Land and environment consultants

Bushfire management plan

Miriam Vale battery energy storage system | Miriam Vale | Queensland
Prepared for Attexo Group Pty Ltd | 23 May 2024

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Bushfire management plan

Final V1

Report 24003 | Attexo Group Pty Ltd | 23 May 2024

Approved by	Robert Janssen
Position	Managing principal
Signature	
Date	23 May 2024

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Disclaimer

Notwithstanding the precautions adopted in this report, it should always be remembered that bushfires burn under a range of conditions. An element of risk, no matter how small always remains, and although AS 3959-2018 is designed to improve the performance of such buildings, there can be no guarantee, because of the variable nature of bushfires, that any building will withstand bushfire attack on every occasion.

It should be noted that upon lodgement of a development proposal, State Government, council and/or the fire service may recommend additional construction requirements.

Although every care has been taken in the preparation of this report, Land and Environment Consultants Pty Ltd accept no responsibility resulting from the use of the information in this report.

Executive Summary

This bushfire management plan has been prepared for the proposed Miriam Vale battery energy storage system (**the Project**) at 292 Cawthrays Road, Colosseum, approximately 6 kilometres (**km**) west of Miriam Vale, and 60 km south-west of Gladstone, within the local government area of Gladstone Regional Council.

The Project involves the land parcels which are properly described as lot 132/FD32 and lots 136 and 139/FL40301 (**the site**). The part of lot 132/FD32 which accommodates the battery energy storage system (**BESS**) is hereafter referred to as the **Project area**. Access to the Project area from Burgess Road is located within lots 136 and 139/FL40301.

A development application will be made for the Project under the Gladstone Regional Council Planning Scheme 2017.

The site is identified as a bushfire hazard area by the Gladstone Regional Council Planning Scheme 2017 *Bushfire hazard overlay map*. As a result, the development application for the Project is subject to compliance with the Gladstone Regional Council Planning Scheme 2017 *Bushfire hazard overlay code* (**Bushfire hazard overlay code**) and the example bushfire overlay code in *Natural Hazards, Risk and Resilience – Bushfire, State Planning Policy State Interest guidance material* (DSDMIP 2019) (**SPP guidance material – bushfire**), where relevant to the development application.

The Project involves the development of a BESS with a discharge capacity of up to 500 megawatts (**MW**) with up to four hours of storage, ie up to 2,000 MW hours of energy, laydown area, maintenance and storage shed and fire-fighter water supply tank.

The Project will be connected to the electricity network via a substation and switching station which is to be constructed within the Project area and adjoining the Powerlink Calliope to Gin Gin overhead transmission line (**OHTL**).

The bushfire hazard assessment of the Project area confirmed the Project is within a bushfire hazard area.

Bushfire mitigation measures that must be included in the design of the Project and implemented during the construction and operational phases are specified in Chapter 6. These include:

- establishing and maintaining an asset protection zone;
- establishing and maintaining a mineral earth surface under the BESS, switching station and substation;
- requirements for the disposal of vegetation waste that is cleared from the site;
- design guidelines for the construction of access tracks;
- design guidelines for fire-fighter water storage and supply;
- requirements for wayfinding signage;
- requirements for buildings and structures to comply with the relevant governing Queensland laws and national codes and standards that apply to the building industry; and
- administrative controls which are to be implemented during the construction and operational phases.

With the implementation of the above listed bushfire mitigation measures, the development application for the Project is considered to be compliant with the Bushfire hazard overlay code and the SPP guidance material - bushfire.

1 Introduction

Land and Environment Consultants Pty Ltd (**LEC**) was engaged to prepare a bushfire management plan (**BMP**) for the proposed Miriam Vale battery energy storage system (**the Project**) at 292 Cawthrays Road, Colosseum, approximately 6 kilometres (**km**) west of Miriam Vale, and 60 km south-west of Gladstone, within the local government area of Gladstone Regional Council.

A development application will be made for the Project under the Gladstone Regional Council Planning Scheme 2017.

The Project involves the land parcels which are properly described as lot 132/FD32 and lots 136 and 139/FL40301 (**the site**). The part of lot 132/FD32 which accommodates the battery energy storage system (**BESS**) is hereafter referred to as the **Project area**. Access to the Project area from Burgess Road is located within lots 136 and 139/FL40301.

The site is identified as a bushfire hazard area by the Gladstone Regional Council Planning Scheme 2017 *Bushfire hazard overlay map* (**Bushfire hazard overlay map**). As a result, the development application for the Project is subject to compliance with the Gladstone Regional Council Planning Scheme 2017 *Bushfire hazard overlay code* (**Bushfire hazard overlay code**). The Gladstone Regional Council may also consider the example bushfire overlay code in *Natural Hazards, Risk and Resilience – Bushfire, State Planning Policy State Interest guidance material* (DSDMIP 2019) (**SPP guidance material – bushfire**) to be relevant to the development application.

This BMP has been prepared in general accordance with *Bushfire Resilient Communities Technical Reference Guide for the State Planning Policy State Interest 'Natural Hazards, Risk and Resilience - Bushfire'* (QFES 2019) (**Bushfire resilient communities**), which was prepared by the Queensland Fire and Emergency Services (**QFES**) to provide technical guidance for the implementation of the SPP guidance material – bushfire. It also considers guidelines for a BESS by the Australasian Fire and Emergency Services Authorities Council (AFAC 2020).

This BMP documents a bushfire hazard assessment for the Project area, identifies strategies that will mitigate the potential risk of bushfire hazards for the construction and operational phases of the Project and demonstrates how of the development application for the Project will comply with the Bushfire hazard overlay code. It includes:

- an introduction (this section) and description of methods and information resources used for the preparation of this BMP;
- description of the Project area and Project;
- bushfire hazard assessment;
- identification of bushfire hazards associated with the Project area and Project;
- radiant heat exposure assessment;
- a plan for mitigating the potential risk of bushfire hazards; and
- assessment of compliance with the Bushfire hazard overlay code.

Please note, this BMP does not consider fire hazards associated with the BESS including (amongst other things) electrical hazards, chemical hazards, explosions, potential fire spread due to the proximity of battery enclosures or mechanical damage to battery enclosures. These are matters which will be dealt with via a separate fire safety study.

1.1 Bushfire management plan review

This BMP has been prepared for a development application. Upon approval of the Project, the appointed construction contractor and operational contractor may wish to prepare their own version of this BMP to distil the matters which are specific to their contract or to include corporate

documentation or procedures. Notwithstanding, this does not permit the construction contractor or operational contractor to change or deviate from the mitigation measures specified in Chapter 6 or associated development approval conditions.

1.2 Method

To meet requirements of the SPP guidance material - bushfire and Bushfire resilient communities, the following tasks were undertaken:

- review of the Bushfire hazard overlay map in Gladstone Regional Council's online mapping system (GRC 2024);
- review of the Queensland regional ecosystem map, vegetation hazard class (**VHC**) map, severe fire weather map and fire history map in the QFES online mapping system (QFES 2024) (**Catalyst**);
- review of fire history mapping in the North Australia and Rangelands Fire Information online mapping system (DISER 2024) (**NAFI**);
- a drive over the Project area and field inspection for vegetation characteristics, current land management practices, slope and evidence of previous fires;
- bushfire hazard assessment in general accordance with the method in Bushfire resilient communities;
- radiant heat exposure assessment using the Fire Protection Association of Australia *BAL calculator V4.9* (**BAL calculator**) which models the 'method 2' bushfire attack level assessment procedure in the *Australian Standard* (**AS 3959-2018**) *Construction of buildings in bushfire prone areas* (Standards Australia 2018); and
- identification of mitigation measures required to reduce the potential risk of bushfire hazards to the construction and operational phases of the Project and to demonstrate compliance with the Bushfire hazard overlay code.

Aerial imagery of the Project area was accessed online from Google Earth and the Queensland Globe to assist in validating observations and measurements made during the field inspection.

1.3 Suitably qualified person

This BMP was prepared by Robert Janssen who is a suitably qualified and experienced bushfire management consultant.

Robert is the managing principal at LEC and has over 25 years of experience in bushfire planning and operations. He has prepared bushfire management plans for residential, commercial and industrial property developments, utilities, government facilities and conservation estates.

Robert's formal qualifications as an environmental scientist and consulting experience are coupled with 10 years of experience as a nationally accredited fire-fighter with the national parks and wildlife service in New South Wales and Queensland.

2 Description of the Project area and the Project

This chapter provides a description of the Project area and the Project.

2.1 The Project area

The site and Project area are shown in Figure 2.1 and is located 6 km west of Miriam Vale, and 60 km south-west of Gladstone.

