

This copied document to be made available
for the sole purpose of enabling
its consideration and review as
part of a planning process under the
Planning and Environment Act 1987.
The document must not be used for any
purpose which may breach any
copyright

**ADVERTISED
PLAN**

Frasers Battery Energy Storage System, Glengarry North, VIC 3854

**Risk Management Plan & Fire Safety Study
Version 1.1**

April 2026

Document control

Document		Frasers Battery Energy Storage System, Glengarry North, VIC 3854 - Risk Management Plan & Fire Safety Study
Client:	Holly Andree Graduate Environmental Consultant Entura holly.andree@entura.com.au	
Authors:	Fire Risk Consultants Pty Ltd Project Team including: Rob Whittle Senior Fire Risk Consultant & Tasmanian Projects Lead FRC Rohan Gordon Senior Fire Risk Consultant & Renewable Energy Projects Lead FRC	
Synopsis:	This Fire Risk Management Plan (FRMP) and Fire Safety Study (FSS) has been prepared for the proposed Frasers Battery Energy Storage System (BESS) at Glengarry North, Victoria, in accordance with Clause 13.02-1S (Bushfire Planning) of the Victorian Planning Provisions and the Country Fire Authority (CFA) <i>Design Guidelines and Model Requirements – Renewable Energy Facilities (Version 4.4)</i>. The report assesses bushfire and fire risks associated with the site, surrounding landscape and proposed infrastructure across construction, commissioning and operational phases. A risk assessment aligned with AS ISO 31000:2018 has identified key fire hazards and evaluated their likelihood and consequence. The assessment demonstrates that with the implementation of prescribed mitigation measures including compliant access, firefighting water supply, vegetation management, and site-specific Fire Management Plan, the residual fire risk can be reduced to acceptable levels. The Project is assessed as not increasing bushfire risk to surrounding land or communities and is considered consistent with relevant planning and fire safety objectives.	

Distribution schedule

Version	Date	Distribution	Reference
V0.1	12/03/2026	Initial draft report distributed to Entura for feedback.	FRCv1.0
V1.0	18/03/2026	Report distributed to Entura following initial client feedback.	FRCv1.0
V1.1	30/04/2026	Revised report following CFA engagement	FRCv1.1

**ADVERTISED
PLAN**

ADVERTISED PLAN

Fire Risk Consultants Pty. Ltd.
PO Box 12, Glengarry VIC 3854
0487 790 287
www.fireriskconsultants.com.au

Disclaimer and Information Statement

This report is issued by Fire Risk Consultants Pty Ltd and the information in this report is current as at the date of publication. Any Bushfire Emergency Plan or Bushfire Response Plan is current only at the date of issue as it is up to you to maintain the Australian Standard AS3959:2018 (or equivalent) and AS3745:2018 (or equivalent) for the property and/or building. Failure to maintain the property and/or building to these standards may compromise an insurance policy if currently covering any of your assets or those of any third party that may be consequentially affected due such failure. If not insured, and if you are seeking insurance, this report may not influence the decision of any insurer not to offer cover. To the extent permitted by law, Fire Risk Consultants Pty Ltd will not be held liable for any claims, demands, costs or expenses for any personal injury, property damage or death arising out of failure by you to maintain the property and/or building to AS3959:2018 (or equivalent) and AS3745:2018 (or equivalent).

The information and/or the recommendations contained in this report have been compiled and based on the information, records, data and any other sources of information supplied by you. Whilst we have exercised all due care and skill in compiling the report, you should confirm the accuracy and reliability of the information and material we have relied upon in producing the report. The information contained in the report is confidential and you should only read, disclose, re-transmit, copy, distribute or act in reliance on the information as you are authorised to do so. This report may also contain information, systems or data which is the property of Fire Risk Consultants Pty Ltd and Fire Risk Consultants Pty Ltd has in no way waived or altered in any way its ownership right, or provided consent for use by the report recipient, unless expressly provided in the report.

Any fire safety work, including but not limited to planned burning, back burning and/or fire suppression, on any property or building is specifically excluded from this report.

*Where the term **“Bushfire prevention and mitigation related activities”** (or words to that effect) are used, this is to be defined as the clearance of vegetation in accordance with the Victorian State Government guidelines, including clearing and maintenance of existing fire breaks and/or fire access for fire fighters under electricity pylons and properties that have been constructed to Australian Standard AS3959 and/or the National Construction Code.*

Cover image: Frasers Battery Energy Storage System, Glengarry North, VIC 3854 (Fire Risk Consultants)

ADVERTISED PLAN

Contents

1	Introduction.....	1
2	Project Overview.....	2
3	Existing conditions assessment.....	5
3.1	Site description and location.....	5
3.2	Risk indicators.....	8
3.2.1	Bushfire Management Overlay.....	8
3.2.2	Designated Bushfire Prone Area.....	10
3.2.3	Municipal Fire Management Plan.....	12
3.2.4	Bushfire history.....	12
3.2.5	SUNTERA JKE-5015K-2H-LAA battery fire safety.....	14
4	Risk assessment process.....	16
4.1	Clause 13.02 – Bushfire Planning Assessment.....	16
4.1.1	Bushfire Hazard Assessment.....	16
4.1.2	Bushfire Landscape Assessment.....	19
4.1.3	Assessment against Clause 13.02-1S summary.....	26
4.2	Analysis against CFA Guidelines.....	26
4.3	Treatment summary.....	39
4.4	Acoustic walls.....	40
4.4.1	Location of fire breaks in relation to acoustic walls.....	40
5	Risk Assessment.....	41
5.1	Introduction.....	41
5.2	Context.....	42
5.3	Analysis of fire risk.....	42
5.3.1	Assessment of fire risk during construction.....	42
5.3.2	Assessment of fire risk during operations.....	42
5.4	Risk identification.....	43
5.5	Risk analysis.....	44
5.5.1	Likelihood.....	44
5.5.2	Consequence.....	45
5.5.3	Risk analysis worksheets.....	46
6	Conclusion.....	58
	Appendix A – UL9540A test overview.....	59
	Appendix B – UL9540A test results.....	60
	Appendix C – SUNTERA JKE-5015K-2H-LAA Container Product Specifications.....	65
	Appendix D – Site photos.....	67
	Appendix E – Fire Management Plan.....	73
	Purpose of the Fire Management Plan (FMP).....	1
	Plan status and review.....	2
	Control measures.....	3

Figure 1: Development overview indicative layout.....	4
Figure 2: The Project site and surrounding landscape	7
Figure 3: Project area and overlap of parcels with BMO	9
Figure 4: Location of the BPA in relation to the property	11
Figure 5: Documented fire history adjacent to Project site	13
Figure 6: 1km Landscape Bushfire Risk Assessment	21
Figure 7: 20-kilometre landscape Bushfire Risk Assessment	22
Figure 8: Indicative site bushfire attack level map	23
Figure 9: Overview of AS/NZS ISO 31000-2018 risk management process.....	41
Table 1 - Overview of fire safety systems.....	14
Table 2 - Assessment against Clause 13.02	17
Table 3 - Bushfire Scenarios	19
Table 4 - Response to Clause 13.02 - Settlement Objectives	24
Table 5 - CFA Guideline requirements.....	28
Table 6 - Hazard identification and description	43
Table 7 - Likelihood table	44
Table 8 - Risk assessment consequence table.....	45
Table 9 - Risk matrix	46
Table 10 - Risk assessment - Electrical hazards causing a fire.....	47
Table 11 - Risk assessment - Fire causing spread to adjoining infrastructure on the property	48
Table 12 - Risk assessment - Fire causing offsite impacts	50
Table 13 - Risk assessment - Offsite fire impacting on the site.....	51
Table 14 - Risk assessment - Dangerous Goods	52
Table 15 - Risk assessment - Fire water runoff.....	53
Table 16 - Risk assessment – Staff and firefighters	54
Table 17 - Risk assessment - Off gassing and smoke impacts	55
Table 18: Risk assessment – Lightning strike and arc flash hazards.....	57

**ADVERTISED
PLAN**

1 Introduction

Fire Risk Consultants Pty Ltd has been engaged to develop a Fire Risk Management Plan (FRMP) and Fire Safety Study (FSS) for the Fraser's Battery Energy Storage System (BESS) (the Project). The Project is located in Victoria, approx. 2km south of the Toongabbie township and 5km north of the Glengarry township. Access to the site is via Traralgon-Maffra Road, Glengarry North, Victoria, 3854 (Figure 2).

The Project proposes to install, commission and connect a BESS to the electricity network via AusNet Electrical Network. The Project involves the construction, commissioning and operation of the BESS with a total capacity of 936 MWh.

This report has been prepared following an assessment of the site, analysis of supplied information relating to the site layout and design, and the fire safety systems and testing reports for the proposed battery.

In accordance with Victorian planning and fire service requirements for the project area, the design has been undertaken in accordance with the Country Fire Authority (CFA) Guidelines - *Design Guidelines and Model Requirements – Renewable Energy Facilities* (CFA Guidelines, V4.4, June 2025), the Victorian Planning Provisions and the Latrobe Planning Scheme.

The CFA Guidelines also state that the NSW Planning's *Hazardous Industry Planning Advisory Paper 2: Fire Safety Study Guidelines (2011)* should be utilised. The various requirements outlined within the Advisory Paper have been included within this report as it relates to the Project.

The Fraser's Solar Farm located directly adjacent to the north of the Fraser's BESS is outside the scope of this report.

**ADVERTISED
PLAN**

2 Project Overview

South Energy, on behalf of Frasers Lane Development Pty Ltd, intends to lodge a section 72 amendment under the *Planning and Environment Act 1987* for PA1900723 to include a BESS facility alongside the currently approved Frasers Solar Farm on the corner of Frasers Lane and Traralgon-Maffra Road in Glengarry North, Victoria. The amended permit application will be submitted to allow for an additional 25ha parcel to the southeast of the solar farm footprint (parcel: 125B\PP3627). The BESS footprint is intended to take up a 5ha portion in the northeast corner of this parcel and will be subject to a subdivision application at a later stage of project development. The scope of this report is the 5ha portion only.

It is proposed that the BESS will connect into an existing distribution line that runs externally to the east of the Project site within the Traralgon-Maffra Road easement.

Infrastructure associated with the Project may include:

- 144 x 6.5MWh BESS containers totaling 936MWh.
- Demountable building containing 33kv switchgear and control room.
- 66kv switchgear.
- Auxiliary transformer.
- 66.33kv power transformer.
- Diesel generator.
- 33kv reactive power compensation equipment.
- Power conversion system.
- Pump house.
- Operations and maintenance building.
- Fire hydrants.
- Site shed.
- Internal access roads.
- Perimeter boundary fencing.
- Sound wall (up to 7m high).

**ADVERTISED
PLAN**

The property proposed for development is rectangular in shape, largely cleared of vegetation, and currently used for agricultural use including grazing.

The project site is located approximately 2km south of the Toongabbie, 5km north of the Glengarry, and 12km northeast of Tyers.

With regard proximity to the Toongabbie township, the BESS units are proposed to be located approx. 2km south of the outskirts of the township.

The Project site does not have access to reticulated water.

The Project site will be accessed from Frasers Lane through the proposed Solar Farm to the north.

Narrow corridors of native vegetation and introduced grass can be found on local road easements. Shelter belts of native trees have been planted around the adjacent solar farm location. Shelter belt planting are currently <1m high.

The Project will install various fire safety systems including firefighting suppression and detection systems within each unit.

The nearest known dwelling is located approx. 530m southwest of the Project site, with approx. two known residences within a 1,000m buffer of the Project site.

The indicative site layout is shown on Figure 1. The Project site and surrounding landscape is shown on Figure 2.

**ADVERTISED
PLAN**



Figure 1: Development overview indicative layout

Note* This plan is conceptual in nature and subject to further refinement. Any future modifications, detailed design development, or changes to layout, infrastructure, or operational elements must be undertaken in accordance with this Risk Management Plan.

3 Existing conditions assessment

3.1 Site description and location

The Project site is located at 1205 Traralgon-Maffra Road, Glengarry North, 3854. The Project site is approx. 2km south of Toongabbie and 5km north of the Glengarry.

The Frasers Solar Farm is located directly adjacent to the north of the Project site.

The Project is being developed on a single property that has historically been utilised for agricultural purposes including livestock grazing. The development is within the 'Latrobe' Local Government Area (LGA).

The Project is planned to be built in one stage across one parcel of land as outlined in the following table:

Development Stage	Shorthand Name (for this report)	Renewable Components	Address	Standard Parcel Identifier (SPI)	Approx. Cadastral Parcel Size (ha)	Bushfire Management Overlay (BMO) – by parcel
Stage 1	<i>The Project site</i>	- BESS (936MWh) - Demountable building containing 33kv switchgear and control room. - 66kv switchgear. - Auxiliary transformer. - 66.33kv power transformer. - Diesel generator. - 33kv reactive power compensation equipment. - Power conversion system. - Pump house. - Operations and maintenance building. - Fire hydrants. - Site shed. - Internal access roads.	1205 TRARALGON -MAFFRA ROAD GLENGARRY NORTH 3854	125B\PP362 7	25.3	Partial (northeastern corner) ~5.0ha

**ADVERTISED
PLAN**

Development Stage	Shorthand Name (for this report)	Renewable Components	Address	Standard Parcel Identifier (SPI)	Approx. Cadastral Parcel Size (ha)	Bushfire Management Overlay (BMO) – by parcel
		- Perimeter boundary fencing. - Sound wall (up to 7m high).				
Total Project Size (ha)					~5.0ha (0% in BMO)	

For the purpose of this report and clarity of writing, this report will refer to various parts of the Project per the *Shorthand Name* in the table above.

The Project will be developed over an approximate area of 5ha on one property in Glengarry North. Access to the Project site will be from the primary access point. The primary access point will be created from Frasers Lane passing through the proposed Frasers Solar Farm to the north of the Project Site. When assessed in accordance with AS3959:2018 – *Construction of Buildings in bushfire-prone Areas* (AS3959), the dominant vegetation within and surrounding the Project site is Group G Grassland. The Project site is surrounded by agricultural properties.

The topography on the Project site is flat, with topography in the surrounding 1km landscape also being flat.

An above ground distribution line runs externally adjacent to the Project site on the eastern boundary within the road easement.

The surrounding landscape is dominated by farming properties, and zoned 'Farming Zone' under the Latrobe Planning Scheme. Farming activities in the surrounding landscape include livestock grazing.

Within the Project site, the vegetation is consistent with the surrounding landscape.

The elevated risk areas are those where vegetation can accumulate. Some roadsides and waterways can contain elevated levels of fuel.

The surrounding road network is considered effective and provides access to the BESS Project site and the surrounding landscape.

The nearest public land forests are located approx. 3km west within the Great Dividing Range. This area presents significant landscape bushfire risk to the Project site.

There are no known timber plantations within the external landscape that will contribute to bushfire risk towards the Project site.

Dominant vegetation on neighboring properties include:

- Group G Grassland.

The location of the Project site in relation to the surrounding landscape is shown in Figure 2.

**ADVERTISED
PLAN**



Figure 2: The Project site and surrounding landscape

3.2 Risk indicators

In support of the risk assessment contained within Section 5, the following information has been obtained and provides relevant information that informs the analysis of risk. This information relates to the potential bushfire risk and the fire risk relating to a BESS development.

3.2.1 Bushfire Management Overlay

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

The BMO is not present within the Project site. The closest parcel of land to the Project site included within the BMO is approx. 2.5km to the west where the Great Dividing Range transitions to agricultural land.

The location of the BMO within the surrounding landscape is shown in Figure 3.

**ADVERTISED
PLAN**

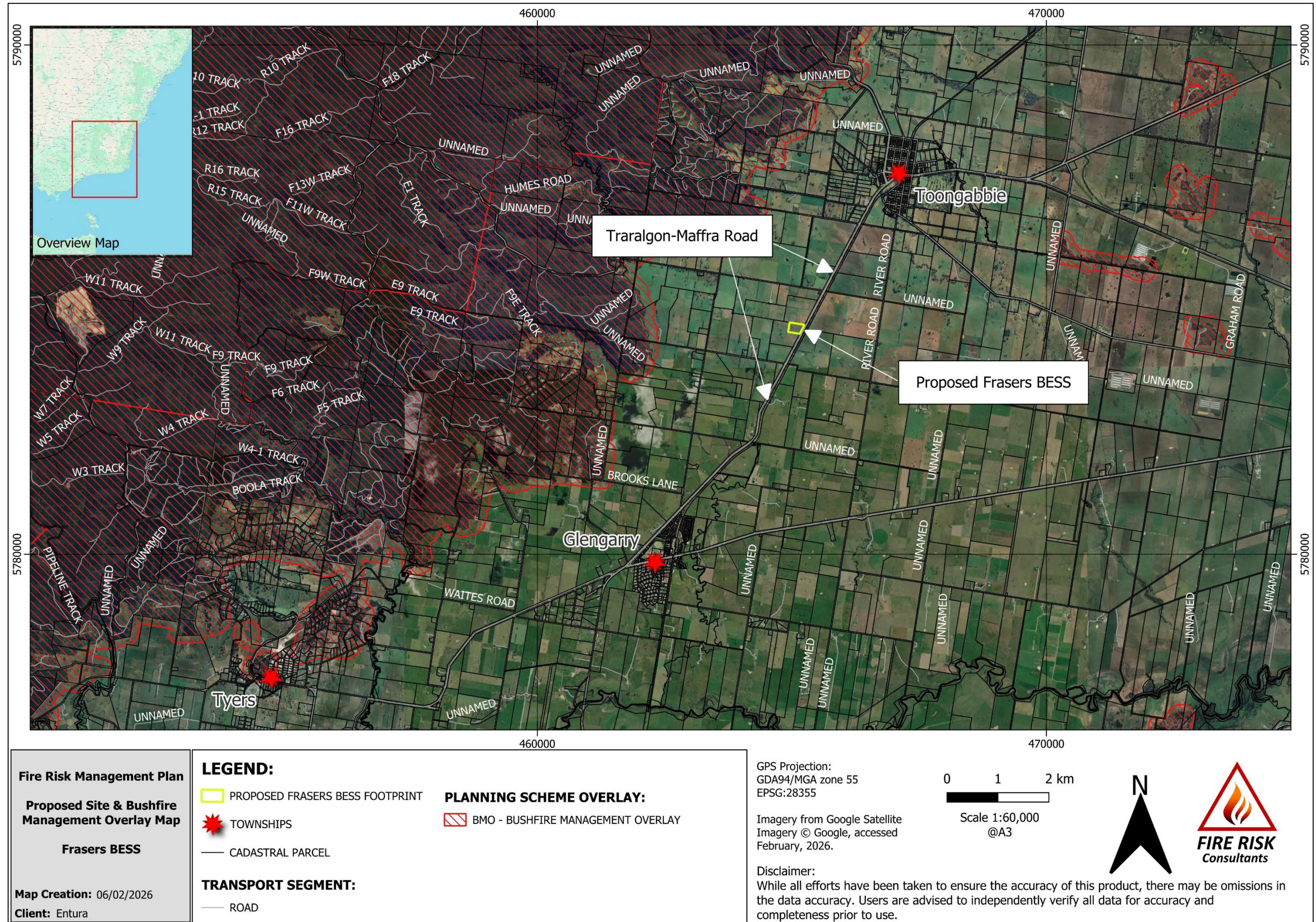


Figure 3: Project area and overlap of parcels with BMO

3.2.2 Designated Bushfire Prone Area

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

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

A minimum construction standard applies to new residential buildings, schools, childcare centres, hospitals, aged care facilities, industrial buildings and associated buildings in designated Bushfire Prone Areas.

Landowners are required to build to a minimum Bushfire Attack Level (BAL) of 12.5 in these areas as outlined within *AS3959:2018 Construction of Buildings in Bushfire-prone Areas*. The existence of the BPA will trigger the need to respond to Clause 13.02 of the Planning Scheme.

The location of the BPA within the surrounding landscape is shown in Figure 4.

