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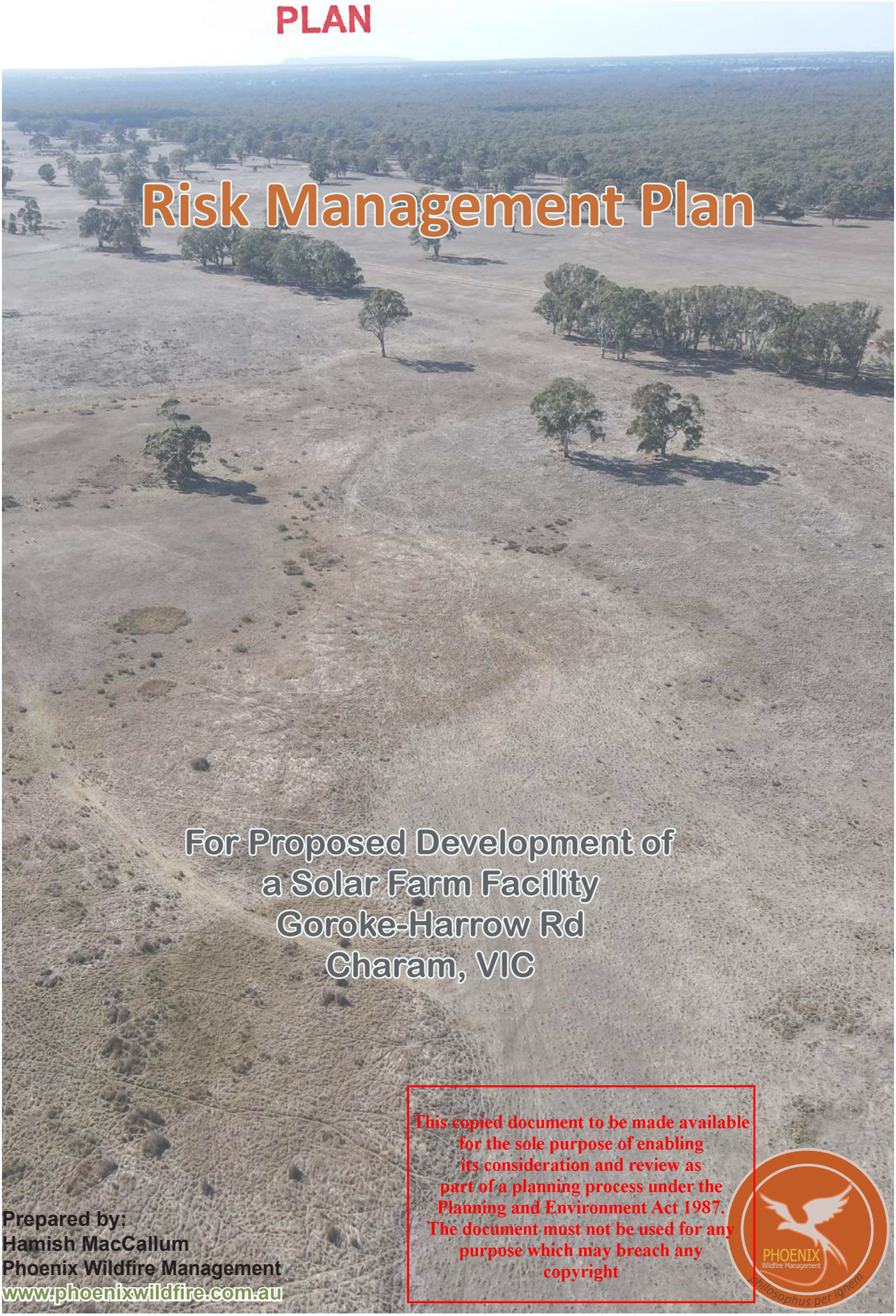

Risk Management Plan

For Proposed Development of a Solar Farm Facility Goroke-Harrow Rd Charam, VIC

Prepared by:
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Risk Management Plan

Charam Solar Farm, Goroke-Harrow Road, Charam VIC

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Version Control

Report Version	Name	Date Completed	Comments
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5			

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Glossary Of Terms

Term	Meaning
Asset Protection Zone	(APZ) a buffer zone of modified fuel and vegetation to reduce the threat to life and property adjoining key community assets and critical infrastructure. Also referred to as a 'fire break'.
Battery Energy Storage System	(BESS) is a dedicated battery and associated components housing, often shaped like a shipping container.
Bushfire	Unplanned fire in natural or managed vegetation.
Bushfire Prone Vegetation	Vegetation that is vulnerable to fire, either through specific adaptation or by inherent characteristics such as high levels of fine fuels, volatile oils or dead material retention.
Crown Fire	Fire that reaches and burns the tree canopy, which can be spread to neighbouring trees by wind.
Defendable Space	An area of managed vegetation surrounding an asset to protect it from radiant heat and direct flame contact.
Fire Behaviour Index	(FBI) is a potential fire intensity scale running from 0 to 100 and beyond, with increasingly high values indicating increasingly dangerous fire behaviour and therefore fire danger risk.
Fuel Load	The amount of fire fuels available to burn in a given area, usually described in Tons per hectare.
Fuel Reduction	The process of removing/reducing fuel loads through mechanical, burning or chemical means.
Minimum Fuel Condition	Describes managed landscapes where fuel reduction or management such as mowing, watering or spraying has occurred to restrict the severity, impact and spread of fire.
Solar Energy Facility	A facility where solar energy is converted to electricity, often connected to the electricity grid. They can be photovoltaic or solar thermal technology.
Spot Fire	Fires that occur ahead of the main fire front during a bushfire, usually started by embers carried ahead of the fire by strong winds.

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Abbreviations

Term	Meaning
APZ	Asset Protection Zone
AS 3959:2018	Australian Standards, Construction of Dwellings in Bushfire Prone Areas.
BAL	Bushfire Attack Level
BESS	Battery Energy Storage System
BMO	Bushfire Management Overlay
BPA	Bushfire Prone Area
CFA	Country Fire Authority
EMP	Emergency Management Plan
FBI	Fire Behaviour Index
FDR	Fire Danger Rating
FMP	Fire Management Plan
RMP	Risk Management Plan
PCS	Power Conversion System
PV	photovoltaic
RMU	Ring Main Unit
VFRR	Victorian Fire Risk Register

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1 Introduction

Phoenix Wildfire has been engaged by Green Gold Energy (the 'Developer') to undertake a Risk Management Plan (RMP) and provide recommendations on mitigation strategies to manage the fire risk at the proposed Charam Solar Energy Facility (the 'Proposal') on land at Goroke-Harrow Road, Charam (the 'Study Area'). The overall risk assessment has been undertaken for the site to identify and demonstrate how the proposed development can appropriately mitigate the fire risk at the site from both within and external to the property, including the broader landscape bushfire risk.

The Proposal is for the construction, operation and eventual decommissioning of a 4.95 Mw Photovoltaic Solar Farm with BESS storage capacity (yet to be decided). See Section 3 and the project site plan (figure 3) for an overview of the proposed development.

Protection of life and property is the primary directive for this FRA in identifying the risks and providing mitigation strategies to ensure greater protection of the proposed development and its employees, emergency responders and the broader community.

This report will respond to and comply with the applicable bushfire planning and building controls, policies and guidelines.

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1.1 Aims and Objectives

This RMP aims to:

- Identify the risks and hazards associated with the site infrastructure, layout and broader landscape throughout construction and operation of the facility.
- Reduce the risk to emergency responders by ensuring safe access to critical infrastructure including firefighting facilities.
- Provide guidance for appropriate on-site firefighting resources commensurate to the identified risk.
- Provide guidance for the design and management of vegetation to reduce bushfire risk.
- Provide guidance for the prevention of fire spread on the site and to adjoining properties.
- Provide guidance for the prevention and mitigation of external fire impacting the site.
- Provide effective emergency planning specific to the site in relation to construction, operations and other fire hazards such as bushfire.
- Provide the framework for the development of a Fire Management Plan
- Provide the framework for the development of an Emergency Management Plan

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1.2 Methodology

1.2.1 Key Documents

This report responds to the strategies and guidance provided in:

- Design Guidelines and Model Requirements: Renewable Energy Facilities Version 4 (CFA, 2023).
- Solar Energy Facilities Design and Development Guideline (DELWP, 2022)
- Clause 13.02-1S of the Victorian Planning Scheme.
- AS/NZS ISO 31000:2018 Risk Management – Principles and Guidelines.
- CSIRO Assessing Bushfire Hazards (CSIRO, 2023)
- Bushfire State Planning Policy Amendment VC140, Planning Advisory Note 68.
- AS 3959-2018 Construction of buildings in bushfire prone areas (Standards Australia, 2020).
- Local Planning for Bushfire Protection, Planning Practice Note 64 (DELWP, 2015).

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1.2.2 Assessment Approach

This report has considered the following throughout the report:

- Reducing the risk from fire to employees, firefighters and the broader community as a priority.
- Identifying the risks and mitigation strategies to prevent or reduce the impact of fire from within or impacting the site.
- Reviewing the relevant literature.
- Assessing the site conditions and the broader landscape conditions through a field and aerial assessment.
- Reviewing the site conditions against the proposal to identify the risk factors.
- Assessing the identified risks against the CFA guidelines.
- Developing the recommendations for the design, construction and operation of the proposal to ensure the risk from fire is properly mitigated.

1.2.3 Literature Review

The following literature has been reviewed as part of the assessment process:

- The key legislative and planning framework for the management of fire risk at solar energy facilities.
- Relevant articles relating to fires at solar energy facilities and BESS fires.
- The municipal and regional bushfire management plans for the Grampians region and West Wimmera LGA

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2 Legislative Framework

There are a number of planning and building systems that regulate land use and development to ensure bushfire hazards and risks are appropriately considered and managed. This section outlines the relevant controls relating to this proposal.

2.1 Planning Policy Framework (PPF)

The Planning Policy Framework provides the foundation for how the planning scheme can be used to assess and respond to planning decisions in relation to bushfire hazards. The primary policies that provide the relevant decision making context for bushfire are:

2.1.1 Clause 13.01-1S Natural Hazards and Climate Change

Cl.13.01-1S 'seeks to minimise the impacts of natural hazards and adapt to the impacts of climate change through risk-based planning. It ensures that hazard assessments, risk assessments, strategic planning and planning applications have regard to all natural hazards and their risks'. (Bushfire Planning Policy, VPA 2023)

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The impact of anthropogenic climate change is undisputed and is leading to an increase in fire occurrence and intensity. This trend towards a more bushfire prone landscape is to be considered in the context of population growth to minimise the risk to life, property and community infrastructure.

2.1.2 Clause 13.02-1S Bushfire planning

Cl. 13.02-1S seeks to 'strengthen the resilience of settlements and communities to bushfire through risk based planning that prioritises the protection of human life'. The policy applies to all decision making relating to any property:

1. Within the Designated Bushfire Prone Area
2. Subject to the Bushfire Management Overlay
3. Used or developed in a way that would create a bushfire hazard.

The West Wimerra Planning Scheme outlines the priorities of Cl.13.02 as:

- 'Prioritising the protection of human life over all other policy considerations.
- Directing population growth and development to low risk locations and ensuring the availability of, and safe access to, areas where human life can be better protected from the effects of bushfire.
- Reducing the vulnerability of communities to bushfire through consideration of bushfire risk in decision-making at all stages of the planning process'.

This report responds to the relevant strategies of Cl.13.02 in relation to the development study area in Section 6.

2.2 Bushfire Prone Area

Bushfire Prone Areas are areas that are subject to or likely to be subject to bushfire. The study area is within the designated Bushfire Prone Area. The Building Regulations AS 3959-2018 require bushfire construction standards in these areas and these are implemented by the relevant building surveyor as part of the building permit.

These construction standards are referred to as Bushfire Attack Levels (BAL). The BAL is a measure of a building's potential to withstand ember attack, radiant heat or direct flame contact. The minimum Bushfire Attack Level requirement within a Bushfire Prone Area is BAL-12.5. The BAL requirement for specific sites is determined by thorough assessment of the site hazard, or as a planning scheme requirement.

The study area has been assessed using the methodology outlined in AS 3959-2018 *Construction of Buildings in Bushfire Prone Areas*.

2.3 Other Planning and Building Controls

2.3.1 Clause 71.02-3 Integrated Decision Making

Cl. 71.02 states 'planning and responsible authorities should endeavour to integrate the range of planning policies relevant to the issues to be determined and balance conflicting objectives in favour of net community benefit and sustainable development for the benefit of present and future generations. However, in bushfire affected areas, planning and responsible authorities must prioritise the protection of human life over all other policy considerations'. (West Wimmera Planning Scheme).

2.3.2 Zoning

The study area is in the Farming Zone.

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3.4.3 Overlays

There are no other overlays aside from the BPA that have any implications for bushfire.

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2.4 Bushfire Hazard Assessment

Clause 13.02 states that the planning process is required to assess and address the bushfire hazard posed to the development, and the likely bushfire behaviour it will produce at a landscape, local, and site scale, including the potential for neighbourhood-scale destruction. The assessment process addresses this by:

- 'Applying the best available science to identify vegetation, topographic and climatic conditions that create a bushfire hazard',

and considering and assessing the bushfire hazard on the basis of:

- 'Landscape conditions - meaning the conditions in the landscape within 20 kilometres and potentially up to 75 kilometres from a site;
- Local conditions - meaning conditions within approximately 1 kilometer from a site;
- Neighbourhood conditions - meaning conditions within 400 metres of a site; and
- The site for the development.' (West Wimmera Planning Scheme, 2018a).

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The site assessment (around 150m of the site boundaries) provides the foundation to determine the BAL construction standards and is based on the classified vegetation and topography within the 150 metres surrounding the study area in all directions.

Although the BPA usually requires a 100m site assessment, larger developments generally require a larger assessment area (150m) within the BPA.

2.5 Victorian Fire Risk Register

The Victorian Fire Risk Register - Bushfire (VFRR-B) is a process in which representatives from local government, fire services, public land managers, utilities and community groups map assets at risk from bushfire and assess the level of risk to the assets (VFRR, 2023). The risk is assessed by combining the local hazard threat, the site susceptibility, and the likelihood of ignition and spread.

The study area has no current risk rating under the VFRR, however the nearby settlements of Edenhope, Apsley and Goroke have similar landscape, vegetation and topographical features to the study area. These townships have been assessed as having very high risk, with a high threat rating, moderate susceptibility, and with fire spread expected to impact assets. It however indicates there to be a low incidence of ignitions. Ember attack, smoke, radiant heat exposure and direct flame contact (grassfire) are possible.

