

Bushfire Hazard Assessment Bushfire Management Report

Project No:	B6111
Address:	213-221 Mountain Ridge Rd South Maclean QLD 4280
Lot Plan:	Lot 19 RP 143361
Local Government Area:	Logan City Council
Proposed Development:	Telecommunication facility
Asset Protection Zone:	Designed APZ
Radiant Heat Flux:	Less than 29 kW/m ²

Document History

Version	Description	Date	Author	Approved by
1.0	Report - Draft	17/02/2026	HL	HL
2.0	Report - Final	26/02/2026	HL	HL
2.1	Report - Final	6/03/2026	HL	HL

Report Expiry

Please be aware that the bushfire hazard assessment and BAL rating provided in this report are valid for 12 months from the date of issuance. It is advisable to consult with a qualified professional to confirm the accuracy of the assessment if this report is more than 12 months old. If any discrepancies are identified or if an update is necessary, a new report should be obtained.

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Practitioner Declaration

Name:	Henry (Hongxi) Liang
Position:	Senior Bushfire Consultant
I hereby certify that I have undertaken the assessment of the above-mentioned site and determined the Bushfire Attack Level stated above in accordance with the requirements of AS 3959:2018 and/or the Bushfire Resilient Communities - Technical Reference Guide published by Queensland Fire and Emergency Services. I hereby declare that I am a suitably qualified bushfire consultant, holding AQF Level 8 qualifications and tertiary degrees below: ▪ Graduate Diploma Bushfire Protection ▪ Graduate Certificate in Bushfire Protection ▪ Master of Business Administration ▪ Bachelor in Engineering	
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Acronyms and Abbreviations

APZ	Asset Protection Zone
AEP	Annual Exceedance Probability
AS 3959:2018	Australian Standard 3959:2018 Construction of Buildings in Bushfire-Prone Areas (This Standard incorporates Amendment No. 1 (June 2019) and Amendment No. 2 (December 2020))
BCA	Building Code of Australia
BPA	Bushfire Prone Area
BMP	Bushfire Management Plan
BVG	Broad Vegetation Group
FDI	Fire Danger Index
FFDI	Forest Fire Danger Index
FWS	Fire Weather Severity
IMS	Interactive Mapping System
LMP	Landscape Management Plan
MCU	Material Change of Use
NCC	National Construction Code
QFES	Queensland Fire and Emergency Services
RH	Relative Humidity
RAL/ROL	Reconfigure A Lot/Reconfiguration of Lot
SPP	State Planning Policy 2017
SPP map input data	Statewide Map of Bushfire Prone Areas Input Data E.G. FFDI (5% AEP), Maximum Landscape and Vegetation Hazard Class
VHC	Vegetation Hazard Class
VMP	Vegetation Management Plan

Executive Summary

Project No:	B6111
Type of bushfire assessment:	Site-specific bushfire hazard assessment Bushfire management plan
Location:	213-221 Mountain Ridge Rd South Maclean QLD 4280 Lot 19 RP 143361
Site area:	20,090 sqm
Local Government Area:	Logan City Council
Client(s):	BMM Group Pty Ltd
Proposed Development:	Telecommunication facility
Site plan by:	The Client(s)
Asset Protection Zone:	Designed APZ
Radiant Heat Flux:	Less than 29 kW/m ²
Bushfire Overlay Cod Compliance	Comply

1. Introduction

1.1 Purpose

Max Bushfire Protection Consulting was engaged by the client(s) to conduct a site-specific bushfire hazard assessment for the proposed development on the subject site.

The objective of this report is to assess the potential bushfire hazard and related risks concerning the proposed development, aligning with several regulatory frameworks such as the Queensland State Government State Planning Policy - Part E (SPP 2017), the Bushfire Resilient Communities Technical Reference Guide (QFES, 2019), the local council planning scheme - bushfire hazard overlay code, and the Australian Standard – Construction in Bushfire Prone Areas (AS 3959:2018). These guidelines delineate the State and Council's concerns regarding bushfire hazard within the context of evaluating development applications.

The development shall be carried out on the lot referred to as the 'Subject Site'.

1.2 Subject site

- Site Address: 213-221 Mountain Ridge Rd South Maclean QLD 4280
- Lot Plan: Lot 19 RP 143361
- Site Area: 20,090 sqm

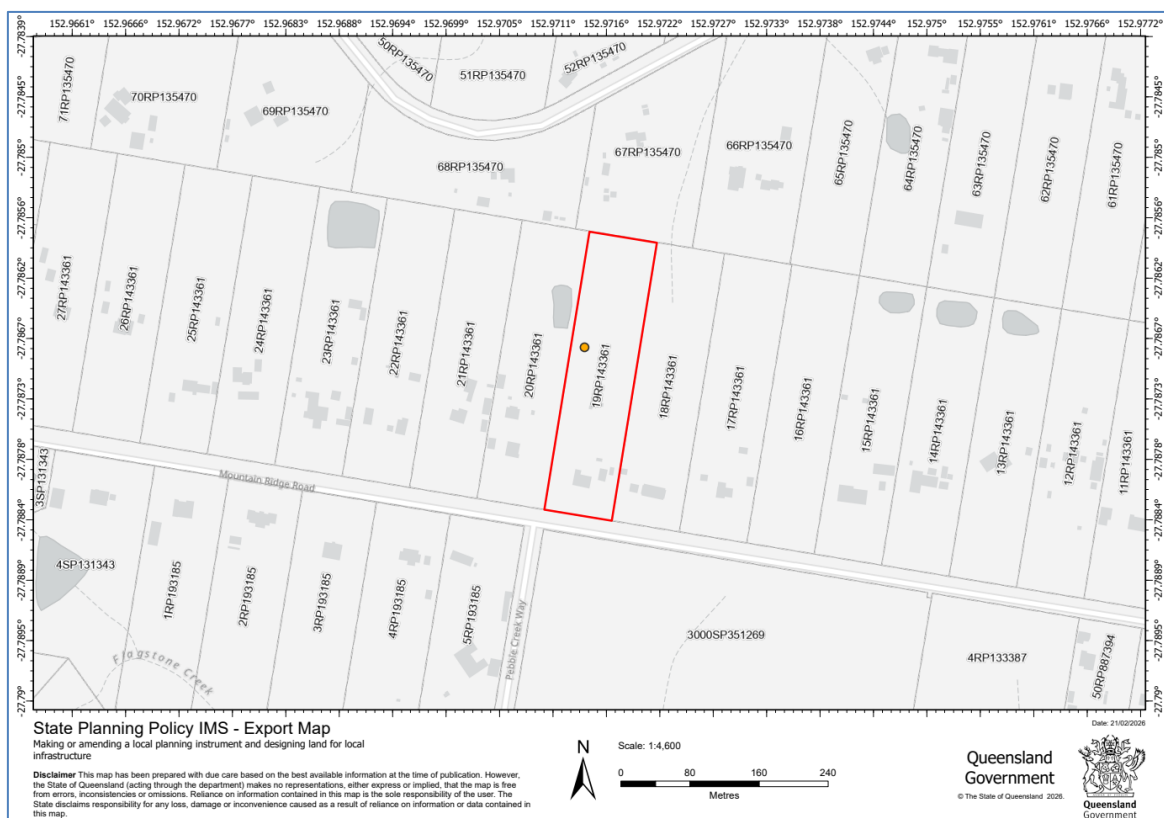


Figure 1-1: Subject Site

1.3 The proposed development

The proposed development comprises the construction of an unmanned Telecommunication facility (mobile network Wi-Fi tower), consisting of the tower structure only with no on-site staff and no building presence.

1.4 Bushfire Prone Land

The Council's designation of land as "bushfire prone" carries two primary consequences:

- It mandates the formulation of a Bushfire Management Plan that conforms to the specifications delineated in the Planning Scheme. This includes strict adherence to the Bushfire Overlay Code stipulated within the planning scheme.
- It activates the application of the Building Code of Australia (BCA) and the National Construction Code (NCC), necessitating compliance with their performance objectives pertaining to bushfire mitigation. Furthermore, adherence to AS 3959:2018, which governs the construction of buildings in bushfire-prone regions, is imperative.

1.5 Scope and objectives

The scope and objectives of this assessment are to:

- Identify bushfire-related risk factors linked to the positioning of the development footprint. This includes the probable direction of bushfire attack, hazard ratings associated with existing and proposed vegetation on and around the subject site, and planning separation from potential hazards.
- Recommend suitable protective measures to alleviate the risk posed by the assessed BAL in alignment with the State Planning Policy (SPP 2017), AS 3959:2018, and the Bushfire Hazard Overlay Code of the Council Planning Scheme.
- Prepare a comprehensive site-specific bushfire management plan and conduct an assessment of compliance with the Bushfire Hazard Overlay Code to illustrate how adherence can be attained.

2. Assessment Methodology

2.1 Assessment and Legislative

Assessment and legislative review were conducted to identify overlay mapping and requirements under the SPP 2017 and Logan City Council planning scheme. The review included:

- Planning Act 2016 (Planning Act)
 - Planning Regulation 2017 (Planning Regulation)
 - State Planning Policy (SPP 2017) mapping
 - State Assessment and Referral Agency (SARA) mapping (Department of Infrastructure, Local Government and Planning)
- Logan City Council Planning Scheme
 - Bushfire Hazard Overlay Code
 - Planning Scheme interactive mapping
- Queensland FIRE and Emergency Services
 - Catalyst interactive mapping
- Building Act 1975 (Building Act)
- National Construction Code 2022: Building Code of Australia (NCC 2022)
- AS 3959:2018 Construction of Buildings in Bushfire-Prone Areas

2.2 Bushfire Hazard Assessment

A site-specific bushfire hazard assessment aims to identify and understand the bushfire hazards on the site. The site's vegetation and terrain characteristics were surveyed using a complete site examination, aerial photography, accessible databases, and relevant mapping. The site-specific assessment included:

- Recording the structure, composition, and condition of vegetation communities located in the development footprint and all land within 100m of the development footprint, extending to 150m-300m where necessary.
- Assessing site slope and effective slope.
- Determining the aspect of the site.
- Identifying waterway and wetland features within the assessment area.
- Calculating potential fire line intensity and Radiant Heat Flux.

Bushfire Hazard Assessment and subsequent BAL review were conducted in accordance with the Bushfire Resilient Communities Technical Reference Guide for the State Planning Policy State Interest 'Natural Hazards, Risk and Resilience – Bushfire' (QFES 2019), which was prepared by the Queensland Fire and Emergency Services to provide technical guidance for the SPP 2017 guidance material. The method involves a quantitative assessment of the vegetation communities, fuel loads, slope, and other relevant factors.

2.3 Bushfire Attack Level Assessment

The determination of the site-specific Bushfire Attack Level (BAL) for the development footprint and classified vegetation was undertaken in accordance with the Bushfire Resilient Communities – SPP Technical Reference Guide and AS 3959:2018. This includes the identification of the following input values:

- FFDI (5% AEP fire weather event)
- Vegetation hazard class, surface and overall fuel load
- Site slope, effective slope, and whether the effective slope is upslope or downslope of the development
- Distance of the development footprint from classified vegetation

Radiant heat exposure was calculated using the Bushfire Asset Protection Zone calculator provided by the Sustainable Development Unit of Queensland Fire and Emergency Services and/or the AS 3959:2018 Method 2 Calculator.

AS 3959:2018 defines the Bushfire Attack Level as a method for measuring the severity of a building's potential exposure to ember attack, radiant heat, and direct flame contact, using increments of radiant heat expressed in kilowatts per square meter. This method serves as the basis for establishing construction requirements to improve the protection of building elements from bushfire attack. Consequently, the assessment results and accompanying BAL construction requirements only apply to proposed buildings or structures, not the entire development area.

