Appendix

E

E.12 | Bushfire Assessment Report

EMM creating opportunities | SPARK RENEWABLES

Bush Fire Assessment Report

Dinawan Wind Farm

REF: W23032

Date: 24 May 2024

WARATAH BUSHFIRE

PLANNING | GIS | ASSESSMENT

Bush Fire Assessment Report

Dinawan Wind Farm

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WARATAH BUSHFIRE

PLANNING | GIS | ASSESSMENT

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EXECUTIVE SUMMARY

Spark Renewables Pty Limited (Spark Renewables) proposes to develop the Dinawan Wind Farm (the project). The project includes the installation, operation, maintenance and decommissioning of up to approximately 200 wind turbine generators (WTGs) and associated infrastructure. The project will have a generation capacity of up to approximately 1,200 megawatts (MW) (AC), equivalent to the needs of 600,000 New South Wales (NSW) households per year.

The project is located about halfway between the towns of Coleambally and Jerilderie and lies within the Murrumbidgee and Edward River local government areas (LGAs) in NSW.

This bush fire assessment report forms part of the project's environmental impact statement (EIS). Approval for the project is required under Part 4, Section 4.12(8) of the *Environmental Planning and Assessment Act 1979* (*EP&A Act*).

The project is a state significant development (SSD) (SSD-50725708) with the determining authority being the NSW Minister for Planning and Public Spaces. The Secretary's Environmental Assessment Requirements (SEARs) were issued by the NSW Department of Planning, Housing and Infrastructure (DPHI) on 14 December 2022. The SEARs identified key issues for assessment, including identifying potential hazards and risks associated with bush fires, consideration of the risk that a wind farm would cause bush fire and any potential impacts on aerial fighting of bush fire and to demonstrate compliance with Planning for Bush Fire Protection 2019.

The NSW Rural Fire Service (RFS) provided correspondence regarding the project, stating that the SEARs should incorporate a bush fire hazard assessment undertaken by a suitably qualified consultant to address the aims and objectives of *PBP 2019*.

This assessment has found that bush fire can potentially affect the project from the surrounding grassland and woodland vegetation.

Waratah Bushfire Planning proposes the following combination of bush fire mitigation measures to address the risk of bush fire caused by the project and to demonstrate compliance with *PBP 2019;*

- Provision of APZs for infrastructure including WTGs, meteorological monitoring masts (MET mast), operations and maintenance (O&M) buildings, staff offices,

temporary worker accommodation facilities and maintenance sheds, in accordance with Appendix 4 of *PBP 2019*.

- Buildings within 100 metres of bush fire prone vegetation are constructed to comply with *AS3959:2018 – Construction of buildings in bushfire-prone areas.*
- Provision of access and water supply in compliance with *PBP 2019*.
- Maintenance and housing of infrastructure so that it will not create a source of ignition to the surrounding vegetation and grassland.
- Preparation of a Bush Fire Emergency Management and Evacuation Plan; and
- Preparation of a Fire Management Plan in consultation with the NSW RFS District Office for the Mid Murray Zone.

GLOSSARY

AC	Alternating current
APZ	Asset Protection Zone
AS1596	Australian Standard – The storage and handling of LP Gas
AS3745	Australian Standard – Planning for emergencies in facilities
AS3959	Australian Standard – Construction of buildings in bushfire-prone areas 2018
BAL	Bushire Attack Level
BPL	Bush fire prone land
BCA	Building Code of Australia
BPM	Bush fire protection measures
BSA	Bush Fire Safety Authority
CFA	Country Fire Authority
DA	Development application
DCP	Development Control Plan
DPHI	Department of Planning, Housing and Infrastructure
EIS	Environmental impact statement
EMM	EMM Consulting Pty Limited
EP&A Act	Environmental Planning and Assessment Act 1979
EP&A Regulation	Environmental Planning and Assessment Regulation 2000
FFDI	Forest Fire Danger Index
GFDI	Grassland Fire Danger Index
GW	Gigawatts
ha	Hectares
IPA	Inner Protection Area
kV	kilovolts
LEP	Local Environmental Plan
LGA	Local government area
m	metres
MW	megawatt
MET mast	meteorological monitoring masts
NCC	National Construction Code

NSW	New South Wales
NPWS	National Parks and Wildlife Service
OPA	Outer Protection Area
O&M building	Operations & maintenance building
PCT	Plant Community Type
PHA	Preliminary Hazard Analysis
PBP 2019	Planning for Bush Fire Protection 2019
REZ	Renewable energy zone
RF Act	Rural Fires Act 1997
RFS	Rural Fire Service
SEARs	Secretary's Environmental Assessment Requirements
SSD	State significant development
SWS	Static water supply
SVTM	State Vegetation Type Map
WTG	Wind turbine generator

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ATTACHMENTS

1. INTRODUCTION

Spark Renewables Pty Limited (Spark Renewables) proposes to develop the Dinawan Wind Farm (the project). The project includes the installation, operation, maintenance and decommissioning of up to approximately 200 wind turbine generators (WTGs) and associated infrastructure. The project will have a generation capacity of up to approximately 1,200 megawatts (MW) (AC), equivalent to the needs of 600,000 NSW households per year.

The project is within the South West Renewable Energy Zone (REZ), a region selected by the NSW Government for its significant potential for renewable energy generation and regional development.

The project will connect to the Dinawan Substation, currently under construction as part of the Project EnergyConnect interconnector that will run between Robertstown in South Australia and Wagga Wagga in NSW. The substation and interconnector are a separate approved project that is being built by Transgrid.

The project is a state significant development (SSD) pursuant to schedule 1 of the *State Environmental Planning Policy (Planning Systems) 2021 (Planning Systems SEPP)*. Accordingly, approval for the project is required under Part 4, Division 4.7 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act).

1.1 Purpose of this report

This bush fire assessment report forms part of the environmental impact statement (EIS) for the project and has been prepared in accordance with the Secretary's environmental assessment requirements (SEARs) (application number: SSD-50725708) issued for the project on 14/12/2022 by the NSW Department of Planning, Housing and Infrastructure (DPHI) and the correspondence received by the NSW Rural Fire Service (RFS) on 17 March 2023 as summarised below:

Table 1-1 – SEARs and RFS assessment requirements

SEARs requirements		Section addressed
Key Issue – Hazards including:	Identify potential hazards and risks associated with bush fires/use of bushfire prone land, including the risks that a wind farm would cause bush fire and any potential impacts on the aerial fighting of bushfires and demonstrate compliance with Planning for Bush Fire Protection 2019.	Section 4.9, 5.2 and Section 6

NSW RFS requirements		Section addressed
Bush Fire Hazard Assessment - minimum requirements	The proposed development is to incorporate a bush fire hazard assessment to address the aims and objectives of PBP 2019	Section 4.8 & Section 6.1
	Suitable access for fire fighting vehicles, including access around structures on the site	Section 5.2.3
	Suitable static water supply (SWS) including access for fire fighting vehicles	Section 5.2.4
	Appropriate asset protection zones (APZs) and bush fire attack level (BAL)for structures, where appropriate	Section 5.2.1
	Preparation of a Bush Fire Emergency Management and Evacuation Plan in accordance with Table 6.8d of PBP 2019 and be consistent with the NSW RFS document: A Guide to Developing a Bush Fire Emergency Management and Evacuation Plan	Section 5.2.8
	Provision of a Fire Management Plan that at minimum includes: o Ongoing bush fire fuel management within the site; o Site infrastructure plan;	Section 5.2.7

NSW RFS requirements		Section addressed
	○ Site access and internal road plan; ○ APZs and their continued maintenance; ○ Location of hazards (physical, chemical etc) that may impact on fire fighting operations; and ○ Any such additional matters as may be required by the NSW RFS District Office for the Mid Murray Zone. (Phone 03 5898 4100).	

1.2 Aims of the assessment

The aims of the bush fire assessment report are to:

- Provide recommendations for the protection of human life and to minimise impacts on property from the threat of bush fire.
- Address the bush fire risk in accordance with *PBP 2019*, through bush fire hazard identification and assessment, including a bush fire hazard site and landscape assessment.
- Reduce the occurrence and consequences of bush fires through risk-based design: and
- Enable safe and effective emergency response through the provision of;
    - safe access in and around the project area including firefighting infrastructure such as water supply,
    - management of vegetation,
    - implementation and maintenance of building construction standards,
    - prevention of fire ignition on site and prevention of fire spread between site infrastructure,
    - operational procedures to address the impact on aerial fighting of bush fires.

This report has been prepared following guidance from the NSW RFS document PBP 2019, as well as bush fire design guidelines developed for renewable energy generating systems and electricity network operators.

1.3 Referenced documents & information collation

Assessment of the bush fire risk and measures required to mitigate this risk was performed through a desktop assessment. Documents reviewed for the preparation of this report include the following:

- SEARs Dinawan Wind Farm, application number SSD-50725708, dated 14/12/2022.
- Correspondence from NSW RFS dated 17 March 2023, ref: DA20221116011759-SEARS-1.
- Environmental Impact Statement prepared by EMM, Job no. E220305, dated May 2024.
- Bush Fire Risk Management Plan prepared by the Mid Murray Bush Fire Risk Management Committee, 2009.
- Vegetation mapping by Biosis.
- State Vegetation Type Map (STVM) by DPE (SVTM_vC1.1.M1.1).
- Environmental Systems Research Institute (ESRI) aerial photography (2023).
- Planning for Bush Fire Protection 2019 (PBP), NSW RFS.
- Comprehensive Vegetation Fuel Loads, March 2019, NSW RFS.
- Design Guidelines and Model Requirements Renewable Energy Facilities, March 2022 by the Country Fire Authority (CFA).
- Australian Standard 3959 Construction of buildings in bushfire-prone areas (2018).
- Wind Farms and Bushfire Operations, Guideline Version 3.0, 25 October 2018 by AFAC.

1.4 Project location

The project is located about halfway between the towns of Coleambally and Jerilderie and lies within the Murrumbidgee and Edward River local government areas

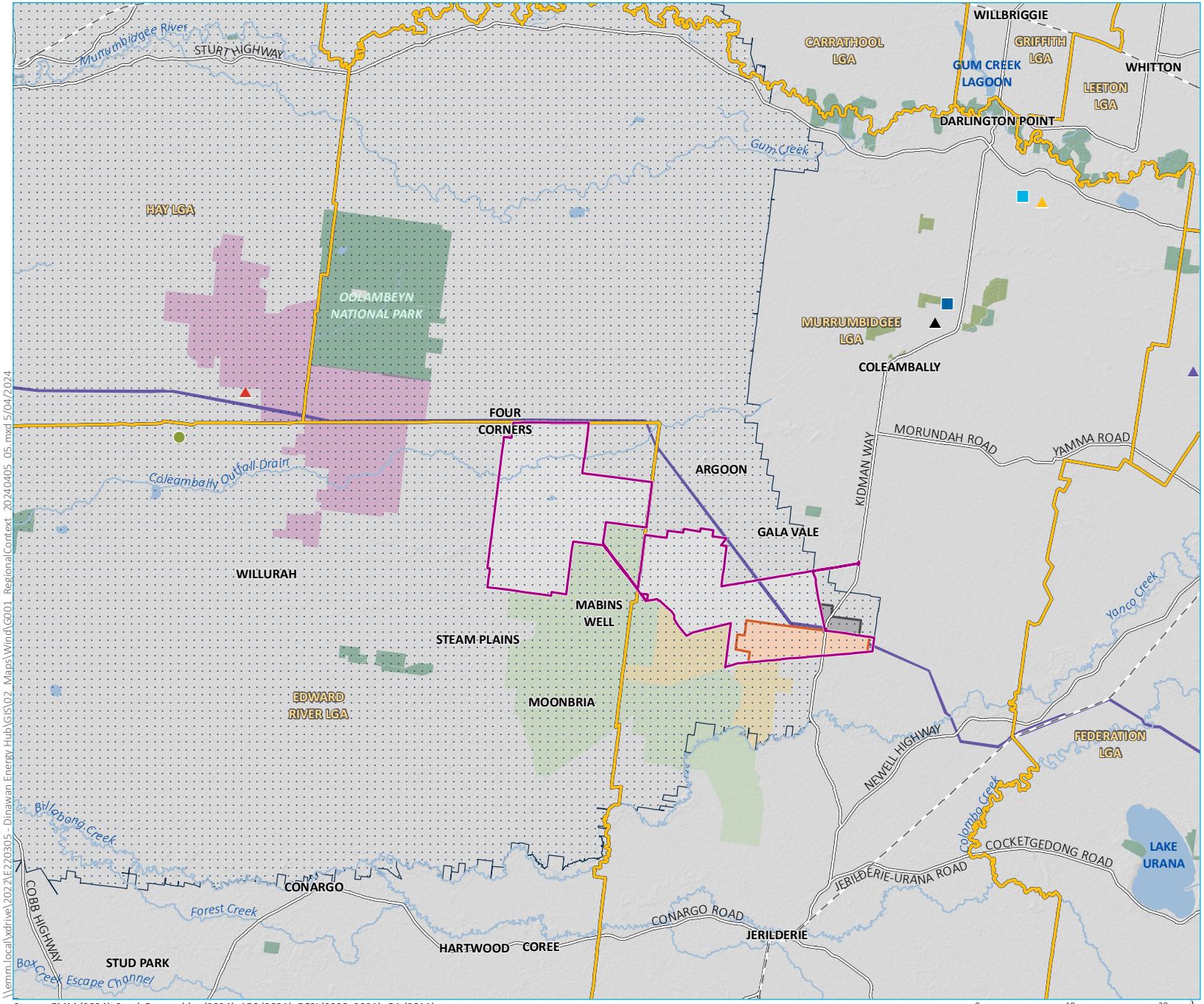
(LGAs) in New South Wales (NSW). The regional and local context of the project is shown in Figure 1-1 and Figure 1-2 respectively.

The project area is approximately 39,061 ha. The majority of the land within the project area is privately owned and is predominantly used for sheep and cattle grazing and some irrigated cropping.

Within the project area, the development corridor is approximately 7,256 ha (Figure 2-1 and 2-2). The development corridor has been refined based on the results of environmental surveys, including biodiversity, Aboriginal cultural and historical heritage surveys, and with consideration of community and regulatory stakeholder feedback.

A development footprint has also been provided and is approximately 1,339 ha within the development corridor. This assessment assumes that the development footprint will be disturbed. As part of detailed design, the development footprint may move within the development corridor; however, total direct surface disturbance is not anticipated to increase. All APZs have been located within the development footprint.

The preferred point of connection to Transgrid's network is via the Dinawan Substation, which forms part of Project EnergyConnect and will be constructed on land adjacent to the project area. An overhead transmission line will connect the project's collector substations to the Dinawan Substation.



KEY

- Project area
- Dinawan Solar Farm project area
- Renewable Energy Zone

Project EnergyConnect (Transgrid)

- Dinawan Substation
- Transmission line

Neighbouring renewable energy developments

- Coleambally Solar Farm (operating)
- Darlington Point Solar Farm (operating)
- Coleambally BESS (approved)
- Yarrabee Solar Farm (approved)
- Pottinger Solar Farm (proposed)
- Pottinger Wind Farm (proposed)
- Woodland BESS (proposed)
- Yanko Delta Wind Farm (approved)
- Argoon Wind Farm (proposed)
- Bullawah Wind Farm (proposed)

Existing environment

- Rail line
- Major road
- Named watercourse
- Named waterbody
- NPWS reserve
- State forest
- Local government area

Source: EMM (2024); Spark Renewables (2024); ABS (2021); DFSI (2020, 2021); GA (2011)

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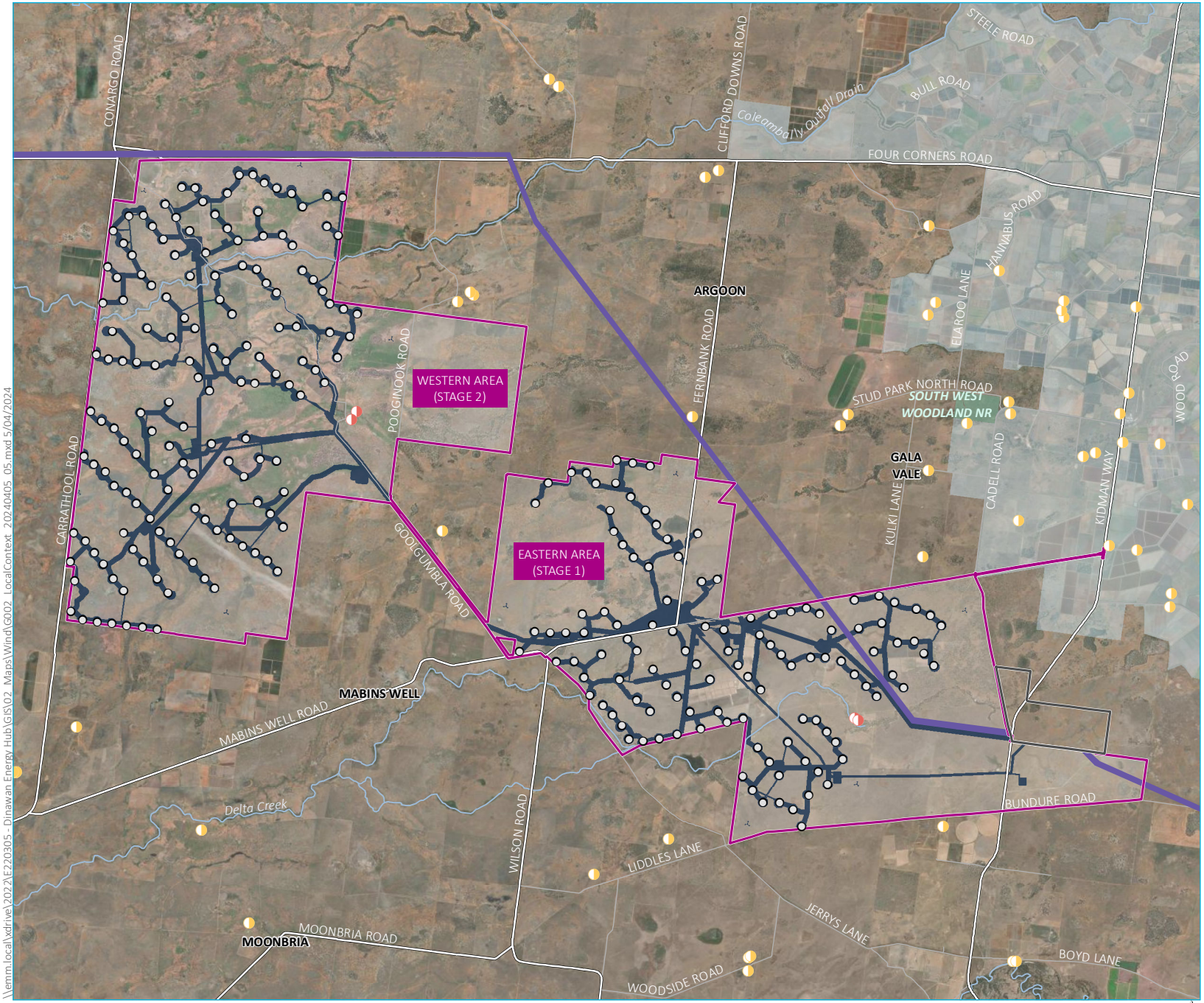
Regional context

Dinawan Wind Farm
Bushfire Assessment Report
Figure 1.1

EMM
creating opportunities



KEY

- Project area
- Development corridor
- Wind turbine generator (WTG)

Project EnergyConnect (Transgrid)

- Dinawan Substation
- Transmission line

Residence

- Associated
- Non-associated

Existing environment

- Major road
- Minor road
- Watercourse (third order and higher)
- Coleambally irrigation area
- NPWS reserve

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Source: EMM (2024); Spark Renewables (2024); DFSI (2020, 2021); ESRI (2024)

0 5 10 km

GDA2020 MGA Zone 55

N

Local context

Dinawan Wind Farm
Bushfire Assessment Report
Figure 1.2

EMM
creating opportunities

2. PROJECT DESCRIPTION

2.1 Overview

The project includes the installation, operation, maintenance and decommissioning of approximately 200 WTGs and supporting infrastructure (Figure 2-1 and 2-2). The project will have a generation capacity of up to approximately 1 GW.

The project area; physical layout and design; activities and project timing are detailed in the following sections. A summary of the project is provided in Table 2-1.

Table 1-2 – Project summary

Project element	Summary
Project area	Approximately 39,061 ha, comprised of 349 land parcels
Development corridor	Approximately 7,256 ha
Development footprint	Approximately 1,339 ha
Generation capacity	Up to 1,200 MW (AC)
Key infrastructure	• up to 200 WTGs (up to 280-m-tall, ground to maximum tip height) including: – tower, nacelle and blades – concrete foundations – hardstand pad – associated electrical infrastructure • electrical collection system, collector substations and control rooms • electricity transmission line infrastructure (above ground and underground) • electricity transmission line infrastructure connecting the collector substations to the Dinawan Substation • operations and maintenance (O&M) infrastructure, including: – site offices and amenities – equipment and maintenance sheds

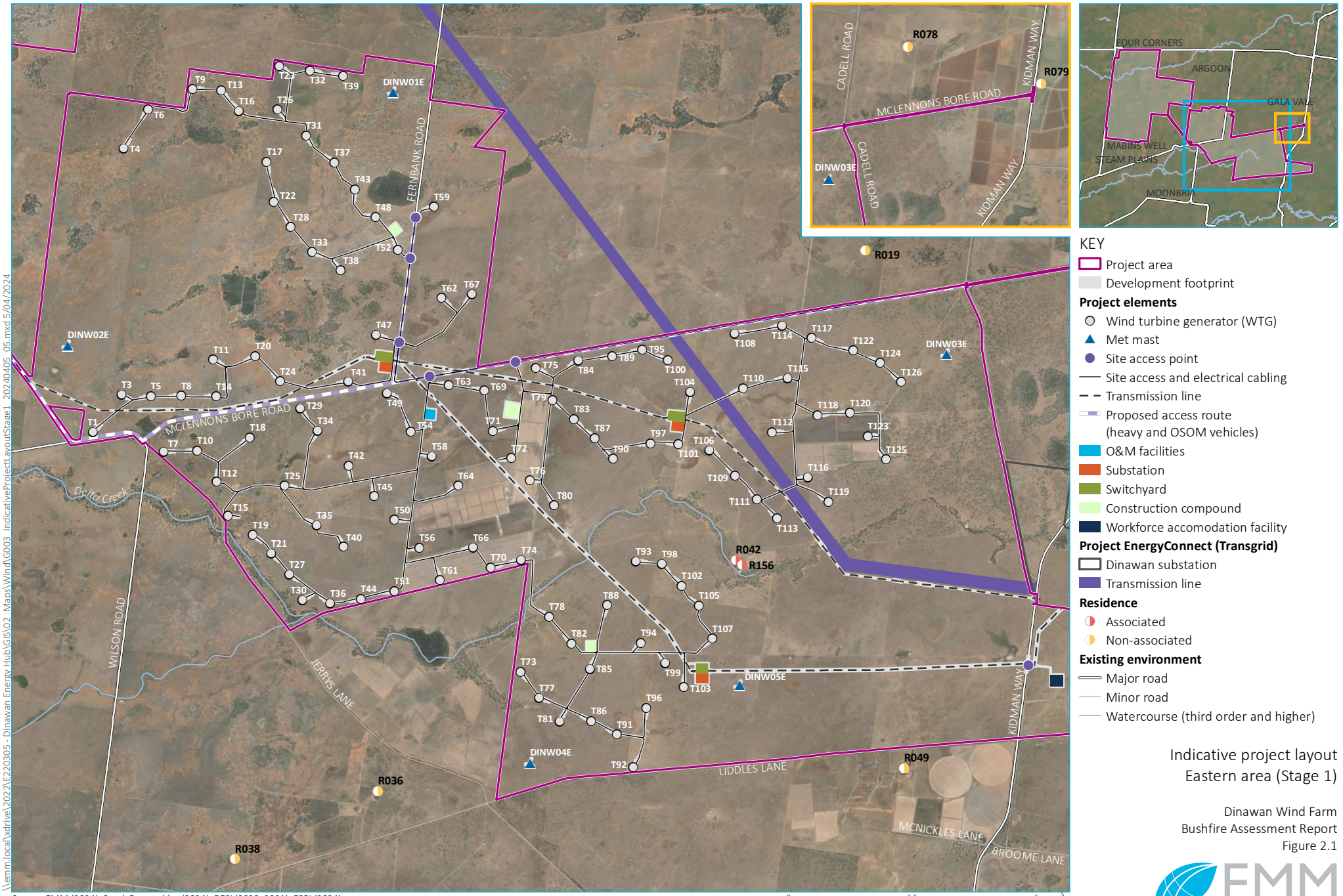
Project element	Summary
	– laydown, storage and parking areas • temporary construction facilities, including: – worker accommodation facility – construction compounds – site offices and amenities – concrete batching plants – construction materials storage (including stockpiles) – laydown areas – temporary meteorological monitoring masts (MET mast) (up to 200 m high) – water tanks – water and sediment management infrastructure – storage and parking areas – borrow pits • other permanent infrastructure, including: – hardstands – water tanks – permanent MET mast (up to 200 m high) – new access tracks – upgrades to existing access tracks – access points from the public road network.
Workforce	Approximately 600 personnel during peak construction. Up to 50 full-time employees and varying numbers of contractors during operations.
Hours of operation	Standard day time construction hours (7.00 am to 6.00 pm Monday to Friday and 8.00 am to 1.00 pm Saturday). Once operational, the project will operate continuously, 24 hours per day, 7 days per week.
Project life	Construction: 36 months per stage (approximately 60 months total due to overlap between stages).

Project element	Summary
	Operations: 25–35 years with potential to extend.
Construction stages	It is anticipated that the project will be constructed in two stages: • Stage 1 will be the construction of the eastern wind area, including associated public road upgrades, grid connection infrastructure and workforce accommodation facility. Stage 1 is within the Murrumbidgee LGA. • Stage 2 will be the construction of the western wind area, including associated public road upgrades, grid connection infrastructure and workforce accommodation facility. Stage 2 is predominantly within the Edward River LGA, with the exception of additional public road upgrades and grid connection infrastructure within Murrumbidgee LGA. A separate on-site workforce accommodation facility may be required for both Stage 1 and Stage 2; however, only one workforce accommodation facility is expected to be in use at any one time.
Roads	Site access points will be on McLennons Bore Road, Fernbank Road, Goolgumbla Road and Kidman Way (access point for Stage 1 accommodation facility). Upgrades to the local road network will include intersection improvements and road widening.An internal network of access tracks within the development corridor: • access to Stage 1 (east) from McLennons Bore Road, Fernbank Road and kidman way (accommodation facility access only). • access to Stage 2 (west) from Goolgumbla Road.

Project infrastructure will be contained within the development corridor, which will provide the necessary flexibility for further detailed design (micro-siting). The potential sources of project components, construction materials and water, and the locations

of construction workforce accommodation will be finalised following appointment of the construction contractor post-approval.

The development application will seek approval to directly clear and/or disturb all land within the development footprint described in the EIS. As part of detailed design, the development footprint may move within the development corridor; however, total direct surface disturbance is not anticipated to increase.