**ADVERTISED
PLAN**

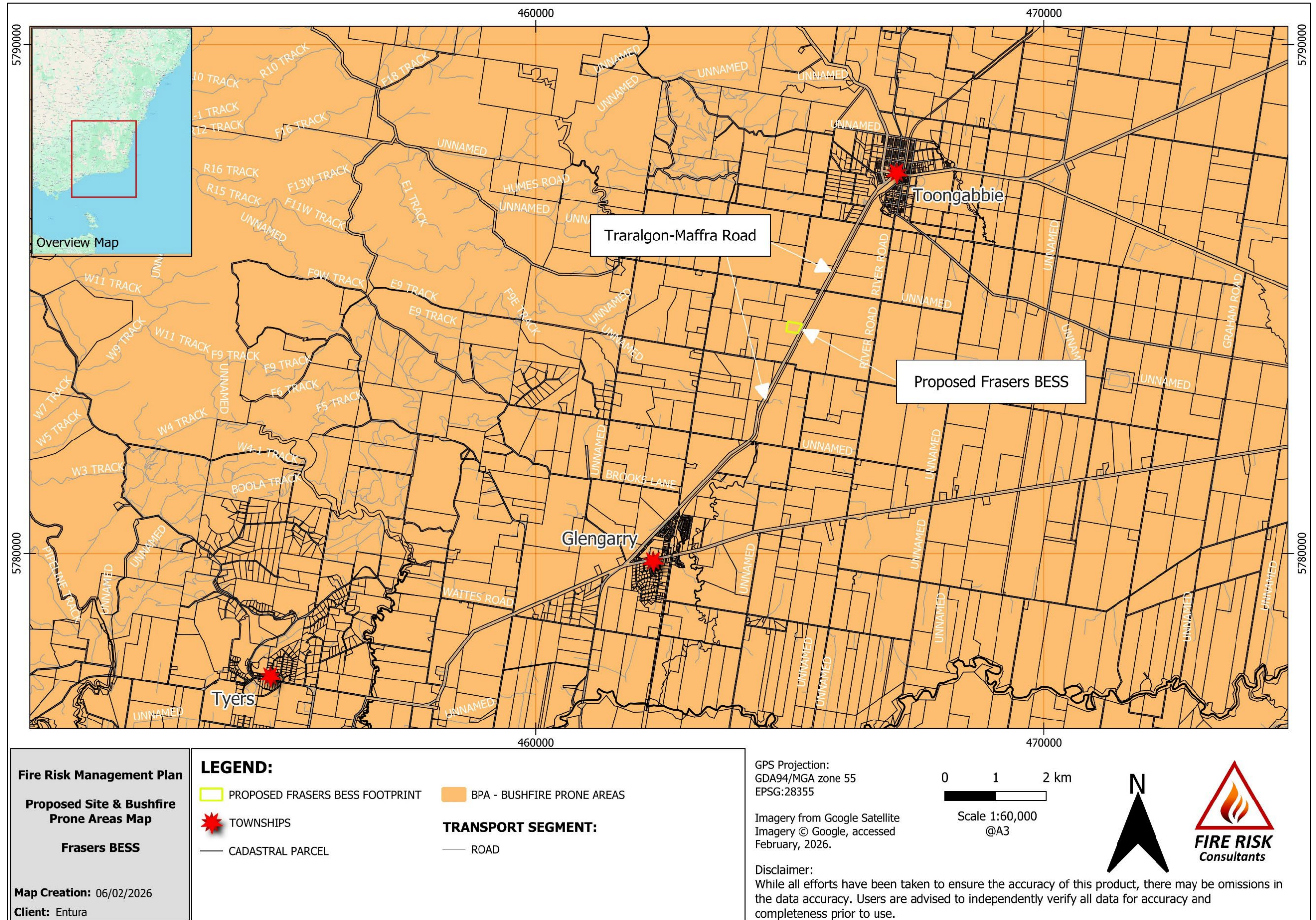


Figure 4: Location of the BPA in relation to the property

3.2.3 Municipal Fire Management Plan

Each municipality has in place a Municipal Fire Management Plan (MFMP) that is a sub-plan of the Municipal Emergency Management Plan. The MFMP outlines the fire management treatments applied to risks identified on the Victorian Fire Risk Register (VFRR).

The Latrobe City MFMP¹ notes that 'Latrobe Valley bushfire catchment contains almost 3% of the risk to life and property containing varying topography ranging from steep, almost inaccessible hills' (p13&14).

The Latrobe City MFMB identifies initial risk ratings using the VFRR. The Latrobe City MFMP notes the likely fire scenario to impact Toongabbie is direct fire attack from grassland to the north to southwest and ember attack from forest into grasslands.

3.2.4 Bushfire history

There are no documented bushfires to have directly impacted the Project site.

The analysis of documented bushfire history in the surrounding landscape has identified large areas of bushfire activity to the north, west and southwest of the Project site within the forested vegetation within the Great Dividing Range on public land. There is also documented bushfire history to the east and northeast of the site within grassland on private land.

The last major bushfire relative to the Project site impacted the hills to the north during 2006 (Coopers Creek fire). The topography within this area includes steep, almost inaccessible hills making ground based firefighting challenging.

The majority of bushfires relative to the Project site have occurred on public land to the north, west and southwest.

Documented bushfire history relevant to the Project site is shown in Figure 5.

**ADVERTISED
PLAN**

¹ Latrobe City Municipal Fire Management Plan 2018

www.latrobe.vic.gov.au/sites/default/files/2024-06/Latrobe%20City%20Municipal%20Fire%20Management%20Plan%202018%20%282018%29.pdf

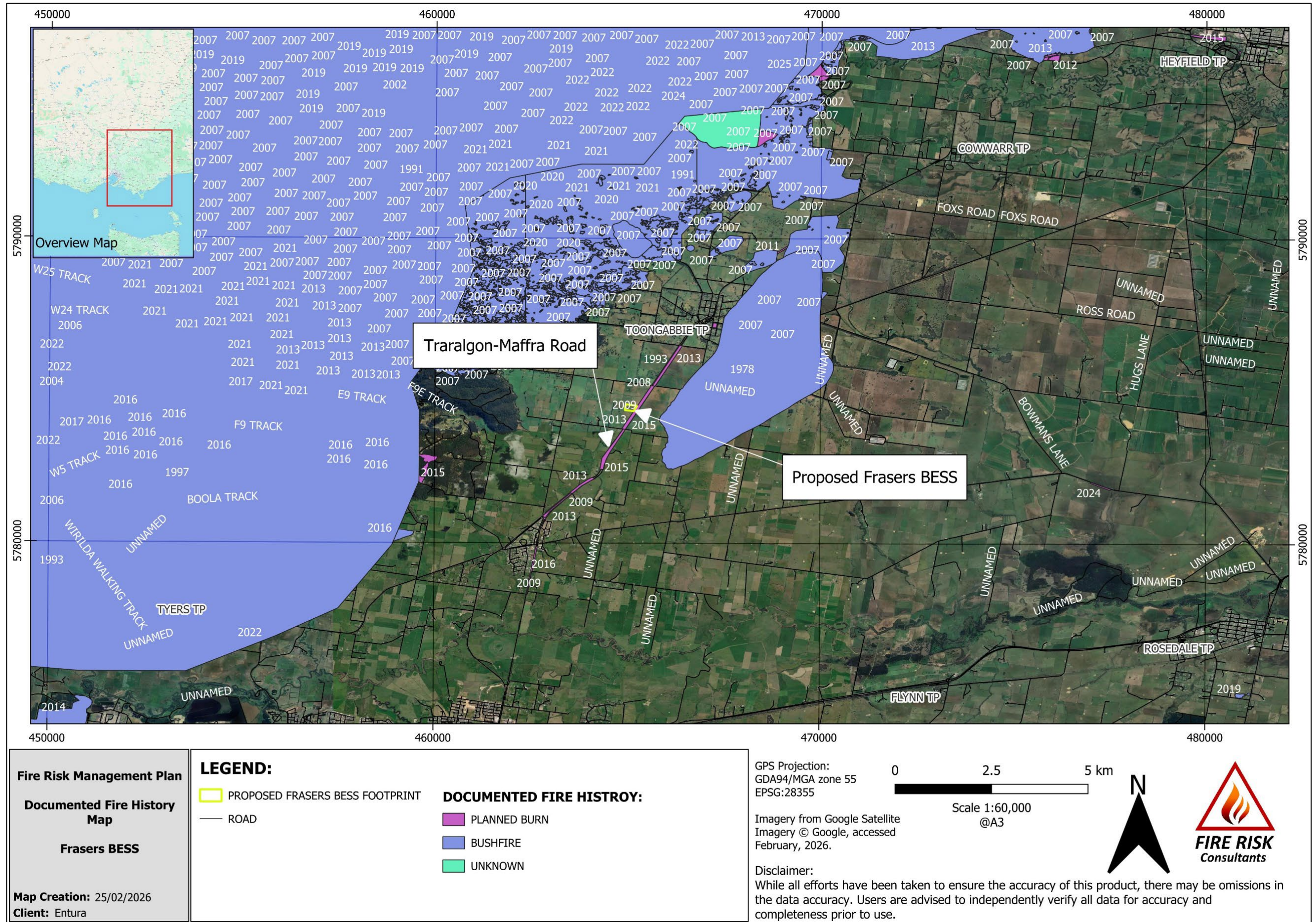


Figure 5: Documented fire history adjacent to Project site

3.2.5 SUNTERA JKE-5015K-2H-LAA battery fire safety

The development is proposing to install SUNTERA JKE-5015K-2H-LAA Battery Energy Storage Systems. Each battery container is assembled within a factory and arrives with a small charge and largely a plug-in type of installation. The product is fitted with a range of systems that manage the battery and receives and responds to various alerts. The Battery Management System (BMS) can be remotely updated as new technologies or learnings are introduced into the software.

The SUNTERA JKE-5015K-2H-LAA is provided with a range of manuals that address installation, maintenance and safety. The SUNTERA JKE-5015K-2H-LAA product has been tested in accordance with UL9540A that demonstrates that the design of the system meets the requirements of UL9540A (see Appendix B).

The SUNTERA JKE-5015K-2H-LAA units are fitted with a range of sensors that connect through a Supervisory Control and Data Acquisition (SCADA) system to a remote monitoring centre. The sensors will detect various activities that indicate a cell could undergo thermal runaway if no intervention occurs. Due to the remote monitoring capability, the monitoring center can remotely commence shut down procedures if required. The units are also fitted with gas detection devices and an E-stop system that enable the unit to be shut down externally via onsite personnel.

In addition to default fire suppression systems, the SUNTERA JKE-5015K-2H-LAA units can be optioned to include internal sprinklers, explosion vent panels and aerosol suppressant systems.

Table 1 - Overview of fire safety systems

Fire Safety System	Description
Battery Management System (BMS)	The BMS constantly monitors cell and pack level voltage, temperature, State of Charge (SOC), and other parameters to ensure early detection of pre fault conditions, and rapid detection of fault events. Should any parameter exceed a permissible value, the BMS will disconnect the effected Units and send an alarm to the Monitoring Centre.
Non-walk through design	The SUNTERA JKE-5015K-2H-LAA units are designed for outdoor use, and do not require walk in access to conduct inspections of battery racks. This eliminates the requirement for personnel to work in tight spaces inside a vented container.
Emergency Stop (E-Stop)	Each SUNTERA JKE-5015K-2H-LAA contains E-stop buttons on the container structure. When pushed, the SUNTERA JKE-5015K-2H-LAA will immediately commence shut down, and the BMS will isolate the battery strings from the main system bus.
Fire detection and alarms	The SUNTERA JKE-5015K-2H-LAA is equipped with smoke and heat detectors calibrated to detect early signs of fire within the container. Both detectors are ceiling mounted. The SUNTERA JKE-5015K-2H-LAA contains both an audible fire alarm and visual fire strobe located on the outside of the Unit. If the smoke and/or heat detectors are triggered, alarms will activate, and corresponding alarms will be sent to the Monitoring Centre through the SCADA system. The SUNTERA JKE-5015K-2H-LAA is equipped with a flammable gas detector and pressure relief (off-gassing) ports. If the combustible gas sensor is triggered, both audible and visual alarms will activate, and the off-gassing valves will be opened for exhaust. Corresponding alerts will be sent to the Monitoring Centre through the SCADA System.
Emergency system shutdown	In the event of an emergency on site, the SUNTERA JKE-5015K-2H-LAA can be shut down locally, or remotely. A system shutdown will result in electrical isolation of the battery strings and cessation of battery charging or discharging.

**ADVERTISED
PLAN**

Fire Safety System	Description
Explosion prevention	The explosion prevention system installed within the SUNTERA JKE-5015K-2H-LAA is associated with the flammable gas detector which will activate an active ventilation system and will vent the flammable gases from the container.
IP Rating	The IP (Ingress Protection) rating for product is IP55. The rating is defined by the International Standard EN 60529 (British Standard BS EN 60529:1992). The first digit relates to the ability for solids to enter the enclosure and the second digit indicates the ability for liquids to enter the enclosure.² The IP55 rating is classified as: 5 – Dust protected 5 – Protected against water jets In the unlikely event of bushfire embers impacting a unit, the IP55 ratings will likely mitigate and reduce the ability for embers to enter the unit.
Firefighting equipment	Fire extinguishers will be installed throughout the site and located as per AS 2444-2001 and fire service guidelines.

The SUNTERA JKE-5015K-2H-LAA complies with the following industry standards:

- International Electrotechnical Commission (IEC) 61000 - Electromagnetic compatibility (EMC).
- IEC 62619 - Safety requirements secondary lithium cells and batteries, for use in industrial applications.
- United Nations (UN) 38.3 – Transportation Testing for Lithium Batteries and Cells.
- Underwriters Laboratories (UL) 9540A - Energy Storage Systems and Equipment.
- UL 1973 – Batteries for Use in Light Electric Rail (LER) Applications and Stationary Applications.
- IEC 61000-4-6 – Electromagnetic compatibility (EMC) – Part 4-6: Testing and measurement techniques – Immunity to conducted disturbances, induced by radio-frequency fields.

**ADVERTISED
PLAN**

² IP Ratings, International Electrotechnical Commission (IEC). <https://www.iec.ch/ip-ratings>

4 Risk assessment process

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

- Clause 13.02-1S – Bushfire Planning – Latrobe Planning Scheme³
- Assessment against the requirements of the CFA Guidelines *Design Guidelines and Model Requirements: Renewable Energy Facilities (Version 4.4, August 2025)*⁴ (CFA Guidelines)
- Risk assessment that meets Section 3 of the CFA Guidelines.

The risk assessment is based on the information outlined in this report along with industry best practice and our professional expertise.

4.1 Clause 13.02 – Bushfire Planning Assessment

As planning approval has not yet been granted for the BESS, Clause 13.02-1S of the Latrobe Planning Scheme is utilised to support the assessment of bushfire risk in the context of best practice. The Clause 13.02-1S policy aims to strengthen the resilience of settlements and communities and prioritises protection of human life through several objectives. However, it should be noted the Project does not introduce new settlements into the landscape. The assessment has been undertaken within the context of a BESS development.

4.1.1 Bushfire Hazard Assessment

Elevated bushfire risk in south-east Australia is often dominated by strong and gusty north-westerly winds followed by a south-westerly change that normally occurs in the afternoon or early evening. In very high and extreme conditions, such fire behaviour has historically resulted in the loss of life and property and are usually associated with elevated fire danger warnings issued by the fire agencies.

Table 2 outlines the hazard assessment relating to the Project.

Figures 6 and 7 provide an overview of the likely bushfire scenarios within the surrounding area. There is the potential for bushfires to approach from a north-westerly or south-westerly direction due to the connectivity of grassed areas and roadside vegetation.

An indicative Bushfire Attack Level Assessment (BAL) was prepared using the Method 1 procedure as detailed in Section 2.2 Simplified Procedure (Method 1) of AS3959:2018. Vegetation and relevant effective slopes within 100m of the Project site have been inspected and classified.

The relevant Fire Danger Index (FDI) used in Victoria in accordance with Table 2.4 of AS3959:2018 is 100.

The classified vegetation in accordance with Table 2.3 of AS3959:2018 within 100m of the Project site is Group G Grassland. The relevant effective slope in accordance with Table 2.4 of AS:3959:2018 is All upslopes and flat land (0 degrees).

**ADVERTISED
PLAN**

³ Latrobe Planning Scheme, <https://planningschemes.app.planning.vic.gov.au/Latrobe/ordinance/13.02>

⁴ CFA Design Guidelines and Model Requirements for Renewable Energy Facilities (Version 4.4, August 2025), Country Fire Authority Victoria, <https://www.cfa.vic.gov.au/ArticleDocuments/1933/250611%20-%20CFA%20DGM%20Renewable%20Energy%20Facilities%20v4.4.pdf>

In accordance with Table 2.4 of AS3959:2018 the Project site requires a minimum 19m separation distance between the bushfire-prone vegetation to achieve a radiant heat flux of less than 12.5 Kw/m². Figure 8 of this report provides an indicative BAL map.

Clause 13.02-1S outlines the need to assess the bushfire hazard based on:

- *Landscape conditions* - meaning conditions in the landscape within 20 kilometres (and potentially up to 75 kilometres) of a site.
- *Local conditions* - meaning conditions in the area within approximately 1 kilometre of a site.
- *Neighborhood conditions* - meaning conditions in the area within 400 metres of a site; and
- *The site for the development.*

This assessment has considered and assessed the bushfire hazard at the Project site, one kilometer and 20 kilometers from the Project site. The reasons for this include:

- Due to the surrounding vegetation primarily being used for agricultural purposes, the key driver of bushfire hazard is within 400 metres of the development. The BMO is not present within the Project site. The closest parcel of land to the Project site included within the BMO is approx. 2.5km to the west where the Great Dividing Range transitions to agricultural land.
- The analysis of documented bushfire history in the surrounding landscape has identified large areas of bushfire activity to the north, west and southwest of the Project site within the forested vegetation within the Great Dividing Range on public land. The majority of bushfires relative to the Project site have occurred on public land to the north, west and southwest.
- Any assessment beyond 20 kilometers serves little benefit to the assessment of the bushfire hazard to the Project site.

Considering the landscape factors, assessment of the bushfire hazard can be effectively achieved using a methodology that includes the Project site, one kilometer and 20 kilometers from the development.

It is acknowledged that bushfires may approach from other directions, however the treatment of the risk from these aforementioned aspects will be sufficient to offset bushfire approach from any direction.

Table 2 - Assessment against Clause 13.02

Bushfire hazard type	Conditions	Likely Scenario	Considerations
The site for the development	Once completed, the Project will comply with the conditions specified within the CFA Guidelines that include the management of vegetation around the Project site during the fire danger period.	A bushfire starting on the property is a possibility during the construction phase of the Project. This risk is already present and doesn't change other than the need to maintain the grass vegetation during the fire danger period.	During the construction phase, where possible, vegetation on the Project site and within 100 metres of the construction areas will be managed during the fire danger period. At the completion of the construction phase, during

Bushfire hazard type	Conditions	Likely Scenario	Considerations
	During construction, there is a risk of a fire igniting and spreading through unmanaged vegetation.	Fires starting because of construction or operational activities have the potential to leave the property and enter adjoining areas. There is sufficient grassed areas and connectivity in some directions for a fire to spread rapidly under elevated fire danger conditions. Management of vegetation during the construction phase will occur regularly and be maintained during the fire danger period. Following construction, the BESS will have either all vegetation removed or managed as per the requirements of the Fire Management Plan.	the fire danger period the grassed areas will be managed as per the CFA Guideline requirements. Hot works are not to occur within 10 metres of vegetation (including grass and other plants) during the fire danger period. When the fire danger conditions are elevated (e.g. Catastrophic Fire Danger Rating), the Emergency Management Plan will outline procedures to close the site during the construction phase and limit maintenance operations unless critical. Access roads will be established during the construction phase and maintained for the life of the Project.
Neighborhood and local conditions (one kilometer)	Within one kilometer of the development, the surrounding landscape is generally flat and grassland. The landscape includes farming properties, residences, electrical distribution lines and local roads. There is the potential for a bushfire to start along the surrounding road network and spread towards the Project. The surrounding road network provides access and egress opportunities for emergency services.	Under strong wind conditions a bushfire can travel quickly across the landscape. Grassfires are heavily influenced by the quantity of fuels within the paddocks and the wind strength. Roadsides may contribute to bushfire spread when they haven't been managed prior to a bushfire commencing.	The provision of access roads and vegetation management around the BESS will limit the impact of a fire. This will include a 19 meter wide fire break around the perimeter of the Project site. Under lower fire danger conditions, the roads and other landscape features may slow or stop a fire spreading towards the development. The surrounding fragmented landscape will limit the ability for a bushfire to develop. The access road and vegetation management requirements will limit the chances of a bushfire starting

**ADVERTISED
PLAN**

Bushfire hazard type	Conditions	Likely Scenario	Considerations
			on the site and impacting on the surrounding landscape.
Landscape conditions (20 kilometers)	The landscape hazard surrounding the Project site consists primarily of grassland, with public forest beyond 3km from the Project site in a north, west, and southwest direction.	The likely bushfire behaviour which will result in the greatest intensity and risk to the Project will be from either the north-west or south-west. Both directions have extensive grassland dominated properties that under the right conditions, would support bushfire behaviour. Significant landscape bushfire risk sits to the north and west of the Project site, with the proximity of the Great Dividing Range. The forest in this area will increase the risk of ember attack from forest into grasslands and influence fire intensity.	The protection of the Project through the provision of vegetation management arrangements and access roads will reduce bushfire intensity. The vegetation management arrangements will be effective regardless of whether a fire starting locally or having travelled some distance before impact. The provision of access roads will increase the ability for firefighters to access the areas surrounding the Project site.

