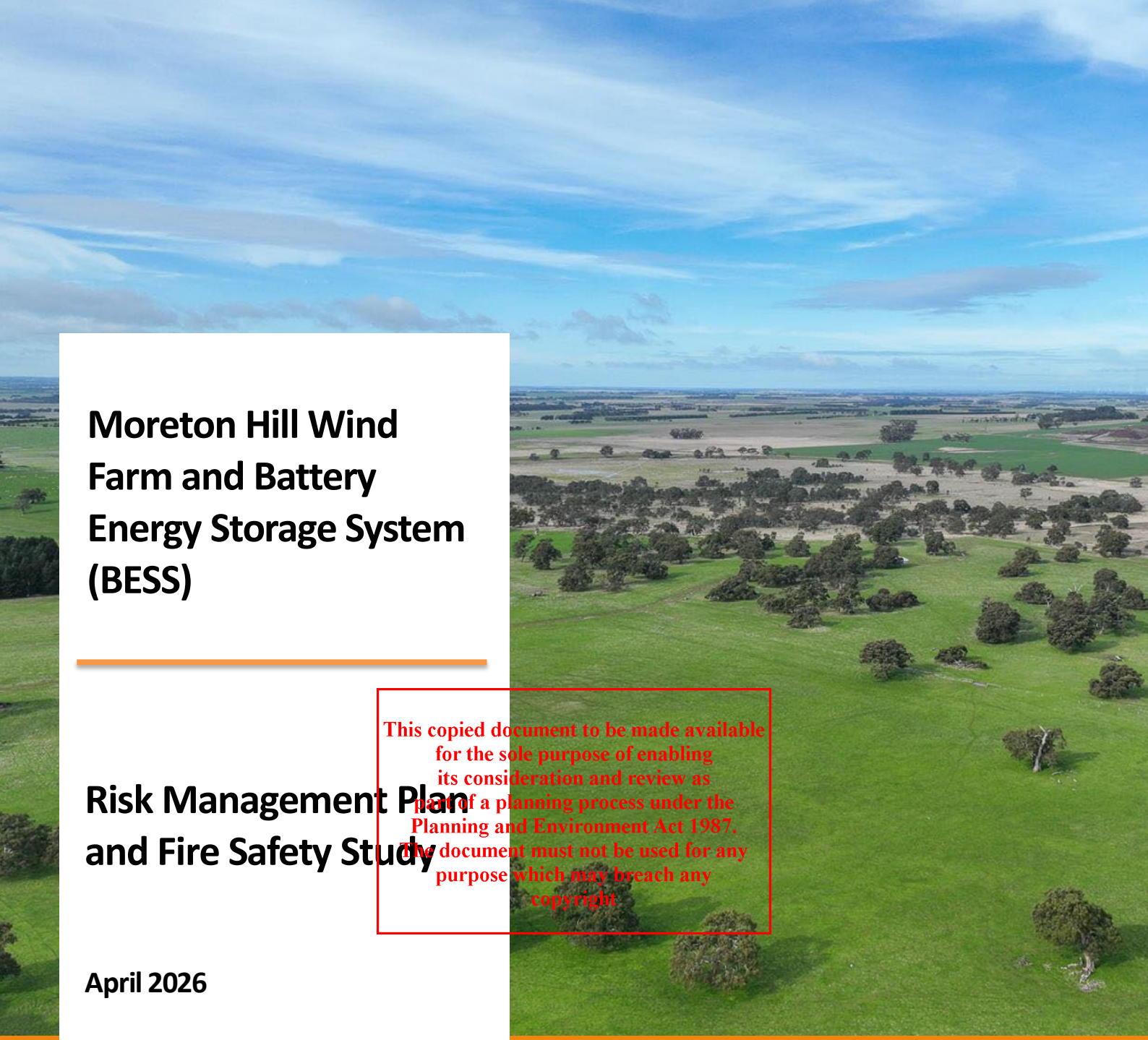

# Moreton Hill Wind Farm and Battery Energy Storage System (BESS)

## Risk Management Plan and Fire Safety Study



April 2026



FIRE RISK Consultants

**Cover photo –** View of the typical landscape within and surrounding the proposed Moreton Hill Wind Farm and BESS. (Fire Risk Consultants)

**Document history and date**

| Revision | Date | Description | By | Review | Approved |
|---|---|---|---|---|---|
| V0.1 - DRAFT | 1/8/2023 | Initial draft following assessment of available information and detailed site visit. | M Potter & FRC Project Team | FRC Review Team | G Taylor Managing Director |
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# Contents

# Executive Summary

The Moreton Hill Wind Farm and BESS project proposes to develop up to 62 Wind Turbine Generators (WTG) and a Battery Energy Storage System (BESS) and associated infrastructure approximately 6 kilometres to the southeast of Skipton in western Victoria.

The project covers approximately 6,878 hectares of private land between the townships of Pittong, Skipton, Bradvale and Linton. The project is within both the Corangamite and Golden Plains Shires.

Technical assessments prepared to support the Environment Report and Planning Permit Application have assessed a wind turbine layout consisting of 68 WTGs. These assessments considered six additional WTGs beyond the proposed 62 WTGs to allow for flexibility in the project design and respond to environmental and heritage constraints that may arise. WTGs that avoided identified constraints were prioritised in developing the final layout for the Project. This has allowed the Project to seek approval for a layout of 62 WTGs that have been selected to avoid and minimise potential impacts as much as possible. The Project will only seek planning approval to construct and operate up to 62 WTGs. Developments plans to be submitted as part of planning approval will only show locations of the proposed 62 WTGs.

To assess the risk of fire in relation to the Wind Farm, this Risk Management Plan (RMP) has been developed to consider fire risk associated with bushfire and a fire starting within the proposed infrastructure. The RMP follows the guidance provided by CFA in their *Design Guidelines and Model Requirements: Renewable Energy Facilities V4 2023 (Updated 2025 V4.4)* (CFA Guideline). It also includes the assessment of bushfire risk in accordance with Clause 13.02-1S of the Corangamite and Golden Plains Planning Schemes.

The assessment of bushfire risk has identified a landscape that is consistent with much of southwest Victoria. The surrounding landscape has experienced large bushfires in the past. Whilst the area of the proposed Wind Farm and BESS have not been impacted by large bushfires, there is no doubt that bushfires can occur under elevated fire danger conditions in this landscape. The assessment of bushfire risk in this report has resulted in recommendations for a range of mitigation treatments that align with the CFA Guideline.

This report contains an assessment of fire risk within the Wind Farm including the wind turbine nacelle, office compound and the BESS, and identifies the low risk associated with these types of development. This low risk in addition to the mitigation treatments outlined within the CFA Guideline, ensures a high level of fire safety in a Wind Farm and BESS. The outcome of the risk assessment has recommended a range of mitigations to manage fire risk including:

- Installation of static water supply tanks spread across the Wind Farm and the BESS area that complies with the CFA Guidelines and *AS2419.1:2021 Fire hydrant installations* (AS2419.1).
- Provision of fire breaks around the base of the wind turbines, BESS, substation and the operations and maintenance area.
- Installation of smoke detection and fire suppression systems within the nacelle.
- Installation of fire safety systems within the BESS enclosures that is based on the manufacturer specifications and results of the UL9540A test.
- Provision of access tracks including overtaking bays.
- Ongoing maintenance programs for the life of the project in accordance with the relevant Standards or manufacturer specifications.

The outcome of the risk assessment has indicated that the project can occur in this landscape and not increase the risk of fire to surrounding communities, farming assets and other infrastructure.

# 1 Introduction

Fire Risk Consultants have been engaged to develop an RMP for the proposed Moreton Hill Wind Farm and BESS located between the townships of Pittong, Skipton, Bradvale and Linton. The Wind Farm consists of up to 62 Wind Turbine Generators, a BESS and associated infrastructure including a site substation, access tracks, underground cabling, overhead lines and underground transmission powerlines that will connect to the Berrybank terminal station. The proposed Moreton Hill Wind Farm and BESS is within both the Corangamite and Golden Plains Shires in south-western Victoria.

This RMP is required to achieve compliance with the CFA Guideline - *Design Guidelines and Model Requirements: Renewable Energy Facilities V4 2023 (updated 2025 V4.4)* (CFA Guideline). The CFA Guideline outlines the purpose and need for a Risk Management Plan (RMP). CFA engagement will occur once the plan has been approved by the project design team. The RMP has been developed to provide sufficient information for CFA to make an informed decision on fire risk related matters. It is expected that the Planning Permit will require a Fire Management Plan (FMP) and Emergency Management Plan (EMP) in accordance with the requirements of the CFA Guidelines.

As the Project is at the planning application stage, the selection of a battery supplier has not been finalised. This is normal practice at this stage of a project, with the final design and supplier being confirmed and assessed as part of an update to this RMP (and other documentation) prior to the construction of the Project. Section 5.3 of the CFA Guidelines outlines the information required to support the development of an RMP. How this RMP addresses these requirements is outlined in Table 1.

**Table 1 - CFA Guidelines requirements**

| CFA Guideline – RMP requirement | How this RMP addresses the requirement? |
|---|---|
| **a) Describe the risks and hazards at the facility to and from the battery energy storage system and related infrastructure.** | Chapter 2, 3 and 4 |
| **b) Specify and justify, in accordance with Section 6.2 of the CFA Guidelines:** | |
| **The location of the battery energy storage system on-site and in the landscape.** | Chapter 4.2 |
| **Emergency vehicle access to and within the facility that:**<br>• **Includes site access points of a number suitable to the size and hazard of the facility (a minimum of two).**<br>• **Provides access to battery energy storage systems, substations and fire service infrastructure.** | Chapter 4.2 |
| **Firefighting water supply for the facility.** | Chapter 4.2 |
| **A fire break width of 10m or greater, based on radiant heat flux (output) as an ignition source:** | Chapter 4.2 |

| CFA Guideline – RMP requirement | How this RMP addresses the requirement? |
|---|---|
| • **Around the perimeter of the facility.**<br>• **Between any landscape buffer/vegetation screening and battery energy storage systems (and related infrastructure).** | |
| **The separation distance, based on radiant heat flux (output) as an ignition source, between:**<br>• **Adjacent battery containers/enclosures.**<br>• **Battery containers/enclosures and related battery infrastructure, buildings/structures, and vegetation.** | Chapter 2, 3 and 4.2 |
| **All other controls for the management of on and off-site hazards and risks at the facility (including all proposed battery energy storage system safety and protective systems).** | Chapter 4.2 and 5.5.3 |
| **c) Provide an evidence-based determination of the effectiveness of the risk controls against the identified hazards, including justification for the omission of any battery safety and protective system/s.** | Chapter 5.5.3 |
| **d) Be peer-reviewed by a suitably qualified, independent third party.** | The Project is not proposing variations to the CFA Guidelines and therefore a peer review has not been considered as necessary. |
| **e) Form the basis for the design of the facility.** | The outcomes of the assessment against the CFA Guideline and the risk assessment within Chapter 5 have influenced the design of the Project. |

As per the CFA Guidelines, this report also aligns with NSW Planning's *Hazardous Industry Planning Advisory Paper 2: Fire Safety Study Guidelines (2011)*. The various requirements outlined within the Advisory Paper have been included within this report where it relates to the project. Where the CFA Guideline provides specific requirements relating to matters that are outlined within the Fire Safety Study Guidelines, the CFA Guideline information has been utilised.

In summary, the following sections of the Fire Safety Study Guidelines have been covered within this report.

**Table 2 - Response to NSW Fire Safety Study Guideline**

| Section 2 summary | Response |
|---|---|
| **Identification of fire hazards and the consequences of possible fire incidents** | The CFA Guideline and NFPA 855 provides an outline of the types of fire hazards associated with renewable energy developments. This report also analyses previous fire history (Chapter 5.3) and includes the assessment of risk resulting from these fire events and other information that is supplied by the developer and manufacturer. |
| **Fire prevention strategies and measures** | The outcome of the assessment of risk and the assessment of the design against the CFA Guideline has resulted in a range of fire prevention strategies and measures. These strategies and measures will be included within the Fire Management Plan and include their design and maintenance standards. |
| **Analysis of the requirements for fire detection and protection and identification of the specific measures to be implemented** | The CFA Guideline provides specific fire detection and protection requirements including the installation of a fire hydrant system, detection and suppression systems and bushfire protection measures. |
| **Calculation of firefighting water supply and demand** | The CFA Guideline provides clear requirements to design and install the fire hydrant system to AS2419 – open yard protection requirements. This includes the development of a firefighting water supply and demand requirement for the BESS area. |
| **Containment of contaminated firefighting water** | The CFA Guideline provides the requirement to contain firefighting water at the BESS to enable testing to occur before it is allowed to either entre the stormwater drainage system or needs to be sent to a disposal location. |
| **First aid fire protection requirements.** | The CFA Guideline imposes certain requirements along with the obligation on the operator to meet the occupational health and safety requirements imposed by various legislation. This includes the provision of fire extinguishers, warning signs, road access minimum requirements, staff training, induction programs and emergency management planning. |

# 2 Project Overview

## 2.1 Introduction

The Moreton Hill Wind Farm (the Project) is located in the Central Highlands region of Western Victoria within the Golden Plains Shire and Corangamite Shire local government areas (LGA). The Project Site is approximately 35 km south-west of Ballarat. The nearest townships are Skipton and Linton, approximately 5 km to the west and east of the Project Site, respectively. The Project Site is predominantly used for agricultural practices, primarily dryland mixed farming of sheep, as well as cattle grazing and cropping. The proposed Project Site layout is shown in Figure 1.

Once completed, the Project will accommodate 62 WTGs of up to 252 m in height. With a turbine nameplate capacity of approximately 6.8 Megawatts (MW) the Project would have an estimated installed generating capacity of 421 MW. The Project will connect into the National Electricity Market (NEM) via a 15 km underground transmission line connecting the onsite substation into Berrybank Terminal Station. The Project also comprises of a battery energy storage system (BESS) with a 100 MW 4hr storage capacity, that will enable the Project to store and dispatch scheduled and reliable energy to the NEM.

Modern wind turbines operate at a range of wind speeds, from approximately 3.0 m/s to 25 m/s. Based on onsite wind monitoring the predicted wind resource is considered excellent.

Technical assessments prepared to support the Environment Report and Planning Permit Application have assessed a wind turbine layout consisting of 68 WTGs. These assessments considered six additional WTGs beyond the proposed 62 WTGs in order to allow for flexibility in the project design and respond to environmental and heritage constraints that may arise. WTGs that avoided identified constraints were prioritised in developing the final layout for the Project. This has allowed the Project to seek approval for a layout of 62 WTGs that have been selected to avoid and minimise potential impacts as much as possible. The Project will only seek planning approval to construct and operate up to 62 WTGs. Developments plans to be submitted as part of planning approval will only show locations of the proposed 62 WTGs.

## 2.2 Project overview

The Project involves the establishment of a Wind Farm and associated electrical infrastructure, including a BESS and a new underground transmission line connecting the Wind Farm to the existing electricity network.

The Project's key components include:

- Up to 62 WTGs with a total installed capacity of approximately 421 MW.
- Onsite substation.
- BESS with a storage capacity of approximately 100MW 4hr.
- Underground 220 kV transmission line, connecting the onsite substation to the Berrybank Terminal Station.
- Underground and overhead 33 kV electrical reticulation cabling between WTGs, connecting WTG to the onsite substation.

- Ancillary infrastructure, including operations and maintenance facilities, permanent turbine foundations and hardstands, site access points and access tracks, transmission and grid connection infrastructure.
- Temporary infrastructure required during construction, such as concrete batching plants, site compounds, equipment laydown areas and storage yards.
- Up to four permanent meteorological monitoring masts.
- Eight main site access points off Glenelg Highway and Rokewood-Skipton Road.

## 2.3 Project Site

The Project Site contains the key components detailed above within an area of approximately 6878 ha. The Project Site is defined by a project boundary which accommodates all of the Project's infrastructure. The boundaries of the Project Site are located to align with title boundaries of land hosting infrastructure including accommodating construction activities.

The construction footprint includes land that will be subject to direct disturbance during construction (including the location of infrastructure, access tracks, laydown areas etc.), this equates to approximately 1.4 % of the total Project Site. The construction footprint allows for a disturbance area around both the temporary and permanent Project infrastructure.

The operational footprint representing the permanent Project infrastructure would be much less than construction, equating to approximately 1% of the Project Site.

The Project Site is largely bound by the Glenelg Highway in the north, Cahills Lane in the east, Lismore-Pittong Road in the south and Mount Bute Road in the west. Rokewood Skipton Road bisects the Project site from east to west.

The Project Site is generally flat with no substantial changes in elevation, which allows for efficient and optimal harvest of wind energy. Land within the Project Site has been significantly modified over time to accommodate agricultural uses, including sheep grazing and cropping of cereals and grains. This has resulted in much of the native vegetation within private land being removed, with native vegetation predominantly restricted to roadsides or isolated clusters.