KEY

- Project area
- Development footprint

Project elements

- Wind turbine generator (WTG)
- Met mast
- Site access point
- Site access and electrical cabling
- Transmission line
- Proposed access route (heavy and OSOM vehicles)
- O&M facilities
- Substation
- Switchyard
- Construction compound
- Workforce accomodation facility

Project EnergyConnect (Transgrid)

- Dinawan substation
- Transmission line

Residence

- Associated
- Non-associated

Existing environment

- Major road
- Minor road
- Watercourse (third order and higher)

Source: EMM (2024); Spark Renewables (2024); DFSI (2020, 2021); ESRI (2024)

0 2.5 5 km

GDA2020 MGA Zone 55

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Indicative project layout Eastern area (Stage 1)

Dinawan Wind Farm
Bushfire Assessment Report
Figure 2.1

EMM creating opportunities

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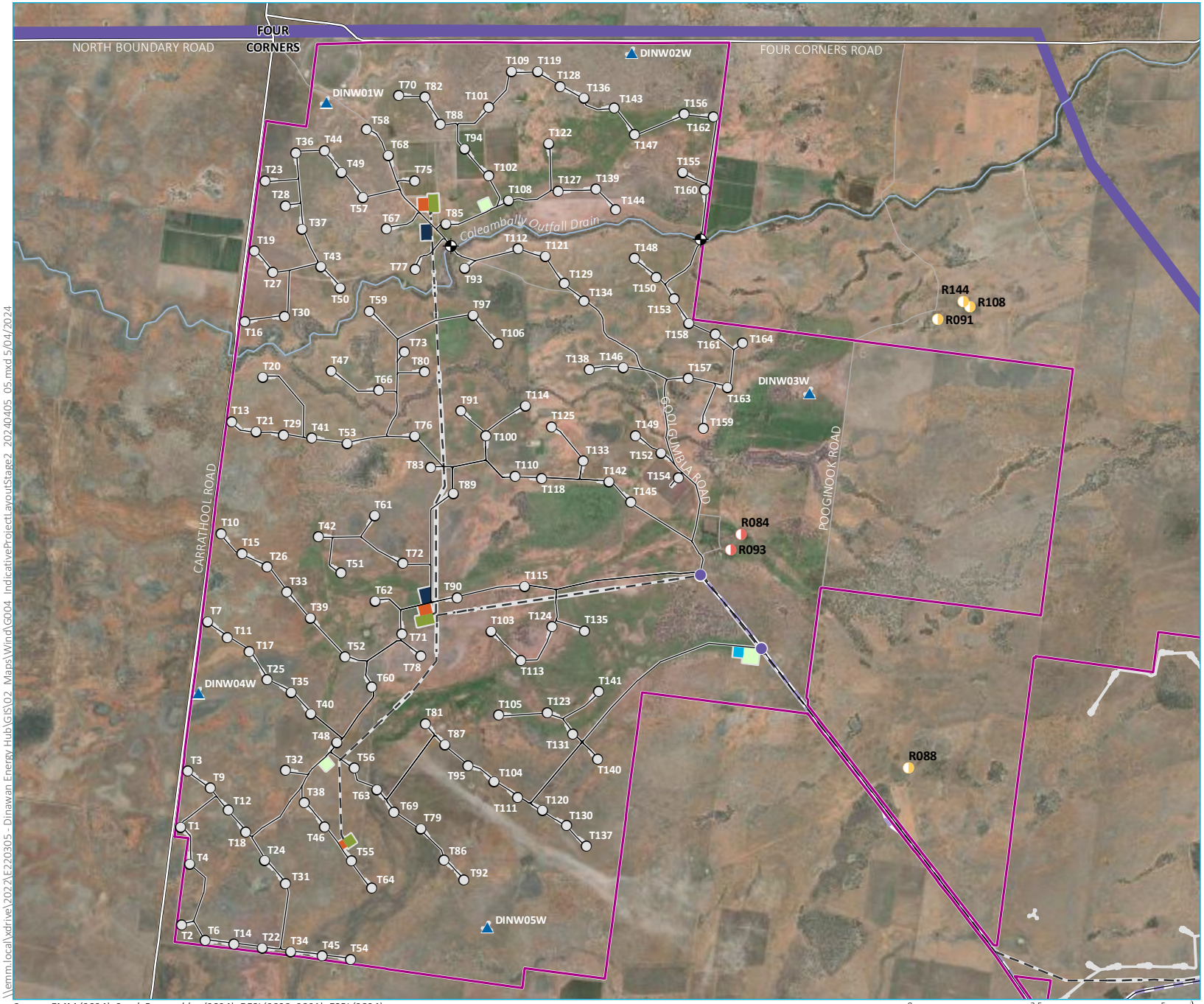

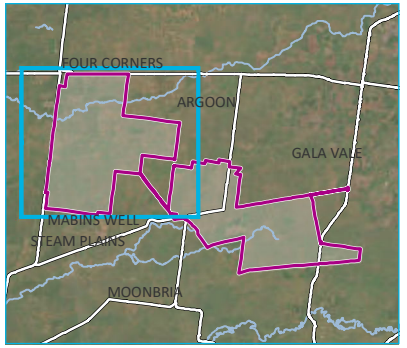

KEY

- Project area
- Development footprint

Project elements

- Wind turbine generator (WTG)
- Met mast
- Site access point
- Site access and electrical cabling
- Transmission line
- Proposed access route (heavy and OSOM vehicles)
- O&M facilities
- Substation
- Switchyard
- Construction compound
- Workforce accomodation facility

Project EnergyConnect (Transgrid)

- Transmission line

Residence

- Associated
- Non-associated

Existing environment

- Bridge
- Major road
- Minor road
- Watercourse (third order and higher)

Indicative project layout
Western area (Stage 2)

Dinawan Wind Farm
Bushfire Assessment Report
Figure 2.2

EMM
creating opportunities

Source: EMM (2024); Spark Renewables (2024); DFSI (2020, 2021); ESRI (2024)

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2.2 Wind turbines

The wind farm will have a generation capacity of up to approximately 1.2 GW. The project will include the installation of up to approximately 200 WTGs.

The WTGs will be installed in the eastern (Stage 1) and western (Stage 2) wind areas. The indicative layout in Figure 2-1 and Figure 2-2 includes 117 WTGs in the eastern and 150 WTGs in the western wind areas, respectively. The proposed layout is indicative and changes will be made during detailed design to ensure the total number of WTGs doesn't exceed 200. The selection of the final WTG model for construction may also result in amendments to the proposed layout.

Components of a typical WTG are illustrated in Photo 1. Each WTG will have a foundation approximately 20-m-wide (approximately 400 m^2) with a tip height of 280m. Further details on the design, coordinates and specifications of the WTGs is provided in Chapter 3 of the EIS.

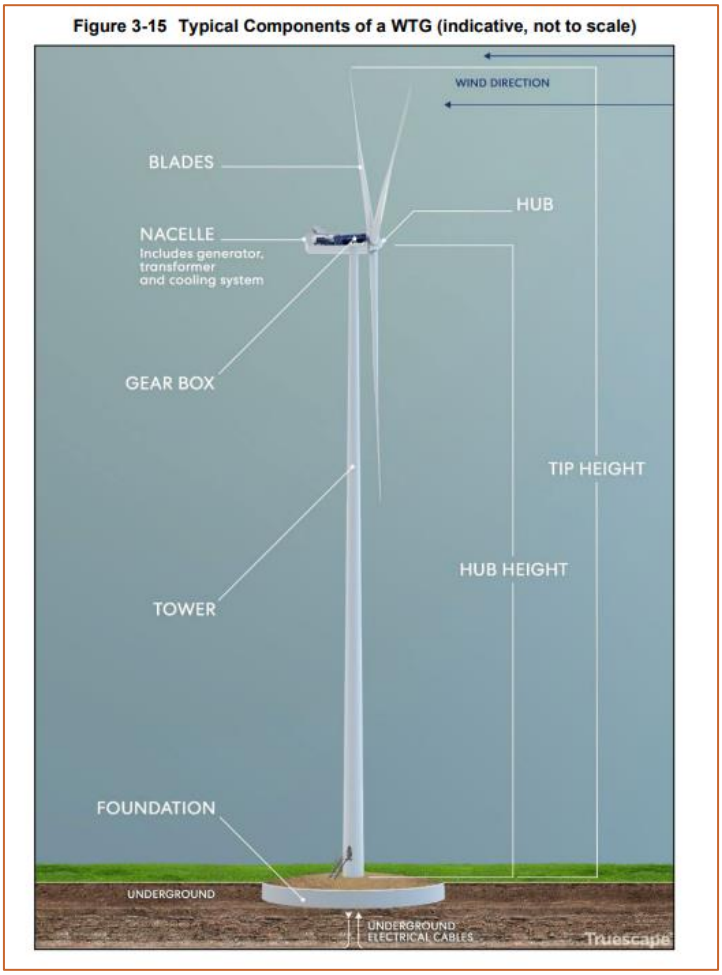


Photo 1: Typical components of a WTG

2.3 Electrical collection system

Electricity produced by each WTG will be transformed from low-voltage to medium-voltage (33 kilovolts (kV) or greater) by a transformer located within the nacelle or adjacent to the WTG.

A network of underground and overhead powerlines within the development corridor will connect WTGs to up to six collector substations. The exact routes of overhead and underground lines will be determined as part of detailed design.

The project electrical network is expected to comprise 33-kV circuits between the WTGs and collector substations, and a 132-kV or 330-kV transmission line between the collector substations and Dinawan Substation. Overhead electricity lines carrying less than 66-kV are generally installed on single power poles while lines carrying 66-kV or more are generally installed on transmission towers.

Power poles carrying less than 66-kV lines are expected to be between 10–20 m tall, while lines carrying 66-kV or more will be on transmission towers between 40–80 m tall. The distance between power poles and transmission towers will be dependent on the type used.

The eastern (Stage 1) and western (Stage 2) wind areas will be connected via an underground or overhead line within the road reserve of Goolgumbla Road. An indicative alignment for this infrastructure is shown in Figure 2-2.

2.4 Collector substations

The collector substations will convert 33-kV AC electricity from the WTGs to 330-kV or 500-kV for export to the Dinawan Substation.

Indicative sites for the collector substations are provided in Figure 2-1 and Figure 2-2. Each substation will have a footprint of up to 6 ha. Ancillary infrastructure may also be placed within the substation site.

2.5 Network connection

Dinawan Substation is the preferred point of connection to Transgrid's network. The Dinawan Substation is part of Project Energy Connect, which will be constructed on land adjacent to the project area.

Overhead 330-kV or 500-kV transmission lines will connect the collector substations to the Dinawan Substation. The design and precise location of the overhead transmission lines will be determined as part of detailed design; however, will remain within the development corridor.

The part of the overhead 330-kV or 500-kV transmission line within the development corridor is considered as part of this application. The part of the transmission line and connection infrastructure within Project Energy Connect's project area (i.e. Lot 1 of DP 1282091) at Dinawan Substation is as defined in Energy Connect (NSW – Eastern Section) Environmental Impact Statement (Transgrid 2022) and as approved under SSI-9172452. The footprint nominated for Dinawan Substation provides sufficient space for renewables connections.

2.6 Temporary supporting infrastructure

Temporary supporting infrastructure required during construction will include:

- construction compounds
- site offices and amenities
- concrete batching plants
- construction materials storage (including stockpiles)
- laydown areas
- temporary MET mast (up to 200 m high)
- water tanks
- water and sediment management infrastructure
- storage and parking areas
- borrow pits.

Up to six concrete batching plants will be required within the development corridor and will be co-located with the footprints nominated for construction compounds. Only one concrete batching plant will be operating at any point in time with the infrastructure relocated between the six construction compounds. Each facility is expected to require an area of approximately 100 m by 100 m (approximately 10,000 m^2). The concrete batching plants will include:

- cement silos
- stockpile areas
- water tanks

- wastewater storage
- parking
- a bunded refuelling bay.

2.7 Temporary worker accommodation facility

Three potential locations for the temporary worker accommodation facility are provided on Figure 2-1 and Figure 2-2 and include:

- one site for Stage 1 (east) and, should it be approved, will be co-located with the temporary worker accommodation facility proposed as part of Dinawan Solar Farm
- two sites for Stage 2 (west); however, only one site will be selected for the construction and operation of the facility.

Only one workforce accommodation facility will be in use at any one time. Each facility will accommodate up to 450 workers (including carparking). The facility will principally accommodate employees and long stay contractors. Visitors and short stay contractors may also be accommodated.

Once operational, the accommodation facility will be used for 24 hours a day, 7 days a week.

The nominated footprints for the accommodation facilities are approximately 9 ha. The exact location of the facilities within the nominated footprints will be determined during the detailed design stage of the project; however, all components will sit within the development corridor.

The facility will include:

- modular and relocatable single rooms/quarters
- office building
- wet mess area (including stores, kitchen and dining area)
- laundry facilities
- toilet and shower facilities
- car and shuttle bus parking area
- a medical centre or first aid room staffed by personnel with suitable first-aid/medical training
- recreation areas.

2.8 Permanent infrastrucuture

Permanent supporting infrastructure will be required during operations and will include:

- a site office and O&M buildings (including offices, amenities and equipment storage sheds) with parking
- hardstands
- water tanks
- 10 permanent MET masts (up to 200 m high).

Lighting, security cameras and weather stations will be installed where necessary for safety, operational maintenance, and security purposes. Lightning protection will be provided as required.

2.9 Construction works

A workforce of approximately 600 personnel will be required on-site during peak construction.

Temporary construction infrastructure will include construction compounds, site offices, concrete batching plants, material storage (including stockpiles) and laydown areas, temporary MET masts and internal access tracks.

Earthworks will include turbine foundation excavation, hardstand and access track formation and drainage works.

Site preparation works will include:

- site survey to confirm infrastructure placement
- establishment of accommodation facility
- construction of access tracks
- upgrading the existing bridges across the Coleambally Outfall Drain (Stage 2 only)
- establishment of temporary construction areas, including:
    - construction compounds (including offices and amenties)
    - laydown and parking areas
    - construction materials storage areas
    - concrete batching plants

- ongoing geotechnical investigations to confirm the ground conditions.

Laydown areas; waste handling; and fuel and chemical storage areas will be strategically placed to minimise potential environmental impacts during construction.

Construction activities will include:

- construction of the accommodation facility
- construction of hardstand areas
- delivery of project infrastructure (including WTG components)
- construction of footings for WTG and permanent MET masts
- erection of permanent MET masts and WTG components
- erecting power poles and transmission towers and stringing lines and/or trenching and line installation
- installation of substation
- construction of O&M facilities
- test and commission project infrastructure
- rehabilitation and revegetation.

Plant and equipment required for the construction of the project will include:

- earthmoving plant
- cable trenching and laying equipment
- material handling equipment (including forklifts and cranes)
- machinery and equipment for connection infrastructure establishment
- water trucks for dust suppression
- light vehicles for personnel transport.

2.10 Construction program & staging

Project construction is expected to commence in 2025, subject to receiving the required approvals. Construction of the project is expected to be completed over approximately 60 months.

Stage 1 of the project is expected to be commissioned in 2027–2028, subject to the availability of grid access. The project will operate continuously, 24 hours per day, 7 days per week.

It is anticipated that the project will be constructed in two stages;

- Stage 1 will be the construction of the eastern wind area, including associated public road upgrades, grid connection infrastructure and workforce accommodation facility. Stage 1 is within the Murrumbidgee LGA.
- Stage 2 will be the construction of the western wind area, including associated public road upgrades, grid connection infrastructure and workforce accommodation facility. Stage 2 is predominantly within the Edward River LGA, with the exception of additional public road upgrades and grid connection infrastructure within Murrumbidgee LGA.

The road upgrades have also been separated into two stages as vehicles associated with the construction of the eastern wind area will not use Wilson Road or Goolgumbla Road and therefore upgrades to these roads are not proposed until commencement of construction of Stage 2.

The sequencing of the project will be determined as part of detailed design. Sequencing is likely to include overlap between activities but indicatively will involve the following steps:

1. construction of supporting infrastructure and grid connection works
2. construction of wind farm and associated infrastructure.

Subsequent stages of the project will be:

- operation (25–35 years)
- decommissioning (1–2 years).

2.11 Operations

The WTGs and infrastructure will be maintained during operations to ensure ongoing efficient electricity generation, energy storage and site operations. Maintenance will include:

- servicing WTGs, collector substations, and other infrastructure, with repair or replacement of components where required
- vegetation maintenance
- weed and pest management
- fence and access road management
- internal track management
- drainage and erosion management

- landscaping (if required).

Light vehicle access will be required throughout operations and occasional heavy vehicles may also be required.

Sheep and cattle may be grazed on portions of the development corridor following the completion of project construction.

The operational workforce will also be responsible for ongoing security monitoring. Security cameras may be utilised to assist with monitoring project infrastructure.

2.12 Decommissioning

The operational lifespan of the project is expected to be in excess of 25–35 years, depending on the nature of WTG technology and energy market demands.

Once the project reaches the end of its operational life, a decision will be made to either decommission or re-power the facility, subject to approval requirements.

If the project is decommissioned, all aboveground structures will be removed and the site rehabilitated generally to its pre-existing land use, as far as practicable. Project infrastructure will be managed in accordance with the waste management hierarchy and contemporary waste management legislation.

If re-powering is proposed, stakeholders will be consulted and the required approvals sought.

3. LEGISLATIVE AND POLICY REQUIREMENTS

3.1 Environmental Planning and Assessment Act 1979

The project has been declared SSD under Part 4, section 4.12(8) of the Environmental Planning and Assessment Act, 1979 (*EP&A Act)*.

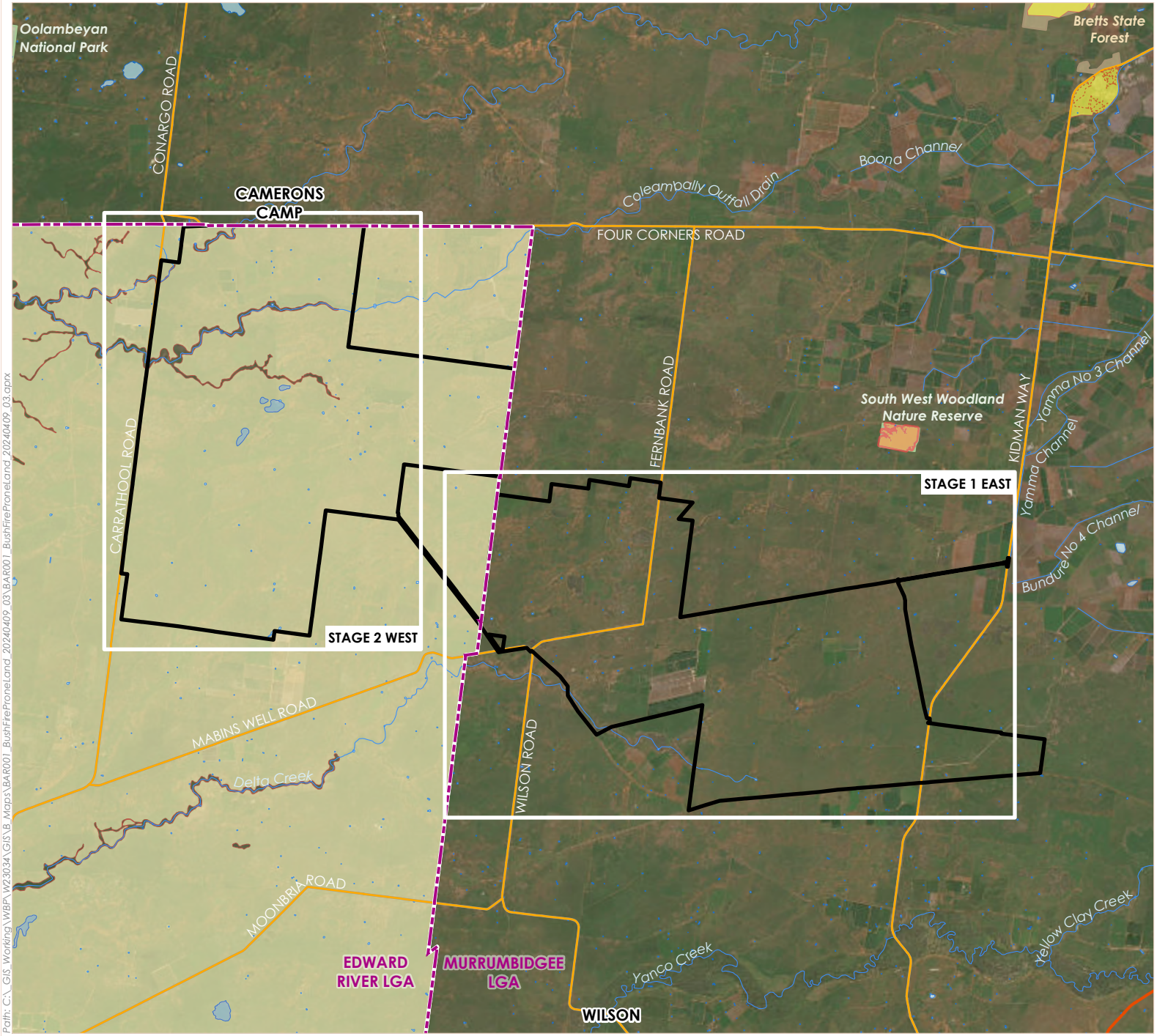
3.1.1 Bush Fire Prone Land Mapping

The *EP&A Act 1979* requires that any development on bush fire prone land (BPL) for any purpose complies with PBP 2019. Councils maintain and update BPL maps according to the NSW RFS *Guide for Bush Fire Prone Land Mapping* and then they are certified by the NSW RFS. BPL maps are based on the vegetation types present which are classified into one of four categories, as follows:

- Category 1: which includes areas of forest, woodland, heath, forested wetland and timber plantation. Highest risk category.
- Category 2: rainforests and "lower risk vegetation parcels". These parcels contain remnant vegetation that is limited in its connectivity to larger areas and land parcels with land management practices that actively reduce bush fire risk (and are subject to a bush fire plan or similar).
- Category 3: which includes grasslands, freshwater wetlands, semi-arid woodlands, alpine complex and arid shrublands. Moderate risk category; and
- Exclusion: Areas of vegetation less than 1 ha and greater than 100 m separation from category 1, 2 or 3 vegetation; small patches or strips of remnant vegetation; managed grasslands; agricultural cropland; gardens; and mangroves are not mapped as bush fire prone.

BPL is defined as land with category 1, 2 or 3 vegetation and land within 100 m of category 1 or within 30 m of category 2 or 3 vegetation.

As depicted in Figure 3-1, the project area within Edward River Council is mapped as bush fire prone (Category 3 vegetation). Murrumbidgee Council does not map the project areas as bush fire prone. As required under the SEARs and the RFS response, key issues such as hazards, including the requirement to demonstrate compliance with *PBP 2019,* must be addressed.



LEGEND

- Project area
- Major road
- Minor road
- Classified fire trail
- Named watercourse
- Waterbody
- National park/reserve
- State forest
- Local government area

Bush fire prone land (RFS, 2023)

- Vegetation Buffer
- Vegetation Category 1
- Vegetation Category 2
- Vegetation Category 3

Figure 3.1 – Bush fire prone land map

Dinawan Wind Farm

09/04/2024 (v3) 1:250,000 @A4 GDA2020 MGA Zone 55

0 2.5 5
kilometres

WARATAH BUSHFIRE
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Data source: WBP (2024); EMM (2024); ABS (2021); DCSSS (2024); ESRI (2024); GA (2011, 2019); RFS (2023)

Path: C:_GIS_Working\WBP_W23034\GIS\B_Maps\BAR001_BushFireProneLand_20240409_03\BAR001_BushFireProneLand_20240409_03.aprx

3.2 Rural Fires Act 1997

The objectives of the *Rural Fires Act 1997* are to provide:

- the prevention, mitigation and suppression of fires
- coordination of bush fire fighting and prevention
- protection of people and property from fires; and protection of the environment.

In relation to the management of bush fire fuels on public and private lands within NSW, sections 63(1) and 63(2) of the *Rural Fires Act 1997* require public authorities and owners/occupiers of land to take all practicable steps to prevent the occurrence of bush fires on their land, and to minimize the danger of the spread of bush fires.

3.3 Planning for Bush Fire Protection 2019

The NSW RFS document PBP 2019 provides and explains the legal requirements, framework and protection measures needed for all types of development on bush fire prone land in NSW.

Section 8.3.5 of PBP 2019 states that specific consideration should be provided for wind and solar farms with adequate clearance to combustible vegetation, firefighting access and water supply. The following should be provided:

- A minimum 10m APZ for structures and associated buildings/infrastructure.
- The APZ must be maintained to the standard of an inner protection area (IPA) for the life of the development.
- Essential equipment should be designed and housed in such a way to minimise the impact of bush fires on the infrastructure and should be designed and maintained so it will not create a source of ignition to the surrounding vegetation and grassland.
- A bush fire emergency management and operation plans (BFMOP) should identify relevant risks and mitigation measures associated with the construction and operation of the wind and solar farm.

3.4 Other guidelines relevant to renewable energy projects

The CFA, in conjunction with industry and regulatory authorities, has developed the *Design Guidelines and Model Requirements for Renewable Energy Facilities* (March 2022) to support designers and operators of facilities to consider and mitigate fire risk. This includes fires which originate within the facility itself as well as bush fire impact on the site from external factors.

While these were developed in a Victorian context, CFA expertise and the guidelines have been sought for supporting fire safety at renewable energy facilities across Australia and internationally. The CFA guidance represents the current leading practice and has been utilised within this document as it builds upon the principles and knowledge from recent fires at large-scale renewable energy facilities.

Network Standard NS187 Passive Fire Mitigation Design of Major Substations is an Ausgrid document that details the minimum levels for passive fire protection systems at Ausgrid's major substations (sub-transmission and zone substations). The recommended mitigation measures provided in this document have been applied to guide the design of the on-site substations (and associated switchgear). Substation design should aim for a high level of bush fire protection for critical assets and a rapid return to service following a bush fire event.

Wind Farms and Bushfire Operations, prepared by AFAC highlights issues and provides guidance relating to planning for bushfire prevention, preparedness, response and recovery operations in and around existing and planned wind farm facilities.

4. BUSH FIRE RISK FACTORS

The following assessment uses the methodology identified in PBP 2019 to provide a focussed assessment used to qualify the risk by assessing the hazardous vegetation and the effective slope within 140m of the proposed infrastructure, as well as providing a review of the current bush fire management controls, fire history and potential fire behaviour.

4.1 Current bush fire management controls

The project area comprises 349 land parcels of privately held land with historical grazing use. The Mid Murray Zone Bush Fire Risk Management Plan does not identify the area as an asset or apply any specific treatment strategies.

However, the following programs and activities are examples of current local government-wide controls and will be considered and defined in the Fire Management Plan for Dinawan Wind Farm:

- the declaration and management of burning restrictions, such as Total Fire Bans, Restricted Burning Times, Prohibited Burning Times and Harvest and Vehicle Movement Bans to reduce ignition risk.

The area is also well-served by fire response services. The nearest volunteer fire brigade is Goolgumbla East Rural Fire Brigade located within the project area (west) and Argoon Rural Fire Brigade located approximately 7km to the south of the project area.

4.2 Climate and bush fire season

As outlined in the Bush Fire Risk Management Plan, the Mid Murray Zone is warm temperate with predominately winter rainfall.

Rainfall is spread across the year although peaking in late winter and spring. Average annual rainfall is generally low in the 350mm to 450mm range with summer rainfall between 20mm and 30mm per month and winter rainfall between 30mm and 40mm per month. Annual variations can be extreme producing droughts or floods. Summer rainfall is usually as a result of thunderstorms.

The start date for the Bush Fire Danger period generally runs from October – November through to March – April, adjusted according to seasonal conditions. Fire weather

conditions are usually associated with winds from the west around to the north accompanied by high daytime temperatures and low relative humidity. Dry lightning storms occur frequently during the bush fire season often starting forest and grass fires.

Weather extremes do occur in summer with temperatures up to 45 degrees, low humidity (5%) and strong winds (+60kph) which have combined potential for disastrous results.

4.3 Fire ignition

Bush fires within the region are typically started by natural causes (i.e. lightning), unattended camp fires, power lines, machinery and traffic, escapes from agricultural burns and use of cutting and welding equipment.

Earth moving equipment, power tools (e.g., welders, grinders), mowers and slashers are known for starting bush fires under conditions of high temperature, low humidity and high wind. Therefore, hot works or use of machinery that could cause a spark within the project area will be a potential source of ignition during the bush fire danger season (typically November to the end of March).