4.1.2 Bushfire Landscape Assessment

Figures 6 and 7 show the outcome of the bushfire hazard landscape assessment. The assessment identifies the two likely scenarios that may occur in relation to the Project. Both scenarios are possible, however they would be influenced by the surrounding landscape that includes various farming practices, fuel availability, roads and other landscape features. Table 3 provides a description of each of the scenarios.

Table 3 - Bushfire Scenarios

Scenario	Description
A	A bushfire that approaches from the north-west can travel some distance before impacting on the Project site. As the bushfire approaches, bushfire behaviour would likely remain consistent when in grassland. The presence of the local road network, variation in dryland pasture species, and varying rural land uses will likely influence the way the bushfire travels through the landscape. Under lower fire danger conditions, the bushfire is likely to be influenced by the surrounding landscape features which will reduce the risk to the Project. The bushfire hazard from the north-west is likely to be human-caused and likely involve ignition sources such as vehicles traveling along roadsides, farming machinery or arson. There is potential for unplanned ignitions caused by lighting within the Great Dividing Range. This may result in ember attack from forested vegetation into adjacent grasslands.

Scenario	Description
	At the local level, the properties and vegetation immediately surrounding the Project site will likely be managed during the fire danger period and the amount of available vegetation reduced. A grassfire impacting the Project site is likely to spread rapidly toward the managed areas; however, fire intensity is expected to reduce upon entry due to lower fuel loads and implemented on-site mitigation measures.
B	A bushfire that approaches under a south-westerly wind influence usually occurs after a north-westerly wind has been influencing the weather conditions. The wind change may occur after a bushfire has been burning for some time under the north-westerly influence. As with Scenario A, there is potential for bushfires burning within the Great Dividing Range to influence ember attack into grasslands adjacent to the Project site and influence fire intensity. The relatively flat topography, local road network and predominant vegetation contributing to fire intensity being grassland will likely reduce bushfire behavior towards the Project site under lower fire danger conditions.

**ADVERTISED
PLAN**

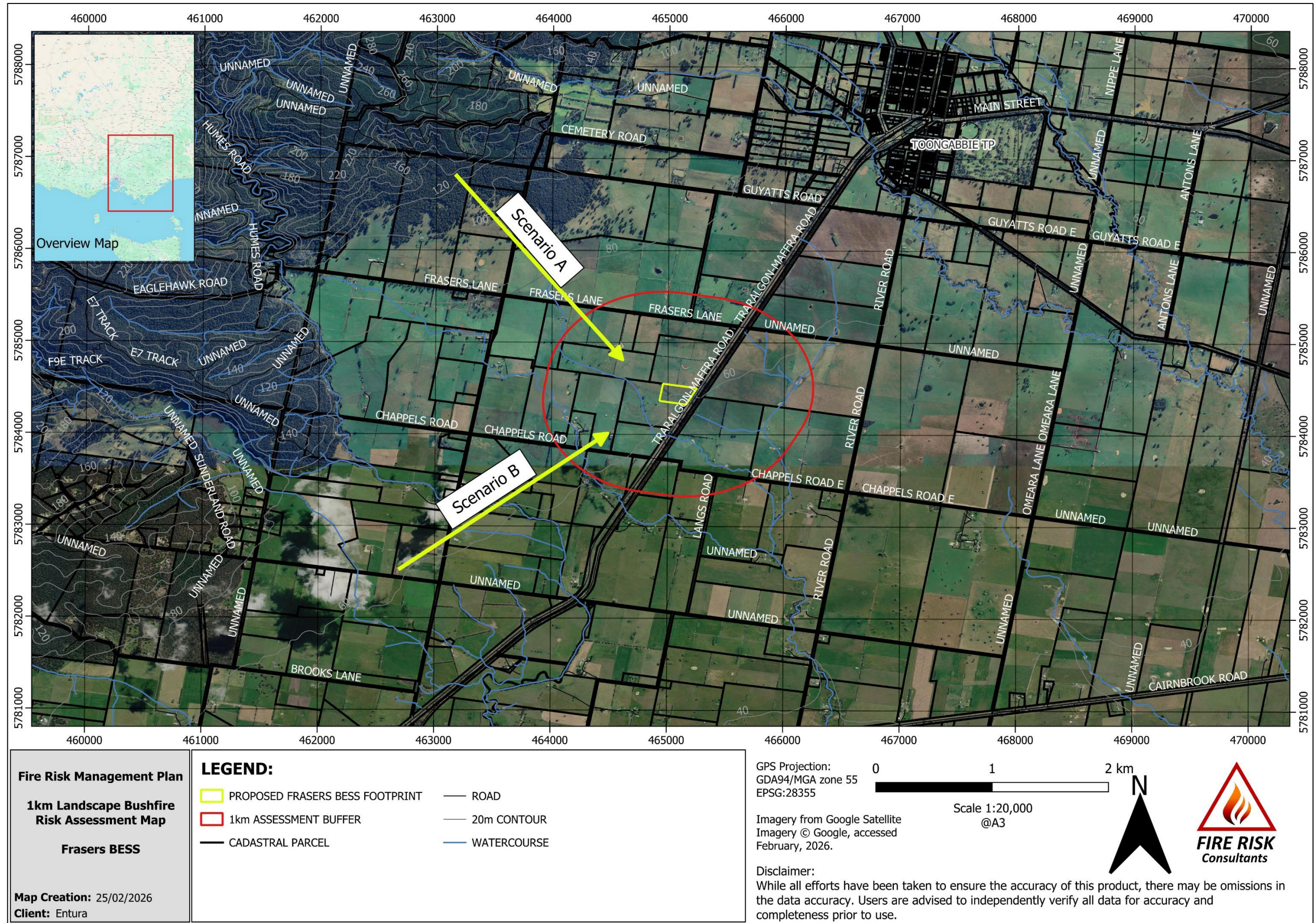


Figure 6: 1km Landscape Bushfire Risk Assessment

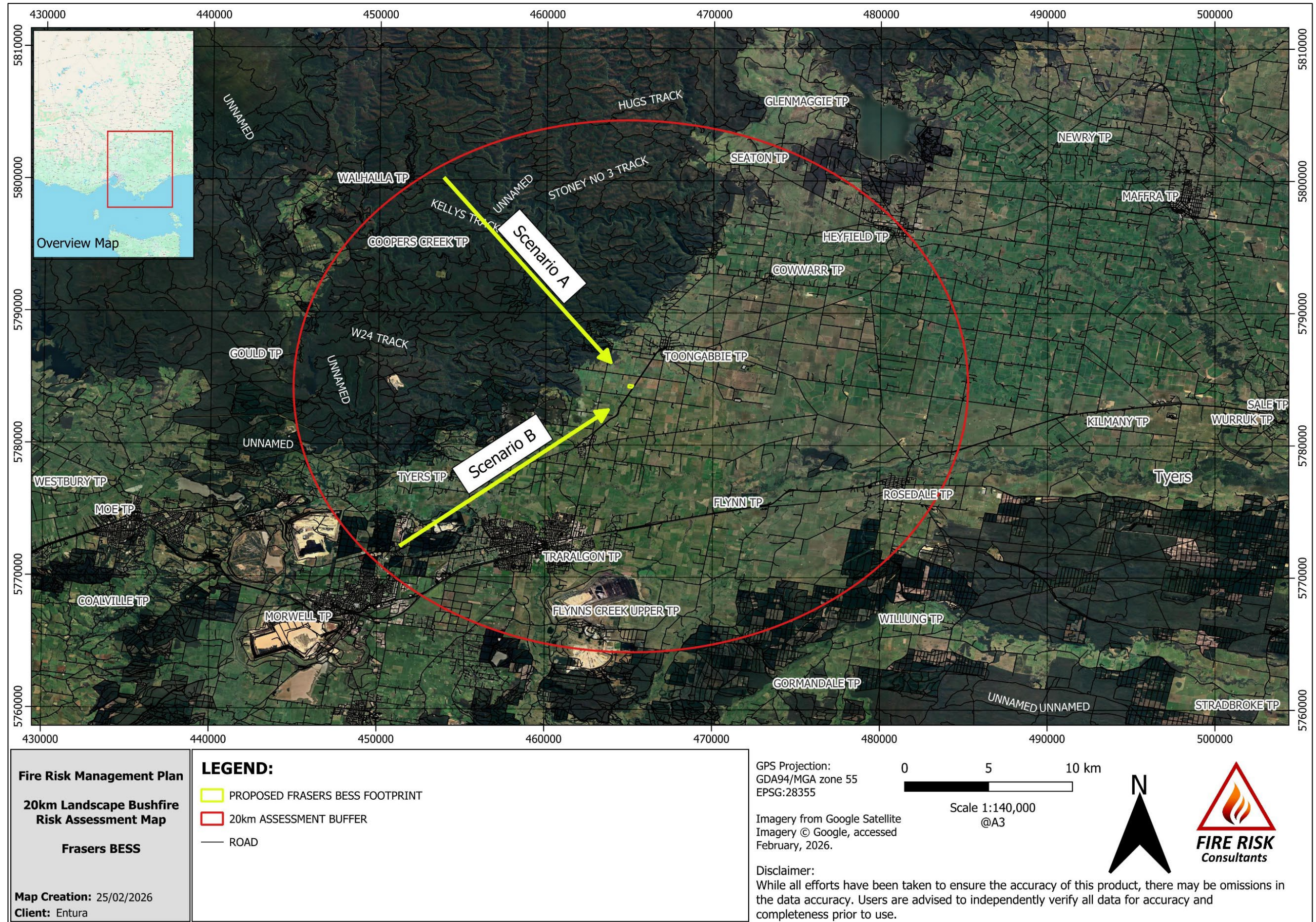
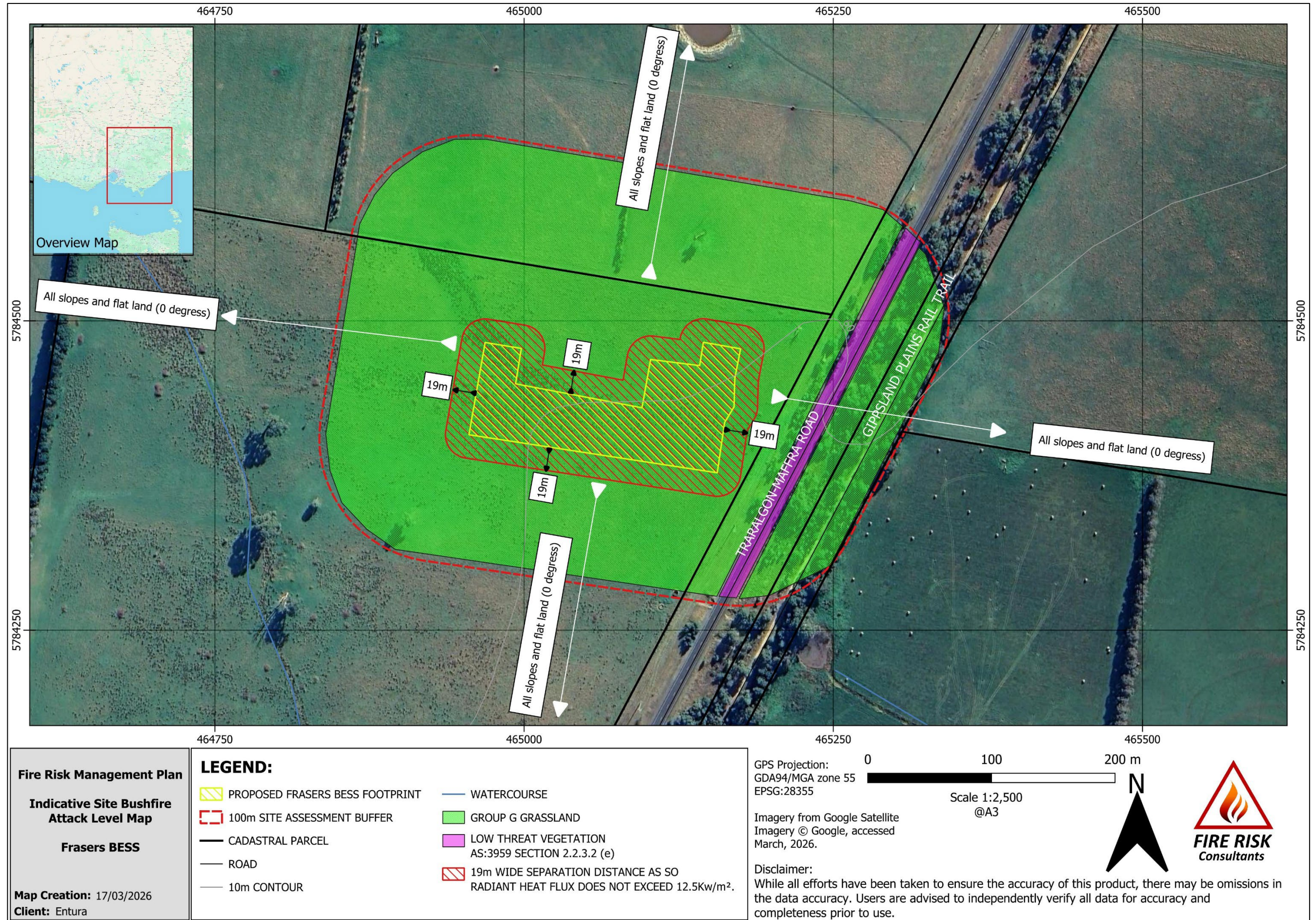


Figure 7: 20-kilometre landscape Bushfire Risk Assessment



Clause 13.02 Settlement Objectives are primarily related to settlement development of which it could be argued that a BESS development does not meet these definitions. Regardless, an assessment of the Project has been undertaken in Table 4 against the Settlement Objectives to allow for detailed consideration of the Project against the Clause 13.02-1S Policy.

Table 4 - Response to Clause 13.02 - Settlement Objectives

Settlement planning objectives	Project response	Achieved (✓ or ✗)
Directing population growth and development to low risk locations, being those locations assessed as having a radiant heat flux of less than 12.5 kilowatts/square metre under AS 3959:2018 Construction of buildings in bushfire-prone areas (Standards Australia, June 2019).	The Project will not contribute to population growth. The Project involves the installation of a BESS and related infrastructure. The Project site is not affected by the Bushfire Management Overlay (BMO) and is therefore identified as being within a low risk environment in accordance with the CFA Guidelines. The Project will include the installation of fire breaks compliant with the model requirements of the CFA Guidelines. The fire breaks will provide appropriate separation distances as so radiant heat flux does not exceed 12.5Kw/m². People will only be onsite during the construction phase and periodically when undertaking maintenance during the operations phase.	✓
Ensuring the availability of, and safe access to, areas assessed as a BAL-LOW rating under AS 3959:2018 Construction of buildings in bushfire-prone areas (Standards Australia, June 2019) where human life can be better protected from the effects of bushfire.	The Project will not result in areas that will achieve a BAL-LOW rating where human life can be better protected from the effects of bushfire. Traralgon township is located 15km south of the Project site (approx. 15min drive by car). Rosedale township is located 24km east of the Project site (approx. 19min drive by car). Both Traralgon and Rosedale provide locations not Designated as Bushfire Prone Areas and can provide multiple locations of BAL-LOW ratings where human life can be better protected from the effects of bushfire. The direction a bushfire is approaching will influence the decision as to which direction to leave the Project site. This will be addressed within the Emergency Management Plan that will be developed prior to construction commencing.	✓
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 Project site is not affected by the Bushfire Management Overlay (BMO) and is therefore identified as being within a low risk environment in accordance with the CFA Guidelines. The BESS facility will be provided with a range of protection measures compliant with the CFA Guideline including fire breaks, access road networks, and firefighting water supply. This will ensure the bushfire risk to existing and future	✓

Settlement planning objectives	Project response	Achieved (✓ or ✗)
	residents, property and community infrastructure will not increase as a result of the BESS 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 reducing bushfire risk overall.	The Project site is not affected by the Bushfire Management Overlay (BMO) and is therefore identified as being within a low risk environment in accordance with the CFA Guidelines. The BESS facility will be designed and constructed in accordance with applicable CFA Guidelines, incorporating fire breaks, compliant emergency vehicle access, and a dedicated firefighting water supply. The proposed mitigation measures ensure the development appropriately responds to bushfire hazard and does not increase risk to existing and future residents, property and community infrastructure.	✓
Assessing and addressing the bushfire hazard posed to the settlement and the likely bushfire behaviour it will produce at a landscape, settlement, local, neighborhood and site scale, including the potential for neighborhood-scale destruction.	Bushfire risk has been assessed at both the broader landscape and local scales. The assessment has identified the potential for the classified vegetation adjoining the Project site to pose a bushfire hazard from the north-west and south-west aspects. The BESS facility will be designed and constructed in accordance with applicable CFA Guidelines, incorporating fire breaks, compliant emergency vehicle access, and a dedicated firefighting water supply. This will address the bushfire hazard posed to the BESS facility. The BESS facility has been designed to reduce the consequence of unplanned ignition events within the Project site and to mitigate the potential for fire spread to adjoining land.	✓
Assessing alternative low risk locations for settlement growth on a regional, municipal, settlement, local and neighborhood basis.	The Project site is not affected by the Bushfire Management Overlay (BMO) and is therefore identified as being within a low risk environment in accordance with the CFA Guidelines. The development of the BESS is within an area that is achieving a balance between managing fire risk, the need to be located away from residential areas, and direct connection to existing power distribution lines. The protection measures compliant with the CFA Guideline ensure the management of risk is occurring based on both landscape and local scale bushfire risk.	✓
Not approving any strategic planning document, local planning policy, or planning scheme amendment that will result in the introduction or intensification of development in an area that has, or will on	The Project will include the installation of fire breaks compliant with the model requirements of the CFA Guidelines. The fire breaks will provide appropriate	✓

Settlement planning objectives	Project response	Achieved (✓ or ✗)
completion have, more than a BAL-12.5 rating under AS 3959-2009 Construction of Buildings in Bushfire-Prone Areas (Standards Australia, 2009).	separation distances as so radiant heat flux does not exceed 12.5Kw/m ² .	

4.1.3 Assessment against Clause 13.02-1S summary

The assessment against Clause 13.02-1S has identified that the Project is within an area where bushfires are possible. There is the potential for fires to start locally, however these will likely be of lower intensity due to the surrounding landscape and vegetation management programs that will occur on the Project site. The Project is well situated within the landscape to minimize the impact of fires entering or exiting the Project site. As the Project is required to achieve the requirements outlined within the CFA Guidelines as a minimum, this will ensure that the settlement planning objectives are achieved. The proposed location and parcel of land has been effectively designed to avoid areas of very high and extreme bushfire hazard, densely populated residential areas and areas of undisturbed land.

4.2 Analysis against CFA Guidelines

CFA has produced the Design Guidelines and Model Requirements – Renewable Energy Facilities. The guideline provides standard considerations and measures for fire safety, risk and emergency management in designing, constructing and operating new renewable energy facilities, and upgrading existing facilities. This report has been prepared utilising version 4.4 of the guidelines which are available at www.cfa.vic.gov.au.

Table 6 of this report outlines the model requirements from the CFA Guidelines and how the proposal addresses each model requirement.

Section 5 of this report provides a detailed risk assessment to support the proposal meeting the model requirements.

Section 3.3 of the CFA Guidelines note:

Risk Management Plan

“A Risk Management Plan must be developed for all renewable energy facilities”.