## 2.4 Battery Energy Storage Systems

Whilst the selection of a battery supplier has not been finalised, there are numerous consistencies in the design, construction and installation of the battery units. This is mainly driven by the requirement to comply with International and Australian codes and standards. In relation to managing fire risk, the following standards and codes will be complied with:

- UL9540A Standard for Test Method for Evaluating Thermal Runaway Fire Propagation in Battery Energy Storage Systems
- UL9540 Energy Storage Systems and Equipment
- NFPA 855 Standard for the Installation of Stationary Energy Storage Systems.

The battery unit will likely be assembled offsite within the factory and arrive with a small charge and largely a plug-in type of arrangement. The product will be fitted with a range of systems that manage the battery units and receive and respond to various alerts, these are outlined in Table 2.

The equipment will be supplied with a range of manuals that address installation, maintenance and safety. The manuals will outline the outcomes of the various tests including UL9540A that demonstrates that the design of the system meets the requirements of UL9540.

Table 2 outlines the typical fire safety systems that are likely to be installed within the battery units:

**Table 2 - Overview of fire safety systems**

| Fire Safety System | Description |
|---|---|
| **Battery Management System (BMS)** | The BMS constantly monitors cell and pack level voltage, temperature, State of Charge (SOC), and other parameters to ensure early detection of pre fault conditions, and immediate detection of fault events.<br><br>Should any parameter exceed a permissible value, the BMS will disconnect the affected battery units and send an alarm to the monitoring centre.<br><br>The BMS can be regularly updated as new technologies or learnings are introduced into the software |
| **Detection and suppression systems** | The battery units will be fitted with smoke, heat and gas detectors and an aerosol suppression system to detect and suppress fires. These systems will be connected to a Fire Indicator Panel located within a central area and will also be monitored through the Supervisory Control and Data Acquisition (SCADA) system. |
| **Site Controller and Monitoring (SCADA)** | Beyond the built-in safeguards of the BMS described above, the battery units will have 24/7 remote monitoring, diagnostics, and troubleshooting capabilities, without the need to have a technician on site.<br><br>Customers and first responders will benefit from immediate support from trained technicians via the monitoring centre. Additionally, the facility will have a local SCADA system. |
| **Emergency system shutdown** | In the event of an emergency on site, the battery units can be shut down locally, or remotely. A system shutdown will result in electrical isolation of the battery strings and cessation of battery charging or discharging. |
| **IP Rating** | The IP (Ingress Protection) rating varies for each manufacturer, but it will likely be elevated in that it will prevent ember ingress into the battery units. The IP rating is defined by the international standard EN 60529 (British Standard BS EN 60529:1992). The first digit relates to the ability for solids to enter the enclosure and the second digit indicates the ability for liquids to enter the enclosure.<br><br>Most battery units are a minimum of IP55 rating, and this is classified as: |

| Fire Safety System | Description |
|---|---|
| | • Ingress of dust is not entirely prevented, but it must not enter in sufficient quantity to interfere with the safe operation of the equipment.<br>• Water projected by a nozzle (6.3 mm) against enclosure from any direction shall have no harmful effects.<br>In the unlikely event of a bushfire in the surrounding vegetation that develops embers, the IP rating will likely reduce the ability for embers to enter the battery unit. |
| **Explosion prevention** | The chosen battery unit will comply with Clause 9.6.5.1.5 of NFPA 855. This clause permits compliance with either NFPA 68 or NFPA 69.<br>The explosion prevention system that is provided will be designed to direct overpressure, and any other explosive events or flammable gases, away from the battery unit. |

### 2.4.1 Battery unit design fire

The BESS supplier selection process will be guided by the information contained within this RMP.

The minimum requirements include:

- The battery unit and its components has been tested in accordance with the UL9540A test method.
- The BESS supplier has undertaken a large-scale fire test to demonstrate that the separation between the battery units is sufficient.

Prior to construction, and once a BESS supplier is selected, more detailed analysis will be undertaken to ensure the outcomes of fire testing meets the requirements of the CFA Guidelines. The available data will provide a range of information including:

- The likely radiant heat impact on adjoining battery units from a fully involved battery unit fire.
- The performance of the cell, module and unit when exposed to elevated temperatures as specified within UL9540A.
- The required separation distances to prevent fire spread between battery units.

## *2.5 Wind Turbines*

As with the BESS development, the selection of the turbine manufacturer will not occur until the project has planning approval. However, the types of risk and the mitigation of these risks is generally consistent.

The turbine is one element of the equipment required to support the generation of electricity. The key components include:

- Nacelle
- Turbine (located within the nacelle)
- Tower
- Substation

As with any electrically charged equipment, they can be a fire hazard, and the two key areas are the nacelle and the Substation areas. The nacelle, housing the generator, gearbox, and electrical components, is the most fire prone section of a wind turbine due to its enclosed structure, high electrical loads, and presence of lubricants that may be flammable. The base of the turbine and nearby electrical substations contain transformers, switchgear, and power electronics that could potentially contribute to the fire hazard.

The typical fire mitigation systems installed within this type of infrastructure includes:

- Gaseous fire suppression system
- Smoke detection systems
- Use of low flammability oils within the nacelle.

In addition to the mitigation systems, a wind turbine must comply with a variety of Australian and Internation Standards including AS3000:2018 – Wiring Roles.

## 2.6 Transmission Line

There is an underground high voltage transmission line connecting the project to the Berrybank terminal station and a very small section of overhead low voltage reticulation across Hoyles Creek. The transmission line is being constructed to provide the ability to transmit electricity to the National Electricity Grid from the Wind Farm to the Substation and BESS. The transmission line will be established underground, through a road reserve. Once established, the ongoing risk associated with the underground transmission line will be negligible.

The presence of people, vehicles, plants and construction activities within bushfire prone land during the construction phase can lead to an elevated fire risk.

Bushfire risk assessments will often be influenced by the presence of people, the type of equipment being used and the infrastructure itself. During the construction phase, people and equipment will be present and interacting with the surrounding environment undertaking activities that could be an ignition source. These would likely include driving vehicles, operating equipment that relies on a power source and personal behaviours that may cause an ignition if not undertaken carefully (i.e. smoking).

The management of ignition risks is often driven by ensuring site based personal behaviours and activities are safe and unlikely to cause an ignition. These behaviours and actions would include equipment test and tag programs, smoking only occurring in fuel free environments, the introduction of a hot works permit system and restricting vehicles travelling on vegetated surfaces during the Fire Danger Period.

Regarding the operation of the transmission line infrastructure, the transmission line will be almost entirely underground. Additionally, there is no history of transmission lines starting fires[1]. They are regarded as having the lowest bushfire risk of all powerline infrastructure. CFA indicate that the fire ignition risk for transmission lines relates to the construction period[2].

The CFA indicates the presence of the Bushfire Mitigation Plan for the Electricity Transmission Network that is required by the Electricity Safety Act (1998). The responsibility to ensure that the Bushfire Mitigation Plan is maintained and effective is assigned to Energy Safe Victoria (www.esv.vic.gov.au). Any new transmission line infrastructure is required to comply with the legislative requirements and ensure a Bushfire Mitigation Plan is in place and approved by Energy Safe Victoria.

In summary, the main risk associated with the transmission line is during the construction phase. Once the infrastructure moves into the operations phase, residual risk will be considered negligible.

## 2.7 CFA engagement

On 8th April 2026 a meeting occurred with CFA in relation to their preliminary comments on the proposed treatment of fire risk. CFA provided feedback on the project, and this included:

- CFA noted they would be comfortable with the turbine layout as it stands. However, they did suggest further detail in relation to Turbine 25 which is located within the BMO.
- CFA are comfortable with current turbines in the cleared areas of BMO in the northeast (T19, T22, T27, T21, T15, T8, T10).
- CFA queried potential for plantations to be re-planted in the future. RE Futures noted that existing agreements with landholders have restrictions in place for plantings to occur.
- CFA noted that for endorsement of management plans post approval, CFA will want the plans to reflect current status of vegetation and provide details on the restrictions captured in landholder agreements.
- CFA queried location of the nearest fire station. This has been confirmed as Mannibadar Fire Brigade located more than one kilometre from the closest WTG.

[1] https://www.energyco.nsw.gov.au/sites/default/files/2024-09/energyco-fact-sheet-bushfire-risk-september-2024.pdf#:~:text=While%20electrical%20infrastructure%20can%20present%20a%20fire%20risk%2C,of%20all%20powerline%20infrastructure%20%28transmission%20and%20distribution%20lines%29.

[2] https://www.cfa.vic.gov.au/about-us/what-we-do/fighting-fires-around-transmission-lines

# 3 Existing conditions assessment

## 3.1 Site description and location

The Wind Farm is spread over approximately 6,878 hectares and is in south-west Victoria between the townships of Skipton and Linton. The project involves the construction, commissioning and operation of up to 62 WTGs (see Figure 1), BESS and associated infrastructure. It should be noted that while 68 WTGs are shown in Figure 1, only 62 will be constructed and operated.

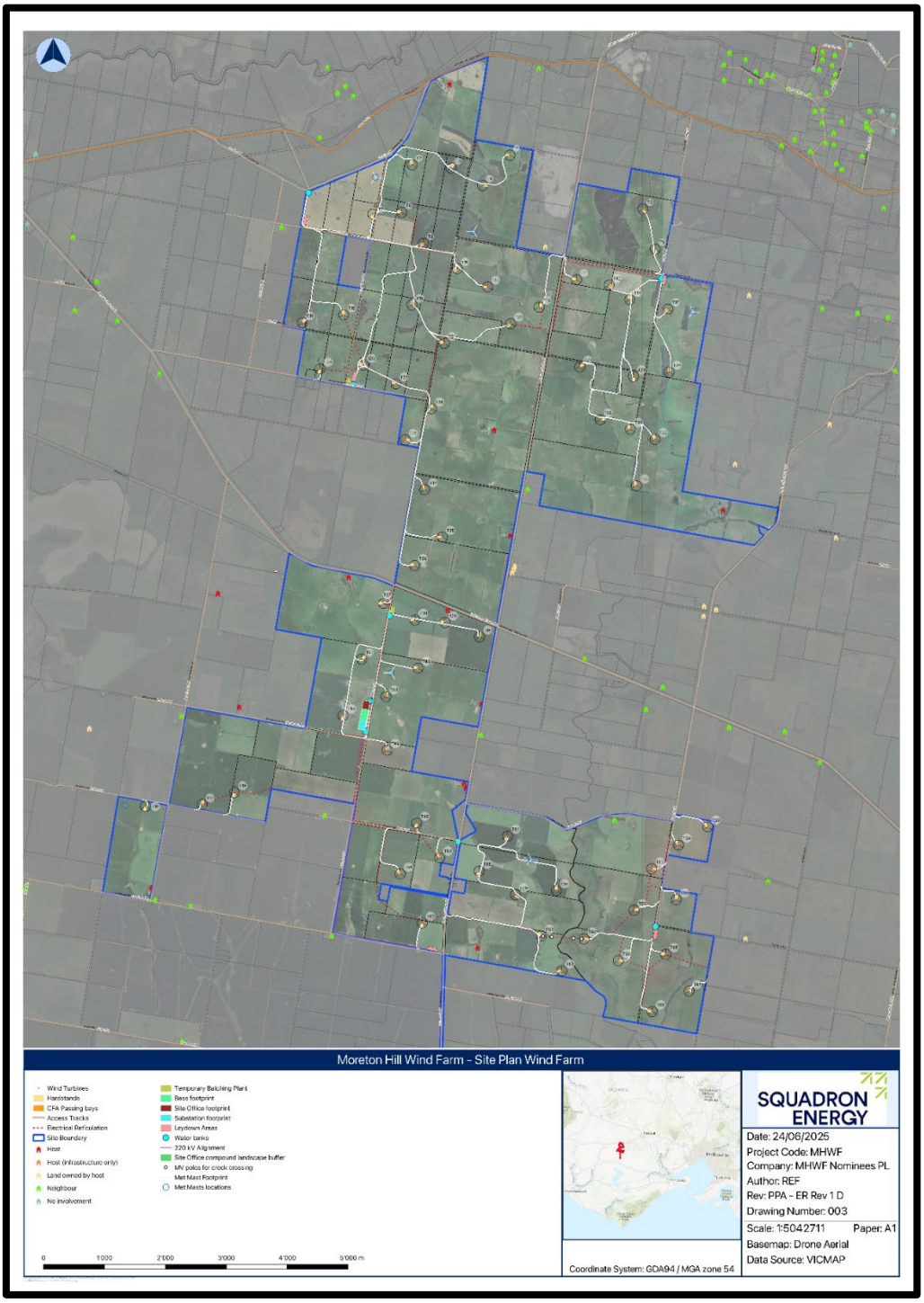



**Figure 1 - Overview of the Moreton Hill Wind Farm (supplied by RE Future)**

## 3.2 Risk indicators

The following information has been obtained and provides relevant information that informs the analysis of risk. This information is primarily related to the bushfire risk that exists in the surrounding area.

### 3.2.1 Bushfire Management Overlay

The Bushfire Management Overlay (BMO) is a Planning Scheme Overlay provided within the Victorian Planning Scheme. It is reliant on areas of a municipality being identified as at risk from bushfire.

The criteria[3] to determine if a BMO should be implemented includes the identification of vegetation that may include forest, woodland, scrub, shrubland, mallee and rainforest vegetation that is 4 hectares or more in size. Once this is confirmed, a 150 metre buffer is applied from the edge of vegetation. Fire authorities also have the ability to advise locations that may be subject to extreme landscape bushfires.

Figure 2 outlines the location of the BMO in relation to this Wind Farm. The BMO has not been updated following the removal of plantations that were in place when the BMO was mapped. The area that this relates to is to the south of Moreton Hill Road. Most of the landscape that is covered by the BMO in this area is no longer a Plantation and is utilised for farming activities with grassland being the dominant vegetation.

The proposed Wind Farm has ensured that the WTG, substation or the BESS are not located within areas where the bushfire risk is elevated. It is acknowledged that the proposed plan outlines the placement of WTGs within the BMO, but these areas have been largely cleared.

There is one location where the WTG (T25) is located within the BMO and adjacent to a small area of forested vegetation (Figure 2). This area is approximately 6 hectares in size and is separated some distance from other areas of forested vegetation or covered by the BMO. The location of the WTG will result in the removal of some of the vegetation thereby reducing the size of the patch. The vegetation is not fenced off, and stock are permitted to graze under the tree canopies.

[3] https://www.planning.vic.gov.au/__data/assets/pdf_file/0027/447921/Fact-sheet-Bushfire-mapping-methodology-and-criteria.pdf

**Figure 2 - Area of vegetation located adjacent to T25. Photo taken from the north looking south**

The fragmentation of the BMO and the limited connection between the areas is unlikely to support an elevated landscape risk assessment outcome. There are several landscape features that will likely slow or stop bushfires from spreading. These include changes in vegetation types and the surrounding road network.

