Bushfire management plan/Statement addressing the Bushfire Protection Criteria coversheet

Site address: 26 Marri Crescent Lesmurdie

Site visit: Yes ☑ No ☐

Date of site visit (if applicable): Day 07 Month March Year 2024

Report author or reviewer: Kathy Nastov

WA BPAD accreditation level (please circle):

Not accredited ☐ Level 1 BAL assessor ☐ Level 2 practitioner ☐ Level 3 practitioner ☑

If accredited please provide the following.

BPAD accreditation number: BPAD27794 Accreditation expiry: Month August Year 2024

Bushfire management plan version number: 1.1

Bushfire management plan date: Day 26 Month June Year 2024

Client/business name: Peter Ng - PAR Property Development Consultants

	Yes	No
Has the BAL been calculated by a method other than method 1 as outlined in AS3959 (tick no if AS3959 method 1 has been used to calculate the BAL)?		✔
Have any of the bushfire protection criteria elements been addressed through the use of a performance principle (tick no if only acceptable solutions have been used to address all of the bushfire protection criteria elements)?	✔	

Is the proposal any of the following (see SPP 3.7 for definitions)?	Yes	No
Unavoidable development (in BAL-40 or BAL-FZ)		✔
Strategic planning proposal (including rezoning applications)		✔
High risk land-use		✔
Vulnerable land-use	✔	

None of the above ☐

Note: Only if one (or more) of the above answers in the tables is yes should the decision maker (e.g. local government or the WAPC) refer the proposal to DFES for comment.

Why has it been given one of the above listed classifications (E.g. Considered vulnerable land-use as the development is for accommodation of the elderly, etc.)?

Vulnerable tourism land use - short term accomodation - bed and breakfast

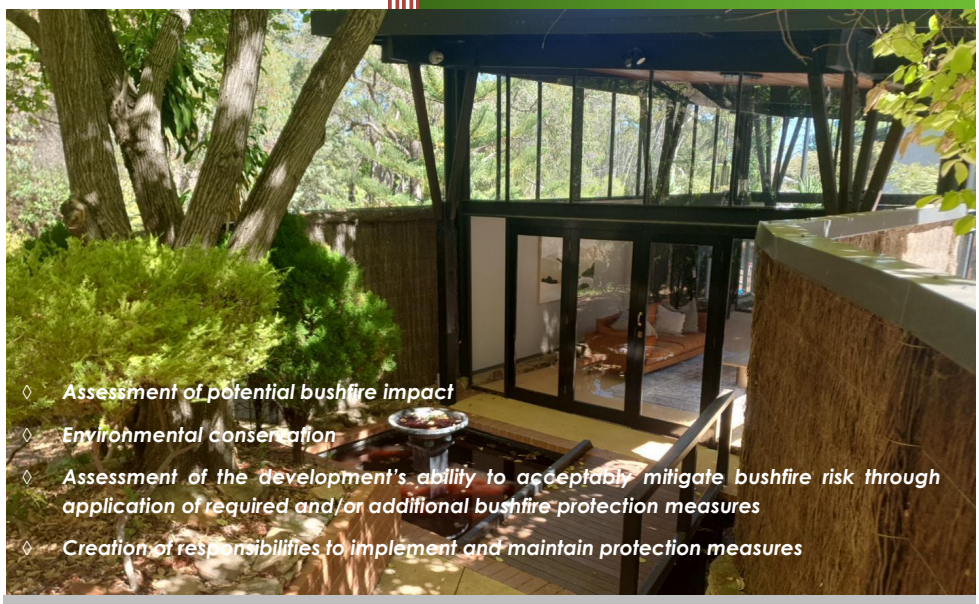
The information provided within this bushfire management plan to the best of my knowledge is true and correct:

Signature of report author or reviewer 

Date 26/06/2024

BUSHFIRE PRONE PLANNING

Bushfire Management Plan (BMP)



Produced to meet the relevant requirements of STATE PLANNING POLICY 3.7 Planning in Bushfire Prone Areas & Guidelines