From the Bruce Highway, access to the site is via Blackman Gap Road and Burgess Road. There is alternative access via Blackman Gap Road and Cawthrays Road.

The Project area and adjoining land is used for grazing cattle and consists of a grassland. The exception is the adjoining land to the south which has bushland regrowth.

The topography of the site consists of drainage lines, alluvial plains and low rolling hills.

The Powerlink Queensland (**Powerlink**) 275 kilo volt (**kV**) Calliope to Gin Gin overhead transmission line (**OHTL**) runs north-south along the eastern boundary of the Project area. An Ergon 22 kV OHTL runs parallel to Powerlink's OHTL easement and connects to an existing substation south of Burgess Road.

2.2 The Project

The layout of the Project is shown in the layout plan provided in Appendix 1.

The Project involves the development of a BESS with a discharge capacity of up to 500 megawatts (**MW**) with up to four hours of storage of energy, ie up to 2,000 MW hours of energy. The Project will be connected to the electricity network via a substation and switching station which is to be constructed within the Project area and adjoining the Powerlink Calliope to Gin Gin OHTL. Based on advice from Energy Queensland, an exclusion zone buffer of 20 metres (**m**) (10 m either side of the Powerlink OHTL centreline) has been incorporated into the Project design to ensure an acceptable distance from the transmission infrastructure is maintained during the construction and operational phases of the Project.

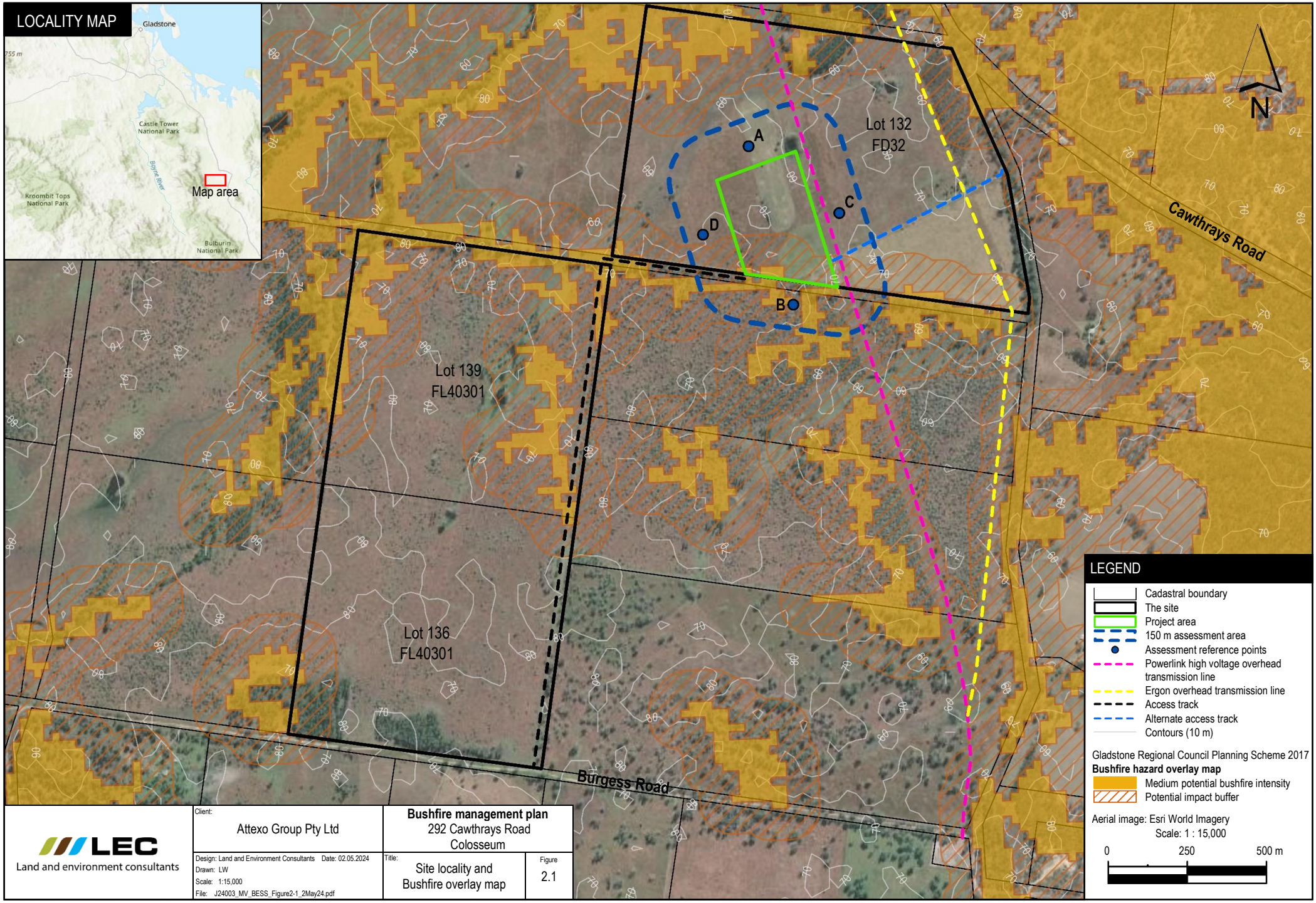
The Project also includes a laydown area, maintenance and storage shed and fire-fighter water supply tank. The maintenance and storage shed will be a steel structure which is used to house ancillary equipment for the operational phase of the Project.

No project infrastructure, other than access tracks are proposed within lots 136 and 139/FL40301.

The Project involves community infrastructure for essential services and hazardous materials in the context of bushfire hazard as defined in the SPP guidance material – bushfire.

2.3 Bushfire hazard overlay map

The Bushfire hazard overlay map for the site and Project area is shown in Figure 2.1. It shows the site and Project area are affected by medium potential bushfire intensity areas and potential impact buffer areas.



LEC
Land and environment consultants

Client: Attexo Group Pty Ltd

Bushfire management plan
292 Cawthrays Road
Colosseum

Design: Land and Environment Consultants Date: 02.05.2024
Drawn: LW
Scale: 1:15,000
File: J24003_MV_BESS_Figure2-1_2May24.pdf

Title: Site locality and Bushfire overlay map

Figure 2.1

3 Bushfire hazard assessment

This chapter provides details about the desktop review, field inspection and bushfire hazard assessment.

3.1 Severe fire weather

The severe fire weather map in Catalyst indicates the 5 % annual exceedance probability forest fire danger index (**FFDI**) for the Project area is 53. An FFDI value of 53 has been used for the potential bushfire intensity calculations in Section 3.4 and the radiant heat exposure assessment in Section 3.6.

For the assessment of grassfire attack, the FFDI value of 53 has been converted to a grass fire danger index (**GFDI**) value of 75, based on the GFDI values in Table B1 of AS 3959-2018.

3.2 Fire history

Fire history data in Catalyst and NAFI indicate that the site and adjoining land is regularly subject to fire. The fire history data does not identify whether the fires are planned burns or unplanned bushfires.

3.3 Site inspection

LEC inspected land within 150 m of the Project area from 8-9 February 2024. Observations were recorded about current land use and management, vegetation characteristics, the slope of land and evidence of previous fires.

The locations of assessment reference points used for the bushfire hazard assessment are shown in Figure 2.1. Table 3.1 provides a summary of observations from the site inspection and notes about the bushfire hazard assessment of assessment reference points. Features of the assessment reference points are shown in Photographs 3.1-3.4.

Table 3.1 Site observations

Assessment reference point	Catalyst VHC	Ground truthed VHC	Notes
A	VHC 40.4 *Continuous low grass or tree cover* (**VHC 40.4**)	VHC 40.4	Grassland
B	VHC 9.2 *Moist to dry eucalypt woodland on coastal lowlands and ranges* (**VHC 9.2**)	VHC 9.2 regrowth	Bushland regrowth
C	VHC 40.4	VHC 40.4	Grassland
D	VHC 40.4	VHC 40.4	Grassland

Photograph 3.1 VHC 40.4 at A

Photograph 3.2 VHC 9.2 regrowth at B

Photograph 3.3 VHC 40.4 at C

Photograph 3.4 VHC 40.4 at D

3.4 Potential bushfire intensity calculations

The potential bushfire intensity of assessment reference points was determined using the Queensland Public Safety Business Agency *Potential Bushfire Intensity Calculator* (version November 2014) which is an Excel spreadsheet calculator that models the bushfire hazard assessment method in Bushfire resilient communities.