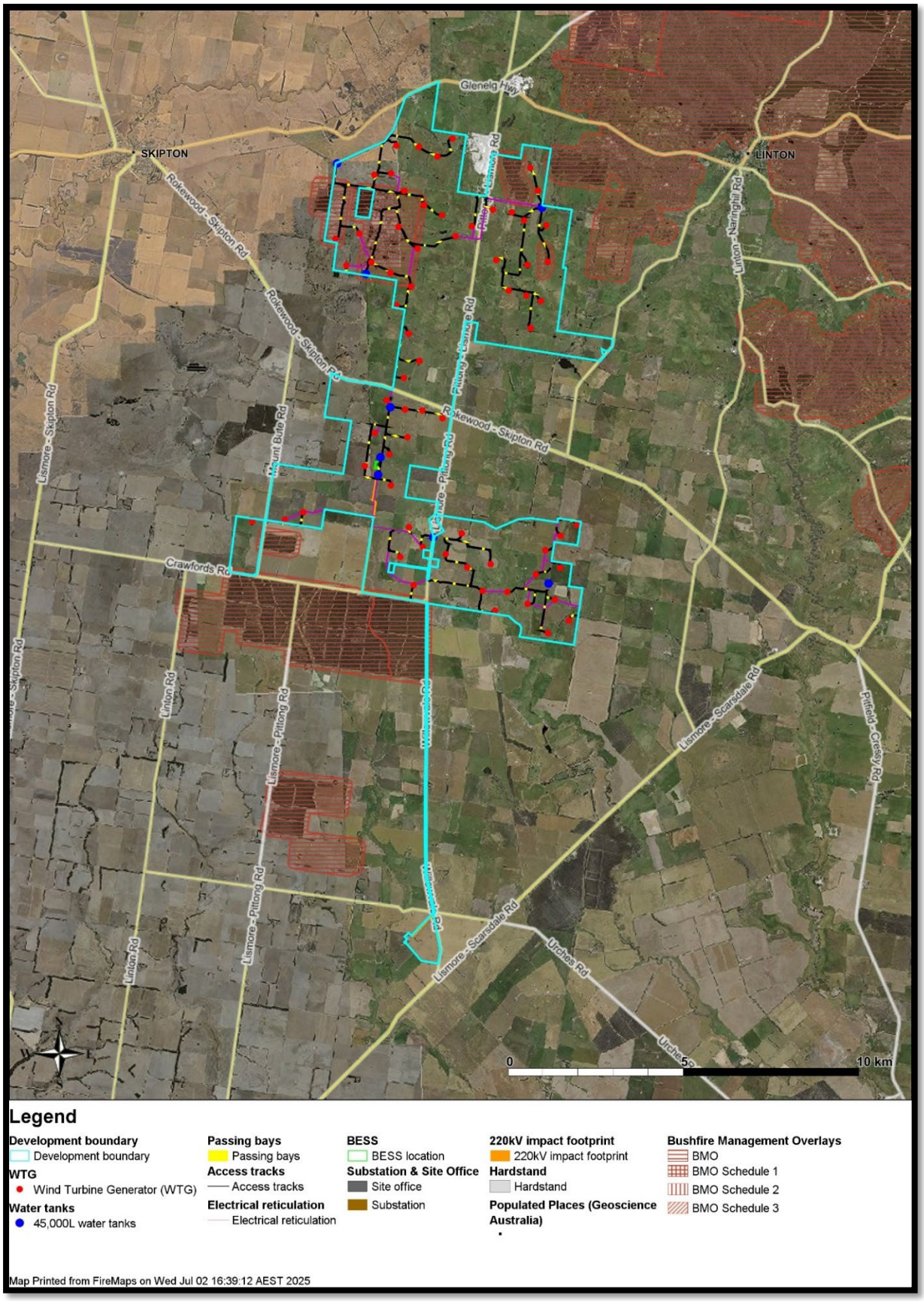



**Figure 3 - Location of Bushfire Management Overlay (red) in relation to the Proposed Wind Farm**

### 3.2.2 Bushfire Prone Area

Bushfire Prone Areas (BPA) are areas that are subject to, or likely to be subject to, bushfires. The Minister for Planning has determined that specific areas are designated BPAs for the purposes of the building control system. Specific bushfire construction standards apply in designated bushfire prone areas in Victoria. The entire Wind Farm is located within a Bushfire Prone Area.

These bushfire construction requirements are aimed at improving bushfire protection for residential buildings. The creation of the BPA map fulfils one of the 67 recommendations made by the Victorian Bushfires Royal Commission that occurred following the 2009 Black Saturday bushfires.

Whilst the control's purpose is for the improvement in residential construction, it is also a trigger for other controls including an assessment against Clause 13.02 of the Planning Scheme. Refer to Section 4.1.

### 3.2.3 Municipal Fire Management Plan

As the project is located across two municipalities (Corangamite and Golden Plains) and that a large component of the bushfire hazard is located to the north within the Pyrenees Shire, the assessment of the municipal fire management planning arrangements has included all three areas.

The three plans that have been considered are:

- Otway District Strategic Fire Management Plan 2021-24 (Shires of Corangamite, Colac Otway and Surf Coast)[4]
- Golden Plains Shire Municipal Fire Management Sub Plan[5]
- Municipal Fire Management Plan 2018 – 2021 Pyrenees Shire[6]

Figure 3 outlines the location of the Wind Farm in relation to the three surrounding municipalities.

The project is located at the northern end of the Corangamite Shire and the Otway District Strategic Fire Management Plan which covers this area does not specifically mention this location. The Plan recognises the presence of farming properties and that these are considered a lower risk when compared to forested environments. The Plan does not outline any additional treatments required in this area other than the ongoing treatments including fire prevention inspections, roadside vegetation management and community education.

The Golden Plains Fire Management Plan outlines the Linton area and the elevated risk due to the mix of forested vegetation and residential areas. Bushfires in the area surrounding Linton would likely not cause issues due to the north westerly and south westerly wind patterns that are usually associated with elevated fire danger days. It is an important consideration for the project to limit the possibility of bushfires that may be caused by the Wind Farm to impact on the residential areas to the north west under a south westerly wind.

[4] https://www.corangamite.vic.gov.au/files/assets/public/documents/plans-amp-strategies/emergency/strategic-fire-management-plan-otway-district-2021-2024-final.pdf

[5] https://www.goldenplains.vic.gov.au/sites/default/files/2023-05/Golden%20Plains%20Shire%20MFMP%20-%20FINAL%202023%20-%202026%20V1.pdf

[6] https://www.pyrenees.vic.gov.au/files/assets/public/council-publications/2018.12.12-pyrenees-shire-municipal-fire-management-plan-2018-21-v1.03.pdf

The Plan that outlines the management of the north westerly bushfire hazard is the Pyrenees Municipal Fire Management Plan. The Wind Farm is not located within the Pyrenees Shire, but the hazard influences the overall bushfire risk of the project. In describing the landscape, the Plan states:

*South of the Shire are extensive open grassed farmlands which are used for cropping and raising stock.*

The landscape is dominated by farming properties and extensive areas of grassland and cropping. The risk of fast running grassfires is elevated during the Fire Danger Period.

All three Plans outline the importance of the Glenelg Highway as a strategic fire break and that this is maintained by the relevant Road Manager. This includes the management of excessive fuel loads and regular slashing of parts or all of the roadside.

The Plans also outline that several roads within the surrounding landscape have been identified as fire breaks. The listed roads have been allocated a treatment being either grazing, burning or slashing. This detail is available within the relevant Plan.

The existing strategic fire break network provides a network of fuel managed areas that may either slow or stop a bushfires spread. The likely bushfire approaches from the north western or south western aspects are likely to be influenced by the presence of the strategic fire breaks.

The Plans also outline several treatments that are provided to address bushfire risk across the municipalities. The treatments include:

- Community education programs
- Fire Danger Period advisory signs
- Neighbourhood Safer Places (Linton)
- Private property planning
- Municipal Fire Prevention Notices
- Fuel hazard reduction

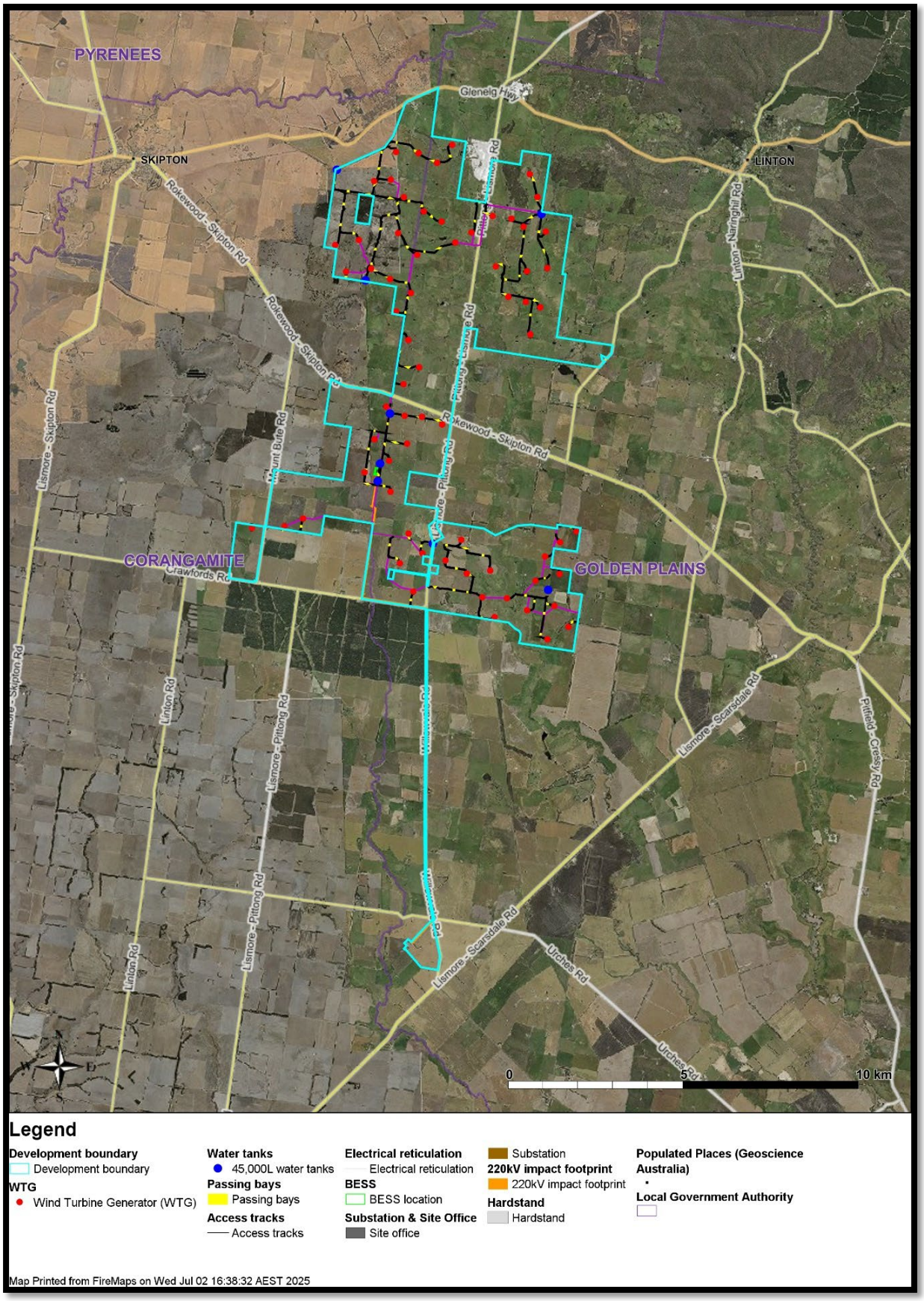



**Figure 4 - Overview of municipalities surrounding the project site.**

### 3.2.4 Safer Together assessment[7]

The Safer Together project delivered by the Victorian State Government has developed strategies for the various Regions of Victoria. The Barwon South West Bushfire Management Strategy was developed to reflect the region's unique environments and communities and includes the location for the Moreton Hill Wind Farm. The strategy was developed through a regional planning process that was guided by the knowledge and priorities of experts, stakeholders and community members from the Region.

The Barwon South West Bushfire Management Strategy 2020 is the result of an analysis of bushfire risk across the Region. The Strategy indicates the threat of grassfires, however it does not provide any additional strategies to reduce the risk other than those already undertaken.

### 3.2.5 Bushfire history

An analysis of bushfire history in the area surrounding the proposed Wind Farm indicates some bushfire activity in the surrounding landscape, with little impact on the project site. According to the data provided by DEECA (Figure 4), there is no evidence of historical bushfires within the project footprint, except for one planned burn in 2020. Some smaller bushfires have occurred in the surrounding landscape; however, it appears that rapid intervention has kept the fires to a small size.

The larger fires in the surrounding landscape are typical of a north westerly influence followed by a south westerly wind change. Under elevated fire danger conditions, large bushfires can travel large distances through the grass fuels and under a south westerly wind change, turn the eastern flank into the fire front. These types of fires would likely travel rapidly but with less intensity when compared to bushfires in forested areas.

The landscape to the east of the Wind Farm due to the prevalence of forested areas has experienced regular bushfire activity. These areas would also experience regular fuel reduction burning activities within the Public Land properties. The western area of Victoria, including the surrounding landscape, also experiences regular roadside burning programs by CFA Brigades.

[7] Barwon South West Bushfire Management Strategy 2020 - https://www.safertogether.vic.gov.au/__data/assets/pdf_file/0024/493530/DELWP_BushfireManagementStrategies_2020_BarwonSouthWest_rr.pdf

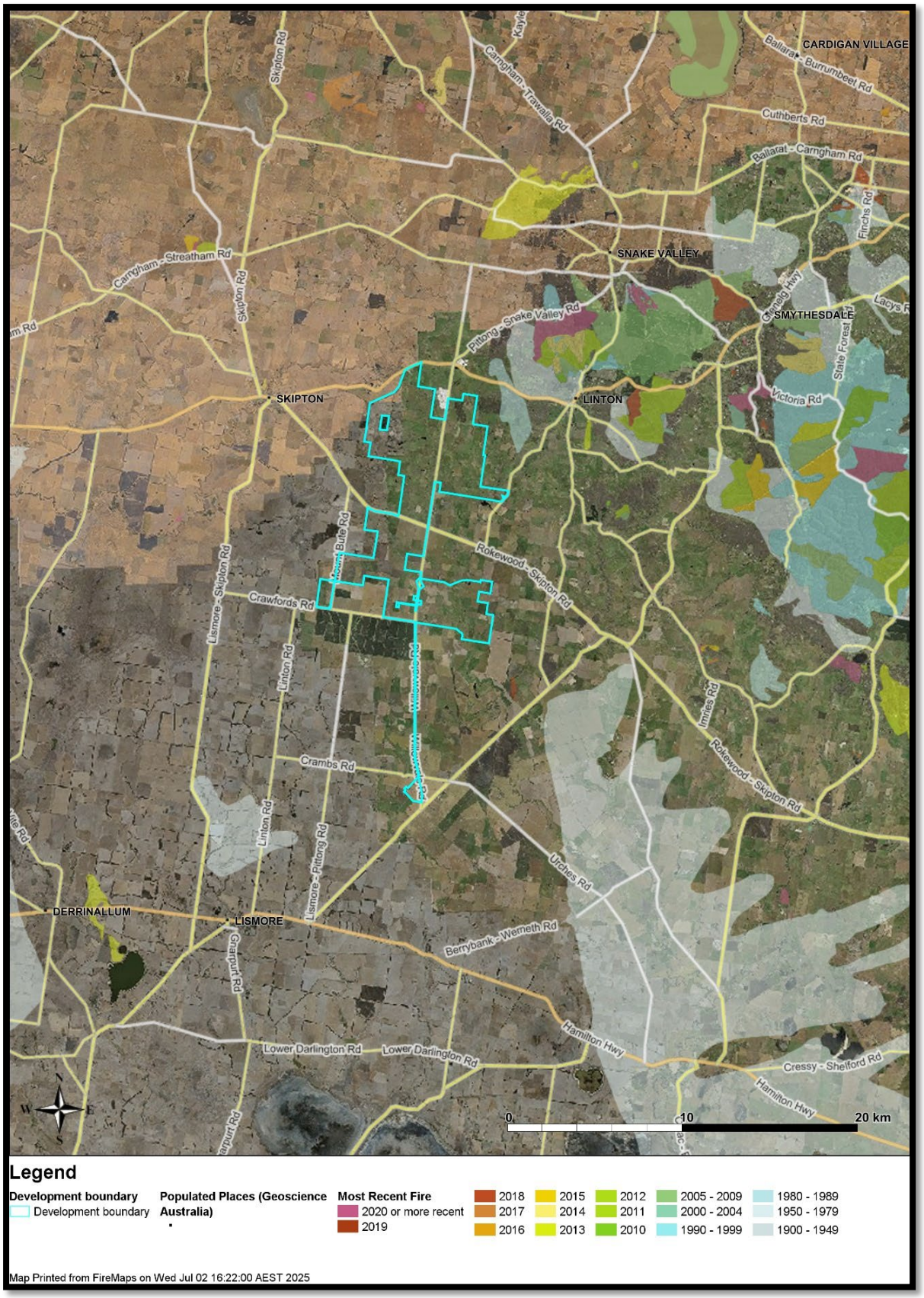



**Figure 5 - Bushfire history surrounding the Moreton Hill Wind Farm**

# 4 Risk assessment process

To effectively assess the fire risk associated with the proposal, this report is structured to assess risk using the following frameworks:

- Clause 13.02 -1S – Bushfire Planning
- Assessment against the requirements of the CFA Guideline *Design Guidelines and Model Requirements: Renewable Energy Facilities 2023 V4.3* (*updated 2025 V4.4)*
- Risk assessment that meets section 5 of the CFA Guidelines.

The risk assessment provides the opportunity to bring the information gained from the above processes or information together and if required, make any additional recommendations. All recommendations are aimed at reducing the risk to an acceptable level.

## *4.1 Clause 13.02-1S – Bushfire planning assessment*

Clause 13.02-1S of the Corangamite and Golden Plains Planning Schemes aims to strengthen the resilience of settlements and communities, prioritising the protection of human life through several objectives. However, it should be noted that the proposed Wind Farm does not introduce new settlements into the landscape. The assessment has been undertaken within the context of a Wind Farm and BESS. Clause 13.02 – 1S is the same for both Golden Plains and Corangamite Shires.

### 4.1.1 Bushfire hazard assessment

Elevated bushfire behaviour in south east Australia is often dominated by strong and gusty north westerly winds followed by a south westerly change that normally occurs in the afternoon or early evening. These conditions have historically caused the loss of life and property and are usually associated with elevated fire danger warnings issued by the fire agencies.