The register also identifies Charam Electrical Substation as an asset with medium risk from grassfire.

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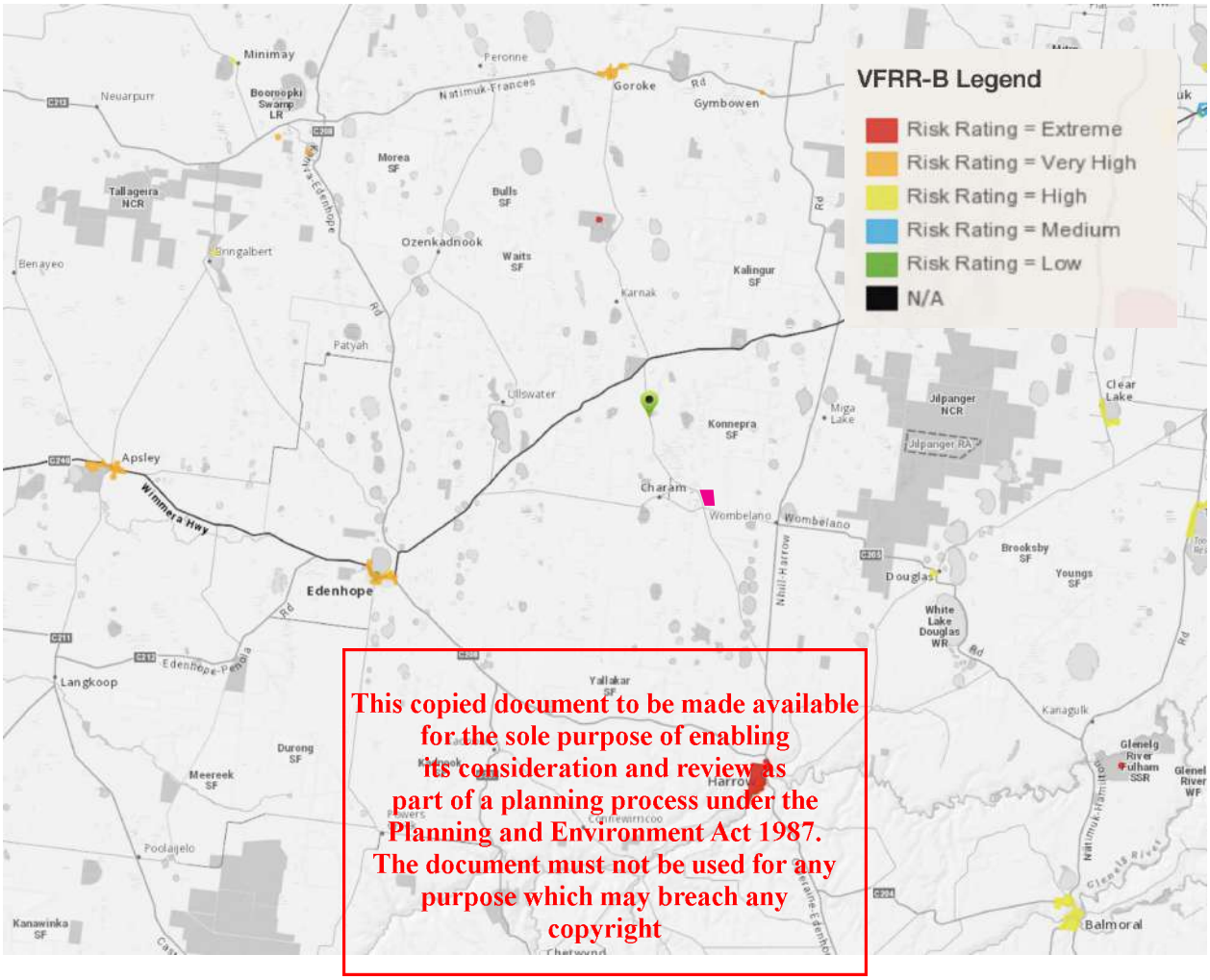

Fig.1 VFRR-B mapping showing the fire risk rating for Charam and surrounding areas. The Study Area is marked in pink (VFRR-B 2024).

2.6 Regional Fire Management Plans

2.6.1 Grampians Bushfire Management Strategy

The Grampians Bushfire Management Strategy (2020) is a joint Forest Fire Management Victoria, CFA, Emergency Management Victoria and Local Government strategic planning document.

The report states that agriculture is the predominant land-use, especially in the western half of the region. Grassfire is recognised as the most common wildfire in the western half of the Grampians region. A larger number of property losses are likely to occur within settlements in this locality, due to the density of the population. Bushfire simulations generated by Phoenix RapidFire illustrate risk by showing where significant impacts on houses may occur. Simulations are undertaken using a range of different weather conditions, likelihood of an ignition, maximum fuel loads and limited bushfire suppression. The data show the modelled house loss as low around the Study Area, due to grass fires being not as hot and producing less embers.

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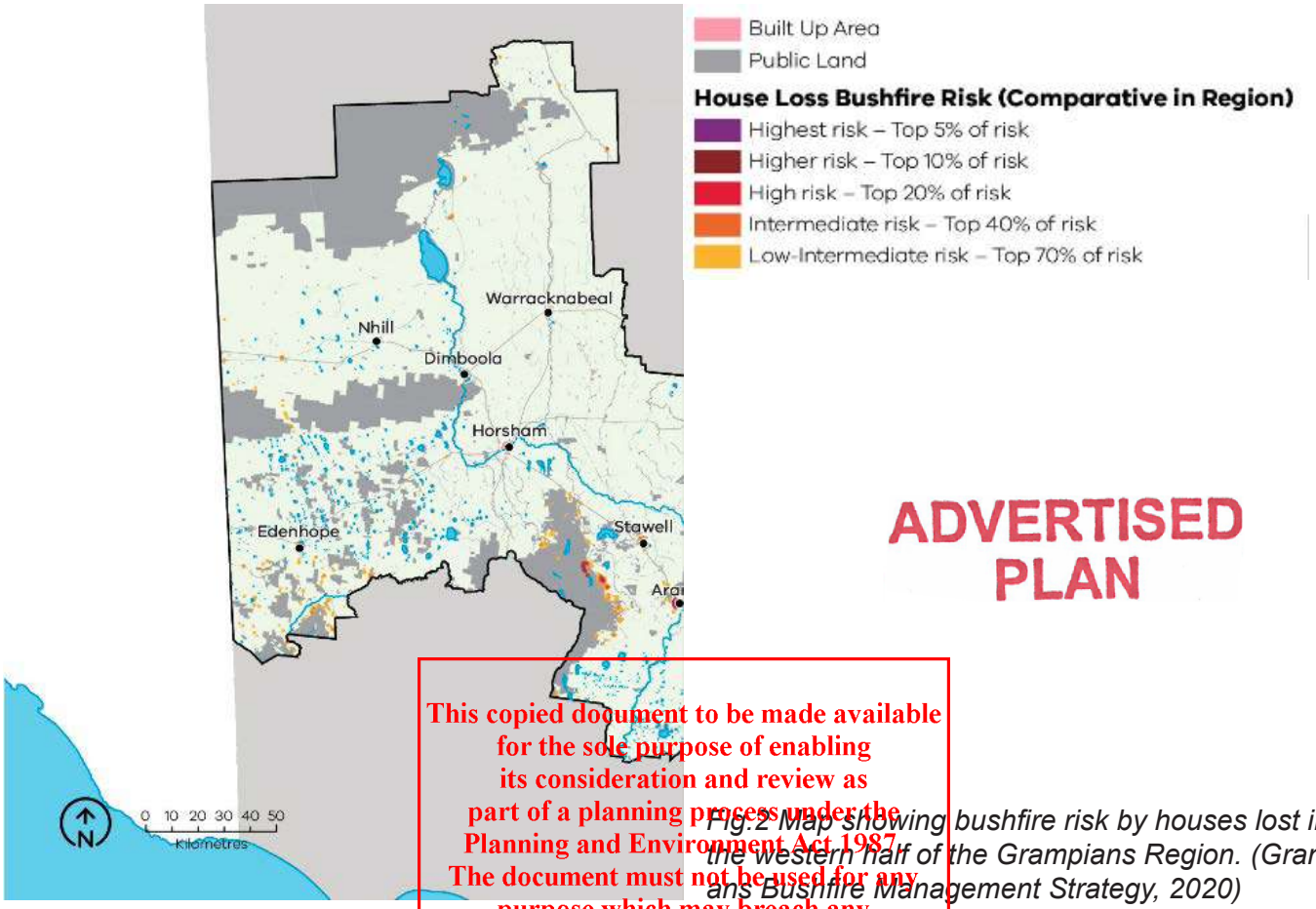

Fig.2 Map showing bushfire risk by houses lost in the western half of the Grampians Region. (Grampians Bushfire Management Strategy, 2020)

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2.6.2 Regional Bushfire Planning Assessment

The *Regional Bushfire Planning Assessment (RBPA) - Grampians Region* (2012) provides information on matters relevant to strategic and settlement planning and focuses on the factors considered important by the Victorian Bushfire Royal Commission, including:

- areas identified from local information provided by either the relevant fire authority or the council that may need to be considered in planning decision making.

The RBPA describes the central and southern areas of the municipality as being dominated by vast grassland areas generally devoid of woodland or forest vegetation and corresponding bushfire hazard.

2.6.3 West Wimmera Shire Municipal Fire Management Plan (MFMP)

The West Wimmera Shire MFMP describes the bushfire season generally running from November to April. Prevailing weather conditions associated with the bushfire season in the Shire area are warm to hot north-westerly winds accompanied by high temperatures and low relative humidity, followed by a cool south-westerly change.

The plan sites lightning, machinery and car exhaust as example sources of ignition, with lightning being the most likely in the Shire.

3 Project Outline

3.1 Location

The site is located approximately 10km west of the township of Edenhope, Victoria on the intersection of Charam-Wombelano Road and Goroke-Harrow Road in the West Wimmera Local Government Area. Primary access to the site is via Charam-Wombelano Road, with a secondary access on the Goroke-Harrow Road. Both access roads are sealed. The surrounding landscape is primarily open farming land (grazing and cropping) with bushland areas to the west and south of the facility. The topography is gently undulating and relatively benign.

3.2 Proposal

The proposed development consists of the following components:

- 10,287 Photovoltaic modules (solar panels) capable of generating up to 4.95 MW.
- Up to 4 BESS container systems each with 2752 kWh capacity, with fire safety systems including liquid cooling, fused sprinkler heads, explosion prevention and ventillation IDLH gases.
- A central inverter station (one inverter).
- Site storage and amenity facilities, only on-site during the construction phase.
- HV Switchboard facility.
- Access via multiple entry points from all-weather roads, with the main entrance providing direct access to a perimeter fire break track and hardstand area.
- A firefighting water supply (288kL)
- A 2.3m high chain link security fencing around the solar farm.
- 10m APZ around the BESS.
- 10m traversable perimeter fire break around the entire solar farm facility. Peripheral landscaping buffer surrounding the site.
- Infrastructure setback greater than 30m from property boundaries and to adjoining land uses.

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Fig.3 Site plan and Infrastructure Layout for the proposed Solar Farm.

4 Fire Risk Assessment

4.1 Introduction

The Risk Management Plan is formulated around the identification, analysis, evaluation and mitigation of the fire risks at and surrounding the site. The risk assessment is a key requirement of the *CFA Design Guidelines and Model Requirements for Renewable Energy Facilities* (version 4, 2023) (hereafter referred to as 'the CFA Guidelines'). The CFA Guidelines define the types of hazards that should be considered at solar PV and BESS facilities.

The risk assessment process as described in AS/NZS ISO 31000:2018 Risk Management – Principles and Guidelines is one way of achieving a structured approach to the management of risk. Consistently implemented, it allows risks to be identified, analysed, evaluated and managed in a uniform and focused manner (AS ISO 31000:2018 Risk management – Guidelines).

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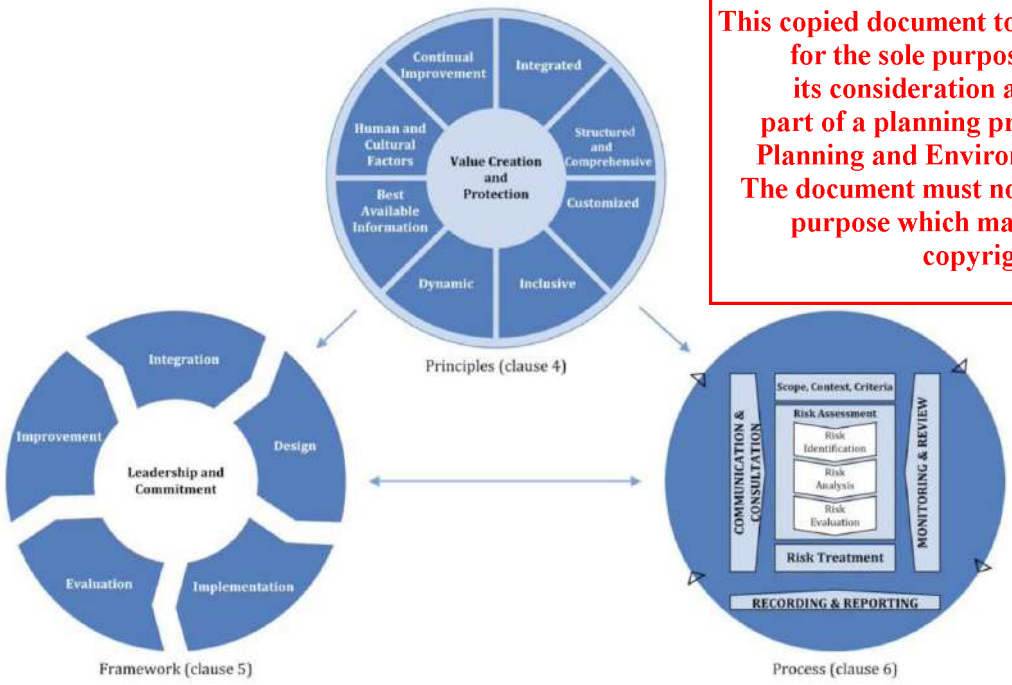

Diagram 1: Source - IS0 31000:2018 Risk Management Principles and Guidelines

The Risk Management Plan process will provide the framework to achieve the outcomes that will mitigate the identified risks throughout the life of the project, from construction to decommission.