Bushfire resilient communities defines bushfire hazard classes as follows:

- very high – potential bushfire intensity > 40,000 kilowatts/(**kW/m**);
- high – potential bushfire intensity 20,000-40,000 kW/m;
- medium – potential bushfire intensity 4,000-20,000 kW/m; and
- non bushfire hazard - potential bushfire intensity <4,000 kW/m.

Results of the potential bushfire intensity calculations which determine the bushfire hazard class of the assessment reference points shown in Figure 2.1 are presented in Table 3.2.

Table 3.2 Potential bushfire intensity

Assessment reference points	VHC	Potential fuel load (tonnes (t)/ha)[1]	Slope (°)	Potential bushfire intensity (kW/m)	Bushfire hazard class
A	VHC 40.4	5	1	880	Non-bushfire hazard class[2]
B	VHC 9.2	17.2	2	11,160	Medium
C	VHC 40.4	5	1	880	Non-bushfire hazard class[2]

Table 3.2 Potential bushfire intensity

Assessment reference points	VHC	Potential fuel load (tonnes (t)/ha)[1]	Slope (°)	Potential bushfire intensity (kW/m)	Bushfire hazard class
D	VHC 40.4	5	1	880	Non-bushfire hazard class[2]

Notes 1. Potential fuel load taken from Bushfire resilient communities.
2. VHC 40.4 is defined in Bushfire resilient communities as a grassfire hazard and having continuous grassfire fuel.

3.5 Bushfire hazard areas

Results of the potential bushfire intensity calculations in Table 3.2 generally align with the Bushfire hazard overlay map and confirm that the Project is within a bushfire hazard area and the development application is subject to compliance with the Bushfire hazard overlay code.

The Project is exposed to the effects of grassfire attack from the north, east and west and bushfire attack from the south. The radiant heat profile of these grassfire and bushfire attack scenarios are further analysed in Section 3.6.

3.6 Radiant heat exposure assessment

The Bushfire hazard overlay code does not identify a radiant heat exposure outcome to determine setbacks between hazardous vegetation and above ground infrastructure. Therefore, this BMP defers to the SPP guidance material – bushfire and Bushfire resilient communities which require community infrastructure for essential services and the storage of materials that are hazardous in the context of bushfire hazard, ie the BESS, substation and switching station, to be setback from hazardous vegetation by a distance which achieves a radiant heat flux level of ≤ 10 kW/m^2 at their development footprint.

The fire-fighter water supply tank and maintenance and storage shed are not community infrastructure for essential services or the storage of materials that are hazardous in the context of bushfire hazard. Therefore, they can be setback from hazardous vegetation by a distance which achieves a radiant heat flux level of ≤ 29 kW/m^2 at their development footprint.

The setbacks referred to above are hereafter referred to as an asset protection zone (**APZ**). The purpose of the APZ is to minimise the effects of grassfire or bushfire attack on above ground infrastructure and to provide access and a defendable space for fire-fighters to operate.

The radiant heat profile of grassfire and bushfire attack on the Project area was analysed using the BAL calculator. Inputs used in the BAL calculator and results are provided in Appendix 2.

Results of the radiant heat exposure assessment have been used to determine the width of the APZ specified in Section 6.1.

During the construction phase there will be temporary infrastructure located within the site, ie construction facilities, construction compounds, laydown areas, etc. An APZ with a nominal cleared width of 10 m is recommended around the perimeter of this temporary infrastructure.

4 Bushfire hazards associated with the Project area and the Project

This chapter identifies bushfire hazards associated with the Project area and the Project.

4.1 Fire danger season

The fire danger season at the site starts in late winter, peaks during spring and will begin to fall when consistent rainfall occurs during late spring or summer. Typically, the worst fire weather conditions will be experienced during the fire danger season when the wind direction is from the north or west.

An FFDI of 53, ie the 5 % annual exceedance probability FFDI for the site, will be associated with hot, dry and windy conditions. If a bushfire or grassfire starts and takes hold under these conditions, it will be difficult to control and fast moving in large areas of bushland or grassland vegetation.

The fire danger rating (**FDR**) system provides advice about the level of bushfire threat on a day. The FDR system has four levels which are summarised below:

- moderate – most fires can be controlled;
- high – fires can be dangerous;
- extreme – fires will spread quickly and be extremely dangerous; and
- catastrophic – if a fire starts to take hold, it could result in the loss of life.

The FDRs will be monitored during both the construction and operational phases of the Project.

4.2 Fire history

As discussed in Section 3.2, fire history data indicates that the site and adjoining land regularly burns. Therefore, it is considered almost certain that the Project area will be exposed to bushfire or grassfire attack in the future.

4.3 Vegetation

The Project area will be cleared of vegetation in preparation for civil works. It will be established as an asset protection zone (**APZ**) and will be maintained for the life of the Project. The ground surface of the BESS, switching station and substation will be mineral earth and maintained free of weeds, woody regrowth and grass.

4.4 Bushfire attack and the protection of above ground infrastructure

The protection of above ground infrastructure from grassfire or bushfire attack will be supported by the APZ and vehicle access tracks located around the perimeter of the above ground infrastructure.

4.5 Workforce

The Project will not result in the permanent exposure of large numbers of people to bushfire hazard. It is expected that the workforce will peak during the construction phase at 150 personnel over an 18 to 24 month construction period and will be reduced to up to 4 roles during the operational phase to manage site operations and maintenance facility.

Workers will not be accommodated within the Project area during the construction or operational phases of the Project. It is anticipated that workers will be accommodated in local housing.

4.6 Hazardous chemicals

Storage or handling of hazardous chemicals during the construction and operational phases of the Project will be in accordance with *Managing risks of hazardous chemicals in the workplace – Code of Practice* (SWA 2023), applicable safety data sheets, and otherwise in accordance with the Queensland *Work Health and Safety Act 2011* and its regulations.

4.7 Access

The Project will establish an access track through lots 136 and 139/FL40301 which will link the Project to Burgess Road. There will be an alternate emergency access track connection between the Project area and Cawthrays Road.

The access tracks will be designed for emergency vehicles. If there are gates across the access tracks, they will be at least 4 m wide.

The requirement for access tracks to be designed for urban fire trucks will be advised by the fire safety study.

4.8 Rural Fire Brigade resources and capability

The local Rural Fire Brigades (**RFBs**) are voluntary primary producer brigades and have limited resources to respond to a fire ignition within the site. They are unlikely to have any training or experience operating around electrical infrastructure, ie the BESS, switching station or the substation, and have limited capability to respond to structural fires.

4.9 Fire-fighter water supply

There will be dedicated fire-fighter water supply tanks for the construction and operational phases of the Project.

There are numerous dams and creeks within the site. However, the standard of vehicle access to these features and the reliability of their water supply is unknown and they should not be relied upon.

Please note, the fire-fighter water supply recommended in this BMP is separate to any requirement for hydrants and static fire water storage specified in the *National Construction Code–Building Code of Australia* (ABCB 2022) (**NCC-BCA**) and *Queensland Development Code* (QG 2021) (**QDC**).

4.10 Warning and evacuation requirements

Queensland emergency services use a range of methods to warn the community about bushfire, severe weather and other emergencies that require preparation and action at the property level. The construction workforce and operational workforce will be subject to advice and warnings by Queensland emergency services via radio, online media and local community safety announcements.

A safety and emergency management plan and an evacuation plan will be prepared for the construction phase and operational phase of the Project. These plans will provide details of actions to be undertaken in response to a bushfire emergency. They are separate plans to this BMP.

4.11 Buildings and structures

Offices and worker amenities that are required for the construction phase of the Project will be demountable buildings, ie temporary buildings, that will be in a cleared compound.

Buildings and structures associated with the Project will be designed to meet the fire resistance and safe access and egress requirements of the NCC-BCA and governing Queensland laws, codes and standards that apply to the building industry.

Fire detection and first attack fire-fighting equipment in buildings will comply with requirements in the NCC–BCA and any Queensland specific requirements.

5 Fire ignition risks

This chapter identifies fire ignition risks within the Project area.

5.1 Land use

The Project area adjoins farming land which have large continuous areas of woodland and grassland vegetation.

The operation of equipment and machinery or hot works associated with agricultural activities could result in unplanned fires that impact on the Project area, particularly on days with an FDR of high or above. In addition, landowners may light fires to burn waste or for fuel hazard reduction. Therefore, land which is used for agricultural activities is considered to be a potential bushfire hazard to the Project.

5.2 Overhead transmission lines

The Powerlink OHTL is susceptible to 'flashover' which can cause a fire ignition in surrounding vegetation. Fires with a flame height greater than 1 m adjacent to or under high voltage overhead transmission lines have the potential to:

- create electrical arcs (known as flashovers) that can endanger people, animals and objects;
- damage or destroy wires, insulators and supports of the transmission line; and
- interrupt power supply to households, business and industry.