26 Marri Crescent Lesmurdie

City of Kalamunda

Development Application - Change of Land Use

26 June 2024

Job Reference No: 240028

BPP GROUP PTY LTD T/A BUSHFIRE PRONE PLANNING

ACN: 39 166 551 784 | ABN: 39 166 551 784

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DOCUMENT CONTROL

PREPARATION		
Author:	Selina Hutcheon	
Co-Author:	Kathy Nastov (BPAD Level 3 No. 27794)	

VERSION HISTORY		
Version	Status/Details	Date
1.0	Original	26 June 2024
-	-	-

DISTRIBUTION					
Destination		Version	No. Copies	Hard Copy	Electronic Copy
Person	Email				
Peter Ng	Peter@parpdconsultants.com	1.0		☐	☒
		-		☐	☐

Limitations: *The protection measures that will be implemented based on information presented in this Bushfire Management Plan are minimum requirements and they do not guarantee that buildings or infrastructure will not be damaged in a bushfire, persons injured, or fatalities occur either on the subject site or off the site while evacuating.*

This is substantially due to the unpredictable nature and behaviour of fire and fire weather conditions. Additionally, the correct implementation of the required protection measures (including bushfire resistant construction) and any other required or recommended measures, will depend upon, among other things, the ongoing actions of the landowners and/or operators over which Bushfire Prone Planning has no control.

All surveys, forecasts, projections and recommendations made in this report associated with the proposed development are made in good faith based on information available to Bushfire Prone Planning at the time. All maps included herein are indicative in nature and are not to be used for accurate calculations.

Notwithstanding anything contained therein, Bushfire Prone Planning will not, except as the law may require, be liable for any loss or other consequences whether or not due to the negligence of their consultants, their servants or agents, arising out of the services provided by their consultants.

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SUMMARY STATEMENTS

THIS DOCUMENT – STATEMENT OF PURPOSE

The Bushfire Management Plan (BMP)

The BMP sets out the required package of bushfire protection measures to lessen the risks associated with a bushfire event. It establishes the responsibilities to implement and maintain these measures.

The BMP also identifies the potential for any negative impact on any environmental, biodiversity and conservation values that may result from the application of bushfire protection measures or that may limit their implementation.

Risks Associated with Bushfire Events

The relevant risks are the potential for loss of life, injury, or destroyed or damaged assets which results in personal loss and economic loss. For a given site, the level of that risk to persons and assets (the exposed elements) is a function of the potential threat levels generated by the bushfire hazard, and the level of exposure and vulnerability of the at risk elements to the threats.

Bushfire Protection Measures

The required package of protection measures is established by *State Planning Policy 3.7 Planning in Bushfire Prone Areas (SPP 3.7)*, its associated *Guidelines* and any other relevant guidelines or position statements published by the Department of Planning, Lands and Heritage. These measures are limited to those considered by the WA planning authorities as necessary to be addressed for the purpose of land use planning. They do not encompass all available bushfire protection measures as many are not directly relevant to the planning approval stage. For example:

- Protection measures to reduce the vulnerability of buildings to bushfire threats is primarily dealt with at the building application stage. They are implemented through the process of applying the Building Code of Australia (Volumes 1 and 2 of the national Construction Code) in accordance with WA building legislation and the application of construction requirements based on a building's level of exposure - determined as a Bushfire Attack Level (BAL) rating); or
- Protection measures to reduce the threat levels of consequential fire (ignited by bushfire and involving combustible materials surrounding and within buildings) and measures to reduce the exposure and vulnerability of elements at risk exposed to consequential fire, are not specifically considered.