The primary outcomes from the RMP are:

- Fire Management Plan
- Emergency Management Plan

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4.2 Assets at Risk

There are a number of assets, aside from the solar farm itself, that surround the proposed site and are potentially at risk from fire emerging from the solar farm. It is assumed that all assets are at risk from fire originating from external sources. The following assets have been identified as being at risk:

Economic Assets

- Charam Zone Substation.
- Horsham - Charam 66KV Sub-transmission Line.
- Edenhope Bore Supply.
- Riordan Receival Site.
- Surrounding grazing pastures and stock.
- Surrounding cropping land.
- Numerous wildlife reserves (hunting).

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Human Settlement Assets

- Numerous rural residences and scattered farming communities, including shedding ancillary to farming activity.
- Nearby townships and rural hamlets including Charam, Wombelano, Douglas, Harrow and the larger community of Edenhope.

Although there are numerous small communities, most are widespread and are far enough from the solar farm site for the risk to be considered low.

The assets at risk on the solar farm site include:

- PV panels
- BESS
- Switchboard and inverter facilities
- Electrical infrastructure
- Fencing and landscaping

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4.2.1 Risks to Public Safety

The risk of fire spreading from the site has the potential to impact local communities, workers and public involved in recreational activity nearby. There is no public access to the facility and the site will be protected from public access by security fencing, limiting the threat to public safety onsite.

It would be expected that the mitigation strategies of ignition prevention and fire suppression would reduce the likelihood of fire spreading from the site and impacting the public.

4.2.2 Risks to Firefighter Safety

There are a number of CFA brigades in the area that would respond to fire from within the site or in the broader landscape. It would be assumed that the standard Dynamic Risk Assessment for grassland fire would be employed when responding to landscape fire.

The effective de-energising of electricity from PV solar panels and battery storage systems is difficult, and procedures for undertaking this process are unclear at the moment. All equipment that is damaged, faulty or involved in fire should be treated as energised and presenting an electrocution hazard.

Risks to firefighter safety associated with fire at solar farm facilities include:

Solar Panels

- Electrocution- PV panels remain energised when they are exposed to a light source and DC current isolation can only occur external to the arrays.
- Toxic fumes from smoke generated from fire impacting the solar panels, including from plastic and rubber components.

BESS infrastructure

- Electrocution - BESS have significant risks with electrical shock at hazardous voltage levels
- Explosions and Arc flash- short circuiting of the battery components can result in temperatures exceeding 1200℃, potentially causing fire and explosions.
- Hazardous Chemical Exposure- BESS systems can be compromised through exposure to extreme temperatures. Thermal runaway is a chemical chain reaction in lithium-ion batteries and occurs when a battery cell short circuits and starts to heat up uncontrollably. In lithium-ion batteries this can create a flammable and toxic vapour. Temperatures can exceed 1000°C and igniting vapours and can be violent and explosive in nature.

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4.2.3 Fire Ignition Risks

There are a number of factors that could lead to uncontrolled fire impacting the site or the broader surrounds. The most common ignitions occur from natural sources, especially lightning strikes, but there are common anthropogenic sources including machinery operation, tools, motor vehicles, arson and illegal burns.

The dominant land use surrounding the site is agricultural, with cropping and grazing enterprises involving activities that can ignite uncontrolled fire. Slashing and mechanical harvesting are often ignition sources leading to rapid uncontrolled fire.

These sources are beyond the control of the solar farm facility, however there are number of ignition sources that can arise from the day to day construction and operation of a solar farm, including:

- Electrical faults
- Machinery and equipment operation
- Tool use during construction and maintenance (e.g. angle grinding, welding)
- Vegetation management activity (chainsaw use, fire break management)
- Accidental fire (discarded cigarettes, vehicle accidents, damage to infrastructure)
- Inappropriate storage of dangerous and flammable goods

4.3 Bushfire Risk

The Bushfire Risk Assessment has been informed by Clause 13.02-1S of the West Wimerra Planning Scheme. The objective of this policy is ‘to strengthen the resilience of settlements and communities to bushfire through risk-based planning that prioritises the protection of human life’ (West Wimerra PS, 2018).

Clause 13.02-1S outlines strategies to identify and assess the bushfire risks by:

- Applying the best available science to identify vegetation, topographic and climatic conditions that create a bushfire hazard.
- Considering the best available information about bushfire hazard including the map of designated bushfire prone areas prepared under the Building Act 1993 or regulations made under that Act.
- Applying the Bushfire Management Overlay to areas where the extent of vegetation can create an extreme bushfire hazard.
- Considering and assessing the bushfire hazard on the basis of:

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a. Landscape conditions - meaning conditions in the landscape within 20 kilometres (and potentially up to 75 kilometres) of a site;

b. Local conditions - meaning conditions in the area within approximately 1 kilometre of a site;

c. Neighbourhood conditions - meaning conditions in the area within 400 metres of a site; and

d. The site for the development.

By analysing the broader landscape and site conditions with the predominant fire weather, landscape fuel loads and landscape topography, a model of expected fire behaviour at the site can be developed.

4.4 Fire Weather

Fire weather influences the likelihood of ignition, fire severity and rate of spread from uncontrolled fire. The conditions that lead to a declaration of fire weather (usually but not exclusively within the declared Fire Danger Period) are determined by a number of factors such as relative humidity, wind speed, wind direction and air temperature.

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Typical fire weather pertinent to Charam and surrounds has been analysed through the Bureau of Meteorology (BOM 2024) based on observations and statistics from the Edenhope Airport weather station. As with much of Central and Western Victoria, the hottest and driest period is January to March, with the Fire Danger Period usually declared between November and April. The West Wimerra Municipal Fire Management Plan describes prevailing weather conditions associated with the bushfire season in the Shire area as warm to hot northwesterly winds accompanied by high temperatures and low relative humidity followed by a cool southwesterly change.

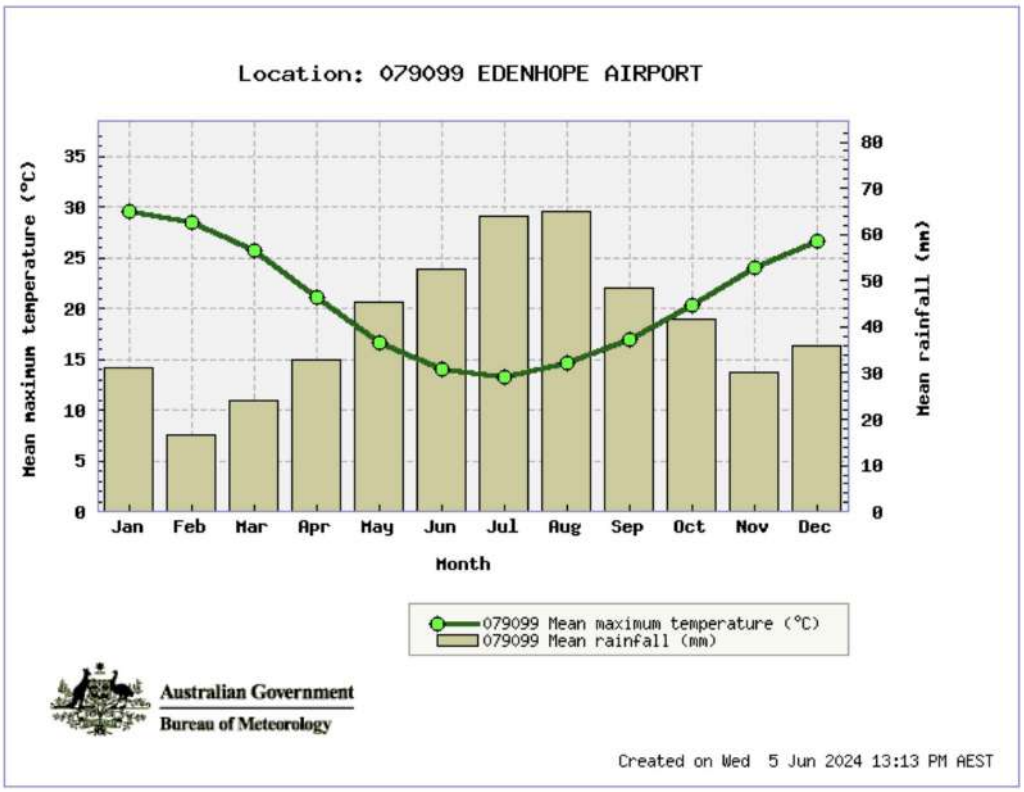

Fig.4 Graph showing mean rainfall compared to maximum temperatures, from Edenhope Airport (BOM 2024)

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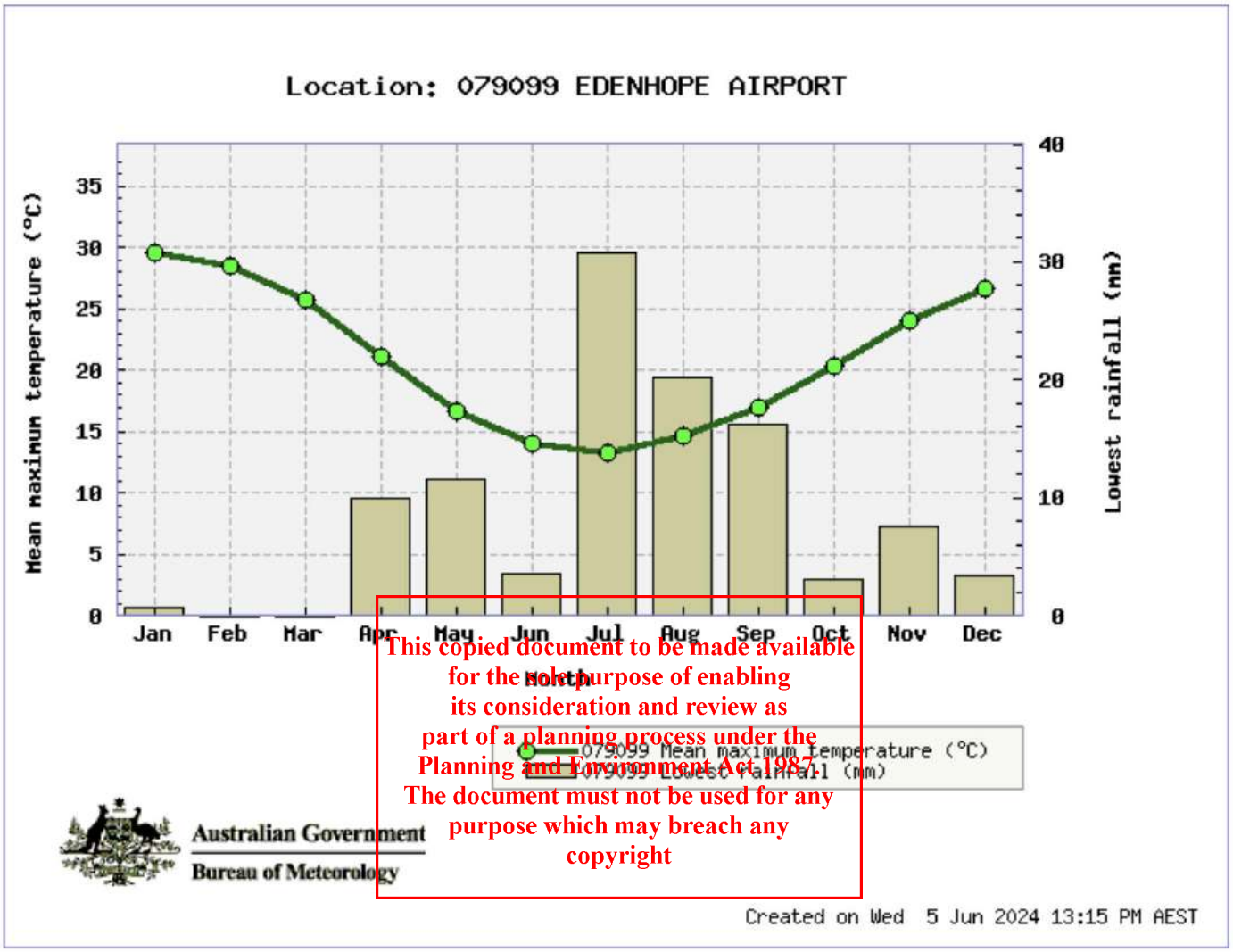

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Fig.5 Graph showing lowest rainfall compared to maximum temperatures, from Edenhope Airport (BOM 2024)

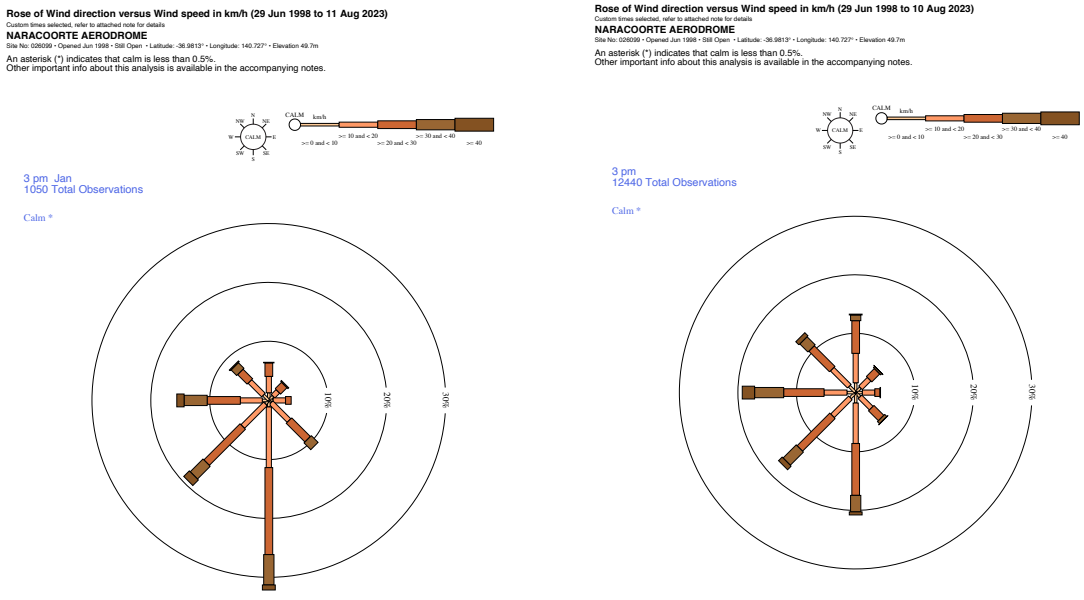

Fig.6 Wind rose showing wind speed and direction, Naracoorte Aerodrome (BOM 2024)

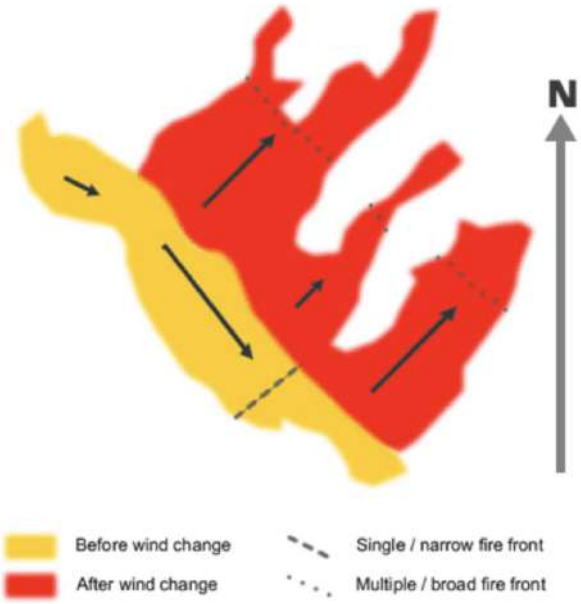

Fig.7 Diagram demonstrating the increase in fire front following a southwesterly wind change.