Table 3 below outlines the hazard assessment relating to the proposed Wind Farm. Figure 5 and Figure 6 provide an overview of the likely bushfire scenarios within the surrounding area. The assessment has identified the presence of the north west and south west likely bushfire impacts. This is supported by the Municipal Fire Management Plans outlined within Section 3.2.3.

**Table 3 - Assessment against Clause 13.02**

| Bushfire hazard type | Conditions | Likely Scenario | Considerations |
|---|---|---|---|
| **The site for the development** | Once completed, the Wind Farm and BESS will be required to comply with conditions as specified within the CFA Guideline that includes the management of vegetation around the base of the turbine towers and surrounding the BESS and other infrastructure during the Fire Danger Period.<br><br>During construction, there is a risk of a fire igniting and spreading through unmanaged vegetation.<br><br>During the construction phase, the properties surrounding the construction area will continue to be used for farming activities including stock grazing.<br><br>The Wind Farm is separated into various areas by roads. | A bushfire starting on the property is a possibility in particular during the construction phase due to the increased number of people working on the project and the operating machinery.<br><br>Bushfires that are started by lightning, arson or other human caused events could burn through the Wind Farm and threaten the surrounding properties and the BESS.<br><br>The access track network and vegetation management requirements around the turbine towers, BESS and other infrastructure will limit bushfire spread under elevated fire danger conditions.<br><br>During construction, any work that is occurring near unmanaged grassland has the potential to start a bushfire and leave the property. | During the construction phase of the Wind Farm and BESS, where possible, all vegetation within 100 metres of works areas (where achievable) is to be managed during the Fire Danger Period with all grassland less than 100mm in height.<br><br>When the fire danger conditions are elevated (Catastrophic), the Emergency Management Plan will outline procedures to close the site during the construction phase and limit maintenance operations unless critical.<br><br>The CFA Guideline requires the provision of vegetation management surrounding the base of the turbine towers, the BESS area and other infrastructure.<br><br>The access roads will be established during the construction phase and maintained for the life of the project. These access roads will likely assist with bushfire containment under lower fire danger conditions. |
| **Neighbourhood (400 metres) and local conditions (one kilometre)** | Within one kilometre of the Wind Farm, the surrounding landscape is predominantly grassland that is used | Under strong wind conditions a bushfire can travel quickly across the landscape. Grassfires are heavily influenced by the quantity of | The provision of access roads throughout the Wind Farm will assist with containing bushfires and providing increased accessibility to the landscape. |

| Bushfire hazard type | Conditions | Likely Scenario | Considerations |
|---|---|---|---|
| | for agricultural purposes.<br><br>There is an area of plantations to the south of the Wind Farm that will likely contribute to short distance spotting.<br><br>The surrounding road network provides access and egress opportunities for emergency services and in some cases, these are maintained as fire breaks. | fuels within the paddocks and the wind strength.<br><br>Roadsides will contribute to bushfire spread due to the unmanaged fuels and the presence of trees that will likely generate short distance ember attack.<br><br>The nature of the farming properties results in a highly fragmented landscape where some areas are considered as containing reduced fuel or other areas have elevated fuels due to cropping. | The managed areas will also significantly limit the chances of a bushfire starting at the towers and BESS. |
| **Landscape conditions (20 kilometres)** | The landscape surrounding the Wind Farm consists of primarily grassland vegetation.<br><br>There are small areas of forests and plantations to the south and east of the Wind Farm. | The likely bushfire behaviour will involve fast running grass fires that will have varying intensities and will be heavily influenced by changes in vegetation types and other landscape features including dwellings, managed areas and roadways.<br><br>The grass fire can approach from any direction, but the greatest risk is from the north west or south west aspects. | The protection of the Wind Farm and BESS infrastructure from bushfire impact is required by the CFA Guideline.<br><br>The provision of access roads will increase the ability for firefighters to access the areas surrounding the Wind Farm. |

### 4.1.2 Bushfire Hazard Landscape Assessment

Figures 5 and 6 outlines the outcome of the bushfire hazard landscape assessment. The assessment identifies the two likely scenarios that may occur in relation to the Wind Farm. Both scenarios are consistent in that the likely bushfire impact on the Wind Farm is from either the northwest or southwest. Table 4 provides a description of each of the scenarios contained within Figure 5 and Figure 6.

**Table 4 - Bushfire scenarios**

| Scenario | Description |
|---|---|
| A | Bushfires burning under a north westerly wind influence will burn through predominantly grassland fuels. These fuels will be varied due to the different farming practices, private, municipal and state roads and residential properties. Traditionally a north westerly wind influence is associated with elevated fire danger days.<br><br>Other landscape features including the surrounding fire breaks listed within the Municipal Fire management plans and roadside management undertaken by adjoining landowners will provide opportunities to slow or stop bushfires spreading in the local area.<br><br>It is likely for the new track network to provide additional areas where bushfire spread may be interrupted depending on the fire danger conditions. |
| B | A bushfire that approaches under a south westerly wind influence usually occurs after a north westerly wind has been influencing the weather conditions. The wind change can occur after a bushfire has been burning for some time under the north westerly influence. Depending on the location of the bushfire, the entire western and southern side of the Wind Farm can come under threat at the same time. This type of bushfire behaviour is consistent with large grassfires that have occurred in the past in the surrounding landscape.<br><br>The presence of the Plantation to the immediate south of the Wind Farm and other treed areas throughout the landscape will likely contribute to the generation of embers.<br><br>The fragmented vegetation that is associated with farming activities will influence bushfire behaviour. The road network will also contribute to slowing or stopping the bushfire spreading. |

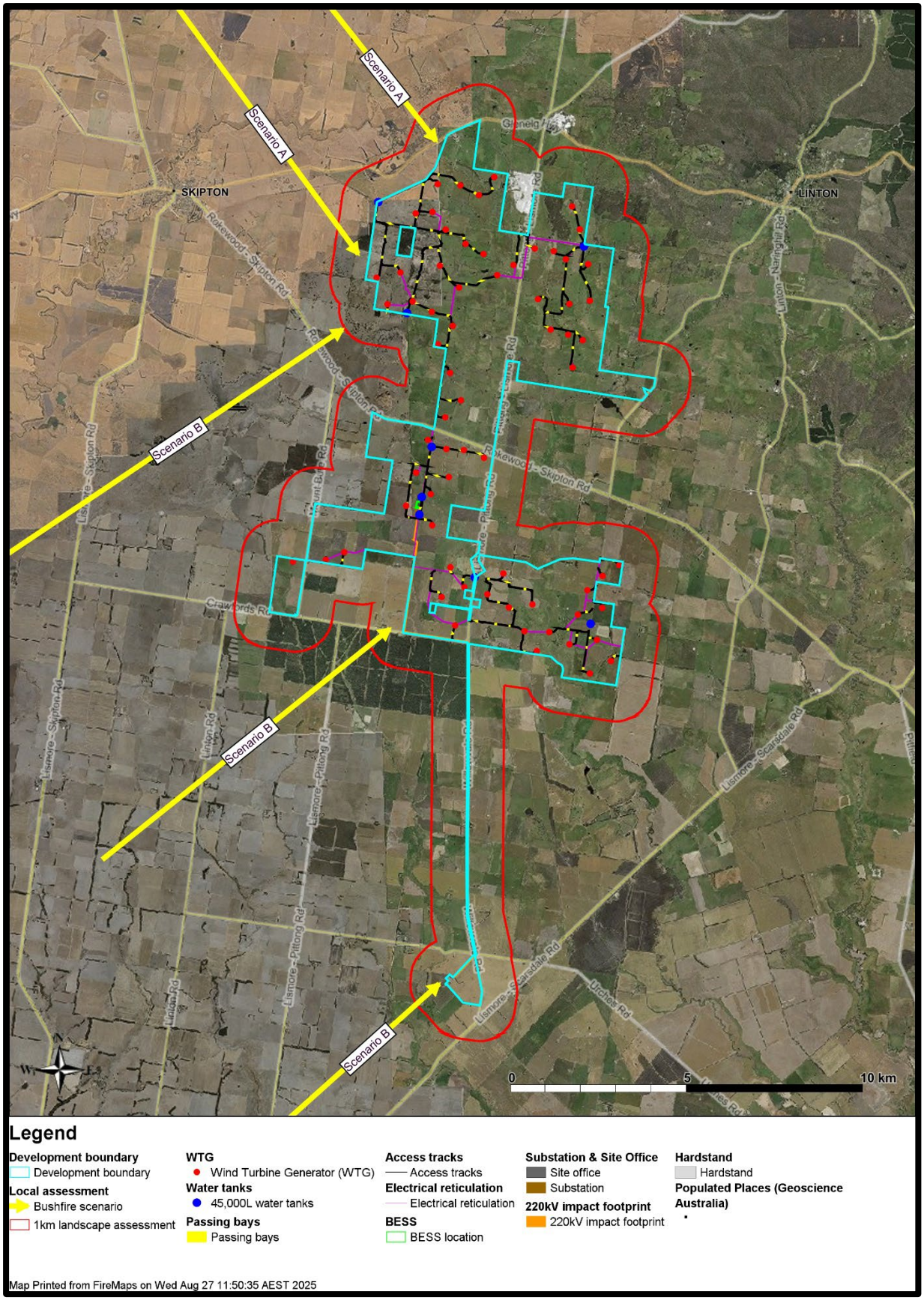



**Figure 6 – One kilometre local condition assessment**

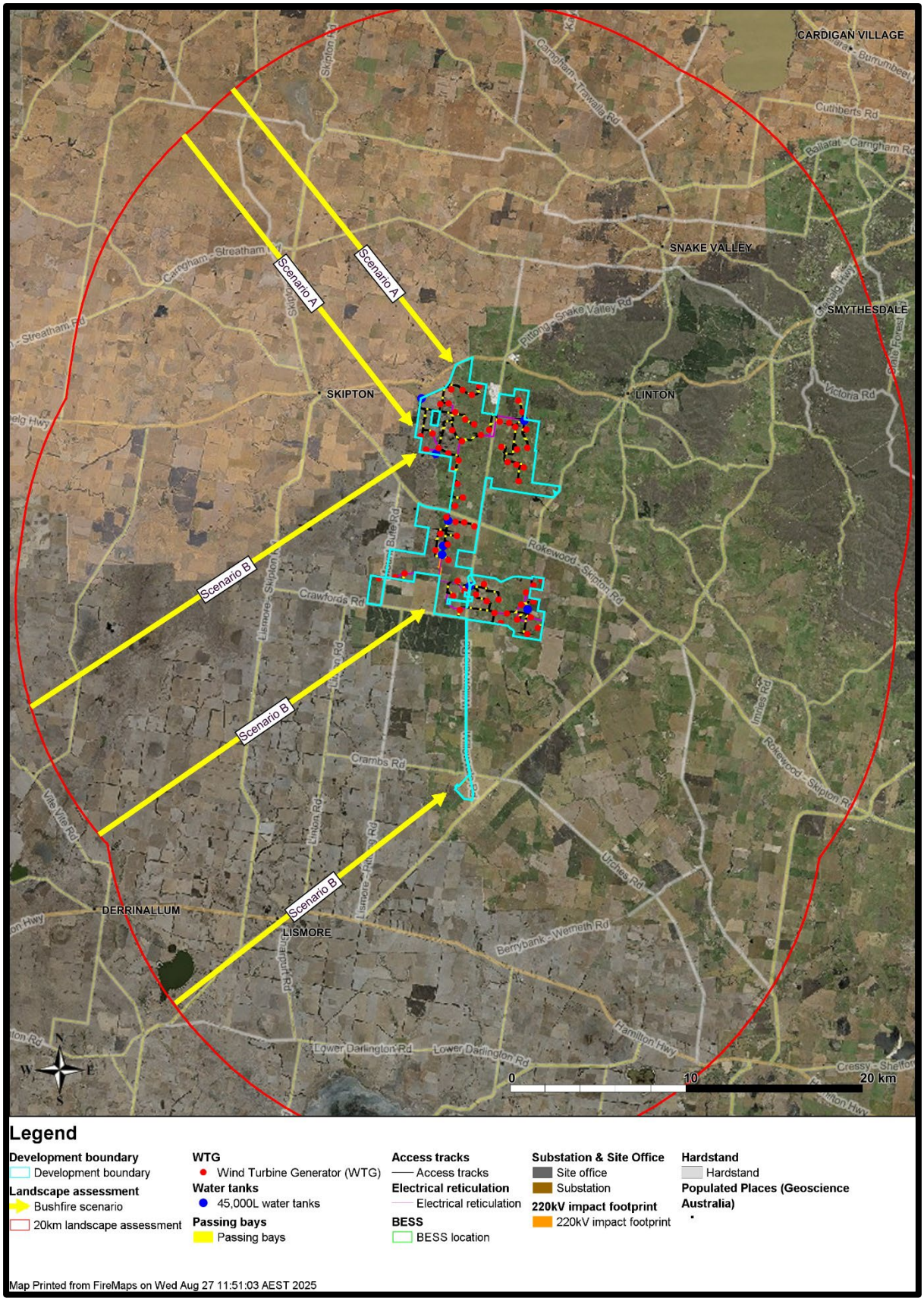



**Figure 7 - 20 kilometre landscape assessment**

Clause 13.02 Settlement Objectives are primarily related to settlement development of which it could be argued that a Wind Farm and BESS does not meet these definitions. Regardless, an assessment of the project has been undertaken against the Settlement Objectives to allow for a detailed consideration of the project against the Clause 13.02 Policy.

**Table 5 - Response to Clause 13.02 - Settlement Objectives**

| Settlement planning objectives | Project response | Achieved (✓ or ×) |
|---|---|---|
| **Directing population growth and development to low risk locations, being those locations assessed as having a radiant heat flux of less than 12.5 kilowatts/square metre under AS 3959-2009 Construction of Buildings in Bushfire-prone Areas (Standards Australia, 2009).** | This project does not promote population growth and will only have people onsite during the construction phase and when undertaking maintenance during the operations phase.<br><br>The design has ensured that the location of the infrastructure will be in low risk areas. | ✓ |
| **Ensuring the availability of, and safe access to, areas assessed as a BAL-LOW rating under AS 3959-2009 Construction of Buildings in Bushfire-prone Areas (Standards Australia, 2009) where human life can be better protected from the effects of bushfire.** | The Wind Farm project will result in areas that will achieve a Bushfire Attack Level (BAL) Low rating when assessed against AS3959. This will include the BESS, substation and compound areas.<br><br>Depending on the location of a bushfire in the surrounding landscape, there are several travel routes available to leave the area and travel to an area deemed to be BAL LOW. These locations would include Skipton and Linton. There is a Neighbourhood Safer Place in located within Linton.<br><br>The identification and travel routes to the various locations that meet the BAL LOW requirements will be addressed within the Emergency Management Plan that is developed for the Wind Farm and BESS. | ✓ |
| **Ensuring the bushfire risk to existing and future residents, property and community infrastructure will not increase as a result of future land use and development.** | The Wind Farm and BESS will be provided with a range of protection measures that will ensure the bushfire risk to existing and future surrounding properties will not increase. These measures include:<br><br>• Asset Protection Zone surrounding the base of each Turbine Tower, the BESS area, substation and other works areas.<br><br>• A fire detection (smoke/heat) and suppression (gas) system will be installed within the high risk electrical cabinets in the wind turbine nacelle, with the details/design of this system to be determined in consultation with CFA. | ✓ |

| Settlement planning objectives | Project response | Achieved (✓ or ✗) |
|---|---|---|
| | • BESS design considerate of fire risk and provided with suitable monitoring systems with the aim of preventing fires.<br>• Access road network to be developed and maintained to allow for access to each of the towers.<br>• Provision of static water supplies to support firefighting operations at the BESS and throughout the Wind Farm. | |
| **Achieving no net increase in risk to existing and future residents, property and community infrastructure, through the implementation of bushfire protection measures and where possible reducing bushfire risk overall.** | The fire protection measures required by the CFA Guideline ensures that there is no net increase in risk to existing and future residents.<br>The site for the Wind Farm and BESS has been chosen to ensure separation from existing dwellings is achieved. | ✓ |
| **Assessing and addressing the bushfire hazard posed to the settlement and the likely bushfire behaviour it will produce at a landscape, settlement, local, neighbourhood and site scale, including the potential for neighbourhood-scale destruction.** | The bushfire risk has been assessed at the landscape level. This has identified the potential for long bushfire runs to occur from the north west and south west aspects.<br>This project will not change the current expected bushfire behaviour in the landscape, it will likely reduce the risk in the surrounding areas due to the addition of an access track network and management around the base of the turbines, BESS and other works areas. | ✓ |
| **Assessing alternative low risk locations for settlement growth on a regional, municipal, settlement, local and neighbourhood basis.** | The project including a Wind Farm and the BESS is required to occur in remote locations. This area has been chosen due to the low number of dwellings in the surrounding landscape.<br>The CFA Guideline requirements ensures the management of risk is occurring that reflects the landscape bushfire risk. | ✓ |
| **Not approving any strategic planning document, local planning policy, or planning scheme amendment that will result in the introduction or intensification of development in an area that has, or will on completion have, more than a BAL-12.5 rating under AS 3959-2009 Construction of Buildings in Bushfire-Prone Areas (Standards Australia, 2009).** | The Wind Farm will achieve a less than BAL 12.5 rating when assessed against AS3959 through the provision of Asset Protection Zones around the infrastructure. | ✓ |

### 4.1.3 Assessment against Clause 13.02 summary

The assessment against Clause 13.02 has identified that the Wind Farm is within an area where the landscape bushfire risk is influenced by the potential for grassfires in the surrounding landscape. These grassfires have the potential to travel long distances depending on the weather conditions being experienced. However, the proposal has been designed to limit both the potential impact on the Wind Farm and the BESS and the potential for fires to leave the property and enter the surrounding landscape. As the project is required to achieve the requirements outlined within the CFA Guidelines as a minimum, this will ensure that the settlement planning objectives are achieved.