4.4 Fire history

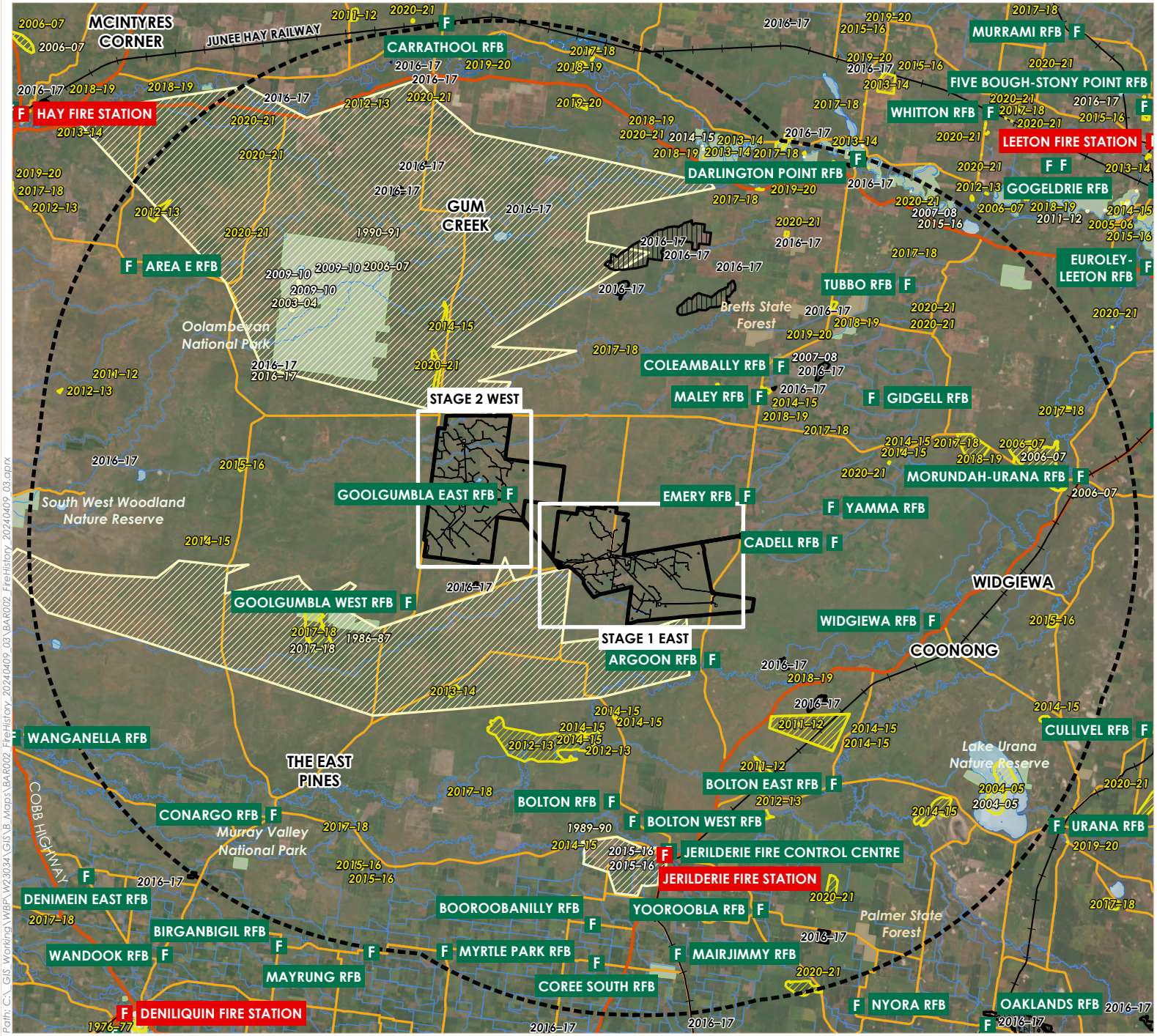
The Mid Murray Zone Bush Fire Management Committee (BFMC) area has on average 250 bush fires per year of which 6-10 on average are considered a major fire (BFMC, 2008).

Potential major risk seasons follow significant periods of high vegetation growth from high winter rainfall. These seasons allow build-up of fine fuels and create the potential for a major fire season across the whole of the Mid Murray Zone when this vegetation material cures. Over the last 50 years, these potential major fire seasons have been 1956/57, 1974/75, 1975/76, 1989/90, all of these seasons have followed significant high winter rainfall.

NPWS fire history (dataset dated 23/11/2023) and NSW Fire History (accessed on 08/01/2024) have been reviewed which suggests that there have been no fires recorded within the project area. These datasets combine data from NPWS, State Forests, Fire & Rescue NSW and the NSW RFS. These datasets are incomplete as not every bushfire incident or prescribed burn has been mapped going back in time. A

wildfire was recorded to the south of the project area in 1986-87 (92 ha). The recorded cause of the fire was a lightning strike. A wildfire in 1990 – 91 occurred adjacent to the northern project area boundary (181ha) with the cause recorded as a motor vehicle.

Anecdotal evidence provided by the local community to Spark Renewables during the consultation process also acknowledges that there is evidence of additional fires in the general area as recently as 1-2 years ago.



LEGEND

- Project area
- Development footprint
- Development footprint – 50 km buffer
- Rural fire service
- Fire and rescue
- Rail
- Major road
- Minor road
- Named watercourse
- Named waterbody
- National park/reserve
- State forest

NPWS fire history

- Wildfire
- Prescribed burn

NSW Fire history (DCSSS, 2024)

- Wildfire
- Unknown

Figure 4.1 – Fire history and location of emergency services

Dinawan Wind Farm

09/04/2024 (v3) 1:700,000 @A4 GDA2020 MGA Zone 55

0 10 20
kilometres

WARATAH BUSHFIRE
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Data source: WBP (2024); EMM (2024); DCSSS (2024); ESRI (2024); GA (2011); NPWS (2023)

Path: CA_GIS_Working\WBP_W23034\GIS\B_Maps\BAR002_FireHistory_20240409_03\BAR002_FireHistory_20240409_03.aprx

4.5 Fire behaviour potential

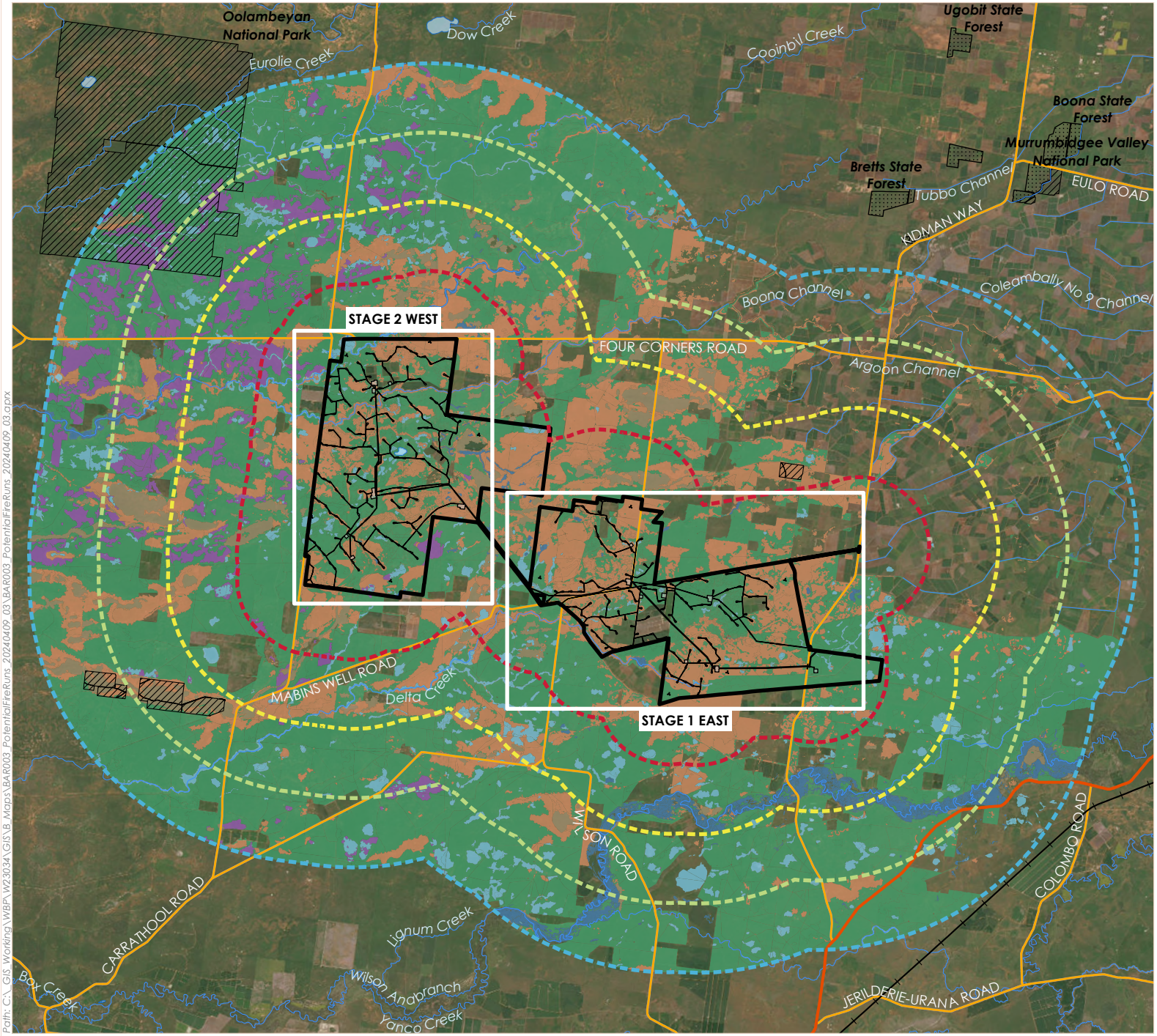
Grassland (subject to grazing and cropping), woodland, forested and freshwater wetland communities (within drainage depressions) surround the project area and make up the predominant fuel for bush fire. Potential fire runs of more than 20km extend to the northwest and west, south and east and predominantly relate to the connectivity of grassland communities within the region (Figure 4-2).

These lands particularly to the south and southeast may be subject to further renewable energy development (including Dinawan Solar Farm, Yanco Delta Wind Farm and Argoon Wind Farm) which could reduce the potential fire run from these directions in the future.

Until the adjoining lands are developed and subject to an ongoing management regime there will be periods when the adjoining grazing and cropping lands are non-flammable due to climatic and agricultural practices. There will also be periods when these grassland and woodland areas are cured and highly flammable.

An ignition point takes some time to build to a quasi-steady state rate of spread, however, under extreme weather conditions a grass fire can be expected to reach the maximum rate of spread within 30 minutes or even less (Cheney and Sullivan, 2008), by which time the fire is likely to be uncontrollable.

It should also be assumed that, under the most extreme weather, a fire can spread even in heavily grazed grass and embers may breach any APZ. The residence time for flames in heavily grazed pasture is likely to be very short (less than five seconds) (Cheney and Sullivan, 2008), so the project area will have a similarly short time of exposure to high radiant heat under such a scenario.



LEGEND

- Project area
- Development footprint
- Rail
- Major road
- Minor road
- Named watercourse
- Named waterbody
- National park/reserve
- State forest

Development footprint buffer

- 5 km
- 10 km
- 15 km
- 20 km

Vegetation formation

- Arid Shrublands
- Forested Wetlands
- Freshwater Wetlands
- Grasslands
- Grassy Woodlands
- Semi-arid Woodlands

Figure 4.2 – Potential fire runs (landscape scale)

Dinawan Wind Farm

09/04/2024 (v3) 1:400,000 @A4 GDA2020 MGA Zone 55

0 5 10
kilometres

WARATAH BUSHFIRE
PLANNING | GIS | ASSESSMENT

Path: C:_GIS_Working\WBP_W23034\GIS\B_Maps\BAR003_PotentialFireRuns_20240409_03\BAR003_PotentialFireRuns_20240409_03.aprx

Data source: WBP (2024); EMM (2024); DCSSS (2024); DPE (2023); ESRI (2024); GA (2011)

4.6 Predominant vegetation

PBP 2019 guidelines require the identification of the predominant vegetation formation in accordance with the publication *Ocean Shores to Desert Dunes* (David Keith, 2004) if using the simplified acceptable solutions. The hazardous vegetation is calculated for a distance of at least 140m from a proposed building envelope. The vegetation posing a bush fire threat to the project area and development footprint (including accommodation facilities, WTG, substations, O&M buildings and construction compounds) includes:

Table 1-3 – Vegetation

Vegetation class (Biosis, 2024)	*Vegetation formation*	*Acceptable solution fuel loads (t/ha) (PBP 2019)*
Riverine Plain Woodland	Semi-arid Woodlands	10.5/20.2
Inland Floodplain Woodland		
Riverine Sandhill Woodland		
Inland Riverine Forest	Forested wetland	8.2/15.1
Inland Floodplain Shrublands	Freshwater Wetlands	4.4/4.4
Inland Floodplain Swamp		
Riverine Chenopod Shrubland	Arid shrubland	6.2/6.2
Riverine Plain Grasslands	Grasslands	6/6
Riverine Derived Grasslands	Grasslands	6/6

The vegetation classes within the development corridor (plus 500m buffer) have been confirmed by Biosis during their field survey. Vegetation mapping beyond the 500m buffer is sourced from State Vegetation Type Map by DPE (2022, version C1.1M1.1).

4.7 Effective slope

Topography has a significant effect on bush fire behaviour and therefore can increase the risk to assets. For example, fire travels faster when moving uphill when compared to downhill. For every 10 degrees slope, the fire will double its speed and increase in intensity.

The topography within the project area is generally flat with minor undulations associated with the creek corridors. The effective slope has been assessed within the vegetation up to 100m from the development footprint to determine the minimum APZs required and the expected radiant heat output in a bush fire event. This is described in detail within

and the figures in Appendix 2.

4.8 Bush fire attack assessment

The following assessment has determined the APZ and BAL setbacks for the project and will be used as a guide for the final detailed design (micro-siting) for buildings associated with the accommodation facilities. They can also be used as a guide for the location of critical infrastructure (e.g. substations and switchyards), O&M buildings, offices and other permanent structures.

The assessment has provided the:

- minimum APZ to avoid flame contact on buildings and infrastructure (refer Column 4 in Table 4-2);
- minimum APZ required for a suitable safe refuge building within each of the accommodation facilities (<10kW/m^2) using Table A1.12.1 of PBP 2019(refer Column 5 in Table 4-2); and
- radiant heat levels (expressed in BAL thresholds BAL 29, BAL 19 & BAL 12.5) using Table A1.12.6 of PBP 2019. Refer Appendix 2 for figures.

A fire danger index (FDI) of 80 has been used to calculate bush fire behaviour in the project area based on its location within the Southern Riverina region.

Table 1-4 – Bush fire attack assessment

Aspect	Vegetation Formation within 140m	Effective slope	Minimum APZ recommended (avoid flame contact)	*Minimum APZ recommended for safe refuge*	*Available APZ (to include full extent of development footprint)*	*BAL thresholds*
WTG						
All aspects	Grassland / woodland	0-5^0	10 m	N/A	10m (WTG foundations provide sufficient APZ)	N/A
Temporary worker accommodation facilities, substation & switchyard (west) refer Map 1 of 14 in Appendix 2)						
North & south	Grassland	Level	7m	36m	15m	BAL 19 (14-<20m) BAL 12.5 (20-<50m)
East & west	Semi-arid woodland	Level	8m	42m	15m	BAL 29 (11-<16m) BAL 19 (16-<22m) BAL 12.5 (22-<100m)
Construction compound/s (west) – refer Map 2 & 4 of 14 in Appendix 2						
North, south, and west	Grassland	Level	7m	N/A	>15m	BAL 19 (14-<20m) BAL 12.5 (20-<50m)
Temporary worker accommodation facilities, substation & switchyard (west) refer Map 3 of 14 in Appendix 2						
North, west & southeast	Semi-arid woodland	Level	8m	42m	15m	BAL 29 (11-<16m) BAL 19 (16-<22m) BAL 12.5 (22-<100m)

Aspect	Vegetation Formation within 140m	Effective slope	Minimum APZ recommended (avoid flame contact)	*Minimum APZ recommended for safe refuge*	*Available APZ (to include full extent of development footprint)*	*BAL thresholds*
South, east and northwest	Grassland	Level	7m	36m	15m	BAL 19 (14-<20m) BAL 12.5 (20-<50m)
Substation & switchyard (west) – refer Map 5 of 14 in Appendix 2						
North, south, east and west	Semi-arid woodland	Level	8m	N/A	15m	BAL 29 (11-<16m) BAL 19 (16-<22m) BAL 12.5 (22-<100m)
O&M building & construction compound (west) – refer Map 6 of 14 in Appendix 2						
North, south, east & west	Semi-arid woodland	Level	8m	N/A	15m	BAL 29 (11-<16m) BAL 19 (16-<22m) BAL 12.5 (22-<100m)
Construction compound/s (east) – refer Map 7, 10 & 12 of 14 in Appendix 2						
North, south, east and west	Semi-arid woodland	Level	8m	N/A	15m	BAL 29 (11-<16m) BAL 19 (16-<22m) BAL 12.5 (22-<100m)
North, south, and west	Grassland & freshwater wetland	Level	7m	N/A	15m	BAL 19 (14-<20m) BAL 12.5 (20-<50m)
Substation & switchyard/s (east) - refer Map 8, 11 & 13 of 14 in Appendix 2						
North, south, east and west	Semi-arid woodland	Level	8m	N/A	15m	BAL 29 (11-<16m) BAL 19 (16-<22m) BAL 12.5 (22-<100m)

Aspect	Vegetation Formation within 140m	Effective slope	Minimum APZ recommended (avoid flame contact)	*Minimum APZ recommended for safe refuge*	*Available APZ (to include full extent of development footprint)*	*BAL thresholds*
North, south, east and west	Grassland	Level	7m	N/A	15m	BAL 19 (14-<20m) BAL 12.5 (20-<50m)
Operation and Maintenance Building (O&M) (east) - refer Map 9 of 14 in Appendix 2						
North, south and east	Grassland	Level	7m	N/A	15m	BAL 19 (14-<20m) BAL 12.5 (20-<50m)
West & southwest	Semi-arid woodland	Level	8m	N/A	15m	BAL 29 (11-<16m) BAL 19 (16-<22m) BAL 12.5 (22-<100m)
Temporary worker accommodation facilities (east) - refer Map 14 of 14 in Appendix 2						
North, south, east & west	Grassland	Level	7m	36m	15m	BAL 19 (14-<20m) BAL 12.5 (20-<50m)

Note 1 – The predominant vegetation in many circumstances has been determined as woodland. Whilst the site contains a large amount of grassland derived from woodland, where mixes of vegetation formations are located together, the vegetation formation providing the greater hazard shall be used for the purpose of assessment. The fuel loads associated with the woodland community are higher than those for grassland and freshwater wetland and therefore the predominant vegetation has been determined as woodland to many aspects.

4.9 Bush fire risk created by the project

Fire risks have been identified and must be effectively managed during the construction and commissioning of the project.

4.9.1 Assessment of bush fire risk during construction and decommissioning

The potential sources of ignition of bush fires resulting from the construction of the project and decommissioning include:

- Construction equipment including bulldozers, excavators and vegetation removal machinery using slashers and mulching machines. These activities can produce sparks when steel blades encounter rock, with the potential to ignite surrounding vegetation.
- Motor vehicle exhaust systems and diesel-powered trucks with pollution control devices have the potential to emit burning diesel particles and ignite grassland and woodland ground fuels.
- Hot works such as welding and grinding can produce sparks resulting in an extreme level of risk of ignition for cured vegetation.
- Electrical equipment faults create a high level of risk of ignition of vegetation.
- Inappropriate storage of chemicals has the potential to cause a chemical fire or explosion. Failure to clean up a spill can also lead to fire; and
- Arson.

In general, the risk of bush fire impact during construction and decommissioning is dependent on factors such as fuel loads, weather and the scale (size) of fires which may occur. There is a threat to construction personnel or firefighters from fast moving bush fire events which may impact the project area.

Mitigation measures required to manage and minimise these risks are outlined in Section 5.

4.9.2 Assessment of bush fire risk during operation

Wind farms are not expected to adversely affect fire behaviour, nor create major ignitions risks (AFAC, 2018). The materials used for the turbines are non-combustible and are required to meet accepted quality and safety standards. However risk of fire always exists when electronics and combustible oils and hydraulic fluids existing in the same enclosure.

The potential sources of ignition of bush fires resulting from the operation of the project include:

- Nacelle (including turbine oil) fires.
- Electrical faults.
- Impacts from downwind air turbulence on fire behaviour.
- Impacts of lightning.
- Landscape hazards, such as bush fire/grass fire ignition from fire within the facility, or external ignition of site infrastructure from embers, radiant heat and flame contact.
- Chemical hazards, such as the leakage of oils and lubricants within the turbine/ancillary equipment.
- Electrical hazards, such as wind turbine electrical faults, power surges, hot surfaces, lightning strike or falling blades.

In addition to the above, firefighting limitations within and adjoining the wind farm footprint, should also be considered such as limitations on aerial support. Wind turbines, power transmission infrastructure and in particular unmarked MET masts and guy ropes can cause a potential obstruction for aerial firefighting.

However, with the implementation and maintenance of the mitigation measures outlined in Section 5 the bush fire risk from the project to the surrounding environment (and vice versa) is reduced significantly.

5. BUSH FIRE MITIGATION MEASURES

Bush fire mitigation measures have been developed for construction, operational and decommissioning phases of the project, based on guidance from NSW RFS guidelines, *PBP 2019,* electrical network industry sources and best practice design guidelines prepared by the CFA (2022). Adoption of these measures is expected to reduce, to an acceptable level, both the risk of bush fire ignition by construction and/or operation of the assets and the risk that bush fires in the landscape pose to the assets.

5.1 During construction and decommissioning

Construction and decommissioning activities may pose a potential for on-site ignitions which may result in a fire escaping to the surrounding private land. These mainly arise from hot work, fire risk work, vegetation clearing and management and use of vehicles on site. It is recommended that contractors incorporate the following bush fire mitigation measures to ensure the risk is appropriately managed.

- Two mobile water supplies with a minimum capacity of 500L each (e.g. tanks on utes or standalone tankers) will be made available on-site.
- The use of construction equipment, slashers and mulching machines in areas where rock is known to occur shall be accompanied by the mobile water supply, equipped with a diesel pump and hose.
- The fire management plan should include activities that are exempt from Total Fire Ban days and should consider the Grain Harvesting and Fire Safey guide (refer Appendix 1). If the standard exemptions don't cover the proposed activities a specific exemption can be made using the NSW RFS Total Fire Ban Exemption Form.
- Precaution should be used during all external hot works with shielding and a water supply (i.e., mobile water supply) provided. Contractors must be aware of prohibited activities or exemptions that are notified by the Commissioner of the NSW RFS under the RF Act s99.
- Spark Renewables will continue to consult with Argoon Rural Fire Brigade around specific weather conditions that may require works to temporarily cease during construction.

- Spark Renewables will investigate options for firefighting training for construction and operational personnel, as well as opportunities to incentivise workforce participation in Argoon Rural Fire Brigade.
- Motor vehicles should not be driven across long cured (dry) vegetation (grass & crops) and should be equipped with a nine kilogram water fire extinguisher.
- Operators of diesel-powered trucks should be made aware of the risk of ignition of vegetation posed by the exhaust emission system. These trucks should be equipped with a nine-kilogram water fire extinguisher.
- Any electrical equipment used during construction or decommissioning should be checked for potential faults.
- All chemicals should be managed and stored in accordance with safety data sheet requirements.

Management protocols should be introduced to reduce the risk of ignition from discarded cigarettes.

- Provide first-aid equipment, such as fire extinguishers (and where possible, portable fire hose reels at all construction portables/buildings on site), in the vicinity of all construction activities and in site-based vehicles.
- The CFA and AFAC guidelines both identify the minimum separation distances between turbines required to ensure aircraft can still undertake firefighting activities within a wind farm. In most cases this distance is 300 m. Thus, provided there is a minimum of 300 m separating wind turbines, firefighting aircraft will be able to continue to operate in the area. The project has turbine separation distances of at least 500 m, if not more.

5.2 During operation (permanent mitigation measures)

Section 8.3.5 of PBP outlines the following requirements for wind farms;

- A minimum 10m APZ for the structures and associated buildings/infrastructure (excluding roads, fences and power or other services to the development footprint).
- The APZ must be maintained to the standards of an IPA for the life of the development.

- Essential equipment should be designed and housed in such a way as to minimise the impact of bush fires on the capabilities of the infrastructure during bush fire emergencies. It should also be designed and maintained so that it will not serve as a bush fire risk to surrounding vegetation.
- Preparation of a Fire Management Plan as outlined in the NSW RFS correspondence.

Additional bush fire mitigation measures to prevent ignition and support fire fighting efforts include;

- In addition to the static water supply requirements (refer Section 2.2.4), two mobile water supplies with a minimum capacity of 500L each (e.g. tanks on utes or standalone tankers) will be made available on-site during construction and operation.
- Fire safety measures (passive and active) for WTGs. This includes lightning protection, use of non-combustible hydraulic and lubricant oils, heat barriers to protect combustible elements, heat and/or smoke detection systems and suppression systems to contain the fire.
- Recording of MET masts in the Tall Structures Database maintained by Air Services Australia (Civil Aviation Safety Authority 2018). Warning lights or visible markers (such as orange balls) on all masts are to be installed to minimise risks during aerial firefighting operations.
- Protocols for the rapid shut down of turbines in emergency situations ensuring acknowledgement of who has the authority to direct turbine shut-down procedures.

5.2.1 Asset protection zones

As specified in PBP a minimum 10m APZ is to be established around each WTG and MET mast in accordance with PBP 2019. APZ's have also been recommended around the temporary accommodation facilities, switchyard and substations, construction compounds and the O&M buildings to avoid flame contact and inform future design and locations of infrastructure.

To provide increased bush fire resilience refuge buildings within the accommodation camps can and should be sited outside the special fire protection purpose (SFPP) APZ to ensure radiant heat levels of <10kW/m^2.

The APZ must be effectively managed for the duration of the operational life of the project.

The effective management of vegetation and fuel can reduce both the risk of fire entering the development footprint, and the consequences of fire. The following measures are recommended:

- Vegetation and grass management within the development footprint (especially during the fire danger period).
- Long grass and deep leaf litter must not be present in areas where heavy equipment will be working.
- The entire substation/s must be surfaced to eliminate all vegetation including grasses. Substations must be inspected and cleaned regularly to prevent the build-up of any combustible matter: and
- Landscape screening (if required) should consider the potential increase in fire risk due to the type (species), density, height, location and overall width of the vegetation screening. Where landscaping is proposed to provide a visual screen:
    - Landscaping shall be located >100m from dwellings or the temporary accommodation facilities or:
    - Landscaping within 100m from dwellings or the temporary accommodation facilities shall be in accordance with Clause A1.10 Low threat vegetation – exclusions or shall be in accordance with the requirements of Appendix 4 PBP 2019.

Substation & switchyard APZs

Substation design should aim for a high level of bush fire protection for critical assets and a rapid return to service following a bush fire event.

Network Standard NS187 Passive Fire Mitigation Design of Major Substations is an Ausgrid document that details the minimum levels for passive fire protection systems at Ausgrid's major substations (sub-transmission and zone substations).

Radiant heat is the most likely cause of damage to switchyard equipment and structures. Therefore, it is recommended that switchyard equipment is adequately set back from bush fire prone vegetation. Other causes of fire spread are embers to combustibles in the switchyard. Therefore, consideration shall be given to the protection of combustible switchyard equipment against ember damage.

The radiant heat exposure limits for critical substation structures and high voltage components are provided in Table 5-1. Critical elements are those deemed to be essential for return to service following a bush fire event.

APZ widths may potentially reduce where critical exposed elements nearest the boundary can be locally protected and/or rapidly replaced following a bush fire event.

Table 1-5 – Radiant heat exposure limits for switchyard equipment (Ausgrid 2020)

Item	*Maximum allowable radiant heat flux (RHF) (kW/m2)*	*Comment*
Cable	12.5	Polyvinyl chloride cables begin to distort and may ignite
	20	Ignition of cross-linked polyethylene cables between 85 and 550 seconds
Steel support structure	35	To 60% of yield strength after a maximum duration of 5 minutes. This applies where elastic deflections due to elevated temperatures are not critical
Porcelain bushing/insulators	>30	Damage may occur requiring replacement or in extreme case resulting in catastrophic failure. See Note 1
Polymeric bushing/insulators	>30	Damage may occur requiring replacement or in extreme case resulting in catastrophic failure. See Note 1
Aluminium busbar	20	Based on 250°C after a maximum duration of 5 minutes. Comparable to withstand temperature under fault conditions
Copper busbar	25	Busbars may undergo significant distortion and impose significant stresses on rigid insulators
Transformer tank	>35 (see Note 2)	Refer to above regarding bushings and cables

Item	Maximum allowable radiant heat flux (RHF) (kW/m2)	Comment
Combustibles	12.5	Piloted ignition may occur on timber

Note 1: Detailed information on radiant heat exposure limits is not available. However, in service applications exposed to bush fire indicate a high radiant heat limit and low risk of damage or failure.