The pattern of cool southerly changes can significantly increase the severity of rate of spread of bushfire and grassfire. The open grasslands surrounding the study area are subject to strong winds and may result in difficult to control conflagrations over a large front, especially during a southwesterly change.

4.5 Fuel loads

The landscape immediately adjacent to the site and up to 450 metres surrounding the site is predominantly grassland vegetation managed for pasture grazing. The expected fuel loads would vary, but an average estimate for fully cured grassland, 20-30cm high with 70% cover and moderate thatching would be 2.5-3 t/ha. Grassland fuels are relatively easy to treat to reduce the available fuels during the season by slashing and grazing. Fuel buffers and APZ's are relatively easy to establish with machinery or grazing. Fire breaks and control lines can be readily established as part of direct attack strategies during grassfire firefighting.

4.6 Topography

The surrounding landscape topography is relatively benign, with gentle slopes (well under 5°) at around 180m above sea level. It would be expected that the gentle terrain would have little impact on fire behaviour.

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4.7 Landscape Risk Typologies

The table below (DELWP Technical Guide *Planning Applications in the Bushfire Management Overlay,* 2017) describes four broader landscape types representing different landscape risk levels to inform consistent decision making based on overall risk.

The study area as a whole is characteristic of Broader Landscape Type 3. Neighbourhood scale destruction is possible, especially under extreme bushfire conditions. Bushfire can generally approach from multiple directions. The prevailing bushfire weather sectors (northwest and southwest) are predominantly grassland vegetation. There is fragmentation of the grassland by sealed roads that offer a reasonable buffer, although it would be expected that in severe bushfire conditions especially when driven by stronger winds (>25km/h) fire would likely jump control lines and buffers by embers starting spotfires ahead of the front.

The primary forest vegetation near the site is over 400m to the east. The eastern sector is less likely to drive severe fire behaviour, therefore wind-driven embers and radiant heat from this sector are less likely to impact the site.

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Broader Landscape Type 1	Broader Landscape Type 2	Broader Landscape Type 3	Broader Landscape Type 4
• There is little vegetation beyond 150 metres of the site (except grasslands and low-threat vegetation). • Extreme bushfire behaviour is not possible. • The type and extent of vegetation is unlikely to result in neighbourhood- scale destruction of property. • Immediate access is available to a place that provides shelter from bushfire.	• The type and extent of vegetation located more than 150 metres from the site may result in neighbourhood-scale destruction as it interacts with the bushfire hazard on and close to a site. • Bushfire can only approach from one aspect and the site is located in a suburban, township or urban area managed in a minimum fuel condition. • Access is readily available to a place that provides shelter from bushfire. This will often be the surrounding developed area.	• The type and extent of vegetation located more than 150 metres from the site may result in neighbourhood-scale destruction as it interacts with the bushfire hazard on and close to a site. • Bushfire can approach from more than one aspect. • The site is located in an area that is not managed in a minimum fuel condition. • Access to an appropriate place that provides shelter from bushfire is not certain.	• The broader landscape presents an extreme risk. • Fires have hours or days to grow and develop before impacting. • Evacuation options are limited or not available.
INCREASING RISK			

Fig.8 Table of broader landscape typologies (DELWP 2017)

4.8 Bushfire History

Recent bushfire history shows that frequent fires have occurred in the surrounding landscape since 1979 (Konnipera State Forest) with larger fires in 2006 (Yallakar State Forest), and with the most recent fire being 2013 (Caldows State Forest). The size and extent of fires suggest that larger fires tend to be more common in forested areas, and that fire outbreaks in grassland would have a higher suppression success rate. Larger fires in grassland tend to be more common in drought years when conditions tend to support more intense uncontrollable fires.

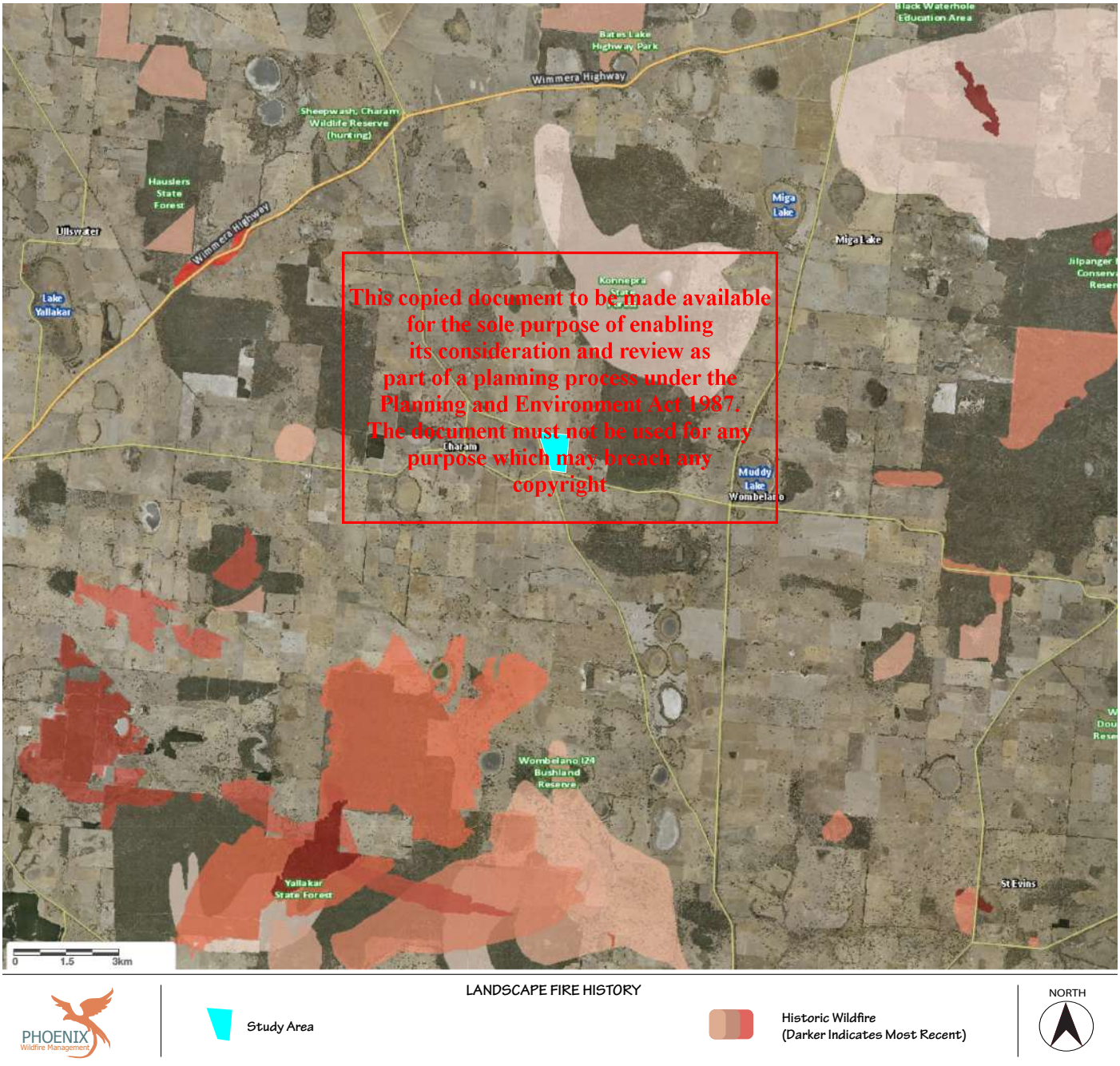

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Fig.9 Landscape Fire History Plan.

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4.9 Landscape and Site Conditions

4.9.1 Broader Landscape Conditions (20km)

The broader landscape surrounding the study area is evaluated out to 20km from the site. The study area sits 2km to the east of the Edenhope township and approximately 70km to the southwest of Horsham which offers the closest areas of BAL-LOW. The predominant vegetation surrounding the site is grassland associated with farming activity. The primary land use is a broad mix of cropping and grazing activity. There are isolated patches of forested vegetation, with notably two larger areas to the east (Konnipera State Forest and Jilpanger Conservation Reserve) and to the west (Hauslers State Forest). These forested areas are well separated from the site and fire in the forested areas is unlikely to have a direct impact.

A likely broader landscape scenario would see fire breaking out in the northwestern sector driven by strong winds towards the site in fire weather. The fire front from this sector is more likely to have greater impact over a larger area if a southwesterly change increases the expanse of the front, pushing it northeast towards the site.

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Likely Scenarios

The most likely scenario for fire starting at this scale would be from lightning strikes, accidental machinery fires on farming properties, roadside fires from car exhausts or careless or negligent activity. The higher fuel loads in the forest vegetation would pose a risk for spotfires emerging in grassland vegetation and running towards the site, particularly if driven by prevailing fire weather in the northwestern sector. Fires would be difficult to control during drought conditions and severe fire weather. In less severe conditions, fires would be more likely to be controllable through direct suppression tactics aided by significant fuel breaks such as the surrounding road network.

Recommended Mitigation

Incorporating an Asset Protection Zone (APZ) through a modified vegetation buffer and perimeter tracks around the facility would reduce the potential for fire to enter (or exit) the facility. Regular vegetation management would reduce the chance of spread and the fire intensity.

Fire breaking out nearby would reduce the potential for any on-site workers to safely evacuate. Provision of a ‘safer place’ where there is reasonable setback from vegetation should be provided, along with instruction on the protocols for sheltering for on-site staff.

Developing and implementing the Emergency Management Plan would guide the actions of staff in preparation for and during a bushfire.

Reducing higher risk activity on elevated bushfire risk days would reduce the chance of accidental ignition.

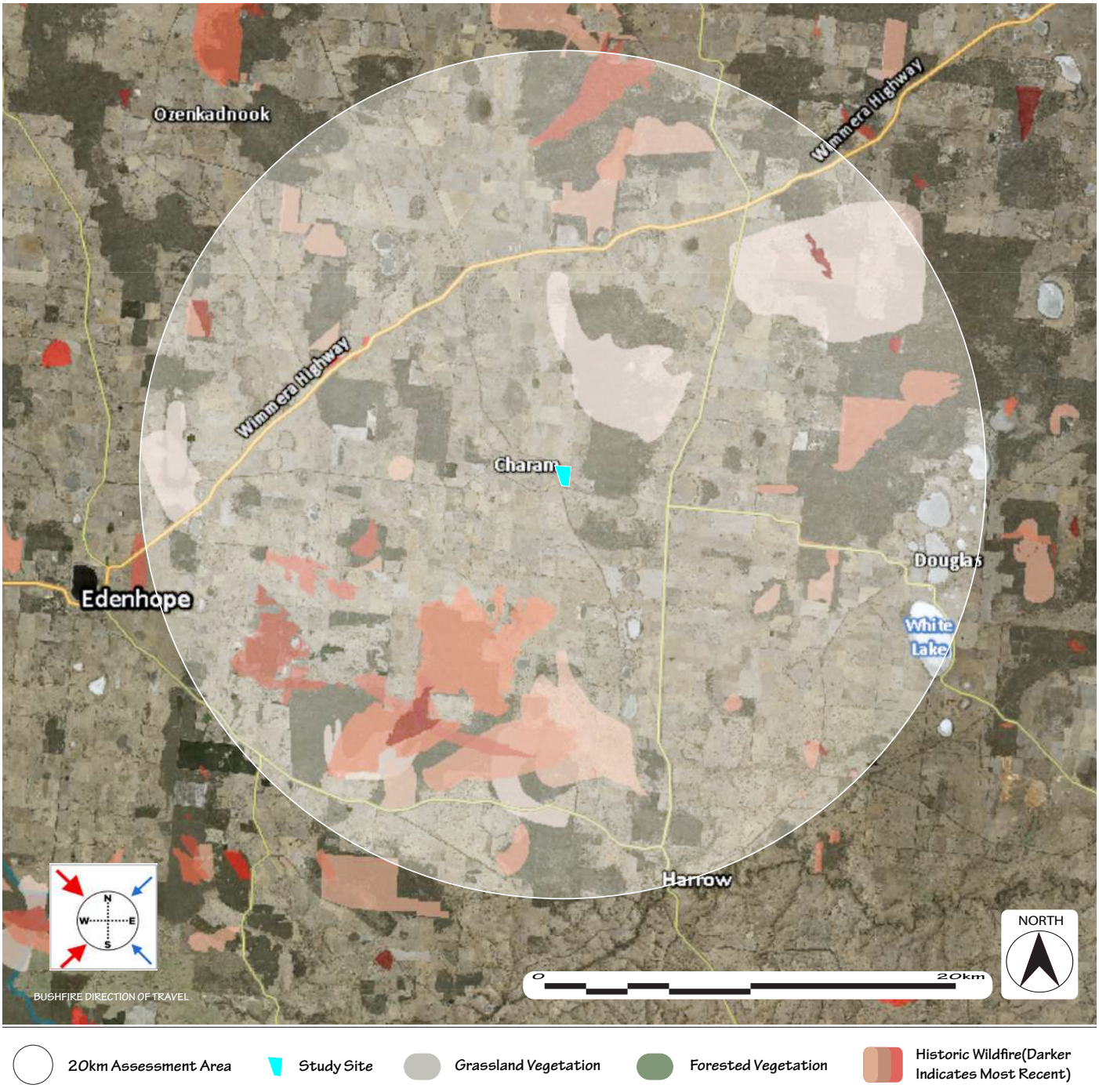

Fig.10 Broader Landscape Site Plan, detailing the landscape risks within 20km of the study area.