The package of required bushfire protection measures established by the Guidelines includes:

- The requirements of the bushfire protection criteria which consist of:
  - Element 1: Location (addresses threat levels).
  - Element 2: Siting and Design of Development (addresses exposure levels of buildings).
  - Element 3: Vehicular Access (addresses exposure and vulnerability levels of persons).
  - Element 4: Water (addresses vulnerability levels of buildings).
  - Element 5: Vulnerable Tourism Land Uses (addresses exposure and vulnerability as per Elements 1-4 but in use specific ways and with additional considerations of persons exposure and vulnerability).
- The requirement to develop Bushfire Emergency Plans / Information for 'vulnerable' land uses for persons to prepare, respond and recover from a bushfire event (this addresses vulnerability levels).
- The requirement to assess bushfire risk and incorporate relevant protection measures into the site emergency plans for 'high risk' land uses (this addresses threat, exposure and vulnerability levels).

Compliance of the Proposed Development or Use with SPP 3.7 Requirements

The BMP assesses the capacity of the proposed development or use to implement and maintain the required 'acceptable' solutions and any additionally recommended bushfire protection measures - or its capacity to satisfy the policy intent through the justified application of additional bushfire protection measures as supportable 'alternative' solutions.

THE PROPOSED DEVELOPMENT/USE – BUSHFIRE PLANNING COMPLIANCE SUMMARY		
Environmental Considerations		**Assessment Outcome**
Will land with identified environmental, biodiversity and conservation values limit the full application of the required bushfire protection measures?		Yes
Will land with identified environmental, biodiversity and conservation values need to be managed in the implementation and maintenance of the bushfire protection measures - but not limit their application?		Yes
Required Bushfire Protection Measures The Acceptable Solutions of the Bushfire Protection Criteria (Guidelines)		**Assessment Outcome**
Element	The Acceptable Solutions	
5: Vulnerable Tourism Land Uses		
B&B/Holiday House – within RBA	A5.1 Siting and Design	Not Compliant
	A5.1a Siting and Design - APZ	Not Compliant
	A5.2 Vehicular Access	Fully Compliant
	A5.2a Vehicular access – private driveways – technical requirements	Fully Compliant
	A5.2b Vehicular access – signage	Fully Compliant
	A5.3 Provision of Water	Fully Compliant
	A5.3a Provision of water - reticulated	Fully Compliant
Other Documents Establishing Bushfire Protection Measure Variations or Additions		**Assessment Outcome**
A 'Planning Approval' or a 'Notice of Determination' which contains 'Conditions' to be met.		N/A
A DPLH/WAPC 'Position Statement'		N/A
Bushfire Management Plan Guidance for the Dampier Peninsula (DPLH 2021 Rev B)		N/A
The Methodology Applied to the Development of an Alternative Solution The necessity for an alternative solution is in response to non-compliance with the applicable acceptable solutions.		**Applied**
Merit based assessment - identified as 'minor' development (Guidelines s4.5.3)		Yes
Summary Statement: The proposal is identified as minor development as a single house on an existing lot 1,100m^2 or greater. A BAL-29 cannot be achieved within the lot.		

Other 'Bushfire Planning' Documents to Be Produced This necessity for additional documents is determined by the proposed development/use type and the requirements established by SPP 3.7 and the associated Guidelines (as amended). They may be produced concurrently or subsequent to the BMP. Relevant actions will be identified within Section 6 'Responsibilities for Implementation of Bushfire Protection Measures.	**Required**
Bushfire Emergency Plan: An operational document presenting prevent, prepare, respond and recover procedures and associated actions. As necessary, supporting information to justify determinations is included.	Yes
Summary Statement: To be developed alongside this BMP.	
Bushfire Emergency Information (Poster): As a concise response information poster for certain vulnerable land uses.	Yes
Summary Statement: To be developed alongside this BMP, to be provided to occupants.	
Bushfire Emergency Information (Content): As content for inclusion into the Site's Emergency Plan for certain high risk land uses:	No
Bushfire Risk Assessment and Management Report:	No

