bat habitat</li> <li>• Undertake a monitoring and control program for feral predators (cat) across disturbance areas, especially riparian zones (refer Feral predator control sub-plan Section 7.11)</li> </ul>
Red goshawk	<ul style="list-style-type: none"> <li>• Pre-clearance surveys targeting potential nest trees must be undertaken prior to clearing. Surveys are required in all works areas within 1 km of permanent water, with particular focus on tall emergent trees</li> <li>• Any nest trees detected must be avoided and a 400 m permanent exclusion zone applied to turbine placement</li> <li>• Clearing within 4 km of confirmed nest trees must not remove more than 25% of habitat within the area<sup>12</sup></li> </ul>
Masked owl	<ul style="list-style-type: none"> <li>• Minimise removal of large hollow-bearing trees in masked owl habitat</li> </ul>
Magnificent brood frog (MBF)	<ul style="list-style-type: none"> <li>• Prevent direct and indirect disturbance of Magnificent Brood Frog Management Area A<sup>13</sup>: <ul style="list-style-type: none"> <li>○ Specifically designated these areas as a no-go zone</li> <li>○ Prevent sedimentation (refer Soils and sediment sub-plan Section 7.5)</li> <li>○ Maintain pre-construction surface water flows through construction (refer Surface water sub-plan Section 7.8)</li> </ul> </li> <li>• Minimise the disturbance of magnificent brood frog potential habitat through micro siting infrastructure intersecting Magnificent Brood Frog Management Area B<sup>17</sup> (refer Figure 7-1 and Figure 7-2)</li> <li>• Maximise the placement of infrastructure and associated clearing outside of and/or downstream from Magnificent Brood Frog Management Area B</li> </ul>

<sup>12</sup> Fledgling success significantly drops (33% success rate compared to 77% success rate) when greater than 25% of species home range habitat is cleared (Baker-Gabb 2009)

<sup>13</sup> MBF Management Areas have been generated by buffering inverts within MBF potential habitat by 100 m. Area A are buffers to inverts outside the development footprint and 100 m micro-siting buffer. Area B are buffers to inverts where MBF potential habitat is located within the development footprint, or within the 100m micro-siting buffer.



**Legend**

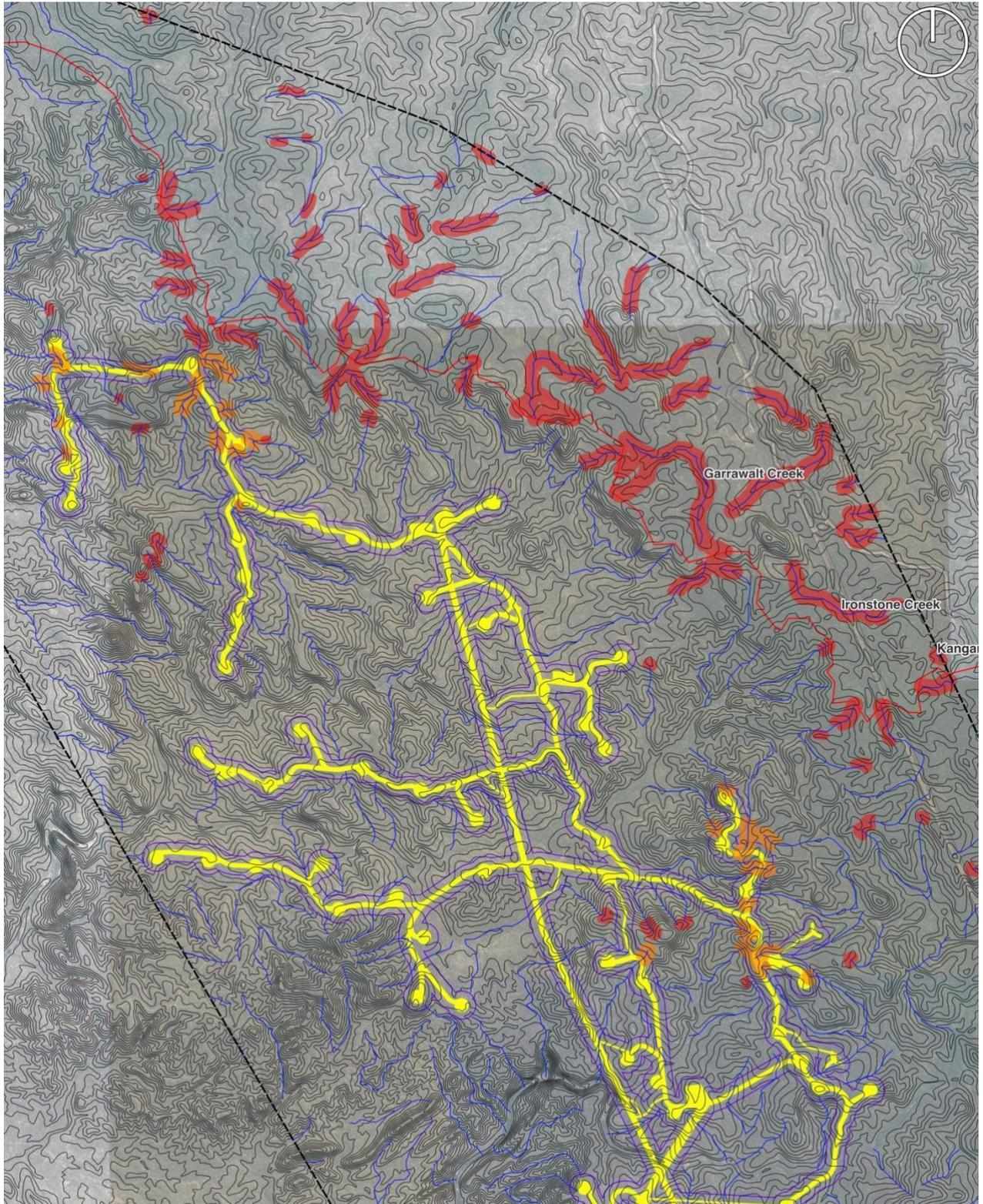
- Project Cadastral Boundary
- Survey Area
- Development footprint
- 100 m micro-siting buffer
- MBF Management Area A
- MBF Management Area B

0 2.5 5 km

Coordinate System: GDA 1994 MGA Zone 55s

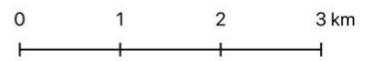
Service Layer Credits: Source: QSpatial, QLD Gov; Google Earth

Figure 7-1: Magnificent Brood Frog Management Areas Overview



**Legend**

- Project Cadastral Boundary
- 100 m micro-siting buffer
- MBF Potential and suitable habitat
- Survey Area
- 10 m elevation contours
- MBF Management Area A
- MBF Management Area B
- Development Footprint
- Order 1 Watercourse



Coordinate System: GDA 1994 MGA Zone 55s

Service Layer Credits: Source: QSpatial, QLD Gov; Google Earth

Figure 7-2: Magnificent Brood Frog Management Areas Detail

### 7.1.8 Monitoring and Recording

The monitoring program for fauna and habitat has been designed to ensure that construction of the project is consistent with the control measures (Table 7-8). Monitoring will measure the success of these actions and the need for corrective actions to be implemented.

Table 7-8: Monitoring and recording requirements

Monitoring	Details	Timing	Responsibility	Records
Weather conditions	Ensure predicted conditions are suitable for works; implement any additional adverse weather (inc. fire bans days and rainfall events) controls	Daily & ongoing	Construction Contractor	Daily environment checklist
Implementation of mitigation measures	Ensure all of the above listed mitigation measures are being implemented effectively <ul style="list-style-type: none"> <li>Monitor dust levels</li> <li>Monitor hazardous material storage areas (refer Hazardous materials and spills sub-plan)</li> <li>Monitor open trenches daily</li> </ul>	Weekly & ongoing	Construction Contractor	Weekly environment checklist
Habitat boundary demarcation review	Inspection of adequacy of demarcation of all approved boundaries; ensure all flagging & fencing is in good condition	Weekly	Construction Contractor	Weekly environment checklist
Habitat clearing	Record the location, date of clearing and total hectares of all habitat clearing; ensure cumulative totals tracked against approved limits	Ongoing	Construction Contractor	Disturbance limits register Event report
Pre-clearing & fauna recovery	Record methods & outcomes of all preclearing surveys undertaken by spotter-catchers, including any fauna recovery incidents	Ongoing	Construction Contractor; lead spotter catcher	Pre-clearing inspection report
Analysis of Incident Trends	Analyse incidents reported for any non-compliances, incidents (including unauthorised clearing or fauna injury/fatality)	Monthly	HSE Manager	Incident report

At a minimum, monitoring records should contain the following information:

- Date and time of monitoring event
- Name of personnel performing monitoring
- Features being monitored
- Outcomes of monitoring and details of compliance / non-conformance
- Requirement for corrective actions
- Photographic records detailing evidence of monitoring.

Results of monitoring will be recorded and maintained by the construction contractor and will be made available to relevant agencies upon request.

### 7.1.9 Corrective Actions and Contingencies

Where required contingency actions will be implemented, as outlined in Table 7-9.

Table 7-9: Corrective actions and contingencies

Trigger	Action
Injury or death of conservation significant vertebrate fauna as a result of vehicle collision, or other project activity.	<ol style="list-style-type: none"> <li>1. Investigate cause.</li> <li>2. Undertake appropriate remedial action (e.g. contacting a nominated carer to assess possible rescue and rehabilitation of the animal) as required.</li> <li>3. Report as an incident to relevant regulatory body and undertake specific, additional actions as required</li> <li>4. Revise procedures and education / induction programs as required to prevent reoccurrence.</li> <li>5. Collate reports of any such incidents for reporting</li> </ol>
Marked habitat clearing boundary not in accordance with approvals.	<ol style="list-style-type: none"> <li>1. Stop work in relevant area.</li> <li>2. Investigate and complete an incident report</li> <li>3. Implement corrective actions, including the amendment of clearing boundaries.</li> </ol>
Habitat clearing outside the approved area is identified.	<ol style="list-style-type: none"> <li>1. Stop work in relevant area.</li> <li>2. Investigate and complete an incident report.</li> <li>3. Report to regulators as required (with notice of proposed corrective action).</li> <li>4. Implement corrective actions, including rehabilitation where required.</li> </ol>
Dust build up on vegetation	<ol style="list-style-type: none"> <li>1. Increase water frequency of dust suppression measures</li> </ol>
A threatened species not previously recorded, is found within the project area.	<ol style="list-style-type: none"> <li>1. Stop work in immediate area if animal is in construction area.</li> <li>2. Allow opportunity for animal to leave construction area or where appropriate allow a qualified fauna handler to relocate to adjacent habitat.</li> <li>3. Assess likely extent of habitat for threatened species and notify relevant regulatory bodies (as required).</li> <li>4. Undertake an assessment of potential impacts to the species as a result of project activities.</li> <li>5. Assuming assessment identifies no significant impacts, recommence work within minimum works area.</li> <li>6. Investigate opportunities to prevent or minimise the impact to recorded fauna such as evaluating potential to relocate temporary construction areas, access roads, camps or any other infrastructure that there is potential to shift at this stage of planning or construction.</li> <li>7. Indicate 'no-go' areas / habitats to be avoided through flagging / repegging.</li> </ol>

## 7.2 VEGETATION MANAGEMENT SUB-PLAN

### 7.2.1 Overview of Ecological Surveys

Numerous ecological investigations and surveys of the project area have been undertaken over a period of several years. An overview of surveys undertaken, and their primary purpose is outlined in Table 7-1 in section 7.1.1 above and discussed in detail in Public Environment Report (PER) Section 2: Existing Environment and MNES. Ecological survey reports are provided as Appendices E to G of the

PER. This information is also provided in the Ecology Impact Report, Section 2: Existing Environment and Appendices A to D.

The flora assessment included ground-truthing of State Regional Ecosystem (RE) mapping across the survey area. Data on vegetation characteristics (floristic and structural form), ecological condition and extent of the vegetation communities was collected via two methods - secondary and quaternary assessments, in accordance with Nelder et.al. (2019, 2020; ELA 2020, 2022). Sites were selected to sample as many mapped REs as possible, within time and access constraints (ELA 2020).

Targeted searches for threatened flora species were also undertaken across the survey area based on desktop survey results and known habitat preferences. Incidental observations of weed species across the survey area were recorded (ELA 2020, 2022).

### 7.2.2 Vegetation Communities and Regional Ecosystems

Most of the area (>97%) is mapped as Category B - remnant vegetation with small areas (<3%) of Category C – high value regrowth vegetation and Category X – other areas.

A total of 69 Regional Ecosystems (RE) have been ground-truthed in the survey area. Of these, 36 (including multiple vegetation associations within singular REs, eg. 7.12.29a and 7.12.29b) are likely to be impacted by the development.

The condition of the vegetation was found to be generally high, with relatively small areas of poor condition vegetation near roads, watercourses and some farm dams. The area has been grazed by domestic stock for about 100 years, and there has been some localised timber extraction for local building purposes. Fire management (whether deliberate or accidental) has maintained mosaics of time-since-fire patches of vegetation that afford a broad range of habitats for wildlife. However, some invasive weeds are very widespread throughout the project area (see Section 7.3).

No Threatened Ecological Communities were confirmed in the project area.

### 7.2.3 Threatened Flora

One threatened flora species, listed under the NC Act, was detected within the survey area but lies outside the proposed clearing footprint. *Commersonia reticulata* (Byttneriaceae, syn. *Androcalva reticulata*) was found in two populations in RE 9.12.2/9.12.1a. Populations were comprised of approximately 50 and 20 plants respectively, both in single dense clusters (probably from suckering (Guymer 2005)). This species is Vulnerable under the NC Act and has only been recorded from four localities in North Queensland. The occurrence in the survey area lies between the southernmost known locations (Hervey and High Ranges west of Townsville) and in Giringun National Park. This species was not returned in the results of the desktop searches.

A number of other threatened flora species may occur but have not been detected during surveys to date (Table 7-10).

Table 7-10: Threatened flora species potentially occurring in the project area

Scientific Name	Common Name	NC Act Status	EPBC Act Status	Presence in development footprint
<i>Acacia longipedunculata</i>	-	NT	-	Not detected, potential to occur

Scientific Name	Common Name	NC Act Status	EPBC Act Status	Presence in development footprint
<i>Acacia tingoorensis</i>	Tingoorensis wattle	V	-	Potential. Not detected in development footprint. Known to occur in project area
<i>Commersonia reticulata</i>	-	V	-	Potential. Not detected in development footprint. Known to occur in project area
<i>Corchorus subargenteus</i>	-	V	-	Unlikely. Not detected, suitable habitat within project area but not development footprint
<i>Corybas cerasinus</i>	Red helmet orchid	NT	-	Not detected, potential to occur
<i>Corymbia leptoloma</i>	Yellowjacket	V	V	Not detected, potential to occur
<i>Cycas platyphylla</i>	-	V	V	Unlikely. Distinctive species, not detected during targeted surveys
<i>Dichanthium setosum</i>	Bluegrass	-	V	Unlikely. Not detected during optimal survey conditions. Marginal habitat present in project area outside development footprint.
<i>Drosera adela</i>	Sundew	NT	-	Not detected, potential to occur
<i>Glossocardia orthochaeta</i>	-	E	-	Not detected, potential to occur
<i>Homoranthus porteri</i>	-	V	V	Not detected, potential to occur
<i>Marsdenia brevifolia</i>	-	V	V	Not detected, potential to occur
<i>Phaius pictus</i>	-	V	V	Unlikely. Not detected, no suitable habitat with development footprint
<i>Phalaenopsis amabilis</i> subsp. <i>rosenstromii</i>	Native moth orchid	E	E	Unlikely. Not detected, no suitable habitat with development footprint
<i>Rhomboda polygonoides</i> (syn. <i>Zeuxine polygonoides</i> )	Velvet jewel orchid	V	V	Unlikely. Not detected, no suitable habitat with development footprint
<i>Solanum graniticum</i>	Granite nightshade	E	E	Not detected, potential to occur

## 7.2.4 Potential Impacts

Planning for the Gawara Baya has included detailed assessments of environmental risks. The locations of turbines and roads have been selected to avoid sensitive environmental assets as far as possible, including Of Concern REs, Essential Habitat, Protected Plant High Risk Areas. However, practicalities of turbine installation, access and landholder requirements mean some impacts to Regulated Vegetation may be unavoidable.

Potential impacts to vegetation from the Gawara Baya include:

- Clearing including removal of trees, shrubs and ground covers
- Reduction in flora habitat (amount and diversity)
- Fragmentation of vegetation communities
- Introduction and spread of invasive weeds and pathogens
- Local erosion and sedimentation of waterways and associated riparian vegetation.

The area of clearing of Category B Regulated Vegetation required by the 616.5 ha construction footprint is 612.7 ha (within property boundary, not including dedicated road easements). Rehabilitation and restoration activities will be undertaken over approximately 468.6 ha of this area, leaving an operational disturbance footprint of 147.9 ha. More details on rehabilitation can be found in the Rehabilitation Plan, at Appendix C.

Areas of each Vegetation Management (VM) Act class of vegetation and major vegetation types to be cleared for construction are given in Table 7-11.

*Table 7-11: Areas of each vegetation class proposed to be cleared within the property lot<sup>14</sup> (Lot 3198 on Plan PH2177)*

Class	Total Area of Property (ha)	Gawara Baya Clearance Area (ha)	% of Total Clearance Area
<b>VM Act status</b>			
Category B - Endangered	0	0	0
Category B – Of Concern	1301	12.96	1.00
Category B - Least Concern	49278	599.75	1.21
Category C	154	0.23	1.15
Category R	174	0	0

Regulated vegetation to be cleared for construction that area MSES under Qld State Code 16 are outlined in Table 7-12 below:

<sup>14</sup> Excludes existing dedicated road easements

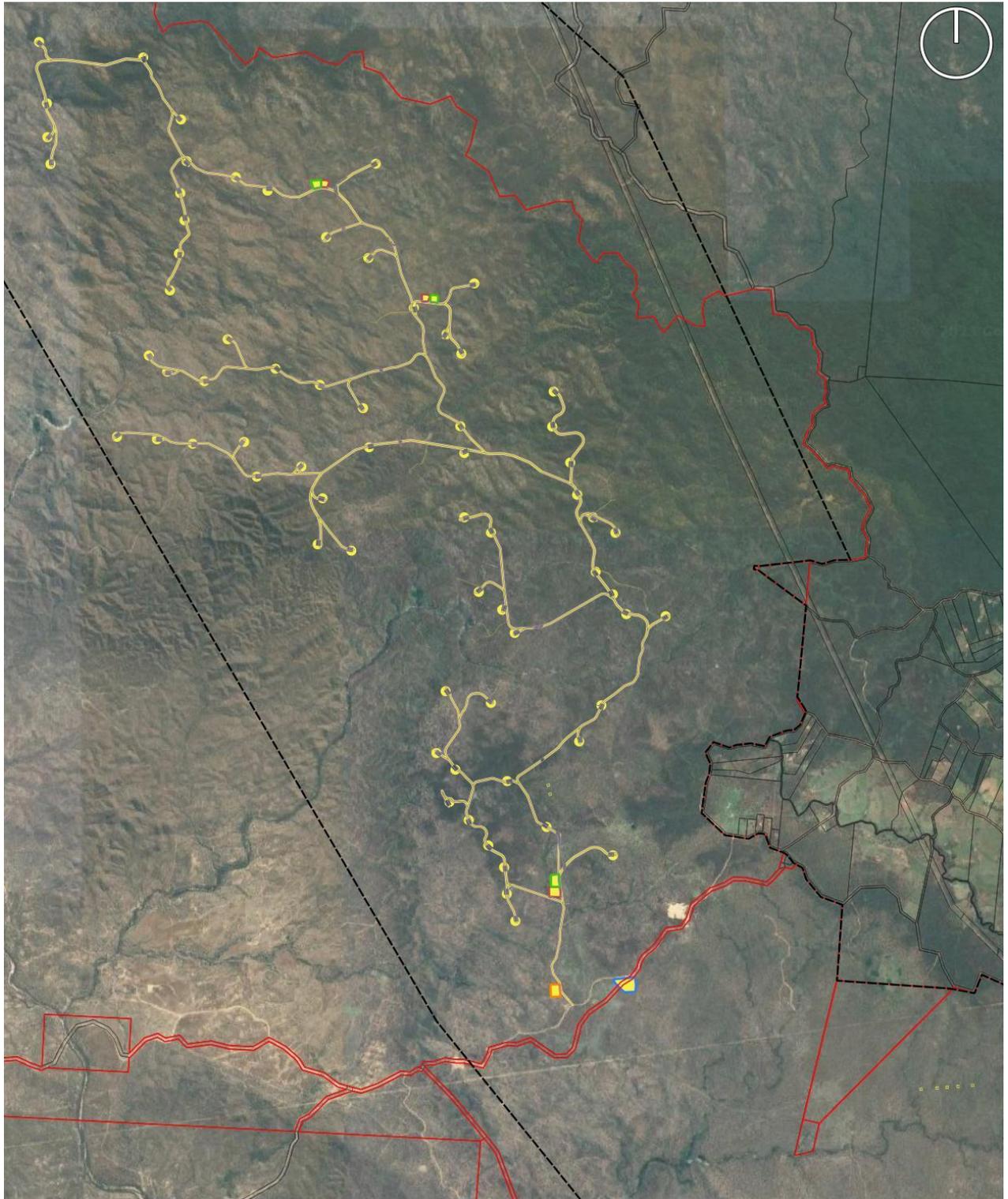
Table 7-12: Areas of MSES Regulated Vegetation to be cleared

Regulated Vegetation (VM Act)	Total Area of Property (ha)	Gawara Baya Clearance Area (ha)	% of Total Clearance Area
Prescribed regional ecosystems that are Of Concern Regional Ecosystem	1,301	13	1
Prescribed Regional Ecosystems that intersect with an area of Essential Habitat on the Essential Habitat Map for an animal that is Critically Endangered wildlife, Endangered wildlife or Vulnerable wildlife or a plant that is Critically Endangered wildlife, Endangered wildlife or Vulnerable wildlife	1,337	33	2.5
Prescribed Regional Ecosystems within defined distance from the defining banks of a relevant watercourse	3,220	14	0.4

The areas of temporary clearing (147.9 ha) and permanent clearing (616.5 ha) include clearing for the following infrastructure:

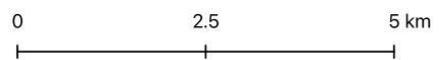
- Temporarily cleared areas:
  - Turbine construction hardstand areas (incorporating blade laydown areas) and rotor lift clearance area
  - Concrete batching areas and temporary laydown areas
  - Construction site offices and accommodation camp
  - Parts of the internal access roads required for construction activities
- Areas cleared for the operational life of the project (for the purposes of calculating SRI and offsetting requirements):
  - Wind turbine hardstands
  - Electrical infrastructure, including:
    - collector substations
    - switchyard
    - 33kV overhead electrical transmission line and easement
    - 275kV overhead electrical transmission line and easement
  - Permanent operation and maintenance facility
  - Access roads required for light vehicle access on-site
  - Permanent meteorological / wind monitoring masts

The areas of temporary clearing are identified in Figure 7-3 below.