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4.9.2 Neighbourhood and Local Landscape Conditions (1-5km)

The landscape conditions within 5km of the study area are similar to the broader landscape, with predominantly flat and gently undulating land covered with three distinct land types:

- Forest vegetation areas are closest at the east of the study area (Konnepra State Forest) and are over 400m away.
- Grassland paddocks abut the site to the north and east. There is a potential for grassfire to impact the site, especially during years with increased drought and high winds. Roads separate the grassland vegetation to the west and south. Shelterbelts and roadside vegetation typically have higher fuel loads and may increase the likelihood of spotfires and fire jumping control lines and roadways.
- The Konnepra Swamp to the west of the site would provide some buffer from extreme fire behaviour when there is significant levels of moisture available in the swamp. However, during drought years and severe fire weather conditions, the fuel load would likely be high and contribute to an increase in fire behaviour.

Likely Scenarios

The surrounding roadways fragment the grassland vegetation and offer a break to the site from the western, southwestern and southern sectors. The most likely scenario for fire starting at the local scale would be from accidental machinery fires on neighbouring properties, roadside fires from car exhausts, or careless or negligent activity. The higher fuel loads on roadside vegetation would pose the greater risk. There is a small risk from local lightning strikes.

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Recommended Mitigation

Incorporating an APZ through a modified vegetation buffer and perimeter tracks around the facility would reduce the potential for fire to enter (or exit) the facility. Regular vegetation management would reduce the chance of spread and the fire intensity.

Fire breaking out nearby would reduce the potential for any on-site workers to safely evacuate. Provision of a 'safer place' where there is reasonable setback from vegetation should be provided, along with instruction on protocols for sheltering for on-site staff.

Developing and implementing the Emergency Management Plan would guide the actions of staff in preparation for and during a bushfire.

Reducing higher risk activity on elevated bushfire risk days would reduce the chance of accidental ignition.

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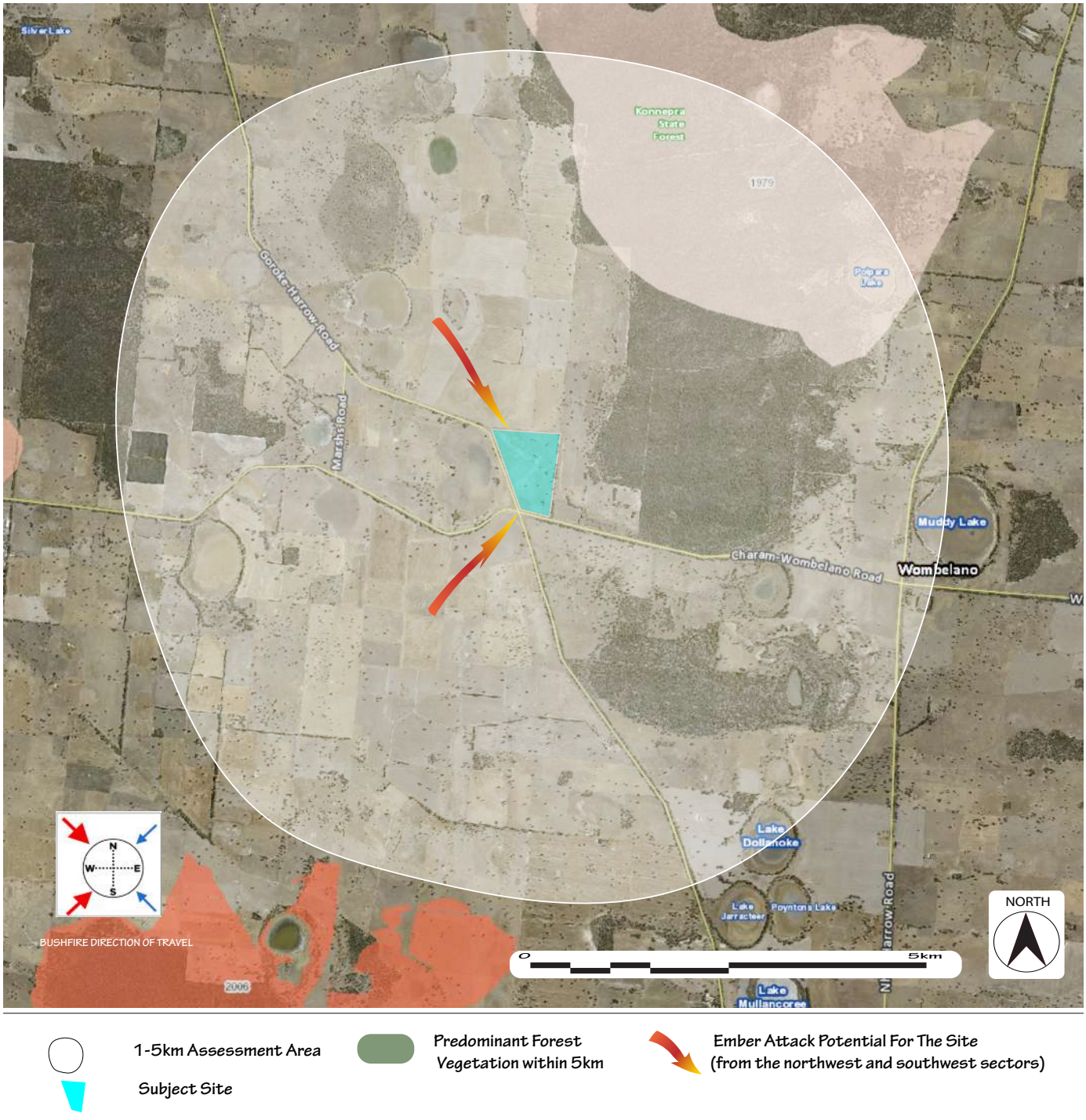

Fig.11 Broader Landscape Site Plan, detailing the landscape risks within 5km of the study area.

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4.9.3 Site Conditions (1km)

This BMO/BPA Vegetation classification is designed to assist in differentiating between vegetation classes in order to aggregate vegetation communities based on typical fire-behaviour characteristics. These classifications aim to help determine defendable space and construction requirements under the Bushfire Management Overlay (BMO) and AS 3959–2018. This approach uses a generalised description of vegetation based on the AUSLIG (Australian Natural Resources Atlas: No.7 – Native Vegetation) classification system, also referred to as the Specht system (Specht, 1970).

4.9.4 Study Area Vegetation Profiles

In accordance with AS 3959-2018 *Construction of Buildings in Bushfire Prone Areas*, the classifiable vegetation types identified up to 1km of the study area are as follows:

- **Forest Vegetation:** Characterised by tall Eucalyptus spp. with canopies exceeding 30% cover, moderate to high mid level understorey growth.

The Ecological Vegetation Classification (EVC) for this forested area is 'Wimmera Heathy Woodland', however although the EVC description is 'woodland', the overall bushfire vegetation as per AS 3959 is more consistent with forest vegetation. The variability of the woodland vegetation and high presence of understorey vegetation aligns with forest vegetation as per the classifications of AS 3959.

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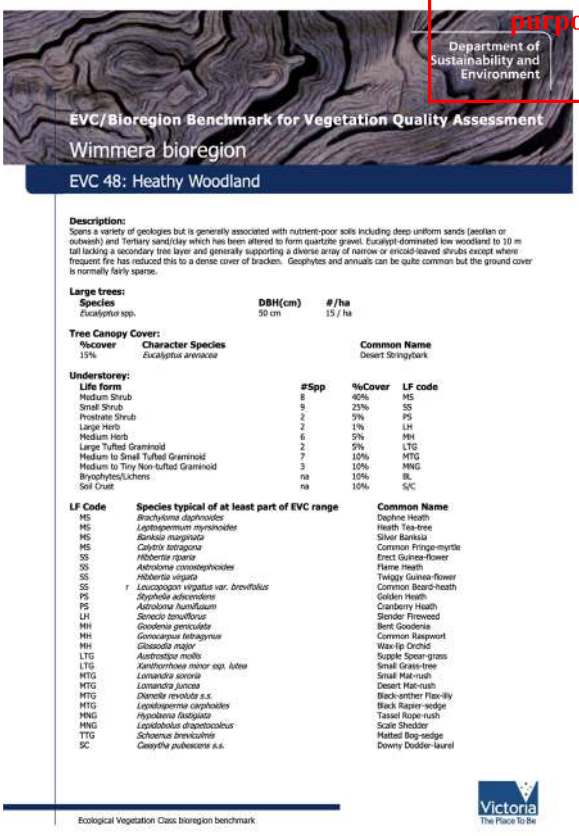
Department of Sustainability and Environment

EVC/Bioregion Benchmark for Vegetation Quality Assessment

Wimmera bioregion

EVC 48: Heathy Woodland

Description:
Spans a variety of geologies but is generally associated with nutrient-poor soils including deep uniform sands (aeolian or outwash) and Tertiary sand/clay which has been altered to form quartzite gravel. Eucalypt-dominated low woodland to 10 m tall lacking a secondary tree layer and generally supporting a diverse array of narrow or ericoid-leaved shrubs except where frequent fire has reduced this to a dense cover of bracken. Geophytes and annuals can be quite common but the ground cover is normally fairly sparse.

Large trees:

Species	DBH(cm)	#/ha
Eucalyptus spp.	50 cm	15 / ha

Tree Canopy Cover:

%cover	Character Species	Common Name
15%	*Eucalyptus arenacea*	Desert Stringybark

Understorey:

Life form	#Spp	%Cover	LF code
Medium Shrub	8	40%	MS
Small Shrub	9	25%	SS
Prostrate Shrub	2	5%	PS
Large Herb	2	1%	LH
Medium Herb	6	5%	MH
Large Tufted Graminoid	2	5%	LTG
Medium to Small Tufted Graminoid	7	10%	MTG
Medium to Tiny Non-tufted Graminoid	3	10%	MNG
Bryophytes/Lichens	na	10%	BL
Soil Crust	na	10%	S/C

LF Code	Species typical of at least part of EVC range	Common Name
MS	*Brachyloma daphnoides*	Daphne Heath
MS	*Leptospermum myrsinoides*	Heath Tea-tree
MS	*Banksia marginata*	Silver Banksia
MS	*Calytrix tetragona*	Common Fringe-myrtle
SS	*Hibbertia riparia*	Erect Guinea-flower
SS	*Astroloma conostephioides*	Flame Heath
SS	*Hibbertia virgata*	Twiggy Guinea-flower
SS	*r Leucopogon virgatus var. brevifolius*	Common Beard-heath
PS	*Styphelia adscendens*	Golden Heath
PS	*Astroloma humifusum*	Cranberry Heath
LH	*Senecio tenuiflorus*	Slender Fireweed
MH	*Goodenia geniculata*	Bent Goodenia
MH	*Gonocarpus tetragynus*	Common Raspwort
MH	*Glossodia major*	Wax-lip Orchid
LTG	*Austrostipa mollis*	Supple Spear-grass
LTG	*Xanthorrhoea minor ssp. lutea*	Small Grass-tree
MTG	*Lomandra sororia*	Small Mat-rush
MTG	*Lomandra juncea*	Desert Mat-rush
MTG	*Dianella revoluta s.s.*	Black-anther Flax-lily
MTG	*Lepidosperma carphoides*	Black Rapier-sedge
MNG	*Hypolaena fastigiata*	Tassel Rope-rush
MNG	*Lepidobolus chaetocoleus*	Scale Shedder
TTG	*Schoenus brevicalmis*	Matted Bog-sedge
SC	*Cassytha pubescens s.s.*	Downy Dodder-laurel

Victoria The Place To Be

Ecological Vegetation Class bioregion benchmark

Fig.12 EVC for the local forested areas.

Fig.13 Photo of the forested vegetation to the east of the study area.

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Grassland Vegetation: All open grasslands or cropping and pasture where tree cover does not exceed 10% cover.

The grassland within the 1km area is typical of pasture grass associated with grazing land. There is reasonable likelihood that during drought years paddocks would carry lower fuel loads due to the increased grazing pressure and reduced cropping growth, however under these conditions the drought factor would increase fire rate of spread.

The Konnepra Swamp to the west of the site would provide some buffer from extreme fire behaviour when there is significant levels of moisture available in the swamp. However, during drought years and severe fire weather conditions, the fuel load would likely be high and contribute to an increase in fire behaviour.

Likely Scenarios
The surrounding roadways fragment the grassland vegetation and offer a break to the site from the western, southwestern and southern sectors. The most likely scenario for fire starting at the local scale would be from accidental machinery fires on neighbouring properties, roadside fires from car exhausts, or careless or negligent activity. The higher fuel loads on roadside vegetation would pose the greater risk. There is a small risk from local lightning strikes.
Recommended Mitigation
Incorporating an APZ through a modified vegetation buffer and perimeter tracks around the facility would reduce the potential for fire to enter (or exit) the facility. Regular vegetation management would reduce the chance of spread and the fire intensity. Fire breaking out near the site would reduce the potential for any on-site workers to safely evacuate. Provision of a 'safer place' where there is reasonable setback from vegetation should be provided, along with instruction on protocols for sheltering for on-site staff. Developing and implementing the Emergency Management Plan would guide the actions of staff in preparation for and during a bushfire. Reducing higher risk activity on elevated bushfire risk days would reduce the chance of accidental ignition.

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Fig.14 Grassland directly southwest of the study area.

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Fig.15 Site Hazard Assessment within 1km of the study area.

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5 Clause 13.01-1S Natural Hazards and Climate Change

Climate change is expected to increase bushfire severity and behaviour. The link between climate change and bushfires is well-established. Climate change is expected to increase the frequency and severity of bushfire through:

- **Rising Temperatures:** One of the most significant impacts of climate change is the increase in global temperatures. In Australia temperatures have been rising over the past century. According to the *State of the Climate 2020* report by the Australian Bureau of Meteorology and CSIRO, Australia has experienced an increase in average temperatures, which contributes to more frequent and intense heatwaves.

- **Drier Conditions:** Climate change can lead to decreased rainfall and prolonged droughts. The *State of the Climate* report also notes that southern Australia, including Victoria, has experienced reduced rainfall, leading to drier conditions, which can make vegetation more susceptible to ignition.

- **Extreme Weather Events:** Climate change is linked to an increase in extreme weather events, including more frequent and severe heatwaves. These conditions create ideal circumstances for bushfires to ignite and spread rapidly. The Intergovernmental Panel on Climate Change (IPCC) reports, such as the *Special Report on Global Warming of 1.5°C* (2018), highlight the increasing frequency and intensity of extreme weather events as a consequence of global warming.