## *4.2 Analysis against CFA Guideline*

CFA has produced Guidelines that outline their requirements to address fire risk within renewable energy installations. Section 5 of the Guideline outlines the process to analyse risk to enable the identification of hazards that may or can cause fires.

The CFA Guideline also specifies model requirements for renewable energy installations. Prior to the risk assessment being undertaken, it is important to assess the Wind Farm and BESS project against these requirements. This will increase the effectiveness of the risk assessment.

The following table provides the model requirements from CFA's Guideline and how this project addresses the specific areas.

**Table 6 - Response to CFA Guideline**

| Model requirement | Compliance | Comments |
|---|---|---|
| **Section 2 – consulting with CFA** | | |
| a) Where located within a Bushfire Prone Area, bushfire risk is addressed according to the Victoria Planning Provisions, Clause 13.02-1S (Bushfire Planning), through bushfire hazard identification and assessment (including a bushfire hazard site and landscape assessment). This assessment must include risks to the proposed technologies from the landscape (bushfire/grassfire). | ✓ | The property is within a BPA with the BMO in the surrounding landscape. This RMP includes an assessment against Clause 13.02 within Section 5.1. The assessment has identified the potential for bushfires to approach the development from either the northwest or southwest. |
| b) Address risks from proposed technologies through a comprehensive risk management process, documented in a Risk Management Plan. | ✓ | This RMP includes an analysis of risk to demonstrate that the mitigation solutions are sufficient to manage the fire risk. |
| c) Indicate where the exact specifications of elements within the renewable energy facility will be determined during the detailed | ✓ | This RMP considers the indicative layout and design and identifies further design solutions to manage the fire risk. |

| Model requirement | Compliance | Comments |
|---|---|---|
| design phase, such as solar panel and wind turbine model/manufacturer and battery chemistry. | | The RMP will be updated prior to construction, in accordance with any anticipated Planning Permit conditions, and for the final BESS supplier and project layout. Additionally, informed by the RMP, a Fire Management Plan and Emergency Management Plan will also be developed. |
| d) Explicitly state that the following documentation will be prepared in accordance with this guideline, in consultation with CFA, before development starts:<br>• Risk Management Plan<br>• Fire Management Plan<br>• Emergency Management Plan | ✓ | This document is the Risk Management Plan (RMP), which (as discussed above) will be updated prior to construction. The outcomes of this assessment will inform the preparation of a Fire Management Plan and Emergency Management Plan. |
| **Section 3 – Risk Management Plan** | | |
| A Risk Management Plan must be developed for all renewable energy facilities. | ✓ | This Risk Management Plan has been prepared for the proposed Wind Farm and BESS. |
| The Risk Management Plan must: | | |
| a) Describe the infrastructure (natural and built), landscape, nature of operations and occupancy of the facility. | ✓ | Refer to Section 2. |
| b) Describe the risks and hazards at the facility to and from the renewable energy infrastructure (including battery energy storage systems). | ✓ | Refer to Section 4 and 5. |
| c) Specify and justify, in accordance with Section 4.2 of this guideline: | | |
| • The location of the facility in the landscape, and the proposed infrastructure on-site. | ✓ | Refer to Section 3 and the below sections of this table. |
| • Emergency vehicle access to and within the facility that:<br>○ Includes site access points of a number suitable to the size and | ✓ | Refer to Section 3, 4, and the below sections of this table. |

| Model requirement | Compliance | Comments |
|---|---|---|
| hazard of the facility (a minimum of two).<br>○ Provides access to renewable energy infrastructure, substations and fire service infrastructure. | | |
| • Firefighting water supply for the facility. | ✓ | Refer to Section 4.2.2 of this Table. |
| • A fire break width of 10m or greater, based on radiant heat flux (output) as an ignition source:<br>○ Around the perimeter of the facility.<br>○ Between any landscape buffer/vegetation screening and infrastructure. | ✓ | Refer to Section 4.2.5 of Table 6 (this Table). |
| • The separation distance, based on radiant heat flux (output) as an ignition source, between:<br>○ Adjacent renewable energy infrastructure (e.g., between adjacent battery containers/enclosures).<br>○ Battery containers/enclosures and related battery infrastructure, buildings/structures, and vegetation. | ✓ | Refer to Section 4.2.6 of Table 6 (this Table). |
| • All other controls for the management of on and off-site hazards and risks at the facility (including all proposed battery energy storage system safety and protective systems). | ✓ | Refer to the below sections this Table. |
| d) Provide an evidence-based determination of the effectiveness of the risk controls against the identified hazards, including justification for the omission of any battery safety and protective system/s. | ✓ | Refer to Section 5. |

| Model requirement | Compliance | Comments |
|---|---|---|
| e) Form the basis for the design of the facility. | ✓ | The outcomes of the assessment against Clause 13.02-1S, the CFA Guidelines and the risk assessment contained within Section 6 have been used to form the basis of the design.<br>The design will be further improved following the more detailed assessment once the manufacturer's details have been determined, post the planning consent being issued. |
| **Section 4- Facility Location and Design** | | |
| **Section 4.1 – Facility Location** | | |
| Planning applications for all renewable energy facilities proposed in high-risk environments must address the following: | | |
| a) An assessment against policy at Clause 13.02-1S (Bushfire Planning) where the facility is located in a Bushfire Prone Area (BPA). | ✓ | This RMP includes an assessment against Clause 13.02 within Chapter 4.1. The assessment has identified the potential for bushfires to approach the development from either the north west or south west. |
| b) The impact of any ignitions arising from the infrastructure (solar panels, wind turbines, battery energy storage systems, electrical infrastructure) on nearby communities, infrastructure and assets. | ✓ | This report considers the impact and the likelihood of fires that leave the property. The Clause 13.02 assessment has considered this and has also been addressed within the risk assessment in Section 5. |
| c) The impact of bushfire on the infrastructure (e.g. ember attack, radiant heat impact, flame contact). | ✓ | This report considers the impact of bushfire on the infrastructure. The Clause 13.02 assessment considered this and has also been addressed within Section 6. |
| d) Assessment of whether the proposal will lead to an increase in risk to adjacent land and how the proposal will reduce risks at the site to an acceptable level. | ✓ | The Clause 13.02 assessment has considered this and determined that there will be no increase in bushfire risk because of the development. The requirements including managing vegetation around the base of the turbine towers and BESS area, detection and suppression systems installed within the wind turbine nacelle and provision of |

| Model requirement | Compliance | Comments |
|---|---|---|
| | | access roads supports the management of bushfire risk. |
| **Section 4.2 – Facility Design** | | |
| **Section 4.2.1 – Emergency vehicle (Fire Truck) access** | | |
| **All facilities** | | |
| a) Construction of a four (4) metre perimeter road within the perimeter fire break. | ✓ | The BESS will be located on hardstand with a four metre wide perimeter road (within a firebreak) constructed around the BESS development.<br>The wind turbines will be developed on hardstand. This will allow firefighters to park adjacent to the wind turbine and conduct operations around the perimeter of the wind turbine. |
| b) Roads must be of all-weather construction and capable of accommodating a vehicle of fifteen (15) tonnes (e.g. no compacted earth). | ✓ | All access roads will be all weather construction and be capable to accommodate a minimum of 15 tonnes. The access roads will not be compacted earth. |
| c) Constructed roads should be a minimum of four (4) metres in trafficable width with a four (4) metre vertical clearance for the width of the formed road surface. Ensure any fencing along access routes allows for width of fire vehicles. | ✓ | The access roads constructed for the Wind Farm, BESS and Terminal Station developments will be a minimum of four metres in trafficable width with four metres of vertical clearance for the width of the road surface. |
| d) The average grade should be no more than 1 in 7 (14.4% or 8.1°) with a maximum of no more than 1 in 5 (20% or 11.3°) for no more than fifty (50) metres. | ✓ | The internal access track network has been designed to avoid steep slopes.<br>Where required, the average grade will be no more than 1 in 7 (14.4% or 8.1°) with a maximum of no more than 1 in 5 (20% or 11.3°) for no more than fifty (50) metres. |
| e) Dips in the road should have no more than a 1 in 8 (12.5% or 7.1°) entry and exit angle. | ✓ | Where there are dips, the road should have no more than a 1 in 8 (12.5% or 7.1°) entry and exit angle. |

| Model requirement | Compliance | Comments |
|---|---|---|
| f) Roads must incorporate passing bays at least every 600 metres, which must be at least twenty (20) metres long and have a minimum trafficable width of six (6) metres. At least one passing bay must be incorporated where roads are less than 600 metres long. | ✓ | The access / perimeter roads will exceed distances of 600m long. As such, passing bays will be provided. |
| g) Road networks must enable responding emergency services to access all areas of the facility, including fire service infrastructure, buildings, battery energy storage systems and related infrastructure, substations and grid connection areas. | ✓ | The proposed access roads will provide direct access to the base of all wind turbines, BESS area and related infrastructure. |
| h) Provision of at least two (2) but preferably more access points to each part of the facility.<br>The number of access points must be informed through a risk management process, in consultation with CFA. | ✓ | As the development is a Wind Farm, there are numerous access points located throughout the development.<br>The BESS will be provided with dual access/egress points. |
| **Wind Energy Facilities** | | |
| Constructed roads developed during the construction phase of facilities must be maintained post-commissioning and throughout the operational life of the facility, to allow access to each turbine for maintenance and emergency management purposes. The number and location of vehicle access points must be determined in consultation with CFA. | ✓ | The access roads that will be developed for the construction phase will be retained throughout the life of the project. This will provide access for maintenance activities along with emergency vehicle access if required. |
| **Battery Energy Storage Systems** | | |
| At least two access points are to be provided into each section where battery energy storage systems are located. The number and location of vehicle access points must be | ✓ | The BESS area will be provided with two access points, and the final selection will be completed in consultation with CFA. |

| Model requirement | Compliance | Comments |
|---|---|---|
| determined in consultation with CFA. | | |
| **Section 4.2.2 Firefighting Water Supply** | | |
| **All Facilities** | | |
| a) Water access points must be clearly identifiable and unobstructed to ensure efficient access. | ✓ | Static water supplies for the Wind Farm and BESS will be located where possible at the property entrances or at other strategic locations around the site. The final location of static water supplies will be determined through detailed analysis and in consultation with CFA. |
| b) Static water storage tank installations must comply with *AS 2419.1-2021: Fire hydrant installations – System design, installation and commissioning*. | ✓ | The static water supply will be located within tanks that comply with AS2419.1:2015. |
| c) The static water storage tank(s) must be an above-ground water tank constructed of concrete or steel. | ✓ | The static water tanks will be above ground. |
| d) The static water storage tank(s) must be capable of being completely refilled automatically or manually within 24 hours. | ✓ | Site management will have an arrangement with a local water carrier to ensure static water supplies are refilled within 24 hours. This will be addressed within the Emergency Management Plan. |
| e) The static water storage tanks must be located at vehicle access points to the facility and must be positioned at least ten (10) metres from any infrastructure (solar panels, wind turbines, battery energy storage systems, etc.). | ✓ | Static water tanks will be located at the entrances to the access roads constructed for the wind turbine development. They will be located at least 10 metres from all infrastructure. |
| f) The hard-suction point must be provided, with a 150mm full bore isolation valve equipped with a Storz connection, sized to comply with the required suction hydraulic performance.<br>*Adapters that may be required to match the connection are: 125mm, 100mm, 90mm, 75mm, 65mm Storz* | ✓ | The static water tanks will be provided with a hard suction point and adapters that will allow for the typical firefighting appliances to access the water supplies. |

| Model requirement | Compliance | Comments |
|---|---|---|
| *tree adapters with a matching blank end cap to be provided.* | | |
| g) The hard-suction point must be positioned within four (4) metres to a hardstand area and provide a clear access for emergency services personnel. | ✓ | The hard suction points will be accessible by firefighting appliances. |
| h) An all-weather road access and hardstand must be provided to the hard-suction point. The hardstand must be maintained to a minimum of 15 tonne GVM, eight (8) metres long and six (6) metres wide or to the satisfaction of the CFA. | ✓ | The tanks will be provided with access to allow firefighting appliances to access the hard suction point. |
| i) The road access and hardstand must be kept clear at all times. | ✓ | This requirement will be specified within site procedures and the Emergency Management Plan. |
| j) The hard-suction point must be protected from mechanical damage (e.g. bollards) where necessary. | ✓ | Bollards will be provided to protect the static water tanks outlets from mechanical damage. |
| k) Where the access road has one entrance, an eight (8) metre radius turning circle must be provided at the tank. | ✓ | Turning provisions will be provided at the base of each wind turbine that will enable firefighting appliances to safely turn around. |
| l) An external water level indicator must be provided to the tank and be visible from the hardstand area. | ✓ | This will be included within the design. |
| m) Signage indicating 'FIRE WATER' and the tank capacity must be fixed to each tank. | ✓ | This will be included within the design. |
| n) Signage must be provided at each vehicle entrance to the facility, indicating the direction to the nearest static water tank (s). | ✓ | Signage will be provided at all property entrances that show the location of the closest static water supply to that location. |
| **Wind Energy Facilities** | | |
| a) The fire protection system for wind energy facilities must incorporate at least one static fire water storage tank of at least | ✓ | Following an assessment of the project, 8 x 45,000 litre static water tanks will be supplied as outlined in Appendix B. The tanks proposed adjacent to the BESS area |

| Model requirement | Compliance | Comments |
|---|---|---|
| 45,000L effective capacity at each site entrance. | | are in addition to the water supplies required for the BESS area. |
| b) Additional static fire water storage tanks of at least 45,000L effective capacity must also be incorporated in facility design. The number and location of tanks is to be determined through a comprehensive risk management process (Risk Management Plan), in consultation with CFA. | ✓ | Additional static water tanks have not been identified to be necessary (beyond the 8 x 45,000L static water tanks prescribed above) for the Wind Farm area. Additional water supplies will be provided for the substation and BESS area, and these are outlined in further sections. |
| c) Nacelles must be equipped with automatic fire detection, alarm and fire suppression systems. | ✓ | A fire detection (smoke/heat) and suppression (gas) system will be installed within the high risk electrical cabinets in the nacelle, with the details/design of this system to be determined during consultation with CFA.<br>The systems will be monitored 24/7 by the monitoring system and if activated, an alert will be sent to the site operator. The Emergency Management Plan will include procedures for alerting the CFA to a fire. |
| **Battery Energy Storage Systems (Centralised)** | | |
| 1) For facilities with battery energy storage systems, the fire protection system must include as a minimum: | | |
| a) Where reticulated water is available, a fire hydrant system that meets the requirements of AS2419.1-2021: Fire hydrant installations, Section 3.9: Open Yard Protection, and Table 2.2.5(D): Number of Fire Hydrant Outlets Required to Flow Simultaneously - Open Yards.<br>*Except, that fire hydrants must be provided and located so that every part of the battery energy storage system is within reach of a 10m hose stream issuing from a nozzle at the end of a 60m length of hose connected to a fire hydrant outlet.* | ✓ | Not applicable. Reticulated water supplies are not available to the site. |