**Legend**

- |                              |  |
|------------------------------|--|
| Project Cadastral Boundaries | <b>Temporary infrastructure components</b> |
| Survey Area                  | Access roads                               |
| Temporary clearance          | Accomodation camp                          |
|                              | Concrete batching                          |
|                              | Site office                                |
|                              | Temporary laydown                          |



Coordinate System: GDA 1994 MGA Zone 55s

Service Layer Credits: Source: QSpatial, QLD Gov; Google Earth

Figure 7-3: Temporary cleared areas

## 7.2.5 Management objectives

Environmental targets and performance indicators have been prescribed in line with flora and vegetation management objectives for the project, identified in Table 7-13.

Table 7-13: Flora and vegetation performance management

Issue	Objective	Target	Measurement Criteria
Disturbance to native vegetation	Minimise and manage disturbance to native vegetation particularly sensitive vegetation communities (of concern REs), hollow-bearing trees (HBTs) and threatened fauna habitat	<ul style="list-style-type: none"> <li>Total area of native vegetation to be cleared not to exceed 616.5 ha</li> <li>Removal of 'of concern' REs is reduced to as low as possible</li> <li>Removal of HBTs is minimised</li> <li>No contravention of vegetation clearing permits or EPBC approval specifying spatial limits to vegetation clearing</li> </ul>	<ul style="list-style-type: none"> <li>Conformance with spatial delineation of approved vegetation clearance</li> </ul>
Potential presence of threatened flora	Confirm threatened flora species do not occur within development footprint	<ul style="list-style-type: none"> <li>Pre-clearance flora surveys are undertaken within potential threatened flora habitat within development footprint<sup>15</sup></li> </ul>	<ul style="list-style-type: none"> <li>No threatened flora species are cleared without prior approvals in place</li> </ul>
Conservation of threatened flora species	Minimise the disturbance to or removal of threatened flora species and communities	<ul style="list-style-type: none"> <li>No disturbance to or removal of threatened flora species or communities other than that approved.</li> </ul>	<ul style="list-style-type: none"> <li>Conformance with requirements for approval to interfere with threatened flora species</li> <li>No clearing undertaken within 100 m of threatened flora species without an impact management plan in place</li> </ul>

## 7.2.6 Management measures

A range of control measures to reduce the potential for impacts on vegetation and flora are provided in Table 7-14.

<sup>15</sup> A pre-clearance survey does not preclude the requirements of the *NC (Plants) Regulation 2020 Protected Plant Flora Survey Guidelines*

Table 7-14: Measures to be implemented to avoid and manage impacts from construction activities

Parameter	Control measures	Responsibility
General	<ul style="list-style-type: none"> <li>All staff will attend site inductions prior to commencing works and daily toolbox talks. The site inductions and Toolbox talks will include environmental requirements, notices and special attention areas. All environmental requirements, risks and measures will also be reflected in the relevant work SWMS</li> <li>Smoking will be prohibited on site</li> <li>Pets including dogs will be prohibited on site.</li> </ul>	Construction contractor
Habitat loss	<ul style="list-style-type: none"> <li>Vegetation clearing is only permitted in approved areas</li> <li>Micro-siting of infrastructure will prioritise the use of already cleared or disturbed areas, in preference of vegetated areas</li> <li>The extent of vegetation clearing will be clearly marked on construction plans and in the field prior to clearing commencing to ensure only approved vegetation is cleared</li> <li>To reduce impacts to threatened species by retaining vegetation and canopy cover, the proposed 275kV overhead transmission line will be constructed by: <ul style="list-style-type: none"> <li>selectively placing transmission line towers in already cleared areas or in areas of lower ecological value;</li> <li>utilising taller towers so that the existing canopy can be retained where feasible, subject to detailed design;</li> <li>reducing vegetation clearing where feasible, subject to detailed design;</li> <li>maintaining vegetation (including canopy trees) where the transmission line crosses a major riparian zone (e.g., Douglas Creek and Michael Creek), subject to detailed design.</li> </ul> </li> </ul>	Construction contractor
Fencing	<ul style="list-style-type: none"> <li>No go zones and areas of high conservation significance will be marked with high visibility fencing or flagging. Identification of such areas, will be undertaken by a suitably qualified ecologist or spotter-catcher</li> <li>Where possible, fencing shall be erected to align with the Tree Protection Zones of trees to be retained (refer AS 4970-2009 <i>Protection of Trees on Development Sites</i>)</li> <li>Vehicle movement and storage of machinery to be excluded from Tree Protection Zones</li> <li>Any fencing or flagging material must be maintained in good condition and replaced as soon as practical if damaged/removed to reduce the potential for accidental clearing</li> <li>All fencing must be fauna friendly<sup>9</sup> unless specifically erected to exclude fauna from trenches/pits etc</li> </ul>	Construction contractor
Threatened flora	<ul style="list-style-type: none"> <li>Undertake pre-clearing surveys where threatened flora potential habitat is located with development footprint</li> </ul>	Construction contractor

Parameter	Control measures	Responsibility
Watercourses	<ul style="list-style-type: none"> <li>Where infrastructure must cross waterways, areas of existing disturbance (i.e. existing tracks) have been selected. Where this is not practical, vegetation clearing will be minimised as far as practicable (targeting 10 – 20 m clearing widths) and large habitat trees will be preferentially retained</li> <li>Refer Soils and Sediment sub-plan, install culverts early in construction period at major waterway crossings, and drainage pipes at all minor water crossings to maintain natural flow. Stabilise and rehabilitate (refer Rehabilitation Plan) immediately following installation</li> <li>The duration of instream works will be minimised as far as possible to reduce the potential for sedimentation</li> </ul>	Construction contractor
Vegetation clearing	<ul style="list-style-type: none"> <li>If works occur outside the approved area, an incident investigation will be undertaken as soon as possible and appropriate controls instated in response</li> <li>Clearing will be undertaken sequentially</li> <li>Unless used for habitat features (e.g. large woody debris), vegetation will be mulched and stockpiles will be respread or mulched and respread on areas of disturbed ground</li> <li>Mulching of weeds should be avoided, where not possible mulch piles should be left to age for 6 months, weeds being treated as they appear, prior to use</li> <li>Cleared vegetation (including topsoil) must not be located within the dripline of retained trees, pushed up or stored against fences/flagging or within 50 m of waterways</li> <li>Delay disturbance of ground covers (grasses, fallen leaves, and mulches) until the last practical moment</li> </ul>	Construction contractor
Temporary clearing	<ul style="list-style-type: none"> <li>Restoration or rehabilitation of temporary construction areas will be undertaken sequentially and as soon as practical after the completion of works. Refer to details in the Rehabilitation Plan, at Appendix C.</li> </ul>	Construction contractor
Weeds	<ul style="list-style-type: none"> <li>The Weed management sub-plan will be implemented. The plan will include the provisions listed in Section 7.3 below as minimum requirements.</li> </ul>	Construction contractor
Habitat degradation from compaction, dust, run-off & sedimentation, spills	<ul style="list-style-type: none"> <li>A detailed Site-specific Erosion and Sediment Control Plan will be developed and implemented incorporating the objectives and measures identified in the Soils and Sediment Sub-Plan (at Section 7.5)</li> <li>The Hazardous materials spill response management sub-plan (refer Section 7.9) will be implemented</li> <li>A detailed Site-specific Weed Management Plan will be developed and implemented (refer to the Weed Management sub-plan, at Section 7.3)</li> <li>All vehicles will stay on designated tracks</li> <li>Dust suppression will be undertaken as required</li> <li>Weather conditions will be monitored and temporary controls implemented during extreme events. This may include ceasing</li> </ul>	Construction contractor

Parameter	Control measures	Responsibility
	construction during adverse weather conditions that have the potential to significantly increase risks from dust, runoff or sedimentation (refer to the Soils and sediment sub-plan at Section 7.5)	
Fire	<ul style="list-style-type: none"> <li>Smoking will be prohibited on site</li> <li>No hot works when fire bans are in effect</li> <li>If controlled burns or other fire management is required, the ecological requirements of relevant species will be considered, including Sharman's rock-wallaby, northern greater glider, koala, red goshawk, masked owl</li> <li>A detailed Site-specific Bushfire Management and Mitigation Plan will be developed and implemented (refer to the Bushfire sub-plan, at Section 7.4).</li> </ul>	Construction contractor

### 7.2.7 Monitoring and recording

The monitoring program for vegetation and flora species has been designed to ensure construction of the project is consistent with the control measures (refer to Table 7-15). Monitoring will measure the success of these actions and the need for corrective actions to be implemented.

Table 7-15: Monitoring and recording requirements

Monitoring	Details	Timing	Responsibility	Records
Weather conditions	Ensure predicted conditions are suitable for works; implement any additional adverse weather (inc. fire bans days and rainfall events) controls	Daily & ongoing	Construction Contractor	Daily environment checklist
Implementation of mitigation measures	Ensure all of the above listed mitigation measures are being implemented effectively: <ul style="list-style-type: none"> <li>Monitor dust levels</li> <li>Monitor hazardous material storage areas (refer Hazardous materials and spills sub-plan)</li> </ul>	Weekly & ongoing	Construction Contractor	Weekly environment checklist
Vegetation clearing boundary demarcation review	Inspection of adequacy of demarcation of all approved boundaries; ensure all flagging & fencing is in good condition	Weekly	Construction Contractor	Weekly environment checklist
Vegetation clearing	Record the location, date of clearing and total hectares of all vegetation clearing; ensure cumulative totals tracked against approved limits	Ongoing	Construction Contractor	Disturbance limits register Event report
Analysis of Incident Trends	Analyse incidents reported for any non-compliances, incidents (including unauthorised clearing)	Monthly	HSE Manager	Incident report

At a minimum, monitoring records should contain the following information:

- Date and time of monitoring event
- Name of personnel performing monitoring
- Features being monitored
- Outcomes of monitoring and details of compliance / non-conformance
- Requirement for corrective actions
- Photographic records detailing evidence of monitoring.

Results of monitoring will be recorded and maintained by the construction contractor and will be made available to relevant agencies upon request.

### 7.2.8 Corrective actions and contingencies

Where required contingency actions will be implemented, as outlined in Table 7-16.

*Table 7-16: Corrective actions and contingencies*

Trigger	Action
Marked vegetation clearing boundary not in accordance with approvals.	<ol style="list-style-type: none"> <li>1. Stop work in relevant area.</li> <li>2. Investigate and complete an incident report</li> <li>3. Implement corrective actions, including the amendment of clearing boundaries.</li> </ol>
Vegetation clearing outside the approved area is identified.	<ol style="list-style-type: none"> <li>1. Stop work in relevant area.</li> <li>2. Investigate and complete an incident report.</li> <li>3. Report to regulators as required (with notice of proposed corrective action).</li> <li>4. Implement corrective actions, including rehabilitation where required.</li> </ol>
Dust build up on vegetation	<ol style="list-style-type: none"> <li>1. Increase water frequency of dust suppression measures</li> </ol>
Weed outbreaks	<ol style="list-style-type: none"> <li>1. Infestations are identified and mapped</li> <li>2. Source of infestation is investigated and addressed</li> <li>3. Infestations are controlled via appropriate use of herbicide or other control techniques</li> <li>4. Implement any rehabilitation as required.</li> </ol>

## 7.3 WEED MANAGEMENT SUB-PLAN

### 7.3.1 Weed presence

A number of weed species were recorded across the project area. Most are limited in extent and/or occur in low density. Those that present a risk within the project area include weeds that are:

- Widespread across the project area
- Present in high densities within the project area
- Recognised by Commonwealth, State or local government as presenting risks.

These are listed in Table 7-17 below.

Table 7-17: Invasive weeds recorded in the project area

Species	Common name	Biosecurity Act restricted matter class	WoNS <sup>16</sup>	Local govt status	Occurrence	Relative density
<i>Bidens pilosa</i>	Cobbler's pegs	N/A	No	N/A	widespread	low
<i>Lantana camara</i>	Lantana	3	Yes	priority	widespread	low to high
<i>Macroptilium atropurpureum</i>	Siratro	N/A	No	N/A	widespread	low
<i>Megathyrus maximus</i>	Guinea grass	N/A	No	N/A	widespread	moderate
<i>Melinis repens</i>	Red Natal grass	N/A	No	N/A	widespread	low
<i>Mesosphaerum suaveolens</i>	Hyptis	N/A	No	N/A	widespread	high
<i>Praxelis clematidea</i>	Praxelis	N/A	No	N/A	very widespread	moderate
<i>Senna obtusifolia</i>	Sicklepod	N/A	No	priority	limited	low
<i>Side rhombifolia</i>	Paddy's lucerne	N/A	No	N/A	widespread	
<i>Sphagneticola trilobata</i>	Singapore daisy	N/A	No	priority	limited	low
<i>Sporobolus jacquemontii</i>	American rat's tail grass	3	Yes	environmental	limited	low
<i>Stylosanthes hamata</i>	Caribbean stylo	N/A	No	N/A	widespread	low
<i>Stylosanthes humilis</i>	Townsville stylo	N/A	No	N/A	widespread	low
<i>Themeda quadrivalvis</i>	Grader grass	N/A	No	N/A	limited	high

### 7.3.2 Environmental activities to be managed

Construction activities have the potential to introduce or disperse weeds through the following aspects of the project:

- Vegetation clearing
- Excavation and earthworks for construction
- Vehicle and personnel movements
- Fire ignition
- Physical presence of infrastructure.

<sup>16</sup> Weeds of national significance

### 7.3.3 Potential impacts

Construction of the project has the potential to result in the following impacts:

- Increased infestations of existing weed species in the project area
- Introduction of new weed species in the project area
- Degradation of vegetation communities
- Degradation of fauna habitat
- Increased fire fuel load and more intense fires.

This sub-plan addresses management of impacts from weeds. Weed management protocols also address the introduction and spread of pathogens including myrtle rust. The management approach for vegetation is outlined in the Vegetation management sub-plan and fire is outlined in the Bushfire sub-plan.

### 7.3.4 Management objectives

Environmental targets and performance indicators have been prescribed in line with weed management objectives for the project, as indicated in Table 7-18.

Table 7-18: Weeds performance management

Issue	Objective	Target	Measurement Criteria
Introduction of new weeds	Minimise the potential for new weeds to be introduced into the project area.	<ul style="list-style-type: none"> <li>• No new species of weeds recorded in the project area within 2 years of completion of construction</li> <li>• Compliance with the <i>Biosecurity Act</i>.</li> </ul>	<p>Species of weed recorded in the project area.</p> <p>No non-compliance with <i>Biosecurity Act</i> and internal weed hygiene procedures.</p>
Spread of existing weeds	Minimise the risk of spreading existing weeds within the project area and to adjacent areas.	<ul style="list-style-type: none"> <li>• No significant change to the extent and distribution of existing weeds within 2 years of completion of construction.</li> <li>• Compliance with the <i>Biosecurity Act</i>.</li> </ul>	<p>Number of recorded locations of weed infestation in project database.</p> <p>Extent of weed cover at recorded locations.</p>

### 7.3.5 Management measures

The construction contractor will be responsible for preparation of a Site-specific Weed Management Plan. The Weed Management Plan will include hygiene protocols restricting the movement of vegetation and soil between impacted areas and areas of significantly lower weed infestation. The Weed Management Plan will include protocols for monitoring and management of weeds to identify and appropriately respond to significant changes in weed distribution and density.

The minimum weed management requirements for this plan are outlined in Table 7-19 below.

Table 7-19: Weed control measures

Parameter	Control measures	Responsibility
Weed extent	<ul style="list-style-type: none"> <li>A weed survey will be undertaken to confirm the initial extent of weeds on site, including the extent of weeds that present a risk within the project area, as listed above</li> <li>Weed mapping conducted prior to construction to identify a baseline and to identify all major infestations that intersect with the construction footprint</li> </ul>	Construction contractor
Declared weed control	<ul style="list-style-type: none"> <li>Declared weeds within construction footprint will be treated or removed prior to the commencement of construction.</li> <li>New weed infestation shall be treated at the earliest stage while small and manageable</li> <li>Treatment options must follow published advice e.g. weed control fact sheets published by Queensland Department of Agriculture and Fisheries (<a href="https://www.daf.qld.gov.au/business-priorities/biosecurity/invasive-plants-animals/fact-sheets">https://www.daf.qld.gov.au/business-priorities/biosecurity/invasive-plants-animals/fact-sheets</a>)</li> </ul>	Construction contractor
Chemical use and storage	<ul style="list-style-type: none"> <li>Will be restricted to approved uses only, following manufacturers' instructions</li> <li>Herbicides will be stored in an appropriate manner</li> <li>Only wildlife-friendly herbicides will be used</li> <li>Herbicide will not to be sprayed near creeks or dams or within two days of rain</li> </ul>	Construction contractor
Vehicle entry	<ul style="list-style-type: none"> <li>Must carry a current weed hygiene certificate from an accredited inspection station.</li> <li>Vehicles re-entering the site will not need a new certificate if they have only been used on formed roads (gravel and bitumen)</li> <li>Temporary vehicle washdown station should be established close to the construction site as the nearest facility is in Ingham</li> <li>Vehicles must use designated tracks only</li> </ul>	Construction contractor
Fill and other imported materials	<ul style="list-style-type: none"> <li>Weed-free declaration certificate required for imported fill</li> <li>Log to record all material imported on site required</li> <li>Log is to include material description, quantity, source and deposition at the site</li> </ul>	Construction contractor
Exposed areas	<ul style="list-style-type: none"> <li>Areas of exposed earth will be minimised and rehabilitated with appropriate non-invasive species</li> </ul>	Construction contractor

### 7.3.6 Monitoring and recording

The monitoring program for weeds has been designed to ensure that construction of the project is consistent with the control measures, management objectives and targets. Monitoring measures are identified in Table 7-20 below.

Table 7-20: Monitoring and recording requirements

Monitoring	Details	Timing	Responsibility	Records
Implementation of mitigation measures	Ensure all of the above listed mitigation measures are being implemented effectively	Weekly & ongoing	Construction Contractor	Weekly environment checklist
Weed infestations or outbreaks	Record any evidence of weed infestations or outbreaks, particular focus on high-risk weeds, comparison to baseline survey results to assist	Ongoing	Construction Contractor; lead spotter catcher	Weed register
Clean entry for vehicles	Ensure all vehicles are adhering to weed hygiene protocols including strict clean on entry requirements	For each vehicle entering site	Construction Contractor	Weed hygiene inspection register
Analysis of Incident Trends	Analyse incidents reported for any non-compliances, incidents (including weed incursion)	Monthly	HSE Manager	Incident report

### 7.3.7 Corrective actions and contingencies

If monitoring indicates that environment objectives and targets for weeds are not being achieved, contingency actions will be enacted, as indicated in Table 7-21.