3. Legislative Context

The following key legislation, policies and guidelines are relevant to the preparation of bushfire assessment:

- State Planning Policy (July 2017, QLD)
- National Construction Code 2022
- AS 3959:2018 Construction of Buildings in Bushfire-Prone Areas
- Local Council Planning Scheme
- Planning Act 2016 (Planning Act) and Building Act 1975 (Building Act)

3.1 State Planning Policy (July 2017)

Supporting the Planning Act 2016 (Planning Act) (Qld), the purpose of the SPP is to guide State and Local government in land-use planning and development by defining the Queensland Government's policies about matters of state interest, to which there are 17 state interests arranged under five broad themes:

- liveable communities and housing
- Economic growth
- Environment and heritage
- Safety and resilience to hazards
- Infrastructure

The SPP Interactive Mapping System includes bushfire hazard area (bushfire prone area) mapping based on the methodologies outlined in Leonard et al. (2014). Under the safety and resilience to hazards theme, the state's interest is to ensure that natural hazards are properly considered in all levels of the planning system. This includes the avoidance of natural hazard areas or the mitigation of risks to an acceptable or tolerable level. The SPP is supported by the SPP – State Interest Guideline – Natural Hazards, Risk and Resilience (April 2016), Technical Manual – Evaluation Report: Bushfire Hazards (April 2016), and Technical Manual – A 'Fit for Purpose' Approach in Undertaking Natural Hazard Studies and Risk Assessments (April 2016) by the Department of Infrastructure, Local Government and Planning. These documents identify the outcomes sought by the state and their application when planning development within a bushfire hazard area (bushfire prone area).

3.2 National Construction Code 2022: Building Code of Australia

The National Construction Code 2022: Building Code of Australia (NCC 2022) sets out technical requirements for the design and construction of buildings and other structures in Australia (The Australian Building Codes Board). NCC 2022 defines ten core building classes, along with various subclasses. It mandates that buildings constructed within designated bushfire prone areas must be designed and constructed to minimize the risk of ignition from bushfires.

3.3 AS 3959:2018 Construction of Buildings in Bushfire-Prone Area

Where development is proposed in designated bushfire prone areas, AS 3959:2018 provides construction requirements designed to enhance resistance against bushfire attack. These construction specifications are determined by specific heat flux exposure thresholds and are categorized into six Bushfire Attack Levels (BAL):

Bushfire Attack Level (BAL)	Radiant Heat Exposure (AS3959:2018)	Description of Predicted Bushfire Attack and Levels of exposures
BAL – Low	Insignificant	Minimal attack from radiant heat and flame due to the distance of the building from the vegetation, although some attack by burning debris is possible. There is insufficient threat to warrant specific construction requirements
BAL - 12.5	0 to 12.5kW/m ²	Attack by burning debris is significant with radiant heat (not greater than 12.5kW/m ²). Radiant heat is unlikely to threaten building elements (such as unscreened glass). Specific construction requirements for ember protection and accumulation of debris are warranted.
BAL - 19	12.5 to 19kW/m ²	Attack by burning debris is significant with radiant heat flux (not greater than 19kW/m ²) threatening some building elements (such as screened glass). Specific construction requirements for embers and radiant heat are warranted.
BAL – 29	19 to 29kW/m ²	Attack by burning debris is significant and radiant heat flux (not greater than 29kW/m ²) threatens building integrity. Specific construction requirements for ember and higher levels of radiant heat are warranted. Some flame contact is possible.
BAL – 40	29 to 40kW/m ²	Radiant heat flux and potential flame contact could threaten building integrity.
BAL - FZ	40kW/m ² plus (Flame Contact)	Significant radiant heat and significantly higher likelihood of flame contact from the fire front will threaten building integrity and result in significant risk to residents.

Table 1: AS3959:2018 Using BAL to determine construction requirements

3.4 Logan City Council Planning Scheme

Relevant bushfire provisions of the Council's Planning Scheme reflect SPP State and Local level interests by identifying designated bushfire prone areas. Where assessable development is proposed on land mapped as containing bushfire hazard areas, a site-specific bushfire hazard assessment prepared in accordance with the planning scheme is required.

4. Bushfire Hazard Assessment

Several factors determine the likelihood and severity of bushfires in a landscape. Key factors include the type of vegetation and the amount of available fuel. Other considerations are topography and land use patterns around potentially hazardous vegetation. Additionally, connectivity between vegetation communities can influence the development and persistence of bushfires.

4.1 Current Bushfire Hazard Mapping

A review of the Bushfire Hazard Overlay Mapping indicates that the site contains bushfire hazard areas, as shown in Figure 4-1.

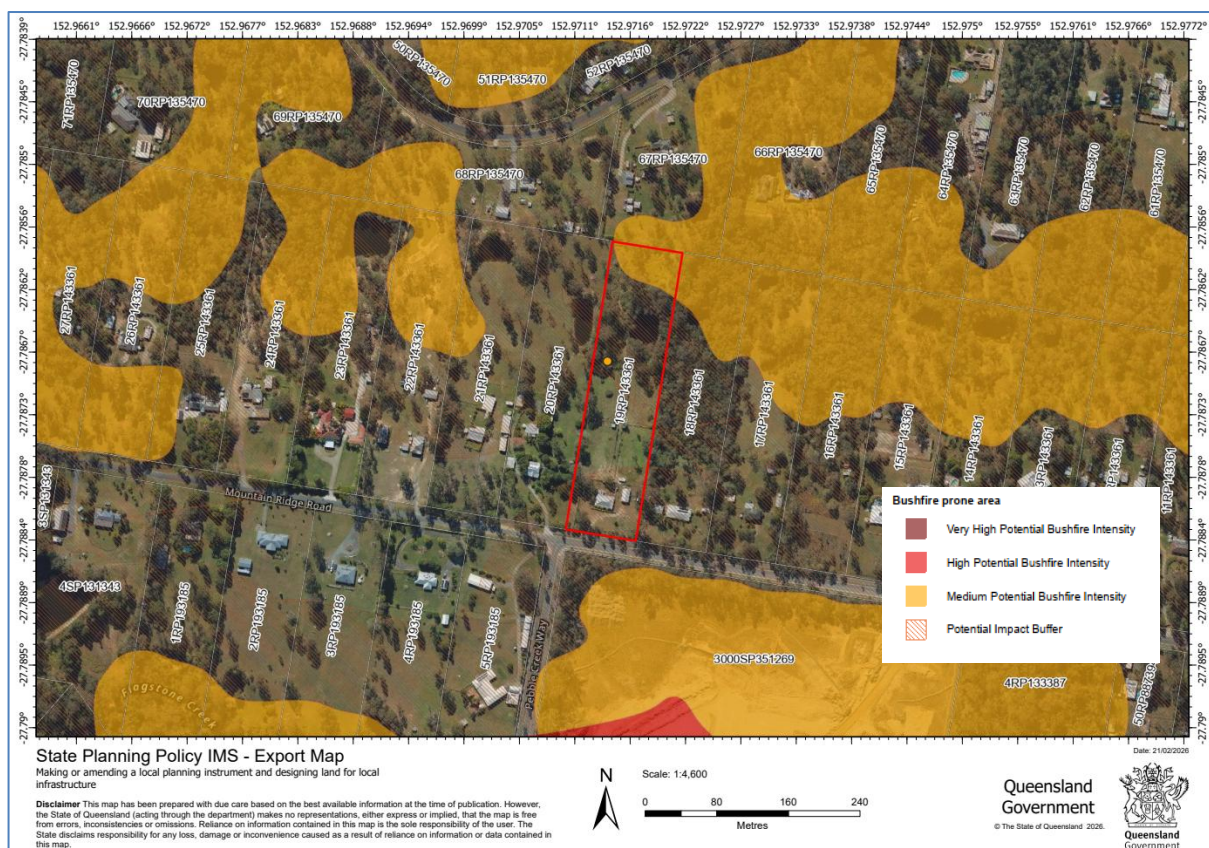


Figure 4-1: Bushfire Hazard Overlay Mapping

4.2 Local FFDI

The fire season in Queensland typically begins in the far north in July, advancing southward by spring and occasionally lasting until February in southern and far south-western regions. These timeframes vary annually due to fuel loads, long-term climate patterns, and short-term weather conditions, differing from other Australian states. In the far north and the northwest, warm, dry winters and springs, with dead grasses and dry fuels, heighten bushfire risks. In the south, the greatest danger follows dry winters and springs, with severe conditions arising when low-pressure

systems bring strong, hot, dry westerly winds to coastal areas. The season ends with the arrival of moist conditions, often influenced by tropical cyclones near the coast.

The Forest Fire Danger Index (FFDI) evaluates the likelihood of fire ignition, its propagation rate, intensity, and the difficulties encountered during suppression, amalgamating factors like air temperature, relative humidity, wind speed, and drought effects. This assessment is accessible through state mappings, revealing an annual exceedance probability FFDI of 56 at a 5% probability level for the subject site. Fire Danger Ratings (FDR) are determined by forecasted weather conditions, particularly the FFDI, offering insight into the level of bushfire threat on a given day. This FFDI corresponds to a high FDR, indicating hot, dry, and windy conditions. Under such circumstances, the ignition and spread of fires may present significant challenges for containment, especially in areas with extensive bushland vegetation.

4.3 Fire History

Fire history information from QFES reveals that between 2015 and 2025, there were no recorded fires within a 1-kilometer radius of the location. Both the historical fire data and observations of fire scars suggest that it has been a substantial amount of time since the site was last exposed to a large-scale fire event. However, it is important to note that while this information does not guarantee the site will remain free from future fires, the likelihood of such events occurring appears to be decreasing due to the surrounding residential and commercial land development patterns.

4.4 Site-Specific Hazard Assessment

This Site-Specific Bushfire Hazard Assessment draws upon several key references and sources, including:

- Vegetation Hazard Classification and Potential Fire-line Intensity for Queensland, as outlined in "A new methodology for state-wide mapping of bushfire-prone areas in Queensland" by CSIRO, Australia (2014).
- The Bushfire Resilient Communities Technical Reference Guide (QFES, 2019).
- The Bushfire Attack Level (BAL), Building setback requirements, and Construction Standards as specified in the Australian Standard AS3959:2018 Construction of buildings in bushfire-prone areas.
- Bushfire Risk Mitigation Measures aligned with current industry best-practice assessment methodologies and compliance with Council's Planning Scheme.

This assessment will utilize factors such as vegetation composition and extent, slope, and industry-standard fuel load calculations to determine the potential bushfire hazard affecting the proposed development. Furthermore, this Bushfire Management

Plan (BMP) will ensure compliance with the Council's Bushfire Overlay Code in relation to the proposed development.

The assessment involved an analysis of the site and its immediate 100 m radius surroundings to determine the typical bushfire risk characteristics. It included the application of Vegetation Hazard Classifications to vegetation located within 100 m of the site. Where necessary, it was expanded to cover an additional area ranging from 150 to 300 m.

According to AS3959:2018, the following vegetation shall be excluded from a BAL assessment, which is considered as low threat vegetation and/or non-vegetation areas:

- Vegetation of any type that is more than 100m from the site.
- Single areas of vegetation less than 1 ha in area and not within 100 m of other areas of vegetation being classified vegetation.
- Multiple areas of vegetation less than 0.25 ha in area and not within 20 m of the site, or each other or of other areas of vegetation being classified vegetation.
- Strips of vegetation less than 20 m in width (measured perpendicular to the elevation exposed to the strip of vegetation) regardless of length and not within 20 m of the site or each other, or other areas of vegetation being classified vegetation.
- Non-vegetated areas, that is, areas permanently cleared of vegetation, including waterways, exposed beaches, roads, footpaths, buildings and rocky outcrops.
- Vegetation regarded as low threat due to factors such as flammability, moisture content or fuel load. This includes grassland managed in a minimal fuel condition, mangroves and other saline wetlands, maintained lawns, golf courses (such as playing areas and fairways), maintained public reserves and parklands, sporting fields, vineyards, orchards, banana plantations, market gardens (and other non-curing crops), cultivated gardens, commercial nurseries, nature strips and windbreaks.

The assessment also takes into account the small and or isolated patches and corridor filtering process of Bushfire Resilient Communities:

- Sub-hectare areas of continuous fuel (i.e. surrounded by either no fuel or non-continuous fuel) those are further than 100 metres from any other continuous fuel greater than two hectares.
- Downgrade the effective fuel load of continuous vegetation patches measuring (a) 1 to 2 hectares (by 66 per cent), and (b) 2-3 hectares patches (by 50 per cent) if the patch is surrounded by either non-continuous fuel or a low-hazard vegetation or land use type, and if the patch is further than 100 metres from any other continuous-fuel vegetation patch greater than two hectares.