The Risk Management Plan must:

- a) *Describe the infrastructure (natural and built), landscape, nature of operations and occupancy of the facility.*
- b) *Describe the risks and hazards at the facility to and from the renewable energy infrastructure (including battery energy storage systems).*
- c) *Specify and justify, in accordance with Section 4.2 of this guideline:*
 - *The **location** of the facility in the landscape, and the proposed infrastructure on-site.*
 - ***Emergency vehicle access** to and within the facility that:*
 - *Includes site access points of a number suitable to the size and hazards of the facility (a minimum of two).*
 - *Provides access to renewable energy infrastructure, substations and fire service infrastructure.*
 - ***Firefighting water supply** for the facility.*

**ADVERTISED
PLAN**

- A **fire break width** of 10m or greater, based on radiant heat flux (output) as an ignition source:
 - Around the perimeter of the facility.
 - Between any landscape buffer/vegetation screening and infrastructure.
 - The **separation distance**, based on radiant heat flux (output) as an ignition source, between:
 - Adjacent renewable energy infrastructure (e.g., between adjacent battery containers/enclosures).
 - Battery containers/enclosures and related battery infrastructure, buildings/structures, and vegetation.
 - **All other controls** for the management of on and off-site hazards and risks at the facility (including all proposed battery energy storage system safety and protective systems).
- d) Provide an evidence-based determination of the effectiveness of the risk controls against the identified hazards, including justification for the omission of any battery safety and protective system/s.
- e) Form the basis for the design of the facility.

**ADVERTISED
PLAN**

Table 5 - CFA Guideline requirements

Model requirement	Compliance	Response
SECTION 2 – CONSULTING WITH CFA		
a) Where located within a Bushfire Prone Area, bushfire risk is addressed according to the Victoria Planning Provisions, Clause 13.02-1S (Bushfire Planning), through bushfire hazard identification and assessment (including a bushfire hazard site and landscape assessment). This assessment must include risks to the proposed technologies from the landscape (bushfire/grassfire).	✓	The bushfire risk has been considered and assessed against the relevant section of the Latrobe Planning Scheme within Section 4.1 of this RMP.
b) Address risks from proposed technologies through a comprehensive risk management process, documented in a Risk Management Plan.	✓	This report meets the requirements of a Risk Management Plan as outlined within the CFA Guidelines.
c) Indicate where the exact specifications of elements within the renewable energy facility will be determined during the detailed design phase, such as solar panel and wind turbine model/manufacture and battery chemistry.	✓	The project is in initial design stage and the requirements within this report will be implemented by the developer.
d) Explicitly state that the following documentation will be prepared in accordance with this guideline, in consultation with CFA, before development starts: • Risk Management Plan • Fire Management Plan • Emergency Management Plan	✓	This report meets the requirements of a Risk Management Plan and includes a Fire Management Plan (see Appendix E). An Emergency Management Plan will be developed and approved in consultation with CFA prior to the commencement of construction activities.
SECTION 3 – RISK MANAGEMENT PLAN		
A Risk Management Plan must be developed for all renewable energy facilities.	✓	This report meets the requirements of a Risk Management Plan as outlined within the CFA Guidelines.
The Risk Management Plan must:		
a) Describe the infrastructure (natural and built), landscape, nature of operations and occupancy of the facility.	✓	Refer to Sections 1, 2 and 3 of this report. The Risk Management Plan must be reviewed prior to a significant design change being implemented onsite. The Site Manager is responsible for ensuring reviews occur.
b) Describe the risks and hazards at the facility to and from the renewable energy infrastructure (including battery energy storage systems).	✓	Refer to Section 5.4 and 5.5.3 of this report.
c) Specify and justify, in accordance with Section 4.2 of this guideline:		

**ADVERTISED
PLAN**

The location of the facility in the landscape, and the proposed infrastructure on-site.	✓	Refer to Section 2 and 3 of this report.
- Emergency vehicle access to and within the facility that: - Includes site access points of a number suitable to the size and hazard of the facility (a minimum of two). - Provides access to renewable energy infrastructure, substations and fire service infrastructure.	✓	The design includes two or more points of entry and exit. The primary and secondary access points will be created from Frasers Lane passing through the proposed Frasers Solar Farm to the north of the Project site. Refer to Figure 1 of this report.
Firefighting water supply for the facility.	✓	An indicative location for the firefighting water supply has been included in Figures 1. The final design will meet the requirements of the CFA Guidelines.
- A fire break width of 10m or greater, based on radiant heat flux (output) as an ignition source: - Around the perimeter of the facility. - Between any landscape buffer/vegetation screening and infrastructure. ADVERTISED PLAN	✓	A minimum 10m wide fire break will be provided around the full perimeter of the facility. Where acoustic walls are present, the fire break starts from the electrical infrastructure, not the acoustic wall. This perimeter fire break will be further supported by an additional minimum 9m of managed grasslands <100mm height all year round to achieve the minimum 19m wide separation distance required by the facility to provide appropriate separation distances as so radiant heat flux does not exceed 12.5Kw/m². The 9m of managed grasslands will be managed through a coordinated maintenance program by the Site Manager. Refer to Figure 8 of this report.
- The separation distance, based on radiant heat flux (output) as an ignition source, between: - Adjacent renewable energy infrastructure (e.g., between adjacent battery containers/enclosures). - Battery containers/enclosures and related battery infrastructure, buildings/structures, and vegetation.	✓	An indicative separation distance has been provided for between the infrastructure as part of the initial design, and will be confirmed as part of the final design.
All other controls for the management of on and off-site hazards and risks at the facility (including all proposed battery energy storage system safety and protective systems).	✓	The BESS units contain an integrated firefighting system, utilising remote SCADA monitoring, suppression systems, alarms and blast protection. The site will be operated by qualified personnel, with emergency management planned for and undertaken in accordance with a site Emergency Management Plan (EMP). The EMP will be developed and regularly reviewed

ADVERTISED PLAN		with input from relevant emergency service organisations. A compliant Fire Management Plan has been included in Appendix E of this report.
d) Provide an evidence-based determination of the effectiveness of the risk controls against the identified hazards, including justification for the omission of any battery safety and protective system/s.	✓	Refer to Section 5.5.3 of this report.
e) Form the basis for the design of the facility.	✓	Refer to Figure 1 for site specific design, development and layout information.

SECTION 4- FACILITY LOCATION AND DESIGN

SECTION 4.1 – FACILITY LOCATION

Planning applications for all renewable energy facilities proposed in high-risk environments must address the following:

a) An assessment against policy at Clause 13.02-1S (Bushfire Planning) where the facility is located in a Bushfire Prone Area (BPA).	✓	This report considers the impact and the likelihood of fires that leave the property. An assessment is provided within Section 4.1 of this report.
b) The impact of any ignitions arising from the infrastructure (solar panels, wind turbines, battery energy storage systems, electrical infrastructure) on nearby communities, infrastructure and assets.	✓	This report includes consideration of the impact of ignitions.
c) The impact of bushfire on the infrastructure (e.g. ember attack, radiant heat impact, flame contact).	✓	This report considers the impact of bushfires.
d) Assessment of whether the proposal will lead to an increase in risk to adjacent land and how the proposal will reduce risks at the site to an acceptable level.	✓	This report has considered if the development will increase the risk to surrounding land. Through the provision of setbacks from the boundary, fire breaks, safety systems and managed vegetation, the development has been assessed as not increasing the overall risk to surrounding areas.

SECTION 4.2 – FACILITY DESIGN

SECTION 4.2.1 – EMERGENCY VEHICLE (FIRE TRUCK) ACCESS

All facilities

a) Construction of a four (4) metre perimeter road within the perimeter fire break.	✓	A four (4) metre wide perimeter road will be provided for within the fire break that meets or exceeds the roading specifications outlined within the CFA Guidelines.
b) Roads must be of all-weather construction and capable of accommodating a vehicle of fifteen (15) tonnes (e.g. no compacted earth).	✓	The access roads constructed for this development will be designed, constructed and maintained to ensure they can support the movement of vehicles up to 15 tonnes.

c) Constructed roads should be a minimum of four (4) metres in trafficable width with a four (4) metre vertical clearance for the width of the formed road surface. Ensure any fencing along access routes allows for width of fire vehicles.	✓	All access roads will be a minimum of four (4) metres wide and with a vertical clearance of four (4) metres.
d) The average grade should be no more than 1 in 7 (14.4% or 8.1°) with a maximum of no more than 1 in 5 (20% or 11.3°) for no more than fifty (50) metres.	✓	The final design will include this requirement.
e) Dips in the road should have no more than a 1 in 8 (12.5% or 7.1°) entry and exit angle.	✓	The final design will include this requirement.
f) Roads must incorporate passing bays at least every 600 metres, which must be at least twenty (20) metres long and have a minimum trafficable width of six (6) metres. At least one passing bay must be incorporated where roads are less than 600 metres long.	✓	Compliant passing bays have been provided for at least every 600 metres as part of the design.
g) Road networks must enable responding emergency services to access all areas of the facility, including fire service infrastructure, buildings, battery energy storage systems and related infrastructure, substations and grid connection areas.	✓	The proposed access roads provide direct access to all areas of the facility, including fire service infrastructure, buildings, battery energy storage systems and related infrastructure, substations and grid connection areas.
h) Provision of at least two (2) but preferably more access points to each part of the facility. The number of access points must be informed through a risk management process, in consultation with CFA.	✓	A main site access point is being provided, along with a secondary emergency access point at a location to be determined prior to construction in consultation with and to the satisfaction of CFA.
BATTERY ENERGY STORAGE SYSTEMS		
At least two access points are to be provided into each section where battery energy storage systems are located. The number and location of vehicle access points must be determined in consultation with CFA.	✓	The final design will include two or more points of entry/exit to the development (the primary and secondary access point will be created from Frasers Lane passing through the proposed Frasers Solar Farm to the north of the Project site).
SECTION 4.2.2 FIREFIGHTING WATER SUPPLY		
All Facilities		
a) Water access points must be clearly identifiable and unobstructed to ensure efficient access.	✓	The static water supply system will be located and marked to enable efficient access for firefighters.
b) Static water storage tank installations must comply with <i>AS 2419.1-2021: Fire hydrant installations – System design, installation and commissioning</i> .	✓	The static water supplies will be stored within tanks that comply with AS2419.1:2021
c) The static water storage tank(s) must be an above-ground water tank constructed of concrete or steel.	✓	The static water tanks will be above ground and constructed of either concrete or steel.

**ADVERTISED
PLAN**

ADVERTISED PLAN

d) The static water storage tank(s) must be capable of being completely refilled automatically or manually within 24 hours.	✓	Site management will have an arrangement with a local water carrier to ensure the static water supplies can be refilled within 24 hours. This will be outlined within the Emergency Plan.
e) The static water storage tanks must be located at vehicle access points to the facility and must be positioned at least ten (10) metres from any infrastructure (solar panels, wind turbines, battery energy storage systems, etc.).	✓	The developer commits to achieve 10m separation from any infrastructure. The static water tanks are proposed to be located in adjacent to one another and accessed from the Project Site's eastern most access road. The location of the tanks is intended to minimise travel distance/turnaround time for responding emergency services when accessing on site water. For reference, the distance from the primary access point via Traralgon - Maffra Road to the BESS's themselves is approx. 300m.
f) The hard-suction point must be provided, with a 150mm full bore isolation valve equipped with a Storz connection, sized to comply with the required suction hydraulic performance. <i>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.</i>	✓	The static water tank will be provided with a hard suction point, adapters and blank end cap that will allow for typical firefighting appliances to access the water supplies.
g) The hard-suction point must be positioned within four (4) metres to a hardstand area and provide a clear access for emergency services personnel.	✓	The hard suction point will be accessible by firefighting appliances. A truck hardstand area will be provided within 4m of each tank outlet.
h) An all-weather road access and hardstand must be provided to the hard-suction point. The hardstand must be maintained to a minimum of 15 tonne GVM, eight (8) metres long and six (6) metres wide or to the satisfaction of the CFA.	✓	The tank will be provided with suitable access to allow firefighting appliances to access the hard suction point.
i) The road access and hardstand must be kept clear at all times.	✓	This requirement will be specified within site procedures and the Emergency Management Plan.
j) The hard-suction point must be protected from mechanical damage (e.g. bollards) where necessary.	✓	Bollards will be provided to protect the static water tank outlet from mechanical damage.
k) Where the access road has one entrance, an eight (8) metre radius turning circle must be provided at the tank.	N/A	The site access includes two entry points. An eight (8) metre radius turning circle is not required as the access roads provide means to safely turn emergency vehicles.
l) An external water level indicator must be provided to the tank and be visible from the hardstand area.	✓	This will be included within the final design.
m) Signage indicating 'FIRE WATER' and the tank capacity must be fixed to each tank.	✓	The tank will be clearly signed FIRE WATER.

n) Signage must be provided at each vehicle entrance to the facility, indicating the direction to the nearest static water tank (s).	✓	Signage will be provided at all property entrances that indicate the location of the closest static water supply.
BATTERY ENERGY STORAGE SYSTEMS (CENTRALISED)		
1) For facilities with battery energy storage systems, the fire protection system must include as a minimum:		
a) Where reticulated water is available, a fire hydrant system that meets the requirements of <i>AS2419.1-2021: Fire hydrant installations</i> , Section 3.9: Open Yard Protection, and Table 2.2.5(D): Number of Fire Hydrant Outlets Required to Flow Simultaneously - Open Yards. <i>Except, that fire hydrants must be provided and located so that every part of the battery energy storage system is within reach of a 10m hose stream issuing from a nozzle at the end of a 60m length of hose connected to a fire hydrant outlet.</i>	N/A	Reticulated water will not be utilised at the property, thus this requirement will not be implemented.
Or		
b) Where no reticulated water is available, a fire water supply in static storage tanks, where:		
i. The fire water supply must be of a quantity no less than 288,000L or as per the provisions of <i>AS2419.1-2021: Fire hydrant installations</i> , 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 developer commits that the fire water supply will be of a quantity no less than 288,000L or as per the provisions of <i>AS2419.1-2021: Fire hydrant installations</i> , Table 2.2.5(D) for open yards flowing for a period of no less than four hours at 20L/s (as calculated by a fire engineer), whichever is the greater.
ii. The quantity of static fire water storage is to be calculated from the number of hydrants required to flow from <i>AS 2419.1-2021: Fire hydrant installations</i> , Table 2.2.5(D). <i>(E.g., For battery installations with an aggregate area of over 27,000m², 4 hydrant outlets are required to operate at 10L/s for four hours, which equates to a minimum static water supply of 576kL.)</i>	✓	As above.
iii. Fire hydrants must be provided and located so that every part of the battery energy storage system is within reach of a 10m hose stream issuing from a nozzle at the end of a 60m length of hose connected to a fire hydrant outlet.	✓	This will be included in the final design.
iv. The fire water supply must be located at vehicle entrances to the facility, at least 10m from any infrastructure (electrical substations, inverters, battery energy storage systems, buildings).	✓	This will be included in the final design.

**ADVERTISED
PLAN**

v. The fire water supply must be reasonably adjacent to the battery energy storage system and shall be accessible without undue danger in an emergency. (E.g., Fire water tanks are to be located closer to the site entrance than the battery energy storage system).	✓	This will be included in the final design.
vi. The fire water supply must comply with AS2419.1-2021: Fire hydrant installations, Section 5: Water storage tanks.	✓	This requirement will be met as part of compliance with the AS2419.1-2021 Fire Hydrant Installation design.

SECTION 4.2.3 FIRE DETECTION AND SUPPRESSION EQUIPMENT

All facilities

Suitable fire detection and suppression equipment must be provided:

a) For on-site buildings and structures, according to the requirements of the National Construction Code.	✓	All buildings, where relevant, will comply with the requirements of the National Construction Code.
b) For storages of dangerous goods, according to the requirements of any Australian Standards for storing and handling of dangerous goods.	✓	All dangerous goods will be stored and handled appropriately and in accordance with the relevant Australian Standards and Material Safety Data Sheets (MSDS).
c) For electrical installations, a minimum of two (2) suitable fire extinguishers must be provided within 3-20m of each [Power Distribution Unit] PCU.	✓	Fire extinguishers will be located as per the model requirements.
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.	✓	This will be complied with and has been addressed within the Fire Management Plan.

SECTION 4.2.5 – FIRE BREAKS

A fire break must be established and maintained around:

a) The perimeter of the facility, commencing from the boundary of the facility or from the vegetation screening inside the property boundary.	✓	A minimum 10m wide fire break will be provided around the full perimeter of the facility. Where acoustic walls are present, the fire break starts from the electrical infrastructure, not the acoustic wall. This perimeter fire break will be further supported by an additional minimum 9m of managed grasslands <100mm height all year round to achieve the minimum 19m wide separation distance required by the facility to provide appropriate separation distances as so radiant heat flux does not exceed 12.5Kw/m². The 9m of managed grasslands will be managed through a coordinated maintenance program by the Site Manager. Refer to Figure 8 of this report.
---	---	---

**ADVERTISED
PLAN**

b) The perimeter of control rooms, electricity compounds, substations and all other buildings onsite. <i>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.</i> ADVERTISED PLAN	✓	A minimum 10m wide fire break will be provided around the full perimeter of the facility. Where acoustic walls are present, the fire break starts from the electrical infrastructure, not the acoustic wall. This perimeter fire break will be further supported by an additional minimum 9m of managed grasslands <100mm height all year round to achieve the minimum 19m wide separation distance required by the facility to provide appropriate separation distances as so radiant heat flux does not exceed 12.5Kw/m². The 9m of managed grasslands will be managed through a coordinated maintenance program by the Site Manager. Refer to Figure 8 of this report.
BATTERY ENERGY STORAGE SYSTEMS		
A fire break must be established and maintained around battery energy storage systems and related infrastructure.	✓	The design includes this requirement via an integrated access road and fire break site layout.
SECTION 4.2.6 – DESIGN SPECIFIC TO FACILITY TYPE		
BATTERY ENERGY STORAGE SYSTEMS		
1) The design of the facility must incorporate:		
a) A separation distance that prevents fire spread between battery containers/enclosures and: • Other battery containers/enclosures. • On-site buildings. • Substations. • The site boundary. • Any other site buildings. • Vegetation. <i>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.</i>	✓	The battery systems proposed for this Project have been through UL9540A⁵ testing and the outcomes of this testing has determined the appropriate separation distances required during installation and operation. The developer commits to having a minimum 3m between BESS on the module access door side/s. The supplier has also tested the battery systems in a large scale fire test and this data has also informed the layout design of the site.
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.	✓	A minimum 10m wide fire break will be provided around the full perimeter of the facility. Where acoustic walls are present, the fire break starts from the electrical infrastructure, not the acoustic wall. This perimeter fire break will be further supported by an additional minimum 9m of

⁵ UL9540A - Standard for Test Method for Evaluating Thermal Runaway Fire Propagation in Battery Energy Storage Systems is specified by the CFA Guideline as the minimum test requirement for large scale battery systems.

<i>Fire breaks must be non-combustible, constructed of concrete, mineral earth or non-combustible mulch such as crushed rock.</i> <i>The width must be calculated based on the ignition source being radiant heat of surrounding vegetation, including landscaping.</i>		managed grasslands <100mm height all year round to achieve the minimum 19m wide separation distance required by the facility to provide appropriate separation distances as so radiant heat flux does not exceed 12.5Kw/m². The 9m of managed grasslands will be managed through a coordinated maintenance program by the Site Manager. Refer to Figure 8 of this report.
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 offsite infrastructure.	✓	The primary and secondary access points will be created from Frasers Lane passing through the proposed Frasers Solar Farm to the north of the Project site. Emergency responders will have a number of options available to them if access is required due to either a fire on the property or threatening the property. The Project site is located on farmland away from residential areas, and BESS location is greater than 500m outside of the BMO.
2) Battery energy storage systems must be:		
a) Located to be reasonably adjacent to a site vehicle entrance (suitable for emergency vehicles). ADVERTISED PLAN	✓	The BESS area will be provided with common primary and secondary access points. These entrance points allow firefighters to determine the safest access option depending on the wind direction or if the wind direction changes during an event. In the event primary access to the BESS is compromised, access via the secondary access point could be utilised. The design and layout has considered the potential for fires and how they may spread through either the BESS areas.
b) Located so that the site entrance and any fire water tanks are not aligned to the prevailing wind direction (therefore least likely to be impacted by smoke in the event of fire at the battery energy storage system.)	✓	The water capacity has been distributed across the site, and will be connected via underground piping to enable drafting of water from multiple areas across the site. This will allow firefighters to position appliances in various locations based on the prevailing wind.
c) Provided with in-built detection and suppression systems. Where these systems are not provided, measures to effectively detect and/or suppress fires within containers must be detailed within the Risk Management Plan.	✓	The BESS is provided with a fire safety system that incorporates the following: • Gas detection • Smoke detection • Heat detection
d) Provided with explosion prevention via sensing and venting, or explosion mitigation through deflagration panels.	✓	A venting system is installed as standard on each BESS.

e) Provided with suitable ember protection to prevent embers from penetrating battery containers/enclosures.	✓	The IP rating⁶ for this Unit (IP55) should ensure the chance of embers entering the unit is unlikely, noting the resistance rating provides for 'dust-protected' and 'protected against water jets' for the battery components only. The battery containers will be fitted with screens to prevent birds, insects and dust entering the container. Housekeeping will be an ongoing task at the site and during the fire danger period, any vegetation against the base of the containers and on horizontal surfaces will be removed. It is unlikely that an ember will be able to penetrate the unit. If an ember does penetrate, the low temperatures that are maintained within the unit will likely extinguish the ember before it is able to ignite any combustibles. The final defense is the detection system that will activate if the ember is able to cause a fire internally within the unit. This activation will also alert the monitoring centre.
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.	✓	The design includes this requirement. Driveway access is provided that allows access and parking east of the O&M building. During construction, parking will be in a separate designated carpark with the construction site offices in the northwestern corner of the Project site, outside of the BMO.
g) Installed on a non-combustible surface such as concrete.	✓	The battery area and supporting infrastructure are being built on non-combustible surfaces.
h) Provided with adequate ventilation.	✓	The batteries are stored with sufficient ventilation around and between the pack of containers and conform with the manufacturer's specifications.
i) Provided with impact protection to at least the equivalent of a W guardrail-type barrier, to prevent mechanical damage to battery containers/enclosures.	✓	This will be incorporated in the final design. A site safety policy will be developed that includes requiring vehicles to use site accessways, reversing protocols (e.g., large vehicles requiring a spotter), speed controls and other measures where appropriate.