Table 7-21: Weed corrective actions and contingencies

Trigger	Action
Weed outbreaks	<ol style="list-style-type: none"> <li>1. Infestations are identified and mapped</li> <li>2. Source of infestation is investigated and addressed</li> <li>3. Infestations are controlled via appropriate use of herbicide or other control techniques</li> <li>4. Implement any rehabilitation as required.</li> </ol>

## 7.4 BUSHFIRE SUB-PLAN

### 7.4.1 Environmental values

The project area is located on the Seaview Range, approximately 65 km south-west of Ingham in North Queensland. The area is characterised by typical dry-tropics climate, with the majority of annual rainfall falling in the four months from December to March. Gawara Baya is situated in an area of moderate bushfire intensity risk, however the project area includes patches of high and very high potential bushfire intensity and is adjacent to a large area of high potential bushfire intensity.

### 7.4.2 Environmental activities to be managed

Construction activities have the potential to increase the risk of fire, causing injury or loss of human life, loss of flora and vegetation, fauna and habitat, and impacting surface water quality, through the following aspects of the project:

- Introduction of ignition sources including vehicles and machinery and equipment such as generators
- Welding, grinding and other hot works
- Introduction or spread of weed species which can increase fuel load.

### 7.4.3 Potential impacts

Construction of the project may result in the following impacts:

- Injury or loss of life to the public and project workforce
- Disruption to utility supply as a result of damage
- Generation of smoke, dust and ash
- Disturbance and /or loss of terrestrial flora species and fire sensitive vegetation communities
- Degradation vegetation communities caused by sediment deposition, physical modification of watercourse
- Degradation or loss of sensitive communities (e.g. 'of concern RE') and hollow bearing trees
- Mortality of fauna
- Loss, degradation and fragmentation of fauna habitat
- Degradation of surface water quality due to input of silt
- Damage to culturally sensitive areas and other infrastructure outside project area.

This sub-plan addresses management of issues relating to bushfire. The management approach to flora and vegetation, terrestrial fauna and habitat, and surface and groundwater is described in the appropriate sub-plans.

### 7.4.4 Management objectives

Environmental targets and performance indicators have been prescribed in line with bushfire management objectives for the project and identified in Table 7-22.

Table 7-22: Bushfire performance management

Issue	Objective	Target	Measurement Criteria
Bushfire	To prevent fires occurring as a result of project activities	No fires caused by project activities.	Number of fires caused by project activities

### 7.4.5 Management measures

Specific actions have been identified to assist in achieving bushfire management objectives for the project as identified in Table 7-23.

Table 7-23: Bushfire control measures

Parameter	Control Measure	Responsibility
Inductions and training	<ul style="list-style-type: none"> <li>• Relevant personnel shall be trained in the use of fire fighting equipment</li> </ul>	Construction Contractor
Fire control equipment	<ul style="list-style-type: none"> <li>• Appropriate fire control equipment (including fire extinguishers, dry chemical, foam extinguisher, water carts as required) will be provided in all vehicles, at construction sites, and when and where</li> </ul>	Construction Contractor

Parameter	Control Measure	Responsibility
	hot works are undertaken, and will be regularly replenished and maintained	
Ignition sources	<ul style="list-style-type: none"> <li>Open fires and ignition sources such as cigarettes, lighters and matches are prohibited in the project area</li> </ul>	All personnel
Consultation	<ul style="list-style-type: none"> <li>All construction activities shall be conducted in accordance with and in liaison with relevant fire authorities</li> </ul>	Construction Contractor
Weather	<ul style="list-style-type: none"> <li>Fire weather warnings will monitored daily and communicated to construction teams</li> </ul>	Construction Contractor
Equipment maintenance	<ul style="list-style-type: none"> <li>All machinery and vehicles will be inspected and maintained in accordance with manufacturer's specifications and to comply with fire safety standards</li> </ul>	Construction Contractor
Equipment maintenance	<ul style="list-style-type: none"> <li>Defective machinery shall be shut down until the defect is rectified and the machine made safe for operations</li> </ul>	Construction Contractor
Vehicles	<ul style="list-style-type: none"> <li>Vehicles shall be regularly inspected for build up of combustible materials including grass and debris, to ensure fire risk is low</li> </ul>	All personnel
Hot works	<ul style="list-style-type: none"> <li>During hot works, including welding, grinding and other hot works, dedicated spotters will be engaged to detect evidence of spot fires</li> <li>Exclusion zones will be maintained around hot works to maintain safe distance from much, vegetation, and any unused vehicles or machinery</li> </ul>	Construction Contractor
Chemical storage	<ul style="list-style-type: none"> <li>Combustible chemicals will be stored in accordance with regulatory requirements and standards, and incompatible chemicals shall not be stored together</li> </ul>	Construction Contractor
Fire prevention	<ul style="list-style-type: none"> <li>Firebreaks shall be maintained around buildings and facilities</li> </ul>	Construction Contractor
Reporting	<ul style="list-style-type: none"> <li>All fires must be immediately reported to a supervisor</li> </ul>	All personnel

#### 7.4.6 Monitoring and recording

The bushfire monitoring program has been designed to ensure that construction of the project is consistent with the control measures. Monitoring will measure the success of these actions in accordance with management objectives and targets and identified in Table 7-24.

Table 7-24: Bushfire monitoring and recording

Monitoring	Details	Timing	Responsibility	Records
Weather conditions	Monitor weather conditions and fire rating to assess fire risk in order to prevent and minimise risk of fire	Daily	Construction Contractor	Environmental Inspections
Hot works	Spotters to be engaged during hot works to identify evidence of hot spots or fire activity to identify fire risk early	During hot works	Construction Contractor	Environmental Inspections

Monitoring	Details	Timing	Responsibility	Records
Site Inspections	Opportunistic observation for evidence of ignition sources or fire hazards to reduce the risk of fires	Daily	Construction Contractor	Environmental Inspections
Fire control equipment	Monitor fire control equipment to ensure in good working order and sufficient supply to ensure preparedness for fire event	Weekly	Construction Contractor	Environmental Inspections
Fire events	Maintain records of fires and near misses including cause, date/time, location, response, outcome. Modify activities to reduce fire risk in the future	Ongoing, as required	Construction Contractor	Fire Incident Report

### 7.4.7 Corrective actions and contingencies

If monitoring indicates that environment objectives and targets for bushfire management are not being achieved, contingency actions will be enacted, as identified in Table 7-25.

Table 7-25: Bushfire contingencies and corrective action

Trigger	Action
Project-induced fire activity	<ol style="list-style-type: none"> <li>In the event of a project-induced fire activity (including hot spots or fire), activate and implement fire control (including on-site response and notification of emergency response authorities, as required).</li> <li>Investigate and complete an incident report.</li> <li>Implement appropriate measures to avoid re-occurrence.</li> <li>Rehabilitate vegetation in the affected area, as required</li> </ol>

## 7.5 SOILS AND SEDIMENT SUB-PLAN

The Soils and sediment sub-plan is to be used to inform the development of a site-specific erosion and sediment control plan. The following objectives, measures for management, monitoring and recording, and the triggers and corrective actions identified in this sub-plan are to be fully incorporated by the site-specific erosion and sediment control plan and implemented. The objectives, measures and actions will apply through all stages of construction and are not limited to bulk earthworks. Where management measures (e.g. sediment fencing) have been removed, as a result of fulfilling construction contract obligations to undertake site rehabilitation (for example), the best practice erosion and sediment control (ESC) as per the International Erosion Control Association (IECA) 2008 Best Practice Erosion and Sediment Control Guidelines (BPESC) Standard must be re-instated prior to any additional soil disturbance or vegetation clearing.

The soils and sediment sub-plan objectives should be the focus of the erosion and sediment control plan and its onsite implementation. Where changing conditions and environment require measures that are different or additional to those identified below, they should always be considered with

regards to the objectives of the sub-plan. In particular, the objective for magnificent brood frog management is a high priority. Further, if the site-specific ESC plan is not achieving the objectives of the soils and sediment sub-plan, amend plan to adapt to changing site conditions.

Responsibility for implementing the ESC is primarily allocated to the construction contractor. However, where the construction contractor no longer has authority over aspects of the site and works, for example when civil contractors' works are completed, the Windlab Construction Manager will have responsibility to ensure all further soil disturbance works are undertaken in accordance with the objectives in this sub-plan.

### 7.5.1 Geology and soil types

The landscape is undulating, ranging from steep to gently sloping. The dominant rock type is granite which is found across more than half the project area. A more detailed overview of geology and soil types is provided in Section 4.1.3.

### 7.5.2 Environmental activities to be managed

Construction activities have the potential to impact on soils and sediment through the following aspects of the project:

- Vegetation clearing
- Excavation
- Vehicle movements outside of designated areas and on unstable ground
- Spills and leaks of hydrocarbons, hazardous materials or liquid (including septic).

### 7.5.3 Potential impacts

Construction of the project has the potential to result in the following impacts:

- Accelerated soil erosion and sedimentation of watercourses
- Landform instability
- Soil compaction
- Contamination of soil and sediment.

This sub-plan addresses management of issues relating to impacts to soils and sediment. The management approach to rehabilitation, weeds, fire, dust (air emissions), surface and groundwater, hazardous materials and spill response is described in the appropriate sub-plans.

### 7.5.4 Management objectives

Environmental targets and performance indicators have been prescribed in line with soils and sediment management objectives for the project and identified in Table 7-26.

*Table 7-26: Soils and sediment performance management*

Issue	Objective	Target	Measurement Criteria
Topsoil	Minimise change to soil profile from excavation activities	<ul style="list-style-type: none"> <li>• No evidence of subsoil on surface within excavated areas following backfill</li> </ul>	<ul style="list-style-type: none"> <li>• Subsoil on surface (as detected by colour and texture) within excavated areas following backfill</li> </ul>

Issue	Objective	Target	Measurement Criteria
		<ul style="list-style-type: none"> <li>No visual evidence of soil compaction following backfill and rehabilitation</li> </ul>	<ul style="list-style-type: none"> <li>Presence of soil compaction following backfill and rehabilitation (e.g. hard soil, local water pooling)</li> </ul>
Erosion control	Prevent occurrence of soil erosion during and following construction	<ul style="list-style-type: none"> <li>No soil erosion inconsistent with that of the surrounding land outside of the construction footprint</li> </ul>	<ul style="list-style-type: none"> <li>Presence of soil erosion inconsistent with that of the surrounding land</li> </ul>
Sediment control	Prevent dirty water from entering waterways prior to treatment	<ul style="list-style-type: none"> <li>Water quality pre-construction maintained during and post-construction</li> </ul>	<ul style="list-style-type: none"> <li>Suspended solids concentrations (SSC) upstream and downstream of waterway crossings</li> </ul>
<b>Magnificent brood frog (MBF) potential habitat management</b>	Prevent sediment from entering MBF Management Area A <sup>17</sup> (refer Figure 7-1 and Figure 7-2) during and following construction	<ul style="list-style-type: none"> <li>No movement of sediment from construction site into the magnificent brood frog potential habitat inconsistent with that of the surrounding land outside of the construction footprint</li> </ul>	<ul style="list-style-type: none"> <li>SSC and vegetation health within MBF potential habitat upstream and downstream of construction works</li> </ul>
	Minimise sediment from entering MBF Management Area B (refer Figure 7-1 and Figure 7-2) during and following construction	<ul style="list-style-type: none"> <li>Disturbance of MBF Management Area B does not extend beyond the development corridor</li> </ul>	<ul style="list-style-type: none"> <li>SSC and vegetation health within MBF potential habitat upstream and downstream of construction works</li> </ul>

### 7.5.5 Management measures

The Soils and sediment sub-plan has been developed in accordance with the IECA BPESC Guidelines (IECA 2008). Specific actions have been identified to assist in achieving soils and sediment management objectives for the project and identified in Table 7-27.

In developing the following into a site-specific ESC plan, it is important to note the following:

- ‘Construction’ in the measures for soils and sediment control identified below refers to all works that will or have potential to disturb soil surface, and is not limited to clearing and bulk earthworks

<sup>17</sup> MBF Management Areas have been generated by buffering inverts within MBF potential habitat by 100 m. Area A are buffers to inverts outside the development footprint. Area B are buffers to inverts where MBF potential habitat is located within the development footprint.

- While some construction will occur outside the wet season, do not assume dry conditions will exist. Rainfall can occur during the 'dry season' and this must be accounted for in the implementation of measures below.

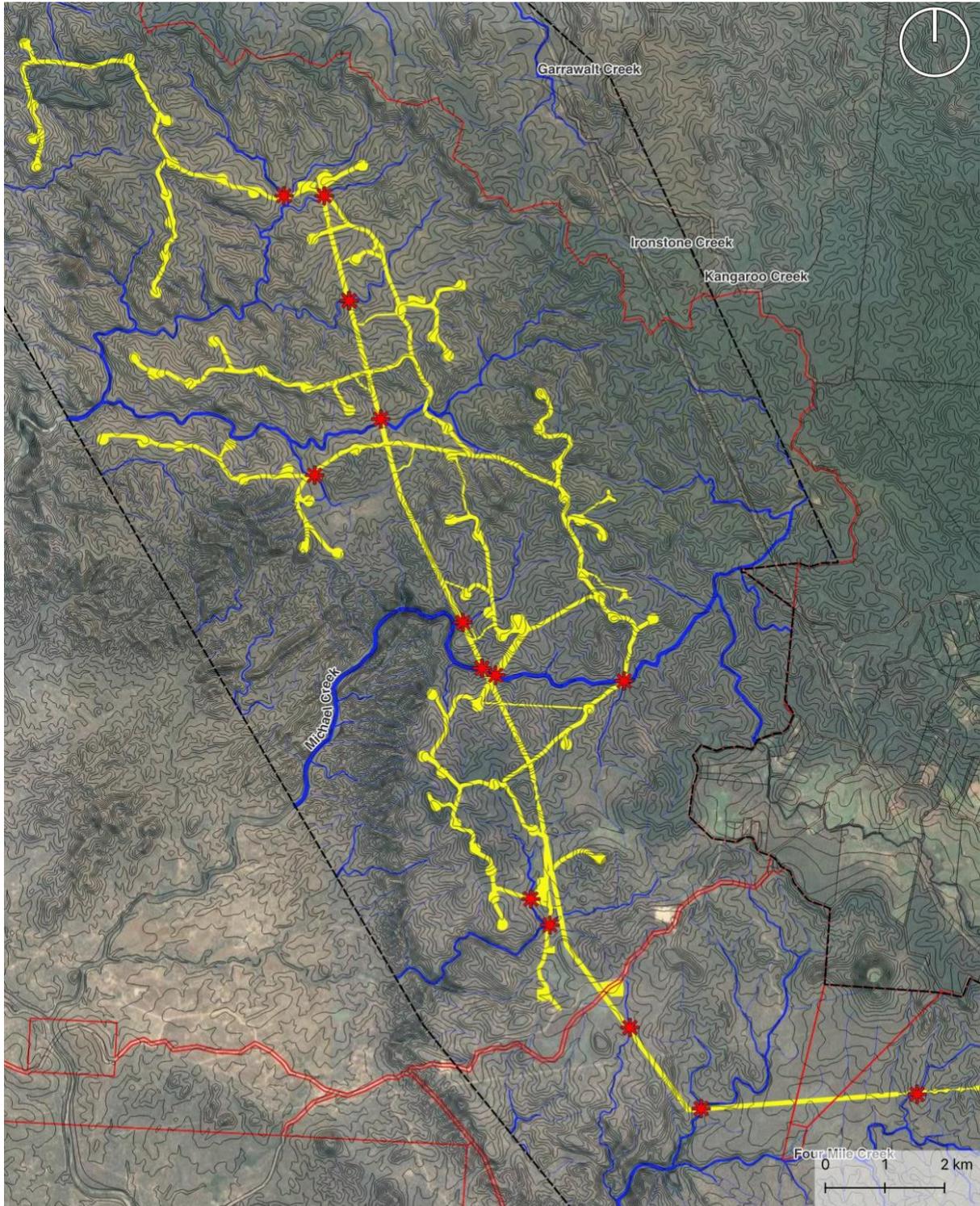
Table 7-27: Soils and sediment control measures

IECA 2008 ESC principle	Control measures	Responsibility
Appropriately integrate the development into the site	<ul style="list-style-type: none"> <li>• Avoid placement of structures within the identified riparian zone, even if riparian vegetation does not currently exist</li> <li>• Minimise disturbance to riparian zones and waterway channel to the minimum necessary to achieve the required project outcomes</li> <li>• Design and construct waterway crossings to accommodate local rainfall</li> <li>• Maximise the placement of infrastructure within existing cleared areas including placement of watercourse crossings within existing gaps in riparian corridor and existing tracks</li> <li>• <b>Magnificent brood frog potential habitat management area</b> <ul style="list-style-type: none"> <li>○ Prevent and minimise clearing and disturbance within MBF Management Area A</li> <li>○ Minimise clearing and disturbance within MBF Management Area B</li> </ul> </li> </ul>	Construction Manager (Windlab)
Integrate erosion and sediment control issues into site and construction planning	<ul style="list-style-type: none"> <li>• ESC standards to be applied during construction are established during the project planning phase and included within construction tender packs and procurement contracts. This includes <b>MBF potential habitat management area mapping and management measures</b></li> <li>• Construction contractor will be required to develop ESC Plans for their work, which are submitted to the proponent for acceptance prior to the commencement of work</li> <li>• Undertake soil mapping to identify erosive soils</li> </ul>	Construction Manager (Windlab)
	<ul style="list-style-type: none"> <li>• Stockpile areas to be designated outside of overland flow areas to minimise impacts on site runoff</li> <li>• Provision of shakedown pit for any entry/exit points to the site</li> <li>• Detailed project start-up toolbox talk followed by weekly toolbox talks to inform site personnel of issues and management measures</li> <li>• Inform staff of No Go Zones and requirements for constraining works to within the approved construction area</li> </ul>	Construction contractor
	<ul style="list-style-type: none"> <li>• The measures identified for sediment management must be complimentary with the MBF objectives and measures in the Surface water sub-plan</li> <li>• Where sediment controls are located in local catchments above MBF Management Area A or within MBF Management Area B, it is important these are able to handle big flow events, and may need to have larger sediment traps</li> </ul>	Construction contractor

IECA 2008 ESC principle	Control measures	Responsibility
Develop effective and flexible ESC Plans based on anticipated soil, weather and construction conditions	<ul style="list-style-type: none"> <li>• Site-specific ESC Plan developed and implemented by those with control over construction work, supported by a suitably experienced ESC professional</li> <li>• ESC to be informed by soil mapping</li> <li>• Ensure site-specific ESC plan incorporates weather monitoring requirements and actions for preparing for high rainfall events</li> <li>• Undertake in-stream works during periods of no flow where possible</li> <li>• Update site-specific ESC plan measures where monitoring (refer Section 7.5.6) identifies objectives of the sub-plan are not being achieved</li> </ul>	Construction contractor
Minimise the extent and duration of soil disturbance	<ul style="list-style-type: none"> <li>• Refer to Vegetation clearing plan (Section 7.2) – clearing to be staged to occur immediately prior to soil disturbance to minimise soil exposure extent and duration</li> <li>• Land disturbance to be limited to the current stage of construction</li> <li>• Delay disturbance of ground covers (grasses, fallen leaves, and mulches) until the last practical moment</li> <li>• In critical areas, such as drainage channels and overland flow paths, exposed soils should be stabilised with turf rather than grass seeding, for minimum time necessary, then revegetated/restored (refer Rehabilitation Plan at Appendix C).</li> <li>• For embankments steeper than 1V:4H, a hydro mulch seed mix or polymer binder such as Vital BonMatt P47-VR1 or similar, is recommended to be applied to the face of the slope as a stabilising agent until such time that revegetation or landscaping can commence</li> <li>• Erosion and sediment control plans should have detailed instructions for No Go Zones and areas outside the approved construction footprint, with appropriate site supervision</li> <li>• Exclude all equipment and workers from identified No-Go Zones</li> <li>• Identify the boundaries of approved construction areas with marker tape or light fauna-friendly fencing</li> </ul>	Construction contractor
Control water movement through the site	<ul style="list-style-type: none"> <li>• Construction of temporary cut-off drains and clean water diversions throughout site to ensure that during and after storm events, clean water upstream flows entering the site are not contaminated with construction material and/or particulates that might enter the downstream system; similarly, site flows should be diverted to temporary sediment basins for treatment prior to leaving site and entering the downstream stormwater network.</li> <li>• <b>Cut off swales and diversion drains not to be directed towards MBF Management Area A or B</b> (refer Figure 7-1 and Figure 7-2)</li> <li>• <b>No concentrated flows will enter MBF Management Area A or B</b> (refer Figure 7-1 and Figure 7-2)</li> <li>• Flow velocities need to be limited to the maximum allowable velocity for each individual drainage system</li> </ul>	Construction contractor