| Model requirement | Compliance | Comments |
|---|---|---|
| b) Where no reticulated water is available, a fire hydrant system that complies with AS 2419.1-2021 must be provided. | | |
| b) Where no reticulated water is available, a fire water supply in static storage tanks, where: | ✓ | Static water supplies in storage tanks will be provided. |
| i. The fire water supply must be of a quantity no less than 288,000L or as per the provisions of AS2419.1-2021: Fire hydrant installations, Table2.2.5(D) for open yards flowing for a period of no less than four hours at 20L/s, whichever is the greater. | ✓ | The BESS layout is being determined, and the provision of water supplies will be in accordance with the provisions of AS2419.1.<br>The aggregate area of the BESS is estimated to be 23,000m$^2$ and will be required to provide 432,000L. |
| ii. The quantity of static fire water storage is to be calculated from the number of hydrants required to flow from AS 2419.1-2021: Fire hydrant installations, Table 2.2.5(D).<br>*(E.g., For battery installations with an aggregate area of over 27,000m2, 4 hydrant outlets are required to operate at 10L/s for four hours, which equates to a minimum static water supply of 576kL.)* | ✓ | The BESS area will be provided with water supplies that conforms with AS2419.1. |
| iii. Fire hydrants must be provided and located so that every part of the battery energy storage system is within reach of a 10m hose stream issuing from a nozzle at the end of a 60m length of hose connected to a fire hydrant outlet. | ✓ | Fire hydrants will be located around the site to enable appropriate hydrant coverage for the facility. |
| iv. The fire water supply must be located at vehicle entrances to the facility, at least 10m from any infrastructure (electrical substations, inverters, battery energy storage systems, buildings). | ✓ | The water supply will be at least 10 metres from any infrastructure. |
| v. The fire water supply must be reasonably adjacent to the battery energy storage system and shall be accessible without undue danger in an emergency. (E.g., Fire water tanks | ✓ | The static water supply and booster assembly will be located adjacent to the main entrance to the BESS area. |

| Model requirement | Compliance | Comments |
|---|---|---|
| are to be located closer to the site entrance that the battery energy storage system). | | |
| vi. The fire water supply must comply with AS2419.1-2021: Fire hydrant installations, Section 5: Water storage tanks. | ✓ | The water supply will comply with the requirements outlined within Section 5. This will as a minimum include:<br>• Appropriate overflows and air gaps<br>• Large and small bore connections<br>• Tank contents indicator<br>• Appropriate signage<br>• Access opening and ladders |
| **Section 4.2.3 Fire Detection and Suppression Equipment** | | |
| **All Facilities** | | |
| Suitable fire detection and suppression equipment must be provided: | | |
| a) For on-site buildings and structures, according to the requirements of the National Construction Code. | ✓ | All buildings will be constructed in accordance with the National Construction Code. |
| b) For storages of dangerous goods, according to the requirements of any Australian Standards for storing and handling of dangerous goods. | ✓ | The storage of dangerous goods will comply with the requirements of any Australian Standards for storage and handling of dangerous goods.<br>This requirement will be included in the Fire Management Plan for the project. |
| c) For electrical installations, a minimum of two (2) suitable fire extinguishers must be provided within 3m-20m of each PCU. | ✓ | Fire extinguishers will be provided at each PCU. |
| d) In all vehicles and heavy equipment, each vehicle must carry at least a nine (9)-litre water stored-pressure fire extinguisher with a minimum rating of 3A, or other firefighting equipment as a minimum when on-site during the Fire Danger Period. | ✓ | All vehicles will be provided with fire extinguishers when on-site during the Fire Danger Period. |

| Model requirement | Compliance | Comments |
|---|---|---|
| **Section 4.2.5 – Fire Breaks** | | |
| A fire break must be established and maintained around: | | |
| a) The perimeter of the facility, commencing from the boundary of the facility or from the vegetation screening inside the property boundary. | ✓ | A fire break will be provided around the base of each Wind Turbine and the BESS area. |
| b) The perimeter of control rooms, electricity compounds, substations and all other buildings onsite.<br>*The width of fire breaks must be a minimum of 10m, and at least the distance where radiant heat flux (output) from the vegetation does not create the potential for ignition of on-site infrastructure.* | ✓ | The Substation and all other buildings must be provided with a 10 metre fire break at the minimum. |
| **Wind Energy Facilities** | | |
| A fire break must be established and maintained around the base of wind turbines. | ✓ | Every tower will be provided with a 10 metre fire break around the base. |
| **Battery Energy Storage Systems** | | |
| A fire break must be established and maintained around battery energy storage systems and related infrastructure. | ✓ | The BESS area will be provided with a minimum fire break of 10 metres around the perimeter of the BESS. |
| **Section 4.2.6 – Design Specific to Facility Type** | | |
| **Wind Energy Facilities** | | |
| a) Wind turbines must be located no less than 300 metres apart. | ✓ | The wind turbines have been located a minimum of 300 metres apart. |
| b) Wind turbines must be provided with automatic shut-down, and the ability to be completely disconnected from the power supply in the event of fire. | ✓ | This requirement has been included within the project specifications. The SCADA system will be designed to enable either onsite operators or remotely operating to shut down a single or multiple wind turbines. |

| Model requirement | Compliance | Comments |
|---|---|---|
| c) Installed weather monitoring stations must be notified to the Civil Aviation Safety Authority (CASA) as per *CASA Advisory Circular AC 139.E-05 v1.1, October 2022* (as for all structures 110m or more above the ground). | ✓ | Any permanent weather masts being installed as part of the project will be marked as per the CASA requirements. |
| d) All guy wires and monitoring towers must be clearly marked, even where marking is not required by CASA. | ✓ | This will be undertaken during the project. |
| **Battery Energy Storage Systems** | | |
| 1) The design of the facility must incorporate: | | |
| a) A separation distance that prevents fire spread between battery containers/enclosures and:<br>• Other battery containers/enclosures.<br>• On-site buildings.<br>• Substations.<br>• The site boundary.<br>• Any other site buildings.<br>• Vegetation.<br>*Separation must be at least the distance where the radiant heat flux (output) from a battery energy storage system container/enclosure fully involved in fire does not create the potential for ignition of these site elements.* | ✓ | The battery system as per the CFA Guideline is required to be designed with appropriate separation between the batteries and supporting infrastructure. The CFA Guideline also requires the battery unit to comply with UL9540 and be certified against UL9540A by an independent testing authority.<br>The results of the UL9540A test guides the required separation distance between the various battery units and other infrastructure to reduce the likelihood of fire spread occurring. The layout of the battery units will conform with the manufacturer specifications that directly relate to the outcomes of the UL9540A test. The UL9540A standards requires the test methodology to:<br>*Determine the capability of a battery technology to undergo thermal runaway and then evaluate the fire and explosion hazard characteristics of those battery energy storage systems that have demonstrated a capacity to undergo thermal runaway.*<br>The spacing requirements are also influenced by NFPA 855 which requires the BESS manufacturer/supplier to determine the spacing requirements |

| Model requirement | Compliance | Comments |
|---|---|---|
| | | through appropriate testing including the use of UL9540A.<br><br>Whilst the selection of a BESS supplier has not been finalised, demonstration of these spacing requirements being met will be part of an update to this RMP, and preparation of the Fire Management Plan and Emergency Management Plan, prior to the commencement of construction. |
| b) A fire break around the battery energy storage system and related infrastructure, of a width of no less than 10m, or greater where determined in the Risk Management Plan.<br><br>*Fire breaks must be non-combustible, constructed of concrete, mineral earth or non-combustible mulch such as crushed rock.*<br><br>*The width must be calculated based on the ignition source being radiant heat of surrounding vegetation, including landscaping.* | ✓ | Surrounding the BESS area will be a perimeter access road that is within the 10m fire break. The remainder of the vegetated areas within the BESS compound will be maintained during the Fire Danger Period. |
| c) A layout of site infrastructure that:<br>• i. Considers the safety of emergency responders.<br>• ii. Minimises the potential for grassfire and/or bushfire to impact the battery energy storage system.<br>• iii. Minimises the potential for fires in battery containers/enclosures to impact on-site and offsite infrastructure. | ✓ | The site layout has been designed to ensure safe and effective access for firefighters and minimises the potential for bushfires to impact on the area. |
| 2) Battery energy storage systems must be: | | |
| a) Located to be reasonably adjacent to a site vehicle entrance (suitable for emergency vehicles). | ✓ | Emergency vehicle access is available to the site. |

| Model requirement | Compliance | Comments |
|---|---|---|
| b) Located so that the site entrance and any fire water tanks are not aligned to the prevailing wind direction (therefore least likely to be impacted by smoke in the event of fire at the battery energy storage system.) | ✓ | The static water supply will be located adjacent to the main entrance. This provides effective access for firefighters. |
| c) Provided with in-built detection and suppression systems. Where these systems are not provided, measures to effectively detect and/or suppress fires within containers must be detailed within the Risk Management Plan. | ✓ | The chosen BESS system will be provided with a fire safety system in consultation with CFA.<br>This is outlined in Chapter 2.5. |
| d) Provided with explosion prevention via sensing and venting, or explosion mitigation through deflagration panels. | ✓ | The battery units will be provided with explosion prevention and venting systems that comply with NFPA855. |
| e) Provided with suitable ember protection to prevent embers from penetrating battery containers/enclosures. | ✓ | The battery units are designed to eliminate the ingress of dust, spiders and other insects. This will also prevent any embers from fires in the surrounding area to enter the battery unit.<br>The chosen battery unit will have a suitable IP rating, and this will be included within the updated RMP. |
| f) Provided with suitable access roads for emergency services vehicles, to and within the site, including to battery energy storage system(s) and fire service infrastructure. | ✓ | Driveway access will be provided that allows access to BESS units along with perimeter access around the battery storage area.<br>The indicative design and the final design will address this requirement. |
| g) Installed on a non-combustible surface such as concrete. | ✓ | The BESS and other associated infrastructure will be installed on a non-combustible surface. |
| h) Provided with adequate ventilation. | ✓ | The battery units are provided with sufficient ventilation. This includes appropriate separation between and within the battery units. The design of ventilation systems will be in accordance |

| Model requirement | Compliance | Comments |
|---|---|---|
| | | with either NFPA 68 or 69 and the manufacturer's specifications. |
| i) Provided with impact protection to at least the equivalent of a W guardrail-type barrier, to prevent mechanical damage to battery containers/enclosures. | ✓ | There will be various protection systems installed, such as bollards to ensure the battery enclosures and other infrastructure are protected from damage from vehicles and other equipment. The final decision for the provision of a system to prevent mechanical damage will be based on a final assessment during detailed design. |
| j) Provided with enclosed wiring and buried cabling, except where required to be above-ground for grid connection. | ✓ | This will be included within the final design. |
| k) Provided with spill containment that includes provision for management of fire water runoff. | ✓ | Suitable spill containment will be provided around the equipment that holds dangerous goods. In most cases the equipment itself is manufactured with its own bunding.<br>A fire water runoff basin will be provided within the BESS property. This area will enable fire water to be captured and if required, to be disposed of. The quantity will be equal to the fire water supply provided to the BESS facility. |
| **Section 5– Facility Construction and Commissioning** | | |
| **Section 5.1.4 – Emergency Management** | | |
| An Emergency Plan must be developed for the construction and commissioning phase, before development starts. | ✓ | An Emergency Management Plan will be developed for both the construction and operations phase. |
| **Section 6 – Facility Operation** | | |
| **Section 6.1 –Fire Management Plan** | | |
| A Fire Management Plan must be developed for the facility, in consultation with CFA, before development starts. | ✓ | A Fire Management Plan will be developed prior to the commissioning of the Wind Farm and BESS. This Plan will be provided to CFA for their consideration and feedback. |

| Model requirement | Compliance | Comments |
|---|---|---|
| **Section 6.2 1 –Fire Hazards and Risk Controls** | | |
| If your facility is at-risk of bushfire, prevention and preparedness activities must be detailed in the Fire Management Plan. | ✓ | The Fire Management Plan will include the requirements for the management of bushfire risk. |
| **Section 6.2 2–Vegetation Management** | | |
| Facility operators must undertake the following measures during the Fire Danger Period: | | |
| a) Grass must be maintained at or below 100mm in height during the declared Fire Danger Period. | ✓ | This requirement will be included within the Fire Management Plan for the areas surrounding the Wind Turbines, BESS, Substation and other infrastructure. |
| b) Long grass and/or deep leaf litter must not be present in areas where heavy equipment will be working, during construction or operation. | ✓ | This requirement will be included within the Fire Management Plan. |
| c) Restrictions and guidance must be adhered to during the Fire Danger Period, days of high (and above) fire danger and Total Fire Ban days (refer to www.cfa.vic.gov.au). | ✓ | This requirement will be included within the Fire Management Plan. |
| **Section 6.2 4–Facility and System Monitoring** | | |
| Appropriate monitoring for facility infrastructure must be provided, to ensure that any shorts, faults or equipment failures with the potential to ignite or propagate fire are rapidly identified and controlled. Any fire must be notified to 000 immediately. | ✓ | In addition to the detection and suppression systems, the site will be provided with a SCADA system that will monitor the day to day operations of the Wind Farm and BESS.<br>The system includes a range of sensors that will detect faults and report them to the monitoring centre. The system is preprogrammed to send alert messages and includes:<br>• Over temperature<br>• Under temperature<br>• Under voltage warning<br>• Power off fault<br>• Voltage and current changes.<br>These alerts are automatically transmitted to a monitoring centre. All |

| Model requirement | Compliance | Comments |
|---|---|---|
| | | alerts received at the monitoring centre will be assessed for the most effective response, which may include:<br>• Deploy a technician to the site.<br>• Call 000 and request emergency service assistance. |
| **Section 6.2.5 – Maintenance** | | |
| **All Facilities** | | |
| Inspection, maintenance and any required repair activities must be conducted for all infrastructure, equipment and vehicles at the facility. Maintenance must be in line with any relevant Australian Standards and the manufacturer's requirements. | ✓ | This requirement will be included within the Fire Management Plan. |
| **Section 7 – Emergency Planning** | | |
| **All Facilities** | | |
| An Emergency Plan must be developed specific to the facility, in conjunction with CFA, before development starts. | ✓ | An Emergency Management Plan will be developed prior to the commissioning of the Wind Farm and BESS. This Plan will be provided to CFA for their consideration and feedback. |
| **Section 8 – Provision of Emergency Information** | | |
| **All Facilities** | | |
| An Emergency Information Book must be developed and available to emergency responders. Emergency Information Books must be located in Emergency Information Containers, provided at each vehicle entrance the facility. | ✓ | An Emergency Information Book will be housed within an Emergency Information Container and located at strategic sites across the development. The final location and number of Emergency Information Containers will be determined in consultation with CFA.<br>An Emergency Information Container will also be located at the main entrance to the BESS facility. |

# 5 Risk Assessment

## 5.1 Introduction

The risk assessment process involves identifying, analysing, evaluating and treating the identified risks. The overall risk assessment process requires a consistent approach and follows *AS ISO 31000:2018 Risk management – Guidelines* as incorporated into the National Emergency Risk Assessment Guidelines (NERAG). Figure 7 provides an overview of the risk assessment process as outlined within *AS ISO 31000:2018 Risk management – Guidelines*.

Risk management is the process of recognising risk and developing methods to both minimise and manage the risk. This requires the development of a method to identify, prioritise, treat (deal with), control and monitor risk exposures.

A risk assessment is a function of the likelihood of an adverse event occurring and the consequence of the event. A comprehensive risk assessment will identify potential risks and consequences and therefore assist with the development of mitigation actions.

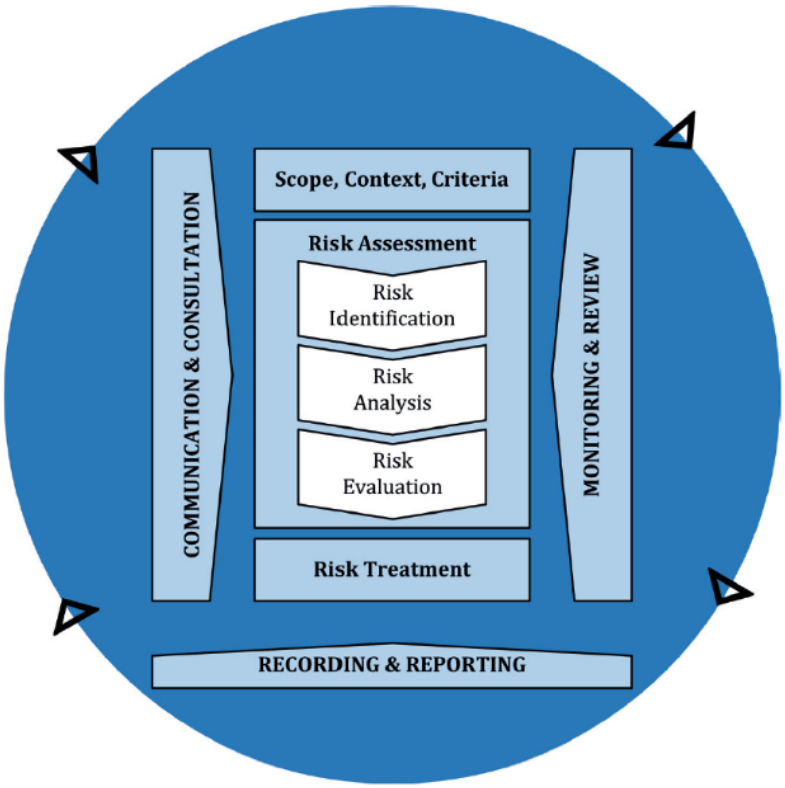



**Figure 8 - Overview of AS/NZS ISO 31000-2018 risk management process**

This report seeks to follow the steps outlined within the risk management guideline along with the process outlined within NERAG. The outcome of this assessment is a detailed understanding of hazards, the likelihood and consequence of a hazard becoming an emergency, and the treatments identified to manage this risk.