- Remove narrow corridors and areas of continuous fuel < 50 m in width that are not sufficiently wide to support a fully developed flame front.
- Small fragments are removed because of the varied quality of the vegetation mapping inputs.

It is noted that the client is actively undertaking vegetation management activities on the site, including the removal of invasive weeds, thinning of overgrown vegetation, and general landscape and property maintenance.

4.4.1 Ground Truthed VHC

The locations of site assessment plots are shown on Figure 4-2. Table 2 presents a summary of observations and the features of site assessment points.

Aspect	Assessment Plot	Mapped VHC	Ground Truthed VHC
North	A	VHC 10.1 Spotted gum dominated open forests	VHC 10.1 Spotted gum dominated open forests
East	B	VHC 10.1 Spotted gum dominated open forests	VHC 10.1 Spotted gum dominated open forests
South	C	VHC 40.4 Continuous low grass or tree cover	VHC 40.4 Continuous low grass or tree cover
West	D	VHC 40.4 Continuous low grass or tree cover	VHC 40.4 Continuous low grass or tree cover

Table2: Ground truthed VHC

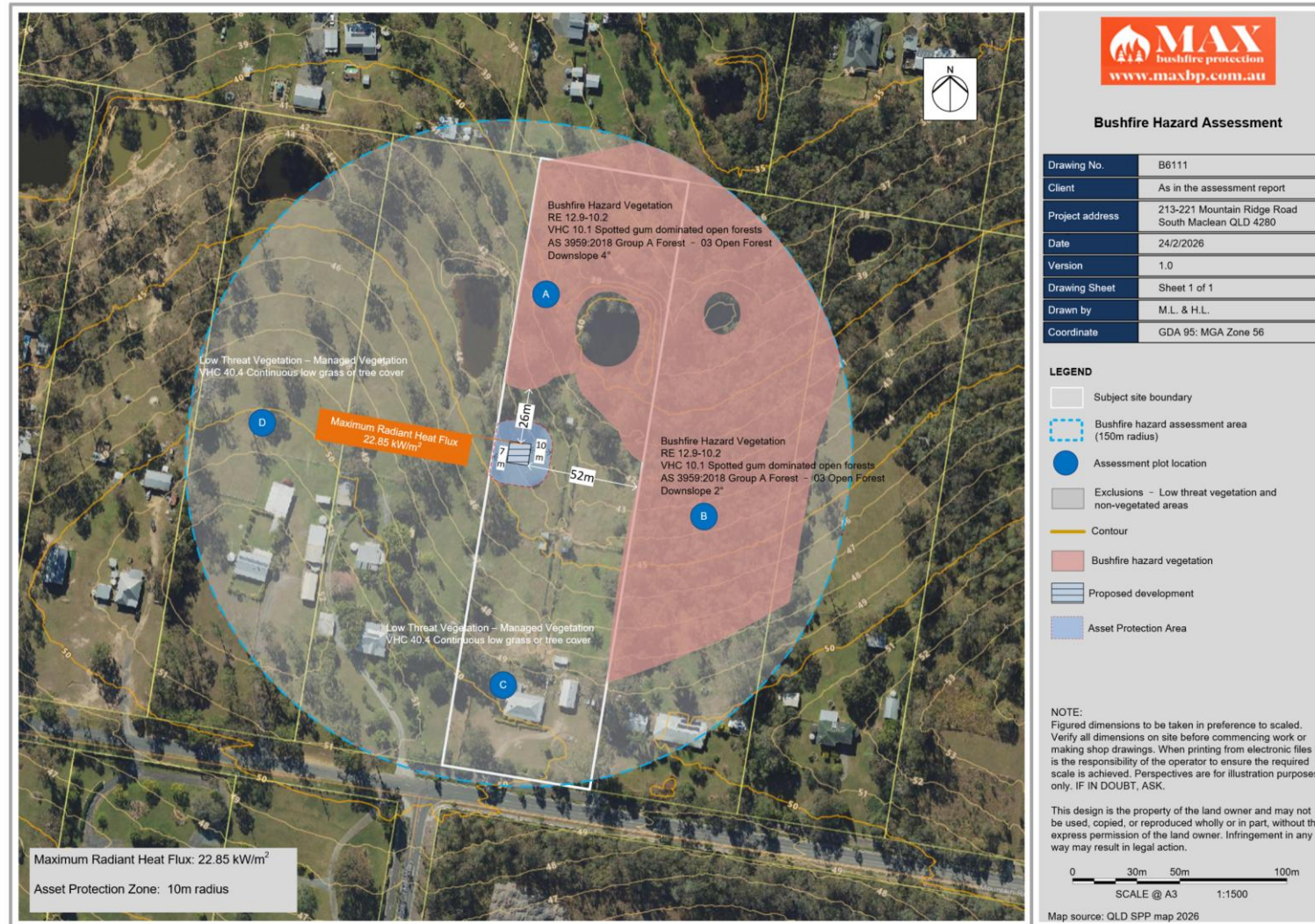


Figure 4-2: Ground truthed VHC and local Bushfire Prone Area map

▪ Classified vegetation conditions to North and East

Land at assessment plot A and B, a large continuous unmanaged hazardous vegetation patch VHC 10.1 Spotted gum dominated open forests was found approximately 26m from the proposed development area to the north and 52m to the east, where the designed Asset Protection Zone is applied. This vegetation patch may contain RE 12.9-10.2 *Corymbia citriodora* subsp. *variegata* +/- *Eucalyptus crebra* open forest on sedimentary rocks. Limited regular maintenance activities have been carried out in this area.

Trees ranging from 10m to 30m in height, characterized by foliage cover 30% to 70%, are typically dominated by eucalypts. The understorey is sclerophyllous, comprising small trees, tall scrubs, or tall shrubs with hard leaves and short internodes. A diverse range of weeds and invasive plant species, including weedy grasses and Lantana, is widespread across the area, occurring under conditions varying from sparse to moderately dense. The predominant tree canopy reaches a height of approximately 25m.

The potential fuel load of the bushfire hazard vegetation patch is determined as following:

Vegetation context	VHC 10.1 with RE 12.9-10.2
Vegetation structure	Open Forest
AS3959:2018 Classification of vegetation	Group A Forest – Open Forest 03
Effective slope under the hazardous vegetation	Downslope 4° North Downslope 2° East
Slope Between Site and hazardous vegetation	Downslope 4° North Downslope 2° East
Surface fuel load	16.3 t/ha
Near-surface fuel load	3.0 t/ha
Elevated fuel load	1.5 t/ha
Bark fuel load	0.0 t/ha
Total fuel load	20.8 t/ha

Table 3: Potential fuel load

▪ Low hazard conditions to South and West

Ground truthed VHC to the north and the south presents the characters VHC 39.2 Low to moderate tree cover in built-up areas. The area comprises managed gardens, residential houses, well-maintained lawns, and paddocks, with trees regularly

trimmed, mowing, slashing, and weed removal conducted to minimize fuel load. As a result, it is classified as managed vegetation with a low bushfire hazard.

Rural residential properties with landscaped gardens and paddocks under regular maintenance, managed gardens and lawns are present within the curtilage of residential houses and roads in this area, which is categorized as managed vegetation. The groundcovers are regularly maintained, shrubs are removed and trimmed frequently, maintaining in low-fuel condition.

■ Vegetation Conditions within the proposed development

Within the proposed development area and the designed Asset Protection Zone, vegetation conditions will be consistently maintained in a low-fuel state, aligning with the characteristics of VHC 40.4 Continuous low grass or tree cover.

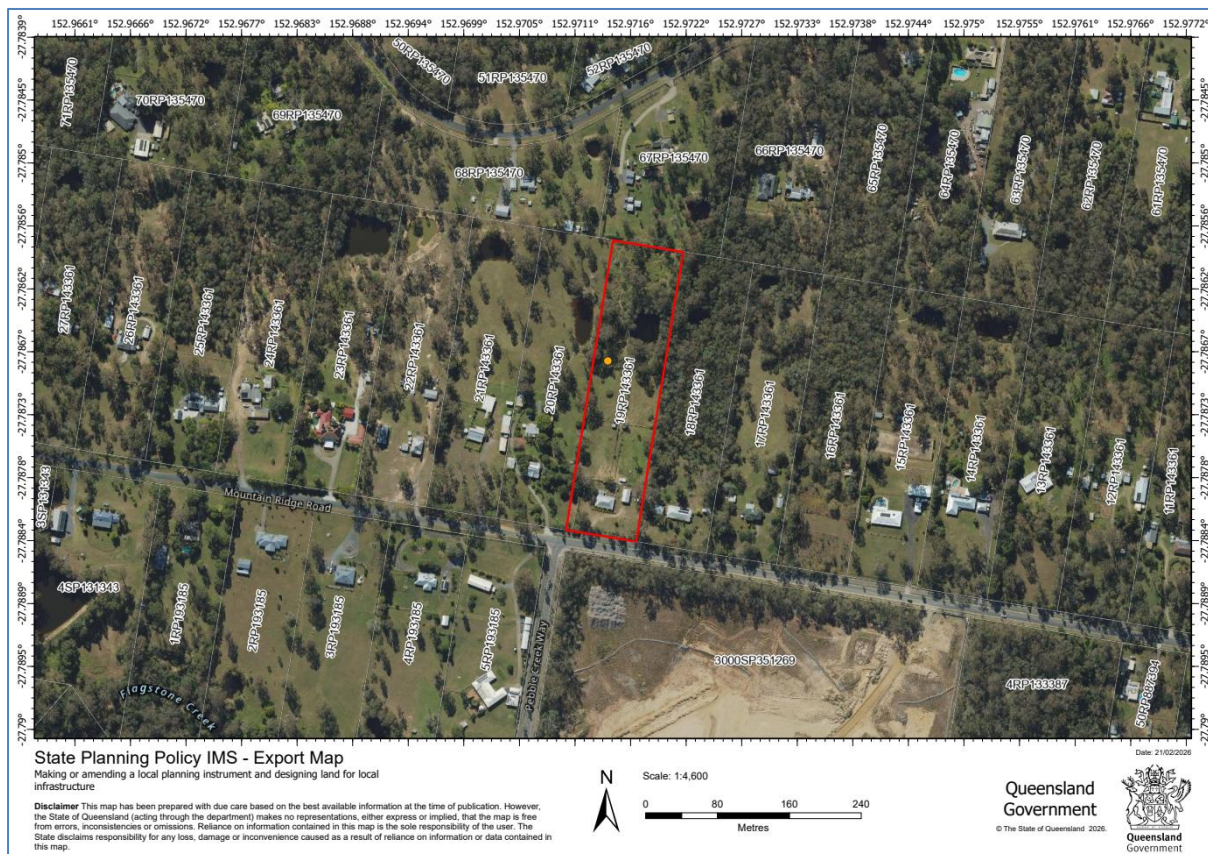


Figure 4-3: Aerial view providing landscape context for the site (Sourced from QLD SPP mapping, captured 09/2025)