IECA 2008 ESC principle	Control measures	Responsibility
Minimise soil erosion	<ul style="list-style-type: none"> <li>• Monitoring of wind speeds for during of construction and dust suppression via water truck</li> <li>• Limit vertical exposure – stage disturbance and rehabilitation of steep batters to a maximum of 3 vertical-meters at any given time. Place a Hold Point in construction contract specifying that cutting and filling operations must not continue until the previous 3 vertical-meters of the batter are suitably stabilised (e.g. mulched)</li> <li>• Long slopes of disturbed or otherwise unstable spoil should be divided into small, manageable drainage areas to prevent or at least minimise rill erosion;</li> <li>• Appropriate outlet scour protection needs to be placed on all stormwater outlets, chutes, spillways, slope drains and downstream side of constructed access tracks to dissipate flow energy and minimise the risk of soil erosion;</li> <li>• Mulch not to be used in overland flowpaths, on slopes steeper than 1 in 4, or within 50 m of a watercourse, unless secured by jute netting or similar (synthetic mesh not to be used as it endangers wildlife)</li> <li>• Where mulch is used in erosion and sediment control, tender documents should specify minimum application rates</li> <li>• Watercourses – Establish channel clearing and stabilisation requirements for the work in line with the best practice channel clearing and stabilisation requirements identified in IECA 2008 Table I11, as a minimum, for all watercourses identified in Figure 7-4)</li> <li>• Access tracks will be constructed in accordance with <i>Erosion control on property roads and tracks – managing runoff</i> (Queensland Government 2013)</li> </ul>	Construction contractor
Promptly stabilise disturbed areas	<ul style="list-style-type: none"> <li>• Topsoil (top 50 mm) retained for site rehabilitation/restoration and stockpiled separately, in low mounds no higher than 1.5 m where desirable to retain seedbank</li> <li>• Finished soil surfaces need to be left in a suitably roughened state and quality to encourage revegetation where appropriate</li> <li>• Appropriate scarification and treatment of subsoils prior to topsoil replacement</li> <li>• Replacement of stockpiled topsoil material on top of disturbed areas to allow revegetation</li> <li>• Where topsoil has been stockpiled for more than 12 months, it should be tested for nutrient properties and revegetation potential</li> <li>• Install culverts early in construction period at major waterway crossings (refer Figure 7-4), and drainage pipes at all minor water crossings to maintain natural flow. Stabilise and rehabilitate (refer Rehabilitation Plan) immediately following installation</li> </ul>	Construction contractor
Maximise sediment retention on the site	<ul style="list-style-type: none"> <li>• Implementation of temporary sediment basins compliant with QLD State Planning Policy target objectives, local</li> </ul>	Construction contractor

IECA 2008 ESC principle	Control measures	Responsibility
	authority specifications, and IECA 2008 standards for estimated soil loss or monthly erosivity <ul style="list-style-type: none"> <li>• Sediment fences to be erected</li> <li>• All waterway crossings need to employ appropriate drainage, erosion and sediment controls to minimise sediment inflow into riparian areas</li> </ul>	
Maintain all ESC measures in proper working order at all times	<ul style="list-style-type: none"> <li>• Regular inspection of sediment control measures</li> <li>• Continual maintenance and upkeep of erected sediment &amp; dust fences, diversion drains, control measures; and</li> <li>• Dynamic response to any changing site conditions such as inclement weather</li> </ul>	Construction contractor
Monitor the site and adjust ESC practices to maintain the required performance standard	<ul style="list-style-type: none"> <li>• Erosion and sediment control devices to be left in-situ until 80% ground cover has been achieved</li> <li>• Maintenance of revegetated areas, e.g. watering (refer Rehabilitation Plan)</li> </ul>	Construction contractor



**Legend**

- |                            |             |                                |
|----------------------------|-------------|--------------------------------|
| Project Cadastral Boundary | Watercourse | Major water crossing locations |
| Survey Area                | Order 1     |                                |
| Development footprint      | Order 2     |                                |
|                            | Order 3     |                                |
|                            | Order 4     |                                |
|                            | Order 5     |                                |

Coordinate System: GDA 1994 MGA Zone 55s

Service Layer Credits: Source: QSpatial, QLD Gov; Google Earth

Figure 7-4: Major watercourse crossings – Best practice clearing and stabilisation, early installation of culverts

## 7.5.6 Monitoring and recording

The monitoring program for soils and sediment has been designed to ensure that construction of the project is consistent with the control measures. Monitoring will measure the success of these actions in accordance with management objectives and targets and identified in Table 7-28.

Table 7-28: Soils and sediment monitoring and recording

Monitoring	Details	Timing	Responsibility	Records
Topsoil stockpile inspection	<ul style="list-style-type: none"> <li>Visual inspection of topsoil stockpiles for evidence of erosion</li> </ul>	<ul style="list-style-type: none"> <li>Weekly</li> </ul>	Construction Contractor	Standard site checklist
Watercourse bed and banks and areas of sloping topography	<ul style="list-style-type: none"> <li>Visual inspection at site of watercourse crossings for evidence of instability, compaction or erosion</li> </ul>	<ul style="list-style-type: none"> <li>Weekly</li> </ul>	Construction Contractor	Standard site checklist
Erosion and sediment control devices	<ul style="list-style-type: none"> <li>Visual inspection of devices to ensure in working order and achieving intended objectives</li> </ul>	<ul style="list-style-type: none"> <li>Daily when rain is occurring</li> <li>Weekly, even if work is not occurring on site until 80% ground cover established</li> <li>Within 24 hrs prior to predicted rainfall events</li> <li>Within 18 hours after rainfall event significant enough to cause site-run-off</li> </ul>	Construction Contractor	Standard site checklist
Water quality	<ul style="list-style-type: none"> <li>As outlined in the site-specific ESC Plan in line with IECA BPESC Standard</li> <li>Performed on any sediment basin controlled discharge</li> <li>Assess total suspended solids concentrations (SSC) and pH as a minimum</li> </ul>	<ul style="list-style-type: none"> <li>Suitably frequently</li> <li>Within 18 hours after rainfall event significant enough to cause site-run-off</li> </ul>	Construction contractor with Senior environment advisor	Water monitoring log

Monitoring	Details	Timing	Responsibility	Records
	<ul style="list-style-type: none"> <li>Ensure impact (sedimentation) to MBF Management Area A is avoided and Area B is minimised (refer Figure 7-1 and Figure 7-2)</li> </ul>	<ul style="list-style-type: none"> <li>Weekly</li> <li>Within 18 hours after rainfall event significant enough to cause site-run-off</li> </ul>	Construction contractor with Senior environment advisor	Water monitoring log
Hazardous materials	Storage, handling and disposal monitored in accordance with the Hazardous Materials Management sub-plan to prevent soil and sediment contamination	In accordance with Hazardous Materials Management sub-plan	Construction Contractor	Monthly Health, Safety, Environment Report
Surface stabilisation	<ul style="list-style-type: none"> <li>Rehabilitation area establishment progress (refer Rehabilitation plan at Appendix C)</li> </ul>	<ul style="list-style-type: none"> <li>As per Rehabilitation plan</li> </ul>	Construction contractor	Rehabilitation report
	<ul style="list-style-type: none"> <li>Surface coverage of finished surfaces (% groundcover)</li> </ul>	<ul style="list-style-type: none"> <li>Weekly, even if work is not occurring on site until 80% ground cover established</li> </ul>	Construction contractor	Rehabilitation report

### 7.5.7 Contingencies and corrective action

If monitoring indicates that environment objectives and targets for soils and sediment are not being achieved, contingency actions will be enacted, as indicated in Table 7-29.

Table 7-29: Soils and sediment contingencies and corrective action

Trigger	Action
Evidence of erosion of topsoil stockpiles	<ol style="list-style-type: none"> <li>Apply erosion control measures such as stabilisers, or other, as appropriate to prevent further loss</li> </ol>
Formation of gullies	<ol style="list-style-type: none"> <li>Investigate cause.</li> <li>Undertake maintenance as required.</li> <li>Adaptive management.</li> </ol>
Instability or compaction of watercourse beds and banks	<ol style="list-style-type: none"> <li>Investigate cause (e.g. vehicle movements)</li> <li>Remediate through stabilisation or ripping, as required</li> <li>Maintain remediated area</li> <li>Review vehicle access to beds and banks, if required</li> <li>Monitor bed and banks and maintain remediated area</li> </ol>
Increased run-off leading to erosion of soil and subsequent deposition	<ol style="list-style-type: none"> <li>Investigate cause (e.g. construction, wind and/or soil erosion, feral animals, inappropriate soil and/or sediment controls).</li> <li>Undertake a risk assessment (risk of remediation options vs do nothing options).</li> </ol>

	<ol style="list-style-type: none"> <li>3. Remediate cause if possible.</li> <li>4. Maintenance of rehabilitated areas until the required outcome is achieved.</li> <li>5. Adaptive management.</li> </ol>
Visible increase in suspended sediments (downstream from major waterway crossings and within magnificent brood frog habitat below construction site)	<ol style="list-style-type: none"> <li>1. Ensure erosion and sediment control devices are operating as designed</li> <li>2. Investigate sources of sediment and improve stabilization of areas</li> <li>3. Install additional sediment management controls in consultation with senior environment advisor</li> <li>4. Undertake rehabilitation/remediation as required in MBF potential habitat</li> </ol>
Hazardous materials spill contaminating soil and/or sediment	<ul style="list-style-type: none"> <li>• Implement measures identified in the Hazardous Material and Spill Response Management sub-plan.</li> </ul>

## 7.6 NOISE SUB-PLAN

### 7.6.1 Environmental values

The project area is remote and there are few anthropogenic sources of noise. There are several sensitive receptors to noise within the vicinity of the project including homes on the properties within the project area and the township of Mt Fox.

### 7.6.2 Environmental activities to be managed

Construction activities have the potential to generate noise through the following aspects of the project:

- Clearing and earthworks activities
- Infrastructure installation
- General operation of equipment during construction
- Construction traffic during the project.

### 7.6.3 Potential impacts

Construction of the project has the potential to result in the following impacts:

- Disturbance to nearby sensitive receptors including nearby residences
- Disruption to fauna behaviour.

This sub-plan addresses management of issues relating to impacts to noise and vibration, other than health and safety issues. The management approach to terrestrial fauna, is described in the appropriate sub-plans. The management approach for health and safety is addressed elsewhere.

### 7.6.4 Management objectives

Environmental targets and performance indicators have been prescribed in line with noise management objectives for the project and indicated in Table 7-30.

Table 7-30: Noise and vibration performance management

Issue	Objective	Target	Measurement Criteria
Noise nuisance	To minimise the impact of project generated noise and vibration emissions on nearby sensitive receptors and the environment	<ul style="list-style-type: none"> <li>No substantiated land user complaints</li> <li>Maintain compliance with relevant noise regulations</li> </ul>	<ul style="list-style-type: none"> <li>Number of substantiated land user complaints</li> <li>Predicted average construction noise levels for all receivers</li> </ul>

### 7.6.5 Management measures

Specific actions have been identified to assist in achieving noise management objectives for the project, as indicated in Table 7-31<sup>18</sup>.

Table 7-31: Noise and vibration control measures

Parameter	Control Measure	Responsibility
Sensitive receptors	<ul style="list-style-type: none"> <li>Residents will be informed of potential noise generating activities prior to the commencement of activities near residences.</li> </ul>	Construction Manager/ Land Manager
Scheduling of activities	<ul style="list-style-type: none"> <li>Noise generating activities will be scheduled to occur during daylight hours; Monday to Sunday 6:30am – to 6:30pm, with extended work hours as required. If this is not possible, additional assessment of impacts to sensitive receptors will be undertaken.</li> </ul>	Construction Contractor
Noise generating equipment	<ul style="list-style-type: none"> <li>Equipment will be selected and maintained to minimise noise emissions as far as practicable</li> <li>Noise abatement devices (e.g. mufflers, silencers and screens) will be utilised where relevant</li> <li>Equipment will be shut down (or throttled down if shut down is not feasible) when not in use and tasks should be completed in the minimum time that is feasible and safe</li> <li>Semi-fixed noise generating equipment (e.g. generators, compressors) shall be located as far as practicable from sensitive receptors. Local shielding provided by site topography and infrastructure will be used.</li> <li>Reversing alarms on plant will be adjusted to limit the acoustic range to the immediate danger area.</li> </ul>	Construction Contractor
Site access	<ul style="list-style-type: none"> <li>Site access and deliveries will be located as far away from sensitive receptors and will use non-residential roads, as much as possible</li> <li>Deliveries will be scheduled to arrive during the day.</li> </ul>	Construction Contractor
Complaints records	<ul style="list-style-type: none"> <li>Report and respond to all noise complaints as an environmental incident.</li> </ul>	Project Manager
Fauna	<ul style="list-style-type: none"> <li>Fauna shall be managed in accordance with the Fauna Management sub-plan.</li> </ul>	Construction Contractor

<sup>18</sup> Additionally, the proponent will have a compliant hotline

### 7.6.6 Monitoring and recording

The monitoring program for noise has been designed to ensure that construction and operation of the project are consistent with the control measures. Monitoring will measure the success of these actions in accordance with management objectives and targets, as indicated in Table 7-32.

Table 7-32: Noise and vibration monitoring and recording

Monitoring	Details	Timing	Responsibility	Records
Analysis of Incident Trends	Analyse incidents reported for identification of noise complaints. Determine number of noise complaints	Annually	HSE Manager	HSE reporting
Noise monitoring	Monitor noise at adjacent sensitive receptors in response to complaints or in high-risk work programs (i.e. those with nearby sensitive receptors where noisy works are required outside standard hours). Determine if noise is at unacceptable levels.	As required	Senior Advisor – Environment and Heritage/ Construction Contractor	Noise Monitoring Report Environmental Incident Report

### 7.6.7 Corrective actions and contingencies

If monitoring indicates that environment objectives and targets for noise are not being achieved, contingency actions will be enacted, as indicated in Table 7-33.

Table 7-33: Noise and vibration contingencies and corrective action

Trigger	Action
Monitoring reveals noise levels are above acceptable levels.	Report as Environmental Incident and initiate Incident Response Procedure, including: <ol style="list-style-type: none"> <li>Investigate cause.</li> <li>Implement corrective actions where required.</li> </ol>
Noise or vibration complaint is received.	Report as Environmental Incident and initiate Incident Response Procedure, including: <ol style="list-style-type: none"> <li>Investigate cause.</li> <li>Implement corrective actions where required.</li> </ol>
Monitoring reveals vibration impacts have occurred (e.g. to threatened fauna habitats).	Report as Environmental Incident and initiate Incident Response Procedure, including: <ol style="list-style-type: none"> <li>Investigate cause.</li> <li>Report to relevant government agency.</li> <li>Implement corrective actions where required.</li> </ol>

## 7.7 AIR EMISSIONS SUB-PLAN – DUST

### 7.7.1 Environmental values

The project area traverses remote areas where there are limited anthropogenic air emission sources. Dust generation from traffic on unsealed roads are likely to contribute to air emissions in the area.

Bushfires may also contribute to the local and regional air quality. Bushfires occur predominantly during mid- to late dry season, and these contribute smoke, which is a mixture of particulate matter, water vapour and gases including carbon monoxide, carbon dioxide and oxides of nitrogen.

### 7.7.2 Environmental activities to be managed

Construction activities have the potential to release dust emissions to the air through the following aspects of the project:

- Vegetation clearing and earthworks for construction
- An increase in vehicle movements on unsealed roads
- Increased fire ignition sources.

### 7.7.3 Potential impacts

Construction of the project has the potential to result in the following impacts:

- Dust emissions causing nuisance and reduced visibility
- Smoke, ash and silt due to bushfire.

This sub-plan addresses management of issues relating to impacts caused by dust emissions. The management approach to surface water, soils and sediment, and flora and vegetation are described in the appropriate sub-plans.

### 7.7.4 Management objectives

Environmental targets and performance indicators have been prescribed in line with dust emission management objectives for the project, as indicated in Table 7-34.

*Table 7-34: Air emissions performance management*

Issue	Objective	Target	Measurement Criteria
Dust causing nuisance reduced visibility or smothering	To minimise the impact of dust emissions from construction activities, machinery and vehicles.	<ul style="list-style-type: none"> <li>• No reasonable substantiated complaints</li> <li>• No air pollution incidents/ events caused by dust deposition</li> <li>• No vegetation smothering from dust deposition</li> </ul>	<ul style="list-style-type: none"> <li>• Number of substantiated complaints and dust related incidents</li> <li>• Vegetation condition assessments</li> <li>• Dust within limits outlined in Australian Standards and in line with DES Guideline (2021)</li> </ul>

Degradation of air quality due to fire activity	To minimise risk of air emissions from project related fire	<ul style="list-style-type: none"> <li>No reported project related fire events</li> <li>No significant change to air quality</li> <li>Compliance with statutory regulations.</li> </ul>	<ul style="list-style-type: none"> <li>Number of reported project related fire events incidents to health and safety</li> <li>Number of substantiated complaints</li> </ul>
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### 7.7.5 Management measures

Specific actions have been identified to assist in achieving air emission objectives for the project, as indicated in Table 7-35.

Table 7-35: Air emission control measures

Parameter	Control Measure	Responsibility
Weather	<ul style="list-style-type: none"> <li>BOM forecasts will be consulted daily to avoid undertaking earthworks during high wind events or when prevailing winds are toward sensitive receptors.</li> </ul>	Construction Contractor
Prevention of dust emissions	<ul style="list-style-type: none"> <li>The construction schedule shall be planned to minimise the elapsed time between clearing, grading and reinstatement.</li> </ul>	Construction Manager
Sensitive receptors	<ul style="list-style-type: none"> <li>Local residents and land users will be advised of the likely duration of ground disturbance activities and mitigation measures to be undertaken whilst construction is occurring in their vicinity.</li> </ul>	Land Manager
Vehicle movements	<ul style="list-style-type: none"> <li>Vehicle movements will be speed and access restricted.</li> </ul>	Construction Contractor
Stockpiles	<ul style="list-style-type: none"> <li>Stockpiles will be located and managed to avoid impacts to sensitive receptors.</li> <li>Physical barriers such as bunds or windbreaks will be constructed around dust generating stockpiles where required.</li> </ul>	Construction Contractor
Vegetation	<ul style="list-style-type: none"> <li>Water spraying of nearby sensitive vegetation will occur if visible dust sedimentation is observed</li> <li>Burning of vegetation will be prohibited.</li> </ul>	Construction Contractor
Dust control	<ul style="list-style-type: none"> <li>Appropriate dust controls (including but not limited to water carts, non-toxic stabilisers, vehicle covers, or other) to be implemented throughout construction as required to prevent and minimise dust impacts to sensitive receptors and the surrounding environment.</li> </ul>	Construction Contractor
Complaints records	<ul style="list-style-type: none"> <li>All complaints regarding dust nuisance shall be reported as an environmental incident<sup>18</sup>.</li> </ul>	Construction Contractor and Land Manager
Bushfire	<ul style="list-style-type: none"> <li>Fire control shall be in accordance with the Bushfire Management sub-plan.</li> </ul>	Construction Contractor

## 7.7.6 Monitoring and recording

The monitoring program for air emissions has been designed to ensure that construction and operation of the project are consistent with the control measures. Monitoring will measure the success of these actions in accordance with management objectives and targets, as indicated in Table 7-36.

Table 7-36: Air emission monitoring and recording

Monitoring	Details	Timing	Responsibility	Records
Visual airborne dust emissions	Ongoing visual inspection to monitor dust emissions required. This includes inspections of vegetation for deposition. Ensure dust suppression is undertaken when necessary.	Ongoing	Construction Contractor	Environmental Inspection Environmental Incident Report

## 7.7.7 Corrective actions and contingencies

If monitoring indicates that environment objectives and targets for air emissions are not being achieved, contingency actions will be enacted, as indicated in Table 7-37.