## 5.2 Context

The assessment of fire risk is a key requirement imposed on the development by CFA through their Guidelines. The CFA Guideline outlines the types of hazards that may need to be considered in relation to Wind Energy Facilities and BESS systems at the design, construction and operations phases.

## 5.3 Analysis of fire risk

Wind Farm and BESS infrastructure is largely acknowledged as having limited potential to cause fires. There have however been fires previously and these have been considered during the assessment of risk outlined within this report.

It is important the assessment of risk considers the various stages of the project including construction and the operations phase.

### 5.3.1 Assessment of fire risk during construction

The construction phase includes various stages including site works, construction of footings and the installation of the turbine towers. This stage also includes the commissioning of the technology and other systems including fire protection systems. This ensures the relevant connectivity is installed to ensure that all alerts and system messages are transmitted to an appropriate monitoring location.

A 2021 fire that occurred at the Victorian Big Battery[8] during its commissioning on the outskirts of Geelong has been assessed and reports are available that outline what occurred and how system manufacturers and installers should consider this information. This fire occurred during the commissioning phase of the particular battery unit. In summary, the isolation of the battery unit whilst it contained a charge was considered an incorrect process[9].

On 28 September 2021, Energy Safe Victoria released their Statement of Findings – Fire at the Victorian Big Battery. They outlined that the root cause was most likely:

> *a leak within the Megapack cooling system that caused a short circuit that led to a fire in an electronic component. This resulted in heating that led to a thermal runaway and fire in an adjacent battery compartment within one Megapack, which spread to an adjacent second Megapack.*

The report outlines the contributory factors, and the lessons learned to prevent a reoccurrence. Energy Safe Victoria provided approval to recommence commissioning at the Victorian Big Battery

[8] https://victorianbigbattery.com.au/wp-content/uploads/2023/10/VBB-Fire-Independent-Report-of-Technical-Findings.pdf

[9] https://victorianbigbattery.com.au/wp-content/uploads/2023/06/VBB_StatementOfFindings_FINAL_28Sep2021.pdf

providing the measures outlined were in place. The report states that the affected battery units failed safely despite total loss.

The outcomes of the Victorian Big Battery fire resulted in changes to the CFA Guideline to ensure the safety of firefighters is at the forefront of design requirements.

The use of plant and equipment during construction also presents a fire risk during the construction phase, particularly when operating in grassland environments. Machinery such as excavators and generators can generate sparks, heat, or fuel leaks that may ignite nearby vegetation or construction materials. Hot works, including welding and grinding, can also contribute to the risk if not properly managed. In dry conditions, even small ignition sources can lead to fires.

### 5.3.2 Assessment of fire risk during operations

The operations phase follows the commissioning stage of the project, and the role of maintenance becomes critical to ensure that the system operates as it was designed, for the life of the project. The ongoing maintenance of the infrastructure and development is critical to ensure the ongoing management of fire risk.

All the system components are to be considered as critical as they all are contributing to the ongoing safe operations. The system components include monitoring connectivity, fire protection systems, vegetation management and other safety systems.

## *5.4 Risk identification*

Through discussions with the client, review of various documentation and the consideration of previous fire history that involved wind energy facilities, the following hazards have been identified:

**Table 7 - Hazard identification and description**

| Hazard | Description |
|---|---|
| **Electrical hazards causing a fire** | Electrical faults and/or hazards can be a key cause of fire in the Wind Farm and BESS infrastructure. BESS hazards including battery faults, overcharging, rapid discharge, loss of remote monitoring systems, internal short circuits and overheating. Hazards include faulty wiring and connections. An outcome of these faults can include 'thermal runaway'. |
| **Fire causing spread to adjoining infrastructure on the property** | A fire that has started in the Wind Farm may spread to adjoining infrastructure or surrounding areas within the facility. Rapid escalation of the fire size and complexity can create issues for on site staff and contractors, firefighters and the community. |
| **Fire causing off-Site impacts** | Any fire on the property that can spread to adjoining properties most likely through vegetation connectivity, on bushfire risk days can start fires in the surrounding landscape that can threaten the community. |
| **Off-Site fire impacting on the Site** | A bushfire burning through the surrounding landscape can enter the property and threaten the infrastructure by potentially starting new fires. |

| | |
|---|---|
| **Dangerous goods storage** | The dangerous goods that are stored within the BESS, substation and inverters may leak and either ignite or require clean up by either on site staff, contractors or firefighters. |
| **Fire water runoff** | In the event of a fire involving the BESS, firefighters will respond and use water to either extinguish or cool the surrounding area until the infrastructure is deemed safe. The fire water may be contaminated and if not contained may create environmental issues. |
| **Staff and firefighters** | The response to a fire by staff, contractors or firefighters can be dangerous due to the various safety hazards associated with a fire in this type of infrastructure. |

The above list may not be exhaustive however it is believed that it will allow the assessment of most hazards that may be encountered in a project of this type.

## *5.5 Risk analysis*

The analysis of risk requires the consideration of the likelihood and consequence of an event occurring and measuring this against a predetermined matrix to enable the consideration of each risk both individually and collectively.

For this assessment, a risk matrix has been developed that enables the effective consideration of risk and to enable a comparison between the outcome of the hazard assessment.

### 5.5.1 Likelihood

An assessment of the likelihood of a fire occurring at this project including the potential to impact on people and other infrastructure/property is a key part of the risk assessment. The following will be considered during the assessment of an event occurring:

- Potential for an unplanned fire to occur
- Potential for this ignition to develop and exhibit significant fire behaviour
- Potential for that fire to destroy assets
- Potential for people to be affected or threatened
- The potential for it to develop into a major fire.

Recommendations for mitigation actions in the area may be determined by a number of approaches depending on the level of assessed risk. Strategies to lower risk are provided to ensure the risk is managed to an acceptable level.

An assessment of likelihood considers factors such as:

- Sources of ignition
- Use of the property and/or surrounding area
- History of ignitions within similar infrastructure
- Ability to spread from the property.

**Table 8 - Likelihood table**

| Likelihood scale frequency | Description |
|---|---|
| Almost certain | The event Is expected to occur in most circumstances. (75%-99%). Has occurred frequently at the location. |
| Likely | The event will probably occur in most circumstance (50% - 75%). Has occurred frequently in the company. |
| Possible | The event should occur at some time. Likely to occur sometime (25% - 50%). Has occurred many times in the industry, but not in the company. |
| Unlikely | The event could occur at some time. Unlikely but possible (10% - 25%). Has occurred once or twice in the industry. |
| Rare | The event may occur only in exceptional circumstances. Assumed it may not be experienced (0% - 10%). Unheard of in the industry. |

### 5.5.2 Consequence

Consequence refers to the potential damage that could result from a fire occurring in relation to people and assets. In assessing the possible consequences, the assessment considers a variety of hazard, exposure and vulnerability factors including:

- The likely number of people at the facility
- The proximity of other assets
- The location of surrounding properties and the type of activities
- Response capability if an event occurred.

The consequence scale refers to the potential impacts which could occur should a fire occur.

**Table 9 - Risk assessment consequence table**

| Consequence scale | Description | | |
|---|---|---|---|
| | **People** | **Environment** | **Plant/Equipment** |
| Catastrophic | Multiple fatalities | Permanent widespread ecological damage. Toxic release off-site with detrimental effect. Likely EPA prosecution | Massive widespread equipment damage (i.e. plant/equipment write-off) ($1M +). |
| Major | Single fatality or permanent disability | Heavy ecological damage with costly restoration. Off-site release contained with outside assistance and little detrimental impact. | Multiple equipment replacements ($200 000 - $1M). |
| Moderate | Major injuries - Incapacitations or requiring time off work | Major but recoverable ecological damage. On-site release contained with outside assistance. | Equipment level replacement /repair ($50 000 - $200 000). |

| | | | |
|---|---|---|---|
| Minor | Significant injuries - Medical treatment, non-permanent injury | Limited but medium term damage. On-site release immediately contained | Component level replacement /repair ($10 000 - $50 000). |
| Insignificant | Slight injuries- First Aid Treatments (cuts/ bruises) | Short term damage. Low financial loss, negligible environmental impact | Slight Damage (< $10 000). |

The risk rating table (Table 10) is used to combine likelihood and consequence to obtain a risk score. The risk score is used to aid decision making by determining which areas are at the greatest risk of a fire starting and spreading through the Wind Farm. Actions can be prioritised using this method to determine where risk mitigation works will occur.

**Table 10 - Risk matrix**

| | | | | Impact Score | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | 1 | 2 | 3 | 4 | 5 |
| | | | | Insignificant | Minor | Moderate | Major | Catastrophic |
| Fire Risk Consultants<br>Risk Assessment Matrix | | | People | Slight Injuries- First Aid Treatments (cuts/bruises) | Significant Injuries - Medical Treatment, non-permanent injury | Major Injuries - Incapacitations or requiring time off work | Single Fatality or Permanent Disability | Multiple Fatalities |
| | | | Environment | Short term damage / Low financial loss, negligible environmental impact | Limited but medium term damage / On-site release immediately contained | Major but recoverable ecological damage / On-site release contained with outside assistance | Heavy ecological damage with costly restoration / Off-site release contained with outside assistance and little detrimental impact | Permanent widespread ecological damage / Toxic release off-site with detrimental effect / Likely EPA prosecution |
| | | | Plant / Equipment | Slight Damage (< $10 000) | Component level replacement /repair ($10 000 - $50 000) | Equipment level replacement /repair ($50 000 - $200 000) | Multiple equipment replacements ($200 000 - $1M) | Massive widespread equipment damage (ie plant/equipment write-off) ($1M +) |
| Likelihood | A | Almost Certain | The event Is expected to occur in most circumstances / 75%-99% / Has occurred frequently at the location | Low (5) | Moderate (10) | Very High (18) | Extreme (23) | Extreme (25) |
| | B | Likely | The event will probably occur in most circumstance / 50% - 75% / Has occurred frequently in the company | Low (4) | Moderate (9) | Very High (17) | Very High (20) | Extreme (24) |
| | C | Possible | The event should occur at some time. Likely to occur some time / 25% - 50% / Has occurred many time in the industry, but not in the company | Low (3) | Moderate (8) | High (13) | Very High (19) | Very High (22) |
| | D | Unlikely | The event could occur at some time. Unlikely but possible / 10% - 25% / Has occurred once or twice in the industry | Low (2) | Low (7) | High (12) | High (15) | Very High (21) |
| | E | Rare | The event may occur only in exceptional circumstances. Assumed it may not be experienced / 0% - 10% / Unheard of in the industry | Low (1) | Low (6) | Moderate (11) | High (14) | High (16) |

The outcomes of the risk assessment are used to inform the recommendations. These are aimed at providing guidance to management to reduce the fire risk at the property.

### 5.5.3 Risk analysis worksheets

The following risk analysis worksheets have assessed the hazards identified in Section 6.4 and results in a risk classification that correspond with strategies to lower risk if it is required.

The initial assessment of risk is based on the information that has been supplied to date. The development of additional strategies to lower risk are made as either there was no information provided that identified the treatment or further clarity is required to be considered.

**Table 11 - Risk assessment - Electrical hazards causing a fire**

| | |
|---|---|
| **RISK** | Electrical hazards causing a fire |
| **CAUSE** | Electrical faults and/or hazards can be a cause of fire in Wind Turbines and BESS systems. Hazards may include faults, loss of remote monitoring systems, internal short circuits and overheating.<br><br>The substation due to the presence of electrically charged equipment may, due to a fault or other cause catch fire.<br><br>Within a BESS, faults can lead to thermal runaway which will create suppression difficulties. |
| **LIKELIHOOD** | Likely |
| **JUSTIFICATION** | There is a history of fires within Wind Energy Facilities including electrical substations/terminal stations. Available data does not indicate that this is widespread. Modern wind turbine nacelles are fitted with smoke detection and suppression systems and other safety systems to either prevent a fault from occurring or to automatically commence shut down procedures if required. They will also send alerts to site operators.<br><br>Fires usually occur within the nacelle which is located at the top of the tower and is where the turbine is located. These areas are difficult to access and rely on trained technicians being available. The turbine and associated equipment will be maintained as per the manufacturer's specifications.<br><br>There are examples of fires within BESS technology that indicates that when faults occur, they can escalate into challenging events including thermal runaway. To offset the likelihood of a fault within the BESS that creates a flammable atmosphere in and around the BESS, escalates to a fire, or a fire that affects adjacent infrastructure, the following mitigation treatments are included:<br><br>• Cooling systems that maintain the temperature of the battery packs during day-to-day operations.<br><br>• Safety systems that send alerts to the monitoring centre if a sensor is activated.<br><br>• Barriers between each of the battery module bays within each BESS designed to reduce the possibility of thermal runaway from spreading to adjoining battery units.<br><br>• Separation distances between individual battery packs and other infrastructure in accordance with manufacturer installation guidelines.<br><br>• The BESS will be installed by qualified and competent people in accordance with the manufacturer's specifications to relevant Australian Standards and including compliance with UL9540A – Energy Storage System Requirements. |
| **CONSEQUENCE** | Moderate |
| **JUSTIFICATION** | A fire is unlikely to occur in more than one turbine due to the separation between the towers. A loss of a single turbine will not significantly impact on business operations. Due to the remoteness of the infrastructure, they will unlikely cause issues that will impact on surrounding people or property.<br><br>If the multiple layers of protection fail or are not able to suppress the fire, then it is highly likely for the entire nacelle to be destroyed in the fire. This is a highly unlikely scenario. The multiple layers include:<br><br>• Smoke detection and fire suppression system. |

| | |
|---|---|
| | • Monitoring systems that detect faults.<br>• Electrical system manufactured and installed in accordance with the relevant Standards.<br>The consequence of a fire within a BESS has been assessed as likely only impacting on the pack where the fire originated. It is unlikely for a fire to spread to other packs. |
| **RISK RATING** | High |
| **STRATEGY TO LOWER RISK** | The requirements outlined within the response to the CFA Guideline will be sufficient to ensure the risk is maintained at a reduced level. Other requirements that will further reduce the risk include:<br>• Development of an Emergency Management Plan that includes in addition to that required by CFA and AS3745:<br>  ○ A system to communicate effectively between the monitoring centre and the onsite staff and contractors.<br>  ○ Provision of 24/7 technical expert contact details for the fire brigade to contact in the event of an emergency or threat of an emergency.<br>• Developing a procedure that requires a technician to be deployed to the site when the site monitoring communications are down.<br>• The site monitoring system will indicate the early stages of a fault or emergency event and provides the ability to commence shut down procedures remotely from the site. |
| **RESIDUAL RISK** | Medium (unlikely/moderate) |

**Table 12 - Risk assessment - Fire causing spread to adjoining infrastructure on the property**

| | |
|---|---|
| **RISK** | Fire causing spread to adjoining infrastructure on the property |
| **CAUSE** | A fire that starts within Wind Farm infrastructure may spread to adjoining infrastructure.<br><br>A fire that has started within a component with the BESS may spread to adjoining infrastructure. |
| **LIKELIHOOD** | Unlikely |
| **JUSTIFICATION** | A fire that starts within a wind turbine nacelle may drop burning materials to the ground and depending on the weather conditions, may spread to an adjoining turbine tower or other infrastructure. Due to the separation between the infrastructure this is highly unlikely to occur.<br><br>The risk of fire spreading to adjoining infrastructure within the BESS and to adjoining infrastructure with the Wind Farm is unlikely due to the design of the components within the BESS, and the mitigation features incorporated into the design. |
| **CONSEQUENCE** | Minor |
| **JUSTIFICATION** | The consequence of a fire affecting adjoining areas of the Wind Farm is likely to be minor due to the provision of fire breaks around the base of the turbine towers, surrounding the BESS, substation and operations and maintenance area.<br><br>The existing road network along with the proposed access roads will assist with slowing or stopping fire spread between the turbine towers and other infrastructure. |
| **RISK RATING** | Low |
| **STRATEGY TO LOWER RISK** | Due to the low rating, no additional strategies are required to be implemented beyond compliance with the CFA Guideline as outlined in Section 4. These strategies include:<br>• Development of an Emergency Management Plan<br>• Development of a Fire Management Plan that outlines the required performance and maintenance of all fire mitigation and management initiatives.<br>• Provision of access tracks and fire breaks around the Wind Farm and BESS.<br>• 24/7 monitoring of the system that will alert operators to any faults or events that may lead to a fire. This will result in immediate shut down of the system. |
| **RESIDUAL RISK** | Low |