Vegetation under the Powerlink OHTL will continue to be maintained in accordance with Powerlink's vegetation management specifications for high voltage overhead transmission line (Powerlink 2018).

The risk of a fire ignition caused by the Ergon OHTL is minor when compared to the risk profile that exists for the Powerlink OHTL. Nonetheless, vegetation under Ergon's OHTL will continue to be maintained in accordance with *Energy Queensland – Vegetation Management Strategy – Version 2* (EQ 2023).

5.3 Lightning strike

A lightning strike could cause a fire ignition within or adjoining the Project area, particularly during the fire danger season when dry electrical storms most commonly occur.

5.4 Electrical fire

There is potential for a fire of electrical origin to develop at the BESS, switching station or substation. Notwithstanding, this infrastructure will be located on a mineral earth surface and an APZ will be maintained around the perimeter. The APZ will be maintained in a low hazard condition during the fire danger season.

5.5 Construction activities

The use of tracked earthmoving machinery, vehicles driving or parking in long grass, hot works and people smoking has potential to cause a bushfire during the construction phase of the Project.

5.6 Operational activities

Similar risks may exist during the operational phase of the Project that existed during the construction phase, ie vehicles driving or parking in long grass, hot works and people smoking. However, worker numbers will be significantly reduced, and access will be on the access tracks.

6 Bushfire mitigation plan

This chapter identifies bushfire mitigation measures that must be implemented during the construction and operational phases of the Project.

The bushfire mitigation measures will reduce the risk of bushfire hazards to a tolerable level which in this BMP means compliance with the Bushfire hazard overlay code.

It is the total of the mitigation measures in this chapter that will reduce the risk of bushfire hazards to a tolerable level. Failure to implement all of the mitigation measures in their entirety could result in an increased level of exposure to bushfire hazards.

6.1 Asset protection zone

An APZ must be established and maintained around the perimeter of the Project's infrastructure as shown in Figure 6.1.

It must be pegged out on-site during the construction phase to ensure that it is maintained consistently during the operational phase.

The APZ must be cleared of weeds and woody vegetation and have a mineral earth or grass surface. If a grass surface is chosen, it must be maintained at a height ≤ 10 centimetres during the fire danger season.

A 10 m wide temporary APZ must be established and maintained around temporary infrastructure located within the site during the construction phase, ie construction facilities, construction compounds, laydown areas, etc.

6.2 Surface under infrastructure

The BESS, switching station and substation must have a mineral earth surface as shown in Figure 6.1. It must be maintained free of weeds, woody regrowth and grass.

6.3 Cleared vegetation

Cleared vegetation must be removed from the site or mulched and used in rehabilitation works. It must not be wind rowed or stockpiled adjacent to the Project area or along vehicle access tracks.

6.4 Access tracks

The proposed access tracks must be extended along the length of the APZ adjoining the northern and the western elevations of the Project area as shown in Figure 6.1.

As a minimum requirement, access tracks must meet the design specifications for category 1 fire-fighter vehicles by the New South Wales Rural Fire Service (NSW RFS 2016) which are summarised as follows:

- Width – The trafficable surface has a width of 4 m except for short constrictions to 3.5 m for no more than 30 m in length where an obstruction cannot be reasonably avoided or removed. Curves have a minimum inner radius of 6 m. The minimum distance between inner and outer curves is 6 m.
- Capacity – Trafficable surfaces and crossing structures are capable of carrying vehicles with a vehicle mass of 15 t and an axle load of 9 t.
- Grade and crossfall – The maximum grade of a trail is not more than 15°. The crossfall of the road surface is not more than 6°. Drainage structures, feature crossings, or other significant changes in

the grade of the trail shall be in accordance with the *Fire Trail Design, Construction and Maintenance Manual* (NSW DISCS 2017).

- Clearance – A minimum vertical clearance of 4 m is provided above the trafficable surface and is maintained clear of obstructions.
- Where the width of the trafficable surface is < 6 m wide, capacity for passing is provided every 250 m comprising:
  - a widened trafficable surface of at least 6 m for a length of at least 20 m; or
  - a 6 m wide and 8 m long area clear of the trafficable surface with a minimum inner curve radius of 6 m and minimum outer radius of 12 m; or
  - a turnaround area is provided (as outlined below).
- Turnarounds – A turning area is provided at the termination of a road and every 500 m and is achieved by:
  - an area clear of the trafficable surface, which is 6 m wide and 8 m deep, with a minimum inner curve radius of 6 m and minimum outer radius of 12 m; or
  - a turning circle of minimum 22 m diameter;
  - a T-junction with each terminating end of the junction being at least 10 m in length from the intersection of the roads and the inner radius of the intersection being at least 6 m; or
  - a road intersection.

Short sections which do not comply with the slope and width criteria outlined above are permissible where topography or environmental constraints do not permit compliance.

Where site constraints prevent turnaround areas being provided every 500 m along an access track, signage must be provided at the access to the track which identifies the distance to the next turnaround area.

Drainage for access tracks must be designed and constructed in accordance with the *Fire Trail Design, Construction and Maintenance Manual* (NSW DISCS 2017).

Access tracks must be inspected at regular times intervals during the calendar year and maintained in accordance with the specifications above prior to the onset of the annual fire danger season.

Note: It is acknowledged that although the Project is in Queensland, guidelines for access tracks from New South Wales (**NSW**) are referenced in this BMP. This is because the NSW guidelines are well defined and documented and feedback received from other projects is that they are practical to implement.

6.5 Fire-fighter water supply

A fire-fighter water storage tank must be installed within the Project area as indicatively shown in Figure 6.1. It must be made of metal or concrete, have a minimum capacity of 40,000 litres and be kept full of water. It must not be used for activities other than bushfire management.

The fire-fighter water storage tank must be fitted with RFB fire-fighting fittings – we recommend contacting the local RFB to confirm the standard RFB fittings in use at the locality. All above ground fittings, ie connections, valves and pipes must be made of metal.

The fire-fighter water storage tank must have a hardstand area within 4 m of the outlet point. The hardstand areas must have the load bearing capacity and dimensions suitable for a vehicle mass of 15 t and an axel load of 9t.

The access point to the static water supply must be identified by reflective wayfinding signage. An example of the wayfinding signage is provided below. It must have a reflective white background and black symbology which is at least 125 mm high.

As stated in Section 4.9, the recommendations in this section are separate to any requirements for hydrants and static fire water storage specified under the NCC-BCA and QDC.

6.6 Buildings

Buildings and structures must comply with the fire resistance and safe access and egress requirements of the NCC-BCA and governing Queensland laws, codes and standards that apply to the building industry.

Fire detection and first attack fire-fighting equipment in buildings must comply with specifications in the NCC–BCA and any Queensland specific requirements.

These matters will be dealt with in detail through the building certification and approvals process.

6.7 Construction phase

6.7.1 Staging of construction works

The fire-fighter water supply and APZ must be installed at the earliest possible stage of construction.

6.7.2 Fire extinguishers and protection equipment

Fire extinguishers, appropriate to the identified emergency scenario, must be provided at all construction facilities and fitted in construction vehicles and mobile plant.

Fire protection equipment must be provided for any storage of hazardous materials in accordance with *Managing risks of hazardous chemicals in the workplace – Code of Practice* (SWA 2023), applicable safety data sheets, and otherwise in accordance with Queensland *Work Health and Safety Act 2011* and its regulations.

6.7.3 Communications equipment and communications planning

The construction office, vehicles and mobile plant must be fitted with an ultra-high frequency (UHF) radio.

The construction contractor must ensure the following is in place by the time construction commences:

- site personnel are aware of the mitigation measures in this BMP;
- an emergency contact number is available online and is attended to at all times by trained personnel;
- contingency communication systems are in place for the onsite representative of the construction contractor in case of failed telephone communication attempts; and
- a mechanism to provide periodical updates to the local QFES and RFBs and neighbouring landowners as the Project is progressively built.

6.7.4 Restrictions during the fire danger season

QFES restrictions during the fire danger season must be adhered to. These are advertised online at https://www.qfes.qld.gov.au/safety-education/using-fire-outdoors/fire-bans-and-restrictions or can be obtained from the Gladstone area office by calling (07) 4899 2200.

Vehicles and mobile plant and equipment must not be operated or parked in long grass unless fire management controls are in place.

Smoking must be restricted to prescribed areas.

Mobile water carts must be located adjacent to construction work areas during the fire danger season.

6.7.5 Hot works

Hot works must be managed under a hot works permit system.