ADVERTISED PLAN

⁶ The Ingress Protection Code (IP Code) indicates how well a device is protected against water and dust. It is defined by the International Electrotechnical Commission (IEC) under the international standard IEC 60529 which classifies and provides a guideline to the degree of protection provided by mechanical casings and electrical enclosures against intrusion, dust, accidental contact, and water.

j) Provided with enclosed wiring and buried cabling, except where required to be above-ground for grid connection.	✓	This has been included within the design.
k) Provided with spill containment that includes provision for management of fire water runoff.	✓	The site layout provides for one firefighting water containment area on the eastern side of the Project site (Figure 1). This location is able to contain the full quantity of firefighting water held on site along with additional capacity to buffer in case of minor rainfall events. Procedures will be included within the Emergency Management Plan, along with contact details for companies that can respond and commence the disposal of contaminated water if required.
SECTION 5– FACILITY CONSTRUCTION AND COMMISSIONING		
SECTION 5.1.4 – EMERGENCY MANAGEMENT		
An Emergency Plan must be developed for the construction and commissioning phase, before development starts.	✓	An Emergency Management Plan will be developed for the construction, commissioning and operational project phases prior to construction commencing.
SECTION 6 – FACILITY OPERATION		
SECTION 6.1 –FIRE MANAGEMENT PLAN		
A Fire Management Plan must be developed for the facility, in consultation with CFA, before development starts.	✓	A Fire Management Plan is included with this document. The Site Manager is responsible for ensuring the Fire Management Plan is reviewed and updated at a minimum every three years, in line with any reviews and changes to hazards and risk management as per the Risk Management Plan, and where there is a near-miss or incident at the facility.
SECTION 6.2.1 –FIRE HAZARDS AND RISK CONTROLS		
If your facility is at-risk of bushfire, prevention and preparedness activities must be detailed in the Fire Management Plan.	✓	This has been included within the Fire Management Plan.
SECTION 6.2.2–VEGETATION MANAGEMENT		
Facility operators must undertake the following measures during the Fire Danger Period:		
a) Grass must be maintained at or below 100mm in height during the declared Fire Danger Period.	✓	This requirement has been included within the Fire Management Plan.
b) Long grass and/or deep leaf litter must not be present in areas where heavy equipment will be working, during construction or operation.	✓	This requirement has been included within the Fire Management Plan.

**ADVERTISED
PLAN**

c) Restrictions and guidance must be adhered to during the Fire Danger Period, days of high (and above) fire danger and Total Fire Ban days).	✓	This requirement has been included within the Fire Management Plan
SECTION 6.2.4–FACILITY AND SYSTEM MONITORING		
Appropriate monitoring for facility infrastructure must be provided, to ensure that any shorts, faults or equipment failures with the potential to ignite or propagate fire are rapidly identified and controlled. Any fire must be notified to 000 immediately.	✓	The site is monitored 24/7 by onsite and/or remote staff. The Emergency Management Plan will outline the process to notify emergency services if required.
SECTION 6.2.5 – MAINTENANCE		
All Facilities		
Inspection, maintenance and any required repair activities must be conducted for all infrastructure, equipment and vehicles at the facility. Maintenance must be in line with any relevant Australian Standards and the manufacturer's requirements.	✓	This requirement has been included within the Fire Management Plan, including (but not limited to) the requirements of: • Relevant Australian Standards (incl. AS 1851-2012 – Routine service of fire protection systems and equipment) • Manufacturers maintenance and repair documentation
SECTION 7 – EMERGENCY PLANNING		
All facilities		
An Emergency Plan must be developed specific to the facility, in conjunction with CFA, before development starts.	✓	An Emergency Management Plan will be developed prior to construction commencing. A version redacted of confidential information, along with a one-page summary, will also be developed to support wider awareness within local emergency management organisations.
SECTION 8 – PROVISION OF EMERGENCY INFORMATION		
All Facilities		
An Emergency Information Book must be developed and available to emergency responders. Emergency Information Books must be located in Emergency Information Containers, provided at each vehicle entrance the facility.	✓	An Emergency Information Book will be developed and provided at the main entrances prior to construction commencing.

4.3 Treatment summary

Following an assessment against the CFA Guidelines, the following treatments will be provided to manage the risk of fires. The Fire Management Plan will outline the detailed requirements for the provision and maintenance of fire management treatments. The treatments can be summarised as:

1. Access to the site to include full perimeter access including appropriate widths, load limits and vegetative clearances per the CFA Guidelines.

**ADVERTISED
PLAN**

2. A minimum 10m wide fire break will be provided around the full perimeter of the facility. Where acoustic walls are present, the fire break starts from the electrical infrastructure, not the acoustic wall.

This perimeter fire break will be further supported by an additional minimum 9m of managed grasslands <100mm height all year round to achieve the minimum 19m wide separation distance required by the facility to provide appropriate separation distances as so radiant heat flux does not exceed 12.5Kw/m².

3. Multiple static water supplies (above ground tanks) to service the BESS development, along with an AS2419.1:2021 compliant fire hydrant system.
4. BESS units compliant with UL9540A.
5. Fire detection systems installed within the battery units.
6. Fire Management Plan.
7. Emergency Management Plan, incl. version redacted of confidential information.
8. Emergency Information Books located within Emergency Information Containers.

Note: the above is a summary only. Compliance should be checked against the Table 5 requirements.

4.4 Acoustic walls

It is understood the developer conducted a noise assessment of the Project. The output of the noise assessment identified the requirement for acoustic walls only on the southern and western sides of the Project (T. Osman, personal communication, March 22, 2026).

The Project includes acoustic walls on the southern and western sides of the BESS (Figure 1).

In most cases, a planning condition is imposed on developments that requires sites with acoustic barriers on two or more sides of a development to undertake smoke, plume and/or consequence modelling.

Given acoustic walls are proposed on two sides of the Project, it is safe to assume that this planning condition can be expected. South Energy should allow for smoke, plume and/or consequence modelling to be undertaken post-planning approval as a planning condition.

It is understood the next iteration of the *CFA Guidelines and Model Requirements for Renewable Energy Facilities* will outline these expectations in further detail, at time of FRMP preparation, this requirement becomes known through consultation with CFA on individual projects then formalised through the FRMP and planning condition processes.

4.4.1 Location of fire breaks in relation to acoustic walls

A minimum 10m wide fire break will be provided around the full perimeter of the facility. Where acoustic walls are present, the fire break starts from the electrical infrastructure, not the acoustic wall.

This perimeter fire break will be further supported by an additional minimum 9m of managed grasslands <100mm height all year round to achieve the minimum 19m wide separation distance required by the facility to provide appropriate separation distances as so radiant heat flux does not exceed 12.5Kw/m².

Refer to Figure 8 of this report. If the acoustic walls are to be fire rated in accordance with the National Construction Code (NCC) and tested to *AS 1530.4:2014 Methods for fire tests on building materials, components and structures, Part 4: Fire-resistance tests for elements of construction*, firebreak distances on the eastern, southern, and western sides of the BESS may be adjusted accordingly.

**ADVERTISED
PLAN**

5 Risk Assessment

This risk assessment has been developed to meet the requirements of Section 3.3 of the CFA Guidelines. Section 3.3 of the CFA Guidelines is summarised within Section 4.2 of this report.

5.1 Introduction

The risk assessment process involves identifying, analysing, evaluating and treating the identified risks. The overall risk assessment process requires a consistent approach and follows *AS ISO 31000:2018 Risk management – Guidelines* as incorporated into the National Emergency Risk Assessment Guidelines (NERAG). Figure 9 provides an overview of the risk assessment process as outlined within *AS ISO 31000:2018 Risk Management – Guidelines*.

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

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

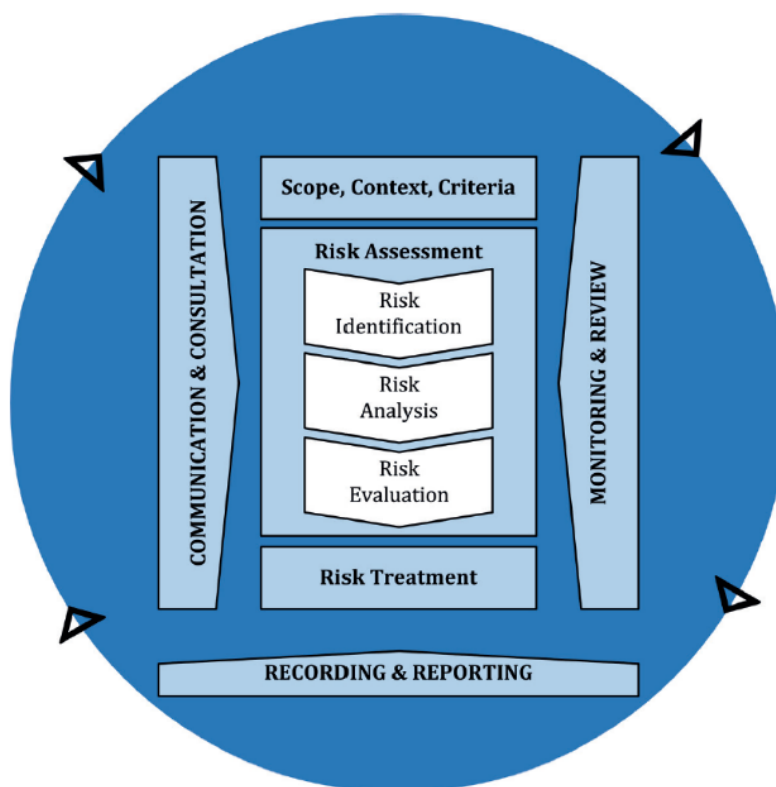


Figure 9: Overview of AS/NZS ISO 31000-2018 risk management process

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

**ADVERTISED
PLAN**

5.2 Context

The assessment of fire risk is a key requirement imposed on the development by CFA through the approvals phase. The CFA Guidelines outline the types of hazards that may need to be considered in relation to BESS infrastructure design, construction, commissioning and operational phases.

5.3 Analysis of fire risk

BESS infrastructure is largely acknowledged as having limited potential to cause fires. Fires have occurred previously and where possible these have been considered during the assessment of risk outlined in this report. The occurrence of fires in large scale battery packs is not common. However, infrequently fires have occurred and these are usually contained to a single battery pack. The range of sensors that are fitted to the systems will in most cases enable an early shut down that will prevent thermal runaway from occurring.

It is important the assessment of risk considers the key phases of the Project being the construction, commissioning and operational phases.

5.3.1 Assessment of fire risk during construction

The construction phase includes various stages including site works, underground infrastructure, construction of footings and the installation of the battery units. This stage also includes the installation and commissioning of the battery units and other systems including fire protection systems. This stage also ensures relevant connectivity is installed (i.e. SCADA) to ensure that all alerts and system messages are transmitted to an appropriate monitoring location.

A fire that occurred at the Victorian Big Battery⁷ installation on the outskirts of Geelong has been assessed and reports are available that outline what occurred and how system manufacturers and installers could mitigate risks in future constructions. This fire occurred during the commissioning phase of the particular unit. In summary, the isolation of the unit whilst it contained a charge was considered an incorrect process⁸.

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

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

The report outlines the contributory factors and the lessons learned to prevent a reoccurrence. Energy Safe Victoria provided approval to recommence commissioning at the Victorian Big Battery providing the measures outlined were in place. The report states that the affected BESS failed safely despite total loss.

The report states that the BESS Manufacturer is investigating why the second BESS was lost and what they could do to prevent this from occurring in the future. The BESS Manufacturer has altered the design of their BESS to limit the potential for fire spread to occur.

5.3.2 Assessment of fire risk during operations

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

**ADVERTISED
PLAN**

⁷ <https://victorianbigbattery.com.au/wp-content/uploads/2022/01/VBB-Fire-Independent-Report-of-Technical-Findings.pdf>

⁸ https://www.energysafe.vic.gov.au/sites/default/files/2022-12/VBB_StatementOfFindings_FINAL_28Sep2021.pdf

maintenance of infrastructure and the overall development is critical to ensure the ongoing management of fire risk.

All the system components are to be considered as critical as they all contribute to the ongoing safe operations of the facility. The system components including monitoring connectivity, fire protection systems, vegetation management, site access controls, battery safety systems and other safety systems.

The BESS manufacturing industry moving from the use of 'Lithium nickel manganese cobalt oxide' (NMC) to 'Lithium iron phosphate' (LFP) materials is likely to see a reduction in large BESS fires. As outlined within the UL9540A testing (refer to provided reports), it is difficult to cause a LFP battery to undergo thermal runaway.

5.4 Risk identification

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

Table 6 - Hazard identification and description

Hazard	Description
Electrical hazards causing a fire	Electrical faults and/or hazards can be a key cause of fire in BESS infrastructure. Hazards including battery faults, overcharging, rapid discharge, loss of remote monitoring systems, internal short circuits and overheating.
Fire causing spread to adjoining infrastructure on the property	A fire that has started in a single battery unit may spread to adjoining batteries, facilities or other infrastructure. Rapid escalation of the fire size and complexity can create issues for onsite staff and contractors, firefighters and the community.
Fire causing offsite impacts	Any fire on the property that is able to spread to adjoining properties most likely through vegetation connectivity, on bushfire risk days can start fires in the surrounding landscape that can threaten the community.
Offsite fire impacting on the site	A bushfire burning through the surrounding landscape can enter the property and threaten the infrastructure by potentially starting new fires.
Fire water runoff	In the event of a fire, firefighters will respond and use water to either extinguish or cool the surrounding area until the infrastructure is deemed safe.
Dangerous Goods exposure	The dangerous goods that are stored within the BESS and associated infrastructure may leak and either ignite or require clean up by either on site staff, contractors or firefighters.
Injury to staff and firefighters	The response to a fire by staff, contractors or firefighters can be dangerous due to the various safety hazards associated with a fire in this type of infrastructure.
Off gassing and smoke impacting on staff, contractors and firefighters	In the event a lithium-ion battery commences off gassing or thermal runaway, there may be an impact on staff, contractors and firefighters.
Lightning strike and arc flash hazards	Lightning strike and arc flash hazards associated with a BESS present a credible ignition source through high-energy electrical discharge. These hazards have the potential to initiate thermal runaway and/or damage critical infrastructure.

Hazards identified in Table 6 will allow the assessment of most hazards that may be encountered in a development of this type.

**ADVERTISED
PLAN**

5.5 Risk analysis

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

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

5.5.1 Likelihood

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

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

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

An assessment of likelihood considers factors such as:

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

Table 7 - Likelihood table

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

**ADVERTISED
PLAN**

5.5.2 Consequence

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

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

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

Table 8 - Risk assessment consequence table

Consequence scale	Description		
	People	Environment	Plant/Equipment
Catastrophic	Multiple fatalities	Permanent widespread ecological damage. Toxic release off-site with detrimental effect. Likely EPA prosecution	Massive widespread equipment damage (i.e. plant/equipment write-off) (\$1M +).
Major	Single fatality or permanent disability	Heavy ecological damage with costly restoration. Off-site release contained with outside assistance and little detrimental impact.	Multiple equipment replacements (\$200 000 - \$1M).
Moderate	Major injuries - Incapacitations or requiring time off work	Major but recoverable ecological damage. On-site release contained with outside assistance.	Equipment level replacement /repair (\$50 000 - \$200 000).
Minor	Significant injuries - Medical treatment, non-permanent injury	Limited but medium term damage. On-site release immediately contained	Component level replacement /repair (\$10 000 - \$50 000).
Insignificant	Slight injuries- First Aid Treatments (cuts/ bruises)	Short term damage. Low financial loss, negligible environmental impact	Slight Damage (< \$10 000).

The risk rating table (Table 9) is used to combine likelihood and consequence to obtain a risk score. The risk score is used to aid decision making by determining which areas are at the greatest risk of a fire starting and spreading through the development. Actions can be prioritised using this method to determine where risk mitigation works should occur.

**ADVERTISED
PLAN**

Table 9 - Risk matrix

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

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

5.5.3 Risk analysis worksheets

The following worksheets have assessed the hazards identified in Section 5.4 and results in a risk classification along with strategies to lower risk if it is deemed required. The initial assessment of risk is based on the information that has been supplied to date. The development of additional strategies to lower risk are made as either there was no information provided that identified the treatment or further clarity is required to be considered.

**ADVERTISED
PLAN**

Table 10 - Risk assessment - Electrical hazards causing a fire

RISK	
Electrical hazards causing a fire	
CAUSE	Electrical faults and/or hazards can be a key cause of fire in BESS infrastructure including battery faults, overcharging, rapid discharge, loss of remote monitoring systems, internal short circuits and overheating. For BESSs, these events may cause thermal runaway.
LIKELIHOOD	Possible (C)
JUSTIFICATION	The occurrence of electrical faults and/or hazards has occurred in the past and are likely to occur again in the future. The likelihood of an electrical fault escalating into an emergency such as a fire is unlikely due to the multiple layers of controls in place including sensors, 24/7 system monitoring and maintenance programs. There are examples of fires within BESS technology that indicates that when faults occur, they can escalate into challenging events including thermal runaway. To offset the likelihood of a fault within the BESS that creates a flammable atmosphere in and around the BESS, escalates to a fire, or a fire that affects adjacent infrastructure, the following mitigation treatments are included: • Cooling systems that maintain the temperature of the battery packs during day-to-day operations. • Safety systems that send alerts to the monitoring centre if a sensor is activated. • Internal barriers within and surrounding the Unit to reduce the possibility of thermal runaway events from spreading to adjoining battery units. • Separation distances between individual Units and rows of Units and other infrastructure in accordance with manufacturer installation guidelines. • The BESS will be installed by qualified and competent people in accordance with the manufacturer's specifications to relevant Australian Standards and including compliance with UL9540A – Energy Storage System Requirements.
CONSEQUENCE	Moderate (3)
JUSTIFICATION	The consequence of an electrical hazard causing a fire in the BESS has been identified as moderate and there are examples of this occurring as outlined previously.
RISK RATING	High (13)
STRATEGY TO LOWER RISK	The early detection of a fault that if not addressed can lead to a fire. Intervention includes shut down, responding a technician or calling the fire brigade. The CFA Guideline requires a range of controls to be implemented and maintained including: • Non-combustible surface that won't support fire spread through vegetation accumulation. • SCADA monitoring system that will send alerts to the monitoring centre. • Compliance with UL9540A. • Appropriate separation between battery containers and other infrastructure. • Smoke detection system connected to a Fire Indicator Panel that will alert the monitoring centre. • The implementation of the controls outlined above will support the prevention of faults from escalating into fires and if a fire does occur, limit the ability for the fire to spread into an adjoining Unit.
RESIDUAL RISK	Moderate (8) based on a likelihood of 'Possible (C)' and a consequence of 'Minor (2)'

Table 11 - Risk assessment - Fire causing spread to adjoining infrastructure on the property