**Table 13 - Risk assessment - Fire causing offsite impacts**

| | |
|---|---|
| **RISK** | Fire causing offsite impacts |
| **CAUSE** | Any fire within the Wind Farm and BESS may spread to adjoining properties most likely through vegetation connectivity. These types of fires would occur on elevated fire danger days during the summer months. |
| **LIKELIHOOD** | Unlikely |
| **JUSTIFICATION** | The compliance with CFA Guidelines requires a range of mitigation strategies implemented including:<br>• Provision of a fire break surrounding the Wind Farm and BESS infrastructure.<br>• Static water supplies for firefighting purposes are scattered through the Wind Farm and at the BESS.<br>• The monitoring system provides for early notification of a fault and will have the ability to remotely shut down the site if required. |
| **CONSEQUENCE** | Minor |
| **JUSTIFICATION** | The Clause 13.02 assessment has identified the limited risk for a fire to spread from the site into the surrounding landscape. The creation of fire breaks surrounding the wind turbines, BESS, substation and operations and maintenance area will reduce the potential for a fire to leave the infrastructure.<br>Under elevated fire danger conditions there is the potential for a fire that is caused by site operations to leave the site. This fire would have started outside the vegetation managed areas. Depending on the level of vegetation management in the surrounding landscape, the fire could spread and become uncontrollable quickly. This fire will be influenced by the various existing fire management activities including roadside vegetation management, personal property preparation, firefighting appliances and equipment and activities undertaken by agencies responsible for fire management. The consequence of this type of fire would be the same as a fire caused by other practices in the surrounding landscape.<br>The surrounding landscape is well managed due to farming operations. This will assist with reducing the potential for bushfires to leave the site and impact on the surrounding community. |
| **RISK RATING** | Low |
| **STRATEGY TO LOWER RISK** | The site Emergency Management Plan will include a procedure for contacting the Municipal Fire Prevention Officer (MFPO) if the vegetation on adjoining properties is unmanaged and becomes a fire risk. The MFPO may, following an assessment issue a Notice requiring the vegetation to be managed.<br>Any vegetation growth on the property will be managed and removed within the fire break area. During the Fire Danger Period, additional inspections will occur to ensure that all weeds and other vegetation is removed from the fire breaks and other critical areas. |
| **RESIDUAL RISK** | Low |

**Table 14 - Risk assessment - Offsite fire impacting on the site**

| | |
|---|---|
| **RISK** | Offsite fire impacting on the site |
| **CAUSE** | A bushfire burning through the surrounding landscape can occur and threaten the infrastructure by potentially starting new fires. |
| **LIKELIHOOD** | Unlikely |
| **JUSTIFICATION** | The Clause 13.02 assessment has identified the surrounding landscape as having the potential for supporting a bushfire. It identifies major fires that have occurred in the surrounding landscape.<br><br>The municipal fire management planning process does not identify this area as having a significant impact on property survivability due to the lack of vegetation that would support large scale ember impact.<br><br>The provision of a firebreak and other managed areas will limit the ability for a bushfire to impact on the property. |
| **CONSEQUENCE** | Minor |
| **JUSTIFICATION** | Due to the separation between the wind turbines and other infrastructure, the separation surrounding the BESS, the possibility of the Wind Farm being impacted by a bushfire is reduced. The provision of fire breaks around the base of the towers, BESS area and other infrastructure will ensure a bushfire can't directly impact on the structure. |
| **RISK RATING** | Low |
| **STRATEGY TO LOWER RISK** | Prior to construction commencing, an Emergency Management Plan will be developed that includes the requirements for vacating the site when the fire danger is elevated during both construction and operations phases of the project.<br><br>The project is monitored through a SCADA system that will enable remote operation in the event that the site needs to be closed to personnel. |
| **RESIDUAL RISK** | Low |

**Table 15 - Risk assessment – Dangerous goods**

| | |
|---|---|
| **RISK** | Dangerous Goods |
| **CAUSE** | With reference to the Dangerous Goods (Storage and Handling) Regulations 2012, there are quantities of Dangerous Goods at the Site within various components of the Proposal. There is the potential for a leak of Dangerous Goods to occur that may cause a threat to people, the environment or be involved in a fire. |
| **LIKELIHOOD** | Unlikely |
| **JUSTIFICATION** | There will be dangerous goods associated with the BESS and the associated infrastructure. The quantities of dangerous goods will depend on the chosen supplier of the battery packs and other the types of other equipment including transformers. As a minimum the following dangerous goods will be present:<br>• Lithium ion<br>• Refrigerant<br>Both products are contained within the battery packs and have their own bunding, and sensors and alert system that will send a message to the operator if a leak is occurring.<br>The Dangerous Goods are installed within the infrastructure during the manufacturing process. This means that Dangerous Goods are contained and sealed and not readily accessible at the site.<br>Following transportation to the Site, any infrastructure with Dangerous Goods will be inspected to ensure it has not been damaged during transportation. If infrastructure with Dangerous Goods is to be stored at Site prior to installation, it will be stored in line with manufacturer's specifications. Infrastructure will be installed in line with manufacturer's specifications (including inspection and testing). Together, these measures will prevent the likelihood of leaks outside the infrastructure footprint.<br>The manufacturers installation specifications include the protection of the battery pack to ensure that no damage occurs during installation.<br>The design of the BESS including the installation of bollards at high risk locations will prevent vehicles from impacting the infrastructure and potentially causing a leak. |
| **CONSEQUENCE** | Minor |
| **JUSTIFICATION** | The assessment of the dangerous goods quantities at the BESS will be confirmed following the selection of the chosen technology and will comply with the requirements of the Dangerous Goods legislation. |
| **RISK RATING** | Low |
| **STRATEGY TO LOWER RISK** | In accordance with the Dangerous Goods (Storage and Handling) Regulations (2012), the fire brigade's views must be sought if the quantities have exceeded the fire protection amounts listed in Schedule 2 as will be likely be the case for the Lithium-Ion and the insulating gas.<br>The Emergency Management Plan will include details of the hazards associated with dangerous goods and appropriate procedures in response to this RMP, including leak management and other response arrangements to Dangerous Goods related emergencies. |
| **RESIDUAL RISK** | Low |

**Table 16 - Risk assessment - Fire water runoff**

| | |
|---|---|
| **RISK** | Fire water runoff |
| **CAUSE** | In the event of a fire involving the BESS, firefighters will respond and use water to either extinguish or cool the surrounding area until the infrastructure is deemed safe. The CFA Guideline outlines the need to provide capacity for the management of fire water runoff for the BESS to ensure this water does not enter the environment. |
| **LIKELIHOOD** | Unlikely |
| **JUSTIFICATION** | The risk of a fire within the BESS that would result in fire water runoff is unlikely due to the design of its components, particularly the battery packs and the mitigation features incorporated into its design. This includes:<br>• Quality components will be selected for the Proposal. Most of the infrastructure that supports the BESS is non-combustible or has low quantities of combustible materials.<br>• The battery packs are contained within an enclosure and have several features incorporated within the design that limits the potential for fire spread between components.<br>• The separation between the battery packs and supporting infrastructure (transformers) is in accordance with manufacturer specifications.<br>• Battery packs will be installed on a non-combustible area that will prevent fire spreading along the ground.<br>Due to the design features incorporated into the BESS the likelihood of a fire occurring at the BESS is low. As such, the likelihood of requiring fire water to extinguish a fire at the BESS is also low. |
| **CONSEQUENCE** | Minor |
| **JUSTIFICATION** | The BESS area will be designed to enable the collection of fire water in the event of a fire. A basin will be constructed where water will flow to and enable testing to then determine the most appropriate disposal method. The basin will ensure that the water is flowing away from firefighters and site staff to enable them to continue to monitor and undertake suppression activities if required. |
| **RISK RATING** | Low |
| **STRATEGY TO LOWER RISK** | The Emergency Management Plan will provide procedures to manage fire water runoff on the site and provide contact details for organisations that can undertake testing and disposal if required. |
| **RESIDUAL RISK** | Low |

**Table 17 - Risk assessment – Staff and responding firefighters**

| | |
|---|---|
| **RISK** | Staff and responding firefighters |
| **CAUSE** | The response to a fire by staff, contractors or firefighters can be dangerous due to the various safety hazards associated with a fire in this type of infrastructure. |
| **LIKELIHOOD** | Likely |
| **JUSTIFICATION** | There is the potential for firefighters and/or staff and contractors to be present during an emergency event and not being familiar with the site and the infrastructure.<br>The CFA Guideline does impose a variety of controls onto the management of the site through the Emergency Management Plan and how CFA interacts with the site if they are called to a fire. |
| **CONSEQUENCE** | Moderate |
| **JUSTIFICATION** | The provision of an Emergency Information Container that will include the Emergency Management Plan, site plans and contact details for technical specialists will ensure responding firefighters seek information prior to entering the property.<br>The local CFA brigades will be provided the opportunity to tour the facility regularly. |
| **RISK RATING** | High |
| **STRATEGY TO LOWER RISK** | In all cases a technician will be dispatched to the site to review any faults or alerts that may if not checked, cause a fire.<br>Any faults that are sent to the monitoring centre will be assessed and a technician deployed to make an initial assessment.<br>The Emergency Management Plan will include a requirement to engage with the responding firefighters early to ensure they are aware that a technician is on their way and that entry to the site can wait until they arrive unless there is a life or property protection emergency.<br>The Emergency Information Container that is required by the CFA Guidelines will provide detailed contact information for responding firefighters to seek specialist advice prior to accessing the property. |
| **RESIDUAL RISK** | Medium |

## *5.6 Cumulative impact assessment*

Consideration of the potential cumulative effects of multiple Wind Farms in the surrounding landscape has not identified any issues that require assessment. The closest Wind Farms area:

- Stockyard Hill Wind Farm is approximately four kilometres to the north.
- Berrybank Wind Farm is nine kilometres to the south.
- Golden Plains Wind Farm is 11 kilometres to the south east.

The matters considered included use of firefighting aircraft, firefighting strategies and bushfire ignition risk and spread. It was determined that due to the existing separation it was unlikely for a bushfire to impact on multiple Wind Farms at the same time. If this did occur, the geographical separation would not cause any cumulative effects.

# 6 Conclusion

The assessment of risk for the proposed Moreton Hill Wind Farm and BESS has identified that this project can occur safely providing the requirements outlined within this RMP are implemented.

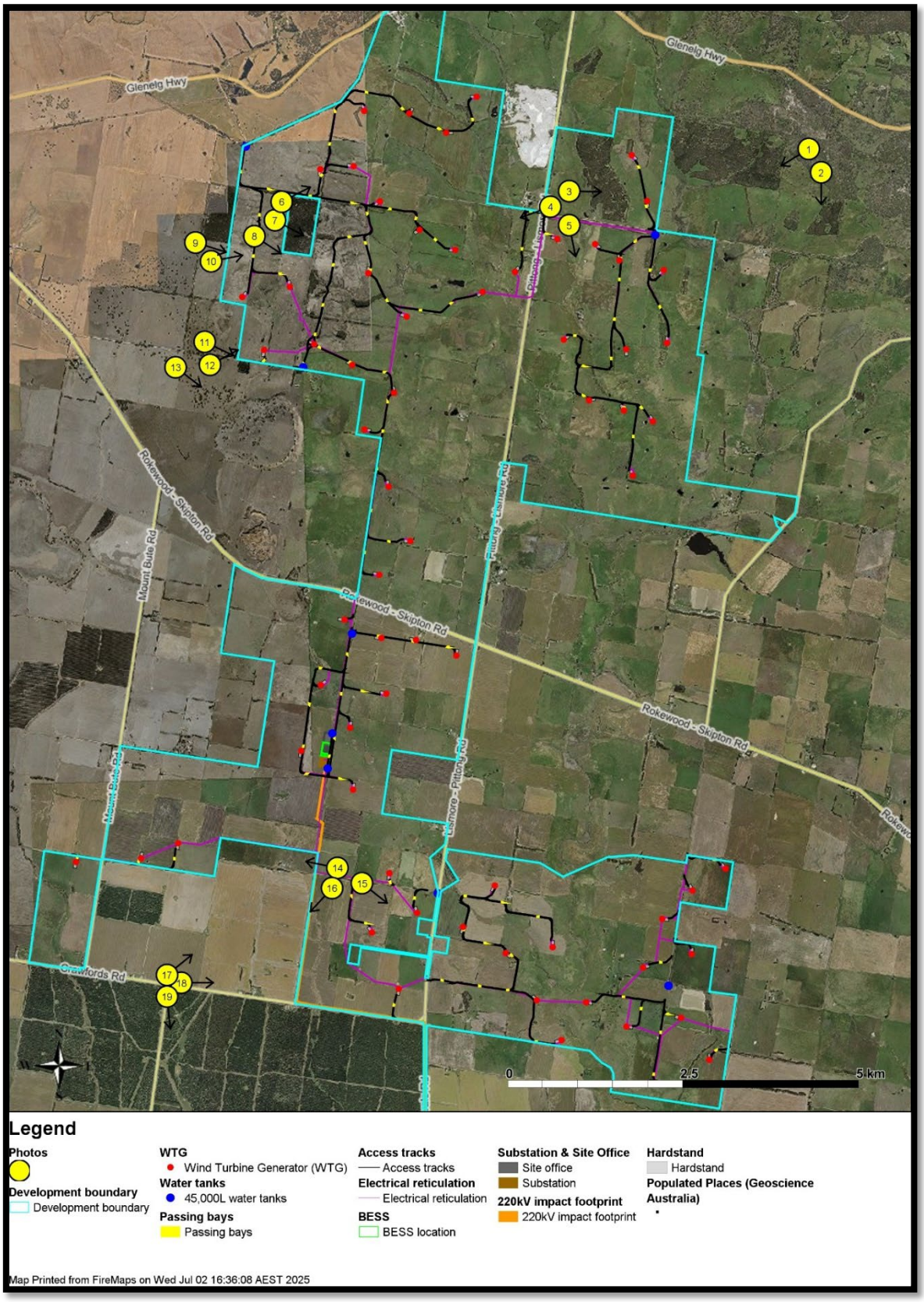
This report acknowledges the existing bushfire risk in the surrounding landscape, and it has demonstrated how the design will reduce the potential for bushfire to either enter or leave the property.

The assessment of fire history in relation to Wind Farm and BESS infrastructure identifies limited examples of where these renewable energy developments and systems have caused fires. There is no doubt that a wind turbine can present fire risks if not designed, constructed, commissioned and operated effectively. The importance of following design requirements and committing to the ongoing maintenance of the system is critical to reduce fire risk.

The additional requirements imposed on the project by the CFA Guideline and this RMP will strengthen the management of fire risk. In addition to this, following the issue of a Planning Permit, the development of a Fire Management Plan and Emergency Management Plan that meets the requirements of the CFA Guideline will assist with managing the risk of fire.

The results of this assessment should provide confidence that the operator of the Wind Farm and BESS will introduce systems, procedures and maintenance programs to ensure fire risk is managed.

# Appendix A – Site photos



| | |
|---|---|
| 1<br><br>Looking towards the project site. The forested areas opens into farming properties in the vicinity of the project site. |  |
| 2<br><br>Typical landscape surrounding the project site. |  |
| 3<br><br>Example of a small plantation area to the east of Pittong Lismore Road. WTGs will be located in the farming areas to the east of this plantation. |  |

| | |
|---|---|
| 4<br><br>Typical vegetation across the majority of the project site. |  |
| 5<br><br>Looking south across the project site. |  |
| 6<br><br>Plantations in the north western section of the project site. The amount of plantation has declined since the introduction of the BMO. |  |

| | |
|---|---|
| 7<br><br>Existing plantation. |  |
| 8<br><br>Existing plantations surrounded by farming properties. |  |
| 9<br><br>Existing plantations surrounded by farming properties. |  |

| | |
|---|---|
| 10<br><br>Plantation area in the north western section of the project site. |  |
| 11<br><br>Typical landscape near Spring Hill Road and Notmans Road. |  |
| 12<br><br>Looking across Notmans Road to the north east. |  |

| | |
|---|---|
| 13<br><br>Typical landscape along the western boundary of the project. |  |
| 14<br><br>Typical landscape near the intersection of Parkers Road and Gillespies Road. |  |
| 15<br><br>Example of the variable farming activities that is developing a highly fragmented landscape and will likely reduce bushfire behaviour in these areas. |  |

| | |
|---|---|
| 16<br><br>Looking south west from near Parkers Road. |  |
| 17<br><br>Looking north east from Crawfords Road. |  |
| 18<br><br>Looking along Crawfords Road to the east. The Plantation is located to the south of the road. |  |

| | |
|---|---|
| 19<br><br>Typical layout within the plantation area to the south of the project site. |  |

# Appendix B – fire water locations