Hot works and other high fire risk activities, eg the operation of track machinery, must be monitored for ignitions and only performed if fire management controls are in place.

6.7.6 Safety documentation

Construction activities must be governed by safety documentation, including safe work method statements. Activity specific bushfire risk management controls must be identified through the safety documentation. Where required, the safety documentation must be managed through a permit to work system which must provide an additional layer of control around bushfire risk management.

6.7.7 Training

Bushfire awareness training must be provided to the construction workforce. It must cover the topics of fire line safety, appropriate personal protective equipment and clothing, principles of fire behaviour, types of fuel, hazards and precautions, effects of weather and topography on fires and bushfire danger season and responsibilities during a fire emergency.

6.7.8 Emergency management plan

An emergency management plan must be prepared for the construction phase prior to the construction contractor mobilising to site. As a minimum, it must detail the arrangements for managing emergencies, include site details, procedures, resources and training.

6.8 Operational phase

6.8.1 Information transfer

Prior to commencing the operational phase of the Project, spatial data which identifies the location of the Project's infrastructure, access tracks, gates and fire-fighter water supply tank must be provided to the QFES so that it can be uploaded into the QFES online incident management system and is readily available for bushfire emergency planning.

The operational contractor must consult with the QFES to determine the information and data format requirements and the specifics of the data transfer.

6.8.2 Fire-fighter operations plan

Prior to commencing the operational phase of the Project, a fire-fighter operations plan must be prepared for the Project and provided to the local RFBs. It must be in the format of a poster plan that can be rolled out and used in the field.

The fire-fighter operations plan must identify (as a minimum) the location of infrastructure, APZs, access tracks, gates, fire-fighter water supply tank and reference wayfinding signage. It must also include contact and communications information, instructions for operating around electrical infrastructure and operational guidelines for fire control.

6.8.3 Bushfire preparedness activities

Non-fire danger period

Preparedness activities that must be undertaken during the non-fire danger period include:

- service plant, vehicles and fire protection systems and equipment;
- conduct site-wide bushfire preparedness inspections of the APZ, access tracks, fire-fighter water supply, signage and building fire protection systems;
- maintain the APZ, access tracks, fire-fighter water supply, signage and building fire protection systems in accordance with the relevant sections of this BMP;
- facilitate a bushfire preparedness meeting with the local QFES and RFBs and neighbouring landowners; and
- review emergency management plans.

The operational contractor must invite the local QFES and RFBs and neighbouring landowners to participate in an annual bushfire preparedness meeting. The meeting will be used to familiarise these stakeholders with the location of the APZ, access tracks, gates and fire-fighter water supply tank and fittings, communication procedures and safety requirements for operating within the Project area. It will also provide an opportunity to review any bushfire incidents within or adjacent to the site and any plans for hazard reduction burns by the neighbouring landowners. It also provides an opportunity to run a bushfire response training drill with the local QFES and RFBs.

Fire danger period

Preparedness activities that must be undertaken during the fire danger period include:

- monitor the QFES FDRs for the Capricornia region four days in advance at https://www.qfes.qld.gov.au/prepare/bushfire/fire-danger-ratings;
- modify site activities based on elevated FDRs, ie high, extreme and catastrophic;
- conduct weekly inspections of the APZ, access tracks, fire-fighter water supply, signage and building fire protection systems;
- implement travel plans to avoid driving through high and very high potential bushfire intensity areas on days with an extreme or catastrophic FDR.

Modification of site activities must be advised by a site-based risk assessment and may include:

- limiting non-essential activities on days with a high or above FDR;
- limiting travel on days with an extreme or catastrophic FDR;
- postponing planned maintenance;
- include bushfire ignition hazards in job safety risk based management process; and
- communicating modified activities and expectations to site personnel and visitors.

6.8.4 Access rules

Access to the Project area must be conditional on site personnel and visitors completing an induction and complying with entry rules, including rules regarding smoking.

Smoking must only be permitted in cleared areas.

6.8.5 Safety documentation

Activities during the operational phase of the Project must be governed by safety documentation as specified for the construction phase in Section 6.7.6.

6.8.6 High voltage overhead transmission line

Fire-fighting operations near the Powerlink OHTL must be planned and implemented in accordance with the *National Guidelines on Electrical Safety for Emergency Service Personnel* (ENA DOC 008-2006) and Powerlink's instructions.

6.8.7 Emergency management planning

An emergency management plan must be prepared for the operational phase of the Project in accordance with requirements of the *Australian Standard* (AS 3745-2010) *Planning for emergencies in facilities* (Standards Australia 2018).

The emergency management plan must include procedures to be followed in the event of a bushfire warning by the QFES and identify the location of safe assembly/evacuation areas and the access routes to these areas.

In the event of a fire ignition that cannot be safely extinguished with available resources, the following procedure must be followed:

1. Contact the QFES via a 000 call.
2. Notify neighbouring landowners of the fire ignition.
3. Evacuate site personnel and visitors to a safe assembly/evacuation area and account for all site personnel and visitors.
4. Meet the QFES and provide information relevant to the fire emergency.
5. Resume activities when advised by the QFES that it is safe to do so.

6.8.8 Electrical safety

The Project must be operated in compliance with the Queensland *Electrical Safety Act 2002* and its regulations and the electrical safety codes of practice by the Electrical Safety Office of Queensland (ESO 2020a, ESO 2020b and ESO 2021).

Electrical equipment installed to support the operational phase of the Project must be regularly inspected in accordance with the manufacturer's guidance (where this applies) or in accordance with industry best practice.

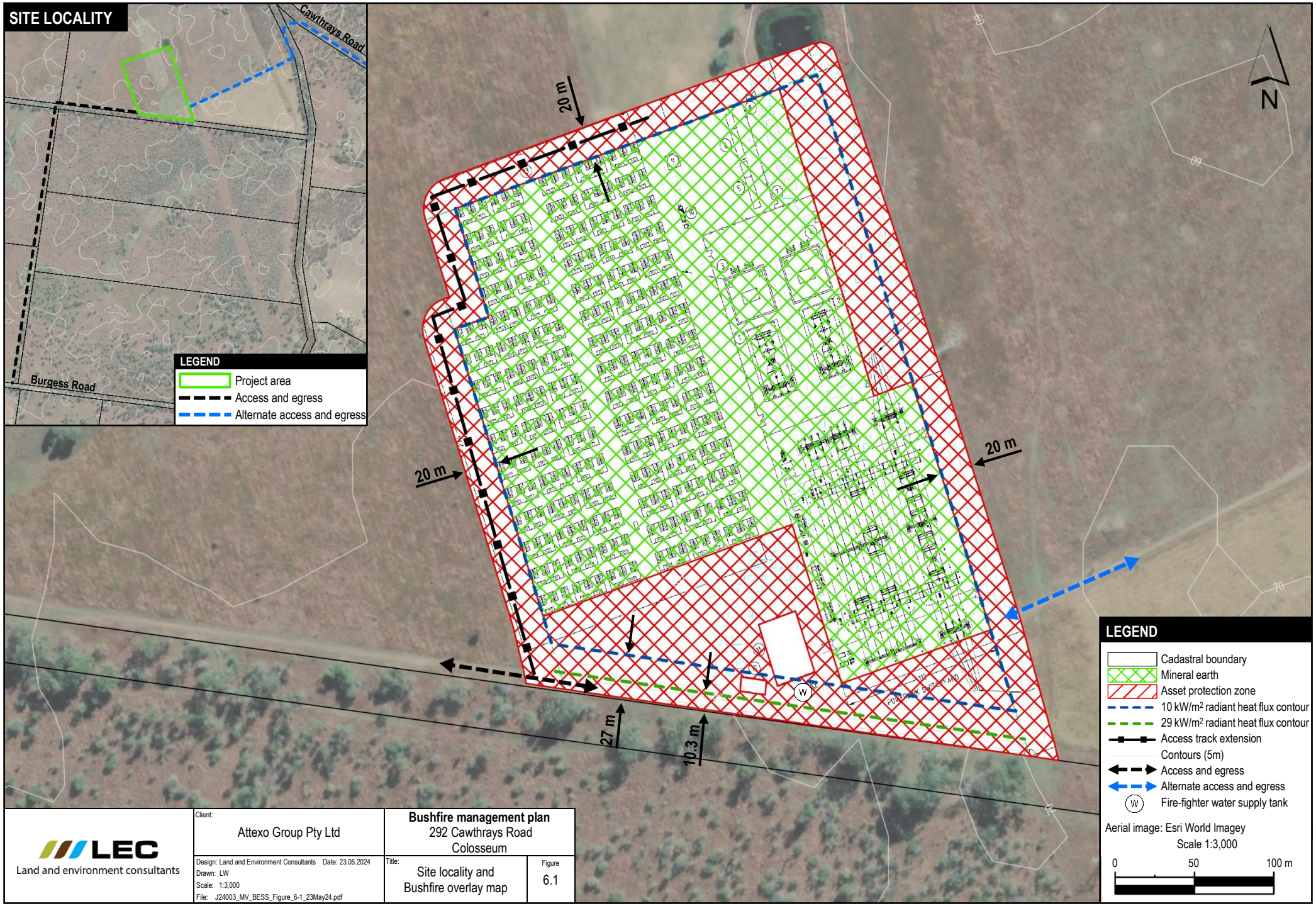
6.8.9 Hazardous materials

Storage or handling of hazardous materials must be in accordance with *Managing risks of hazardous chemicals in the workplace – Code of Practice* (SWA 2023), applicable safety data sheets, and otherwise in accordance with Queensland *Work Health and Safety Act 2011* and its regulations.