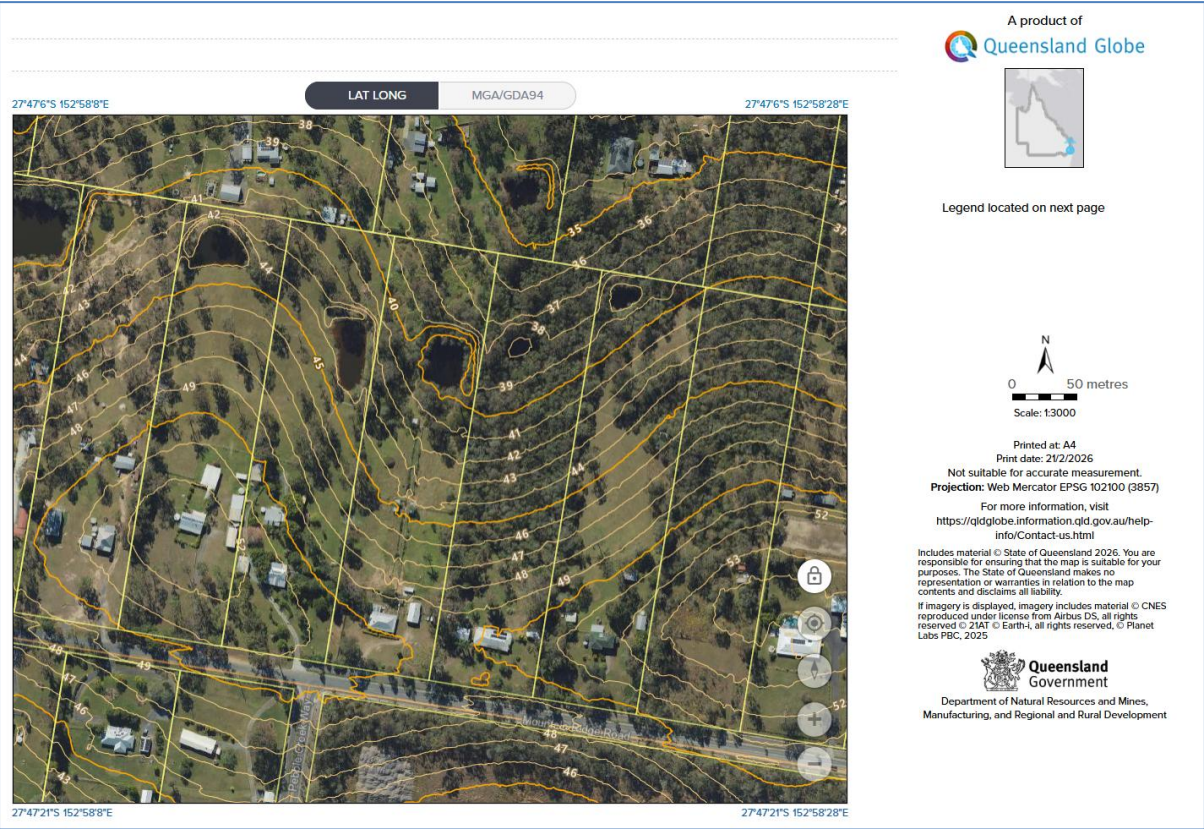


Figure 4-4: 1m interval contour map (Sourced from Queensland Globe mapping, captured 09/2025)

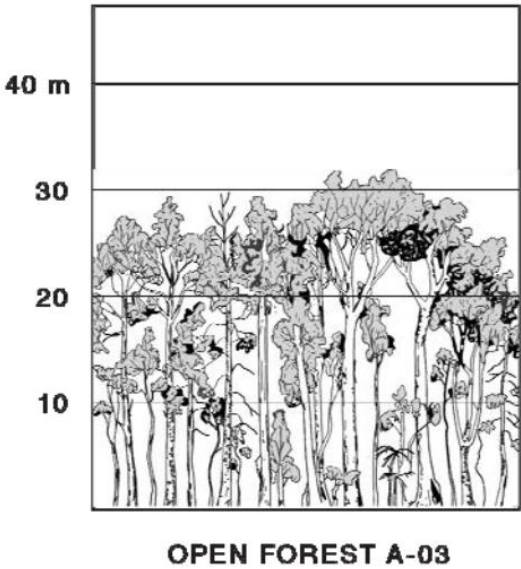


Figure 4-5: AS 3959:2018 Classification of vegetation – Open Forest A-03

Regional ecosystem details for 12.9-10.2

Regional ecosystem	12.9-10.2	Fire management guidelines SEASON: Summer to winter. INTENSITY: Low to moderate. INTERVAL: 4-25 years. INTERVAL_MIN: 4. INTERVAL_MAX: 25. STRATEGY: Aim for 40-60% mosaic burn. Burn with soil moisture and with a spot ignition strategy so that a patchwork of burnt/unburnt country is achieved. Variability in season and fire intensity is important. ISSUES: The fire regime should maintain a mosaic of grassy and shrubby understoreys. Control of weeds (e.g., Lantana camara, asparagus fern Asparagus africanus, balloon cotton-bush Gomphocarpus physocarpus) with fire might be required. There is evidence that the spiral leaf Macrozamia (e.g. M. parcifolia) decline in health if fire interval is greater than 6 years.
Vegetation Management Act class	Least concern	
Wetlands	Not a Wetland	
Biodiversity status	No concern at present	
Subregion	2, 7, 8, (5), (1), (10), (11.18), (6), (11.31), (3)	
Estimated extent ¹	Pre-clearing 220000 ha; Remnant 2021 86000 ha	
Short description	Corymbia citriodora subsp. variegata +/- Eucalyptus crebra open forest on sedimentary rocks	 Condition class 2 Mature, some disturbance e.g. grazing, burning - Tree canopy cover: 40-60%; Tree height: 17-20 m - Tree subcanopy cover: 10-20%; Tree subcanopy height: 7-11 m - Native shrub cover: 2-5% - Large trees: 2-3 eucalypts > 40 cm DBH - Coarse Woody Debris: 30-50 m total length - Species richness: Trees 3-5; Shrubs 3-6; Grass 3-6; Forbs and other 8-12 - Ground cover: Perennial grass cover 10-20%; Organic litter cover 30-45% - Non-native plant species: 2-15% cover - Regeneration: 2-3 tree species in regeneration phase  Condition class 3 Advanced regrowth or moderate disturbance e.g. grazing, clearing - Tree canopy cover: 15-40%; Tree height: 10-18 m - Tree subcanopy cover: 5-20%; Tree subcanopy height: 3-7 m - Native shrub cover: < 2% or > 25% - Large trees: < 2 eucalypts > 40 cm DBH - Coarse Woody Debris: 15-30 m or > 100 m total length - Species richness: Trees < 3; Shrubs < 3; Grass < 3; Forbs and other 5-8 - Ground cover: Perennial grass cover < 10% or > 50%; Organic litter cover 10-30% - Non-native plant species: 15-25% cover - Regeneration: 1-2 tree species in regeneration phase  Condition class 4 Cleared, some regrowth or high disturbance e.g. fire, grazing, weeds - Tree canopy cover: < 15%; Tree height: 2-10 m - Tree subcanopy cover: 0-5%; Tree subcanopy height: 2-3 m - Native shrub cover: < 2% or > 25% - Large trees: < 2 eucalypt trees > 40 cm DBH - Coarse Woody Debris: < 15 m total length or > 100 m total length - Species richness: Trees < 3; Shrubs < 3; Grass < 3; Forbs and other < 5 - Ground cover: Perennial grass cover < 10% or > 50%; Organic litter cover < 10% - Non-native plant species: > 25% cover - Regeneration: < 2 tree species in regeneration phase
Structure code	Open Forest	
Description	Corymbia citriodora subsp. variegata open forest or woodland usually with Eucalyptus crebra. Other species such as Eucalyptus tereticornis, E. moluccana, E. acmenoides and E. siderophloia may be present in scattered patches or in low densities. Understorey can be grassy or shrubby. Shrubby understorey of Lophostemon confertus (whipstick form) often present in northern parts of bioregion. Occurs on Cainozoic and Mesozoic sediments. Not a Wetland. (BVG1M: 10b).	

Figure 4-6: Ecological Condition Profile of RE 12.11.5

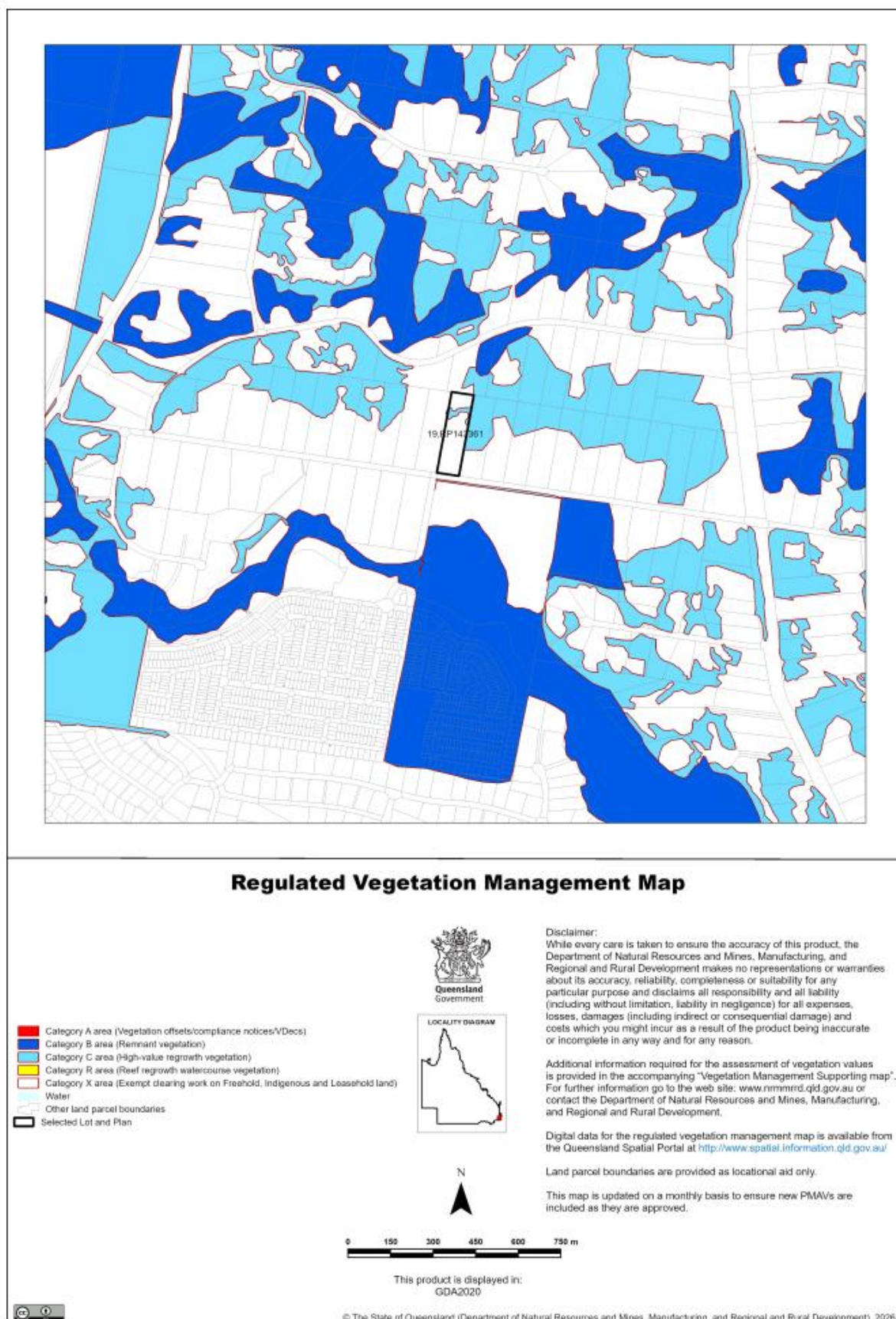


Figure 4-7 Regulated vegetation management map (sourced from Vegetation management report, Department of Resources, 2025)