RISK	Fire causing spread to adjoining infrastructure on the property
CAUSE	A fire that has started within a component within the BESS may spread to adjoining BESS components or other infrastructure within the Project site. Rapid escalation of the fire size and complexity can create issues for on site staff and contractors, firefighters and the community.
LIKELIHOOD	Unlikely (D)
JUSTIFICATION	The installed monitoring systems will send alerts to the monitoring station. These include smoke detection system and the day-to-day monitoring system that will trigger an immediate response if alerted. The battery system is provided with a detailed operating manual that outlines the likely cause of an alert and how the operators are to respond. The site procedures will include a provision that ensures all alerts are addressed within two hours of activation. This will also include an immediate response to any smoke detector activation. Upon activation of the fire protection systems, the monitoring centre will determine an appropriate response that may include: • Notify the on-call technician to attend the site. • Call 000 and report the activation to the fire brigade in addition to notifying the on call technician to attend. The battery system enclosure is non combustible and will provide a level of protection if a fire does occur inside the enclosure. If a fire occurs in an adjoining area of the site, the same enclosures will provide a level of protection. Most of the infrastructure that supports the BESS is non combustible or has low quantities of combustible materials. There are a small number of fire events within BESS technology where a fire has spread to an adjoining battery. The layout design incorporates spaces that will reduce the risk of fire spread occurring.
CONSEQUENCE	Moderate (3)
JUSTIFICATION	The consequence of a fire spreading between components within the BESS or between the BESS and adjoining infrastructure is likely to be minor. The various protection systems, separation between the infrastructure and early notifications and other treatments will ensure that early intervention can occur. The separation between the components of the BESS and the infrastructure has been designed in accordance with the Manufacturer specifications and the CFA Guideline. There is sufficient space provided surrounding the BESS area to enable access for firefighters and technicians. The firefighting water supply will enable firefighters to protect exposures for the duration of the fire event. The layout design is in accordance with the manufacturers specifications which ensures there is suitable separation being provided from Unit to Unit and Unit to other infrastructure.
RISK RATING	High (12)
STRATEGY TO LOWER RISK	The provision of additional controls as required by the CFA Guidelines and the outcome of this assessment will reduce the risk of a fire spreading to other infrastructure. The requirements outlined within the response to the CFA Guidelines will be sufficient to ensure the risk is managed at an acceptable level. Other strategies outlined within the response to the CFA Guidelines that will also assist with managing the risk includes:

**ADVERTISED
PLAN**

	• Development of Emergency Management Plan that includes in addition to that required by the CFA Guidelines: ○ A system to communicate effectively between the monitoring centre and the onsite staff and contractors. ○ Provision of 24/7 contact details for the fire brigade to contact in the event of an emergency or threat of an emergency. • Developing a procedure that requires a technician to be deployed to the site when the site monitoring communications are down.
RESIDUAL RISK	Low (7) based on a likelihood of 'Unlikely (D)' and a consequence of 'Minor (2)'

**ADVERTISED
PLAN**

Table 12 - Risk assessment - Fire causing offsite impacts

RISK		Fire causing offsite impacts
CAUSE		Any fire on the property can spread to adjoining properties. This would most likely be through vegetation connectivity. If this occurs on an elevated fire danger day, the fire could spread into adjoining properties.
LIKELIHOOD		Possible (C)
JUSTIFICATION		The likelihood and consequence of a fire occurring within the BESS area is outlined within Table 7, 8 and 9. In addition to this, the compliance with the CFA Guidelines also requires mitigation strategies implemented including: • Non-combustible surface under the battery containers and other infrastructure. • Provision of a fire break and additional managed areas between the fire break and the boundary fence. • The battery systems are contained within the metal cabinets, and any fire activity will likely stay within the cabinets. • The requirement for a Fire Management Plan and Emergency Management Plan that will include prevention and preparedness activities that must occur annually prior to the fire danger period. • The Fire Management Plan will also provide clear direction on the maintenance of the various controls required to manage the fire risk.
CONSEQUENCE		Moderate (3)
JUSTIFICATION		The Assessment against the Planning Scheme outlines the possible bushfire risk associated with the site and the surrounding landscape. There are reduced dwellings and other infrastructure in the immediate surrounding area. The nearest township is Toongabbie township (approx. 2km north).
RISK RATING		High (13)
STRATEGY TO LOWER RISK		The site Emergency Management Plan will include a procedure for managing elevated fuel loads if the vegetation on adjoining properties becomes a fire risk. The local Council may assist in engaging with the relevant property owners to manage the fire risk. Any vegetation growth on the property will be managed and removed and this will be outlined within the Fire Management Plan. During the fire danger period, additional inspections will occur to ensure that all weeds and other vegetation is removed from the fire break and other areas. The site operators will enact standard Occupational Health and Safety (OHS) policies and procedures including hot works, use of naked flames on the property, smoking management, induction of new staff and contractors and contractor management. The induction procedure will include a requirement to ensure people are aware of their obligations of not creating fire risks during their day to day activities. All plant and heavy equipment is to carry at least a 9-litre water stored-pressure fire extinguisher with a minimum rating of 3A, or firefighting equipment as a minimum when on-site during the Fire Danger Period.
RESIDUAL RISK		High (12) based on a likelihood of 'Unlikely (D)' and a consequence of 'Moderate (3)'

**ADVERTISED
PLAN**

Table 13 - Risk assessment - Offsite fire impacting on the site

RISK		Offsite fire impacting on the site
CAUSE		A bushfire burning through the surrounding landscape can enter the property and threaten the infrastructure by potentially starting new fires through ember attack, radiant heat or flame contact.
LIKELIHOOD		Possible (C)
JUSTIFICATION		The assessment within Section 4.1.2 has identified the potential for bushfires to travel long distances from either the north-west or south-west. The site layout includes fire breaks and managed areas that will limit the ability for a bushfire to burn on the Project site. The Fire Management Plan will outline the management arrangements and the maintenance requirements. The ongoing removal of vegetation in and around the BESS will limit the presence of combustible materials close to the infrastructure. The design of the Battery Units will prevent embers from entering them. The Units are designed to prevent dust, insects and birds from entering. The Units are also fitted with internal climate control systems that will result in the embers likely self-extinguishing due to the cool temperatures.
CONSEQUENCE		Minor (2)
JUSTIFICATION		Due to the primary vegetation in the surrounding landscape being grassed areas associated with farming activities, the ability for a bushfire to generate sufficient radiant heat to affect the Project site is unlikely. The requirements to maintain and manage the onsite vegetation will ensure that fire spread onto the Project site will be limited. It is unlikely for flame contact to impact on the BESS from a bushfire from the surrounding landscape due to the vegetation management programs within the Project site.
RISK RATING		Moderate (8)
STRATEGY TO LOWER RISK		Within the Emergency Management Plan ensure the following is included: - When elevated fire danger conditions are forecast, ensure all vegetation maintenance activities have occurred. - During elevated fire danger conditions, only undertake critical maintenance and other activities on the property. All plant and heavy equipment is to carry at least a 9-litre water stored-pressure fire extinguisher with a minimum rating of 3A, or firefighting equipment as a minimum when on-site during the Fire Danger Period.
RESIDUAL RISK		Low (7) based on a likelihood of 'Unlikely (D)' and a consequence of 'Minor (2)'

**ADVERTISED
PLAN**

Table 14 - Risk assessment - Dangerous Goods

RISK	Dangerous Goods exposure
CAUSE	A Dangerous Goods leak occurring that may cause a threat to people, the environment or be involved in a fire.
LIKELIHOOD	Unlikely (D)
JUSTIFICATION	Dangerous goods are located within the battery Units. The Dangerous Goods are installed within the infrastructure during the manufacturing process. This means that Dangerous Goods are contained and sealed and not readily accessible at the site. Following transportation to the Project site, any infrastructure with Dangerous Goods will be inspected to ensure it has not been damaged during transportation. If infrastructure with Dangerous Goods is to be stored at site prior to installation, it will be stored in line with manufacturer's specifications to ensure its integrity. Infrastructure will be installed in line with manufacturer's specifications (including inspection and testing). Together, these measures will prevent the likelihood of leaks outside the BESS site. The design of the BESS including the installation of bollards around the perimeter of the BESS will prevent vehicles from impacting the infrastructure and potentially causing a leak. The products classified as a Dangerous Good located within the BESS and other infrastructure will be listed within the Site's Dangerous Goods register and the site operators will be aware of the locations and quantities of Dangerous Goods. Maintenance programs will be enacted to ensure all infrastructure that contains Dangerous Goods within the BESS will be maintained in accordance with the manufacturer's specifications and the relevant Australian Standards. This will include checking for physical and electrical faults that could result in leaks. Due to the manufacturing and installation procedures, the potential for a Dangerous Good incident to occur is unlikely.
CONSEQUENCE	Moderate (3)
JUSTIFICATION	The largest quantity of Dangerous Goods will be the Lithium Ion (Class 9). Other Dangerous Goods may include refrigerant and oils. These will be assessed when the final design has been endorsed. The Dangerous Goods referred above, are stored in separate components within the infrastructure (Units), or in separate infrastructure (Transformers, Inverters, etc). It is therefore unlikely for the total quantities of Dangerous Goods on the site to be involved in an incident at the site at the same time. There are other goods that may be utilised and stored on the site, but it would be expected that these would be in small quantities and will be associated with maintenance and operational requirements.
RISK RATING	High (12)
STRATEGY TO LOWER RISK	The fire service will be aware of the presence of Dangerous Goods in relation to the Proposal. Further consultation with CFA to confirm the outcomes of this assessment will occur prior to construction and will be ongoing throughout the life of the proposal. The Emergency Management Plan will include details of the hazards associated with dangerous goods and appropriate procedures in response to this FRMP, including leak management and other response arrangements to Dangerous Goods related emergencies.
RESIDUAL RISK	Moderate (11) based on a likelihood of 'Rare (E)' and a consequence of 'Moderate (3)'

**ADVERTISED
PLAN**

Table 15 - Risk assessment - Fire water runoff

RISK		Fire water runoff
CAUSE		In the event of a fire, firefighters will respond and use water to either extinguish or cool the surrounding area until the infrastructure is deemed safe.
LIKELIHOOD		Unlikely (D)
JUSTIFICATION		As outlined in previous assessments, the risk of a large fire is very low and unlikely. This is due to the separation between various areas of the BESS and the extensive use of non-combustible materials. The smoke and gas detection system that is monitored 24/7 will also alert technicians and if required, the fire brigade to the site early. If a fire occurs, it will likely be contained to a single Unit. The use of firefighting water may be used to cool the adjoining areas and will be considered largely clean as it has not been exposed to the fire or smoke. The site is mainly flat and will not support fire water to leave the property easily. The provided landscaping and stormwater system design will support the containment of fire water runoff.
CONSEQUENCE		Minor (2)
JUSTIFICATION		The site will be provided with a facility to capture fire water runoff within the stormwater system. This water will be contained until testing can occur and then in conjunction with EPA determine the most effective disposal method. The Emergency Management Plan will include procedures to capture fire water and then if required, disposal arrangements off site/
RISK RATING		Low (7)
STRATEGY TO LOWER RISK		Onsite and remote staff will be trained in the fire water runoff management procedures and operation of the stormwater diversion valves. They will then be available to assist firefighters with managing fire water runoff. The requirement to regularly check the fire water runoff retention basin will be contained within the Fire Management Plan.
RESIDUAL RISK		Low (6) based on a likelihood of 'Rare (E)' and a consequence of 'Minor (2)'

**ADVERTISED
PLAN**

Table 16 - Risk assessment – Staff and firefighters

RISK		Injury to staff and firefighters
CAUSE		The response to a fire by staff, contractors or firefighters can be dangerous due to the various safety hazards associated with a fire in this type of infrastructure.
LIKELIHOOD		Possible (C)
JUSTIFICATION		There is the potential for firefighters and/or staff and contractors to be present during an emergency event and not being familiar with the site. The CFA Guidelines does impose a variety of controls onto the management of the site through the Emergency Management Plan and how CFA interacts with the site if they are called to a fire. The potential for a fire to occur whilst a low risk, if it does occur, there is the potential for a firefighter to arrive who is unfamiliar with property and the technology installed.
CONSEQUENCE		Moderate (3)
JUSTIFICATION		The provision of an Emergency Information Container that will include the Emergency Management Plan, site plans and contact details for technical specialists will ensure responding firefighters seek information prior to entering the property. The layout of the site will ensure that firefighters will only access the site through the main entrances which is where the Emergency Information Container is located.
RISK RATING		High (13)
STRATEGY TO LOWER RISK		The arrangements for monitoring the SCADA system through the monitoring centre will ensure that an informed decision can be made following an assessment of the alerts being received. In all cases a technician will be dispatched to the site to review the alert at the BESS. The Emergency Management Plan will include a requirement to engage with the responding firefighters early to ensure they are aware that a technician is on their way and that entry to the site can wait until they arrive unless there is a life or property protection emergency. The Emergency Information Container that is required by the CFA Guidelines will provide detailed contact information for responding firefighters to seek specialist advice prior to accessing the property.
RESIDUAL RISK		Moderate (8) based on a likelihood of 'Possible (C)' and a consequence of 'Minor (2)'

**ADVERTISED
PLAN**

Table 17 - Risk assessment - Off gassing and smoke impacts

RISK		Off gassing and smoke impacting on staff, contractors and firefighters.
CAUSE	In the event of thermal runaway occurring, the lithium ion will cause the production of various gases (referred to as off gassing). The gasses include various flammable products that if ignited, will also cause the production of smoke. <i>Note: the definition of thermal runaway as provided by United Laboratories is:</i> <i>Thermal runaway is one of the primary risks related to lithium-ion batteries. It is a phenomenon in which the lithium-ion cell enters an uncontrollable, self-heating state.⁹</i>	
LIKELIHOOD	Unlikely (D)	
JUSTIFICATION	For off gassing and smoke to impact on staff, contractors and firefighters, there needs to be a thermal runaway event. Whilst there is history of these events occurring in large scale battery systems, compared to the total number of systems installed, they are considered an unlikely event. Due to the remoteness of the BESS facility to residential areas, the likelihood of any off gassing and smoke impacting on these locations is considered unlikely. The likelihood of any impact on staff, contractors and firefighters is considered unlikely due to the following: • All staff and contractors will participate in induction programs that will include the response to various emergencies including thermal runaway. • Firefighters will have access to the Emergency Information Book and have established contact with the Monitoring Centre before entering the site. The on-site Control Room will also have access to data from the various sensors, the smoke detection system and CCTV footage. • All staff, contractors and firefighters will have information supplied prior to any decision being made in relation to next steps. • A Technician will be deployed to the site immediately following alerts being received by the Control Room. If firefighters are deployed to the site prior to the Technician arriving, it will be advised within the Emergency Information Book for firefighters not enter the site until the Technician arrives.	
CONSEQUENCE	Moderate (3)	
JUSTIFICATION	The testing completed as per the requirements of UL9540 and in accordance with UL9540A outlines the products that are generated during the off gassing and smoke phases of thermal runaway. The products of off gassing and combustion are consistent with those that are emitted from car and house fires. As the likelihood assessment indicates that staff, contractors and firefighters will have early notification of a thermal runaway event, the ability for a person to be unknowingly exposed to the products relating to off gassing and smoke are considered low. Therefore, the potential impact on a person is considered of moderate consequence. The size of the development will allow multiple opportunities to position staff, contractors and firefighters up wind of a Unit that has gone into thermal runaway.	
RISK RATING	High (12)	

**ADVERTISED
PLAN**

⁹<https://ul.org/research/electrochemical-safety/getting-started-electrochemical-safety/what-thermal-runaway>

STRATEGY TO LOWER RISK	The layout and design of the BESS facility includes the following risk reducing measures: • The Units are monitored through a SCADA system that provides the Control Room with access to numerous sensors and alerts to indicate thermal runaway triggering situations. The SCADA system also provides the Control Room the opportunity to intervene and commence shut down procedures remotely to prevent a thermal runaway event. • Detection system provides early notification of the event and is connected to the Control Room through a Fire Detection Control and Indicating Equipment (FDCIE). • The site procedures and Emergency Management Plan will require a Technician to be deployed to the site as soon as the monitoring systems are interrupted or fail, and the Control Room can't monitor the site. • The provision of an Emergency Information Book that will be utilised by firefighters prior to entering the site. The emergency information includes contact information for the Control Room. The Control Room and Emergency Management Plan will provide contact details for firefighters to seek technical expertise.
RESIDUAL RISK	Low (2) based on a likelihood of 'Unlikely (D)' and a consequence of 'Insignificant (1)'

**ADVERTISED
PLAN**

Table 18: Risk assessment – Lightning strike and arc flash hazards

RISK Lightning strike and arc flash hazards	
CAUSE	Lightning strikes may occur as a result of convective storm activity within the region. Lightning strikes can trigger arc flashes, however arc flashes may occur independently. A direct or indirect lightning strike on the BESS has the potential to create high-energy electrical discharge. This may result in an ignition source through initiating thermal runaway and/or damage critical infrastructure.
LIKELIHOOD	Unlikely (D)
JUSTIFICATION	It is understood there are no publicly documented locations where a BESS has been confirmed to be directly struck by lightning and recorded as such in incident reports.
CONSEQUENCE	Major (4)
JUSTIFICATION	While direct lightning strikes to BESS infrastructure are considered credible, it is understood there are no widely documented cases where lightning has been confirmed as the primary cause of a BESS incident; however, lightning-induced electrical surges are recognised as a potential initiating mechanism for system failure. A lightning strike may lead to: • Battery damage – Overvoltage and overheating can degrade battery cells. • System failures – Electrical surges can destroy inverters and control electronics. • Fire hazards – A direct or indirect strike can ignite lithium-ion batteries. • Financial losses – Replacing damaged battery systems is expensive.
RISK RATING	High (15)
STRATEGY TO LOWER RISK	A combination of built-in protection measures and physical separation of BESS units can reduce both the likelihood of ignition and the potential for fire propagation as a direct result of lightning strike and arc flash hazards. Built-in protection mechanisms include: • Earthing and bonding to reduce arc flash potential and manage fault currents. • Surge protection devices (SPDs) to protect sensitive BESS components. • Physical separation and spacing between BESS units to limit fire propagation. • Monitoring and automatic isolation systems to detect faults early and de-energise affected components.
RESIDUAL RISK	High (12) based on a likelihood of 'Unlikely (D)' and a consequence of 'Moderate (3)'

**ADVERTISED
PLAN**

6 Conclusion

The Frasers BESS Project has been assessed using a comprehensive fire risk management and safety framework, incorporating both national standards and site-specific considerations. This Fire Risk Management Plan (FRMP) and Fire Safety Study (FSS) demonstrate that the proposed development meets the requirements of the *CFA Design Guidelines and Model Requirements for Renewable Energy Facilities*.

The risk assessment process assessed potential fire hazards common to the construction, commissioning, and operational phases of BESS projects. In accordance with the risk frameworks outlined in the report, the residual risk profile (post-treatment) is considered to be low to moderate. This outcome reflects the robust design considerations and contemporary technology proposed for the project, including:

- Integrated fire detection and suppression systems within each battery unit;
- Multiple above ground firefighting water storage tanks connected to AS2419.1-2021 compliant fire hydrant systems;
- Minimum 19m perimeter fire breaks;
- Emergency vehicle access compliant with model requirements, including roading specifications to accommodate emergency service vehicle weights up to 15 tonnes;
- A site-specific Fire Management Plan, and Emergency Management Plan; and
- Ongoing maintenance and monitoring protocols aligned with relevant Australian and international standards.

The SUNTERA JKE-5015K-2H-LAA battery units have undergone UL9540A testing, validating their resilience against thermal runaway and fire spread. The site layout, infrastructure and operational procedures have been designed to mitigate the risk of fire to both onsite assets and the surrounding area. The broader landscape is considered to have a normal bushfire risk profile for a grassland dominated, predominantly agricultural area.

The Project is well situated within the landscape to minimize the impact of fires entering or exiting the Project site, with the proposed location and parcels of land having been effectively designed to avoid areas of very high and extreme bushfire hazard, densely populated residential areas and areas of undisturbed land.

This FRMP provides a clear pathway for the safe development and operation of the BESS site, ensuring fire risk is effectively managed throughout the life of the Project. Continued engagement with emergency service organisations, adherence to maintenance schedules, and regular review of emergency procedures will be essential to upholding the required safety standards and maintaining stakeholder confidence.

**ADVERTISED
PLAN**

Appendix A – UL9540A test overview

The UL9540A Standard for Test Method for Evaluating Thermal Runaway Fire Propagation in Battery Energy Storage Systems test is a direct requirement of UL9540 Energy Storage Systems and Equipment and is also utilised to demonstrate compliance with NFPA 855 Standard for the Installation of Stationary Energy Storage Systems.

The UL 9540A test method includes an evaluation of BESS anatomy at four levels: cell, module, unit, and installation. Cell level testing is conducted to determine if further testing is required. Module level testing is required if the following observations are recorded:

- Thermal runaway is induced in the cell; and,
- Composition of vent gases exceed 25% of the LFL for flammable gases.