Note 2: Transformers always have some more vulnerable components such as bushings and cables.

Ideally, the APZ should be wide enough to reduce radiant heat flux from any bush fire burning in nearby vegetation to less than that which may be tolerated by the most sensitive component (polymeric bushing/insulators; maximum allowable radiant heat flux of 12.5 kW/m^2).

While the actual location of heat-sensitive components will not be confirmed until detailed design, the allowable setbacks (i.e. >22m adjacent to woodland or >20m adjacent to grasssland) will be large enough in most circumstances to allow placement of the substation and switchyard components so that radiant heat exposure is 12.5kW/m^2 or lower (refer Map 1, 3, 5, 8, 11, 13 of 14 in Appendix 2). BAL 12.5 is depicted in blue and corresponds to a radiant heat flux of 12.5kW/m^2 or lower at a distance of 20m - <50m or 22m -<100m from the outer edge of the development footprint.

5.2.2 Building construction

Essential equipment should be designed and housed in such a way as to minimise the impact of bush fires on the capabilities of the infrastructure during bush fire emergencies. It should also be designed and maintained so that it will not serve as a bush fire risk to surrounding bush.

The temporary worker accommodation facilities (including locations for a suitable safe refuge) are shown in Appendix 2 (Map 1, 3 & 14). While the actual location of the temporary accommodation buildings (and other structures such as site offices, O&M building and material storage) will not be confirmed until the detailed design, the APZ will be large enough in most circumstances to allow placement of these buildings so

that radiant heat exposure is <19kW/m^2 with suitable safe refuge buildings being located within an area exposed to a radiant heat exposure of <10kW/m^2. It is recommended buildings used for accommodation within 100m of bush fire prone vegetation are constructed to comply with *AS3959 – Construction of buildings in bushfire-prone areas*.

5.2.3 Access for firefighting operations

Vehicles will access the project area from the:

- north – travelling south along Kidman Way
- east – travelling west along the Sturt Highway before turning onto Kidman Way
- south –travelling north along the Newell Highway before turning onto Kidman Way.

Public road upgrade works are required to facilitate heavy vehicle movements from Kidman Way onto McLennons Bore Road, Wilson Road, Fernbank Road and Goolgumbla Road (Figure 2-1 & Figure 2-2) and will facilitate access to the development corridor. Existing bridges across the Coleambally Outfall Drain and other unnamed watercourses will be utilised for site access. Upgrades to these bridges will be required.

An internal network of access tracks will also be established to enable responding emergency services to access all areas of the project, including fire service infrastructure (water tanks), buildings and related infrastructure.

Subject to detailed design, internal access tracks will:

- provide access for local emergency service vehicles to each of the WTG sites and around the perimeter of the switchyard and substations, construction compounds and O&M building to undertake property protection activities.
- comply with the requirements for property access as outlined in Table 7.4a of *Planning for Bush Fire Protection 2019* for roads associated with the temporary worker accommodation facilities.

The internal tracks will provide access during construction, for maintenance during operations, and for emergency response.

Access to the temporary accommodation facilities is to comply with the acceptable solutions outlined in Table 5-2 below.

Table 1-6 – Performance criteria for access (PBP 2019)

Performance criteria	*Acceptable solution*	*Achievable for the project*	*Comment*
The capacity of access roads is adequate for firefighting vehicles.	The capacity of perimeter and non-perimeter road surfaces and any bridges/causeways is sufficient to carry fully loaded firefighting vehicles (up to 23 tonnes); bridges/ causeways are to clearly indicate load rating.	☑	Can comply
Firefighting vehicles can access the development footprint and exit the property safely.	Minimum 4m carriageway width;	☑	Can comply
	In forest, woodland and heath situations, rural property access roads have passing bays every 200m that are 20m long by 2m wide, making a minimum trafficable width of 6m at the passing bay;	☑	Roads will be a minimum of 6m allowing passing as required
	A minimum vertical clearance of 4m to any overhanging obstructions, including tree branches;	☑	Can comply
	Provide a suitable turning area in accordance with Appendix 3;	☑	Can comply
	Curves have a minimum inner radius of 6m and are minimal in number to allow for rapid access and egress;	☑	Can comply
	The minimum distance between inner and outer curves is 6m;	☑	Can comply
	The crossfall is not more than 10 degrees; and	☑	Complies

Performance criteria	*Acceptable solution*	*Achievable for the project*	*Comment*
	Maximum grades for sealed roads do not exceed 15 degrees and not more than 10 degrees for unsealed roads.	☑	Complies
Note: Some short constrictions in the access may be accepted where they are not less than 3.5m wide, extend for no more than 30m and where the obstruction cannot be reasonably avoided or removed.			

5.2.4 Water supply

In the event of a fire (structure, grass fire or bush fire), sufficient water must be available and safely accessible to emergency services to ensure fire suppression activities are safe and effective. The water supply must be provided to cover buildings associated with the accommodation facilities, construction compounds, O&M building, substations and grid connections.

There are existing licensed water supply bores and farm dams on-site. Non-potable water will be sourced primarily from existing extraction bores as well as opportunistic use of water from rainwater tanks collecting roof runoff, reuse of water captured by construction sediment basins and extraction from dams.

Potable water will be delivered to the accommodation facility by truck, and stored in tanks that are connected to the units and communal infrastructure. Rainwater tank/s will be installed to capture water that can be used for non-potable functions such as toilet flushing, laundry, vehicle washing or landscape irrigation.

The following outlines the performance criteria for water supply. This criterion does not necessarily relate to wind farms in all circumstances, and therefore additional comments in relation to CFA (2022) guidelines have been incorporated where applicable.

It is recommended that water supply for firefighting purposes is located at the primary vehicle access points to the project area as well as at the accommodation facilities, construction compounds, O&M building, substations and grid connections and elsewhere in consultation with the NSW RFS District Office for the Mid Murray Zone and Fire and Rescue NSW at the detailed design stage.

In addition to static water supply requirements, two mobile water supplies with a minimum capacity of 500 l each (e.g. tanks on utes or standalone tankers) will be available on-site during construction and operations.

Table 1-7 – Performance criteria for water supplies (PBP 2019)

Performance criteria	*Acceptable solutions*	*Achievable for the project*	*Comment*
An adequate water supply is provided for firefighting purposes.	Reticulated water is to be provided, where available	..	20,000L SWS to be provided at each switchyard/substation, construction compound, O&M building 100,000L to be provided at each accommodation facility
	A SWS is to be provided where no reticulated water is available	☑	
The integrity of the water supply is maintained.	All above-ground water service pipes are metal, including and up to any taps	☑	Can comply
A SWS is provided for firefighting purposes in areas where reticulated water is not available.	Where no reticulated water supply is available, water for firefighting purposes is provided in accordance with Table 5.3d of PBP 2019. These requirements are designed for residential development	☑	Water requirements are to be determined in consultation with the district RFS & Fire Rescue NSW
	A connection for firefighting purposes is located within the IPA or non-hazard side and away from the structure; 65mm Storz outlet with a ball valve is fitted to the outlet	☑	Can comply
	Ball valve and pipes are adequate for water flow and are metal	☑	Can comply
	Supply pipes from tank to ball valve have the same bore size to ensure flow volume	☑	Can comply

Performance criteria	*Acceptable solutions*	*Achievable for the project*	*Comment*
	Underground tanks have an access hole of 200mm to allow tankers to refill direct from the tank	☑	Can comply
	A hardened ground surface for truck access is supplied within 4m	☑	Can comply
	Above-ground tanks are manufactured from concrete or metal	☑	Can comply
	Raised tanks have their stands constructed from non-combustible material or bush fire-resisting timber (see Appendix F of AS 3959(2018)	☑	Can comply
	Unobstructed access can be provided at all times	☑	Can comply
	Underground tanks are clearly marked	☑	Can comply
	Tanks on the hazard side of a building are provided with adequate shielding for the protection of firefighters	☑	Can comply
	All exposed water pipes external to the building are metal, including any fittings	☑	Can comply
	Where pumps are provided, they are a minimum 5hp or 3kW petrol or diesel-powered pump, and are shielded against bush fire attack; any hose and reel for firefighting connected to the pump shall be 19mm internal diameter	☑	Pumps are not mandatory. If provided they are to comply with the acceptable solutions.

Performance criteria	Acceptable solutions	Achievable for the project	Comment
	Fire hose reels are constructed in accordance with AS/NZS 1221:1997, and installed in accordance with the relevant clauses of AS 2441:2005	☑	Fire hose reels are not mandatory. If provided they are to comply with the acceptable solutions.

5.2.5 Other mitigation measures

In addition to the measures outlined above, other considerations apply to the operation of renewable energy assets to effectively manage bush fire risk. This is generally outside of the scope of this document but can be summarised as:

- The requirements of the dangerous goods legislative framework, and all relevant Australian Standards.
- Procedure/controls for correct storage of chemicals and combustible materials on-site.
- Engagement with local fire authorities and other emergency services during detailed layout design and site commissioning process to ensure sufficient vehicle movement and SWS requirements (location and capacity).
- Appropriate monitoring for project infrastructure, to ensure that any shorts, faults or equipment failures with the potential to ignite or propagate fire are rapidly identified and controlled, and any fire is notified to 000 immediately.

5.2.6 Potential environmental impact of bush fire mitigation measures

The development footprint is the maximum extent of ground disturbing works associated with the construction and operation of the project and direct impacts within this area have been assessed as part of the EIS (EMM 2024).

All bush fire mitigation measures have been confined to the development footprint.

5.2.7 Fire management plan

A Fire Management Plan must be developed for the project, in consultation with the Argoon Rural Fire Brigade, NSW RFS District Office for the Mid Murray Zone and Fire Rescue NSW, before construction starts. The Fire Management Plan will inform operational and emergency management practices at the facility and effectively describes all fire hazards and provides clear actions and accountabilities for their management.

The minimum requirements of a Fire Management Plan are:

- Ongoing bush fire fuel management within the development footprint.
- Site infrastructure plan.
- Site access and internal road plan.
- APZs and their continued maintenance.
- Location of hazards (physical, chemical etc.) that may impact firefighting operations:
- Activities that may be exempt on periods of Total Fire Ban days: and
- Any such additional matters as may be required by the NSW RFS District Office for the Mid Murray Zone (phone: 03 5898 4100).

Operational considerations should also include:

- Recording of MET masts in the Tall Structures Database maintained by Air Services Australia (Civil Aviation Safety Authority 2018). Warning lights or visible markers (such as orange balls) on all masts are to be installed to minimise risks during aerial firefighting operations
- Protocols for the rapid shut down of turbines in emergency situations ensuring acknowledgement of who has the authority to direct turbine shut-down procedures.

- Spark Renewables will continue to engage with local aerial firefighting operators to develop procedures for their safe operation within the project area.

5.2.8 Bush fire emergency management and evacuation plan

Effective emergency planning will ensure that the facility is prepared in the event of an emergency, providing for the safety of site personnel, emergency responders and the community. A Bush fire emergency management and evacuation plan must be developed for the project.

Table 1-8 – Performance criteria for emergency management plans (PBP 2019)

Performance criteria	*Acceptable Solutions*
A bush fire emergency and evacuation management plan is prepared	A bush fire emergency management and evacuation plan is prepared consistent with the NSW RFS document: A Guide to Developing a Bush Fire Emergency Management and Evacuation Plan, and AS3745:2010.
	The Bush Fire Emergency Management and Evacuation Plan should include planning for the early relocation of occupants.
Note: A copy of the Bush Fire Emergency Evacuation Plan should be provided to the Local Emergency Management Committee for its information prior to the commencement of construction.	
Appropriate and adequate management arrangements are established for consultation and implementation of the Bush Fire Emergency Management and Evacuation Plan	An Emergency Planning Committee is established to consult with staff in developing and implementing an Emergency Procedures Manual.
	Detailed plans of all emergency assembly areas including 'on-site' and 'off-site' arrangements as stated in AS 3745 are clearly displayed, and an annual (as a minimum) trial emergency evacuation is conducted.

6. CONCLUSION & RECOMMENDATIONS

6.1 Conclusion

This bush fire assessment report has been undertaken for Dinawan Wind Farm which includes the installation, operation, maintenance and decommissioning of up to approximately 200 WTGs and associated infrastructure located approximately halfway between the towns of Coleambally and Jerilderie within the Murrumbidgee and Edward River LGA.

The project is categorised by the NSW RFS as 'other development' and complies with the following aims and objectives of PBP 2019.

Table 1-9 – Aims and objective of PBP 2019

Aims and objectives	Statement of compliance
Afford buildings and their occupants protection from the exposure to bush fire	A minimum 10m APZ will be established around each WTG and MET mast in accordance with PBP 2019. APZ's have also been recommended around the temporary accommodation facilities, switchyard and substations, construction compounds and the O&M buildings to avoid flame contact and inform future design and locations of infrastructure. High risk and vulnerable infrastructure are recommended to be located in BAL 12.5 areas or less. The temporary workers accommodation facilities within 100m of bush fire prone vegetation are to be constructed to BAL 19 or BAL 12.5 depending on final location. Suitable safe refuge buildings will be located within an area exposed to a radiant heat exposure of <10kW/m^2.
Provide for a defendable space to be located around buildings	
Provide appropriate separation between a hazard and buildings which in combination with other measures, prevent the likely fire spread to buildings	
Ensure that appropriate operational access and egress for emergency personnel and occupants is available	An internal network of access tracks will be established to enable responding emergency services to access all areas of the project, including fire service infrastructure (water tanks), buildings and related infrastructure. Subject to

Aims and objectives	Statement of compliance
	detailed design, internal access tracks will include access for local emergency service vehicles to each of the WTG sites, switchyard, substation, construction compounds and O&M building to support property protection activities.
Provide for ongoing management and maintenance of bush fire mitigation measures.	All bush fire mitigation measures are confined to the development footprint. A Fire Management Plan is to be prepared to ensure ongoing management and maintenance.
Ensure that utility services are adequate to meet the needs of firefighters	All utility services will comply with PBP 2019. It is recommended that water supply for firefighting purposes is located at the primary vehicle access point to the facility, at the accommodation facilities, O&M building, construction compound, substations and elsewhere in consultation with the Argoon Rural Fire Brigade NSW RFS District Office for the Mid Murray Zone and Fire and Rescue NSW at the detailed design stage. In addition to static water supply requirements, two mobile water supplies with a minimum capacity of 500 l each (e.g. tanks on utes or standalone tankers) will be available on-site during construction and operations.

The following recommendations are provided to ensure that the project has adequate clearances to combustible vegetation, firefighting access and water supplies in accordance with the requirements of *PBP 2019*.

Recommended conditions

Recommendation 1: The following asset protection zones must be maintained as an inner protection area in accordance with Appendix 4.1.1 of *Planning for Bush Fire Protection 2019*:

- A minimum 10 metre APZ around WTG sites
- Temporary workers accommodation (equivalent to BAL 19)
    - A minimum 14m to grassland hazards
    - A minimum 16m to woodland hazards

- Safe refuge buildings (equivalent to <10kW/m^2)
    - A minimum 36m to grassland hazards
    - A minimum 42m to woodland hazards

Recommendation 2: Landscape screening (if required) should consider the potential increase in fire risk due to the type (species), density, height, location and overall width of the vegetation screening. Where landscaping is proposed to provide a visual screen:

- Landscaping shall be located >100m from the accommodation facilities or:
- Landscaping within 100m from the accommodation facilities shall be in accordance with Clause A1.10 Low threat vegetation – exclusions or shall be in accordance with the requirements of Appendix 4 PBP 2019.

Recommendation 3: Construction of accommodation buildings within 100m of bush fire prone vegetation must comply with Australian Standard AS3959-2018 *Construction of buildings in bushfire-prone areas* or the relevant requirements of the *NASH Standard - Steel Framed Construction in Bushfire Areas* (incorporating amendment A - 2015). New construction must also comply with the construction requirements in Section 7.5 of *Planning for Bush Fire Protection 2019*.

Recommendation 4: Subject to detailed design, internal access tracks will:

- provide access for local emergency service vehicles to each of the WTG sites, switchyard, substation, construction compounds and O&M building to support property protection activities,
- comply with the requirements for property access as outlined in Table 7.4a of *Planning for Bush Fire Protection 2019* for roads associated with the temporary worker accommodation facilities.

Recommendation 5: Water supply for firefighting purposes is located at each of the primary vehicle access points to the project area as well as at the accommodation facilities, construction compounds, O&M building, substations and grid connections and elsewhere in consultation with Argoon Rural Fire Brigade, NSW RFS District Office for the Mid Murray Zone and Fire and Rescue NSW at the detailed design stage.

The provision of water must comply with the following in accordance with Table 7.4a of *Planning for Bush Fire Protection 2019*.

- A 20,000L SWS shall be provided at each switchyard/substation, construction compound and O&M building;

- A 100,000L SWS shall be provided at each accommodation facility;
- a SWS must be provided on site located within the IPA or non-hazard side and away from structures;
- unobstructed access is to be provided within 4m of the SWS at all times;
- a 65mm Storz connection with a ball valve is fitted to the outlet of the SWS;
- ball valve and pipes are adequate for water flow and are metal;
- supply pipes from tank to ball valve have the same bore size to ensure flow volume;
- underground tanks have an access hole of 200mm to allow tankers to refill direct from the tank and a hardened ground surface for truck access is supplied within 4m;
- underground tanks are clearly marked;
- above-ground tanks are manufactured from concrete or metal;
- raised tanks have their stands constructed from non-combustible material or bush fire-resisting timber (see Appendix F of AS 3959);
- all exposed water pipes external to the building are metal, including any fittings;
- where pumps are provided, they are a minimum 5hp or 3kW petrol or diesel-powered pump, and are shielded against bush fire attack;
- any hose and reel for firefighting connected to the pump must be 19mm internal diameter; and
- any fire hose reels are constructed in accordance with AS/NZS 1221:1997, and installed in accordance with the relevant clauses of AS 2441:2005.

In addition to static water supply requirements, two mobile water supplies with a minimum capacity of 500 l each (e.g. tanks on utes or standalone tankers) will be available on-site during construction and operations.

Recommendation 6: The provision of gas must comply with Table 7.4a of Planning for Bush Fire Protection 2019.

- reticulated or bottled gas is installed and maintained in accordance with AS/NZS 1596:2014 and the requirements of relevant authorities, and metal piping is used,
- all fixed gas cylinders are kept clear of all flammable materials to a distance of 10m and shielded on the hazard side,
- connections to and from gas cylinders are metal,
- polymer-sheathed flexible gas supply lines are not used, and

- above-ground gas service pipes are metal, including and up to any outlets.

Recommendation 7: A Fire Management Plan must be prepared that addresses the following (as a minimum):

- Ongoing bush fire fuel management within the development footprint;
- Site infrastructure plan;
- Site access and internal road plan;
- APZs and their continued maintenance;
- Location of hazards (physical, chemical etc.) that may impact firefighting operations;
- Activities that may be exempt on periods of Total Fire Ban days: and
- Any such additional matters as may be required by the NSW RFS District Office for the Mid Murray Zone. (Phone 03 5898 4100).

Operational considerations should also include:

- Recording of MET masts in the Tall Structures Database maintained by Air Services Australia (Civil Aviation Safety Authority 2018). Warning lights or visible markers (such as orange balls) on all masts are to be installed to minimise risks during aerial firefighting operations
- Protocols for the rapid shut down of turbines in emergency situations ensuring acknowledgement of who has the authority to direct turbine shut-down procedures.
- Spark Renewables will continue to engage with local aerial firefighting operators to develop procedures for their safe operation within the project area

Recommendation 8: Bush Fire Emergency Management and Evacuation Plan is to be in accordance with Table 6.8d of Planning for Bush Fire Protection 2019 and be consistent with the following:

- The NSW RFS document: A Guide to Developing a Bush Fire Emergency Management and Evacuation Plan;

A copy of the Bush Fire Emergency Management and Evacuation Plan should be provided to the Local Emergency Management Committee for its information prior to the commencement of construction.

1. REFERENCES

Cheney N.P., Gould J.S. Catchpole W.R. (2008) – *Grassfires: Fuel weather and fire behaviour*. CSIRO Publishing 2nd Edition, Collingwood, Vic.

Councils of Standards Australia AS3959 (2018) – *Australian Standard Construction of buildings in bush fire-prone areas.*

Country Fire Authority (CFA) (2022) - *Design Guidelines and Model Requirements Renewable Energy Facilities,*

Mid Murray Bush Fire Risk Management Committee (2009) – *Bush Fire Risk Management Plan*

Keith, David (2004) – *Ocean Shores to Desert Dunes – The Native Vegetation of New South Wales and the ACT*. The Department of Environment and Climate Change.

Rural Fire Service (2019) - *Planning for bush fire protection – a guide for councils, planners, fire authorities and developers*. NSW Rural Fire Service.

Appendix 1 – Grain Harvesting and Fire Safety

GRAIN HARVESTING AND FIRE SAFETY

September 2022

Is the wind speed too high for me to harvest right now?

1. Measure the current temperature, humidity and wind speed on your property. Average out the wind speed over 10 minutes and round down humidity readings.
2. Using your temperature and humidity readings, find the maximum recommended wind speed in the table. For example, a temperature of 40° and 15% humidity equals 21 km per hour.
3. If the wind speed you've recorded is equal to or greater than the wind speed in the table, it is recommended you do not harvest. Reassess weather conditions later.

Produced in partnership with the NSW Rural Fire Service, NSW Farmers and Australian Custom Harvesters

Current Temperature	Current Relative Humidity									
FBI = 40	5%	10%	15%	20%	25%	30%	40%	50%	60%	65%
15°C	33	36	39	43	47	51	60	60	60	60
20°C	29	32	35	38	41	45	53	60	60	60
25°C	26	28	31	33	36	40	47	56	60	60
30°C	23	25	27	30	32	35	41	49	58	60
35°C	21	22	24	26	28	31	36	43	51	56
40°C	18	20	21	23	25	27	32	38	45	49
45°C	16	18	19	21	22	24	28	34	40	43

Average wind speed (kph) that equates to 40 Fire Behaviour Index (FBI)

Is the wind speed you recorded equal to or greater than the wind speed shown above?
If yes, it is recommended you do not harvest. Check weather conditions later.

NSW RURAL FIRE SERVICE

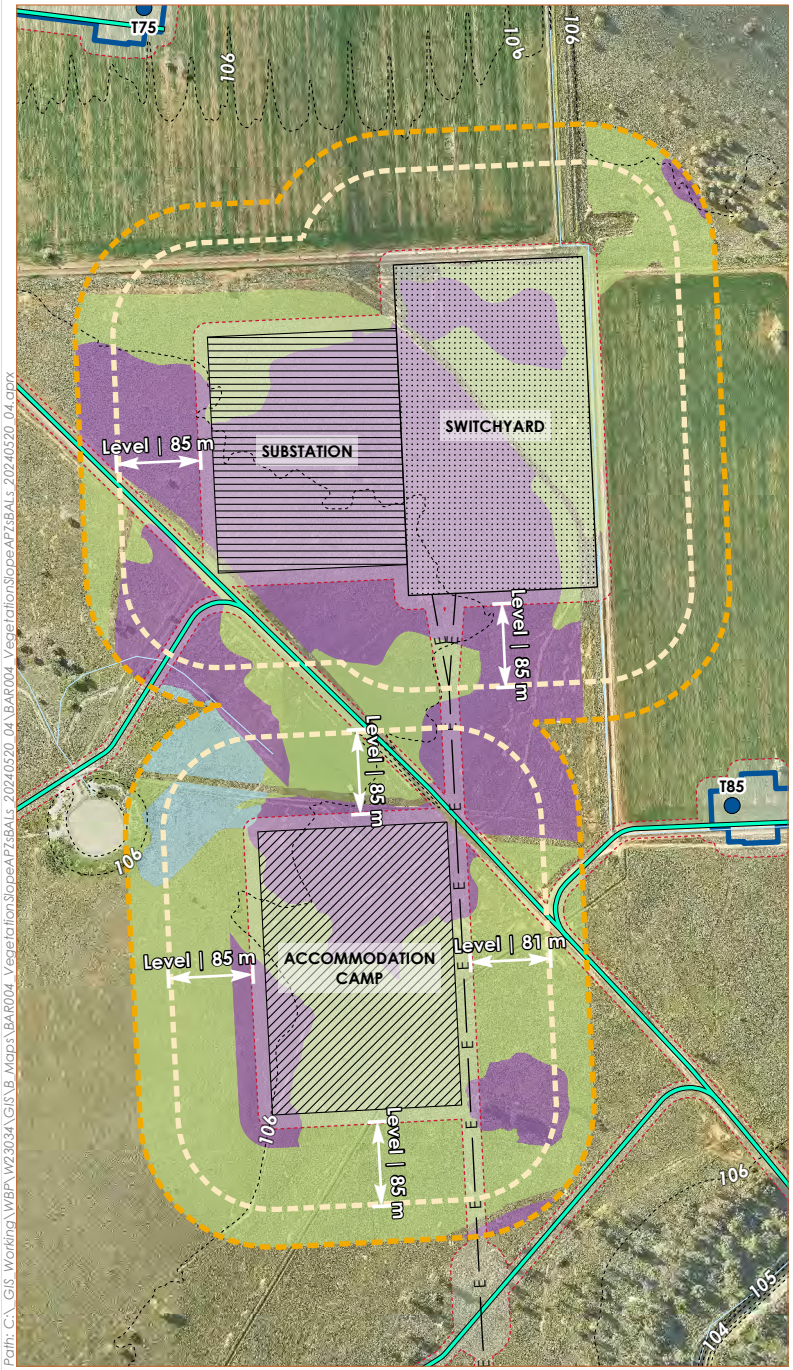
FIRE DANGER RATINGS – www.rfs.nsw.gov.au/fdr
LATEST WEATHER – www.bom.gov.au

BUSH FIRE INFORMATION LINE – 1800 679 737
REPORT ALL FIRES TO TRIPLE ZERO – 000

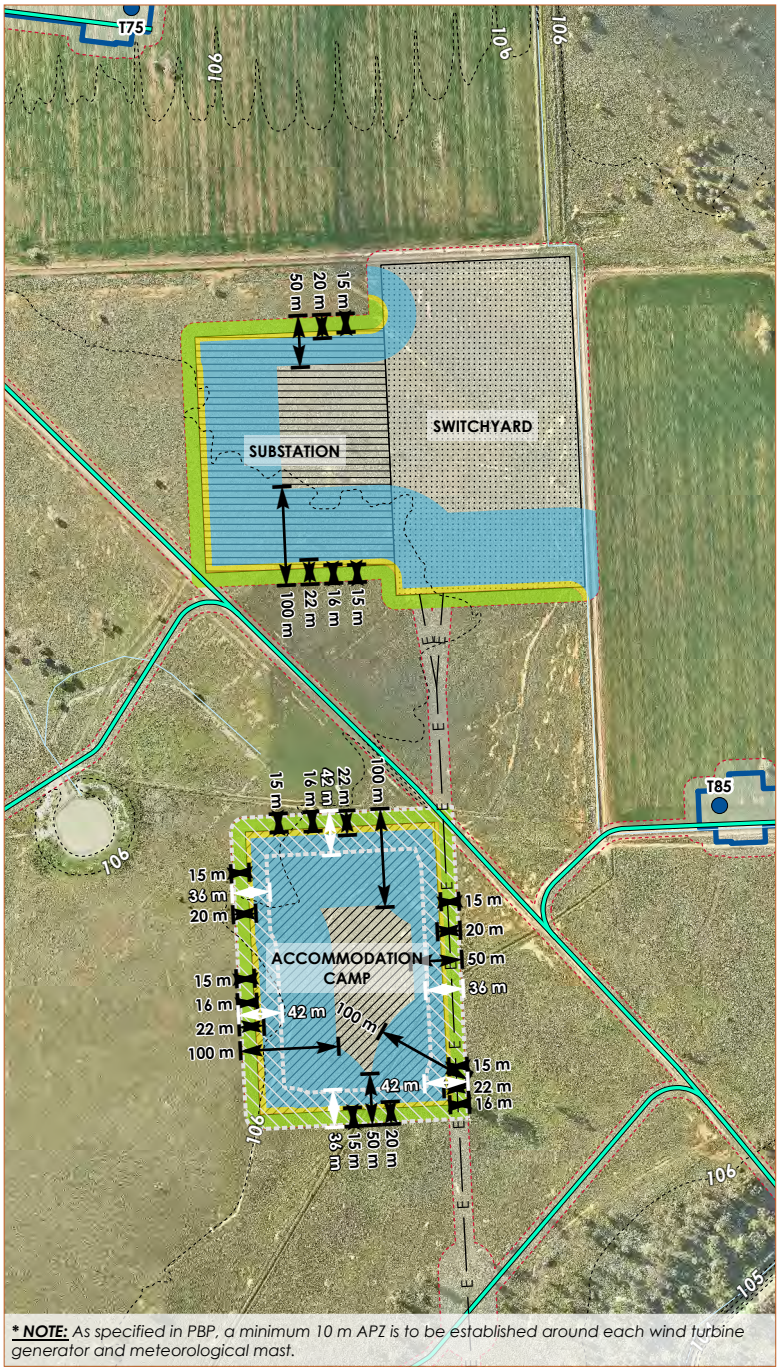
NSW

Appendix 2 – Bush fire assessment and mitigation measures

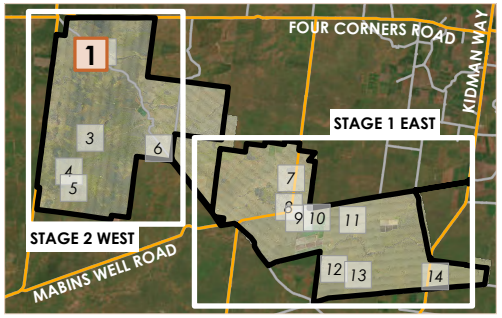
Vegetation and slope assessment



Asset Protection Zone (APZ) & Bush fire Attack Level (BAL)