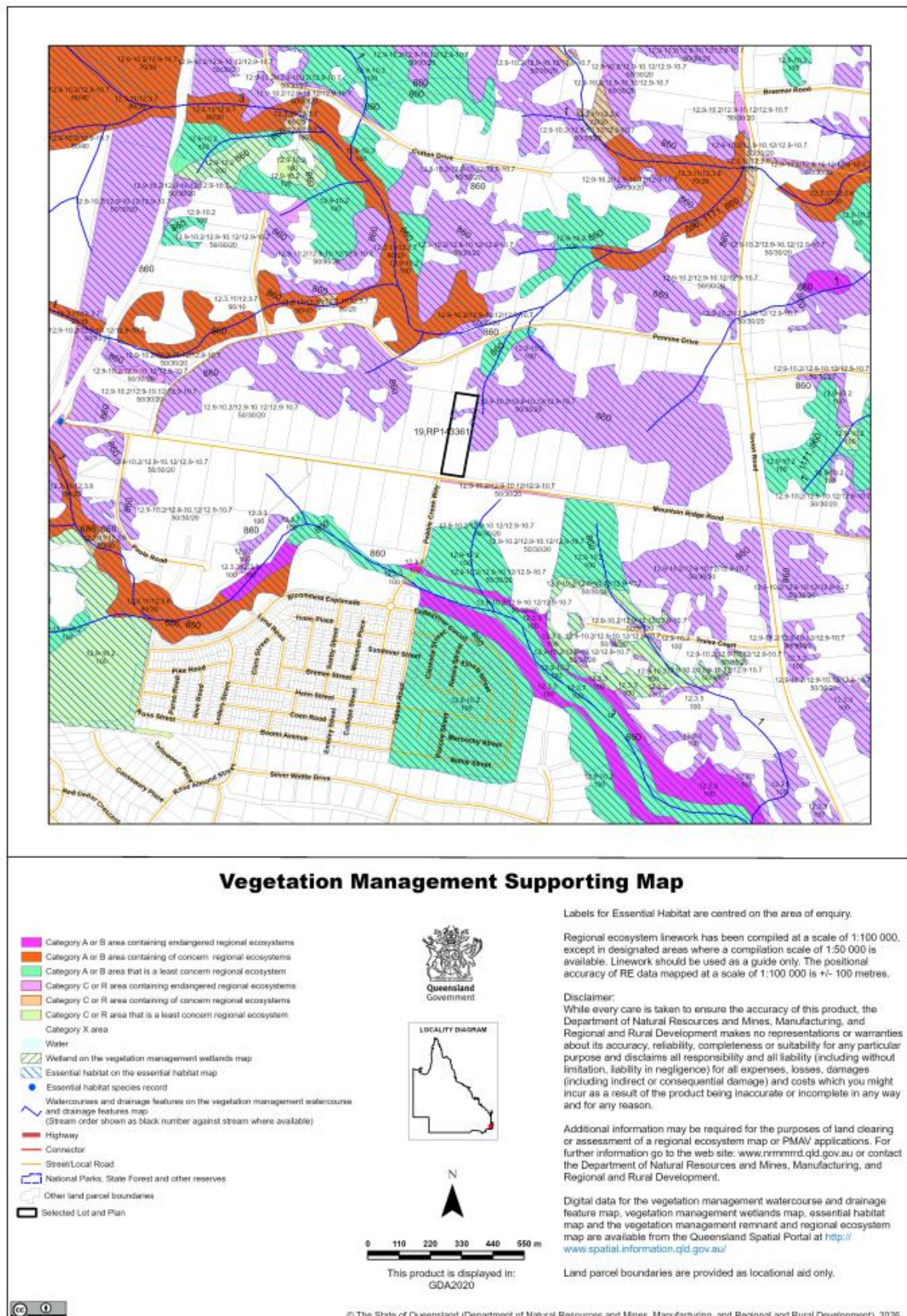


Figure 4-8: Vegetation Management Support Map providing RE context on the site (sourced from Vegetation management report, Department of Resources, 2025)

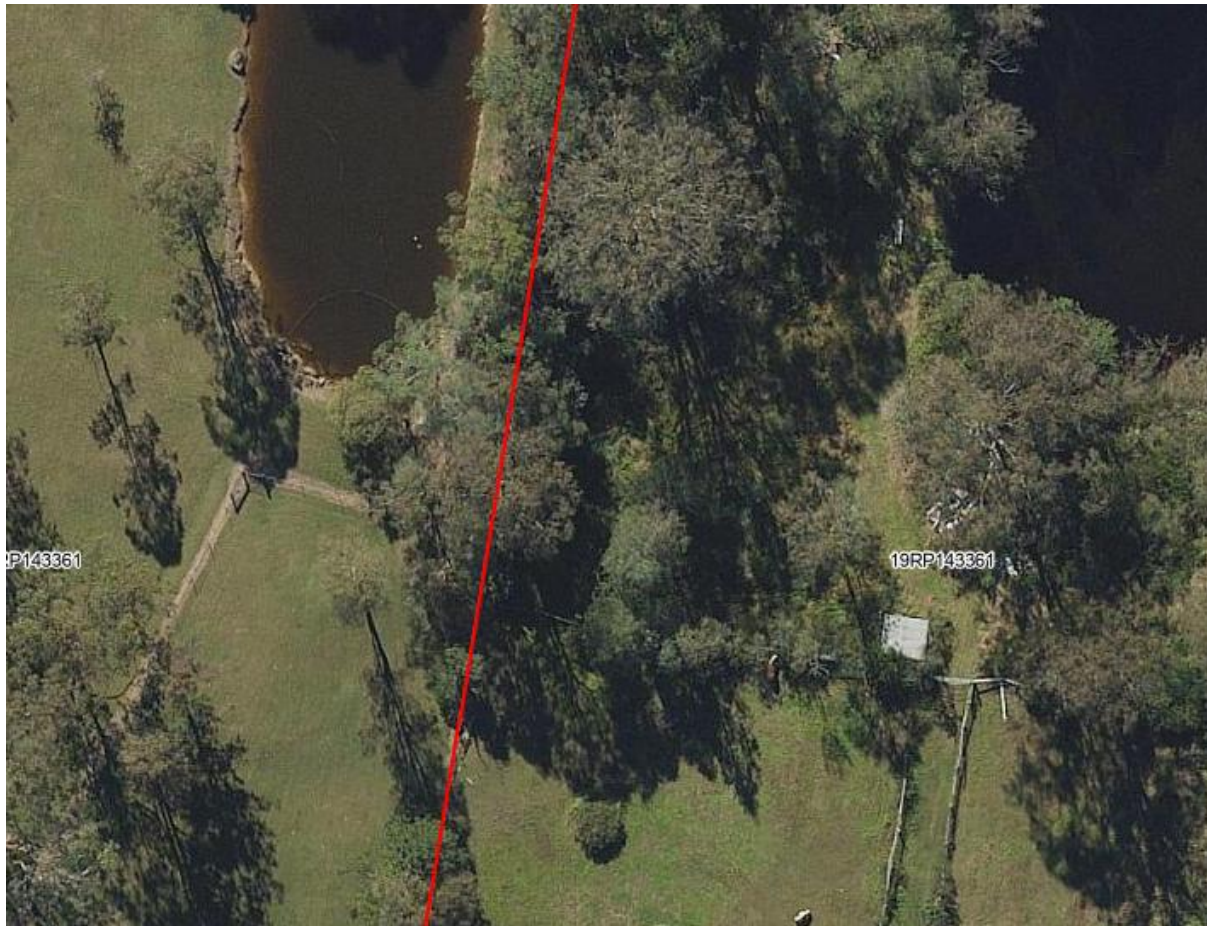


Photo 1: The proposed development area



Photo 2: Site entrance from Mountain Ridge Rd





Photo 3: Bushfire hazard vegetation VHC 10.1 to north and east



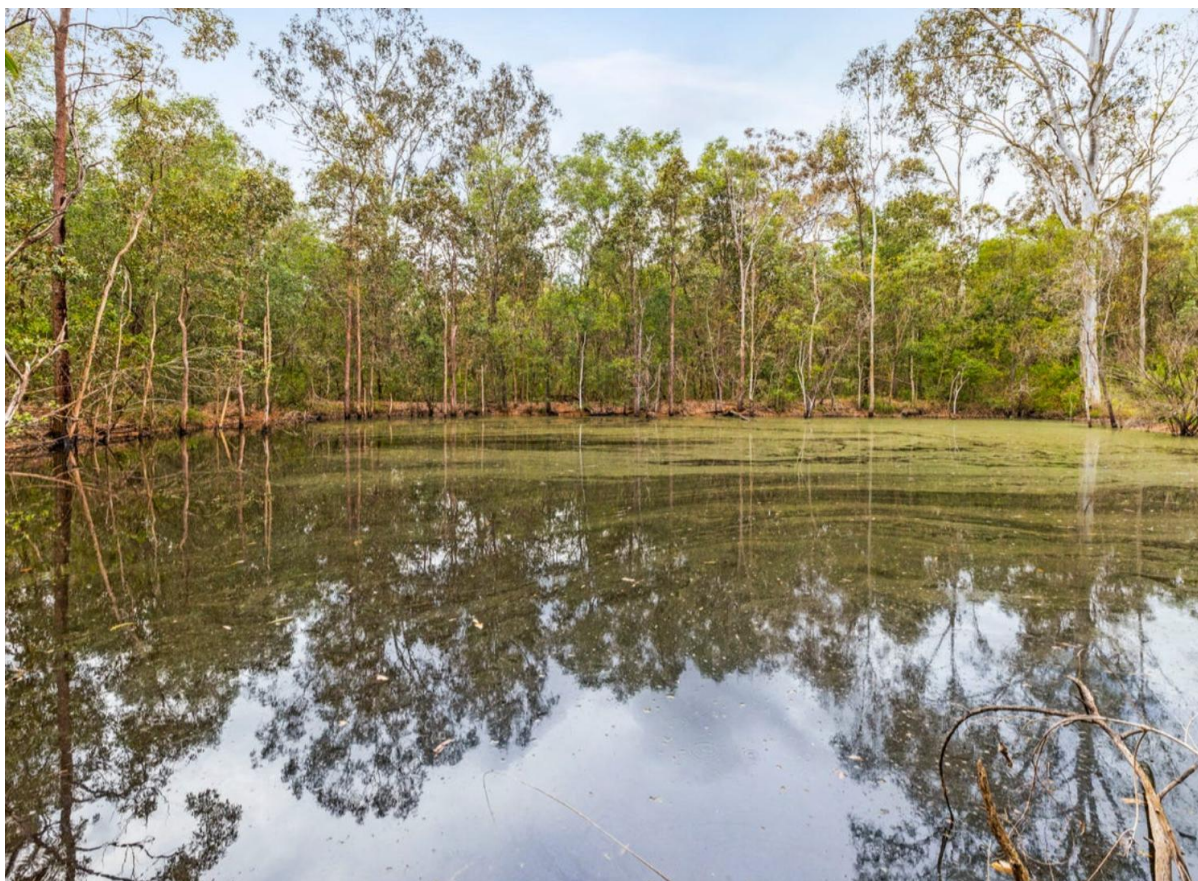


Photo 4: Low hazard areas near the proposed development

4.4.2 Potential Bushfire Intensity Calculations

The Bushfire Resilient Communities Technical Reference Guide (QFES, 2019) defines bushfire hazard classes as follows:

- Very high potential bushfire intensity > 40,000 kW/m.
- High potential bushfire intensity 20,000-40,000 kW/m.
- Medium potential bushfire intensity 4,000-20,000kW/m.
- Grass fire hazard, generally less than 4,000kW/m.
- Potential impact buffer, where land is within 100m of a very high, high and medium potential bushfire intensity area.
- Low hazard, where potential bushfire intensity < 4,000kW/m and more than 100m to very high, high and medium potential bushfire intensity area.

Potential fireline intensity is a function of fire weather severity (Local FFDI), landscape slope and vegetation fuel load based on classified vegetation communities according to the method described by the CSIRO methodology as follow:

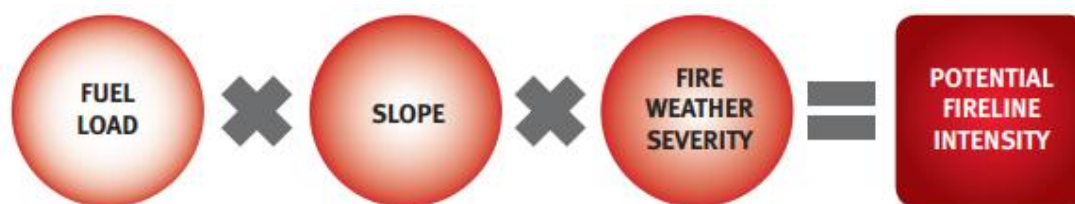


Figure 4-9: Method for calculation of potential fireline intensity (by CSIRO)

The results of the potential bushfire intensity calculations as presented in Table 4.