- **Increased Fuel Load:** As vegetation becomes drier and more prone to ignition due to prolonged drought and higher temperatures, it contributes to an increase in fuel load. Dry, combustible vegetation serves as a ready source of fuel for bushfires. The Climate Council's report, *The Facts about Bushfires in Australia* (2020), explains how climate change leads to more fuel available for fires.

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- **Longer Bushfire Seasons:** Climate change can extend the bushfire season. The Bushfire and Natural Hazards Cooperative Research Centre (BNHCRC) conducted research that indicates an increase in the length of the bushfire season in southern Australia due to climate change.

- **Stronger Winds:** Climate change can also lead to stronger and more erratic winds, which can influence the speed and direction of bushfires. These winds can make fires less predictable and more challenging to control. The Bureau of Meteorology's report on the link between climate change and Australian bushfires highlights the role of strong winds in fire behaviour.

In summary, climate change is expected to increase bushfire severity and behaviour by raising temperatures, reducing rainfall, creating drier conditions, increasing the risk of extreme weather events, prolonging the bushfire season, enhancing fuel availability, and influencing wind patterns. It's important to note that addressing climate change and taking measures to adapt to its impacts are critical steps in mitigating the increased risk of bushfire in Victoria, especially when planning critical infrastructure such as solar farms.

The site has been assessed as being relatively low-risk and capable of supporting a range of mitigation strategies that will continue to be effective and adaptable in light of the growing bushfire risk from climate change.

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6 Clause 13.02 Bushfire Planning Strategies

This section outlines more specific responses to the strategies for developments stipulated in Clause 13.02-1S.

6.1 Protection of Human Life Strategies

Give priority to the protection of human life by:

Prioritising the protection of human life over all other policy considerations.

This report has considered the broader landscape and local bushfire risks and concluded that the extent of bushfire vegetation combined with the gentle terrain is not expected to significantly increase bushfire behaviour beyond what would be expected in grassland vegetation. Applying the applicable mitigation strategies and relevant bushfire protection measures commensurate to the localised risk will sufficiently mitigate the bushfire risk to the facility to an acceptable level. Adapting a comprehensive Emergency Management Plan in conjunction to the mitigation strategies will ensure that protection of human life has been prioritised over all other policy considerations.

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Strategies include:

- Development of a comprehensive Emergency Management Plan.
- Development and management of the APZ's around the perimeter and critical infrastructure.
- Monitoring and regulating high risk activities on the site (such as 'hot works') during elevated fire danger conditions.
- Good access for emergency vehicles to enter the site and engage in firefighting activities and good egress for safe evacuation of workers.

Reducing the vulnerability of communities to bushfire through the consideration of bushfire risk in decision making at all stages of the planning process.

This report provides the framework to consider community resilience to bushfire risk throughout the planning process and has considered all the relevant guidance for planning future settlement.

The proposed solar farm development is in keeping with this priority through considering protection measures such as:

- Directing the development to locations of lower bushfire risk.
- Avoiding development in locations where there is significant bushfire risk that cannot be avoided.
- Avoiding development in locations of extreme bushfire risk.
- Avoiding development in areas where planned bushfire protection measures may be incompatible with other environmental objectives (CFA, 2015).

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6.2 Bushfire Hazard Identification and Assessment Strategies

This report has identified the bushfire hazards for the site and outlined the appropriate risk assessment strategies by:

Applying the best available science to identify vegetation, topographic and climatic conditions that create a bushfire hazard:

This report has used the accepted methodologies of AS 3959-2018 to identify vegetation, topographic and climatic conditions that create a bushfire hazard. Additionally, guidance has been provided by Planning Practice Note 64 Local planning for bushfire protection (DEWLP, 2015), Planning Permit Applications Bushfire Management Overlay, Technical Guide (DEWLP, 2017), and Vegetation Classes,Victorian Bushfire Management Overlay (CFA, 2014).

Climate and weather data has been taken from The Bureau of Meteorology Climate Statistics.

Considering the best available information about bushfire hazard including the map of designated bushfire prone areas prepared under the Building Act 1993 or regulations made under that Act:

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The extent of the BPA has been mapped in relation to the study area (see Fig 16) based on mapping available through VICPLAN (Version 2.4.4, 2023).

Applying the Bushfire Management Overlay in planning schemes to areas where the extent of vegetation can create an extreme bushfire hazard:

The extent of the BMO has been mapped in relation to the subject site (see Fig 23) based on mapping available through VICPLAN (Version 2.4.4, 2023)

Fig.16 Map showing the extent of the BPA and BMO coverage surrounding the Study Area (blue) (VICPLAN 2023) .

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Consulting with emergency management agencies and the relevant fire authority early in the process to receive their recommendations and implement appropriate bushfire protection measures:

CFA will be consulted during the process of preparing the current development plan. It is anticipated that further consultation with CFA and other agencies may occur for the study area.

Ensuring that strategic planning documents, planning scheme amendments, planning permit applications and development plan approvals properly assess bushfire risk and include appropriate bushfire protection measures:

The applicable planning regulations relevant to the BPA and BMO have been used in conjunction with DELWP advisory and practice notes to apply the appropriate bushfire protection measures in this report. The regional and municipal bushfire plans, bushfire history and the Victorian Bushfire Risk Register have also been considered in the preparation of this report.

Not approving development where a landowner or proponent has not satisfactorily demonstrated that the relevant policies have been addressed, performance measures satisfied or bushfire protection measures can be adequately implemented:

The bushfire risk to the proposed solar farm development can be deemed to be acceptably mitigated if the objectives and strategies set out in this report are complied with in accordance with AS 3959-2018 and the relevant CFA guidelines. It is expected that the bushfire hazards that have been identified and the proposed mitigation strategies set out in this report are able to respond to the risk through implementing the relevant mitigation measures.

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6.3 Settlement and Planning Strategies

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 proposed facility has been located away from population centres where the risk of exposure to fire and associated toxic fumes could present a risk to existing populations. The nearest large population centre of Edenhope is 20 kilometres to the east and unlikely to be significantly impacted by fire at the proposed facility.

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 reduce bushfire risk overall:

There will be no increase in risk to the existing and future residents or community infrastructure provided:

- The identified mitigation strategies set out in this report are implemented.
- Appropriate water supplies and access and egress for emergency vehicles are provided to the site.
- Implementing appropriate setbacks from classifiable vegetation and APZ requirements will ensure there is a net decrease in bushfire risk from unmanaged vegetation.

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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 3959-2018 Construction of Buildings in Bushfire-prone Areas (Standards Australia, 2018):

The site vegetation has been assessed against the slope (grassland <5º downslope) and a setback of greater than 22m is required to achieve <12.5Kw/m². The proposal shows that there is greater than 30m separation between potentially unmanaged vegetation over the property boundary and any critical infrastructure on the site. The proposed vegetation buffer around the perimeter fence along with the grassland between this vegetation and the boundary will need to be managed in a low-threat condition to ensure there is not an increase in fire fuel near the facility. It is recommended that a mown buffer be provided externally to the perimeter fencing and vegetation screening to reduce the radiant heat potential throughout the fire danger period.

6.4 Biodiversity and Conservation Value

Ensure settlement growth and development approvals can implement bushfire protection measures without unacceptable biodiversity impacts by discouraging settlement growth and development in bushfire affected areas that are important as areas of biodiversity.

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The site was assessed to determine the existing flora and its biodiversity values. Significant trees were identified as River Red Gum (*Eucalyptus camaldulensis*) and as part of the endangered Plains Woodland EVC. These trees are to be retained and have been incorporated into the proposed development plan. The trees have also been considered in the overall vegetation management strategies and requirements for the site.

Fig.17 One of the larger significant tress to be retained within the facility.

6.5 Use and development control in a Bushfire Prone Area

Clause 13.02 states 'In a bushfire prone area designated in accordance with regulations made under the Building Act 1993, bushfire risk should be considered when assessing planning applications for the following uses and development:

- Subdivisions of more than 10 lots.
- Accommodation.
- Child care centre.
- Education centre.
- Emergency services facility.
- Hospital.
- Indoor recreation facility.
- Major sports and recreation facility.
- Place of assembly.
- Any application for development that will result in people congregating in large numbers.

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While renewable energy facilities are not referenced under the use and development policy contained within Clause 13.02-1S Bushfire Planning, other policies in the control still apply.

There is an expectation that the risk of bushfire to people, property and community infrastructure is considered, and that appropriate bushfire protection measures to address the identified bushfire risk to and from the proposed development are proposed to at least the level within this guideline within the planning application.

The CFA Guidelines for renewable energy facilities provide guidance for the minimum standards that should be met for solar energy facilities through the model requirements outlined in the Guidelines. The provision of a Fire Management Plan consistent with the model requirements will demonstrate how the proposed facility will be compliant.

Further to the Fire Management Plan, a comprehensive Emergency Management Plan prepared for the site would ensure that arrangements for managing emergencies, including the facility details, structures, procedures, resources and training, are provided specific to the infrastructure, operations and location of facilities, and are informed by a sound risk management process.

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6.7 Risk Management Plan Summary

A summary of the identified fire risks has concluded:

- Fire at the site is considered unlikely and the site location is considered low-risk overall, however accidental fire at the site, or unmanaged fire from the broader landscape, are possible.
- Fire affecting the site from within, or from the surrounding landscape, would be predominantly in grassland. The relatively benign landscape topography and natural buffers such as the road network would reduce the chance of severe fire impacting the site. The management of on-site vegetation and APZ's would significantly reduce the impact of fire on critical infrastructure and reduce the chance of fire spreading from within the facility.
- Unmanaged landscape fire would be most hazardous to the site on high fire danger days, especially during drought years, where fire intensity would be greater and suppression tactics would be less effective.
- The proposed solar farm would not significantly increase bushfire risk to the local community, provided the mitigation measures in the Fire Management Plan are incorporated and implemented during the construction and operation of the facility. It would be expected that the overall reduction of fuel loads over the site would reduce bushfire risk to the surrounding landscape.

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7. Fire Risk Mitigation Strategies

7.1 Introduction

Implementing the following risk mitigation strategies would ensure fire could be managed to an acceptable level. Consistent application of the strategies would significantly reduce the risk of fire ignition on the site during the construction and operation of the facility, as well as reduce the risk of fire impacting the site from the surrounding landscape. The CFA guidelines are reflected throughout the strategies and are considered CFA's minimum requirement for renewable facilities in low-risk environments.

7.2 Facility Location

The location of the proposed site has been covered in detail in this report. The site is considered low risk, as indicated by the following attributes:

- Grassland vegetation adjoining the site.
- No continuous other vegetation types within 1- 20km of the project site.
- Generally flat topography, some undulation present, with slopes less than 5 degrees.
- Good road access with multiple routes available to and from the project site.
- No Bushfire Management Overlay or Land Subject to Inundation Overlay applies.

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7.3 Facility Design

Facilities should be designed to eliminate or reduce the overall risk from fire occurring from within the site or impacting the site from the surrounding landscape.

7.3.1 Design Specific to Micro Solar Farms and BESS

Below are the model requirements for facility design under Section 4.2.6 of the CFA Guidelines for Micro Solar Farms and associated BESS, as appropriate for the proposed development:

Model Requirements	Compliance
Micro Solar Facilities	
Separating solar panel banks by six (6) metres is not required for micro solar facilities.	There are no specific requirements for micro scale solar energy facilities.
BESS	
The design of the facility must incorporate: **a)** A separation distance that prevents fire spread between battery containers/enclosures and: • Other battery containers/enclosures. • On-site buildings. • Substations. • The site boundary. • Any other site buildings. • Vegetation. 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. **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. Fire breaks must be non-combustible, constructed of concrete, mineral earth or non-combustible mulch such as crushed rock. The width must be calculated based on the ignition source being radiant heat of surrounding vegetation, including landscaping. **c)** A layout of site infrastructure that: i. Considers the safety of emergency responders. ii. Minimises the potential for grassfire and/or bushfire to impact the battery energy storage system. iii. Minimises the potential for fires in battery containers/enclosures to impact on-site and off- site infrastructure.	**a)** The proposed BESS battery cabinets are housed in non-combustible shipping containers that offer good opportunity for fire detection and suppression equipment. Analysis of the UL 9540-A Unit Test Report (TUV Rheinland, March 2023) has concluded that a minimum separation distance of 4m be provided between BESS. This arrangement reduces the radiant heat flux received by the adjacent BESS to 1.55 kW/m2 based on modelled RHF output. This would suggest a temperature below 149.6°C (below the threshold for Thermal Runaway). A minimum separation distance of 5m (4m head to head) should be provided between the BESS units and other infrastructure. A fire rated wall separating BESS can allow closer spacings (see below). **b)** A fire break (APZ) of 10m width is proposed around the perimeter of the facility, along with a further 10m APZ directly around the BESS. **c)** The proposed facility design incorporates a range of design strategies to maximise firefighter safety, reduce the likelihood of bushfire impacting the BESS and the potential for fires emerging from the BESS and impacting the site and beyond, including: Two access/egress points, the primary entry to the south Charam-Wombelano Rd), and an alternative entry (Goroke-Harrow Rd) • A trafficable perimeter fire break; • 10m wide firebreak around the BESS compound and the entire solar farm facility; • A water supply tank dedicated for fire fighting located near the BESS. The fire hose connections should be located on the lee side so that they are shielded from radiant heat in the event of a BESS fire. The proposed BESS model (Sungrow ST2752UX) details are provided in the FMP accompanying this report and includes: • BESS Preventative Maintenance Plan and Layout Guide. • BESS Unit Liquid Cooling Test Report. • BESS Arc Flash Hazard Report. • UL 9540A BESS Thermal Runaway Evaluation (Rack and Module)

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Model Requirements	Compliance
BESS	
2) Battery energy storage systems must be: **a)** Located to be reasonably adjacent to a site vehicle entrance (suitable for emergency vehicles). **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.) **c)** Provided with in-built fire and gas detection systems. Where these systems are not provided, measures to effectively detect fires within containers must be detailed within the Risk Management Plan. **d)** Provided with explosion prevention via sensing and venting, or explosion mitigation through deflagration panels. **e)** Provided with suitable ember protection to prevent embers from penetrating battery containers/enclosures. **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. **g)** Installed on a non-combustible surface such as concrete. **h)** Provided with suitable ventilation. **i)** Provided with impact protection to at least the equivalent of a W guardrail-type barrier, to prevent mechanical damage to battery containers/ enclosures. **j)** Provided with enclosed wiring and buried cabling, except where required to be above-ground for grid connection. **k)** Provided with spill containment that includes provision for management of fire water runoff.	**2a)** The proposed BESS compound is currently located in close proximity (within 180 m) to the primary site entrance off Charam-Wombelano Road. **b)** Based on the prevailing wind from the BOM (Narracorte Aerodrome) weather station, the predominant winds for the month of January are from the south and west. Therefore, fire and smoke as a result of fire from the BESS are unlikely to impact access to the water tank. It is recommended that layout of the hardstand in relation to the BESS and water tank be considered in more detail and adjusted, to offer more radiant heat protection to firefighters if the hardstand were to be placed on the leeward side of the water tank. **c)** All Battery Energy Storage System (BESS) units will be equipped with an integrated Aerosol Fire Suppression system, which includes aerosol generators, smoke detectors, thermal detectors, flammable gas detectors, a ventilation exhaust system, and control and auxiliary accessories(see appendices). **d)** The proposed BESS units include aerosol suppression, explosion prevention and ventilation of IDLH gases. (See appendix) **e)** The proposed BESS units are expected to be fitted out with ember exclusion and screened openings, with ember protection to be in accord with Australian Standard AS 3959:2018 Construction of buildings in bushfire prone areas (AS 2018). **f)** The proposed access design layout is compliant with the model requirements. **g)** The proposed BESS units will be installed on concrete foundations. **h)** The proposed BESS units have installed ventilation systems. **i)** The proposed BESS compound should be provided with perimeter barrier impact protection, (concrete bollards or a metal guard rail) to prevent vehicle impact damage. **j)** All cabling between the BESS containers and the inverter/ switchgear should be enclosed underground. **k)** Spill containment measures will include a concrete bund around the perimeter of two BESS containers. This bunded area will be flush with the ground and will feature a small concrete wall approximately 200mm high to contain any contaminated water. The bunded area will also have a rainwater sump with a gravity-draining path to disperse rainwater into the environment. In case of a fire, emergency personnel can manually close the valve to prevent any liquid from being released into the environment. No water will be sprayed onto the burning battery. Any residual water will collect in the bund, and after the fire, it will be drained and transported off-site for disposal.