Module level testing examines the module design, heat release rate, gas generation, external flaming, and flying debris hazards. Unit level testing is required if the following observations are recorded:

- Module design is unable to contain thermal runaway; and,
- Cell vent gas is flammable.

Unit level testing assesses the design of the unit, heat release rate, gas generation and composition, deflagration and flying debris hazards, BESS and wall surface temperatures, heat flux at the target walls, and reignition. The unit level testing is conducted with Battery Management System, fire protection system, and explosion protection systems disabled. The protection provided by these systems are not evaluated during the unit level test. Installation level testing is required if the following observations are recorded during unit level testing:

- Flaming is observed outside the initiating BESS unit.
- Surface temperature of the modules in the adjacent BESS unit exceeds the temperature at which cell level gas venting occurred.
- Surface temperatures of wall surfaces increases more than 207°F (97°C) from ambient; and,
- Explosion hazards are recorded.

Installation level testing is the final level of UL 9540A tests. Installation level testing assesses fire protection system equipment performance in addition to criteria assessed in the unit level test.

The UL 9540A test report and test results is included in Appendix B.

**ADVERTISED
PLAN**

Appendix B – UL9540A test results

	
Certificate of Compliance	
Certificate:	80214635
Master Contract:	303757
Project:	80214635
Date Issued:	2024-11-26
Issued To:	Zhejiang Jinko Energy Storage Co., Ltd. No.8, Xiangxin Road Huangwan Town, Haining City Jiaxing, Zhejiang, 314415 China
Attention: Yao Xiaojing	
<i>The products listed below are eligible to bear the CSA Mark shown with adjacent indicator 'US' for US only.</i>	
	Issued by: Simon Ji <i>Simon Ji</i>
PRODUCTS CLASS - C370385 - BATTERIES Energy Storage System Subassembly - Certified to US Standard Li-ion Battery Energy Storage System Subassembly (Pre-Engineered of Matched Component type), models JKE-3343K-2H-LAA, JKE-3761K-2H-LAA, JKE-4179K-2H-LAA, JKE-4597K-2H-LAA and JKE-5015K-2H-LAA. Refer to following table for component of Pre-Engineered of Matched Component ESS.	
DOD 507 Rev. 2019-04-30 © 2018 CSA Group. All rights reserved. Page 1	

**ADVERTISED
PLAN**



Certificate: 80214635
Project: 80214635

Master Contract: 303757
Date Issued: 2024-11-26

BESS Subassembly					
Model:	JKE-3343K-2H-LAA	JKE-3761K-2H-LAA	JKE-4179K-2H-LAA	JKE-4597K-2H-LAA	JKE-5015K-2H-LAA
Technology Utilized in System	Lithium-ion (LFP)				
Input/Output Rating:					
Voltage, Vdc	Rated 1331.2 (1164.8 to 1497.6)				
Current/(DC1 port+DC2 port), Adc(Maximum continuous)	1552/(776+776)	1746/(970+776)	1940/(1164+776)	2134/(1164+970)	2328/(1164+1164)
Power/(DC1 port+DC2 port), kW	1671.98/(835.99+835.99)	1880.98/(1044.99+835.99)	2089.97/(1253.98+835.99)	2298.97/(1253.98+1044.99)	2507.96(1253.98+1253.98)
Other Rating:					
Auxiliary Voltage, Vac	400				
Auxiliary Current, A	128				
Auxiliary Frequency, Hz	50/60				
Ambient Temperature (°C)	Charge: 0~50 °C, Discharge: -10~50 °C				
Energy output (kWh)	3343	3761	4179	4597	5015
Weight (kg)	31600	34200	36800	39400	42000
Dimension(mm)	W*D*H: 6058x2438x2896				
Quantities of battery system contained (DC1 port, DC2 port)	DC1 port: (416S)4P, DC2 port: (416S)4P	DC1 port: (416S)5P, DC2 port: (416S)4P	DC1 port: (416S)6P, DC2 port: (416S)4P	DC1 port: (416S)6P, DC2 port: (416S)5P	DC1 port: (416S)6P, DC2 port: (416S)6P
Max. overcurrent protective device rating (Amps)	1182A*2				
Special Environmental Ratings and Limitations					
Enclosure Rating	IP55				
Seismic	-				
Suppression System	FK-5-1-12				
Technology Utilized in System	Lithium-ion (LFP)				

Model Difference:

Models JKE-3343K-2H-LAA, JKE-3761K-2H-LAA, JKE-4179K-2H-LAA, JKE-4597K-2H-LAA and JKE-5015K-2H-LAA are identical to each other, except for the quantities of the battery racks.

**ADVERTISED
PLAN**



Certificate: 80214635
Project: 80214635

Master Contract: 303757
Date Issued: 2024-11-26

Conditions of Acceptability:

1. Further evaluation should be considered on end product when the BESS subassembly integrating with the power conversion equipment.
2. The ESS installation was not evaluated. Installation shall be implemented following the subassembly manufacturers' installation manual, national and local codes.
3. ESS was not evaluated for use in specialty environments including: seismically active environments.
4. Based on the test result and condition/method in the UL 9540A report, the acceptability shall be determined by the local AHJ according to the real installation.
5. The Electrical rating for battery system including charging and discharging shall be within the limits of inverters.
6. The short circuit protection device on the inverter DC side shall be able to handle the short circuit current of the battery system.
7. The communication protocols of the inverters shall be considered when matching the battery energy storage subassembly.
8. The compatibility of the environment condition, the pollution degree, overvoltage category shall be considered when interconnecting the BESS with inverter.
9. The enclosure was evaluated only to establish an IP rating of IP55 with the Standard for Degrees of Protection Provided by Enclosure (IP Code) IEC 60529.
10. Product was not evaluated for being used near marine environments. Further evaluation for Resistance of Salt Fog shall be required for the battery system intended to be used in the end product where salt fog condition was applied.
11. The system was intended for outdoor use without arc flash risk considered, further evaluation shall be considered when installing the BESS assembly.

**ADVERTISED
PLAN**



Certificate: 80214635
Project: 80214635

Master Contract: 303757
Date Issued: 2024-11-26

APPLICABLE REQUIREMENTS

ANSI/CAN/UL 9540:2020 Energy Storage Systems and Equipment, Ed 2 with Rev Apr 9, 2021

MARKINGS

See CSA Report

Notes:

Products certified under Class C370385 have been certified under CSA's ISO/IEC 17065 accreditation with the Standards Council of Canada (SCC). www.scc.ca



**ADVERTISED
PLAN**



Supplement to Certificate of Compliance

Certificate: 80214635

Master Contract: 303757

*The products listed, including the latest revision described below,
are eligible to be marked in accordance with the referenced Certificate.*

Product Certification History

Project	Date	Description
80214635	2024-11-26	ANSI/CAN/UL 9540:2020 Ed 2 with Rev Apr 9, 2021 Original Certification for Li-ion Battery Energy Storage System, JKE-3343K-2H-LAA, JKE-3761K-2H-LAA, JKE-4179K-2H-LAA, JKE-4597K-2H-LAA and JKE-5015K-2H-LAA under WMTC program

**ADVERTISED
PLAN**

Appendix C – SUNTERA JKE-5015K-2H-LAA Container Product Specifications

The SUNTERA JKE-5015K-2H-LAA contains an advanced, integrated Fire Suppression System (FSS) as outlined in the Product Specification documentation below.

This document has been included to provide further context to support fire risk analysis and a Fire Safety Study.

www.jinkosolar.com


ADVERTISED PLAN



SUNTERA

JKE-5015K-2H-LAA

SunTera JKE-5015K-2H-LAA is JinkoSolar's new generation of liquid cooling energy storage product, which is equipped with 314Ah LFP cells and integrated with the industry's advanced design concept. SunTera is a safe, reliable, low-cost and high-performance product that provides customers with highly efficient integrated energy storage solutions. In the context of building a new type of power system, JinkoSolar will continue to uphold the mission of changing the energy structure and taking responsibility for the future to provide more reliable products and better experience to customers worldwide.

Intelligent Liquid Cooling

-  Non-uniform refined flow channels, with a temperature difference $\leq 2^{\circ}\text{C}$
-  Multiple liquid cooling control modes, reducing system auxiliary power consumption by 20%

Higher Efficiency

-  Rack-level management scheme, RTE increased by more than 2%
-  Compatible with active equalization technology, enhancing the consistency of cell operation within the Rack

Safe and Reliable

-  Five-level protection from cell to system to prevent thermal runaway
-  Mixed explosion-proof system with integrated gas and water fire suppression

Intelligent Operation and Maintenance

-  Intelligent control management, efficient commissioning, and reduced operational and maintenance costs
-  Supports back-to-back and side-by-side placement to increase energy density at the site

www.jinkosolar.com

JinKO



ESS in Power Generation

Enhance the stability, continuity and controllability of new energy generation to provide stability support to the grid.



ESS in Grid Side

Participate in grid dispatching to meet the demand of grid peaking and frequency regulation, thus enhancing the flexibility and stability of the power system.



ESS in User Side

Relieving the load on the power grid, meeting the demand for electricity from different customers, improving the security of electricity on the customer's side, and thus enhancing the customer's experience of using electricity.



Items	Parameters
Type of cell	Lithium Iron Phosphate(LFP)
Cell parameter	3.2V/314Ah
Max.charge/discharge power	0.5P
Configuration of system	1P416S×12
Rated capacity	5.01 MWh
Rated voltage	1331.2V
Voltage range	1164.8~1497.6V
Cooling method	Liquid Cooling
Operating temperature	-30~50℃
Humidity	≤95%RH, no condensation
Altitude	<3000m, derating above 2000m
Noise level	< 80dB(A), @1m/ 75dB(optional)
IP grade	IP55
Storage temperature	-30~45℃
Corrosion-proof grade	C4/C5(optional)
Fire protection	Temperature sensor + Smoke detector + Combustible gas detector + Deflagration venting + Fire extinguishing gas + Water sprinkler
External communication interface	Ethernet/CAN/RS485
Dimension(L×W×H)	6058×2438×2896mm
Weight	≈42000 kg

© 2024 Jinko Solar Co., Ltd. All rights reserved. Specifications included in this datasheet are subject to change without notice.

JKE-5015K-2H-LAA

**ADVERTISED
PLAN**

Appendix D – Site photos

Grassland north of Project site.

Date & Time: Mon, 09 Feb 2026 at 13:42:03 AEDT
Position: 55 S 465589 5785178 (± 7.2 ft)
Altitude: 212ft (± 9.8 ft)
Datum: AUSTRALIAN GEOCENTRIC 1994 (GDA94)
Azimuth/Bearing: 287° N73W 5102mils True ($\pm 10^\circ$)
Elevation Angle: -07.0°
Horizon Angle: -00.6°
Zoom: 0.5X
Fire Risk Consultants



Image 1

Frasers Lane looking west. Maintained roadside vegetation and grassland north of Project site.

Date & Time: Mon, 09 Feb 2026 at 13:42:28 AEDT
Position: 55 S 465601 5785168 (± 6.9 ft)
Altitude: 214ft (± 9.8 ft)
Datum: AUSTRALIAN GEOCENTRIC 1994 (GDA94)
Azimuth/Bearing: 199° S19W 3538mils True ($\pm 11^\circ$)
Elevation Angle: -09.2°
Horizon Angle: +00.7°
Zoom: 0.5X
Fire Risk Consultants



Image 2

Traralgon-Maffra Road looking south. Right of photo is proposed Frasers Solar Farm (north of Project site). Shelter belts of native trees have been planted adjacent to solar farm and road.

**ADVERTISED
PLAN**

Date & Time: Mon, 09 Feb 2026 at 13:42:52 AEDT
Position: 55 S 465619 5785173 (± 9.4 ft)
Altitude: 216ft (± 9.8 ft)
Datum: AUSTRALIAN GEOCENTRIC 1994 (GDA94)
Azimuth/Bearing: 039° N39E 0693mils True ($\pm 10^\circ$)
Elevation Angle: -08.4°
Horizon Angle: -01.4°
Zoom: 0.5X
Fire Risk Consultants



Image 3

Junction Traralgon-Maffra Road and Fraser's Lane looking northeast. Maintained roadside vegetation.

Date & Time: Mon, 09 Feb 2026 at 13:43:23 AEDT
Position: 55 S 465595 5785169 (± 7.3 ft)
Altitude: 215ft (± 9.8 ft)
Datum: AUSTRALIAN GEOCENTRIC 1994 (GDA94)
Azimuth/Bearing: 237° S57W 4213mils True ($\pm 10^\circ$)
Elevation Angle: -05.2°
Horizon Angle: -01.4°
Zoom: 0.5X
Fire Risk Consultants



Image 4

Junction Traralgon-Maffra Road and Fraser's Lane looking southwest towards proposed Fraser's Solar Farm and shelter belts of native vegetation.

**ADVERTISED
PLAN**

Date & Time: Mon, 09 Feb 2026 at 13:44:56 AEDT
 Position: 55 S 465267 5785220 (± 11.6 ft)
 Altitude: 225ft (± 9.8 ft)
 Datum: AUSTRALIAN GEOCENTRIC 1994 (GDA94)
 Azimuth/Bearing: 217° S37W 3858mils True ($\pm 10^\circ$)
 Elevation Angle: -09.3°
 Horizon Angle: -00.2°
 Zoom: 0.5X
 Fire Risk Consultants



Image 5

Traralgon-Maffra Road looking southwest.

Date & Time: Mon, 09 Feb 2026 at 13:45:14 AEDT
 Position: 55 S 465261 5785229 (± 15.6 ft)
 Altitude: 226ft (± 13.2 ft)
 Datum: AUSTRALIAN GEOCENTRIC 1994 (GDA94)
 Azimuth/Bearing: 282° N78W 5013mils True ($\pm 12^\circ$)
 Elevation Angle: -06.5°
 Horizon Angle: -00.7°
 Zoom: 0.5X
 Fire Risk Consultants



Image 6

Fraser's Lane looking northwest.

**ADVERTISED
PLAN**

Date & Time: Mon, 09 Feb 2026 at 13:51:22 AEDT
Position: 55 S 465089 5784156 (±51.6ft)
Altitude: 196ft (±9.8ft)
Datum: AUSTRALIAN GEOCENTRIC 1994 (GDA94)
Azimuth/Bearing: 030° N30E 0533mils True (±11°)
Elevation Angle: -03.7°
Horizon Angle: -01.0°
Zoom: 0.5X
Fire Risk Consultants



Image 7

Traralgon-Maffra Road looking northeast.

Date & Time: Mon, 09 Feb 2026 at 13:51:37 AEDT
Position: 55 S 465072 5784165 (±15.0ft)
Altitude: 196ft (±11.0ft)
Datum: AUSTRALIAN GEOCENTRIC 1994 (GDA94)
Azimuth/Bearing: 325° N35W 5778mils True (±10°)
Elevation Angle: -06.1°
Horizon Angle: -00.9°
Zoom: 0.5X
Fire Risk Consultants



Image 8

Traralgon-Maffra Road looking northwest towards Project site.

**ADVERTISED
PLAN**

Date & Time: Mon, 09 Feb 2026 at 13:51:54 AEDT
Position: 55 S 465072 5784165 (±16.2ft)
Altitude: 196ft (±10.8ft)
Datum: AUSTRALIAN GEOCENTRIC 1994 (GDA94)
Azimuth/Bearing: 288° N72W 5120mils True (±11°)
Elevation Angle: -04.8°
Horizon Angle: -00.7°
Zoom: 0.5X
Fire Risk Consultants



Image 9

Traralgon-Maffra Road looking northwest

Date & Time: Mon, 09 Feb 2026 at 13:52:21 AEDT
Position: 55 S 465088 5784147 (±11.5ft)
Altitude: 197ft (±9.8ft)
Datum: AUSTRALIAN GEOCENTRIC 1994 (GDA94)
Azimuth/Bearing: 201° S21W 3573mils True (±10°)
Elevation Angle: -05.7°
Horizon Angle: -01.6°
Zoom: 0.5X
Fire Risk Consultants



Image 10

Traralgon-Maffra Road looking southwest. Example of typical roadside vegetation adjacent to Project site.

**ADVERTISED
PLAN**

Date & Time: Mon, 09 Feb 2026 at 13:52:26 AEDT
Position: 55 S 465088 5784147 (± 11.71)
Altitude: 196ft (± 9.8 ft)
Datum: AUSTRALIAN GEOCENTRIC 1994 (GDA94)
Azimuth/Bearing: 042° N42E 0747mils True ($\pm 10^\circ$)
Elevation Angle: -05.0°
Horizon Angle: -01.4°
Zoom: 0.5X
Fire Risk Consultants



Image 11

Traralgon-Maffra Road looking northeast. Example of typical roadside vegetation adjacent to Project site.

Distribution line shown BESS to be connected to.

Date & Time: Mon, 09 Feb 2026 at 13:52:32 AEDT
Position: 55 S 465088 5784146 (± 11.4 ft)
Altitude: 194ft (± 9.8 ft)
Datum: AUSTRALIAN GEOCENTRIC 1994 (GDA94)
Azimuth/Bearing: 116° S64E 2062mils True ($\pm 10^\circ$)
Elevation Angle: +05.9°
Horizon Angle: -01.0°
Zoom: 0.5X
Fire Risk Consultants



Image 12

Traralgon-Maffra Road looking southeast land adjacent to Project site.

**ADVERTISED
PLAN**

Appendix E – Fire Management Plan

**ADVERTISED
PLAN**

Purpose of the Fire Management Plan (FMP)

The purpose of this FMP is to meet the requirements outlined within the CFA Guidelines and the planning consent. The FMP is a requirement of the CFA Guidelines and is the key document to provide the following:

1. A summary of fire hazards and risks to and from the site, specific to its location, infrastructure, activities and occupancy.
2. Description of control measures to prevent fire occurring and limit the consequences of fire at the facility.
3. Description of control measures to prevent and reduce the consequences of external fire impacting the facility.
4. Details of equipment and resources to manage fire at the facility.
5. Policies and procedures that ensure all control measures are appropriate and effective and remain so.
6. Procedures for review of the Plan.

**ADVERTISED
PLAN**

Plan status and review

This FMP has been developed as per the CFA Guidelines and is a requirement of the planning consent.

Any proposed changes to the site will be assessed against the Fire Risk Management Plan (FRMP) and this Plan. It is acknowledged that future changes may require Country Fire Authority (CFA) review, and this will be facilitated and recorded as required.

The responsibility for the implementation and review of the FMP will be allocated to the Site Manager. A review of the FMP must occur at least every three years and prior to major changes occurring.

**ADVERTISED
PLAN**

Control measures

The implementation of a wide range of control measures to manage fire risk is critical.

Following the preparation of the FRMP, a range of control measures have been identified and will be implemented at the required development phase and maintained.

The ongoing maintenance or scheduled checks of the control measures are equally important.

The following control measures are aimed at mitigating the risk of fire from both internal and external fires.

**ADVERTISED
PLAN**

Table 1 - Control measures - policy, procedures and checklists

Ref	Theme	Control measure	Description	Review	Responsible
1.0	Policy, procedures and checklists	1.1 Fire Risk Management Plan (FRMP)	The FRMP has identified the hazards and assessed them to determine a risk level. It includes strategies to lower risk if required. The FRMP has been developed in accordance with the <i>CFA Guideline</i> .	This is prepared for each stage of development. Thereafter reviewed every 3 years or before any site changes occur.	Site Manager
		1.2 Fire Management Plan (FMP)	The FMP outlines the control measures to reduce the risk of fire occurring and is developed in accordance with the <i>CFA Guideline</i> .	This is prepared for each stage of development. Thereafter reviewed every 3 years or before any site changes occur.	Site Manager
		1.3 Emergency Management Plan (EMP)	An EMP will be established, reviewed and updated as required to reflect the different stages of the development including construction, commissioning, and operations. The EMP will be developed in accordance with the <i>CFA Guideline</i> and AS3745 <i>Emergency Planning for facilities</i>. This will include the following as provided in the <i>CFA Guidelines</i> (2022), Section 7.1.2: a. "Emergency prevention, preparedness and mitigation activities. b. Activities for preparing for, and the prevention of emergencies (e.g. training and maintenance). c. Control and coordination arrangements for emergency response (e.g. evacuation procedures, shelter-in-place arrangements, emergency assembly areas and procedures for response to emergencies). d. The agreed roles and responsibilities of on-site personnel (e.g. equipment isolation, fire brigade liaison, evacuation management, shelter-in-place management, if applicable). To facilitate fire brigade response, CFA's expectation is that EMPs include:	This is prepared for each stage of development. Thereafter reviewed annually or following an exercise or emergency event.	Site Manager

**ADVERTISED
PLAN**

ADVERTISED PLAN

Ref	Theme	Control measure	Description	Review	Responsible
			e. A facility description, including infrastructure details, operations, number of personnel, and operating hours. f. A site plan depicting infrastructure (panels, wind turbines, inverters, battery energy storage systems, generators, substations, grid connection points, dangerous goods storages, buildings, bunds), site access points and internal roads; fire services (water tanks, pumps, booster systems, fire hydrants, fire hose reels); drainage; and neighbouring properties. g. Up-to-date contact details for facility personnel, and any relevant off-site personnel that could provide technical support during an emergency. h. Details of emergency resources, including fire detection and suppression systems and equipment; gas detection; emergency eyewash and shower facilities; spill containment systems and equipment; emergency warning systems; communication systems; personal protective equipment; first aid. i. A manifest of dangerous goods (if required under the Dangerous Goods (Storage and Handling) Regulations 2012). j. Evacuation procedures. k. Shelter-in-place procedures for facilities at-risk of bushfire or grassfire, in the event that it is too late to safely evacuate. l. Emergency procedures for all credible hazards and risks, including building, infrastructure and vehicle fire, grassfire and bushfire. i) A Fire (or Bushfire) Management Plan (refer to Section 9). Procedures must include details for notifying the emergency services, at the earliest possible stage of the emergency. The person or role responsible for making or verifying the notification must be specified. '000' must be included in the procedure. m. A Fire (or Bushfire) Management Plan Procedures must include details for notifying the emergency services, at the earliest possible stage of the emergency. The person or role responsible for making or verifying the notification must be specified. '000' must be included in the procedure. Where your facility is within a Bushfire Prone Area or the Bushfire Management Overlay, refer to Section 11 for CFA's advice on bushfire emergency planning.		