Table 7-37: Air emission contingencies and corrective actions

Trigger	Action
Where excessive airborne dust is generated or a substantiated landholder complaint received	A combination of one or more of the following shall be implemented as required: <ol style="list-style-type: none"> <li>1. Application of water or stabilisers via water trucks and sprayers to dampen down soil. No run-off should be generated from application. Applications shall be frequent enough to provide persistent dust suppression.</li> <li>2. Cover vehicles with dust emitting loads (except when loading and unloading).</li> <li>3. Use of dust stabilisers, tarps or geo-textile materials to suppress dust generated from stockpiles.</li> </ol>
Where visible dust sedimentation on sensitive vegetation is observed	<ol style="list-style-type: none"> <li>1. Application of water to remove dust. No run-off should be generated from application.</li> <li>2. See above for implementation of dust suppression measures.</li> </ol>

## 7.8 SURFACE WATER SUB-PLAN

### 7.8.1 Environmental values

The survey area is traversed by numerous watercourses comprised of both minor drainage lines (stream order one) through to major watercourses (stream order five). The largest watercourse traversing the survey area is Michael Creek (stream order five). The survey area lies within two separate drainage basins, Burdekin Basin (associated with the Einasleigh Uplands) and Herbert Basin (associated with the Wet Tropics). The development footprint is located entirely within the Burdekin Basin.

The wind turbines and hardstand are located on, or close to, ridges and therefore above or at the top of drainage paths.

### 7.8.2 Environmental aspects to be managed

Construction activities have the potential to impact on surface and groundwater through the following aspects of the project:

- Vegetation clearing
- Construction of access tracks and hardstand
- Vehicle movements
- Liquid and solid waste disposal may result in contamination of surface waters
- Spills and leaks of hydrocarbons, hazardous materials resulting in contamination of surface water.

This sub-plan addresses management of issues relating to impacts to surface water. The management approach for erosion and sedimentation, hazardous materials and spill response is described in the appropriate sub-plans.

### 7.8.3 Potential impacts

Construction of the project has the potential to result in the following impacts:

- Degradation of surface water quality
- Physical modification of drainage lines, including instability or erosion
- Increased ponding, leading to increased cane toad numbers.

### 7.8.4 Management objectives

Environmental targets and performance indicators have been prescribed in line with surface water management objectives for the project, as indicated in Table 7-38.

Table 7-38: Surface water and groundwater performance management

Issue	Objective	Target	Measurement Criteria
Surface Water	To ensure that natural surface water flow patterns are not detrimentally impacted by activities	<ul style="list-style-type: none"> <li>• Natural surface water flow patterns are maintained.</li> <li>• No detectable increase in erosion and sedimentation along watercourses/drainage lines due to the project.</li> </ul>	<ul style="list-style-type: none"> <li>• Conformance with conditions of licences and/or permits (where applicable)</li> </ul>
Water quality	To prevent contamination of surface water	<ul style="list-style-type: none"> <li>• No fuel and chemical spills.</li> </ul>	<ul style="list-style-type: none"> <li>• No at fault contamination of surface or ground water quality to below background or guideline levels (whichever is deemed relevant)</li> </ul>

Issue	Objective	Target	Measurement Criteria
Ponding	To prevent concentrations of water along access tracks and ponding	<ul style="list-style-type: none"> <li>No prolonged ponding of stormwater</li> </ul>	<ul style="list-style-type: none"> <li>Stormwater clearance protocols implemented</li> </ul>
Magnificent brood frog (MBF) potential habitat management	Maintain pre-construction surface water flows into MBF Management Area A and B (refer Figure 7-1 and Figure 7-2) during and following construction.	<ul style="list-style-type: none"> <li>Surface water flows consistent with pre-construction flows</li> </ul>	<ul style="list-style-type: none"> <li>Site-specific mitigation measures installed to minimise change to natural flows within and into MBF Management Area B</li> </ul>

### 7.8.5 Management measures

Specific actions have been identified to assist in achieving surface water management objectives for the project, as indicated in Table 7-39.

Table 7-39: Surface water and groundwater control measures

Parameter	Control Measure	Responsibility
Runoff	<ul style="list-style-type: none"> <li>The compacted gravel crane hardstand and components storage areas will be located within a flat portion of the turbine clearings to avoid concentration of runoff and to minimise runoff velocities</li> <li>Stormwater runoff from the project areas will be diverted and discharged through vegetated surfaces where possible</li> <li>Concentration of runoff from the proposed access tracks will be avoided by removing stormwater regularly from the track and associated side drains</li> <li><b>No concentrated flows into MBF Management Area A or B</b> (refer Figure 7-1 and Figure 7-2)</li> </ul>	Construction Contractor
Water quality	<ul style="list-style-type: none"> <li>Construction of temporary cut-off drains and clean water diversions throughout site to ensure after storm events, clean water upstream flows entering the site are not contaminated with construction material and/or particulates that might enter the downstream system</li> <li>Where drains are required with wind farm infrastructure, these drains will be discharged through spreaders onto grassed areas designed and maintained to trap any sediment load in the runoff before it reaches to drainage features. The location of the stormwater infrastructure will be determined in the detail design phase</li> <li>Continuous maintenance and upkeep of erected sediment and dust fences, diversion drains and control measures</li> <li>Natural surface water patterns will be maintained to avoid potential impacts on existing overland flow paths. Diversion drains will be installed upstream of the wind farm infrastructure to prevent contaminated runoff from entering disturbed areas</li> <li>No storage of fuel or hydrocarbons shall occur within 200 m of a waterbody</li> </ul>	Construction Contractor

Parameter	Control Measure	Responsibility
	<ul style="list-style-type: none"> <li>Maintenance of mobile equipment and vehicles shall not be conducted within 200 m of a waterbody</li> <li>Refuelling shall not be conducted within 200 m of a waterbody</li> <li>Liquid and solid waste disposal shall be disposed of appropriately</li> </ul>	
Erosion	<ul style="list-style-type: none"> <li>Refer Soils and sediment sub-plan erosion controls</li> <li>The velocities of any table drains be checked during detailed design and an appropriate lining adopted to prevent scour</li> </ul>	Construction Manager
Fire	<ul style="list-style-type: none"> <li>Fire control shall be managed in accordance with the Bushfire sub-plan</li> </ul>	Construction Contractor

### 7.8.6 Monitoring and recording

The monitoring program for surface water has been designed to ensure that construction of the project is consistent with the control measures. Monitoring will measure the success of these actions in accordance with management objectives and targets, as indicated in Table 7-40.

Table 7-40: Surface water monitoring and recording

Monitoring	Details	Purpose	Timing	Responsibility	Records
Watercourse bed and banks and areas of sloping topography	<ul style="list-style-type: none"> <li>Visual inspection at site of watercourse crossings for evidence of instability, compaction or erosion</li> </ul>	Identification of instability, compaction or erosion	Weekly	Construction Contractor	Standard site checklist
Construction areas	<ul style="list-style-type: none"> <li>Visual inspection of at-risk areas of ponding (e.g. access tracks) for evidence of prolonged ponding</li> </ul>	Identification of prolonged ponding (and increased cane toad risk)	Weekly	Construction Contractor	Standard site checklist
	<ul style="list-style-type: none"> <li>Visual inspection drainage systems to ensure in working order</li> </ul>	Early identification of concentrated flows causing erosion	Within 24 hrs prior to predicted rainfall events Within 18 hours after rainfall event significant enough to cause site-run-off	Construction Contractor	Standard site checklist
MBF Management Area A	<ul style="list-style-type: none"> <li>Visual inspection of drainage systems to ensure no diversion of watercourses within or upstream of MBF Management Area A (refer Figure 7-1 and Figure 7-2)</li> </ul>	Ensure MBF management maintains pre-construction flow quantity and duration		Construction Contractor	Standard site checklist
MBF Management Area B	<ul style="list-style-type: none"> <li>Visual inspection of drainage systems to ensure site-specific MBF mitigation</li> </ul>	Minimise any change to pre-construction flows within or		Construction Contractor	Standard site checklist

	measures are in place and in working order within or upstream of MBF Management Area B (refer Figure 7-1 and Figure 7-2)	upstream of MBF Management Area B			
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### 7.8.7 Corrective actions and contingencies

If monitoring indicates that environment objectives and targets for surface water are not being achieved, contingency actions will be enacted, as indicated in Table 7-41.

Table 7-41: Surface water and groundwater contingencies and corrective actions

Trigger	Action
Impact on natural surface water flow patterns	<ol style="list-style-type: none"> <li>Investigate cause</li> <li>Undertake maintenance and remediation as required (e.g. remove accumulated material / stormwater)</li> <li>Modify/re-engineer on-site drainage management system as required</li> </ol>
Integrity of on-site drainage management system compromised.	
Evidence of prolonged ponding	
Increased sediment load in watercourses	
Erosion of watercourses	
Liquid or solid waste spill	<ol style="list-style-type: none"> <li>Implement Hazardous Materials Management sub-plan</li> </ol>

## 7.9 HAZARDOUS MATERIALS AND SPILLS SUB-PLAN

### 7.9.1 Environmental values

The project area is remote with few potential sources of contamination. The land is currently used for cattle grazing, with limited pasture improvement or land clearing having occurred to date.

### 7.9.2 Environmental activities to be managed

Construction activities have the potential to result in the uncontrolled release of hazardous materials through the following aspects of the project:

- Storage, handling and disposal of hydrocarbons and hazardous materials
- Refuelling activities
- Vehicle and equipment maintenance.

### 7.9.3 Potential impacts

Construction of the project has the potential to result in the following impacts:

- Contamination of soils and water resources
- Exposure of workforce and landholders to hazardous materials causing injury or loss of life
- Degradation or loss of vegetation and/or fauna habitat

- Injury to or loss of fauna
- Fire activity causing damage to property, persons or native vegetation and habitats.

This sub-plan addresses management of issues relating to impacts from the storage and handling of hazardous materials.

#### 7.9.4 Management objectives

Environmental targets and performance indicators have been prescribed in line with hazardous material management objectives for the project, as indicated in Table 7-42.

Table 7-42: Hazardous materials performance management

Issue	Objective	Target	Measurement Criteria
Contamination	Prevent the contamination of the environment and injury or loss of life due to accidental spills of hazardous materials.	<ul style="list-style-type: none"> <li>• No significant spills or leaks of hazardous materials.</li> <li>• No spills or leaks in or near watercourses.</li> </ul>	<ul style="list-style-type: none"> <li>• No spills or leaks of hazardous materials in excess of 80 L.</li> <li>• No spills or leaks within 100 m of waterbodies.</li> </ul>

#### 7.9.5 Management measures

Specific actions have been identified to assist in achieving hazardous material management objectives for the project, as indicated in Table 7-43.

Table 7-43: Hazardous materials control measures

Parameter	Control Measure	Responsibility
Induction and training	<ul style="list-style-type: none"> <li>• All personnel involved in hazardous materials handling shall be adequately trained</li> </ul>	Construction Contractor HSE Manager Training manager

Parameter	Control Measure	Responsibility
Management of hazardous materials	<ul style="list-style-type: none"> <li>• All storage locations shall maintain a Material Safety Data Sheet (MSDS) manifest and inventory. MSDSs for all stored hazardous materials shall be readily accessible</li> <li>• All chemicals used during operations shall be transported, stored, handled and disposed of in accordance with statutory requirements, codes of practice and industry standards.</li> <li>• Dangerous goods shall be transported by an appropriately licensed contractor</li> <li>• Chemical use shall be minimised where practicable</li> <li>• Minimum practicable volume of chemicals shall be stored on-site</li> <li>• Hazardous materials shall be stored in containment facilities (e.g. bunded areas, leak-proof trays) designed to hold 110% of the capacity of the largest tank or 25% of the total combined volume of stored materials (whichever is greater) and be impervious to prevent the release of spilt substances to the environment</li> <li>• On-site fuel/chemical storage areas shall be clearly signed and designated</li> <li>• Hazardous materials are to be provided and stored and in sealed, labelled containers, without leaks</li> <li>• Fuels and chemicals shall not be stored or handled within 200 m of waterbodies</li> </ul>	Construction Manager
Spill response	<ul style="list-style-type: none"> <li>• Spills kits are to be provided at the following:</li> <li>• All refueling vehicles carry 250 L spill kits</li> <li>• All vehicles fitted with hydraulic hoses have immediate access to 20 L spill kits</li> <li>• All crews handling hazardous chemicals have immediate access to 20 L spill kits</li> <li>• All supervisors will carry 20 L spill kits</li> <li>• Additional spill containment facilities such as compacted pads or drip trays are to be provided at refueling stations, oil and chemical storage sites and vehicle maintenance areas</li> </ul>	Construction Contractor
Spill prevention	<ul style="list-style-type: none"> <li>• Major servicing of plant and equipment shall be undertaken off-site in appropriately equipped areas</li> <li>• Minor vehicle maintenance, if required during construction activities (i.e. re-fueling/lubricating), it shall be done in dedicated areas at least 200 m from waterbodies</li> <li>• Drip tray or absorbent material to intercept inadvertent spillage will be used at all times when refueling or lubricating</li> <li>• Refueling vehicles shall be equipped with the following to enable quick response to spillages: <ul style="list-style-type: none"> <li>○ 250 L spill kits</li> <li>○ Spill tray(s)</li> <li>○ Shovel</li> <li>○ Containers for temporary storage and transport of contaminated soil</li> </ul> </li> </ul>	Construction Contractor

### 7.9.6 Monitoring and recording

The monitoring program for hazardous materials has been designed to ensure that construction and operation of the project are consistent with the control measures. Monitoring will measure the success of these actions in accordance with management objectives and targets, as indicated in Table 7-44.

Table 7-44: Hazardous materials monitoring and recording

Monitoring	Details	Timing	Responsibility	Records
MSDS and chemicals inventory	Inspect MSDS register and inventory to ensure records are accurate and up to date	Monthly	Construction Contractor	Monthly Health, Safety, Environment Report
Handling procedures	Random monitoring of personnel handling to ensure compliance with safe handling procedures	Ongoing	Construction Contractor	Weekly Environment Report
Storage areas and bunding	Inspect integrity of bunding and supply of leak-proof trays to ensure adequate containment in the event of a spill	Monthly	Construction Contractor	Monthly Health, Safety, Environment Report
Spill kits	Inspect spill kits to ensure adequately stocked to ensure adequate spill response supplies and equipment are available	Monthly or after spill event	Construction Contractor	Monthly Health, Safety, Environment Report
Signage	Inspect storage and handling areas to ensure signage to ensure in place To ensure appropriate signage is in place	Quarterly	Construction Contractor	Annual Environment Report
Refuelling equipment	Inspect tanks, lines, hoses, pumps, couplings, valves and associated equipment To ensure in good working order	Weekly	Construction Contractor	Weekly Environment Report

### 7.9.7 Corrective actions and contingencies

If monitoring indicates that environment objectives and targets for hazardous material management are not being achieved, contingency actions will be enacted, as indicated in Table 7-45.

Table 7-45: Hazardous materials contingencies and corrective action

Trigger	Action
Spill of hazardous materials in excess of 80 L	<ol style="list-style-type: none"> <li>1. Identify source of spill</li> <li>2. Exclude workforce and public from affected area</li> <li>3. Stop leak or spill, where practicable</li> <li>4. Implement containment and control to prevent dispersal of hazardous materials</li> <li>5. Capture and contain hazardous materials</li> <li>6. Remediate affected area in consultation with relevant authorities</li> </ol>

Trigger	Action
	7. Review hazardous materials procedures and report incident
Spill within 100 m of a waterbody	<ol style="list-style-type: none"> <li>1. Identify source of spill</li> <li>2. Exclude workforce and public from affected area</li> <li>3. Implement containment, such as booms to prevent dispersal downstream</li> <li>4. Stop leak or spill, where practicable</li> <li>5. Remediate watercourse, in consultation with relevant authorities</li> <li>6. Engage wildlife rescue service to treat any injury fauna</li> </ol>

## 7.10 WASTE MANAGEMENT SUB-PLAN

### 7.10.1 Environmental values

The project area is remote with few potential sources of rubbish and building waste. The land is currently used for cattle grazing, with limited pasture improvement or land clearing having occurred to date.

### 7.10.2 Environmental activities to be managed

Construction activities have the potential to result in the unintended deposition of construction waste through the following aspects of the project:

- Temporary storage of waste
- Handling and transport of waste
- Waste generated by site personnel.

### 7.10.3 Potential impacts

Construction of the project has the potential to result in the following impacts:

- Contamination of soils, water resources and vegetation
- Degradation or loss of vegetation and/or fauna habitat
- Injury to or loss of fauna
- Attraction and increase in pest species.

This sub-plan addresses management of issues relating to impacts from the storage and handling of waste materials.

### 7.10.4 Management objectives

Environmental targets and performance indicators have been prescribed in line with waste management objectives for the project, as indicated in Table 7-46.

Table 7-46: Waste performance management

Issue	Objective	Target	Measurement Criteria
Waste management	To minimise potential contamination of soil, water,	<ul style="list-style-type: none"> <li>• No land contamination as a result of waste deposition</li> </ul>	<ul style="list-style-type: none"> <li>• No deposition of waste materials within project area</li> </ul>

Issue	Objective	Target	Measurement Criteria
	vegetation or habitat values from improper storage and handling of waste	<ul style="list-style-type: none"> <li>Wastes minimised and opportunities for reuse and recycling identified and implemented</li> <li>All waste disposal to be carried out by a licensed waste contractor</li> </ul>	<ul style="list-style-type: none"> <li>No spills or leaks within 100 m of waterbodies.</li> </ul>

### 7.10.5 Management measures

Specific actions have been identified to assist in achieving waste management objectives for the project, as indicated in Table 7-47.

Table 7-47: Waste control measures

Parameter	Control Measure	Responsibility
Induction and training	<ul style="list-style-type: none"> <li>All project personnel will be instructed in applicable waste management practices as a part of the environmental induction process.</li> </ul>	Construction Manager HSE Manager Training manager
Management of waste materials	<ul style="list-style-type: none"> <li>All general refuse and food wastes to be collected and transported to a local government approved disposal site and suitable bins and skips will be provided for waste streams (general, recyclable, metal, regulated)</li> <li>Portable toilets will be made available at all site offices, accommodation camp and work sites, supplied and managed by licensed contractors</li> <li>All construction waste left on site will be kept in an appropriately secured, stacked area</li> <li>Regulated waste will be stored and appropriately marked, identifying their contents and collected by a licensed waste contractor</li> <li>No on-site burial or burning of waste material</li> <li>Excavated soils will be reused on site where possible</li> </ul>	Construction Manager HSE Manager Construction Manager Project Manager All personnel

### 7.10.6 Monitoring and recording

The monitoring program for waste materials has been designed to ensure that construction and operation of the project are consistent with the control measures. Monitoring will measure the success of these actions in accordance with management objectives and targets, as indicated in Table 7-48.

Table 7-48: Waste materials monitoring and recording

Monitoring	Details	Timing	Responsibility	Records
Waste materials	Housekeeping checks of all waste storage areas to ensure: <ul style="list-style-type: none"> <li>Adequate storage and segregation of waste streams</li> <li>Effectiveness of waste management strategies</li> <li>Waste tracking and recording.</li> </ul>	Weekly	HSE Manager	Environmental checklist

### 7.10.7 Corrective actions and contingencies

If monitoring indicates that environment objectives and targets for waste management are not being achieved, contingency actions will be enacted, as indicated in Table 7-49.

Table 7-49: Waste materials contingencies and corrective action

Trigger	Action
Improper waste management	<ol style="list-style-type: none"> <li>Inspect waste storage areas.</li> <li>If area is untidy or unkept, undertake measures to rectify</li> </ol>

## 7.11 FERAL PREDATOR MANAGEMENT SUB-PLAN

Prior to commissioning of Gawara Baya a feral predator monitoring and control program will be developed, consistent with the Feral Predator Management sub-plan, and implemented during construction and continued during operation (refer Section 8.3).

### 7.11.1 Feral predator presence

A high presence of feral predators such as cats and wild dogs / dingoes were detected on remote cameras, with wild dogs / dingoes also detected in acoustic recordings.

### 7.11.2 Environmental activities to be managed

There is an existing high level of feral predators present within the project area. The Gawara Baya has the potential to increase predation by feral predators on a number of species through:

- Introduction of pets including dogs to the project area from Gawara Baya construction personnel
- Waste materials, particularly food rubbish attracting pest species
- Construction of linear infrastructure improving access to pest species into the project area
- Entrapment leading to exposure to predators.

### 7.11.3 Potential impacts

Gawara Baya supports a number of MNES species that are vulnerable to predation by feral predators. The Gawara Baya has the potential to increase predation by feral predators on a number of species

through the construction of linear infrastructure. Feral cats are identified as a threat within the Recovery Plan for Sharman’s rock wallaby and the Conservation Advice for northern greater glider and greater large-eared horseshoe bat. Wild dogs are identified as a threat to koala in the National Recovery Plan for Koala. Undertaking monitoring and control measures for feral predators will manage potential ongoing impacts of increasing predation on these species and negative pressure on species populations.

This sub-plan addresses management and control of feral predators. The management approach for food wastes is outlined in the Waste Management sub-plan, and management of pits and trenches (entrapment) and pets are outlined in the Fauna Management sub-plan.