Local FFDI	Aspect	Ground Truthed VHC	Potential fuel load (t/ha)	Slope (°)	Potential bushfire intensity (kW/m)	Bushfire hazard class
56	North	VHC 10.1	20.8	Downslope 4	19796	Medium potential bushfire intensity
	East	VHC 10.1	20.8	Downslope 2	17244	Medium potential bushfire intensity
	South	VHC 40.4	5	Upslope 4	484	Low hazard
	West	VHC 40.4	5	Upslope 2	484	Low hazard

Table 4: Potential bushfire intensity calculation

Figure 4-2 presents a local bushfire hazard prone area map, which confirms the potential fireline intensity class of all identified Vegetation Hazard Classes (VHCs) in proximity to the site, taking into account the patch and corridor filtering process as defined by the Bushfire Resilient Communities Technical Reference Guide. This local bushfire prone area map can then replace the SPP map and the Council's Bushfire Hazard Overlay map for the purposes of assessing the application.

4.5 Probable Direction of Bushfire Attack

The anticipated directions of bushfire threat to the proposed development are expected to originate from any direction, primarily in areas classified as having medium, high and very high bushfire hazard levels.

4.6 Asset Protection Zone

An Asset Protection Zone (APZ) will need to be maintained on the subject site to ensure adequate separation from hazardous vegetation. This designed APZ will have a radius of 10 m around the proposed structure as minimum.

Figure 4-2 illustrates the minimum APZ requirements. Management strategies within the APZ will ensure that vegetation or other structures proposed do not increase the overall potential fuel load. The Bushfire Management Plan will detail these requirements comprehensively.

Ongoing vegetation maintenance in the vicinity of the site will assist in managing fuel loads and associated bushfire risk. The existing vegetation management practices are considered adequate. To the west, the Asset Protection Area may be reduced to 7m. The Asset Protection Zone (APZ) is fully contained within the subject lot, and no vegetation clearing on adjoining properties is required.

In the remaining areas on the subject site, the client should continue to maintain the current vegetation management practices. Unmanaged vegetation will increase the bushfire risk.

It is critically important to note that failure to maintain the Asset Protection Zone (APZ) will compromise its effectiveness, leading to an elevated bushfire risk to the proposed development.

4.7 Bushfire Attack Level and Construction Requirements

The Building Code of Australia only requires Classes 1,2 and 3 and certain Class 9 buildings and Class 10a building associated with those buildings to comply with the bushfire provisions of the NCC /BCA. Other class building may not require complying with the bushfire protection provisions.

The bushfire protection provisions of construction requirements are not applicable to the proposed development.

4.8 Radiant Heat Flux Modelling

Figure 4-11 presents the radiant heat modelling undertaken using the 'SPP Bushfire Asset Protection Zone Width Calculator'

SPP Bushfire Asset Protection Zone Width Calculator			
VARIABLE DESCRIPTION	VARIABLE	UNITS	VALUE
<i>Input Values</i>			
FIRE WEATHER SEVERITY	FDI		56.00
VEGETATION HAZARD CLASS	VHC	-	10.1 Spotted gum dominated open forests
REMNERANT STATUS	-	-	Non-Remnant
SLOPE TYPE (UPSLOPE OR DOWNSLOPE)	ST	-	Downslope
EFFECTIVE SLOPE UNDER THE HAZARDOUS VEGETATION	eSlope	degrees	4.00
SLOPE BETWEEN SITE AND HAZARDOUS VEGETATION	θ	degrees	4.00
DISTANCE OF THE SITE FROM HAZARDOUS VEGETATION	d	m	26.00
<i>Advanced Input Values</i>			
FLAME WIDTH	W_f	m	100.00
FUEL MOISTURE FACTOR	mf	-	5.00
FUEL AGE	age	y(years)	20.00
HEAT OF COMBUSTION	hc	kJ/kg	18600.00
FLAME TEMPERATURE	Tf	K	1200.00
AMBIENT TEMPERATURE	Ta	K	308.00
RELATIVE HUMIDITY	RH	%	25.00%
FLAME EMISSIVE POWER	ϵ	-	0.95
WIND SPEED	V	km/h	45.00
<i>Output Values</i>			
SURFACE FUEL LOAD	-	t/ha	16.30
NEAR SURFACE FUEL LOAD	-	t/ha	3.00
BARK FUEL LOAD	-	t/ha	1.50
ELEVATED FUEL LOAD	-	t/ha	0.00
PRONE TYPE	-	-	1.00
EFFECTIVE SLOPE UNDER THE HAZARDOUS VEGETATION	eSlope	°	4.00
AVERAGE HEIGHT OF CLASSIFIED VEGETATION	VH	m	0.00
TOTAL OVERALL FUEL LOAD	W	t/ha	20.80
TOTAL SURFACE FUEL LOAD	w	t/ha	19.30
FORWARD RATE OF SPREAD	R	km/h	1.30
FORWARD RATE OF SPREAD ADJUSTED FOR EFFECTIVE SLOPE	R_{slope}	km/h	1.71
POTENTIAL FIRE LINE INTENSITY	I	kW/m	18368
FLAME LENGTH	L_f	m	13.61
FLAME EMISSIVE POWER	E	-	111.69
FLAME ANGLE	α	°	77
VIEW FACTOR	ϕ	-	0.2474
ELEVATION OF RECEIVER	h	m	4.81
ATMOSPHERIC TRANSMISSIVITY	τ	-	0.827
RADIANT HEAT FLUX	q	kW/m ²	22.85
BUSHFIRE ATTACK LEVEL (AS 3959-2018)	BAL	-	BAL 29
DISCLAIMER: Fire-line intensity and radiant heat calculations where effective slope exceeds 20 degrees (downslope) or 15 degrees (upslope) may be unreliable. In these locations, specialist assessment is warranted.			
BUSHFIRE ATTACK LEVEL (AS 3959-2018)	BAL	-	#N/A
DISCLAIMER: Fire-line intensity and radiant heat calculations where effective slope exceeds 20 degrees (downslope) or 15 degrees (upslope) may be unreliable. In these locations, specialist assessment is warranted.			

Figure 4-10: Radiant Heat Flux Modelling and BAL Rating

5. Bushfire Management Plan

This Bushfire Management Plan (BMP) identifies the bushfire protection measures that should be implemented as part of the proposed development to manage and to reduce the risk from bushfire to an acceptable level. It is important to understand the processes that influence bushfire behaviour and the sources of damage that threaten people and property.

5.1 Bushfire Behaviours

Understanding bushfire behavior is crucial when planning development on bushfire-prone land to effectively mitigate the risks associated with bushfires. Three primary elements significantly influence bushfire behavior, as follows:

5.1.1 Topography

The physical characteristics of the landscape significantly influence bushfire behavior. It is well-established that fires tend to spread more rapidly when they move uphill. This is because flames can easily access unburnt fuel ahead of the fire, which is pre-heated by radiant heat, making it more combustible. Studies indicate that for every 10-degree increase in slope, the fire's speed can double. For example, if a fire is moving at a rate of 5 km per hour on flat ground, and it encounters a 10-degree slope, its speed can double to 10 km per hour uphill. As the fire gains momentum, it also increases in intensity, becoming even hotter.

Conversely, when a fire moves downhill, its speed decreases because the flames have less fuel to consume, and radiant heat pre-heats less fuel in front of the fire. For every 10-degree decrease in slope, the fire's speed is halved. It's important to note that fires typically move more slowly as the slope declines.

5.1.2 Weather Conditions

Weather conditions are a major factor in the behavior and spread of bushfires. Hot, dry, and windy conditions can make fires more intense and difficult to control, while cooler and more humid conditions can slow their spread. Wind can also influence the direction and speed of the fire, and changes in wind direction can make it more difficult for firefighters to predict the fire's behavior. Weather forecasting is a critical component of bushfire management, as it allows firefighters and other responders to anticipate changes in fire behavior and take action to mitigate the risks. In addition, many communities now use tools like automated alert systems to warn residents of potential fire danger based on weather conditions.

The new Australian Fire Danger Rating System (AFDRS) improves and simplifies the reporting of fire danger. Fire danger ratings describe the potential level of danger should a bushfire start. It is a valuable information for taking actions to protect people and property. The AFDRS has four levels, each with a distinct title, colour and key message.

5.1.3 Vegetation

The amount and type of fuel available can greatly influence the behavior of a bushfire. Vegetation is the source of fuel of a bushfire. Vegetation that is dry and dead, or that is densely packed, can create more intense and long-lasting fires. In contrast, areas with little fuel or sparse vegetation may not support a fire at all. The arrangement of fuel can also play a role, as fires that encounter a continuous "fuel ladder" from the ground up into the canopy can become more severe. The amount of fuel surrounding a building can directly impact a buildings survival. Vegetation management, landscaping for bushfire and breaking the continuity of vegetation can limit the spread of fire.

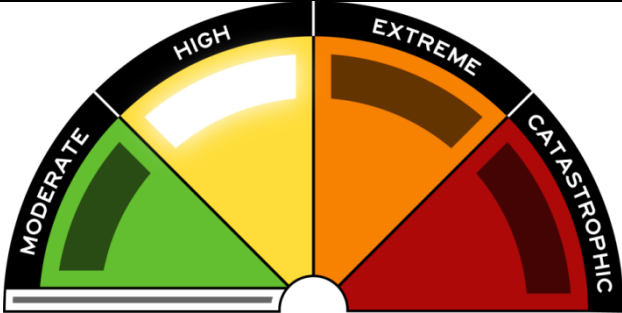

Moderate: Plan and Prepare. Most fires can be controlled ▪ Stay up to date and be ready to act if there is a fire.
High: Be Ready to Act Fires can be dangerous ▪ Decide what you will do if a fire starts. ▪ There's a heightened risk. Be alert for fires in your area. ▪ If a fire starts, your life and property may be at risk. The safest option is to avoid bushfire risk areas.
Extreme: Take Action Now to protect your life and property Fires will spread quickly and be extremely dangerous ▪ These are dangerous fire conditions. ▪ Check your bushfire plan and make sure your property is fire ready. ▪ If a fire starts, take immediate action. ▪ If you and your property are not prepared to the highest level, go to a safer location well before the fire impacts. ▪ Reconsider travel through bushfire risk areas.
Catastrophic: For your survival, leave bushfire risk areas If a fire starts to take hold, lives are likely to be lost ▪ These are the most dangerous conditions for a fire. ▪ Your life may depend on the decisions you make, even before there is a fire. ▪ For your survival, do not be in bushfire risk areas. ▪ Stay safe by going to a safer location early in the morning or the night before. ▪ If a fire starts and takes hold, lives and properties are likely to be lost. ▪ Homes cannot withstand fires in these conditions. You may not be able to leave and help may not be available.

Table 4: Australian Fire Danger Rating

5.2 Potential Bushfire Impacts and Attack Mechanisms

Bushfire attack mechanisms are typically interconnected, rarely occurring in isolation. Both people and property often face a combination of bushfire attack

factors, each operating across different spatial scales. Nevertheless, strategies aimed at mitigating the impacts of direct flame contact, radiant heat exposure, and ember attack can be effectively addressed within the framework of land use planning and development assessments, conducted at manageable scales.

The main sources of direct bushfire attack that give rise to loss of life, and damage to property and infrastructure are as follows:

5.2.1 Direct Flame Contact

Direct flame contact occurs when flames from a bushfire come into direct contact with a building, structure, or individuals. When this happens, the flames can ignite any flammable material present and cause fires to spread rapidly. Direct flame contact can also cause burns and other heat-related injuries to people who are in the path of the flames.

Direct flame contact is a significant concern during a bushfire, especially for buildings and structures that are located in close proximity to the fire. The intensity of the flames and the duration of the exposure can have a significant impact on the severity of the damage.

To reduce the risk of direct flame contact during a bushfire, it's essential to create a defensible space around buildings and structures, clear flammable materials from the area, and use fire-resistant building materials when constructing or renovating buildings. Additionally, it's crucial to follow evacuation orders and stay informed about the fire's behavior and movement to ensure personal safety.