1 PROPOSAL DETAILS AND THE BUSHFIRE MANAGEMENT PLAN

1.1 The Proposed Development/Use Details, Plans and Maps

The Proposal's Planning Stage For which certain bushfire planning documents are required to accompany the planning application.		Development Application - Change of Land Use
The Subject Land/Site		26 Marri Crescent, Lesmurdie
Total Area of Subject Lot/Site		4408m^2
Number of Additional Lots Created		N/A
Primary Proposed Construction	**Type(s)**	N/A
	NCC Classification	N/A
The 'Specific' Land Use Type for **Bushfire Planning** When applicable, this classification establishes a requirement to conduct assessments and develop documents that are additional to this Bushfire Management Plan.		Vulnerable Tourism Land Use
Factors Determining the 'Specific' Land Use Type		The proposed development is a land use that is categorised as a Bed and breakfast and holiday house within a residential built out area. The proposed tourism land use involves visitors who are unfamiliar with the surroundings and/or where they present evacuation challenges. The proposal would benefit from a Bushfire Emergency Plan to manage the safety of occupants in a bushfire event. Therefore, it should be treated as 'vulnerable'.
Factors Determining the 'Specific' Land Use Type		The proposed land use involves visitors who are unfamiliar with the surroundings and/or presents evacuation challenges. The proposal would benefit from a Bushfire Emergency Plan to manage the safety of occupants in a bushfire event.
Description of the Proposed Development/Use		
The proposal is for the change of use of a residential building to be used for short term accommodation use. Guests will stay at the property without the host present. The proposal area can be considered as "within a residential built out area" as the surrounding area is serviced by reticulated water, is within an urban area and is able to achieve access to the north through Kalamunda towards Maida Vale, or to the south via Welshpool Road East towards Wattle Grove, which are both lower threat areas than Lesmurdie with extensive road networks for further egress from the site.		

Figure 1.1

Site Map

Lot 180 on Plan 074459, Area : 4408 sq m
26 Marri Crescent
LESMURDIE
CITY OF KALAMUNDA

------ LEGEND ------

- Subject Site
- Cadastral
- Elevation (5m)
- Hydrants
- Pedestrian Accesway
- Driveways

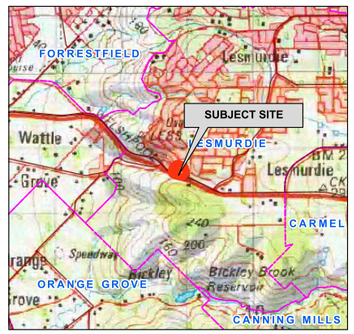
Existing Buildings

- Dwelling
- Car Port

0 20 40 60 80

Metres

------ LOCALITY ------



AERIAL IMAGERY: Landgate/SLIP

BUSHFIRE PRONE PLANNING

Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Merctaor Units: Metre
Map by: Selina Hutcheon 11-03-2024
SCALE (A3): 1 : 1250

240028_Fig1-1_DEV - Lot 180 (26) Marri Crescent Lesmurdie.qgz

Disclaimer and Limitation: This map has been prepared for bushfire management planning purposes only. All depicted areas, contours and any dimensions shown are subject to survey. Bushfire Prone Planning does not guarantee that this map is without flaw of any kind and disclaims all liability for any errors, loss or other consequence which may arise from relying on any information depicted.

Figure 1.2

Location Map

Lot 180 on Plan 074459, Area : 4408 sq m
26 Marri Crescent
LESMURDIE
CITY OF KALAMUNDA

------ LEGEND ------

- Subject Site
- Local Government Area
- Suburb
- Reserves

DBCA Legislated Lands and Waters

- Conservation Park
- Crown Freehold - Dept Managed
- National Park
- Nature Reserve
- SCRM Act - River Reserve
- Section 5(1)(h) Reserve
- State Forest

DBCA Lands of Interest

- Crown Freehold - Dept Interest

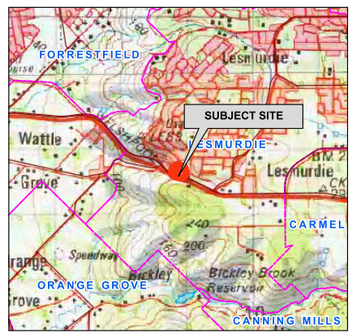
DFES Stations (DFES-023)