#### 7.11.4 Management objectives

Environmental targets and performance indicators have been prescribed in line with feral predator management objectives for the project, as indicated in Table 7-50.

Table 7-50: Feral predator performance management

Issue	Objective	Target	Measurement Criteria
Introduction of feral predators	Avoid the introduction of feral predators into project area	<ul style="list-style-type: none"> <li>No new species of feral predators species in the project area within 2 years of completion of construction</li> <li>Compliance with the <i>Biosecurity Act 2014</i> (Qld) (Biosecurity Act).</li> </ul>	Species of feral predators recorded in the project area. No non-compliance with <i>Biosecurity Act</i>
Predation by feral predators adversely impacting MNES fauna populations in project area	Reduce the threat of feral species predation on Sharman’s rock wallaby, northern greater glider, koala, greater large-eared horseshoe bat in the Gawara Baya project area.	<ul style="list-style-type: none"> <li>A reduction in wild dog and feral cat populations within the project area within 2 years of completion of construction in comparison to baseline (refer Section 7.11.5 Management measures below)</li> <li>Successful design and implementation of control program</li> <li>Compliance with the Biosecurity Act.</li> </ul>	Number of recorded locations of feral predators in project database.

#### 7.11.5 Management measures

The proponent will be responsible for preparation of a Feral Predator Control Program. A key component of the program to manage feral predators at Gawara Baya will be to first understand how these are impacting project area fauna, in particular MNES species. Establishing a baseline of feral

predator distribution, abundance and density prior to implementing control measures will inform the control program design and allow success of program to be measured.

An outline of the minimum measures for the feral predator control program is provided in Table 7-51 below.

*Table 7-51: Feral predator control measures*

Parameter	Control measures	Timing / Frequency	Responsibility
Baseline survey	Control program is informed by dedicated field surveys to provide insight into the distribution, abundance and density of feral predators, prior to construction A focus for the baseline survey will be in and around northern greater glider / koala habitat, Sharman's rock wallaby habitat	Prior to construction	Gawara Baya in partnership with the Traditional Owners Gugu Badhun and other pest management experts where required
Feral predator control	A range of control techniques may be required, and management will include trialling, refining and implementing management targeted at protecting MNES species. Techniques may include baiting, trapping, and / or hunting, tailored to local conditions and MNES species ecology, including breeding periods. Coordination and collaboration with adjacent land managers and natural resources management groups will be an important aspect of the control program. Control to be undertaken at the most appropriate locations to provide the greatest protection to MNES species particularly within 500 m of known Sharman's rock wallaby colonies and riparian zones.	Immediately following the commencement of construction at an appropriately scheduled time to account for MNES species and feral predator ecology, including breeding cycles (Sharman's rock wallaby in particular) Annually for the duration of construction as a minimum and more frequently when required based on monitoring results	
Share knowledge	Key learnings from implementing the program will be shared with key stakeholders and pest management experts.	At the end of the construction control program	Gawara Baya stakeholder liaison officer

### 7.11.6 Monitoring and recording

The monitoring program for feral predators has been designed to ensure that construction of the project is consistent with the control measures, management objectives and targets. Monitoring measures are identified in Table 7-52 below.

Table 7-52: Monitoring and recording requirements

Monitoring	Details	Timing	Responsibility	Records
Feral predator control	Record personnel, time, location and control measures implemented	With every control action	Gawara Baya Project Construction manager Gawara Baya Operations Manager Project ecologist	Feral predator control register
Feral predator incidental sightings	Record any incidental sightings of feral cats and wild dogs	Day of sighting	Gawara Baya Project Construction manager Gawara Baya Operations Manager All personnel	Incident report
Feral predator targeted surveys	Dedicated field survey of feral predator distribution, abundance and density to assess control program success in comparison to baseline	Annually post implementation of control measures Immediately post-construction	Gawara Baya Project Construction manager Gawara Baya Operations Manager	Monitoring report, to be updated annually Update to incorporate incidental sighting records
Review control program	Learnings from construction control program and new technologies informs updates to program for operational phase where appropriate.	Immediately following concluding construction phase feral predator targeted survey	Project ecologist	Monitoring report

### 7.11.7 Contingencies and corrective actions

If monitoring indicates that environment objectives and targets for feral predators are not being achieved, contingency actions will be enacted, as indicated in Table 7-53.

Table 7-53: Feral predator control corrective actions and contingencies

Trigger	Action
Increase in feral predator numbers from baseline Anecdotal or direct evidence of predation of MNES species	Review of control methods and implement adaptive management Increase in program intensity (additional methods) or frequency Assessment of waste control methods at works site and correction where required



## 7.12 SHARMAN'S ROCK WALLABY SUB-PLAN

Prior to commencement of works at Gawara Baya a dedicated Sharman's Rock Wallaby Monitoring and Management Program (SRWMMP) will be developed, consistent with the Sharman's rock wallaby sub-plan, and implemented during construction.

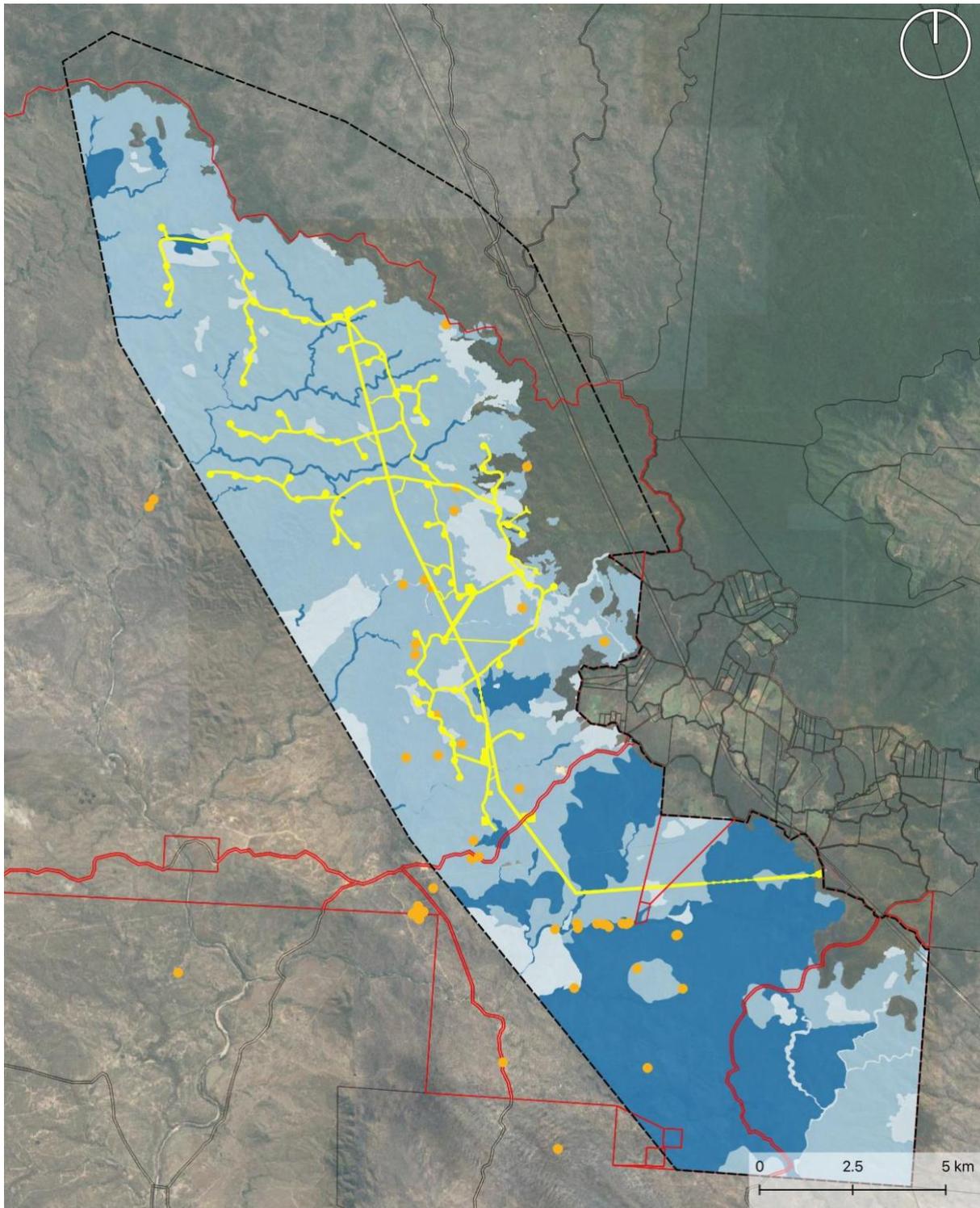
The Sharman's rock wallaby sub-plan below provides an overview of the construction phase of the SRWMMP, however monitoring will be continued for a period of 5 years after construction is completed (refer Operation Environment management, Section 8.1). The SRWMMP will not be a static document and will be updated over the duration of construction to adapt control and mitigation measures in response to monitoring results.

### 7.12.1 Sharman's rock wallaby presence

Sharman's rock wallaby (*Petrogale sharmani*) is listed as vulnerable under both the EPBC Act and the NC Act and has been recorded in the project area. Sharman's rock wallaby preferred habitat includes a variety of rocky habitats (e.g., rocky outcrops and slopes, boulder piles, cliff lines, gorges etc.) within open forests and grassy woodlands. A typically cryptic species by day, it emerges at dusk to feed in close proximity to its rocky shelter habitat.

Key features of the population and habitat within the project area include:

- A number of individual rock-wallaby colonies were recorded and are associated with key habitat areas that occur primarily in the central and south-western extent of the project area (refer Figure 7-5). At least 30 occupied rock piles were observed during field surveys, and these were occupied during both seasons of field survey
- The highest concentrations of individuals were recorded in shelter habitats, which are likely to provide critical habitat resources. Shelter areas within the project area comprise complex arrangements of stacked granite or basalt boulders ('rock piles'), as well as vine thickets along some riparian zones
- Foraging was observed adjacent to occupied shelter areas in grassy woodlands and open forest where ground layer native grasses and forbs provide food resources. Sharman's rock wallaby generally forages around 220 m from rock piles shelters, with an average maximum foraging distance of 500 m (Hayes 2019)
- The project area contains shelter areas and associated dispersal and foraging resources, which are currently unoccupied but provide important habitat areas for the species to utilise over time. These are likely to be important for the long-term persistence of the species in the project area.



**Legend**

- |  |  |
|--|--|
| <span style="border: 1px solid red; display: inline-block; width: 15px; height: 10px; margin-right: 5px;"></span> Project Cadastral Boundary | <span style="background-color: #004a87; display: inline-block; width: 15px; height: 10px; margin-right: 5px;"></span> Sharman's rock wallaby Habitat |
| <span style="border: 1px dashed black; display: inline-block; width: 15px; height: 10px; margin-right: 5px;"></span> Survey Area             | <span style="background-color: #004a87; display: inline-block; width: 15px; height: 10px; margin-right: 5px;"></span> Key breeding                   |
| <span style="background-color: yellow; display: inline-block; width: 15px; height: 10px; margin-right: 5px;"></span> Development footprint   | <span style="background-color: #8eb9e2; display: inline-block; width: 15px; height: 10px; margin-right: 5px;"></span> Foraging habitats              |
| <span style="color: orange; font-size: 12px; margin-right: 5px;">●</span> Sharman's rock-wallaby Record                                      | <span style="background-color: #d9e1f2; display: inline-block; width: 15px; height: 10px; margin-right: 5px;"></span> Connecting habitats            |

Coordinate System: GDA 1994 MGA Zone 55s

Service Layer Credits: Source: QSpatial, QLD Gov; Google Earth

Figure 7-5: Sharman's rock wallaby habitat and records of occurrence in project area

### 7.12.2 Environmental activities to be managed

Construction of Gawara Baya has the potential to impact Sharman's rock wallaby directly and indirectly through the following activities:

- Vegetation clearing
- Excavation and earthworks for construction
- Vehicle and personnel movements
- Unintentional fire ignition
- Physical presence of infrastructure.

### 7.12.3 Potential impacts

A number of potential impacts to Sharman's rock wallaby, from construction activities, are also relevant to other species. These potential impacts are addressed through the EMP sub-plans:

- Fauna management sub-plan (refer Section 7.1)
  - Increased vehicle movement associated with construction of the wind farm may result in vehicle strike
  - Increased human presence
- Feral Predator sub-plan (refer Section 7.11)
  - Construction of linear infrastructure may lead to increased access by feral cats and dogs and predation
- Bushfire management sub-plan (refer Section 7.4)
  - Increased risk of uncontrolled fire
- Noise sub-plan (refer Section 7.6)
  - Construction noise.

The Sharman's rock wallaby sub-plan focusses on avoiding impacts to the species as a result of vegetation clearance and associated habitat removal (key shelter / denning habitat; foraging/ potential shelter / denning habitat; and, potential connecting habitat available) in the project area (refer Figure 7-5).

### 7.12.4 Management objectives

Environmental targets and performance indicators have been prescribed in line with Sharman's rock wallaby key breeding/denning habitat management objectives for the project, as indicated in Table 7-54.

*Table 7-54: Sharman's rock wallaby key breeding/denning habitat performance management*

Issue	Objective	Target	Measurement Criteria
Impact to key breeding and shelter habitat	Construction activities do not result in the displacement of Sharman's rock wallabies from rock piles suitable for breeding	<ul style="list-style-type: none"> <li>• Complex rock piles (suitable for breeding) identified during pre-clearance surveys as occupied prior to construction, continue to be utilised through construction</li> </ul>	Presence of Sharman's rock wallaby

### 7.12.5 Management measures

The intent of the Sharman's rock wallaby sub-plan (construction) is to avoid the construction of the wind farm impacting occupied complex and less complex rock piles (refer Plate 7-1 and Plate 7-2) that provide key breeding and denning habitat for Sharman's rock wallaby. An outline of the measures for the management of Sharman's rock wallaby habitat is provided in Table 7-55 below.

Table 7-55: Sharman's rock wallaby key breeding/denning habitat protection measures

Parameter	Control measures	Timing / Frequency	Responsibility
Integrate SRWMMP into site and construction planning	<ul style="list-style-type: none"> <li>SRWMMP control measures to be applied during construction are established during the project planning phase and included within construction tender packs and procurement contracts</li> </ul>	Prior to construction	Construction Manager (Windlab)
Detailed design	<p><b>Step 1 Design surveys</b></p> <p>While extensive surveys have been undertaken for the project to-date, the proponent will manage changes to project layout and wallaby movements over time by undertaking detailed pre-construction surveys once the project footprint is approved and finalised.</p> <ul style="list-style-type: none"> <li>Design surveys (pre-construction) will be undertaken, within the development footprint and within 220 m<sup>19</sup> of the development footprint, to identify the presence and the physical extent of occupied rock pile habitats. Rock pile habitats are those with a complex structure of stacked granite boulders as illustrated in Plate 7-1, and less complex rocky outcrops as illustrated in Plate 7-2.</li> <li>Occupied rock piles are those boulder stacks and rocky outcrops with confirmed presence of Sharman's rock wallaby. The species presence will be determined through either: <ul style="list-style-type: none"> <li>Observation of the species during design surveys</li> <li>Observation of potential scats with follow-up placement of camera traps to confirm Sharman's rock wallaby presence. Camera traps will remain in place for 14 nights (as per Venz &amp; Rowland 2013).</li> </ul> </li> </ul> <p><b>Step 2. Mapping</b></p>	Prior to detailed design, and before any disturbance to potential Sharman's rock wallaby habitat (refer Figure 7-5)	Head of Windlab Asset Management Project ecologist

<sup>19</sup> A study by Hayes (2019) found 220 m the average foraging distance from shelter sites, 500 m the average maximum foraging distance from shelter sites

Parameter	Control measures	Timing / Frequency	Responsibility
	<ul style="list-style-type: none"> <li>Where occupied rock pile habitat is confirmed within approved development footprint or within 220 m of development footprint, the following steps are to be implemented:                             <ul style="list-style-type: none"> <li>The outer extents of the occupied rock pile habitat are to be mapped onsite by hand-held GPS (refer example rock pile mapping in Figure 7-6)</li> <li>Occupied rock pile habitat mapping with 220 m buffer (Sharman’s rock wallaby key habitat buffer) to be provided to Head of Windlab Asset Management</li> </ul> </li> </ul>		
	<p><b>Step 3. Refine design</b></p> <p>The proponent will avoid impact to Sharman’s rock wallaby occupied rock pile habitat as follows:</p> <ul style="list-style-type: none"> <li>Use Sharman’s key habitat buffer mapping to identify areas of encroachment of the approved development footprint</li> <li>Refine development footprint in consultation with project ecologist to locate all clearing<sup>20</sup> and construction works<sup>21</sup> for Gawara Baya to a minimum of 220 m from occupied rock piles</li> <li>In the event amendments are needed to the approved project design, the proponent will apply for changes to approvals as required.</li> </ul>		Head of Windlab Asset Management
Excavations	<ul style="list-style-type: none"> <li>Excavations which are to be left open overnight located within 500 m<sup>22</sup> of a known colony are to have temporary fencing erected or covered</li> <li>Excavations which are to be left open overnight located within 500m of a known colony are to have ramp or be benched in a manner that provides fauna suitable egress. Ramps or benching must be installed at intervals of 50m or less for trenches. Prioritise rehabilitation of temporary construction areas within 500 m of known colonies</li> </ul>	At all times during construction	Construction contractor in consultation with project ecologist
Feral predators	<ul style="list-style-type: none"> <li>Undertake a monitoring and control program for feral predators (cat/dog) across disturbance areas and particularly within 500 m of known colonies (refer Section 7.11)</li> </ul>	Immediately following the commencement of construction at an	Gawara Baya in partnership with the Traditional Owners Gugu Badhun and other pest

<sup>20</sup> Clearing within this sub-plan excludes tree trimming and lopping

<sup>21</sup> Construction works within this sub-plan excludes the stringing of transmission lines over habitat

<sup>22</sup> A study by Hayes (2019) found 220 m the average foraging distance from shelter sites, 500 m the average maximum foraging distance from shelter sites

Parameter	Control measures	Timing / Frequency	Responsibility
		appropriately scheduled time to account for Sharman’s rock wallaby and feral predator ecology, including breeding cycles (in particular)  Annually for the duration of construction as a minimum and more frequently when required based on monitoring results	management experts where required
Management of occupied rock piles during construction	<ul style="list-style-type: none"> <li>• Access to occupied rock piles at the project area will be prohibited</li> <li>• Where there is an identified occupied SRW rock cluster within 500 m of construction activities, construction will be scheduled outside of dusk hours where practical to minimise disturbance to SRW and other foraging fauna species. Specifically:                             <ul style="list-style-type: none"> <li>○ Works at a WTG location within 500 m of occupied rock clusters will be scheduled outside of dusk (foraging) hours where practical.</li> <li>○ Travel will be avoided on the section of an access track should it sit within 500 m of an occupied rock cluster where practical. Should travel be necessary along that section of road, travel speeds will be reduced to 5-10 km / hr.</li> </ul> </li> <li>• Occupied rock piles confirmed during design surveys will be specifically designated a no-go zone as follows:                             <ul style="list-style-type: none"> <li>○ Areas within 220 m of an occupied rock pile will be designated a no-go zone, demarcated with temporary fencing erected as specified in Table 7-6 at the edge of the construction</li> </ul> </li> </ul>	At all times during construction	Construction contractor in consultation with project ecologist

Parameter	Control measures	Timing / Frequency	Responsibility
	<ul style="list-style-type: none"> <li>○ Signage shall be attached to the fencing at 20 m intervals clearly identifying it is a no-go zone for all construction activities and personnel as follows: 'No Unauthorised Access – Threatened Species Protection', words to be large and clear enough to be read at a distance of 5 m</li> <li>○ No clearing and construction works will commence until the installation of the fencing and signage and approved by project ecologist</li> <li>○ All fencing and signage must be removed at the end of construction</li> </ul>		



*Plate 7-1: Complex stacked boulder habitat*

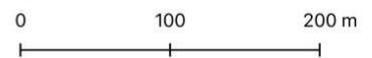


*Plate 7-2: Less complex rocky outcrops*



**Legend**

- Project Cadastral Boundary
- Development footprint
- Complex occupied rock pile extent
- 220 m buffer - Sharman's rock wallaby design survey area



Coordinate System: GDA 1994 MGA Zone 55s

Service Layer Credits: Source: QSpatial, QLD Gov; Google Earth

Figure 7-6: Example of detailed mapping of rock pile habitat

### 7.12.6 Monitoring and recording

The monitoring program for Sharman's rock wallaby has been designed to ensure that construction of the project is consistent with the control measures, management objectives and targets. Monitoring measures are identified in Table 7-56 below. Specific locations where monitoring of species presence and habitat condition will be undertaken will be included in the SRWMMP and informed by further site survey work to be undertaken as outlined above.