5.2.2 Radiant Heat Exposure

Radiant heat exposure is a significant danger during a bushfire. When a bushfire occurs, the heat generated by the flames causes the air surrounding the fire to heat up, and this heat energy is then radiated out in the form of electromagnetic waves. These waves can travel a considerable distance from the fire and can cause surfaces that are not in direct contact with the flames to heat up.

During a bushfire, radiant heat exposure can be intense, and the effects can be severe. Radiant heat can ignite flammable materials, such as dry vegetation or wooden structures, and cause them to catch fire. It can also cause buildings and structures to overheat, leading to structural damage or collapse. Additionally, people who are too close to the flames can suffer from heat stress, dehydration, and serious burns.

The risk of radiant heat exposure during a bushfire can be mitigated by creating a defensible space around buildings and structures, clearing flammable materials from the area, and using fire-resistant building materials when constructing or renovating buildings. It's also important to follow evacuation orders and stay informed about the fire's behavior and movement to ensure personal safety.

5.2.3 Ember Attack

Ember attack, often referred to as spot fires, represents a prominent hazard during bushfires. This phenomenon occurs when burning embers, also known as firebrands or spot fires, are carried by the wind and land in different locations, potentially igniting new fires.

In the midst of a bushfire, the combination of hot air and flames generates updrafts capable of lifting burning embers over considerable distances. These embers can alight on rooftops, in gutters, or on flammable materials near buildings and structures, leading to ignition and the potential initiation of new fires.

Ember attack poses a unique danger because it can manifest hours or even days after the primary fire front has passed, and it has the capacity to ignite fires in areas previously unaffected by the bushfire. Consequently, it is imperative to prepare for ember attack through measures such as establishing a defensible space around buildings and structures, removing flammable materials from the vicinity, and sealing gaps and openings in buildings to prevent ember ingress.

5.2.4 Wind and Smoke Attack

Strong winds can cause a bushfire to spread more rapidly and can also increase the likelihood of ember attack, as burning embers can be carried by the wind over long distances. Wind can also push flames and radiant heat towards buildings and structures, increasing the risk of direct flame contact and radiant heat exposure.

Smoke from a bushfire can also pose a danger to people's health, particularly for those with respiratory problems. Smoke can contain particulate matter, carbon monoxide, and other harmful pollutants that can irritate the lungs and worsen respiratory conditions. In addition to health effects, smoke can reduce visibility, making it more difficult for firefighters to contain the fire and for people to evacuate safely.

5.2.5 Convection and Conduction

Both convection and conduction can play a significant role in the spread and intensity of a bushfire. To reduce the risk of a bushfire spreading through convection and conduction, it's important to create a defensible space around buildings and structures, clear flammable materials from the area, and use fire-resistant building materials when constructing or renovating buildings. It's also crucial to follow evacuation orders and stay informed about the fire's behavior and movement to ensure personal safety.

5.3 Bushfire Protection Measures

This section identifies the bushfire protection measures that will be implemented as part of the proposed development to comply with the requirements of both the State

and local council's Bushfire Prone Area code and to minimise the impact of potential bushfires on people and property.

The proposed measures are prepared in accordance with Queensland State Government State Planning Policy - Part E (SPP 2017), the Bushfire Resilient Communities Technical Reference Guide (QFES, 2019), the local council's Bushfire Overlay Code, and the Australian Standard (AS 3959:2018) for Construction of buildings in bushfire-prone areas.

The legislation mentioned above aims to protect individuals and buildings from bushfires by ensuring that new developments meet specific Performance Outcomes that are appropriate for the identified bushfire hazard. These Performance Outcomes are typically achieved by properly separating the development from the bushfire hazard, providing adequate access for firefighting vehicles, and constructing buildings to the appropriate standards. Additionally, the legislation includes other relevant factors that are deemed necessary for ensuring the safety of individuals and buildings during a bushfire emergency.

5.3.1 Asset Protection Zone (APZ)

An Asset Protection Zone (APZ) is the most important bushfire protection measure. An APZ is a designed area surrounding a building or structure that has been well managed to reduce the risk of a bushfire impacting the building or structure. An APZ provides:

- A buffer zone between a bushfire hazard and an asset
- An area of reduced bushfire fuel that allows suppression of fire
- An area from which backburning may be conducted
- An area which allows emergency services access and provides a relatively safe area for firefighters and homeowners to defend their property.

A correctly designed and regularly maintained APZ will reduce the risk of:

- Direct flame contact on the asset
- Damage to the build asset from intense radiant heat
- Ember attack on the asset

An APZ are typically designed and created by removing vegetation and other combustible materials from around the building or structure, reducing the fuel available for a bushfire. The width of the APZ and the level of vegetation removal required depend on a number of site-specific factors, including the slope of the land, the hazardous vegetation type, and the intensity of the bushfire hazard. The property owner is responsible for creating and maintaining regularly the designed APZ.

(1) Creating APZ by reducing bushfire fuel

The intensity of bush fires can be greatly reduced where there is little to no available fuel for burning. To effectively manage bushfire fuels, there are several approaches to reduce, remove, or change the condition of the fuel.

- Raking or manual removal of fine fuels
- Mowing or grazing of grass
- Removal or pruning of trees, shrubs and understorey
- Slashing and trittering

It is important to note that reducing fuel does not always require removal of all vegetation, which would cause environmental damage. Trees and plants also provide protection against bushfires by mitigating the impact of strong winds, intense heat and flying embers (by filtering embers) and changing wind patterns. Some ground cover vegetation is also needed to prevent soil erosion.

(2) Ongoing management for APZ

The creation of an Asset Protection Zone (APZ) establishes a controlled fuel-managed area that serves to reduce the potential impact of direct flame contact and radiant heat on property development, effectively acting as a defensible space. It is crucial to emphasize that the management of vegetation and landscaping within the APZ is of paramount importance and should maintain a minimal fuel load.

An APZ should be maintained in perpetuity to ensure ongoing protection from the impact of bushfires, and maintenance of the APZ should be regularly undertaken, especially in advance of the bushfire season. The requirements are set out as follows.

When establishing and maintaining the asset protection zone, the following requirements apply:

- General
 - A minimum 1m wide area, suitable for pedestrian traffic, must be provided around the immediate curtilage of the building
 - Planting is limited in the immediate vicinity of the building
 - All leaves and vegetation debris must be removed at regular intervals during the declared fire danger period
 - Planting does not provide a continuous canopy to the building
 - Within 10 metres of a building, flammable objects must not be located close to the vulnerable parts of the building
 - Plants greater than 10 cm in height must not be placed within 3m of a window or glass feature of the building
 - Low flammability vegetation species are used
- Trees
 - Tree canopy cover should be less than 15% at maturity
 - Trees at maturity should not touch or overhang the building
 - Lower limbs should be removed up to a height of 2m above the ground
 - Tree canopies should be separated by 2 to 5m
 - Preference should be given to smooth barked and evergreen trees
- Shrubs

- Create large discontinuities or gaps in the vegetation to slow down or break the progress of fire towards buildings should be provided
- Shrubs should not be located under trees
- Shrubs should not form more than 10% ground cover
- Clumps of shrubs should be separated from exposed windows and doors by a distance of at least twice the height of the vegetation
- Grass
 - Grass should be kept mown regularly (as a guide grass, should be kept to no more than 100mm in height)
 - Leaves and vegetation debris should be removed regularly

5.3.2 Building Construction, Siting and Design

The appropriate design and construction of buildings enhance their survivability from bushfires. Construction measures should not be applied as a stand-alone mitigation solution but should form part of a suite of measures. This should also include APZ, appropriate access, water supply and landscaping. Building design needs to ensure adequate protection of vulnerable building elements. Construction standards are outlined in AS 3959:2018 and the NASH Standard to provide various levels of protection for different building elements.

It should be noted the Building Code of Australia only requires Classes 1, 2 and 3 and certain Class 9 buildings and Class 10a building associated with those buildings to comply with the bushfire provisions of the NCC 2022. The bushfire protection provisions of construction requirements are not applicable to the proposed

5.3.3 Access and Evacuation Arrangement

Developments in bushfire prone areas should be serviced by safe access/exit points for both site personnel and emergency services personnel in the event of an emergency. The local council's Bushfire Hazard Overlay Code prescribes appropriate access for fire management and evacuation to be provided as below:

- Do not exceed an average gradient of 12.5%
- Have a minimum width of 4m and 6m of vegetation clearing, can be up to 10m.
- Have a minimum of 4.8m vertical clearance
- Accommodate turning areas for fire-fighting appliances in accordance with Qld Fire and Emergency Services' Fire Hydrant and Vehicle Access Guidelines
- Passing bays for firefighting appliances are 20m long by 3m wide, with a minimum trafficable width of 7m at the passing bay

- Reversing bays for firefighting appliances are 6m wide and 8.5m deep to any gates, meeting above turning requirements
- Passing bays or turning intervals located every 200m with a maximum grade of 5%
- Compacted driveway to ensure all weather surfaces

The proposed development will provide all weather driveway for vehicular access that enables safe evacuation for occupants and easy access by firefighting appliances. Consequently, the proposed development is in compliance with the Council Bushfire Hazard Overlay.

5.3.4 Water Supply

An adequate supply of water for firefighting purposes will be provided. The proposed development will utilise the existing water supply facility associated with the existing dwelling on the subject site, which is considered sufficient to support firefighting operations.

5.3.5 Reducing Fuel load and Weed Management

Removing excess ground fuels and combustible material is a crucial aspect of effective fire prevention and management. This process involves the careful clearance of various flammable materials, including long dry grass, accumulated dead leaves, and fallen branches. By systematically reducing these fuel sources, the risk of fire ignition and spread is significantly mitigated. Regular maintenance of such clearance efforts is essential to ensure ongoing fire safety and resilience within the environment.

Unmanaged invasive pest plants can swiftly amplify fuel loads, comprising fast-growing introduced grasses, dense woody weeds, and invasive climbing vines. These factors collectively escalate fuel loads, fostering a "laddering" effect, intensifying fire spread and allowing it to transition from ground to canopy. Effective weed management markedly diminishes bushfire risk to the site and surrounding properties.

6. Conclusion

The following recommendations are provided in relation to the requirements of Council's Bushfire Hazard Overlay Code.

- An asset protection zone has been designed and shall be established and managed.
- Construction of building to meet construction requirements of AS 3959:2018 if applicable.
- Provision of water and service to be in accordance with the requirements.
- The location of the proposed development maximizes the use of existing cleared and open space while minimizing the clearing of native vegetation and its impact on the environment.

In conclusion, the proposed development has been designed and managed to ensure that the exposure of people and property to unacceptable bushfire hazard risks has not increased. The development will mitigate bushfire risk through appropriate siting, design, and management measures. It provides suitable access and evacuation routes for both private and emergency service vehicles, in line with the nature of the development and the level of bushfire risk. An adequate water supply for firefighting purposes will be provided, and no hazardous goods will be stored on-site. Overall, the development meets all necessary requirements to minimize the risk of bushfires to people, property, public health, and the environment.

This assessment assumes that vegetation on the site will be maintained according to the client's outlined plans. Should the proposed development require the removal of site vegetation to meet specific requirements set by either the developer or the client, it is the client's responsibility to comply with relevant regulations regarding native vegetation clearing.

Although emergency management arrangements are not a mandatory measure for the proposed development, it is recommended that residents in bushfire prone areas prepare a bushfire survival plan.



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7. References

Australian Standard, 2018. Construction of Buildings in Bushfire-prone Areas (AS3959–2018).