- Bush Fire Brigade
- State Emergency Service Unit
- Volunteer Fire & Rescue Service

0 500 1,000 1,500 2,000

Metres

------ LOCALITY ------



AERIAL IMAGERY: Landgate/SLIP

Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Merctaor Units: Metre
Map by: Selina Hutcheon 11-03-2024
SCALE (A3): 1 : 30000

BUSHFIRE PRONE PLANNING

240028_Fig1-2_LOC- Lot 180 (26) Marri Crescent Lesmurdie.qgz

WHERE SPP 3.7 AND THE GUIDELINES ARE TO APPLY – DESIGNATED BUSHFIRE PRONE AREAS

All higher order strategic planning documents, strategic planning proposals, subdivisions and development applications located in designated bushfire prone areas need to address SPP 3.7 and its supporting Guidelines. This also applies where an area is not yet designated as bushfire prone but is proposed to be developed in a way that introduces a bushfire hazard.

For development applications where only part of a lot is designated as bushfire prone and the proposed development footprint is wholly outside of the designated area, the development application will not need to address SPP 3.7 or the Guidelines. (Guidelines DPLH 2021 v1.4, s1.2).

For subdivision applications, if all the proposed lots have a BAL-LOW indicated, a BMP is not required. (Guidelines DPLH 2021 v1.4, s5.3.1).