6.8.10 Lighting fires

Lighting fires to burn waste is prohibited within the site.

Prescribed burns to achieve fuel hazard reduction or conservation outcomes are permitted within the site subject to compliance with the Queensland *Fire and Emergency Services Act 1990*.



LEC
Land and environment consultants

Client: Attexo Group Pty Ltd

Design: Land and Environment Consultants Date: 23.05.2024
Drawn: LW
Scale: 1:3,000
File: J24003_MV_BESS_Figure_6-1_23May24.pdf

Bushfire management plan
292 Cawthrays Road
Colosseum

Title: Site locality and Bushfire overlay map

Figure 6.1

7 Closing

This BMP was prepared by a suitably qualified person and is in general accordance with the SPP guidance material – bushfire and Bushfire resilient communities.

A bushfire hazard assessment determined the site is affected by bushfire hazard. Therefore, the development application for the Project must demonstrate compliance with the Bushfire hazard overlay code.

Mitigation measures that must be included in the design of the Project and implemented during the construction and operational phases of the Project are specified in Chapter 6. With the implementation of these mitigation measures the development application for the Project is considered to be compliant with the Bushfire hazard overlay code as demonstrated in Appendix 3.

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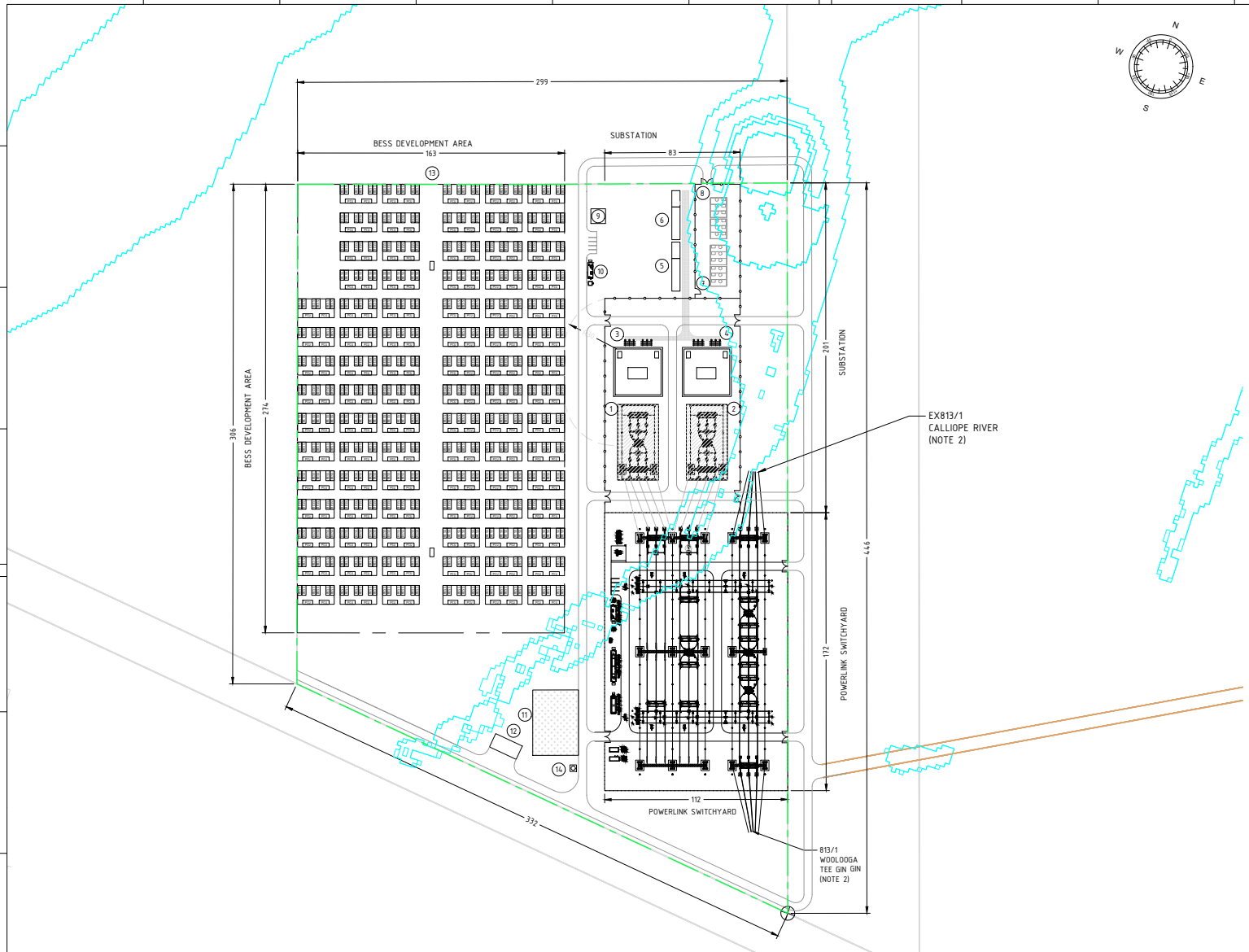
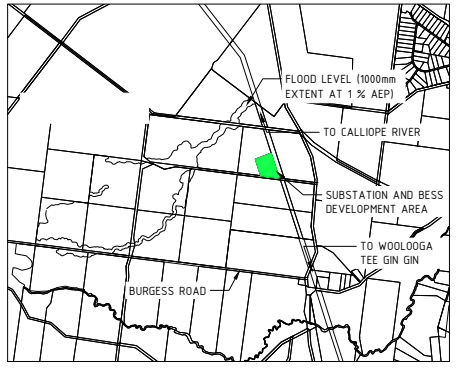
Appendix 1 Layout plan





LOCALITY MAP (SHOWN ORIENTED NORTH)

EQUIPMENT	DESCRIPTION
1	SUBSTATION 1 – 275kV SWITCHGEAR
2	SUBSTATION 2 – 275kV SWITCHGEAR
3	SUBSTATION 1 – TRANSFORMER BUND (30m x 30m)
4	SUBSTATION 2 – TRANSFORMER BUND (30m x 30m)
5	SUBSTATION 1 – 33kV SWITCHROOM AND COMMUNICATIONS
6	SUBSTATION 2 – 33kV SWITCHROOM AND COMMUNICATIONS
7	SUBSTATION 1 – FILTER EQUIPMENT
8	SUBSTATION 2 – FILTER EQUIPMENT
9	ONSITE WORKSHOP/STORAGE SHED (9m x 9m x 4.5m)
10	ABLUTIONS AND SITE OFFICE
11	LAYDOWN AREA (40m X 28m)
12	MAINTENANCE AND STORAGE SHED (9m x 18m x 4.5m)
13	BESS (MINIMUM 500MW/2000MWh-4 HOURS)
14	WATER TANK (10000L CAPACITY)

EQUIPMENT RATINGS (NOTE 8)				
EQUIPMENT	MAKE/MODEL	NAMEPLATE RATING	QTY	TOTAL
BESS	CATL EnerC PLUS	4.073 (MWh)	516	2.10 (GWh)
PCU	SMA SCS 3800 UP-XT	4.4 (MVA)	172	756.80 (MVA)
SUBSTATION 1	TBC	350 MVA (275/33/33 kV)	1	350 (MVA)
SUBSTATION 2	TBC	350 MVA (275/33/33 kV)	1	350 (MVA)

LEGEND	
	FLOOD LEVEL (100mm EXTENT AT 0.5% AEP)
	SUBSTATION AND BESS DEVELOPMENT AREA
	EXISTING ACCESS – CAWTHRAYS ROAD

NOTES:
1. CONCEPT DESIGN ONLY. SUBJECT TO CHANGE.
2. REFER TO POWERLINK DRAWING A0-H-154691-002 FOR POWERLINK SUBSTATION DETAILS.
3. REFER TO 980-007-L-001 FOR THE OVERALL SITE LAYOUT.
4. REFER TO 980-007-E-001 FOR THE ELECTRICAL SLD.
5. SUBSTATION AND BESS DEVELOPMENT AREA = 11.3ha
6. SUBSTATION AND BESS DEVELOPMENT AREA TO REQUIRE EARTHWORKS TO MAINTAIN CLEARANCE FROM IDENTIFIED FLOOD LEVELS.
7. BESS LAYOUT SUBJECT TO DESIGN INPUT FROM OEM FOR ACCESS/CLEARANCE REQUIREMENTS.
8. EQUIPMENT RATINGS SUBJECT TO DETAILED DESIGN VERIFICATION.