*** NOTE:** *As specified in PBP, a minimum 10 m APZ is to be established around each wind turbine generator and meteorological mast.*



LEGEND

- Project area (refer to inset)
- Minor road (refer to inset)
- Local road (refer to inset)

Project elements

- Wind turbine generator
- Electricity transmission line
- Access track and electrical cabling
- Accommodation camp
- Substation
- Switchyard
- Wind turbine generator (WTG) footprint
- Development footprint

Existing environment

- Topographic contour (1 m)
- Watercourse/drainage line
- Slope buffer (100 m)
- Vegetation buffer (140 m)

Vegetation formation:

- Freshwater wetland
- Grassland
- Semi-arid Woodland

Asset protection zone (APZ) & Bush fire Attack Level (BAL)

- APZ*
- APZ for safe refuge building (<10 kWm2)
- BAL 29
- BAL 19
- BAL 12.5

Bush fire assessment and mitigation measures – Map 1 of 14

Dinawan Wind Farm

20/05/2024 (v4) 1:8,000 @A4 GDA2020 MGA Zone 55

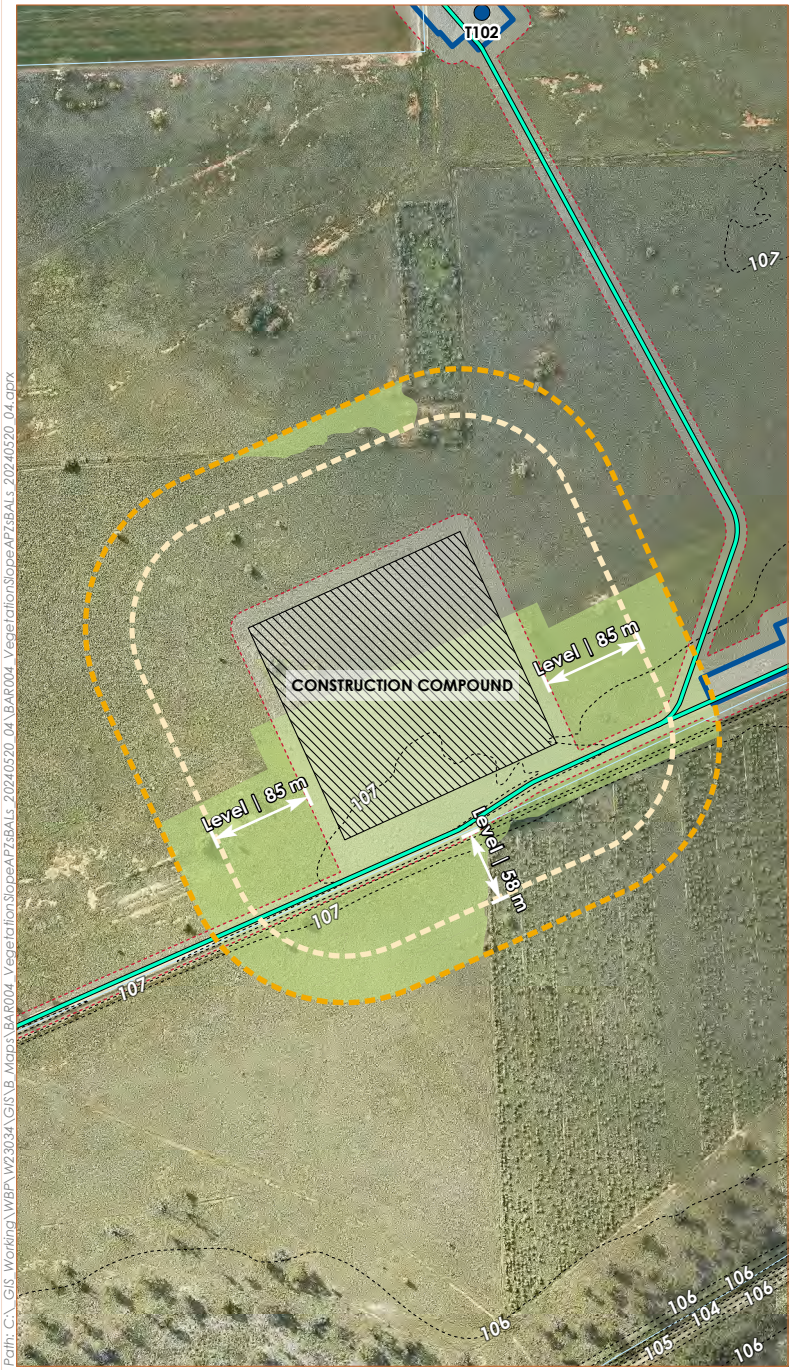
0 100 200
metres

WARATAH BUSHFIRE
PLANNING | GIS | ASSESSMENT

Data source: WBP (2024); EMM (2024); DCSSS (2024); DPE (2023); ESRI (2024)

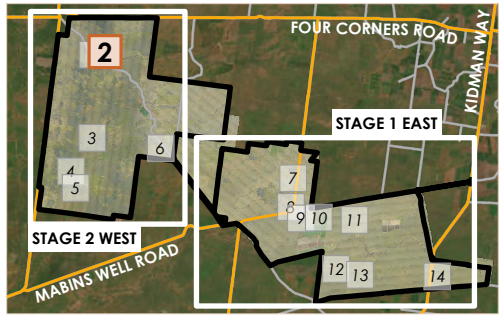
Path: C:\...\GIS Working\WBP\W23034\GIS\B_Maps\BAR004_VegetationSlopeAPZsBALs_20240520_04\BAR004_VegetationSlopeAPZsBALs_20240520_04.aprx

Vegetation and slope assessment



Asset Protection Zone (APZ) & Bush fire Attack Level (BAL)

NOTE: *As specified in PBP, a minimum 10 m APZ is to be established around each wind turbine generator and meteorological mast.*



LEGEND

- Project area (refer to inset)
- Minor road (refer to inset)
- Local road (refer to inset)

Project elements

- Wind turbine generator
- Access track and electrical cabling
- Construction compound
- Wind turbine generator (WTG) footprint
- Development footprint

Existing environment

- Topographic contour (1 m)
- Watercourse/drainage line
- Slope buffer (100 m)
- Vegetation buffer (140 m)

Vegetation formation:

- Grassland

Asset protection zone (APZ) & Bush fire Attack Level (BAL)

- APZ*
- BAL 19
- BAL 12.5

Bush fire assessment and mitigation measures – Map 2 of 14

Dinawan Wind Farm

20/05/2024 (v4) 1:6,500 @A4 GDA2020 MGA Zone 55

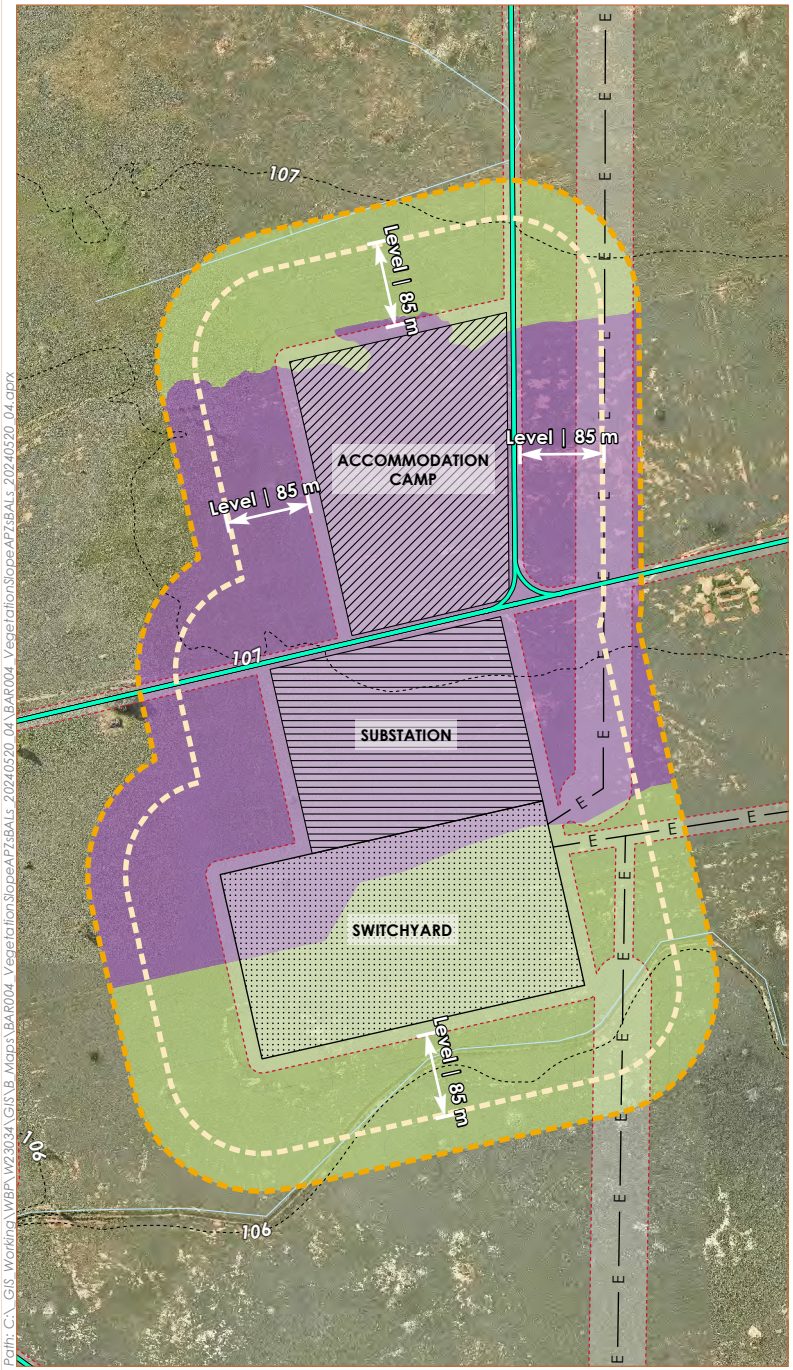
0 100 200
metres

WARATAH BUSHFIRE
PLANNING | GIS | ASSESSMENT

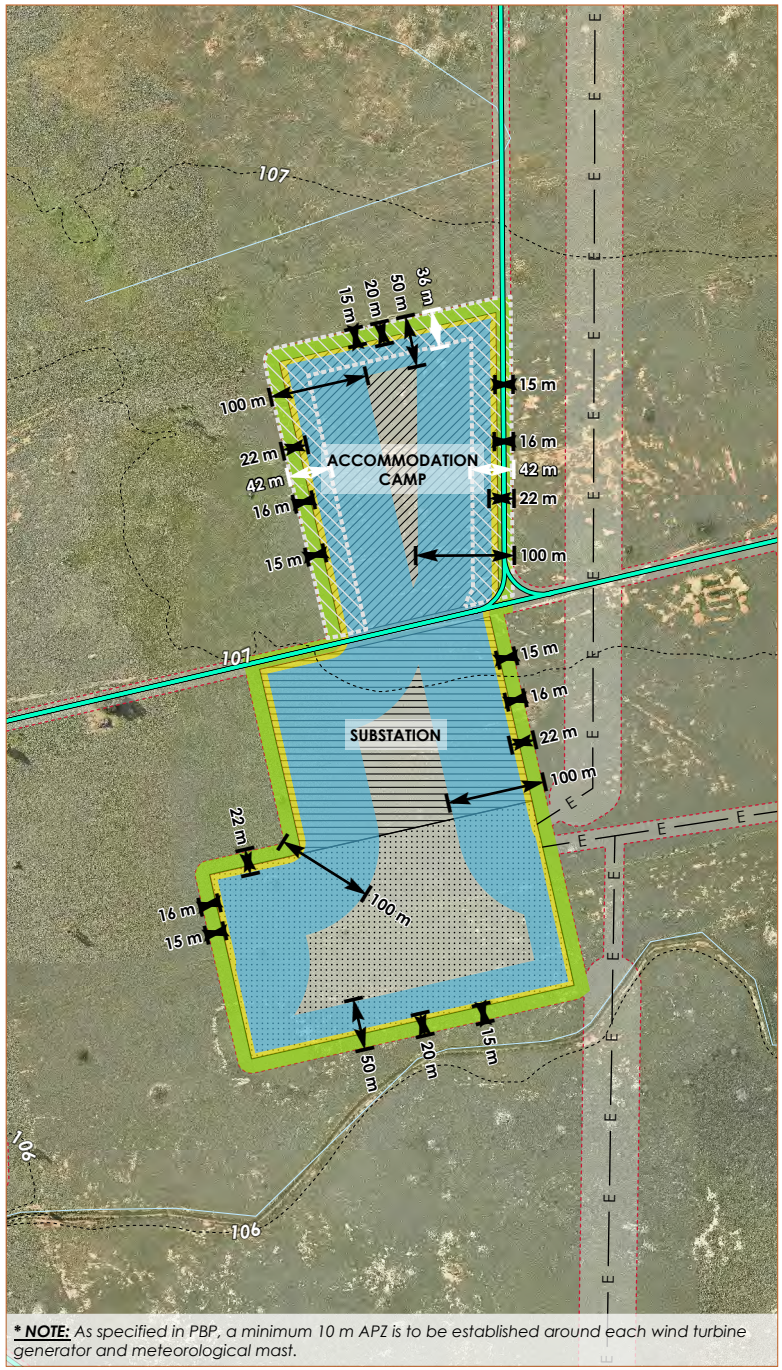
Data source: WBP (2024); EMM (2024); DCSSS (2024); DPE (2023); ESRI (2024)

Path: C:_GIS Working\WBP_W23034\GIS\B_Maps\BAR004_VegetationSlopeAPZsBALs_20240520_04\BAR004_VegetationSlopeAPZsBALs_20240520_04.aprx

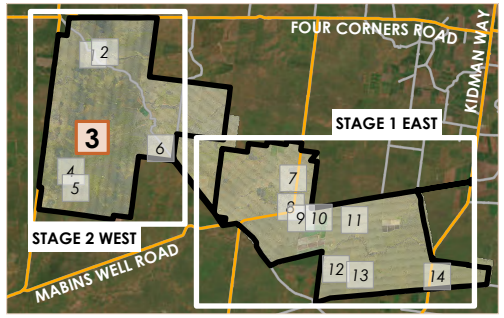
Vegetation and slope assessment



Asset Protection Zone (APZ) & Bush fire Attack Level (BAL)



NOTE: *As specified in PBP, a minimum 10 m APZ is to be established around each wind turbine generator and meteorological mast.*



LEGEND

- Project area (refer to inset)
- Minor road (refer to inset)
- Local road (refer to inset)

Project elements

- Electricity transmission line
- Access track and electrical cabling
- Accommodation camp
- Substation
- Switchyard
- Development footprint

Existing environment

- Topographic contour (1 m)
- Watercourse/drainage line
- Slope buffer (100 m)
- Vegetation buffer (140 m)

Vegetation formation:

- Grassland
- Semi-arid Woodland

Asset protection zone (APZ) & Bush fire Attack Level (BAL)

- APZ*
- APZ for safe refuge building (<10 kWm2)
- BAL 29
- BAL 19
- BAL 12.5

Bush fire assessment and mitigation measures – Map 3 of 14

Dinawan Wind Farm

20/05/2024 (v4) 1:8,000 @A4 GDA2020 MGA Zone 55

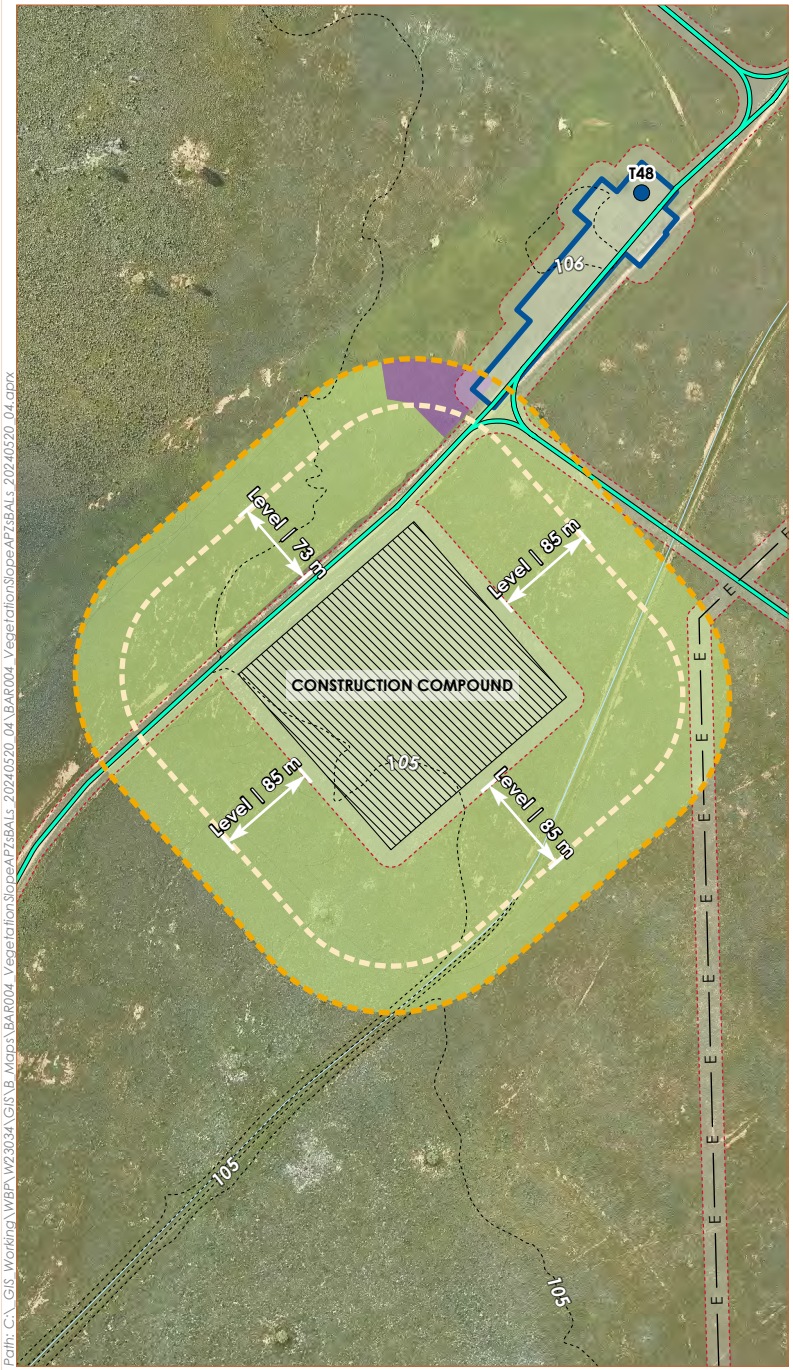
0 100 200
metres

WARATAH BUSHFIRE
PLANNING | GIS | ASSESSMENT

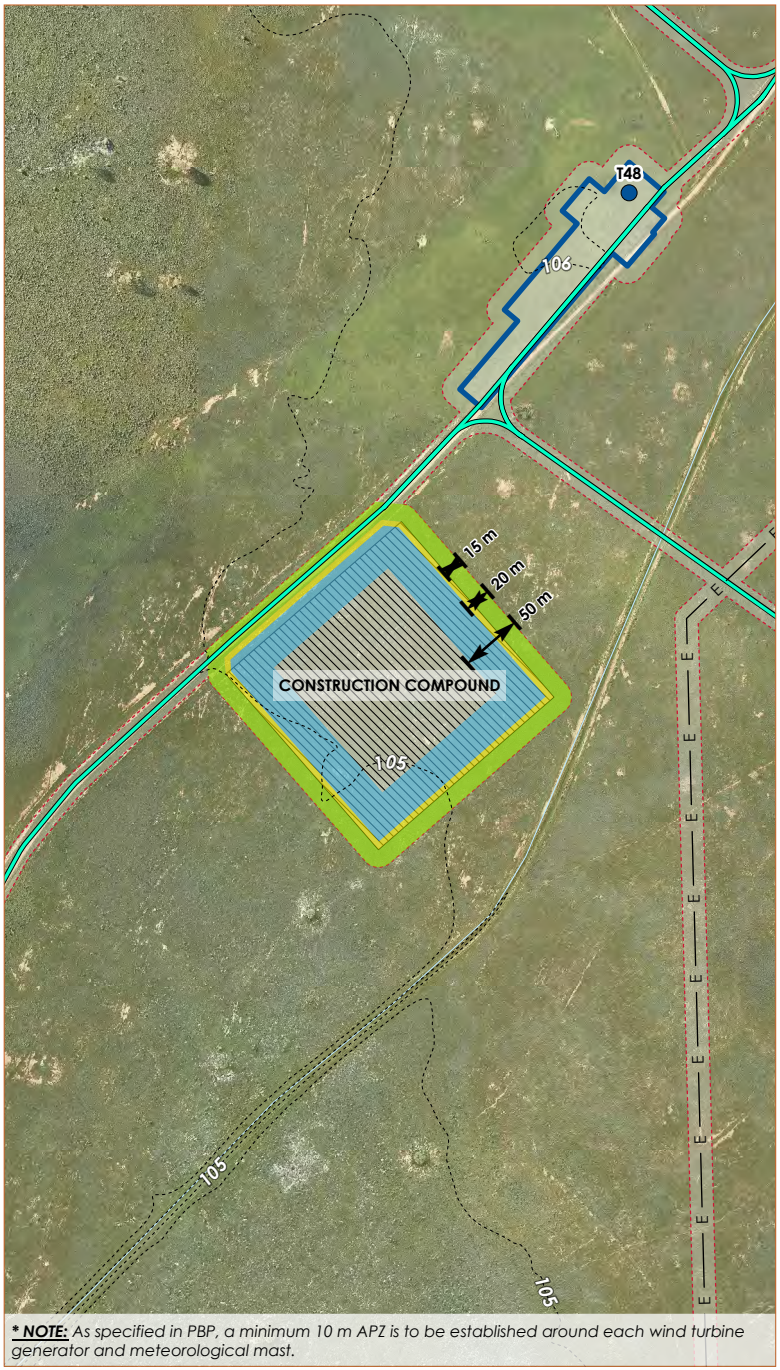
Data source: WBP (2024); EMM (2024); DCSSS (2024); DPE (2023); ESRI (2024)

Path: C:_GIS Working\WBP_W23034\GIS\B_Maps\BAR004_VegetationSlopeAPZsBALs_20240520_04\BAR004_VegetationSlopeAPZsBALs_20240520_04.aprx

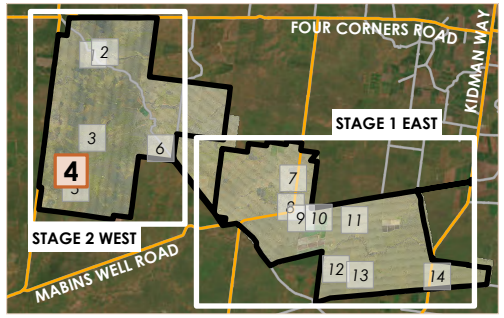
Vegetation and slope assessment



Asset Protection Zone (APZ) & Bush fire Attack Level (BAL)



NOTE: *As specified in PBP, a minimum 10 m APZ is to be established around each wind turbine generator and meteorological mast.*



LEGEND

- Project area (refer to inset)
- Minor road (refer to inset)
- Local road (refer to inset)

Project elements

- Wind turbine generator
- Electricity transmission line
- Access track and electrical cabling
- Construction compound
- Wind turbine generator (WTG) footprint
- Development footprint

Existing environment

- Topographic contour (1 m)
- Watercourse/drainage line
- Slope buffer (100 m)
- Vegetation buffer (140 m)

Vegetation formation:

- Grassland
- Semi-arid Woodland

Asset protection zone (APZ) & Bush fire Attack Level (BAL)