Table 7-56: Monitoring and recording requirements

Monitoring	Details	Timing	Responsibility	Records
Implementation of mitigation measures	Ensure mitigation measures (refer Table 7-55) are being implemented effectively	Weekly & ongoing	Construction Contractor	Weekly environment checklist
Vegetation clearing boundary demarcation review	Inspection of adequacy of demarcation of all approved boundaries; ensure all flagging & fencing is in good condition	Weekly	Construction Contractor	Weekly environment checklist
Vegetation clearing	Record the location, date of clearing and total hectares of all vegetation clearing; ensure cumulative totals tracked against approved limits for Sharman's rock wallaby	Ongoing	Construction Contractor	Disturbance limits register Event report
Sharman's rock wallaby presence <sup>23</sup>	<p>Prior to, during and post construction, collect data for Sharman's rock wallaby activity across the project area through the establishment of monitoring sites as a network of remote cameras across Sharman's rock wallaby habitat (refer Figure 7-5). Monitoring sites will include:</p> <ul style="list-style-type: none"> <li>• Both complex and less complex rock piles (refer Plate 7-1 and Plate 7-2)</li> <li>• Occupied and unoccupied rock piles</li> <li>• A range of distances, min. 220 m from development footprint through to areas unlikely to be impacted by Gawara Baya</li> </ul> <p>Survey timing and duration to be as per survey guidelines <i>Sharman's rock-wallaby Petrogale sharmani</i> (Venz &amp; Rowland 2013).</p> <p>Data analysis will be focused on understanding the proportion of occupied vs unoccupied sites and detecting movement between rock piles over time.</p> <p>The proponent will share data captured to-date, along with data collected as part of ongoing project studies, with sanctioned conservation groups so the project contributes</p>	<p>Prior to construction and min. twice yearly throughout construction</p> <p>Monitoring to be continued yearly for a period of 5 years after construction is completed</p>	Construction manager Project ecologist	Threatened fauna monitoring report

<sup>23</sup> Details of data to be recorded to be provided within SRWMMP, but could also include noting the presence of joeys and evidence of breeding

Monitoring	Details	Timing	Responsibility	Records
	to the scientific understanding of the Sharman's rock wallaby.			
Habitat condition	<p>Associated with remote camera monitoring sites, establish in adjacent suitable foraging habitat, habitat condition monitoring sites.</p> <p>Monitoring methodology to be developed to be standardised, quantifiable and be able to track condition over time. For example, a methodology consistent with a framework like Accounting for Nature.</p> <p><a href="https://www.accountingfornature.org/method-catalogue">https://www.accountingfornature.org/method-catalogue</a> or as implemented within the Offsets Area.</p> <p>Data analysis will be focused on understanding changes to habitat condition over time and will be used to interpret any observations of SRW presence (as per row above).</p>	<p>Prior to construction</p> <p>Once yearly throughout construction</p> <p>Timing based on ability to detect indicators of habitat condition</p> <p>Monitoring to be continued yearly for a period of 5 years after construction is completed</p>	<p>Construction manager</p> <p>Project ecologist</p>	Threatened fauna monitoring report

### 7.12.7 Contingencies and corrective actions

If monitoring indicates that environment objectives and targets for Sharman's rock wallaby key breeding/denning habitat are not being achieved, contingency actions will be enacted, as indicated in Table 7-57.

Table 7-57: Sharman's rock wallaby key breeding/denning habitat corrective actions and contingencies

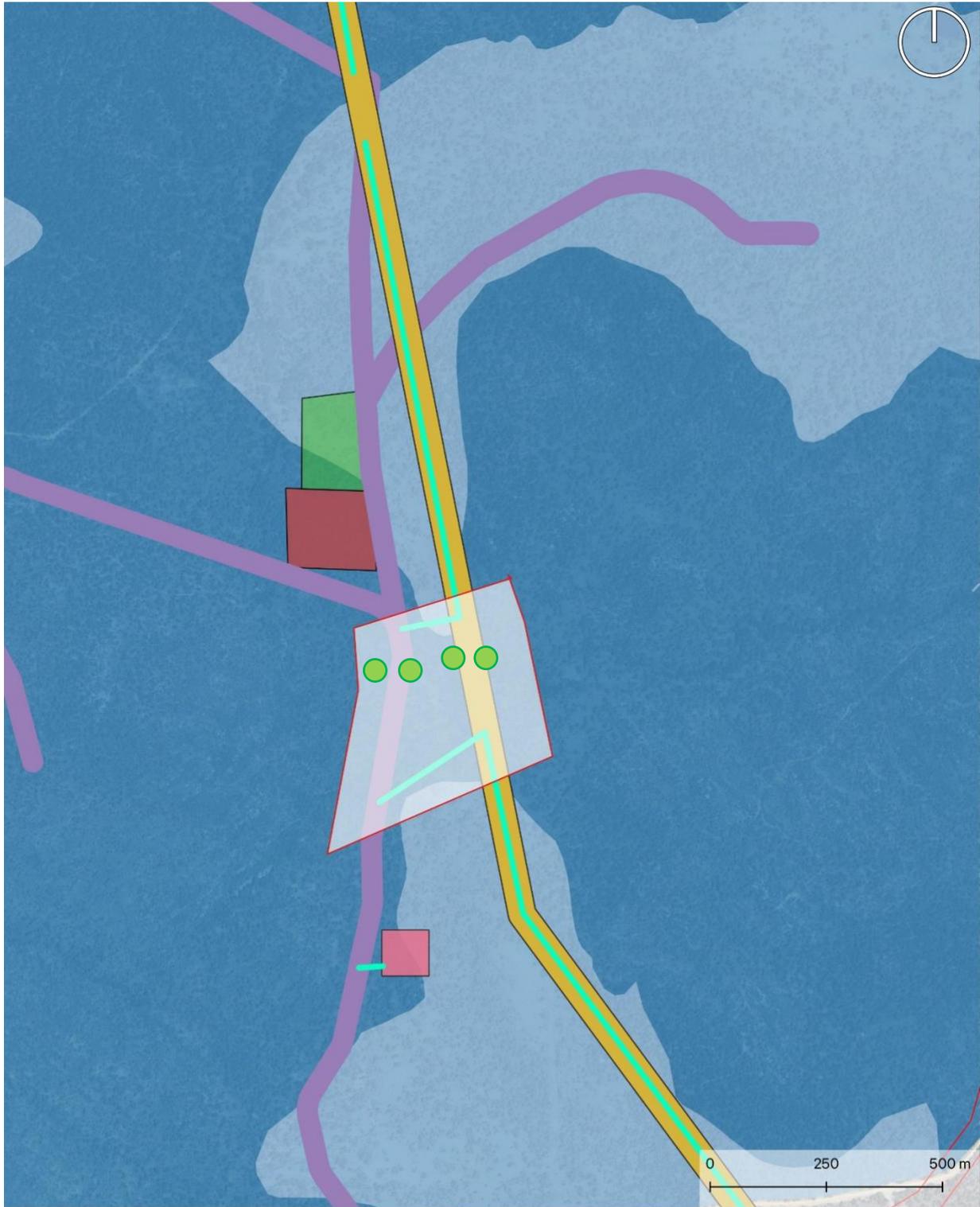
Trigger	Action
<b>A.</b> Marked vegetation clearing boundary not in accordance with approvals.	<ol style="list-style-type: none"> <li>1. Stop work in relevant area.</li> <li>2. Investigate and complete an incident report</li> <li>3. Implement corrective actions, including the amendment of clearing boundaries</li> <li>4. Amend Vegetation clearing plan measures as necessary to avoid further non-compliance.</li> </ol>
<b>B.</b> Vegetation clearing outside the approved area is identified.	<ol style="list-style-type: none"> <li>1. Stop work in relevant area.</li> <li>2. Investigate and complete an incident report.</li> <li>3. Report to regulators as required (with notice of proposed corrective action)</li> <li>4. Implement corrective actions, including rehabilitation where required</li> <li>5. Amend Vegetation clearing plan measures as necessary to avoid further non-compliance.</li> </ol>
<b>C.</b> Presence data (cameras) indicate ongoing reduced occupancy of rock piles within the monitoring area (specific	<ol style="list-style-type: none"> <li>1. Assess whether events associated with Trigger A or B may be the cause</li> <li>2. If no event associated with Trigger A or B can be associated with reduction in occupancy activity, review:</li> </ol>

Trigger	Action
metrics to establish this will be developed as part of the monitoring program)	<p>i) habitat condition monitoring results to investigate correlations with other factors (e.g. climate), and</p> <p>ii) camera monitoring data for trends in feral predator activity</p> <p>3. If feral predator activity is revealed to be increasing review feral predator plan and implement additional and targeted control</p> <p>4. Amend monitoring program (for e.g.):</p> <ul style="list-style-type: none"> <li>• Extend the length of monitoring (i.e. longer than 5-years)</li> <li>• Increase the frequency or length of each monitoring event</li> <li>• Expanding the monitoring area (i.e. establish additional monitoring locations)</li> </ul> <p>5. If monitoring reveals construction activities unlinked to rock pile occupancy, seek to analyse ecological data acquired from remote camera surveys to inform adaptive management in consultation with species experts</p> <p>6. If monitoring reveals construction activities linked to rock pile occupancy, consult species experts to identify further control or mitigation measures that could be implemented.</p>

### 7.13 NORTHERN GREATER GLIDER SUB-PLAN

Prior to commencement of work for Gawara Baya a dedicated Northern Greater Glider Monitoring and Management Program (GGMMP) will be developed, consistent with the northern greater glider sub-plan, and implemented during construction. The greater glider sub-plan provides an overview of the construction phase of the GGMMP, however monitoring will be continued for a period of 5 years after construction is completed (refer Operation environmental management, Section 8.1. The intent of the northern greater glider sub-plan (construction) is to outline steps to be undertaken avoid impairment of ecological function of northern greater glider habitat. That is, through the creation of 'islands' of habitat separated from surrounding habitat by wind farm infrastructure. These habitat islands will be the focus (GGMMP focus habitat survey areas, refer example in Figure 7-7) of the management measures and monitoring outlined in this sub-plan, and to be detailed in the GGMMP.

The GGMMP will not be a static document and will be updated over the duration of construction to adapt control and mitigation measures in response to monitoring results.



**Legend**

- |                            |                                    |   |                                 |
|----------------------------|------------------------------------|---|---------------------------------|
| Transmission easement      | Operation and maintenance building | Greater glider habitat                                  | Indicative glider pole location |
| Light vehicle access track | Concrete batching                  | Foraging and denning / shelter                          |                                 |
| Access road                | Temporary laydown                  | Marginal habitat - Dispersal and lower quality foraging |                                 |

Coordinate System: GDA 1994 MGA Zone 55s

Service Layer Credits: Source: QSpatial, QLD Gov; Google Earth

Figure 7-7: Example of 'islands' (refer area outlined in red)

### 7.13.1 Northern greater glider presence

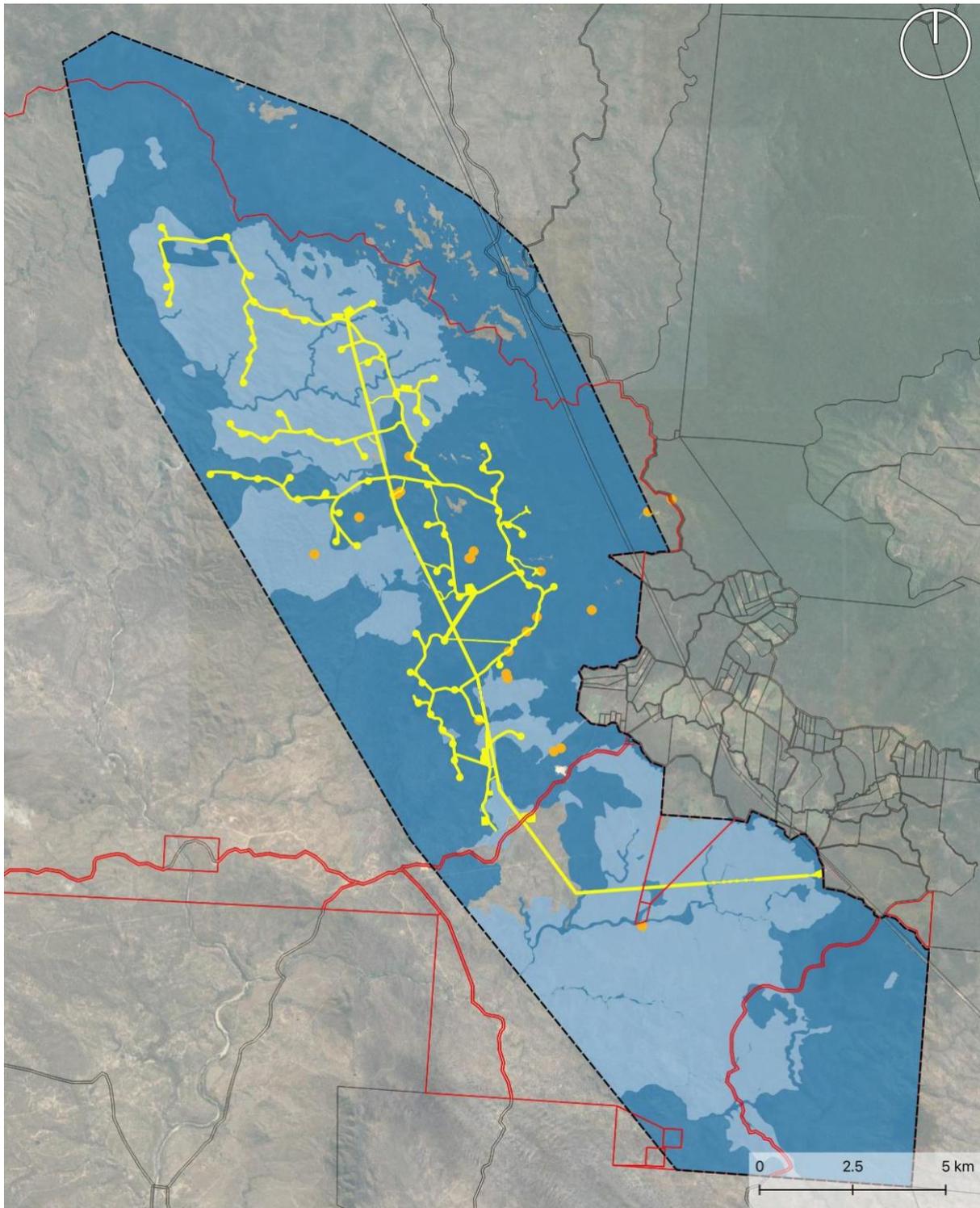
Northern greater glider (northern) (*Petauroides minor*) is listed as vulnerable under the EPBC Act. Northern greater glider (northern) inhabits eucalypt forests and woodlands; typically, moist, montane eucalypt forests that contain taller, older trees with abundant hollows. It is primarily a folivore, consuming eucalypt leaves, and favours young foliage. It is found in forests with a diversity of eucalypt species, with seasonal variation in preferred food trees. Preferred food trees found within the project area include *Eucalyptus acmenoides*, *E. moluccana* and *E. tereticornis*.

Northern greater glider (northern) shelters within tree hollows during the day and due to the species size, larger tree hollows are required (80 mm, with internal hollow measurements reaching 250 x 250 mm), in large, old trees. *Eucalyptus acmenoides* (white mahogany) and *Corymbia citriodora* (lemon-scented gum) are favoured tree species for denning (Comport et al. 1996), with 4 -6 dens used per month. It has also been reported, in the northern part of its range, *E. tereticornis* (forest red gum) is preferentially used as a den tree at a density of two dens per hectare (Starr et al. 2021).

Key features of the population and habitat within the project area include:

Species is widely distributed across the project area, recorded on 22 occasions during field surveys through spotlighting (refer

- Figure 7-8).
- Recorded in both wetter and drier habitat types in the following tree species - *Eucalyptus portuensis*, *E. crebra*, *E. tereticornis*, *E. crebra*, *C. citriodora* and *C. intermedia*.



**Legend**

- Project Cadastral Boundary
- Survey Area
- Development Footprint
- Greater glider Record
- Greater glider habitat
- Foraging and denning/shelter
- Marginal habitat - dispersal and lower quality foraging

Coordinate System: GDA 1994 MGA Zone 55s

Service Layer Credits: Source: QSpatial, QLD Gov; Google Earth

Figure 7-8: Greater glider habitat and recorded observations within project area

### 7.13.2 Environmental activities to be managed

Construction of Gawara Baya has the potential to impact Sharman's rock wallaby directly and indirectly through the following activities:

- Vegetation clearing and loss of habitat, including fragmentation and the creation of 'islands'
- Excavation and earthworks for construction
- Vehicle and personnel movements
- Fire ignition
- Physical presence of infrastructure.

### 7.13.3 Potential impacts

A number of potential impacts to northern greater glider, from construction activities, are also relevant to other species. These potential impacts are addressed through the construction EMP sub-plans:

- Fauna management sub-plan (refer Section 7.1)
  - Open trench excavations for underground cabling may lead to entrapment
  - Increased vehicle movement associated with construction of the wind farm may result in vehicle strike
  - Increased human presence
  - Loss of habitat may lead to higher predation by owls
  - Entanglement in barbed wire
- Feral Predator sub-plan (refer Section 7.11)
  - Construction of linear infrastructure may lead to increased access by feral cats and predation
- Bushfire management sub-plan (refer Section 7.4)
  - Increased risk of uncontrolled fire
- Noise sub-plan (refer Section 7.6)
  - Construction noise.

The Northern greater glider sub-plan focusses on avoiding and mitigating impacts to the species as a result of vegetation clearance and associated habitat removal denning/foraging in the project area.

### 7.13.4 Management objectives

Environmental targets and performance indicators have been prescribed in line with northern greater glider habitat management objectives for the project, as indicated in Table 7-58.

*Table 7-58: Northern greater glider habitat performance management*

Issue	Objective	Target	Measurement Criteria
Isolation of northern greater glider habitat	To avoid impairment of ecological function of northern greater glider denning/foraging habitat as a result of vegetation clearing and infrastructure layout	<ul style="list-style-type: none"> <li>• Movement of northern greater glider into and out of 'islands'</li> </ul>	Continued presence of northern greater glider within 'islands' created by transmission line and access track construction (refer example in Figure 7-7)

			Installation and use of glider poles
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### 7.13.5 Management measures

An outline of the measures for the management of GGMMMP focus areas is provided in Table 7-59. These measures are in addition to measures identified in the Vegetation management, Fauna management and Feral predator management sub-plans.

Table 7-59: GGMMMP focus area control measures

Parameter	Control measures	Timing / Frequency	Responsibility
Integrate GGMMMP into site and construction planning	<ul style="list-style-type: none"> <li>GGMMMP control measures to be applied during construction are established during the project planning phase and included within construction tender packs and procurement contracts</li> </ul>	Prior to construction	Construction Manager (Windlab)
Targeted surveys	<ul style="list-style-type: none"> <li>Targeted northern greater glider surveys within GGMMMP focus survey areas prior to clearing (refer example in Figure 7-7). Surveys to build upon previous surveys undertaken during the project approval process, to ascertain northern greater glider presence. Exact locations to be identified within GGMMMP.</li> <li>Surveys to be undertaken as per <i>Terrestrial Vertebrate Fauna Survey Guidelines for Queensland</i> (Eyre et. al. 2014)</li> </ul>	Prior to construction	Construction Manager (Windlab) Project ecologist
Hollow-bearing trees	<ul style="list-style-type: none"> <li>Hollow-bearing trees, suitable for northern greater glider denning, within clearing corridor to be identified and tagged and retained where possible</li> </ul>	Prior to construction	Construction manager Project ecologist
Micro-siting	<ul style="list-style-type: none"> <li>GPS locations of GGMMMP focus areas and hollow-bearing trees provided to design team to minimise clearing in these areas through micro-siting of infrastructure</li> </ul>	Detailed design, prior to construction	Head of Windlab Asset Management
Vegetation clearing	<ul style="list-style-type: none"> <li>Implement on-site adjustment to access track alignments to retain potential den trees, and canopy vegetation to maximise connectivity where possible<sup>24</sup></li> </ul>	During clearing	Project ecologist
Fragmentation and loss of denning habitat	<ul style="list-style-type: none"> <li>Install glider poles as indicatively illustrated in Figure 7-7.</li> <li>Final locations and placement of glider poles to be guided by northern greater</li> </ul>	As soon as practicable after the construction of	Construction contractor Project ecologist

<sup>24</sup> This measure applies across all greater glider habitat

Parameter	Control measures	Timing / Frequency	Responsibility
	glider activity, final clearing widths, species ecology, advice from fauna ecologist and site constraints (eg. slope; substrate) and detailed in the GGMP <ul style="list-style-type: none"> <li>• Glider poles to include refuge from predation (owls)</li> <li>• Revegetation of temporary clearing areas to reduce access track width outside operational footprint at GGMP focus habitat areas where surveys indicate northern greater glider activity.</li> <li>• Revegetation to include northern greater glider forage species</li> </ul>	access tracks and turbine installation	
	<ul style="list-style-type: none"> <li>• Where removal of den trees cannot be avoided, install three northern greater glider nest boxes for every den tree removed within the immediate vicinity, including close to edge of clearing.</li> <li>• Explore canopy tree suitability for carving of hollows in live trees. Where suitable, include a mix of nest boxes and creation of hollows in live trees</li> </ul>	Prior to clearing	Construction contractor Project ecologist

### 7.13.6 Monitoring and recording

The monitoring program for northern greater glider has been designed to ensure that construction of the project is consistent with the control measures, management objectives and targets. Monitoring measures are identified in Table 7-60 below.