PRELIMINARY
NOT FOR CONSTRUCTION

DRAWING No	REFERENCE DRAWINGS	No.	BY	DATE	REVISION DETAILS	DES	CHK	Client
		E	MIS	16.04.24	UPDATED TRANSFORMER RATINGS	AYS	MWD	
		D	MIS	15.04.24	UPDATED BESS AND PCU QTY	AYS	MWD	
		C	MIS	09.04.24	UPDATED BESS LAYOUT	AYS	MWD	
		B	MIS	21.02.24	UPDATED BESS DETAILS	AYS	MWD	
		A	HM	06.02.24	PRELIMINARY ISSUE ONLY	AYS	BVM	

	BY	DATE
CLIENT		
DESIGN CHECKED	BVM	06.02.24
DESIGNED	AYS	06.02.24
DRAWN	HM	06.02.24

QGE Pty Ltd
ABN 57 144 928 030
www.qge.com.au

privateenergy PARTNERS

MIRIAM VALE BESS

BURGESS ROAD, COLOSSEUM QLD 4677
COUNCIL DA
SUBSTATION AND BESS LAYOUT

980-007-L-009

SCALE 1:1250 | SIZE A1

DRAWING TO DRAFTING STANDARD AS1100.101

REV E

Appendix 2 Radiant heat exposure assessment

Bushfire attack through VHC 9.2 regrowth

- Forest fire danger index - 53
- Vegetation - VHC 9.2 *Moist to dry eucalypt woodland on coastal lowlands and ranges*
- Understorey fuel load – 14.9 tonnes/hectare (**t/ha**)
- Total fuel load – 17.2 t/ha
- Effective slope – 2° slope
- Site slope – 0° slope
- Flame width – 100 metres
- Flame temperature – 1,090 Kelvin (**K**)

Note Inputs used for the radiant heat exposure assessment are in accordance with Section 7.3 of *Bushfire Resilient Communities Technical Reference Guide for the State Planning Policy State Interest 'Natural Hazards, Risk and Resilience – Bushfire 2019* (**Bushfire resilient communities**).

FLAMESOL
FPA AUSTRALIA

Calculated April 9, 2024, 9:28 am (MDc v.4.9)

J24003

Minimum Distance Calculator - AS3959-2018 (Method 2)			
Inputs		Outputs	
Fire Danger Index	53	Rate of spread	1.08 km/h
Vegetation classification	Woodland	Flame length	9.130000000000001 m
Understorey fuel load	14.9 t/ha	Flame angle	54 °, 64 °, 72 °, 77 °, 79 ° & 84 °
Total fuel load	17.2 t/ha	Elevation of receiver	3.69 m, 4.1 m, 4.34 m, 4.45 m, 4.48 m & 4.54 m
Vegetation height	n/a	Fire intensity	9,667 kW/m
Effective slope	2 °	Transmissivity	0.883, 0.869, 0.849, 0.827, 0.8139999999999999 & 0.743
Site slope	0 °	Viewfactor	0.5928, 0.4382, 0.2939, 0.1982, 0.1613 & 0.0441
Flame width	100 m	Minimum distance to < 40 kW/m²	7.6 m
Windspeed	n/a	Minimum distance to < 29 kW/m²	10.3 m
Heat of combustion	18,600 kJ/kg	Minimum distance to < 19 kW/m²	15.3 m
Flame temperature	1,090 K	Minimum distance to < 12.5 kW/m²	22.4 m
		Minimum distance to < 10 kW/m²	27 m

Rate of Spread - Mcarthur, 1973 & Noble et al., 1980

Flame length - NSW Rural Fire Service, 2001 & Noble et al., 1980

Elevation of receiver - Douglas & Tan, 2005

Flame angle - Douglas & Tan, 2005

Radiant heat flux - Drysdale, 1999, Sullivan et al., 2003, Douglas & Tan, 2005

Bushfire attack through VHC 40.4

- Forest fire danger index – 53
- Grass fire danger index (calculated) - 75
- Vegetation - VHC 40.4 *Continuous low grass or tree cover*
- Understorey fuel load – 4.5 t/ha
- Total fuel load – 5 t/ha
- Effective slope – 1° slope
- Site slope – 0° slope
- Flame width – 100 metres
- Flame temperature – 1,090 Kelvin (**K**)

Note Inputs used for the radiant heat exposure assessment are in accordance with Section 7.3 of Bushfire resilient communities.

FLAMESOL
FPA AUSTRALIA

Calculated April 9, 2024, 9:29 am (MDc v.4.9)

J24003

Minimum Distance Calculator - AS3959-2018 (Method 2)			
Inputs		Outputs	
Grassland Fire Danger Index	75	Rate of spread	10.44 km/h
Vegetation classification	Grassland	Flame length	6.19 m
Understorey fuel load	4.5 t/ha	Flame angle	54 °, 64 °, 73 °, 78 °, 80 ° & 85 °
Total fuel load	5.0 t/ha	Elevation of receiver	2.5 m, 2.78 m, 2.96 m, 3.02 m, 3.04 m & 3.08 m
Vegetation height	n/a	Fire intensity	26,986 kW/m
Effective slope	1 °	Transmissivity	0.889, 0.879, 0.864, 0.846, 0.834 & 0.76
Site slope	0 °	Viewfactor	0.584, 0.4296, 0.2884, 0.1938, 0.1573 & 0.0432
Flame width	100 m	Minimum distance to < 40 kW/m²	5.2 m
Windspeed	n/a	Minimum distance to < 29 kW/m²	7.1 m
Heat of combustion	18,600 kJ/kg	Minimum distance to < 19 kW/m²	10.6 m
Flame temperature	1,090 K	Minimum distance to < 12.5 kW/m²	15.7 m
		Minimum distance to < 10 kW/m²	19.3 m

Rate of Spread - Noble et al. 1980

Flame length - Purton, 1982

Elevation of receiver - Douglas & Tan, 2005

Flame angle - Douglas & Tan, 2005

Radiant heat flux - Drysdale, 1999, Sullivan et al., 2003, Douglas & Tan, 2005

Appendix 3 Bushfire hazard overlay code assessment

8.2.4 Bushfire hazard

8.2.4.1 Application

This code applies to development where the code is identified as applicable in the table of assessment for the bushfire hazard overlay code. When using this code, reference should be made to section 5.3.2 and where applicable, section 5.3.3 located in Part 5.

8.2.4.2 Purpose

1. The purpose of the bushfire hazard overlay code is to ensure that:

   Note—Relationship with the building assessment provisions. For the building assessment provisions, the bushfire prone area defined by this planning scheme under map is also designated to be the bushfire prone area for the BCA or QDC pursuant to section 12 of the Building Regulation 2006.

   a. The risks to life, property, community, economic activity and the environment during uncontrolled bushfire events are minimised.
   b. Development does not increase the potential for bushfire damage or risk on–site or to other property.
2. The purpose of the code will be achieved through the following overall outcomes:
   a. Development is compatible with the nature of the bushfire hazard except where there is an overriding need for the development in the public interest and no other site is suitable and reasonably available for the proposal.
   b. Development siting, layout, design and access minimises the risks to personal safety, and damage to property, infrastructure and other assets.
   c. Development directly, indirectly and cumulatively avoids an unacceptable increase in severity of bushfires and does not increase the potential for damage on the site or to other properties.
   d. The potential for the release of hazardous material as a result of a bushfire event is avoided.
   e. Evacuation and disaster management response including firefighting and access for emergency services during bushfire events is facilitated.
   f. Community infrastructure is located and designed to function effectively at all times.