- APZ*
- BAL 19
- BAL 12.5

Bush fire assessment and mitigation measures – Map 4 of 14

Dinawan Wind Farm

20/05/2024 (v4) 1:6,500 @A4 GDA2020 MGA Zone 55

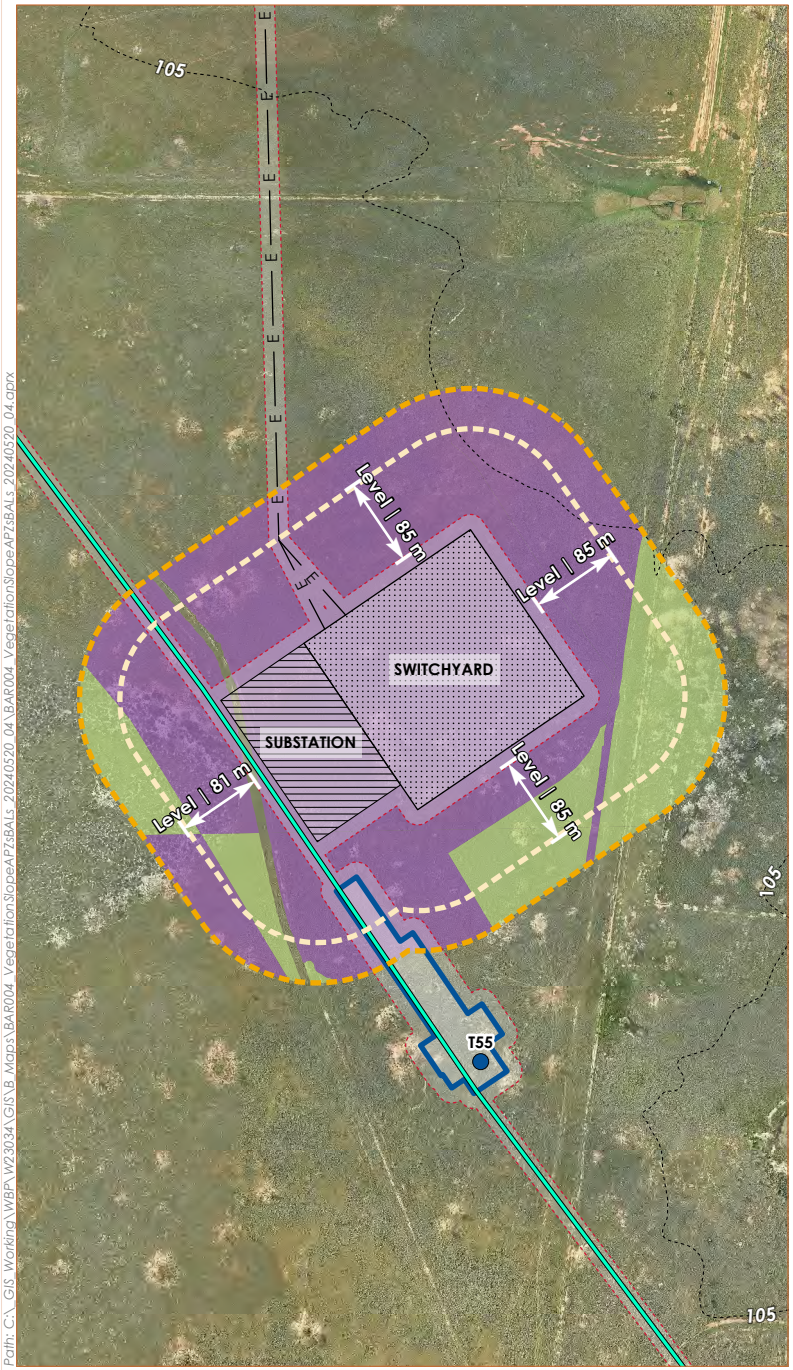
0 100 200
metres

WARATAH BUSHFIRE
PLANNING | GIS | ASSESSMENT

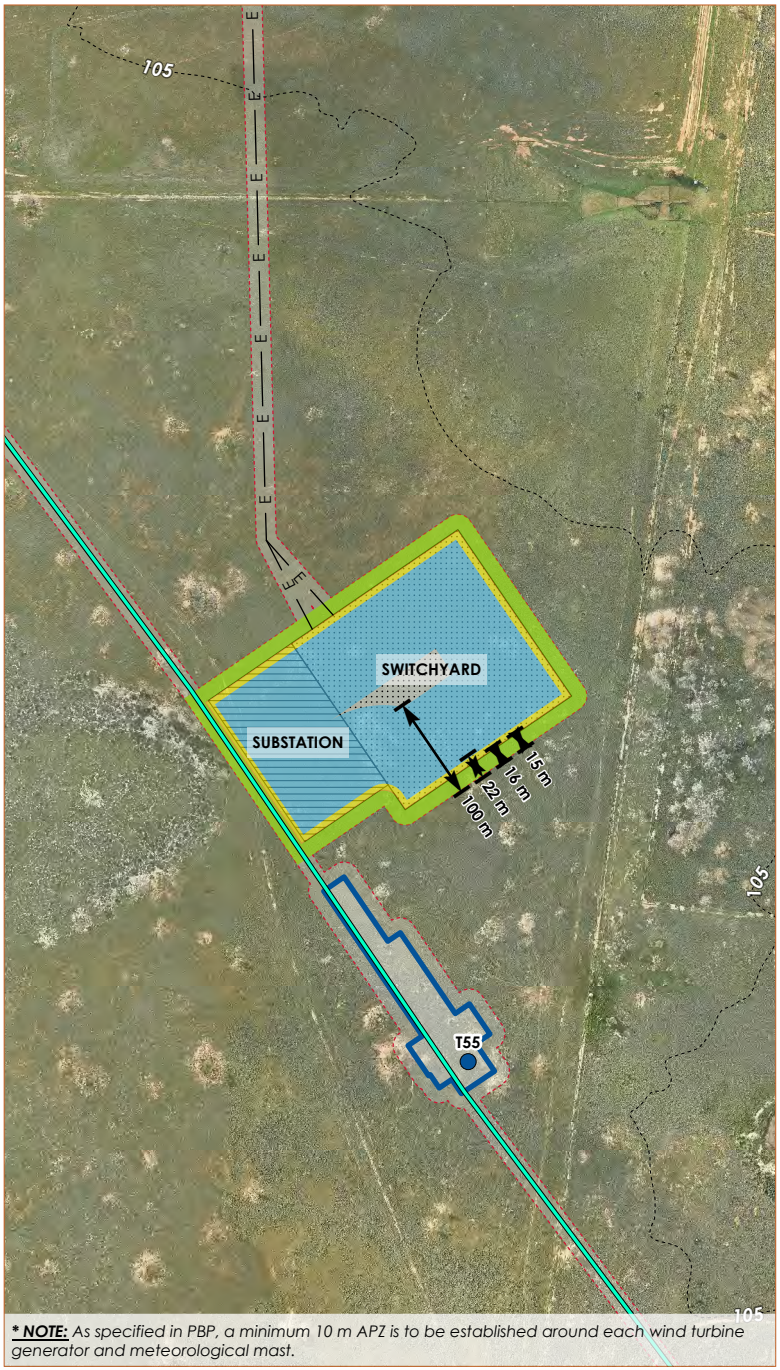
Data source: WBP (2024); EMM (2024); DCSSS (2024); DPE (2023); ESRI (2024)

Path: C:_GIS_Working\WBP_W23034\GIS\B_Maps\BAR004_VegetationSlopeAPZsBALs_20240520_04\BAR004_VegetationSlopeAPZsBALs_20240520_04.aprx

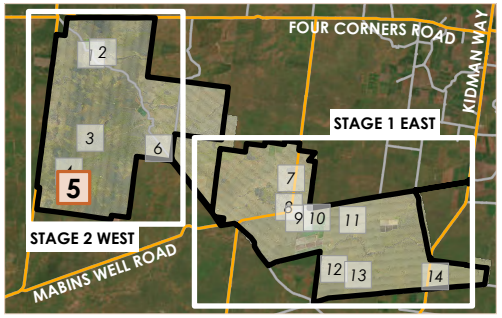
Vegetation and slope assessment



Asset Protection Zone (APZ) & Bush fire Attack Level (BAL)



NOTE: *As specified in PBP, a minimum 10 m APZ is to be established around each wind turbine generator and meteorological mast.*



LEGEND

- Project area (refer to inset)
- Minor road (refer to inset)
- Local road (refer to inset)

Project elements

- Wind turbine generator
- Electricity transmission line
- Access track and electrical cabling
- Substation
- Switchyard
- Wind turbine generator (WTG) footprint
- Development footprint

Existing environment

- Topographic contour (1 m)
- Slope buffer (100 m)
- Vegetation buffer (140 m)

Vegetation formation:

- Grassland
- Semi-arid Woodland

Asset protection zone (APZ) & Bush fire Attack Level (BAL)

- APZ*
- BAL 29
- BAL 19
- BAL 12.5

Bush fire assessment and mitigation measures – Map 5 of 14

Dinawan Wind Farm

20/05/2024 (v4) 1:7,500 @A4 GDA2020 MGA Zone 55

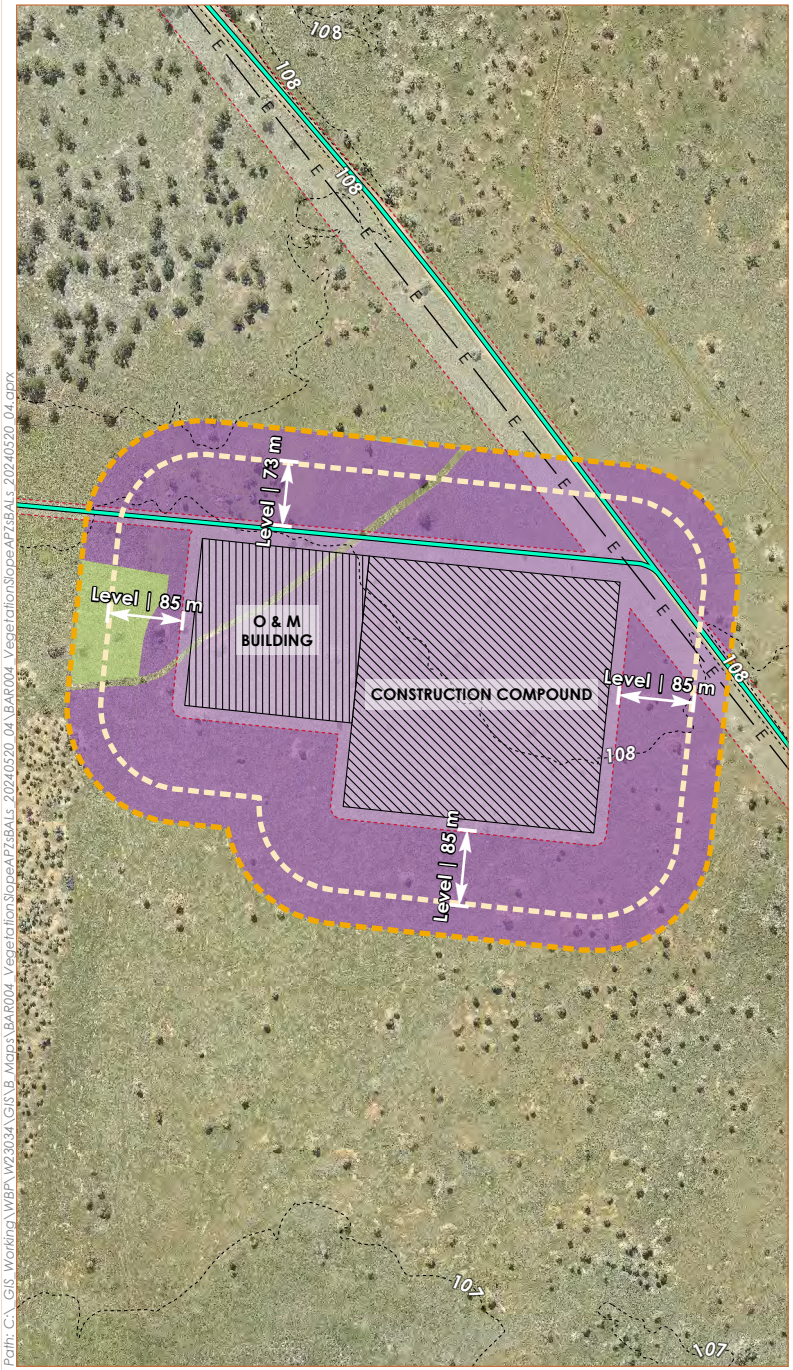
0 100 200
metres

WARATAH BUSHFIRE
PLANNING | GIS | ASSESSMENT

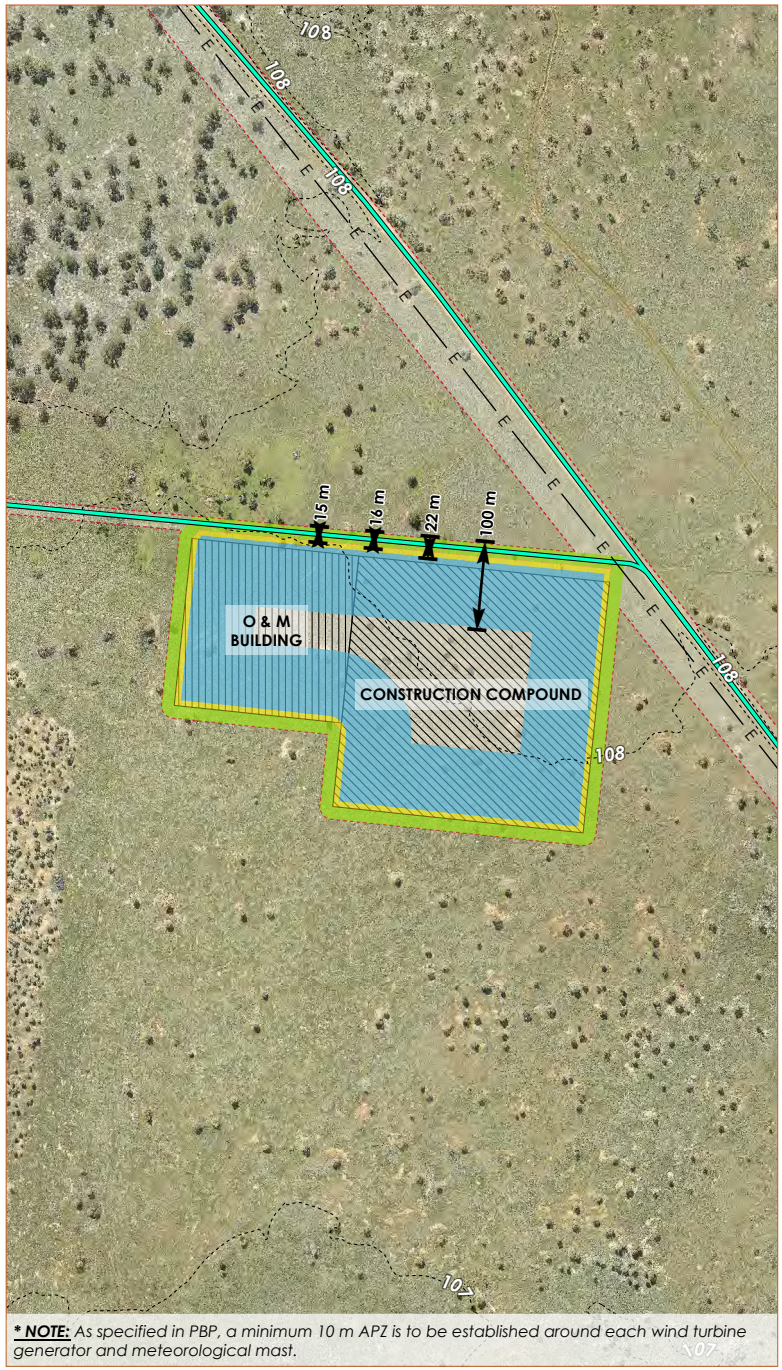
Path: C:_GIS_Working\WBP_W23034\GIS\B_Maps\BAR004_VegetationSlopeAPZsBALs_20240520_04\BAR004_VegetationSlopeAPZsBALs_20240520_04.aprx

Data source: WBP (2024); EMM (2024); DCSSS (2024); DPE (2023); ESRI (2024)

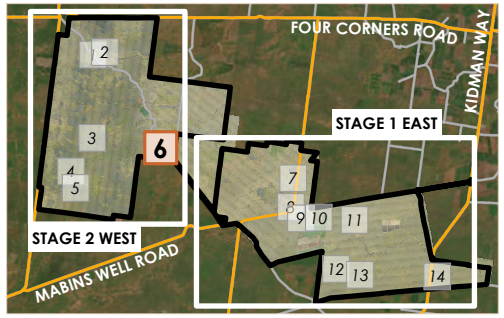
Vegetation and slope assessment



Asset Protection Zone (APZ) & Bush fire Attack Level (BAL)



**** NOTE:*** *As specified in PBP, a minimum 10 m APZ is to be established around each wind turbine generator and meteorological mast.*



LEGEND

- Project area (refer to inset)
- Minor road (refer to inset)
- Local road (refer to inset)

Project elements

- Electricity transmission line
- Access track and electrical cabling
- Construction compound
- Operation and maintenance (O&M) building
- Development footprint

Existing environment

- Topographic contour (1 m)
- Slope buffer (100 m)
- Vegetation buffer (140 m)

Vegetation formation:

- Grassland
- Semi-arid Woodland

Asset protection zone (APZ) & Bush fire Attack Level (BAL)

- APZ*
- BAL 29
- BAL 19
- BAL 12.5

Bush fire assessment and mitigation measures – Map 6 of 14

Dinawan Wind Farm

20/05/2024 (v4) 1:9,000 @A4 GDA2020 MGA Zone 55

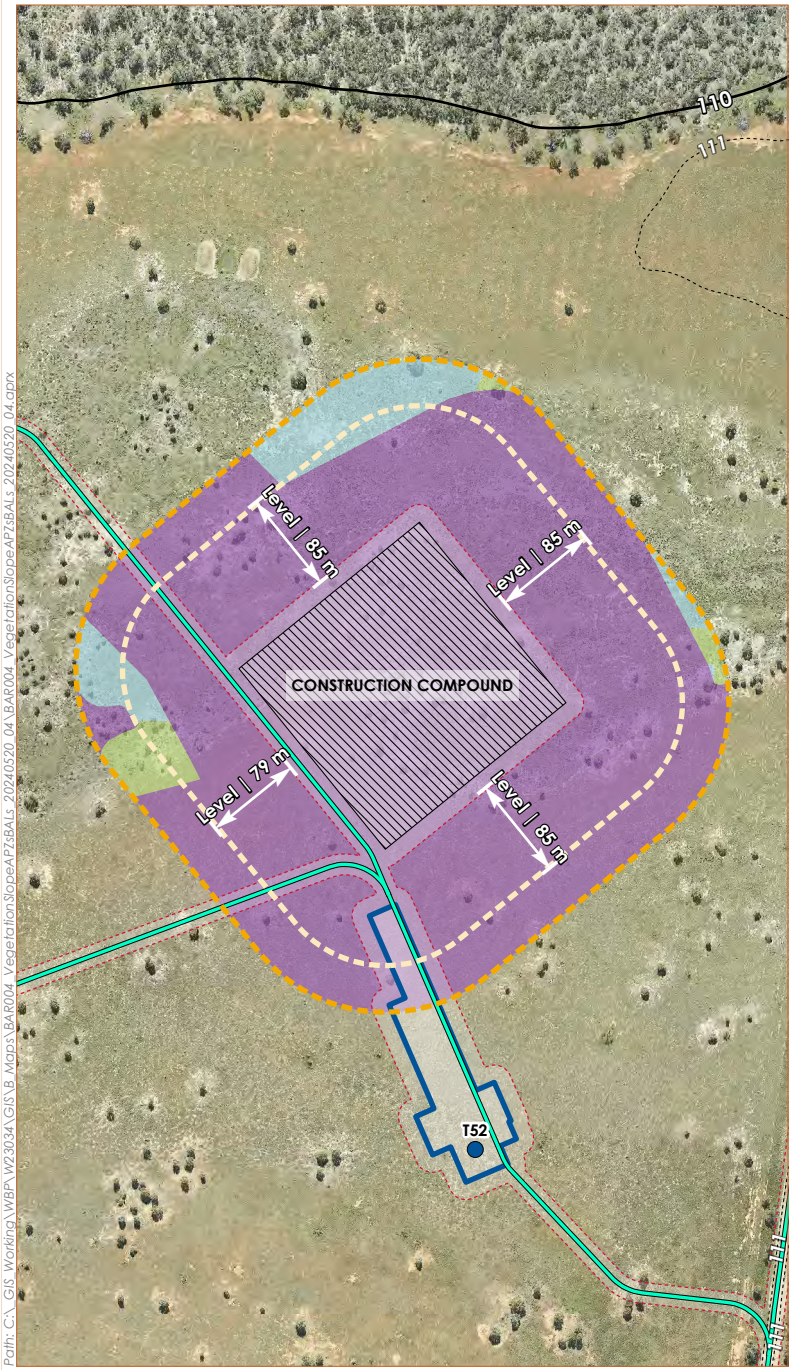
0 100 200 metres

WARATAH BUSHFIRE
PLANNING | GIS | ASSESSMENT

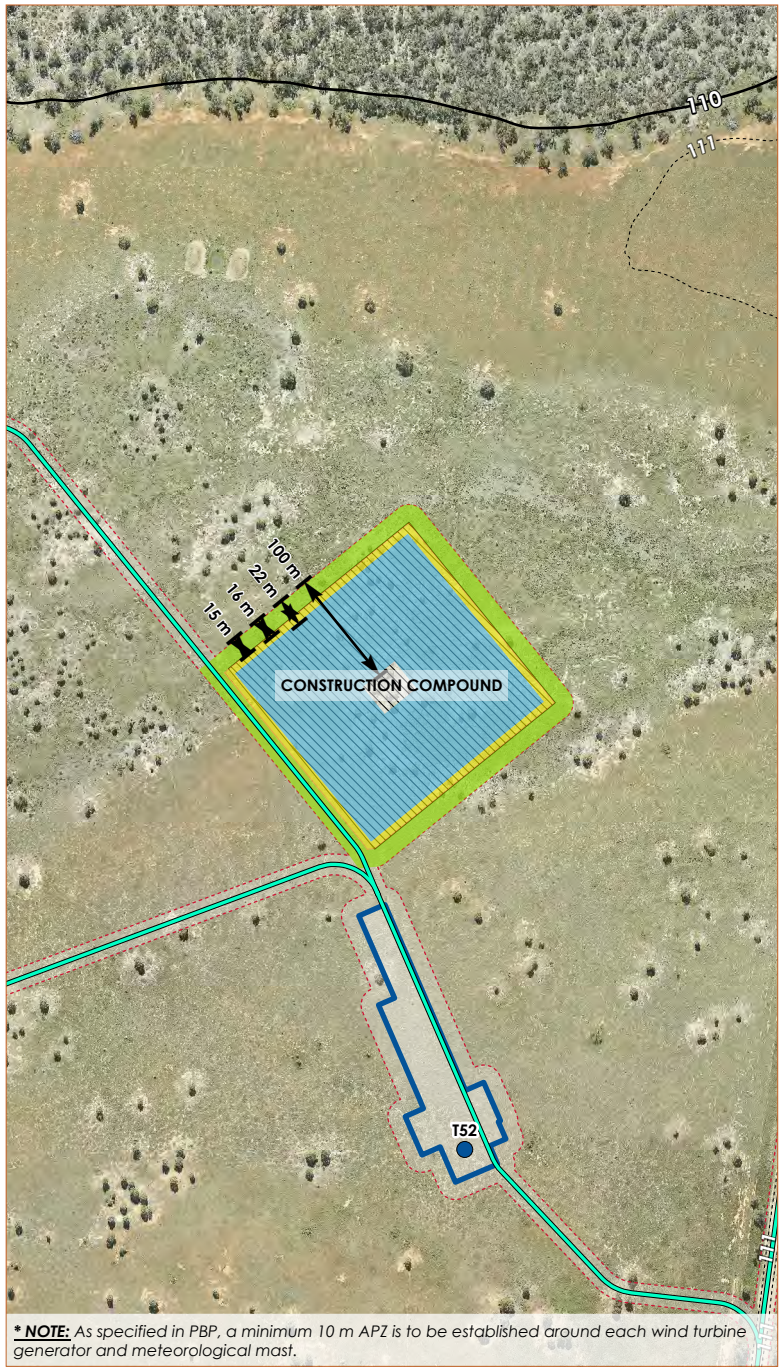
Path: C:_GIS_Working\WBP_W23034\GIS\B_Maps\BAR004_VegetationSlopeAPZtBALs_20240520_04\BAR004_VegetationSlopeAPZtBALs_20240520_04.aprx

Data source: WBP (2024); EMM (2024); DCSSS (2024); DPE (2023); ESRI (2024)

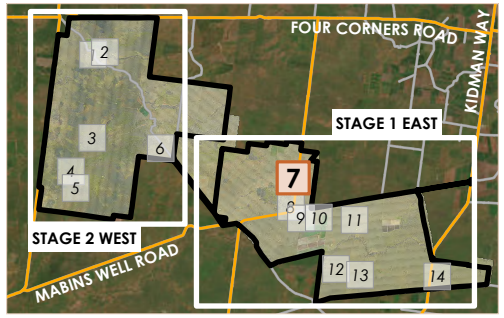
Vegetation and slope assessment



Asset Protection Zone (APZ) & Bush fire Attack Level (BAL)



**** NOTE:*** *As specified in PBP, a minimum 10 m APZ is to be established around each wind turbine generator and meteorological mast.*



LEGEND

- Project area (refer to inset)
- Minor road (refer to inset)
- Local road (refer to inset)

Project elements

- Wind turbine generator
- Access track and electrical cabling
- Construction compound
- Wind turbine generator (WTG) footprint
- Development footprint

Existing environment

- Topographic contour (1 m)
- Topographic contour (10 m)
- Slope buffer (100 m)
- Vegetation buffer (140 m)

Vegetation formation:

- Freshwater wetland
- Grassland
- Semi-arid Woodland

Asset protection zone (APZ) & Bush fire Attack Level (BAL)

- APZ*
- BAL 29
- BAL 19
- BAL 12.5

Bush fire assessment and mitigation measures – Map 7 of 14

Dinawan Wind Farm

20/05/2024 (v4) 1:6,500 @A4 GDA2020 MGA Zone 55

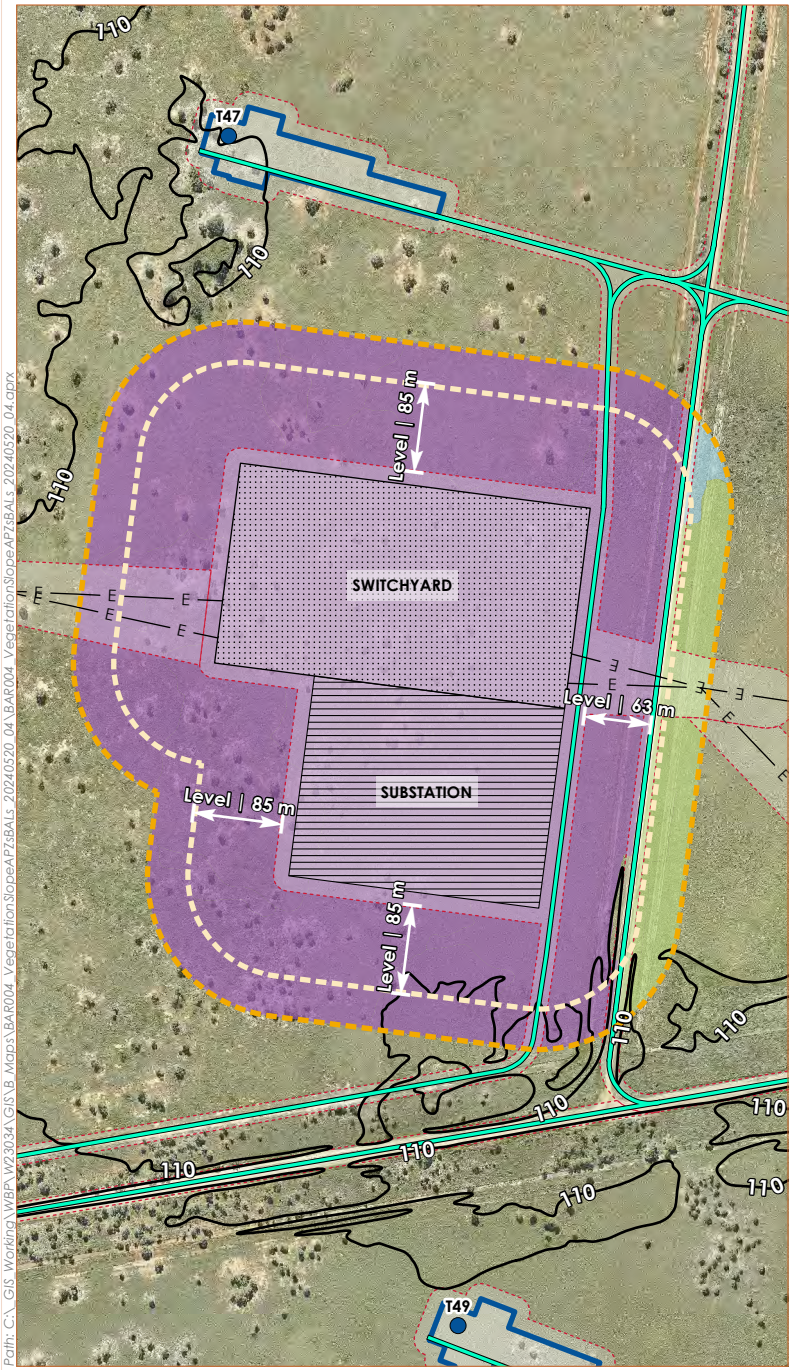
0 100 200
metres

WARATAH BUSHFIRE
PLANNING | GIS | ASSESSMENT

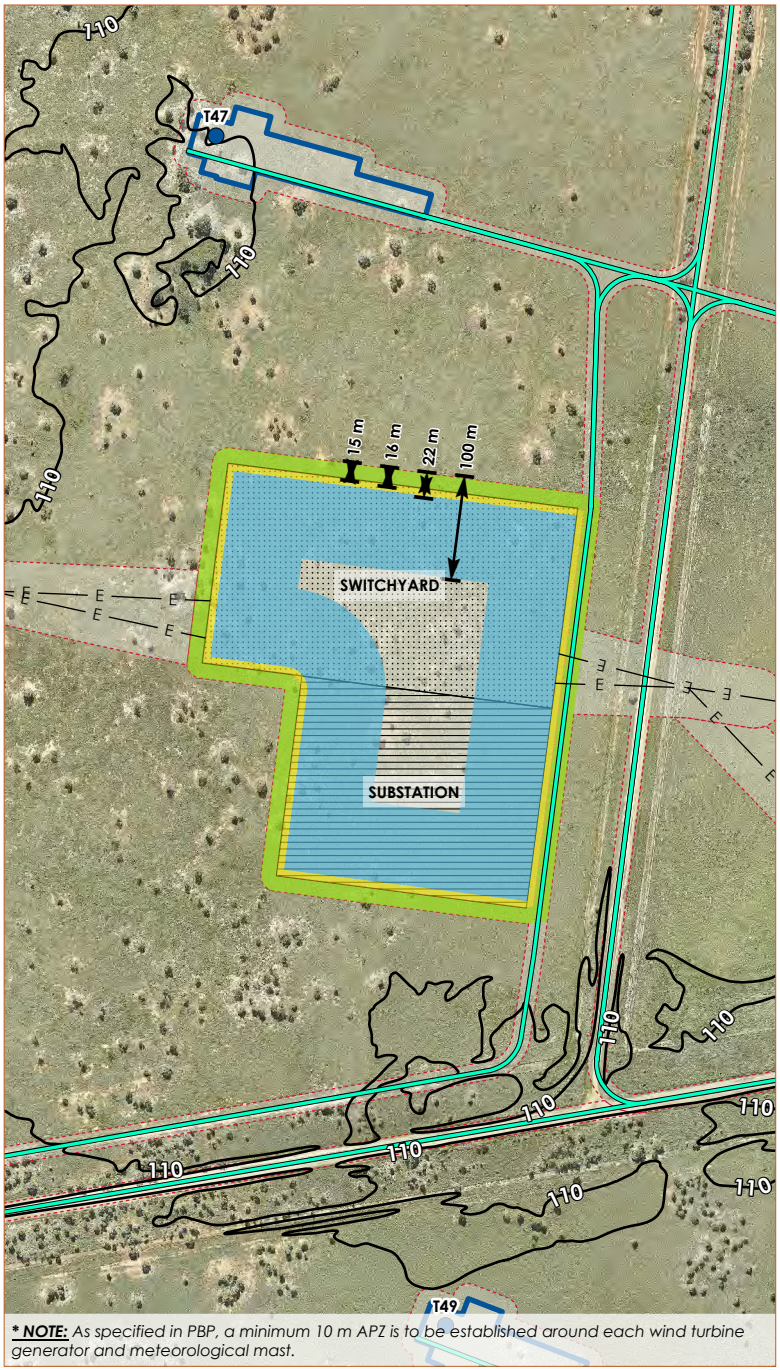
Path: C:_GIS_Working\WBP_W23034\GIS\B_Maps\BAR004_VegetationSlopeAPZsBALs_20240520_04\BAR004_VegetationSlopeAPZsBALs_20240520_04.aprx