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Site Layout

The spacings below show the minimum spacings for BESS unit separation.
Providing a fire rated separation wall can allow for closer spacing between units.

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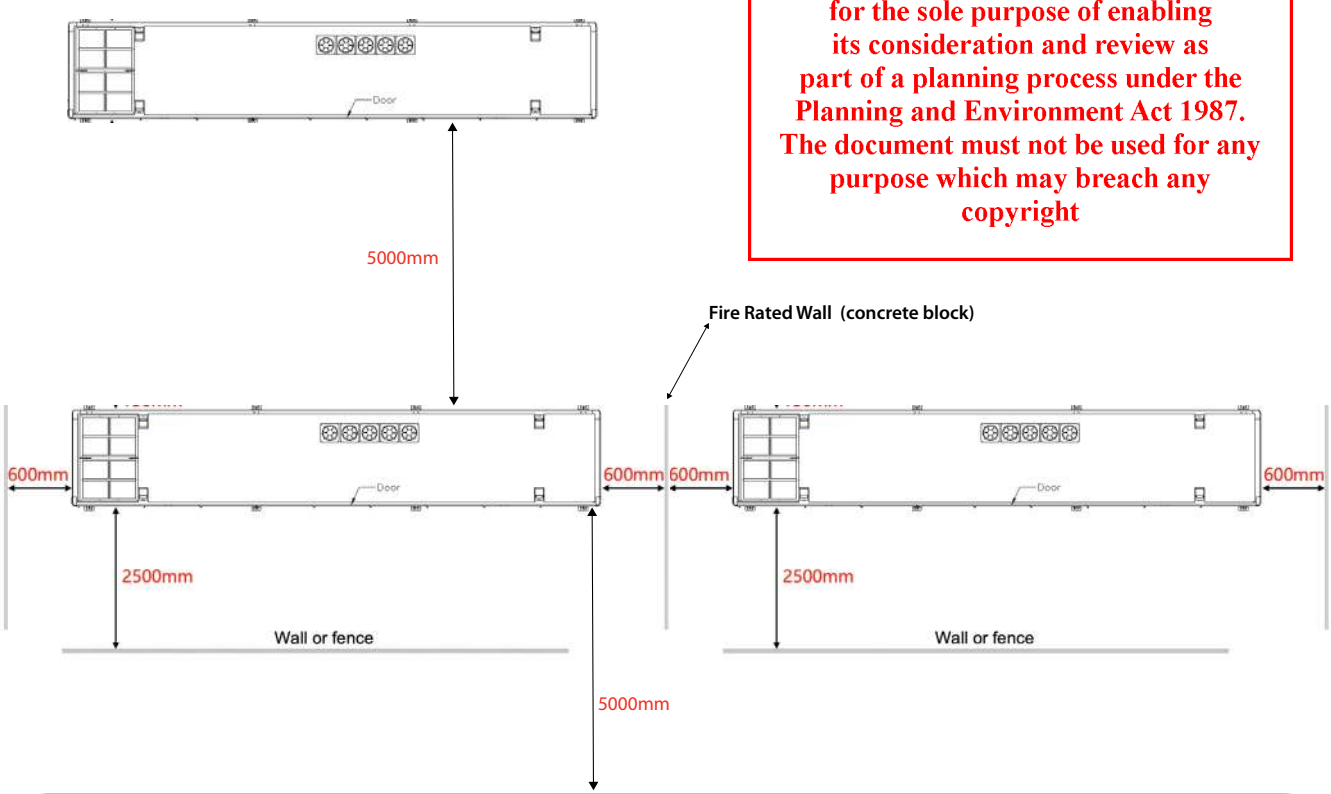

Fig.18 Proposed site layout detailing the recommended separation distances between BESS units to reduce potential RHF exposure to neighbouring BESS, effectively reducing the potential for fire spread through thermal runaway.

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7.3.2 Details for Containment of Contaminated Fire Water

There is potential risk of contaminated water and leaking coolant fluids during fire management operations from fire within the BESS. Containment and removal of this contaminated water must be undertaken to reduce the potential for contamination spreading into the surrounding landscape.

The primary objective for management of a BESS fire for emergency services is to cool the surrounding infrastructure from radiant heat exposure to reduce the potential for further thermal runaway in neighbouring BESS or damage to critical infrastructure. The primary water source for firefighting is the 288,000 L static water tank wit hard suction outlets. Although water will not be directed on to the compromised BESS, there is potential for over-spray and leaking contaminants to spread beyond the BESS units. Provision of concrete bunds is the recommended means to capturing any contaminated fluids.

Each bunded area surrounding the BESS will be constructed from concrete, with a graded sump floor and 200mm high retaining walls. The sump will drain to a collection point controlled by a manually operated valve, where contaminated water can be collected and removed from the site. The bunding will provide collision protection to the BESS and replace the requirement for protective bollards around the BESS area.

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Signage will be provided to notify Emergency Services that valve shutoff should occur before water is applied to the BESS area.

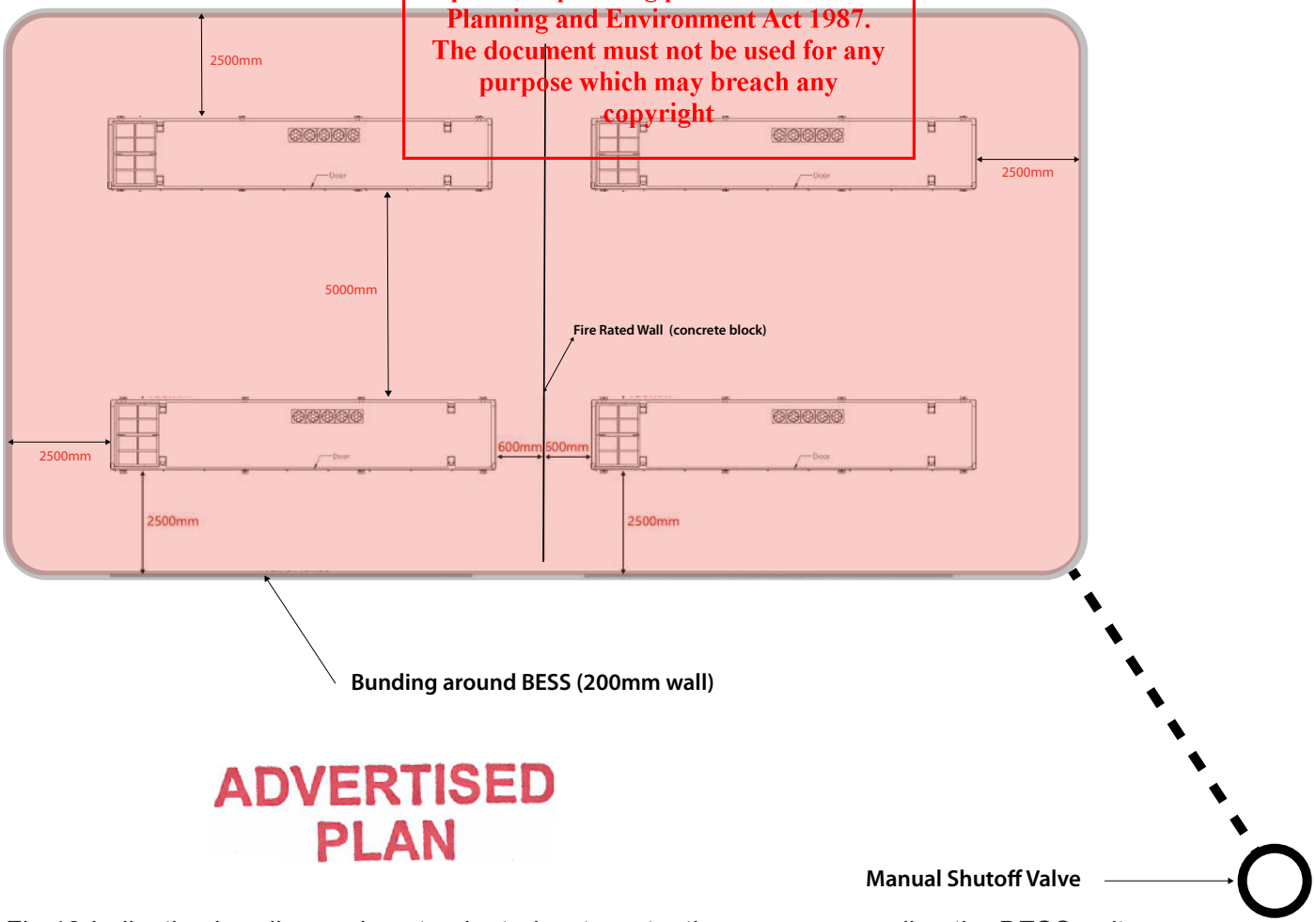

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Fig.18 Indicative bunding and contaminated water retention area surrounding the BESS units.

7.3.3 Emergency Vehicle Access

All facilities are required to provide adequate access for emergency service vehicles to safely respond to areas that may be threatened by fire. Below are the model requirements for emergency vehicle access from Section 4.2.1 of the CFA Guidelines that are required to be addressed at the solar farm facility.

Model Requirements	Compliance
Micro Solar Facilities	
Construction of a four metre perimeter road and the incorporation of passing bays to perimeter roads may be disregarded for micro solar facilities without battery energy storage systems. Where micro solar facilities include battery energy storage systems, perimeter roads may be disregarded where roads suitable for emergency vehicles are provided to fire service infrastructure, and to and around the BESS (4.2.1(g)), with turning circles for dead-end roads.	4.2.1(g) of the CFA Design Guidelines state that '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'. Roads must be of all-weather construction and capable of accommodating a vehicle of fifteen (15) tons (i.e. no compacted earth). 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 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. Dips in the road should have no more than a 1 in 8 (12.5% or 7.1°) entry and exit angle. The proposed facility design provides 2 access points and an access road with a turning circle providing access to the BESS, electrical infrastructure, firefighting water supply and hardstand. The facility perimeter has a 10m wide APZ that is traversable for emergency service vehicles and provides access to the alternative entry point (Goroke-Harrow Road).
BESS	
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 determined in consultation with CFA.	The primary access point to the facility (Charam-Wombelano Road) provides the main access to the BESS, hardstand, hydrant and firefighting water supply. The secondary access point (Goroke-Harrow Road) provides access to the BESS via the traversible 10m wide APZ perimeter firebreak.

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7.3.4 Firefighting Water Supply

In the event of fire at the facility, sufficient water must be available and safely accessible for first responders to undertake fire suppression activity.

There is no available reticulated water supply at the site, therefore a non-reticulated water supply is required to support any firefighting efforts. Below are the model requirements for fire fighting water supply from Section 4.2.2 of the CFA Guidelines that are required to be addressed at the solar farm facility.

Model Requirements	Compliance
All Facilities	
a) Water access points must be clearly identifiable and unobstructed to ensure efficient access.	a) The water access points will be clearly signposted to indicate the location of the static water supply on-site.
b) Static water storage tank installations must comply with AS 2419.1-2021: Fire hydrant installations – System design, installation and commissioning.	b) There is no hydrant system proposed.
c) The static water storage tank(s) must be an above-ground water tank constructed of concrete or steel.	c) The proposed 288Kl static water supply will be constructed of either concrete or steel and located on a hardstand area.
d) The static water storage tank(s) must be capable of being completely refilled automatically or manually within 24 hours.	d) The static water storage tank to be at full capacity during facility operation. Tank water levels will be checked by the facility manager post fire activity and manually filled within a 24 hour period.
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.).	e) The static water storage tank is located adjacent to the site access road, and positioned 10m or more away from any infrastructure.
f) The hard-suction point must be provided, with a 150mm full bore isolation valve (Figure 3) equipped with a Storz connection, sized to comply with the required suction hydraulic performance. *Adapters that may be required to match the connection are: 125mm, 100mm, 90mm, 75mm, 65mm Storz tree adapters with a matching blank end cap to be provided.*	f) A hard-suction point with Storz adaptor(s) will be connected to the tank to the specifications as detailed for this requirement.
g) The hard-suction point must be positioned within four (4) metres of a hardstand area and provide a clear access for emergency services personnel.	g) The hard suction point will comply with the specification as detailed for this requirement.
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.	h) The all weather site access road and BESS perimeter road along with hardstand provides access to the hard-suction point. The hardstand area will meet the minimum GVM and dimensions as detailed for this requirement.
i) The road access and hardstand must be kept clear at all times.	i)The road access and hardstand will be kept clear at all times.
j) The hard-suction point must be protected from mechanical damage (eg., bollards) where necessary.	j) The hard-suction point will be protected from mechanical damage by an appropriate barrier system.
k) Where the access road has one entrance, an eight (8) metre radius turning circle must be provided at the tank.	k) A turning radius of 10m is to be provided at the junction of the site access road, 10m BESS firebreak (with access road) and 10m perimeter fire break that directly adjoins the water tank.
l) An external water level indicator must be provided to the tank and be visible from the hardstand area.	l)The indicator will be provided by the tank manufacturer.
m) Signage indicating 'FIRE WATER' and the tank capacity must be fixed to each tank.	m) Signage will be provided at each entrance to indicate direction to the static water supply.
n) Signage must be provided at each vehicle entrance to the facility, indicating the direction to the nearest static water tank(s).	