Ref	Theme	Control measure	Description	Review	Responsible
			Specific to the BESS the EMP will include: a. <i>Contact information for 24/7/365 specialist technical support for the battery energy storage system.</i> b. <i>Emergency response procedures based on identified risks and hazards of the battery energy storage system and related infrastructure, including but not limited to:</i> I. <i>Electrical infrastructure faults and fire.</i> II. <i>Battery energy storage system damage or faults, including battery monitoring faults, temperature increases above normal operating parameters, electrical faults, chemical spills or reactions, off-gassing, thermal events/runaway, smoke and fire.</i> III. <i>Bushfire and grassfire.</i> IV. <i>The management of fire water runoff.</i> c. <i>Details of the elements monitored/controlled by the Battery Management System (BMS), including internal temperature, state of charge, voltage, etc. and the locations this information is available (e.g. at the BESS containers, in an on-site control room, off-site monitoring facilities).</i> d. <i>A plan for partial and full decommissioning of the battery energy storage system in the event of an emergency incident that renders the facility inoperable or unsafe before its anticipated end-of-life."</i>		
		1.4 Emergency Information Book and Emergency Information Containers	An Emergency Information Book will be developed and available for emergency responders. Emergency Information Books will be located in Emergency Information Containers, provided at each vehicle entrance point to the facility. As per section 8.1 of the <i>CFA Guideline</i>, the Emergency Information Book will include: a. <i>"A description of the premises, its infrastructure and operations.</i> b. <i>Site plans that include the layout of the entire site, including buildings, internal roads, infrastructure, fire protection systems and equipment, dangerous goods storage areas, battery energy storage systems, substations/terminals, grid connections, drains and isolation valves, neighbours and the direction of north.</i>	This is prepared for each stage of development. Thereafter reviewed annually or at the request of CFA.	Site Manager

ADVERTISED PLAN

Ref	Theme	Control measure	Description	Review	Responsible
			c. Up-to-date contact details for site personnel, regulatory authorities and site neighbours. d. A manifest of dangerous goods (if required) as per Schedule 3 of the Dangerous Goods (Storage and Handling) Regulations 2012. e. Safety Data Sheets (SDS) for dangerous goods stored on-site. f. Procedures for management of emergencies, including evacuation, shelter-in-place (for facilities at risk of bushfire/grassfire), containment of spills and leaks, and fire procedures (including infrastructure/plant fires, vehicle fires, grassfire/bushfire). Specific to the BESS the Emergency Information Book will provide information on hazards to emergency responders including: • Specifications for safe operating conditions for temperature. • Schematics and technical data for battery energy storage system containers/enclosures, the number of containers/enclosures on-site, and the number of battery racks or modules within each container/enclosure. • Details of the hazards for the battery energy storage system, including thermal events/runaway, electrical safety hazards, explosion hazards, dangerous goods hazards (including off-gassing), and the effects of fire on the battery energy storage system (e.g., explosion, release of toxic gases). • Details of the elements monitored/controlled by the Battery Management System (BMS), including internal temperature, state of charge, voltage, etc. and the locations this information is available (e.g. at the BESS containers, in an on-site control room, off-site monitoring facilities). • Details of all provided battery failure/safety and protective systems, including a description, the activation process/automatic trigger, and any hazards associated with these systems. • The shut down and/or isolation procedures if the batteries are involved in fire, and appropriate personnel contact details for verifying that the battery enclosure/container system has been isolated/shutdown and de-energised during emergencies.		

ADVERTISED PLAN

Ref	Theme	Control measure	Description	Review	Responsible
			<i>The Emergency Information Containers will be:</i> <i>Painted red and marked 'EMERGENCY INFORMATION' in white contrasting lettering not less than 25mm high.</i> <i>Located at all vehicle access points to the facility, installed at a height of 1.2 metres – 1.5 metres.</i> <i>Accessible with a fire brigade standard '003' key.</i> <i>Kept clear of obstructions, including products, rubbish, vehicles, vegetation and any hazards (e.g. pest infestation)."</i>		
		1.5 Hazard analysis	A system will be introduced that requires any changes or alterations to the site that will likely influence the level of fire risk or fire related systems to be assessed against the RMP. Any changes of risk resulting in altered mitigation treatments will be included within reviews of the FMP and EMP. The system will also outline when the fire service will be consulted on any proposed changes.	As required	Site Manager
		1.6 Personnel Training	All personnel, contractors and, where relevant, visitors will receive site-specific information, instruction and training to ensure compliance with applicable Work Health and Safety (WHS) legislation and safe work practices relevant to the jurisdiction in which the site is located. As per the <i>CFA Guideline</i> (Section 7.4) this will include: - Facility and operational risks and hazards. - Facility emergency management roles, responsibilities and arrangements (as per the Emergency Management Plan). - The on-site emergency (occupant) warning systems and location of evacuation assembly areas. - The safe and effective use of any fire-fighting equipment where there is an expectation for staff to undertake first attack firefighting. - The storage, handling and emergency procedures for dangerous goods at the facility. - The location of first aid facilities and application of first aid equipment.	Personnel training program to be reviewed and updated every three years, or immediately following a change in policy or site infrastructure.	Site Manager

ADVERTISED PLAN

Ref	Theme	Control measure	Description	Review	Responsible
			As the development is at risk from bushfire and grassfire, the following will be included in site-specific information, instruction and training: - Utilisation of fire service endorsed emergency alerting app(s) (including setting of 'watch zones') for the facility location and any related areas of travel. - Information and training on the warning levels and messages issued by Emergency Service Organisations in accordance with the Australian Warning System (AWS).		
		1.7 Site access including induction	Site access arrangements will be introduced that require all new personnel, visitors and contractors to be inducted into the property by a program that relates to their role and exposure to risk. This induction will include an overview of the Emergency Management Plan, and where appropriate the training procedures listed in Control Measure 1.6. Annual refreshers will be provided for all personnel and contractors.	Site induction program to be reviewed and updated every three years, or immediately following a change in policy or site infrastructure.	Site Manager
		1.8 Contractor management	Ensure all Contractors: - Go through an induction process before working on the Site for the first time. The induction process should be renewed annually as per Control Measures 1.6 and 1.7. - Are appropriately briefed and understand their legal obligations in relation to managing fire risks. - Have appropriate procedures, safe work practices, contingency plans, and Safety Data Sheets (SDS) for the operation of all equipment, chemicals, and flammable materials that may contribute to fire risk. - During the fire danger period, have appropriate "initial" suppression equipment available on-site including fire extinguishers and/or knapsacks.	As required.	Site Manager
		1.9 Fire danger period activities	Any hot works or other high-risk activities may require a permit to be issued. Assessments are required to ensure that any activities that may require a permit issued by CFA, the local council, or any other statutory authority during the fire danger period are obtained prior to the period.	Annually – pre fire danger period.	Site Manager

Ref	Theme	Control measure	Description	Review	Responsible
		1.10 Hot Works Permit system	A hot works permit system will be established for the life of the development that will ensure that any hot works, including welding, cutting or grinding will only occur after a hot works procedure permit has been granted by site management.	Every 3 years	Site Manager
		1.11 Fire alarm isolation procedure	During construction, operation and maintenance at the Site, there may be a requirement to isolate the smoke and gas detection and fire suppression systems to prevent unnecessary activation of the alarm. A procedure will be established that outlines the steps taken to isolate systems and to ensure it is reinstated prior to the technician leaving the site.	As required	Site Manager
		1.12 Emergency service liaison	At least annually, contact local emergency service organisations including Fire Services, State Emergency Service and Police) to offer a familiarisation visit and explanation of emergency procedures for the Site.	Annually, with offer to fire services to include both CFA and Fire Rescue Victoria (FRV).	Site Manager
		1.13 Community contact process	A process will be established and maintained to ensure the local community can contact a Site representative of the development directly. Any issues raised will be recorded in a community liaison register and a response will be provided. The process will include updating contact details of neighbouring properties so that they can be contacted in relation to fire risk issues, or in the case of an emergency.	Annually	Site Manager
		1.14 Site commissioning procedure – electrical equipment	Ensure all electrical equipment is fully commissioned and maintained per the manufacturer's specifications and any other legislative requirements.	Ongoing	Site Manager
		1.15 Post seismic activity procedure	Seismic activity is a trigger for inspecting, testing, and servicing the battery energy storage system and its related infrastructure. Any damages or changes in operating parameters must be immediately assessed and rectified by a suitably qualified person.	As required	Site Manager
		1.16	Ensure that that the site complies with relevant legislation for high voltage and complex electrical installations as applicable to the site jurisdiction, including (but not be limited to)	An assessment of the owner's or operator's	Site Manager

**ADVERTISED
PLAN**

Ref	Theme	Control measure	Description	Review	Responsible
		Safety standards for high voltage and complex electrical installations	the requirements associated with design, construction, operation, maintenance, decommissioning and reporting.	compliance with these requirements is carried out every 2 years ¹⁰ , or sooner if required by State legislation.	

**ADVERTISED
PLAN**

¹⁰ ESV Industry Guidance - <https://www.esv.vic.gov.au/industry-guidance/electrical/electrical-technical-information/safety-standards-high-voltage-and>

Table 2 - Control measures - installation requirements

For detailed design requirements – refer to the manufacturer’s installation documentation, other relevant engineering specifications and legislative/regulatory requirements..

Ref	Theme	Control measure	Description	Review
2.0	BESS installation requirements	2.1 Installation standards and guidelines - general	AS/NZS 5139:2019, Electrical installations — Safety of battery systems for use with power conversion equipment AS 1939 Degrees of protection provided by enclosures (IP Code) AS / IEC 62619 Safety requirements for secondary lithium cells and batteries, for use in industrial applications AS 61508 Functional safety of electrical/electronic/programmable electronic safety- related system ASC/ESC 5000 The Australian Battery Guide by the Energy Storage Council AS/NZS 1170.2:2011 (R2016) Structural design actions Wind actions AS 1307.2-1996 (R2015) Surge arresters Metal-oxide surge arresters without gaps for AC systems AS/NZS 1768-2007 Lightning protection AS 2067 Substations and high voltage installations exceeding 1 kV AC AS 2374.1 Power transformers Part 1: General AS 2395 Terminals and switchgear assemblies for alternating voltages above 1 kV AS 3000:2016 Australian Wiring Rules AS 3008 Electrical installations – Selection of cables AS/ IEC 60076 Power Transformer EN 50588-1 Medium Power Transformers AS 60044 Instrument Transformers AS/ IEC 62271 MV switchgear IEC 60376/60480 Technical grade sulphur hexafluoride (SF6) and for reuse of SF6 AS/NZS 1429.1:2000 Electric cables - Polymeric insulated for working voltages 1.9/3.3 (3.6) kV up to and including 19/33 (36) kV AS 1824.2-1995 Insulation coordination (phase-to-earth and phase-to-phase, above 1 kV) Application guide AS 1940 The storage and handling of flammable and combustible liquids IEC 60296 Fluids for electrotechnical applications	The site and BESS system is designed and installed to comply with the listed standards and guidelines.

Ref	Theme	Control measure	Description	Review
		2.2 Fire hydrant system	The fire hydrant system (incl. water storage tanks) will be installed and tested in accordance with AS2419.1:2021 The fire hydrant system (incl. water storage tanks) will be maintained in accordance with AS2419.1:2021, AS1851.1 – <i>Routine service of fire protection systems and equipment</i> and manufacturer specifications.	The fire hydrant system and above ground water storage tank will be designed to comply with this requirement.
		2.3 Fire detection and alarm including fire alarm panel	The following is installed: - Smoke and heat detectors installed within the Unit and connected to a fire alarm panel. - Upon activation the strobe and horn will activate at the Unit. - Gas detectors installed within the Unit and connected to the fire alarm panel. - Upon activation of the gas detector, the ventilation system will activate. - The alarms from the smoke, heat and gas detectors will send a signal to the Battery Management System (BMS). The BMS enable shut down procedures to commence.	Any changes to the site layout will trigger a review of the fire detection and alarm system.
		2.4 Ventilation fan	The ventilation fan is connected to the UPS and will operate when the gas detector is activated. It is designed in accordance with UL9540 and tested against UL9540A. ADVERTISED PLAN	Regular testing and maintenance in accordance with manufacturers guidelines.
		2.5 E-stop	The E-stop function is provided at the Unit. They are designed and installed as per NFPA 855 and UL9540A. Further detail is provided within the SUNTERA JKE-5015K-2H-LAA Installation Manual.	Regular testing and maintenance in accordance with manufacturers guidelines.
		2.6	The communication connection between the site and the monitoring centre will be established in accordance with the manufacturer and site operator specifications.	Regular testing and maintenance

Ref	Theme	Control measure	Description	Review
		Communications connections between FDCIE and Monitoring Centre		in accordance with manufacturers guidelines and site Emergency Management Plan.

**ADVERTISED
PLAN**

Table 3 - Control measures – maintenance

Ref	Theme	Control measure	Description	Review	Responsible
3.0	Maintenance	3.1 Fire Water Runoff system	The following activities must be completed: - Physical inspection of the fire water containment area for signs of integrity failures. - Physical inspection of the stormwater management system leading from the BESS area to the fire water containment area for signs of integrity failures. - If required, clean out the fire water containment system to ensure it is free from debris. - Ensure that the stormwater isolation valves are functional.	Annually	Site Manager
			Ensure the fire water runoff system is always in a ready state, with capacity immediately available to receive the full firefighting water supply volume as needed.	Ongoing	Site Manager
		3.2 Waste and other combustible materials management	Regular inspection and removal of all combustible and other waste materials within the vicinity of the BESS, substation and inverter areas and related infrastructure.	As required	Site Manager
		3.3 BESS Monitoring Systems	The systems that monitor the BESS will be regularly tested as per manufacturers' specifications to ensure they are maintained in working order. This will ensure that faults are detected and resolved early and, if necessary, the BESS can be shut down remotely in the event of an emergency.	As required	Site Manager
		3.4 Battery enclosures and mechanical damage protection.	Regular inspections of battery enclosure containers and related infrastructure for physical damage. Any damage must be immediately assessed and rectified by a suitably qualified person.	As required, otherwise monthly	Site Manager
		3.5 Battery infrastructure	In accordance with the manufacturer's specifications, undertake maintenance of the battery enclosures, transformers, and associated equipment.	As required	Site Manager

Ref	Theme	Control measure	Description	Review	Responsible
		3.6 Battery monitoring system	The system that monitors the battery operation will be regularly tested as per the manufacturer's specifications to ensure all remote operations capabilities are maintained. This will ensure that the BESS can be shut down remotely in the event of an emergency.	As required	Site Manager
		3.7 Access and security	Regular checks will occur of the boundary fence, the CCTV system, and other security measures to ensure unauthorised access is prevented.	Ongoing	Site Manager
		3.8 Emergency vehicle access to the Site	Regularly check the provision of emergency vehicle access to the Site. No equipment or other materials are to be left blocking or impeding emergency vehicle access. All access roads and driveways are to be maintained to ensure they meet requirements of the CFA Guidelines. For <i>roading</i>, the requirements are: a) "Construction of a minimum four (4) meter perimeter road within the perimeter fire break b) Roads must be of all-weather construction and capable of accommodating a vehicle of fifteen (15) tonnes (e.g. no compacted earth) c) Constructed roads should be a minimum of four (4) meters in trafficable width with a four (4) meter vertical clearance for the width with a four (4) meter vertical clearance for the width of the formed road surface. Ensure any fencing along access routes allows of width of fire trucks. d) The average grade should be no more than 1 in 7 (14.4% or 8.1 degrees) with a maximum of no more than 1 in 5 (20% or 11.3 degrees) for no more than fifty (50) meters). e) Dips in the road should have no more than a 1 in 8 (12.5% or 7.1 degrees) entry and exit angle. f) Roads must incorporate passing bays at least every 600meters, which must be at least twenty (20) meters long and have a minimum	Ongoing	Site Manager

**ADVERTISED
PLAN**

Ref	Theme	Control measure	Description	Review	Responsible
			trafficable width of six (6) meters. Where roads are less than 600 meters long, at least one passing bay must be incorporated. g) Road networks must enable responding emergency services to access all areas of the facility, including fire service infrastructure, buildings, and battery energy storage systems and related infrastructure. h) The provision of at least two (2) but preferably more access points to each part of the facility.		
		3.9 Dangerous Goods safety systems	The Dangerous Goods safety system is outlined within the FRMP and complies with the relevant Dangerous Goods Regulations. Ensure all identified Dangerous Goods on the Site are regularly reviewed as per the following: - If any changes occur to the quantities or equipment that houses the Dangerous Goods, the FRMP will be reviewed prior to the works commencing. Any relevant legislative obligations following the changes will be implemented. - Check that the HAZCHEM and dangerous goods signs at the property entrance are current and legible. - The equipment containing dangerous goods are checked in accordance with the manufacturer's specifications to ensure dangerous goods are contained within the environment. Note: other maintenance requirements are included within other areas of this Fire Management Plan including the Emergency Information Book / Container and relevant equipment maintenance.	Annually	Site Manager
		3.10 Site signage	All road signage and any other emergency related signage is to be checked to ensure they haven't degraded and are still current. This may include: - Fire orders - Emergency site plans/Evacuation procedures - Directional signage to the static water supplies.	Annually	Site Manager

Ref	Theme	Control measure	Description	Review	Responsible
		3.11 E-Stop	The E-stop function will be maintained as per the requirements of the manufacturer specifications and NFPA 855 – <i>Standard for the installation of stationary energy storage systems</i> . The E-stop function will be tested at commission phase and will then be required to be tested annually to confirm that it continues to operate as per its design.	Annually	Site Manager
		3.12 Fire hydrant system	The fire hydrant system will be maintained in accordance with AS1851.1 – <i>Routine service of fire protection systems and equipment</i> .	As per AS1851	Site Manager
		3.13 Smoke, heat and gas detection systems	The smoke, heat and gas detection systems will be maintained in accordance with NFPA 72 – <i>National fire alarm and signaling code</i> and AS1851.1 – <i>Routine service of fire protection systems and equipment</i> .	As per the relevant Standards	Site Manager
		3.14 Fire extinguishers	Fire extinguishers will be maintained in accordance with AS1851.1 – <i>Routine service of fire protection systems and equipment</i> .	6 monthly	Site Manager

**ADVERTISED
PLAN**

Table 4 - Control measures - vegetation management

Ref	Theme	Control measure	Description	Review	Responsible
4.0	Vegetation management	4.1 Fire breaks	Ongoing inspection and maintenance of the perimeter and BESS fire breaks will be undertaken to ensure the required 19m defendable space is maintained in accordance with the approved design.	As required and regularly during the fire danger period.	Site Manager
		4.2 Ground's management – other areas	All areas will be regularly maintained, and ground cover across the Site (including the drains) will be kept at a maximum of 100mm during the fire danger period. Any vegetation accumulation will be cleared as soon as possible and removed from the Site.	During the fire danger period.	Site Manager

**ADVERTISED
PLAN**