8.2.4.3 Assessment benchmarks

Table 8.2.4.3.1—Accepted development subject to requirements and assessable development

Performance outcomes	Acceptable outcomes	Comments
Site suitability		
PO1 Development maintains the safety of people and property by not exposing them to an unacceptable risk from bushfire. Note—A site specific bushfire hazard assessment may demonstrate that the site is not within a bushfire hazard area or has a low degree of bushfire risk.	No acceptable outcome is nominated.	**Complies with PO1** A bushfire management plan (**BMP**) has been prepared for the Miriam Vale battery energy storage system (**the Project**) and demonstrates how the development application for the Project will comply with this Bushfire hazard overlay code. The bushfire hazard assessment and radiant heat exposure assessment in the BMP has been undertaken in accordance with *Bushfire Resilient Communities Technical Reference Guide for the State Planning Policy State Interest 'Natural Hazards, Risk and Resilience – Bushfire' 2019* (**Bushfire resilient communities**), which was prepared by the Queensland Fire and Emergency Services to provide technical guidance for the implementation of *Natural Hazards, Risk and Resilience – Bushfire,*

Performance outcomes	Acceptable outcomes	Comments
		State Planning Policy State Interest guidance material 2019. The BMP also considers guidelines for battery energy storage systems by the Australasian Fire and Emergency Services Authorities Council in *Incidents involving PV array and battery energy storage systems 2020.*
PO2 Development does not result in a higher concentration of people living, working or congregating in a high or very high bushfire hazard area unless it can be demonstrated: a. there is an overriding community need in the public interest, and b. no other site is suitable and reasonably available. Note—A 'medium, high or very high bushfire risk hazard area' means land mapped on the bushfire overlay map as having medium, high or very high potential bushfire risk.	**AO2** The following uses are not located on land within a confirmed medium, high or very high bushfire hazard area: a. child care facility b. community care centre c. educational establishment d. hostel e. hospital f. multiple dwelling g. non–resident workforce accommodation h. residential care facility i. retirement facility	**Complies with AO2** The Project does not involve the land uses identified in AO2a-m.

Performance outcomes	Acceptable outcomes	Comments
	j. shopping centre k. short–term accommodation l. tourist attraction m. tourist park.	
Water supply		
PO3 Development in areas with a reticulated water supply has adequate flow and pressure for fire–fighting purposes at all times.	**AO3** The water supply network has a minimum sustained pressure and flow of at least 10L per second at 200kPa.	**PO3 and AO3 are not applicable** The Project is not in a reticulated water supply area.
PO4 Development in areas without a reticulated water supply has an appropriate dedicated water supply for fire–fighting purposes that are safely located and freely accessible for fire–fighting purposes at all times.	**AO4.1** Development involving a gross floor area greater than 50m2 where a reticulated water supply is not available is: a. provided with an easily accessible fire resistant on–site water storage of not less than 5,000L (e.g. concrete tank with fire brigade fittings, in–ground swimming pool, dam fed by a	**Complies with PO4** The BMP identifies the Project will have a water storage tank for the purpose of bushfire fighting. Section 6.5 of the BMP provides specifications for the water storage tank (which are based on AO4.1) and its proposed location is identified in Figure 6.1 of the BMP.

Performance outcomes	Acceptable outcomes	Comments
	permanent water source) that is within 100m of each class 1, 2, 3, or 4 building, and b. has a hard standing area allowing a heavy rigid fire appliance safe access to within 6m of the storage facility. Note—Plastic water tanks are not considered to be fire resistant unless they are submerged.	
	AO4.2 The location of water supplies is readily identifiable from the street frontage with clear signage directing firefighters to its access point.	**Complies with AO4.2** Section 6.5 of the BMP requires the water storage tank to be identified with reflective wayfinding signage.
Roads, fire access trails and firebreaks		
PO5 Roads and fire access trails are designed and constructed to:	**AO5.1** Roads and fire access trails are designed and constructed to:	**Complies with P05**

Performance outcomes	Acceptable outcomes	Comments
a. enable efficient access to buildings and structures for fire–fighting purposes for emergency services, and b. swift evacuation in emergency situations.	a. separate the development from the hazardous vegetation b. have a maximum gradient of 12.5% c. a minimum cleared width of 6m and a minimum formed width of 4m d. have adequate drainage and erosion control devices e. provides passing and turning areas for fire–fighting appliances at intervals of not less than 200m f. have a vehicular access at each end to roads or a bushfire trail g. not involve any cul–de–sac h. have gates locked with a system authorised by QFES, and i. have suitable arrangements in place to ensure maintenance in perpetuity.	The Project includes a vehicle access track around the perimeter of the BESS, switching station and substation. Vehicle access tracks are designed for rural fire trucks and are specified in Section 6.4 of the BMP. The specifications are based on compliance with the minimum requirements for a category 1 fire-fighter vehicle by the New South Wales (**NSW**) Rural Fire Service. This specification has been used in lieu of specifications in the various Queensland guidelines because the NSW guidelines are well defined and documented and practical to implement.
	AO5.2 Development has direct access to an evacuation route with a potential fire intensity exposure no greater than 2kw/m2.	**Complies with AO5.2** The access and egress for the Project is via existing public roads, ie Burgess Road with alternate access via Cawthrays Road.

Performance outcomes	Acceptable outcomes	Comments
	Note—The distance from hazardous vegetation to achieve 2kw/m2 is generally: • 58m in a very high bushfire hazard areas • 52m in a high bushfire hazard area, and • 44 m in a medium bushfire hazard area.	
	AO5.3 Development incorporates an area of managed vegetation that separates lot boundaries from hazardous vegetation by a distance of: a. 20m to a high or very high bushfire risk area, or b. 10 to a medium risk bushfire area and includes a fire access trail.	**Complies with AO5.3** Radiant heat exposure modelling has been used to advise the width of the asset protection zone (**APZ**). It has been designed to separate the BESS, switching station and substation from hazardous vegetation by a distance which achieves a radiant heat flux level ≤ 10 kilowatts/square metre (**kW/m^2**). Access tracks are located within the APZ.
PO6	No acceptable outcome is nominated.	**Complies with PO6**

Performance outcomes	Acceptable outcomes	Comments
Development provides for adequate fire breaks that minimise bushfire hazard by: a. separating hazardous vegetation from development areas, and b. facilitating access for firefighting and emergency vehicles.		Section 6.1 of the BMP requires an APZ to be established around the BESS, switching station and substation. An access track will be located within the APZ.
Hazardous materials		
PO7 The potential for the release of hazardous materials as a result of a bushfire event is avoided. Note—The term 'hazardous material' is defined in the Glossary of the relevant State Planning Policy.	**AO7** Development involving the production or storage of hazardous materials in bulk: a. is not located within a high or very high bushfire hazard area, or b. complies with a site specific bushfire management plan	**Complies with PO7** The Project involves hazardous materials, ie batteries within the BESS, that are present at levels or in quantities that would constitute the use being a hazardous chemical/materials facility. In accordance with guidance in Bushfire resilient communities, the Project includes an APZ which is designed to provide a separation distance from hazardous vegetation which achieves a radiant heat

Performance outcomes	Acceptable outcomes	Comments
		flux level ≤ 10 kWm^2 at the perimeter of the battery storage area. The battery storage area will also be located on a mineral earth surface. The BMP also requires the storage or handling of hazardous materials to be in accordance with *Managing risks of hazardous chemicals in the workplace – Code of Practice 2023*, applicable safety data sheets, and otherwise in accordance with Queensland *Work Health and Safety Act 2011* and its regulations.
Reconfiguration of a lot		
PO8 Additional lots avoid the risk of bushfire hazard to personal and property safety and increased risk of damage to assets. Note—A site specific bushfire hazard assessment may demonstrate that the site is not within a bushfire hazard area or has a low degree of bushfire risk. Any	**AO8** New residential lots (including rear lots) do not occur in a bushfire hazard area.	**PO8 is not applicable** The Project does not involve the reconfiguration of a lot.

Performance outcomes	Acceptable outcomes	Comments
site specific bushfire assessment should be carried out in accordance with the method set out in Appendix 3 of *State Planning Policy 1/03 Guideline Mitigating the adverse impacts of Flood, Bushfire and Landslide*.		
Community infrastructure		
PO9 Development for community infrastructure is located, designed and sited to: a. protect the safety of people during a bushfire b. not increase the exposure of people to the risk from a bushfire event, and c. function effectively during and immediately after bushfire events.	No acceptable outcome is nominated	**Complies with PO9** In accordance with guidance in Bushire resilient communities, the Project includes an APZ which is designed to provide a separation distance from hazardous vegetation which achieves a radiant heat flux level ≤ 10 kWm^2 at the perimeter of the BESS, switching station and substation. The APZ will be complimented by compliance with *National Construction Code - Building Code of Australia 2022* and *Queensland Development Code 2021* requirements and the other mitigation measures specified in Chapter 6 of the BMP.