Data source: WBP (2024); EMM (2024); DCSSS (2024); DPE (2023); ESRI (2024)

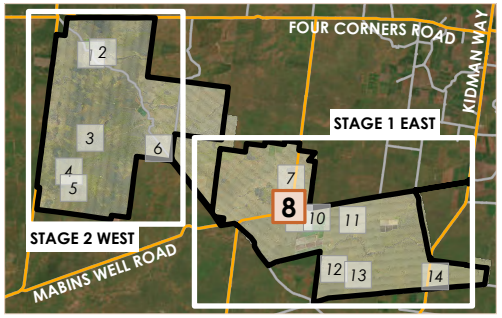
Vegetation and slope assessment



Asset Protection Zone (APZ) & Bush fire Attack Level (BAL)



NOTE: *As specified in PBP, a minimum 10 m APZ is to be established around each wind turbine generator and meteorological mast.*



LEGEND

- Project area (refer to inset)
- Minor road (refer to inset)
- Local road (refer to inset)

Project elements

- Wind turbine generator
- Electricity transmission line
- Access track and electrical cabling
- Substation
- Switchyard
- Wind turbine generator (WTG) footprint
- Development footprint

Existing environment

- Topographic contour (10 m)
- Slope buffer (100 m)
- Vegetation buffer (140 m)

Vegetation formation:

- Freshwater wetland
- Grassland
- Semi-arid Woodland

Asset protection zone (APZ) & Bush fire Attack Level (BAL)

- APZ*
- BAL 29
- BAL 19
- BAL 12.5

Bush fire assessment and mitigation measures – Map 8 of 14

Dinawan Wind Farm

20/05/2024 (v4) 1:7,500 @A4 GDA2020 MGA Zone 55

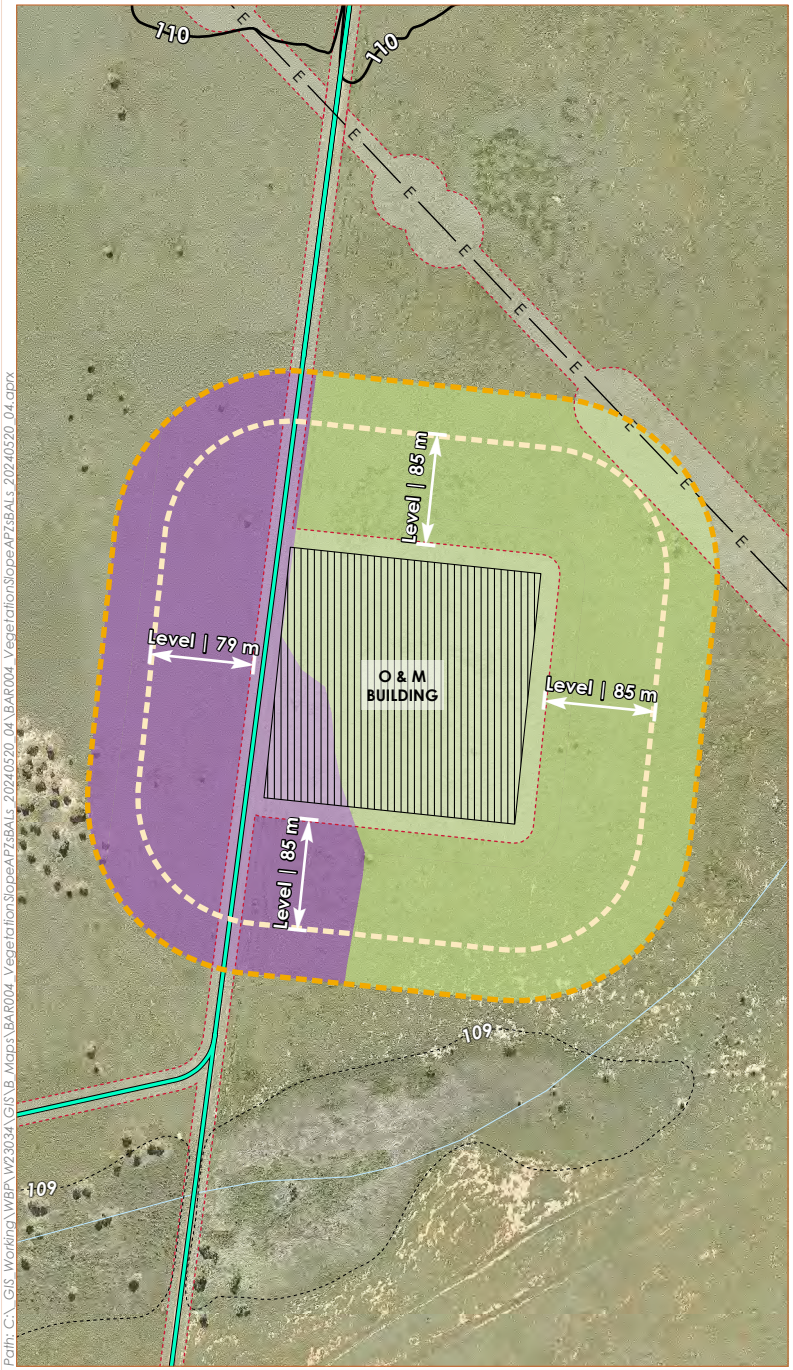
0 100 200 metres

WARATAH BUSHFIRE
PLANNING | GIS | ASSESSMENT

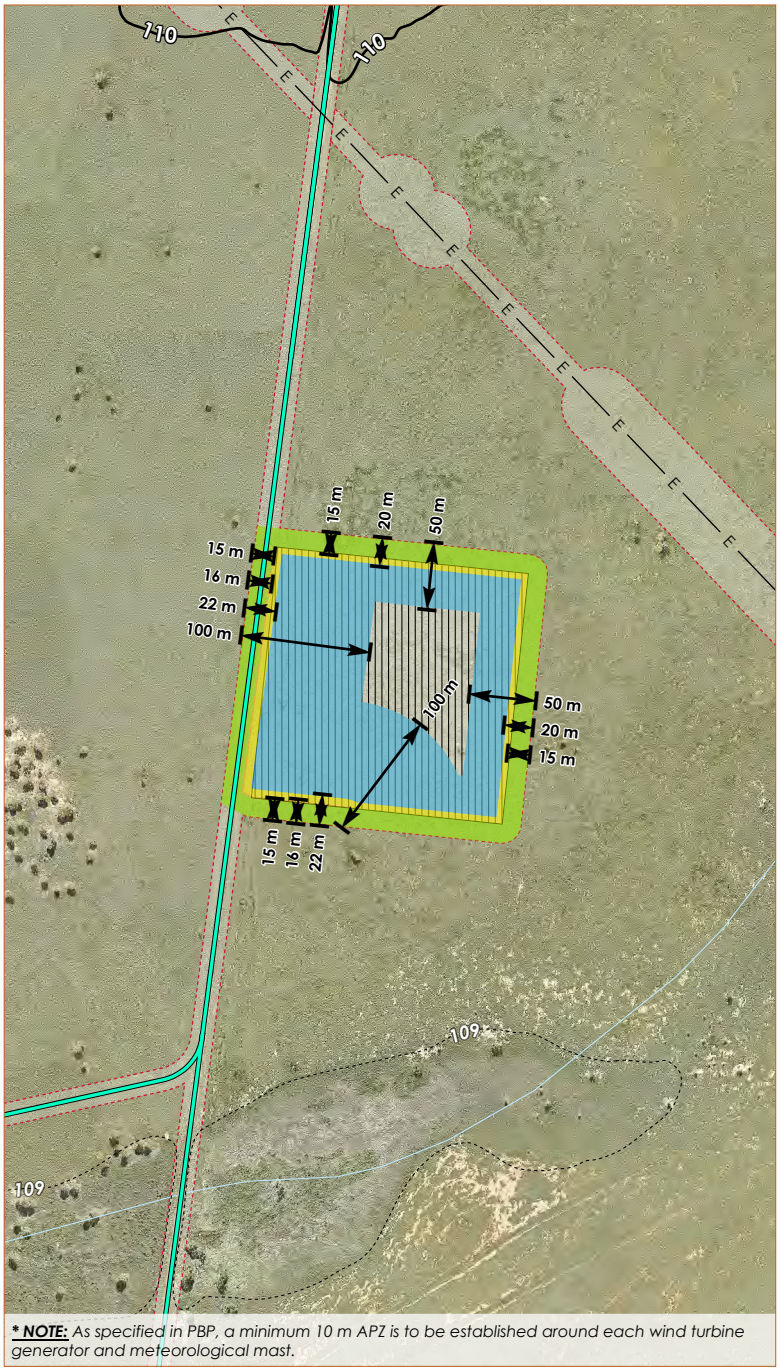
Data source: WBP (2024); EMM (2024); DCSSS (2024); DPE (2023); ESRI (2024)

Path: C:\...GIS Working\WBP\W23034\GIS\B_Maps\BAR004_VegetationSlopeAPZsBALs_20240520_04\BAR004_VegetationSlopeAPZtoBALs_20240520_04.aprx

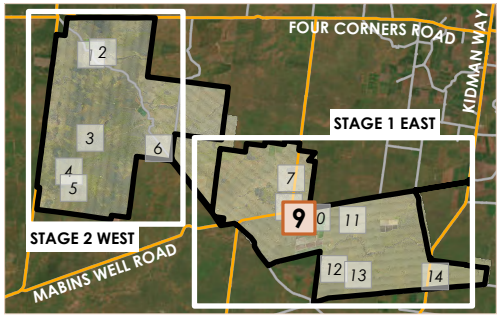
Vegetation and slope assessment



Asset Protection Zone (APZ) & Bush fire Attack Level (BAL)



NOTE: *As specified in PBP, a minimum 10 m APZ is to be established around each wind turbine generator and meteorological mast.*



LEGEND

- Project area (refer to inset)
- Minor road (refer to inset)
- Local road (refer to inset)

Project elements

- Electricity transmission line
- Access track and electrical cabling
- Operation and maintenance (O&M) building
- Development footprint

Existing environment

- Topographic contour (1 m)
- Topographic contour (10 m)
- Watercourse/drainage line
- Slope buffer (100 m)
- Vegetation buffer (140 m)

Vegetation formation:

- Grassland
- Semi-arid Woodland

Asset protection zone (APZ) & Bush fire Attack Level (BAL)

- APZ*
- BAL 29
- BAL 19
- BAL 12.5

Bush fire assessment and mitigation measures – Map 9 of 14

Dinawan Wind Farm

20/05/2024 (v4) 1:6,000 @A4 GDA2020 MGA Zone 55

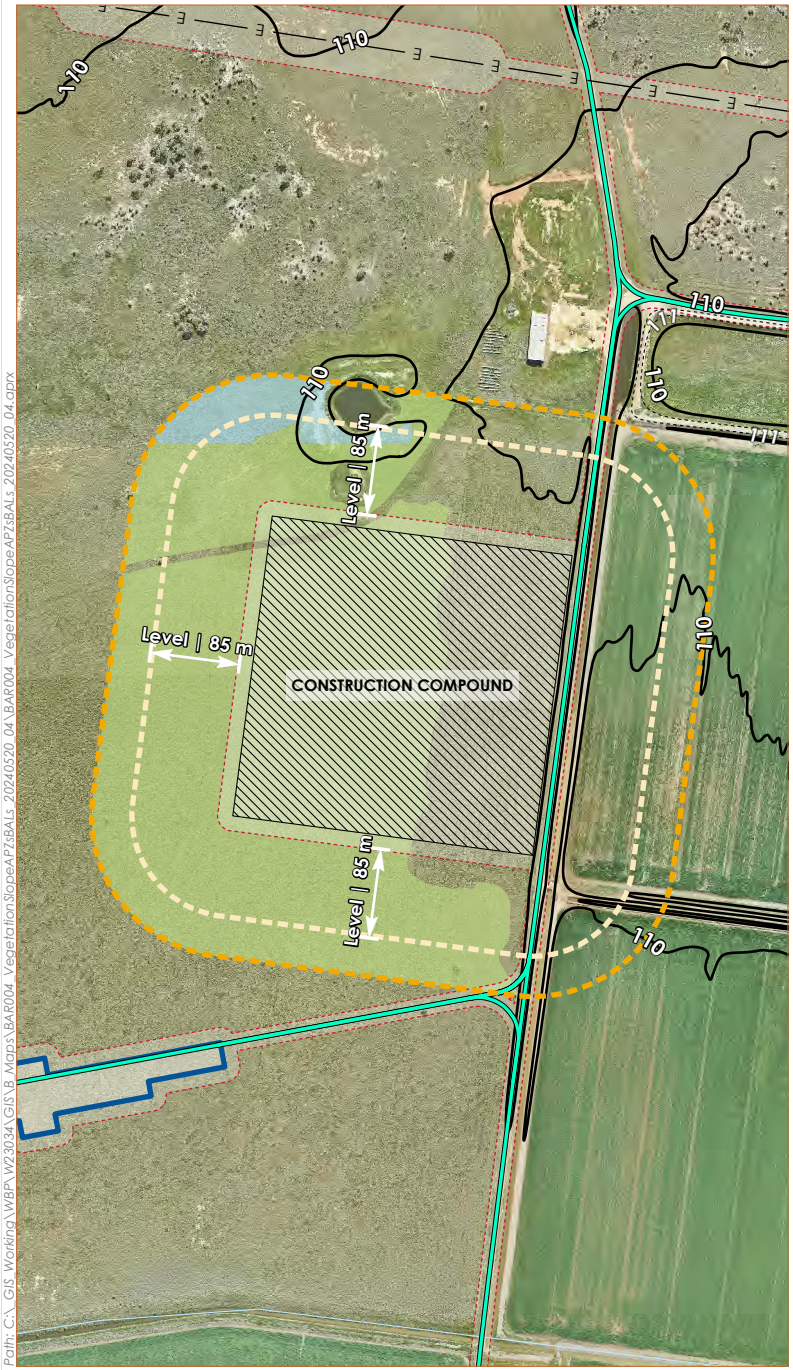
0 100 200
metres

WARATAH BUSHFIRE
PLANNING | GIS | ASSESSMENT

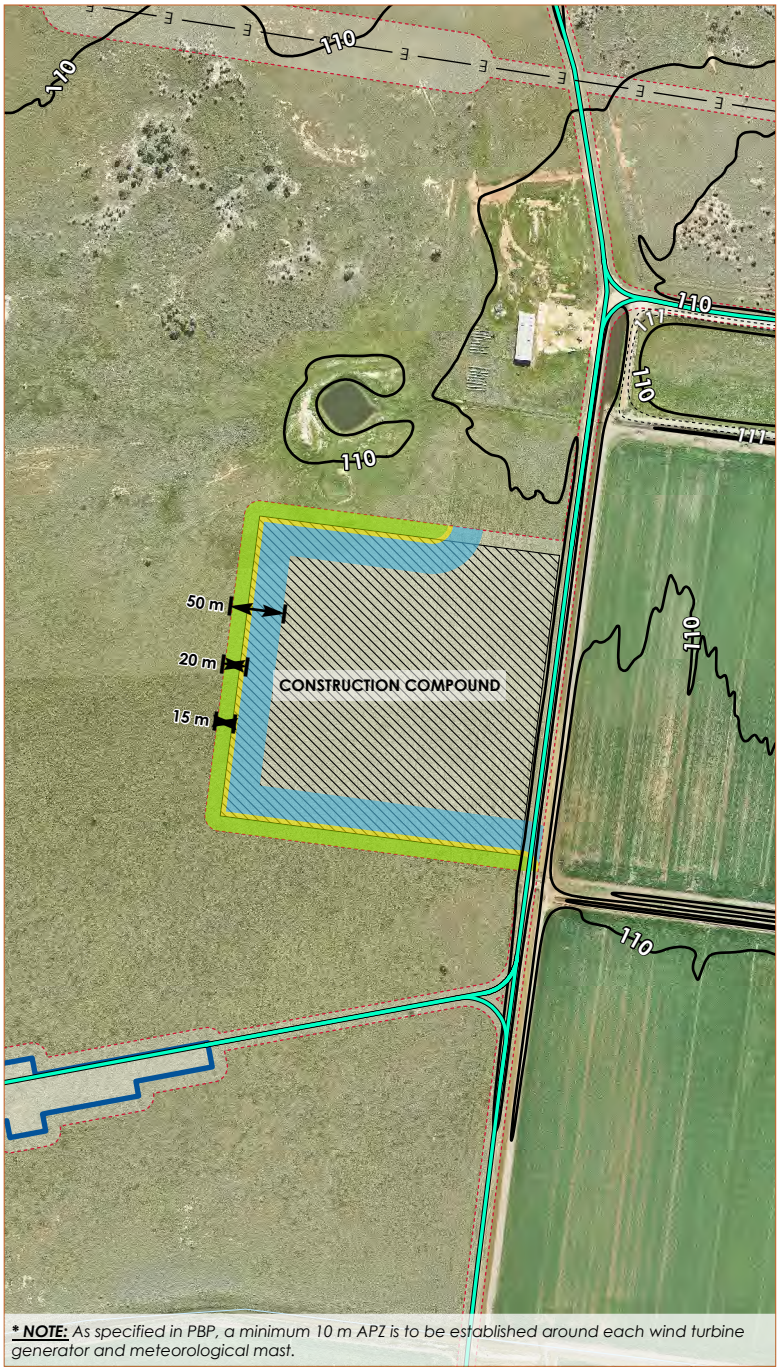
Path: C:_GIS_Working\WBP_W23034\GIS\B_Maps\BAR004_VegetationSlopeAPZsBALs_20240520_04\BAR004_VegetationSlopeAPZsBALs_20240520_04.aprx

Data source: WBP (2024); EMM (2024); DCSSS (2024); DPE (2023); ESRI (2024)

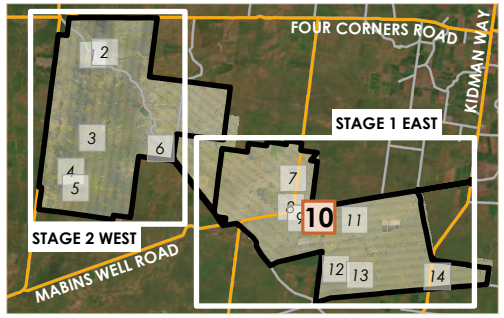
Vegetation and slope assessment



Asset Protection Zone (APZ) & Bush fire Attack Level (BAL)



***NOTE:** As specified in PBP, a minimum 10 m APZ is to be established around each wind turbine generator and meteorological mast.*



LEGEND

- Project area (refer to inset)
- Minor road (refer to inset)
- Local road (refer to inset)

Project elements

- Electricity transmission line
- Access track and electrical cabling
- Construction compound
- Wind turbine generator (WTG) footprint
- Development footprint

Existing environment

- Topographic contour (1 m)
- Topographic contour (10 m)
- Watercourse/drainage line
- Slope buffer (100 m)
- Vegetation buffer (140 m)

Vegetation formation:

- Freshwater wetland
- Grassland

Asset protection zone (APZ) & Bush fire Attack Level (BAL)

- APZ*
- BAL 19
- BAL 12.5

Bush fire assessment and mitigation measures – Map 10 of 14

Dinawan Wind Farm

20/05/2024 (v4) 1:7,500 @A4 GDA2020 MGA Zone 55

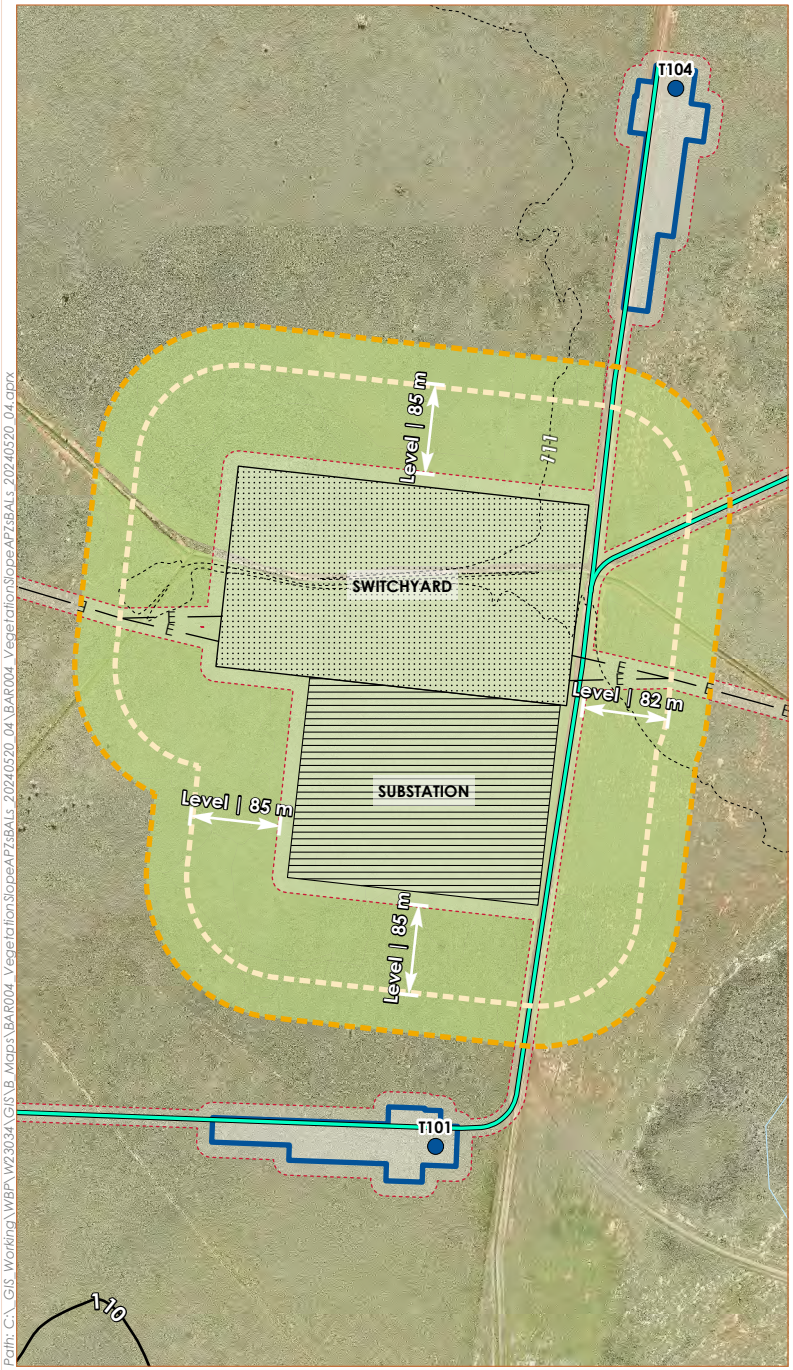
0 100 200
metres

WARATAH BUSHFIRE
PLANNING | GIS | ASSESSMENT

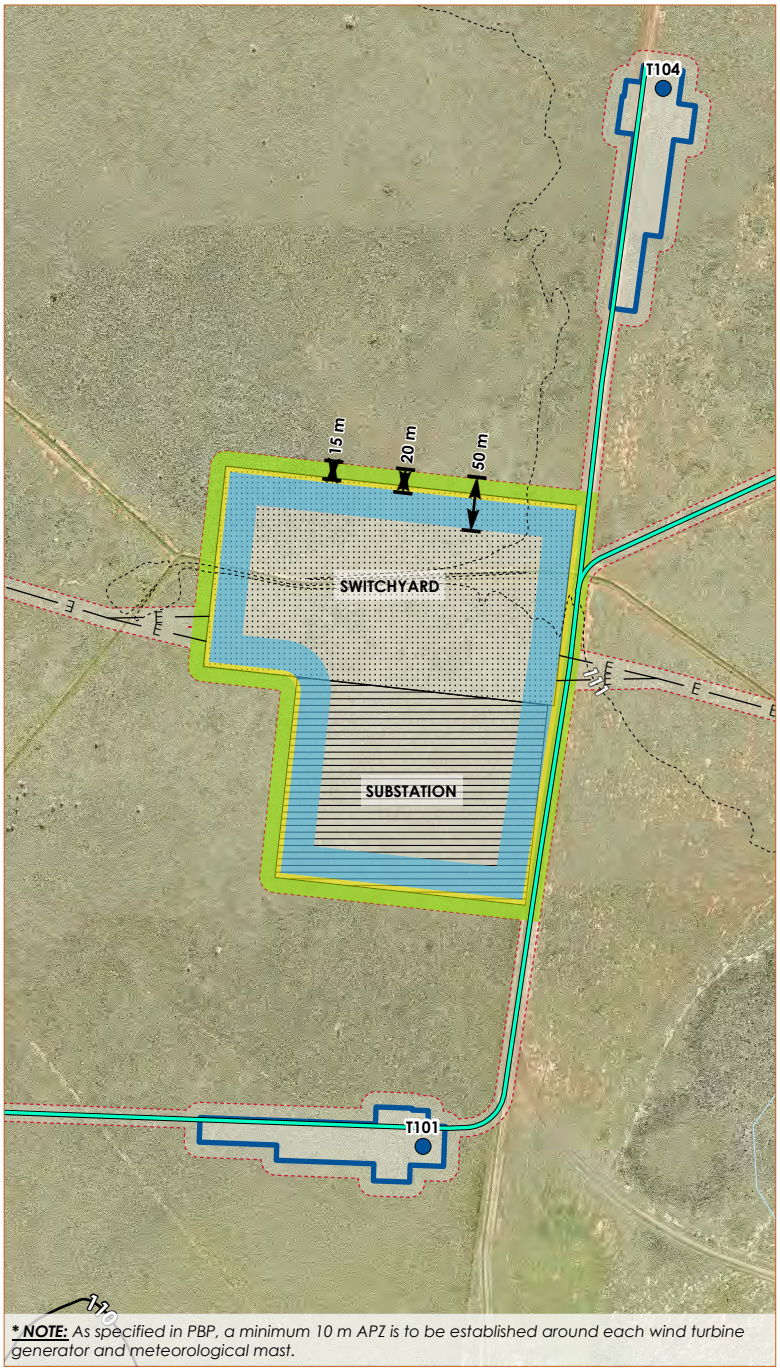
Data source: WBP (2024); EMM (2024); DCSSS (2024); DPE (2023); ESRI (2024)