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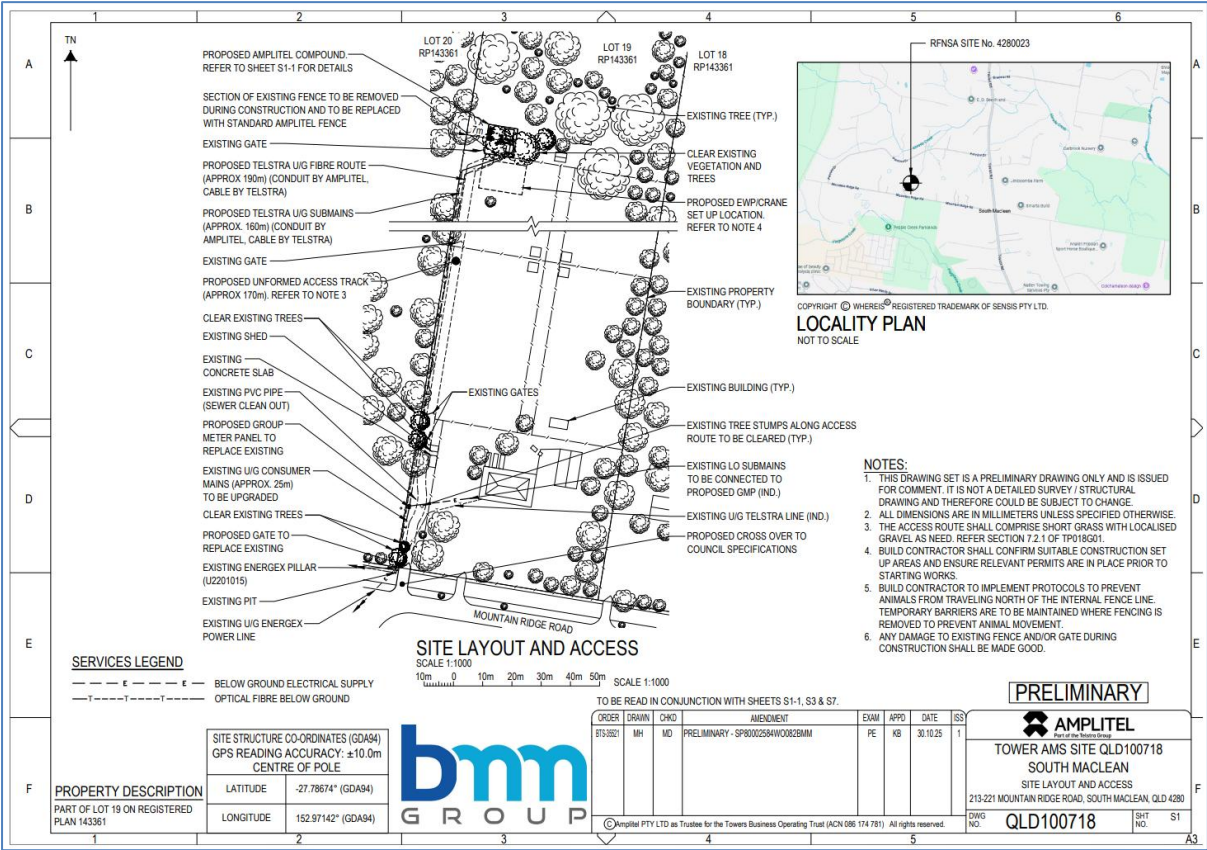
The State of Queensland, October 2019. Bushfire Resilient Communities Technical Reference Guide for the State Planning Policy State Interest 'Natural Hazards, Risk and Resilience – Bushfire.

8. Appendix

Appendix A Site Plan

Appendix B Bushfire Overlay Code Compliance

Appendix A Site Plan



Appendix B: Bushfire Overlay Code Compliance

Prepared by Max Bushfire Protection Consultant

Site address: 213-221 Mountain Ridge Road South Maclean QLD 4280

Date: 26/2/2026

Logan Planning Scheme 2015 V9.2

8.2.3 Bushfire hazard overlay code

8.2.3.1 Application

1. This code applies to accepted development (subject to requirements) and assessable development for which the Bushfire hazard overlay code is identified in the 'assessment benchmarks for assessable development and requirements for accepted development' column in Table 5.10.3.1 - Bushfire hazard overlay map OM-03.00 in Part 5 - Tables of assessment.
2. When using this code, reference should be made to section 5.3.2 - Determining the category of development and category of assessment and, where applicable, section 5.3.3 - Determining the requirements for accepted development and assessment benchmarks and other matters for assessable development located in Part 5 - Tables of assessment.

Note - Pursuant to section 32(a) of the *Building Act 1975* and section 12 of the *Building Regulation 2006*, land identified as a Bushfire hazard area on Bushfire hazard overlay map OM-03.00 is a 'designated bushfire prone area' for the Building Code of Australia and the Queensland Development Code.

8.2.3.2 Purpose

1. The purpose of the code is to protect people and premises in a Bushfire hazard area.
2. The purpose of the code will be achieved through the following overall outcomes:
 - a. Development protects people and premises from bushfire risk:
 - i. through allotment design and siting of development envelope areas and asset protection zones;
 - ii. by providing vehicular access, fire maintenance trails and evacuation routes that are safe and facilitate easy way finding;

- iii. by providing an accessible water supply for firefighting purposes;
- iv. by ensuring the function of community infrastructure is not adversely impacted by bushfire;
- v. by protecting personal health and safety and the environment from hazardous materials.

8.2.3.3 Assessment benchmarks for assessable development and requirements for accepted development

Part A - Requirements for accepted development (subject to requirements) and assessment benchmarks for assessable development

Table 8.2.3.3.1 - Bushfire hazard overlay code: accepted development (subject to requirements) and assessable development

Performance outcomes	Acceptable outcomes	Comments
For accepted development (subject to requirements) and assessable development		
Location, design and siting of development		
PO1 Development is designed to: a. minimise risk of bushfire hazard; b. provide safe premises; c. create efficient emergency access for fire-fighting and other emergency vehicles. Note - Planning scheme policy 6 - Management of bushfire hazard provides guidelines on how to achieve this outcome.	AO1 Development: a. does not increase the number of persons living in, or lots in, the Bushfire hazard area identified on Bushfire hazard overlay map OM-03.00; or b. is on a site that a bushfire hazard assessment prepared in accordance with the methodology in Planning scheme policy 6 - Management of bushfire hazard determines is of low bushfire hazard.	Complies AO1 and PO1. A site-specific Bushfire Hazard Assessment and Management Plan has been prepared. The BHAMP assesses the bushfire hazards relevant to the subject site and incorporates design and management recommendations to ensure compliance with the outcomes of the Bushfire Overlay Code. Confirms the proposed development does not increase the number of persons living in as the facility is unmanned.
PO2	AO2 Development is located and constructed:	Complies AO2 and PO2.

Development is sited and constructed to minimise the bushfire hazard and maximise the protection of life and property from bushfire. Editor's note - Planning scheme policy 6 - Management of bushfire hazard contains guidance on the preparation of bushfire management plans.	a. where there is no bushfire management plan approved by an existing development approval: i. such that the bushfire attack level is less than or equal to BAL-29; ii. away from the most likely direction of a fire front; iii. so that elements of the development least susceptible to fire are sited closest to the bushfire hazard; iv. such that asset protection zones are sited on land with a slope less than 18 degrees; v. such that asset protection zones are entirely within the boundaries of the private property of the development site; or b. where an approved bushfire management plan directs development to be located. Note - BAL = Bushfire attack level is the radiant heat flux a building will experience during a bushfire and is a measure of heat energy impacting on a surface expressed as kW/m². BAL is calculated from the following factors; vegetation type, fuel loads, distance to vegetation, Forest Fire danger Index (FDI), flame length, fire behaviour/intensity and slope. BAL is used to determine the required construction level of a building and the size of asset protection zones (inner and outer radiation zones). Further information on calculating the BAL can be obtained from AS3959-2009.	A site-specific Bushfire Hazard Assessment and Management Plan has been prepared. The BHAMP assesses the bushfire hazards relevant to the subject site and incorporates design and management recommendations to ensure compliance with the outcomes of the Bushfire Overlay Code. The radiant heat flux level at the closest section to the classified vegetation is less than 29 kW/m².
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	Editor's note - Asset protection zones are not located on slopes greater than 18 degrees to ensure maintenance is practical, soil stability is not compromised and the potential for crown/canopy fires is reduced.	
PO3 Reconfiguring a lot ensures that lots are designed to minimise bushfire hazard and provide safe sites for people, property and buildings.	AO3 Lots: a. are suitable for people, property and buildings by: i. having a bushfire attack level less than or equal to BAL-29; or ii. containing a development envelope area that has a bushfire attack level less than or equal to BAL-29; b. provide asset protection zones that: i. are located on land with a slope less than 18 degrees; ii. are located on the same lot.	Not applicable.
Vehicular access and fire maintenance trails		
PO4 Access for fire management and evacuation is provided by access that: a. separates premises from adjoining vegetation; b. is safely accessible by fire fighting vehicles; c. has regular vehicular access points for bushfire management, response and evacuation; d. has regular vehicle passing and turning areas for bushfire management, response and evacuation;	AO4 Access for fire management and evacuation is provided by vehicular access in the form of a perimeter road: a. with a minimum reserve width of 20 metres; b. located between the premises and adjoining vegetation; c. with a maximum gradient of 12.5 percent; d. constructed to otherwise comply with section 3.4 - Movement infrastructure standards of Planning scheme policy 5 - Infrastructure;	Complies AO4 and PO4. Confirms the proposed development can provide safe access for fire management and evacuation.

e. allows access at all times for fire fighting vehicles; f. allows for maintenance, burning off and bushfire response; g. has vehicular links to an alternative through road; h. is readily maintained. Editor's note - Planning scheme policy 6 - Management of bushfire hazard provides details on alternative solutions for providing fire management access and evacuation	e. that has a layout that does not include a cul-de-sac.	
Water supply		
PO5 Development has access to adequate water supply for fire fighting purposes.	AO5 Development: a. is connected to a reticulated water supply scheme that has sufficient flow and pressure characteristics for fire fighting purposes at all times with a minimum pressure and flow of 10 litres per second at 200kPa; or b. has an on-site water storage in accordance with Table 8.2.3.3.2 - Water storage for fire fighting, dedicated or retained for fire fighting purposes that is made of fire resistant materials and is: i. a separate tank; or ii. a reserve section in the bottom part of the main water supply tank. Editor's note - The requirement in AO5 is: - in addition to the requirement for potable water supply/storage in AO2 in Table 9.4.3.3.1 - Infrastructure code: accepted	Complies AO5 and PO5. Confirms the proposed development has access to adequate water supply for fire fighting purposes.

	development (subject to requirements) and assessable development.; - reflected in AO5 in Table 9.4.3.3.1 - Infrastructure code: accepted development (subject to requirements) and assessable development.	
For assessable development		
Community infrastructure		
PO6 Community infrastructure is not located in a bushfire hazard area or is able to function effectively during and immediately after a bushfire event.	AO6 Community infrastructure is: a. not located in a Bushfire hazard area identified on Bushfire hazard overlay map OM-03.00; or b. located to ensure that: a. the core services provided by the community infrastructure is able to function effectively during bushfire events; b. access to the community infrastructure is not compromised by bushfire events; c. the safe storage of valuable records, public records and items of cultural or historic significance is able to be maintained during a bushfire event.	Complies AO5 and PO5. A site-specific Bushfire Hazard Assessment and Management Plan has been prepared. The BHAMP assesses the bushfire hazards relevant to the subject site and incorporates design and management recommendations to ensure compliance with the outcomes of the Bushfire Overlay Code. Confirms the proposed development is able to function effectively during and immediately after a bushfire event.
Hazardous materials		
PO7 Public safety and the environment are not adversely affected by the adverse impacts of bushfire on hazardous materials including fuels,	AO7 Hazardous materials:	Not applicable.

explosives and flammable chemicals manufactured or stored in bulk on premises.	a. storage is in compliance with AS1940 - The storage and handling of flammable and combustible liquids; b. manufacturing does not occur in a Bushfire hazard area on Bushfire hazard overlay map OM-03.00.	
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Table 8.2.3.3.2 - Water storage for fire fighting

Column 1 Lot size / use type	Column 2 Water requirement
For each residential lot:	
(a) less than 1,000m ²	5,000 litres
(b) between 1,000m ² and less than 1 hectare	10,000 litres
(c) greater than 1 hectare	20,000 litres
Multiple dwelling	5,000 litres per dwelling up to a maximum of 20,000 litres
A use other than Multiple dwelling	5,000 litres or the prevailing rural fire brigade standard