Table 7-60: Monitoring and recording requirements

Monitoring	Details	Timing	Responsibility	Records
Implementation of mitigation measures	Ensure mitigation measures (refer Table 7-59) are being implemented effectively	Weekly & ongoing	Construction Contractor	Weekly environment checklist
Vegetation clearing boundary demarcation review	Inspection of adequacy of demarcation of all approved boundaries; ensure all flagging & fencing is in good condition	Weekly	Construction Contractor	Weekly environment checklist
Vegetation clearing	Record the location, date of clearing and total hectares of all vegetation clearing; ensure cumulative totals tracked against approved limits for northern greater glider	Ongoing	Construction Contractor	Disturbance limits register Event report
Rehabilitation	Monitor performance of GGMP focus area targeted rehabilitation (refer Rehabilitation Plan)	Refer Rehabilitation plan	Construction contractor	Rehabilitation report

Monitoring	Details	Timing	Responsibility	Records
Glider poles	Undertake spotlighting surveys to assess northern greater glider movement within GGMP focus habitat areas and nest box utilisation	Within 6 months after turbine installation, then yearly for 5 years after construction is completed	Project ecologist	Threatened species monitoring report
Nest box use		Within 6 months post-clearing, then yearly for 5 years after construction is completed		

### 7.13.7 Contingencies and corrective actions

If monitoring indicates that environment objectives and targets for northern greater glider are not being achieved, contingency actions will be enacted, as indicated in Table 7-61.

Table 7-61: Northern greater glider corrective actions and contingencies

Trigger	Action
Marked vegetation clearing boundary not in accordance with approvals.	<ol style="list-style-type: none"> <li>1. Stop work in relevant area.</li> <li>2. Investigate and complete an incident report</li> <li>3. Implement corrective actions, including the amendment of clearing boundaries</li> <li>4. Amend Vegetation clearing plan measures as necessary to avoid further non-compliance.</li> </ol>
Vegetation clearing outside the approved area is identified.	<ol style="list-style-type: none"> <li>1. Stop work in relevant area.</li> <li>2. Investigate and complete an incident report.</li> <li>3. Report to regulators as required (with notice of proposed corrective action)</li> <li>4. Implement corrective actions, including rehabilitation where required</li> <li>5. Amend Vegetation clearing plan measures as necessary to avoid further non-compliance.</li> </ol>
Rehabilitation not achieving performance criteria	<ol style="list-style-type: none"> <li>1. Undertake additional planting and maintenance, refer Rehabilitation plan</li> </ol>
No northern greater glider recorded within GGMP focus habitat area 'islands' within 3 years after clearing	<ol style="list-style-type: none"> <li>1. Undertake adaptive management in consultation with species experts (including additional nest boxes, glider poles, installation of rope bridges)</li> </ol>
No northern greater glider recorded within GGMP focus habitat area 'islands' 5 years after clearing	<ol style="list-style-type: none"> <li>1. Calculate habitat loss as a result of lost habitat functionality (i.e. the extend of unused 'island' areas)</li> <li>2. Ensure offsets provided by the project are of sufficient scale to account for additional habitat loss. If existing offsets are not sufficient, provide additional northern greater glider offset area to compensate.</li> </ol>

## 8 Environmental Management – Operation

### 8.1 OPERATION ENVIRONMENT MANAGEMENT PLAN

Once in operation the potential for impacts to the environment from Gawara Baya is generally considered low. The most at-risk environmental values during operation are aerial and terrestrial fauna species.

An Operation Environmental Management Plan will be developed and implemented to address small operational risks associated with the site maintenance at a ground level. These controls will be consistent with the above sub-plans, but appropriately scaled down where relevant to provide adequate controls for proposed maintenance related impacts. These include:

- Fauna management
- Vegetation management (including rehabilitation and restoration)
- Feral predator control
- Bushfire control measures
- Hazardous materials and spills management
- Waste management.

The operation EMP for fauna will also include a framework for the ongoing delivery of the Sharman's Rock Wallaby Management and Monitoring Program and the Greater Glider Management and Monitoring Program. The following will be incorporated:

- Twice yearly monitoring of Sharman's rock wallaby presence and habitat condition for a period of 5 years after construction is completed, as outlined in Section 7.12
- Yearly monitoring of GGMP focus area nest boxes and glider poles, for a period of 5 years after construction is completed, as detailed in Section 7.13
- Yearly monitoring of targeted rehabilitation areas within GGMP focus areas, for a period of 5 years after rehabilitation establishment, as detailed in Rehabilitation Plan.

An outline of controls to be included and implemented in the Operation EMP for weeds and feral predators are provided in dedicated sub-plans below.

Potential impacts from turbine collision will be addressed through the implementation of the bird and bat management plan.

Site re-instatement and rehabilitation measures are outlined in the Gawara Baya Rehabilitation Plan.

## 8.2 WEED MANAGEMENT SUB-PLAN

### 8.2.1 Environmental activities to be managed

Operational activities have the potential to introduce or disperse weeds through the following aspects of the project:

- Vehicle and personnel movements
- Fire ignition
- Physical presence of infrastructure.

### 8.2.2 Potential impacts

Operation of the project has the potential to result in the following impacts:

- Increased infestations of existing weed species in the project area
- Introduction of new weed species in the project area
- Degradation of vegetation communities
- Degradation of fauna habitat
- Increased fire fuel load and more intense fires.

This sub-plan addresses management of impacts from weeds. Weed management protocols also address the introduction and spread of pathogens including myrtle rust. The management approaches for vegetation and fire will be consistent with that outlined in Section 7 Environmental Management – Construction, with appropriately scaled down plans to be developed to provide adequate controls for proposed maintenance related impact.

### 8.2.3 Management objectives

Environmental targets and performance indicators have been prescribed in line with weed management objectives for the operation of the project, as indicated in Table 8-1.

Table 8-1: Weeds performance management

Issue	Objective	Target	Measurement Criteria
Introduction of new weeds	Minimise the potential for new weeds to be introduced into the project area.	<ul style="list-style-type: none"> <li>• No new species of weeds recorded in the project area over life of project</li> <li>• Compliance with the Biosecurity Act.</li> </ul>	Species of weed recorded in the project area. No non-compliance with Biosecurity Act and internal weed hygiene procedures.
Spread of existing weeds	Minimise the risk of spreading existing weeds within the project area and to adjacent areas.	<ul style="list-style-type: none"> <li>• No significant change to the extent (increase) and distribution over life of project (from baseline, refer Table 7-19)</li> <li>• Compliance with the Biosecurity Act.</li> </ul>	Number of recorded locations of weed infestation in project database. Extent of weed cover at recorded locations.

### 8.2.4 Management measures

Gawara Baya will be responsible for preparation of an Operational Weed Management Plan. The Weed Management Plan will include hygiene protocols restricting the movement of vegetation and soil between impacted areas and areas of significantly lower weed infestation. The Weed Management Plan will include protocols for monitoring and management of weeds to identify and appropriately respond to significant changes in weed distribution and density.

The minimum weed management requirements for this plan are outlined in Table 8-2 below.

Table 8-2: Weed control measures

Parameter	Control measures	Responsibility
Declared weed control	<ul style="list-style-type: none"> <li>New weed infestation shall be treated at the earliest stage while small and manageable</li> <li>Treatment options must follow published advice e.g. weed control fact sheets published by Queensland Department of Agriculture and Fisheries (<a href="https://www.daf.qld.gov.au/business-priorities/biosecurity/invasive-plants-animals/fact-sheets">https://www.daf.qld.gov.au/business-priorities/biosecurity/invasive-plants-animals/fact-sheets</a>)</li> </ul>	Gawara Baya Site manager (operation)
Chemical use and storage	<ul style="list-style-type: none"> <li>Will be restricted to approved uses only, following manufacturers' instructions</li> <li>Herbicides will be stored in an appropriate manner</li> <li>Only wildlife-friendly herbicides will be used</li> <li>Herbicide will not to be sprayed near creeks or dams or within two days of rain</li> </ul>	Gawara Baya Site manager (operation)
Vehicle entry	<ul style="list-style-type: none"> <li>Vehicles must use designated tracks only</li> </ul>	Gawara Baya Site manager (operation)
Fill and other imported materials	<ul style="list-style-type: none"> <li>Weed-free declaration certificate required for imported fill</li> <li>Log to record all material imported on site required</li> <li>Log is to include material description, quantity, source and deposition at the site</li> </ul>	Gawara Baya Site manager (operation)
Exposed areas	<ul style="list-style-type: none"> <li>Areas of exposed earth will be minimised and rehabilitated with appropriate non-invasive species</li> </ul>	Gawara Baya Site manager (operation)

### 8.2.5 Monitoring and recording

The monitoring program for weeds has been designed to ensure that operation of the project is consistent with the control measures, management objectives and targets. Monitoring measures are identified in Table 8-3 below.

Table 8-3: Monitoring and recording requirements

Monitoring	Details	Timing	Responsibility	Records
Implementation of mitigation measures	Ensure all of the above listed mitigation measures are being implemented effectively	Weekly & ongoing	Gawara Baya Site manager (operation)	Weekly environment checklist
Weed infestations or outbreaks	Record any evidence of weed infestations or outbreaks, particular focus on high-risk weeds, comparison to baseline survey results to assist	Ongoing	Gawara Baya Site manager (operation)	Weed register
Analysis of Incident Trends	Analyse incidents reported for any non-compliances, incidents (including weed incursion)	Monthly	Gawara Baya Site manager (operation)	Incident report

### 8.2.6 Corrective actions and contingencies

If monitoring indicates that environment objectives and targets for weeds are not being achieved, contingency actions will be enacted, as indicated in Table 8-4.

Table 8-4: Weed corrective actions and contingencies

Trigger	Action
Weed outbreaks	<ol style="list-style-type: none"> <li>1. Infestations are identified and mapped</li> <li>2. Source of infestation is investigated and addressed</li> <li>3. Infections are controlled via appropriate use of herbicide or other control techniques</li> <li>4. Implement any rehabilitation as required.</li> </ol>

## 8.3 FERAL PREDATOR MANAGEMENT SUB-PLAN

Prior to commissioning an operational feral predator control program will be developed consistent with the construction control program and the following framework:

- Overview of construction feral predator control program, including:
  - Feral predator distribution, abundance and density at final construction targeted survey
  - Learnings from construction control program (eg. what worked and should be continued vs. what was unsuccessful)
- Outline an approach to stakeholder engagement and coordination
- Identify operational activities that could contribute to increased threat of predation by feral species
- Targets and measurement criteria for the following management objectives
  - Avoid the introduction of feral predators into project area
  - Reduce the threat of feral species predation on Sharman's rock wallaby, northern greater glider, koala, greater large-eared horseshoe bat in the Gawara Baya project area
- Management measures including timing/frequency of actions and responsible personnel
- Monitoring and recording requirements
- Identify triggers and corrective actions.

The Operational Feral predator control program will be implemented over the life of the project, or as determined necessary by monitoring results.

## 9 Environmental Management – Decommissioning

The Gawara Baya will be designed with an operational life of 30 years and will be designed fit for purpose. With refurbishment, the wind farm may have a much longer operational life.

At the appropriate time, areas disturbed as part of the operational footprint will be rehabilitated and the wind farm decommissioned consistent with the requirements of legislation, Australian Standards and industry practices at the time, and the land agreement requirements and regulatory authorities. At the appropriate time, a detailed decommissioning and rehabilitation plan will be prepared to guide these activities.

## 10 Environmental Management System

Gawara Baya will engage a construction contractor for the project, who will be responsible for commitments to minimising environmental harm, and the delivery of agreed environmental outcomes.

All employees and contractors have a general duty of care under Section 319 of *Environmental Protection Act 1994*. Notwithstanding any specifications in this EMP, Windlab and its contractors must:

- Report environmental incidents to their immediate superior and participate in the investigation and corrective action required to reduce environmental harm or the reoccurrence of the incident
- Comply with the requirements of environmental legislation.

### 10.1 ROLES AND RESPONSIBILITIES

Roles and responsibilities will be assigned to individuals to implement relevant management plans, in accordance with Table 10-1 during construction. Roles and responsibilities for implementation of the Bird and Bat Management Plan are provided in that document and include a number of highly specialised requirements.

The Gawara Baya Project Manager will have overall responsibility and accountability for the implementation of this plan and compliance with all environmental legislation, condition of approval and contractual obligations.

*Table 10-1: Roles and responsibilities for environmental management for the construction phase*

Role	Responsibilities
Project Manager (Gawara Baya)	<ul style="list-style-type: none"> <li>• Handover of design and approvals requirements to the principal contractor</li> <li>• Ongoing oversight and accountability across project delivery</li> <li>• Responsible for managing the construction work timetable in consultation with project personnel listed below</li> </ul>
Principal Contractor – Site Manager	<ul style="list-style-type: none"> <li>• Overall responsibility for ensuring all mitigation measures are implemented during works, including development of any sub-plans</li> </ul>

Role	Responsibilities
	<ul style="list-style-type: none"> <li>• Reviews and approves the final sub-plans</li> <li>• Ensures any design changes during construction are approved by Windlab, including obtaining any necessary additional or modified planning approvals</li> <li>• Ensures the environmental performance of the construction phase, including a responsibility for the effective implementation of health, safety and environment (HSE) management measures</li> <li>• Oversees development and ensures effective delivery of all environmental inductions</li> <li>• Manages community complaints with respect to environmental matters</li> <li>• Responds and reports on incidents</li> </ul>
Clearing Contractor – Environmental Manager	<ul style="list-style-type: none"> <li>• Shall be suitably qualified and experienced environmental scientist/engineer</li> <li>• Responsible for site management, CEMP compliance, including subcontractors</li> <li>• Issues stop work orders, if required</li> <li>• Monitors works to ensure all environmental obligations are met, e.g. undertakes minimum of weekly environmental inspections (or if environmental conditions change, e.g. rain)</li> <li>• Undertakes internal audits</li> <li>• Reports demonstration of compliance with applicable environmental legislation, conditions of approval and contractual obligations</li> <li>• Records any community complaints and notifies Project Manager</li> <li>• Facilitates inductions and toolbox talks for site personnel</li> <li>• Initiates corrective actions</li> <li>• Initiates preventative measures with 48 hours of significant forecast rain events (25 mm within a 24-hour period)</li> <li>• Reports EMP non-conformances to the Project Manager</li> <li>• Notifies the Contractor’s Site Manager if the EMP needs revising</li> </ul>
All staff	<ul style="list-style-type: none"> <li>• Undertakes inductions and training appropriate for this EMP</li> <li>• Constructs and implements environmental controls and procedures</li> <li>• Reports any malfunctions, incidents, emergencies or other environmental incidents to both the Environmental Manager and the Site Manager</li> <li>• Rectifies temporary situations that may result in or are resulting in, environmental harm</li> <li>• Undertakes environmental monitoring where required</li> <li>• Records community concerns and notify Site and Environmental managers</li> </ul>

## 10.2 TRAINING AND INDUCTION

Well trained and environmentally aware personnel are a key factor in ensuring that all aspects of the project are executed with minimal impacts to the environment and that the highest possible standards of environmental management are met. Gawara Baya will ensure all employees and subcontractors involved with the project receive environmental training appropriate to their role. The provision of training will be in accordance with the training and competence HSE management measures developed for the project.

A comprehensive environmental awareness induction will be provided when personnel commence on the project. Environmental topics will also be included in toolbox talks during construction and other

ongoing environmental training is to be provided as appropriate. All training will be guided and maintained by an assessment of training needs.

### 10.2.1 Inductions

A comprehensive environmental awareness induction will be provided when personnel commence on the project and is required for all first-time visitors to the site. This induction will include aspects such as:

- Objectives of relevant management plans and associated control measures
- Guidance on the significance and sensitivity of vegetation within the project area
- Information about threatened species (flora and fauna)
- Environmental objectives and policies of Windlab
- Individual's and organisation's environmental obligations under relevant environmental legislation
- Any restricted or 'no-go' areas
- Controls and procedures to prevent impacts
- Responsibilities for environmental monitoring and reporting
- Procedures for responding to environmental incidents and emergencies.

The environmental induction training will be developed prior to construction commencing.

### 10.2.2 Toolbox talks

All staff and sub-contractors will be briefed daily on environmental requirements for specific construction activities, focussing on reinforcement of practical measures to reduce environmental harm. Toolbox talks will include but not be limited to:

- Identification of vegetation/habitat clearing demarcations
- Management of potentially toxic chemicals
- Vehicle speed limits and refuelling plant and machinery protocols
- Precautions to prevent sediment-laden run-off entering watercourses
- Safety share
- Lessons learnt
- Specific precautions for protected flora and fauna.

### 10.2.3 Training needs assessment

As part of the HSE Management System, a training needs assessment and training plan will be developed for the project to include within the site's overall Construction Environment Management Plan (CEMP). This plan will identify training requirements for each role within the project and will include environmental awareness training areas, including around vegetation management.

### 10.2.4 Emergency response

An emergency response plan will be developed as part of the overall site CEMP and will include measures around emergencies directly related to biodiversity management.

### 10.2.5 Incident management

An incident investigation and reporting procedure will be developed by Windlab as part of the overall CEMP.

## 10.3 INSPECTIONS AND AUDITS

The Construction Contractor shall be responsible for conducting regular weekly inspections against compliance with the relevant management plans. Records shall be maintained in a project log book or other appropriate reporting system. Specific monitoring requirements have been detailed within each management plan, as necessary.

Windlab will conduct regular audits of the Construction Contractor to monitor compliance against this EMP. All open items from previous inspections will be checked during the next inspection to ensure remedial action has been taken, and to determine if that action has been effective. Records of all works including inspections will be maintained to demonstrate compliance with the requirements of the EMP.

Construction is proposed to commence and be completed within the 3 years of the proposed start. At a minimum 3 annual environmental compliance audits will be conducted to ensure that the systems and controls detailed within the EMP are implemented.

## 10.4 REVIEW AND IMPROVEMENT

Windlab policies and procedures will be adopted across the operation of all its businesses and is committed to ongoing review and improvement of existing systems and controls.

Ongoing review commitments relevant to this EMP are presented in Table 10-2.

*Table 10-2: Details of system elements requiring periodic review*

Subject	Detail	Timeframe	Responsibility
EMP	<p>The review shall:</p> <ul style="list-style-type: none"> <li>Assess the appropriateness of the EMP to the construction and operational activities based on audit information</li> <li>Determine if any changes to the EMP are required as a result of scope, legislative or organisational changes.</li> </ul> <p>All revisions shall be submitted to relevant regulators for approval, if required.</p>	In response to a material change to the activities and/or the use of equipment or in response to actions arising from any audit taken.	Senior HSE Advisor
HSE Policy	Review to identify and implement continuous improvement opportunities.	Annual	HSE Manager/ Executive Management Team
Legislation and other requirements	Review to identify amendments to existing and addition of new legislation which is relevant to the	Annual and opportunistic	Audit and Compliance Manager/ Senior HE Advisor

Subject	Detail	Timeframe	Responsibility
	environmental management of wind farm activities.		

## 10.5 REPORTING

To demonstrate and maintain compliance against legislative requirements, routine external reporting to key regulatory agencies shall be conducted. Routine external reporting requirements for the project are summarised in Table 10-3.

*Table 10-3: External reporting*

Report	Details	Frequency	Responsibility
EMP implementation - construction	Reportable incident	Quarterly	Senior HSE Advisor
Native vegetation clearing report	As required in Vegetation Clearing Permits (Development Consent)	As required in Development Consent	Senior HSE Advisor
EPBC Approval	As required in EPBC Approval conditions	As required in relevant EPBC Approval condition	Senior HSE Advisor
EMP implementation – operation (BBMP)	Monitoring reports Adaptive management reporting Reportable incident	Annually or as required by plan	Senior HSE Advisor

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