Path: C:_GIS_Working\WBP\W23034\GIS\B_Maps\BAR004_VegetationSlopeAPZsBALs_20240520_04\BAR004_VegetationSlopeAPZsBALs_20240520_04.aprx

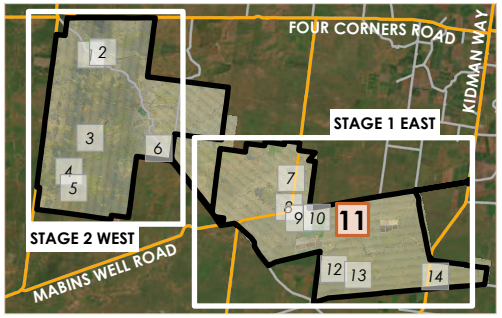
Vegetation and slope assessment



Asset Protection Zone (APZ) & Bush fire Attack Level (BAL)



***NOTE:** As specified in PBP, a minimum 10 m APZ is to be established around each wind turbine generator and meteorological mast.*



LEGEND

- Project area (refer to inset)
- Minor road (refer to inset)
- Local road (refer to inset)

Project elements

- Wind turbine generator
- Electricity transmission line
- Access track and electrical cabling
- Substation
- Switchyard
- Wind turbine generator (WTG) footprint
- Development footprint

Existing environment

- Topographic contour (1 m)
- Topographic contour (10 m)
- Watercourse/drainage line
- Slope buffer (100 m)
- Vegetation buffer (140 m)

Vegetation formation:

- Grassland

Asset protection zone (APZ) & Bush fire Attack Level (BAL)

- APZ*
- BAL 19
- BAL 12.5

Bush fire assessment and mitigation measures – Map 11 of 14

Dinawan Wind Farm

20/05/2024 (v4) 1:7,500 @A4 GDA2020 MGA Zone 55

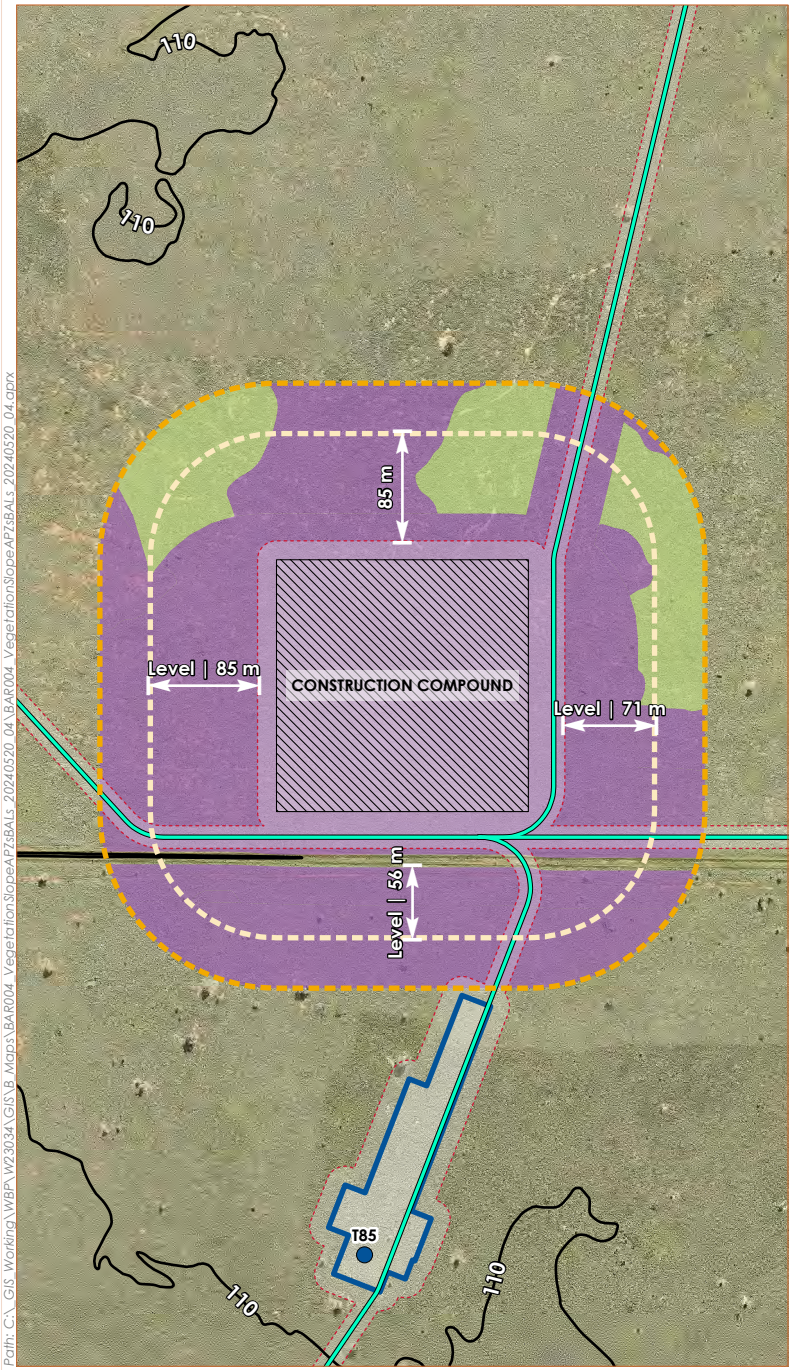
0 100 200 metres

WARATAH BUSHFIRE
PLANNING | GIS | ASSESSMENT

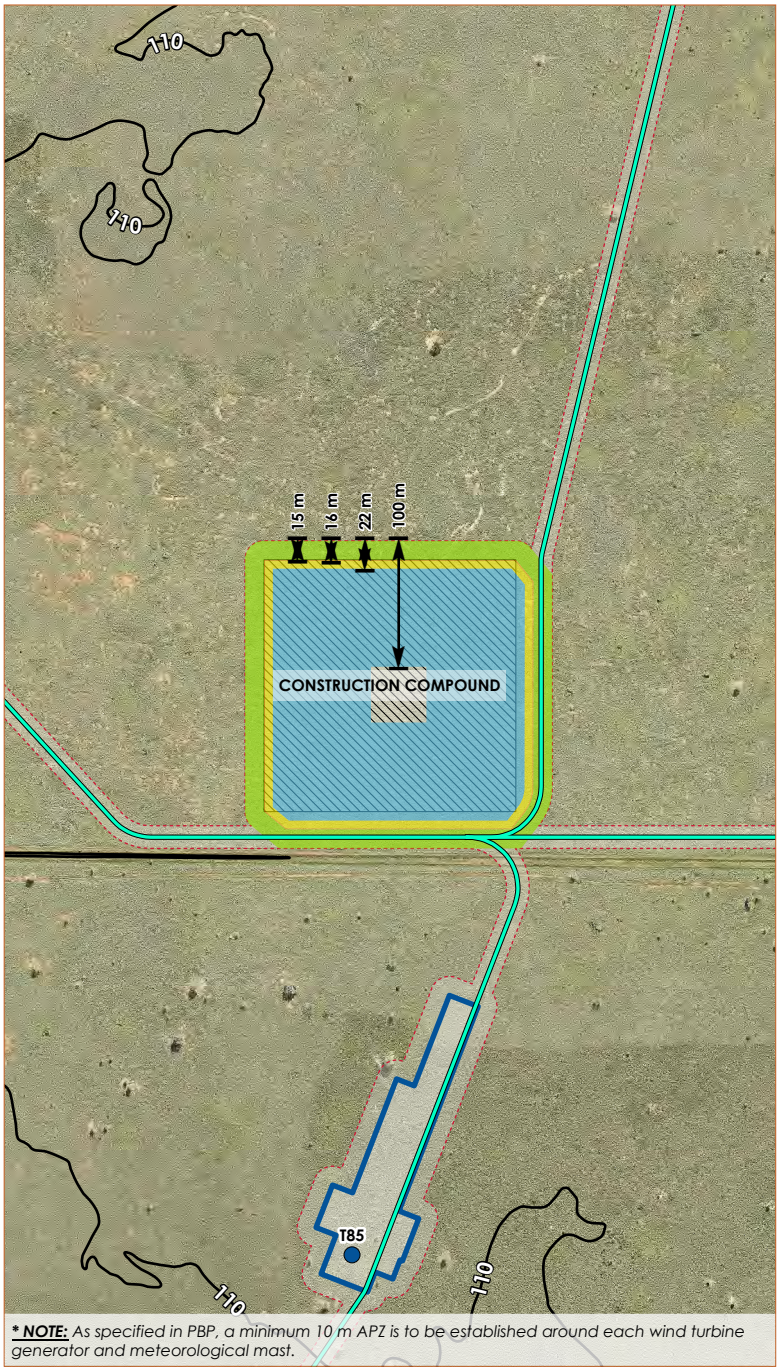
Data source: WBP (2024); EMM (2024); DCSSS (2024); DPE (2023); ESRI (2024)

Path: C:_GIS Working\WBP_W23034\GIS\B_Maps\BAR004_VegetationSlopeAPZsBALs_20240520_04\BAR004_VegetationSlopeAPZsBALs_20240520_04.aprx

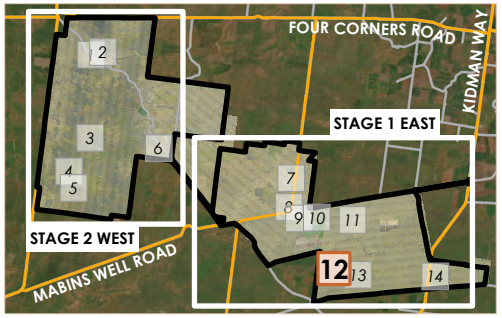
Vegetation and slope assessment



Asset Protection Zone (APZ) & Bush fire Attack Level (BAL)



***NOTE:** As specified in PBP, a minimum 10 m APZ is to be established around each wind turbine generator and meteorological mast.*



LEGEND

- Project area (refer to inset)
- Minor road (refer to inset)
- Local road (refer to inset)

Project elements

- Wind turbine generator
- Access track and electrical cabling
- Construction compound
- Wind turbine generator (WTG) footprint
- Development footprint

Existing environment

- Topographic contour (10 m)
- Slope buffer (100 m)
- Vegetation buffer (140 m)

Vegetation formation:

- Grassland
- Semi-arid Woodland

Asset protection zone (APZ) & Bush fire Attack Level (BAL)

- APZ*
- BAL 29
- BAL 19
- BAL 12.5

Bush fire assessment and mitigation measures – Map 12 of 14

Dinawan Wind Farm

20/05/2024 (v4) 1:6,000 @A4 GDA2020 MGA Zone 55

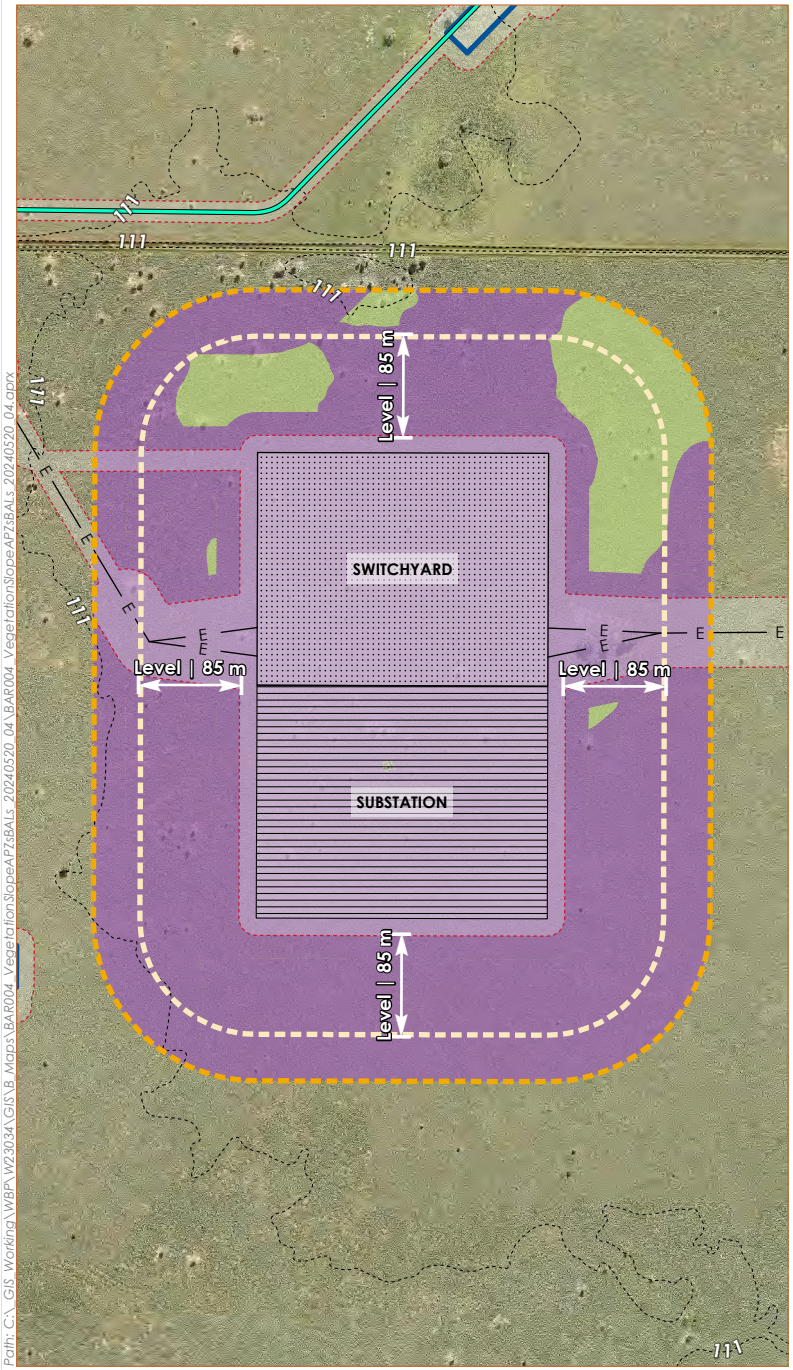
0 100 200
metres

WARATAH BUSHFIRE
PLANNING | GIS | ASSESSMENT

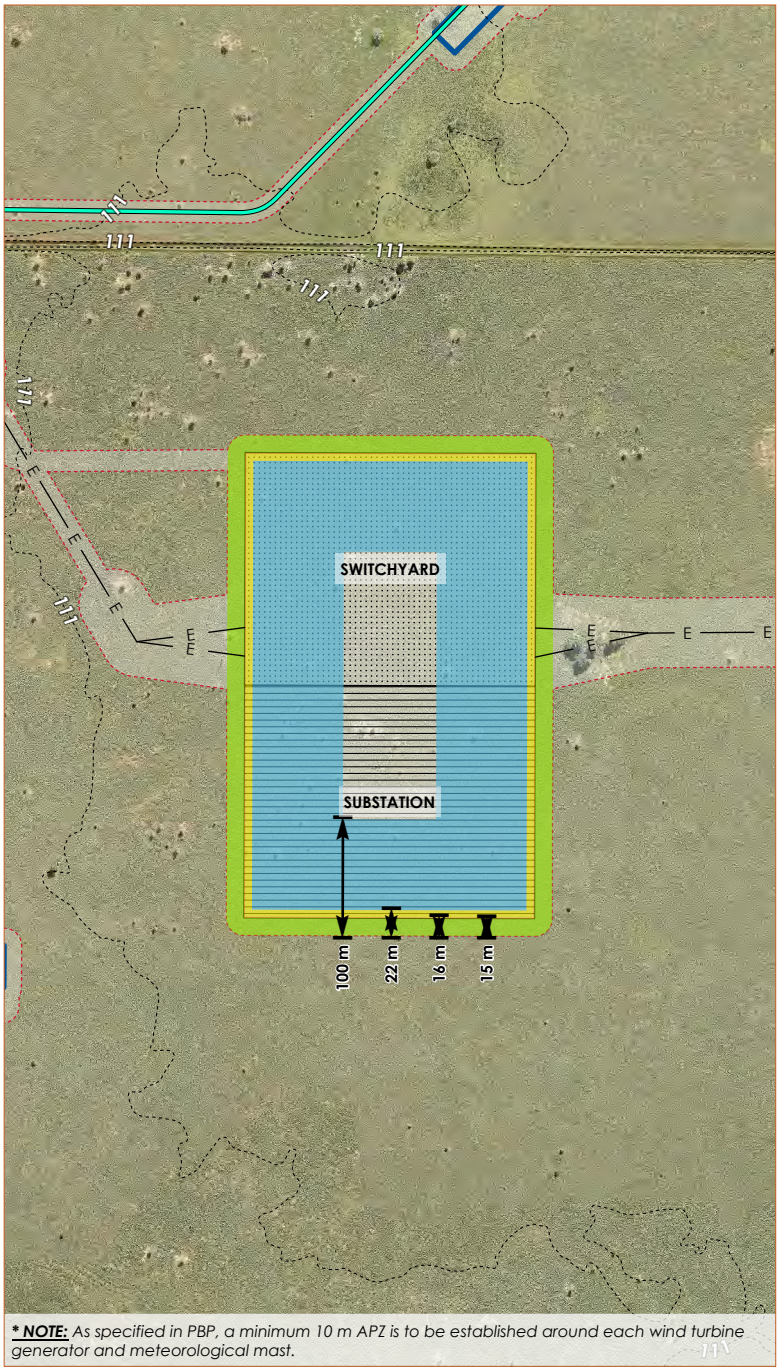
Data source: WBP (2024); EMM (2024); DCSSS (2024); DPE (2023); ESRI (2024)

Path: C:_GIS_Working\WBP_W23034\GIS\B_Maps\BAR004_VegetationSlopeAPZsBALs_20240520_04\BAR004_VegetationSlopeAPZsBALs_20240520_04.aprx

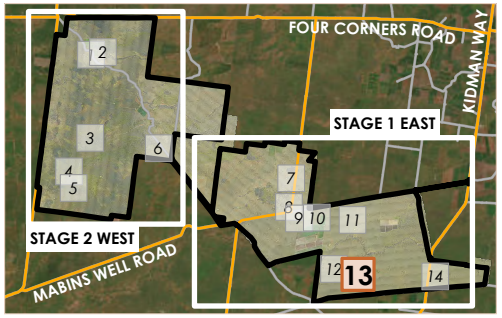
Vegetation and slope assessment



Asset Protection Zone (APZ) & Bush fire Attack Level (BAL)



***NOTE:** As specified in PBP, a minimum 10 m APZ is to be established around each wind turbine generator and meteorological mast.*



LEGEND

- Project area (refer to inset)
- Minor road (refer to inset)
- Local road (refer to inset)

Project elements

- Electricity transmission line
- Access track and electrical cabling
- Substation
- Switchyard
- Wind turbine generator (WTG) footprint
- Development footprint

Existing environment

- Topographic contour (1 m)
- Slope buffer (100 m)
- Vegetation buffer (140 m)

Vegetation formation:

- Grassland
- Semi-arid Woodland

Asset protection zone (APZ) & Bush fire Attack Level (BAL)

- APZ*
- BAL 29
- BAL 19
- BAL 12.5

Bush fire assessment and mitigation measures – Map 13 of 14

Dinawan Wind Farm

20/05/2024 (v4) 1:6,500 @A4 GDA2020 MGA Zone 55

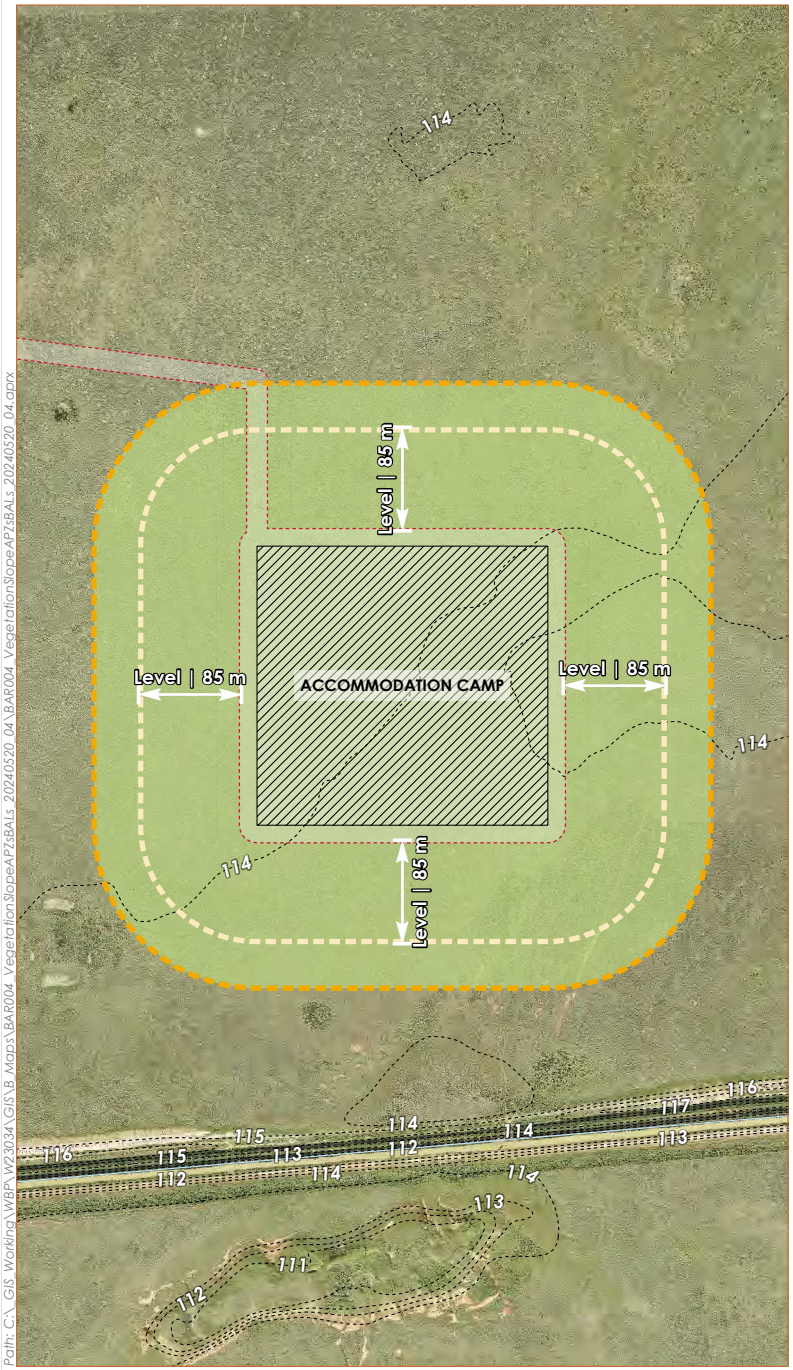
0 100 200
metres

WARATAH BUSHFIRE
PLANNING | GIS | ASSESSMENT

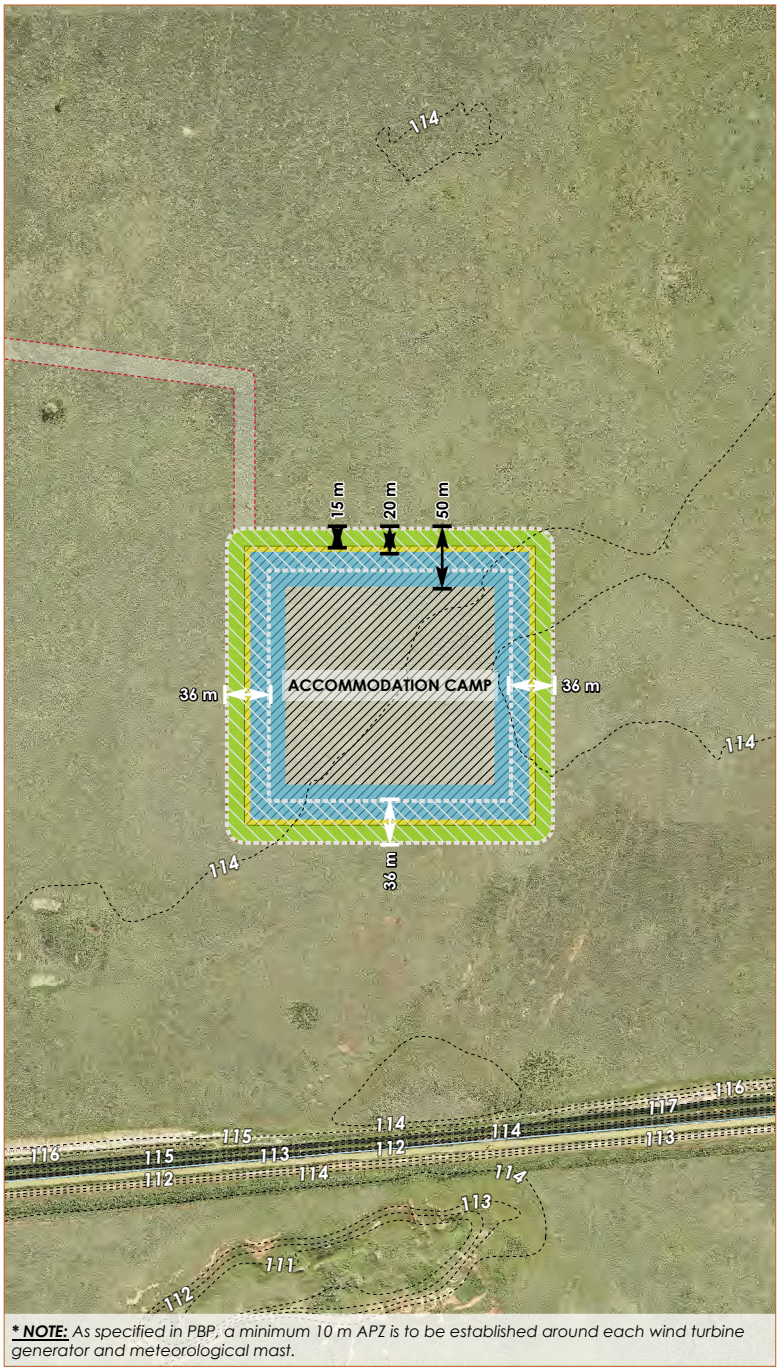
Data source: WBP (2024); EMM (2024); DCSSS (2024); DPE (2023); ESRI (2024)

Path: C:_GIS_Working\WBP_W23034\GIS\B_Maps\BAR004_VegetationSlopeAPZsBALs_20240520_04\BAR004_VegetationSlopeAPZsBALs_20240520_04.aprx

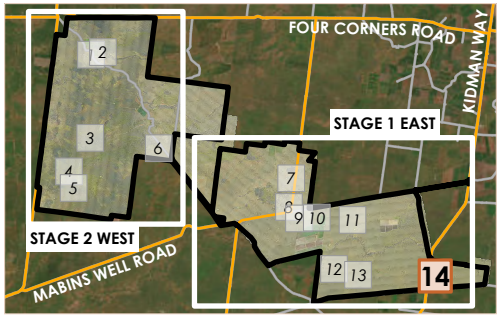
Vegetation and slope assessment



Asset Protection Zone (APZ) & Bush fire Attack Level (BAL)



NOTE: *As specified in PBP, a minimum 10 m APZ is to be established around each wind turbine generator and meteorological mast.*



LEGEND

- Project area (refer to inset)
- Minor road (refer to inset)
- Local road (refer to inset)

Project elements

- Accommodation camp
- Development footprint

Existing environment

- Topographic contour (1 m)
- Watercourse/drainage line
- Slope buffer (100 m)
- Vegetation buffer (140 m)

Vegetation formation:

- Grassland

Asset protection zone (APZ) & Bush fire Attack Level (BAL)

- APZ*
- APZ for safe refuge building (<10 kWm2)
- BAL 19
- BAL 12.5

Bush fire assessment and mitigation measures – Map 14 of 14

Dinawan Wind Farm

20/05/2024 (v4) 1:6,500 @A4 GDA2020 MGA Zone 55

0 100 200
metres

WARATAH BUSHFIRE
PLANNING | GIS | ASSESSMENT

Data source: WBP (2024); EMM (2024); DCSSS (2024); DPE (2023); ESRI (2024)

Path: C:\...\GIS Working\WBP\W23034\GIS\B_Maps\BAR004_VegetationSlopeAPZsBALs_20240520_04\BAR004_VegetationSlopeAPZsBALs_20240520_04.aprx