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Firefighting Water Supply (continued)

Model Requirements	Compliance
Micro Solar Facilities	
Where micro solar facilities include battery energy storage systems, additional fire water supply must be provided in accordance with the below.	A static water supply tank with a capacity of 288,000L is to be provided on site.
BESS	
For facilities with centralised battery energy storage systems, the fire protection system must include at a minimum: • Where no reticulated water is available, a fire water supply in static storage tanks, where: • The fire water supply must be of a quantity no less than 288,000L or as per the provisions of AS 2419.1-2021: Fire hydrant installations, Table 2.2.5(D) for open yards flowing for a period of no less than four hours at 20L/s, whichever is the greater. • 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) (e.g. for battery installations with an aggregate area of over 27,000m2, 4 (four) hydrant outlets are required to operate at 10L/s for four hours, which equates to a minimum static water supply of 576kL). • 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. • 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 fire water supply must be reasonably adjacent to the battery energy storage system and shall be accessible without undue danger in an emergency (i.e. fire water tanks are to be located closer to the site entrance than the battery energy storage system). • The fire water supply must comply with AS 2419.1-2021: Fire hydrant installations, Section 5: Water storage tanks.	The proposed facility design incorporates a dedicated firefighting water supply, with a capacity of 288,000L. The proposed location of the fire water tank and hydrant is compliant with the model requirements. The fire water tank is located in close proximity to the site entrance. The proposed water tank is located adjacent to but greater than 10m away from the nearest BESS, RMU, and auxiliary transformer to allow onsite access for fire fighting personnel to these structures in the event of fire. A 60m length of hose connected to the hydrant outlet will be able to reach all sides of the BESS units with a 10m hose stream.

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7.3.5 Fire Detection and Suppression Equipment

Fire detection and suppression equipment must be provided at the facility. This includes fire extinguishers and fire hose reels for fire incident first-aid.

Model Requirements	Compliance
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 (NCC). b) For storages of dangerous goods, according to the requirements of any Australian Standards for storing and handling of dangerous goods. c) For electrical installations, a minimum of two (2) suitable fire extinguishers must be provided within 3m-20m of 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.	Details of building and infrastructure design are yet to be determined. Details for each building and structure should include the requirements of the NCC for fire detection and suppression equipment. Storage of dangerous goods for the construction and operation of the facility is yet to be determined.

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7.3.6 Landscape Screening and On-Site Vegetation

All on-site vegetation (both proposed and existing) must be considered for its potential to increase fire intensity and spread. Landscaping is a valuable visual amenity for reducing the glare and visual impact on the neighbourhood character, however care must be taken (through species selection and placement) to consider the potential increase to fire fuels.

Model Requirements
Solar Farm Facilities
Select species that have the following characteristics: • Low volatile oil content • Low production of dead fuels and litter • Smooth bark • High mineral content in leaves • Resistance to dieback • Appropriate height for screening • Where practicable, low-flammability vegetation (such as root vegetables) may be planted under solar panels, provided foliage does not extend beyond the panel footprint. Consider mitigation of radiant heat impact through: • Vegetation removal (where permitted). Separation from nearby infrastructure (e.g. fire breaks; refer below). • The provision of thermal barriers at nearby infrastructure. • Other means in consultation with CFA.

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7.3.7 Fire Breaks

A fire break is a strategically placed gap or barrier in vegetation or other combustible material designed to impede the spread of wildfires. It serves as a buffer zone, helping to prevent fires from advancing further by depriving them of fuel or by creating a barrier that the fire cannot easily cross. The CFA Guidelines recommend that fire breaks are mineral earth, crushed rock or other fuel free land/non-combustible surface.

If the fire break is surrounded by highly flammable vegetation such as dry grasslands (especially during drought years), it may still be susceptible to ignition from embers or radiant heat. Strong winds can carry embers across fire breaks, igniting fires on the other side and rendering the break ineffective.

Fire breaks require regular maintenance to remain effective. Without upkeep vegetation can grow back, reducing the break's effectiveness over time. If fire breaks are not maintained before a fire occurs, they may not be effective in slowing or stopping its spread.

Despite their limitations, they are invaluable for reducing the likelihood of bushfire impacting the site and fire spreading from fire ignited on-site.

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Fire breaks must be:

- Non-combustible, constructed of concrete, gravel, mineral earth or non-combustible mulch such as crushed rock.
- Free of vegetation and obstructions at all times. No plant or equipment of any kind is to be stored in fire breaks.

Model Requirements	Compliance
All Facilities	
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. b) The perimeter of control rooms, electricity compounds, substations and all other buildings on- site. 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 proposal design incorporates a 10m fire break (APZ) around the perimeter of the facility and around the proposed BESS site.
BESS	
• A fire break must be established and maintained around BESS and related infrastructure	The proposal design incorporates a 10m fire break (APZ) around the perimeter of the facility and around the proposed BESS site.

7.3.8 Vegetation Management

Regular and effective vegetation management can reduce the both the risk of fire entering the facility and the severity of fire impacting the site. All vegetation must be maintained according to the prescribed measures for the facility.

Model Requirements	Compliance
Micro Solar Facilities	
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, including under solar panel arrays. b) Long grass and/or deep leaf litter must not be present in areas where heavy equipment will be working, during construction or operation. 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).	Operators of solar energy facilities on grazed paddocks must ensure that if additional measures to maintain grass to this level are required, they are implemented prior to, and for the duration of, the Fire Danger Period.
BESS	
Containers/enclosures and infrastructure for battery energy storage systems must be maintained to be clear of vegetation, including grass, for at least ten (10) metres on all sides, or greater as informed by the Risk Management Plan.	The proposed facility design incorporates an APZ (10m width) surrounding the BESS.

Recommendations for annual on-site vegetation management prior to and during the FDP include:

- Gutters, roof surfaces and valleys, kerbs, traps, sumps, bunds, drains, rooves or any other accumulation points for leaf litter, dry vegetation, or any other combustible materials must be cleared, and the debris removed from site.
- Vegetation management activities must be conducted across the entire facility (e.g. grass slashing or mowing, removal of dead/fallen vegetation).
- Extraneous materials or vegetation in fire breaks at the site perimeter, at external building walls, and at other any site plant/assets must be cleared and removed from site.
- Extraneous or unnecessary materials (fuel loads) must be removed from site, e.g. mulch piles, dilapidated/stored vehicles, plant or equipment, excess fuel/chemicals, any combustible waste materials. Vehicles must not be parked on unmanaged vegetation.

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8. Facility Construction

It is expected that there will be up to 20 workers on-site during the construction phase. Fire risks must be identified and effectively managed during the construction and commissioning of renewable energy facilities. Below is a summary of recommendations for the construction phase of the proposal. These have been developed based on this RMP, on Clause 13.02 of West Wimmera Planning Scheme, and the requirements of the CFA Guidelines. A Fire Management Plan for the construction and commissioning phase will be prepared which outlines risk control measures required to be implemented within the development.

Model Requirements	Compliance/Recommendations
Micro Solar Facilities	
An Emergency Plan must be developed for the construction and commissioning phase, before development starts.	An Emergency Management Plan is being prepared to accompany this report. • Ensure the development of an Emergency Management Plan is in consultation with the CFA before development starts. • Ensure on site staff and contractors are familiar with and adhere to the Emergency Management Plan. • Establish emergency assembly areas as part of the site's Emergency Management Plan. • Consider appropriate signage to be placed throughout the site to guide visitors and emergency services personnel during emergencies.

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Construction during the Fire Danger Period or during times of elevated fire risk (sometimes occurring outside of the FDP) will require fire mitigation control measures to reduce the likelihood of ignitions occurring. Mitigation measures that should be employed during the FDP are:

- Construct and maintain the perimeter fire break prior to any infrastructure installation and construction work.
- Manage surrounding vegetation to ensure the site is maintained in a low-threat condition.
- Keep all earthmoving machinery, plant and other construction vehicles clear of any build-up of combustible fuels such as dry grasses.
- All construction involving hot works (grinders, welding, etc.), earthmoving, slashing and any other activity that could generate sparks should cease on days when an elevated fire danger rating is forecast.
- All contractors and staff should be provided with appropriate bushfire training.
- All vehicles should have a 9 litre water fire extinguisher or knapsack installed within the vehicles along with communications devices, and all vehicle operators should be trained in using these.
- Ensure staff monitor the local area during elevated fire danger conditions to detect bushfires early (setting alerts on emergency apps, etc.).
- Ensure on-site risk reduction strategies are implemented, including no smoking and other preventative measures, during elevated fire danger days to reduce the potential for a fire to start on the site.
- Ensure the handling and storage of flammable goods is undertaken in accordance with AS1940-2017.

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9. Facility Operation

It is expected that the site will be unoccupied and remotely operated, apart from regular scheduled inspections or maintenance programs. Fire risks must be identified and effectively managed during the ongoing operation of renewable energy facilities. Below is a summary of recommendations for the ongoing operation of the proposed development. These have been developed based on the FRA, on West Wimmera Planning Scheme Clause 13.02 , and the requirements of the CFA Guidelines. A Fire Management Plan will be prepared which outlines risk control measures required to be implemented within the development.

Model Requirements	Compliance
Micro Solar Facilities	
A Fire Management Plan must be developed for the facility, in consultation with CFA, before development starts.	• A Fire Management Plan will be formulated and updated which outlines risk control measures required to be implemented within the development. • The Fire Management Plan is to ensure all annual fire danger season pre-paredness activities and prevention works are completed before the annual Fire Danger Period is declared.

The safe operation of the facility will be guided through the development and implementation of the Fire Management Plan. This outlines the activities and accountabilities for developing and implementing the appropriate risk control measures. Recommendations for the operational phase of the proposal are as follows:

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- Ensure site induction is provided to all new staff, contractors and visitors, informing them of the site fire and emergency response procedures.
- Ensure all staff are familiar with the Emergency Management Plan.
- Ensure monitoring and maintenance programs are enacted so all infrastructure within the Solar Energy Facility and BESS is maintained in accordance with the manufacturer's specifications and the relevant Australian Standards.
- Ensure vegetation management is undertaken prior to commencement of the Fire Danger Period.
- Ensure fire risk reduction strategies such as no smoking, cooking, hot works, open flames, are limited during elevated fire danger days.
- Ensure staff and contractors are trained to use the firefighting equipment and have appropriate personal protective clothing.
- Ensure staff monitor the local area during elevated fire danger conditions to detect bushfires early (setting alerts on emergency apps, etc.).
- Ensure emergency services are alerted early in the event of a fire in the local area.
- Ensure the local CFA brigades and group are familiar with the facility operations and invite them to become familiar with the site. Engage with them in preparation of a pre-incident plan and engage in regular review.

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10. Infrastructure Management

Ensuring facility infrastructure, equipment and vehicles are maintained in safe, effective working order contributes to efficiency, reliability and importantly, fire safety. Fire detection and protection (suppression) systems, alarms, warning systems, communications and any other emergency equipment must always be in effective working order.

Model Requirements	Compliance
All Facilities	
Arc Flash Management Electrical equipment must be designed to reduce risks associated with arc flash hazards. Where an arc flash hazard exists it must be identified and managed. **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. **Maintenance** 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. 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. **Safe Dangerous Goods Storage and Handling** a) Storage, handling, signage and labelling must be compliant with the Dangerous Goods (Storage and Handling) Regulations 2022.	Electrical infrastructure must be designed, installed and maintained to mitigate the risks associated with arc flash hazards to both persons and ignitable materials, in accordance with the Arc Flash Hazard Management Guideline (Energy Safe Victoria, 2022). FUrther information on Arc Flash Hazards can be found in the FMP. Monitoring systems for the electrical infrastructure of the facility is required to ensure that any shorts, faults or equipment failure that could present a hazard or an ignition risk are rapidly identified and controlled. BESS monitoring equipment should include: • Battery management/monitoring systems; • Detection systems for smoke, heat and gas; • Systems to prevent heat/fire spread; • Systems to prevent explosion; • Systems to prevent water ingress; and • Warning and alarm systems. No buildings are proposed beyond site facilities during the construction phase. Details of location, type and quantities of dangerous goods at the facility are as yet undetermined.

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Further regular housekeeping management at the facility should include:

a) Hazard identification - ensuring that infrastructure, plant, equipment, vehicles and safety/warning signs show no signs of damage or dilapidation.

b) Facility access - ensuring all vehicle site access points, including emergency access points, are clear and accessible.

c) Fire protection systems and equipment - ensuring that all equipment is unobstructed, clearly identifiable, in-service and performing optimally.

d) Vegetation management - ensuring that any accumulation of combustible materials is cleared from infrastructure, buildings and fire breaks, and removed from the site.

e) Security measures - ensuring that fences, gates, and security cameras are inspected for damage, and that any damage is immediately actioned (i.e. repaired or replaced).

11. Conclusion

The Charam Solar Farm Facility is located in a Bushfire Prone Area, and has risk of ignitions due to the introduction of electrically charged equipment and works through the construction and operation phases that could increase the risk of fire ignition.

This Risk Management Plan establishes that there would be no net increase in fire risk associated with the development of the proposed solar farm facility provided that the mitigation strategies set out in this report and the accompanying Fire Management Plan are applied.

The facility has been assessed against the potential fire risks from on-site and from the broader landscape and is deemed to meet the requirements of Clause 13.02-1S – Bushfire Planning. The overall risk is deemed to be relatively low given the relatively benign landscape profile of the site location, combined with the proposed design and mitigation strategies.

This RMP report has concluded that compliance with the Model Requirements outlined in the *Design Guidelines and Model Requirements : Renewable Energy Facilities Version 4* (CFA, 2023) is achievable. Although the risk of ignitions is greater due to the presence of electrical equipment and human activity, the mitigation strategies identified in this report would reduce the potential for fire within the site to impact the surrounding landscape, and reduce the likelihood of uncontrolled external fire from entering the site.

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