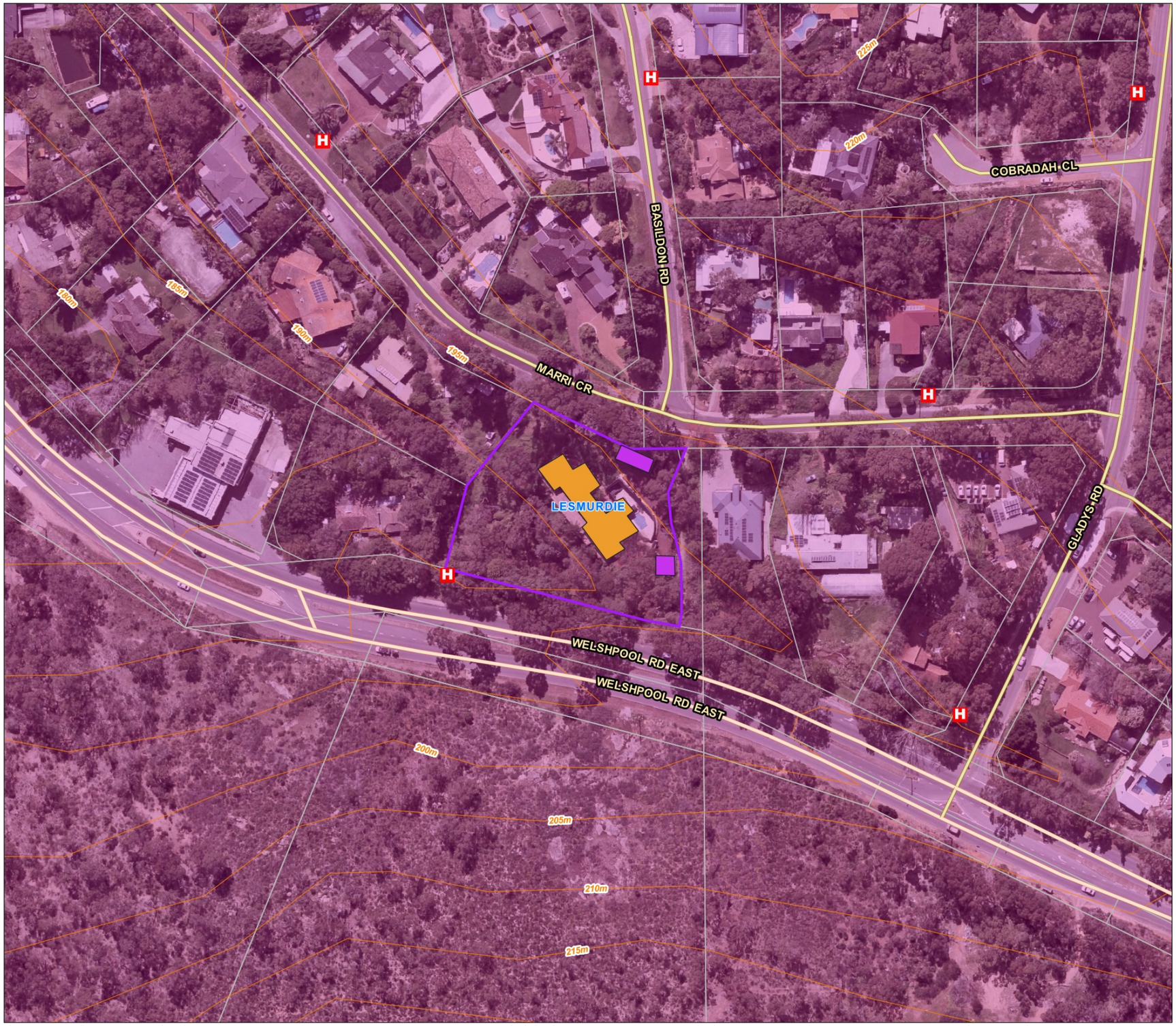


Figure 1.3

Bushfire Prone Area

Lot 180 on Plan 074459, Area : 4408 sq m
26 Marri Crescent
LESMURDIE
CITY OF KALAMUNDA

------ LEGEND ------

- Subject Site
- Cadastral
- Elevation (5m)
- Hydrants
- Bushfire Prone Areas

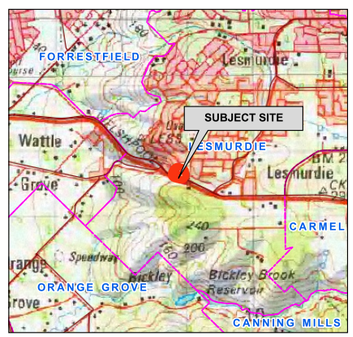
Existing Buildings

- Dwelling
- Car Port

0 20 40 60 80

Metres

------ LOCALITY ------



AERIAL IMAGERY: Landgate/SLIP

Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Merctaor Units: Metre
Map by: Selina Hutcheon 11-03-2024
SCALE (A3): 1 : 1250

BUSHFIRE PRONE PLANNING

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240028_Fig1-3_BPA - Lot 180 (26) Marri Crescent Lesmurdie.qgz

1.2 The Bushfire Management Plan (BMP)

1.2.1 Commissioning and Purpose

Landowner / proponent:	PAR Property Development Consultants
Bushfire Prone Planning commissioned to produce the BMP by:	Peter Ng
Purpose of the BMP:	To assess the proposal's ability to meet all relevant requirements established by State Planning Policy 3.7: Planning in Bushfire Prone Areas (SPP 3.7), the associated 'Guidelines and any relevant Position Statements; and To satisfy a condition of planning approval.
BMP to be submitted to:	City of Kalamunda

1.2.1 Other Documents with Implications for Development of this BMP

This section identifies any known assessments, reports or plans that have been conducted and prepared previously, or are being prepared concurrently, and are relevant to the planned proposal for the subject. They potentially have implications for the assessment of bushfire threats and the identification and implementation of the protection measures that are established by this Bushfire Management Plan.

Table 1.4: Other relevant documents that may influence threat assessments and development of protection measures.

RELEVANT DOCUMENTS					
Document	Relevant	Currently Exists	To Be Developed	Copy Provided by Proponent / Developer	Title
Structure Plan	No	N/A	N/A	N/A	-
Bushfire Management Plan	No	N/A	N/A	N/A	-
Bushfire Emergency Plan or Information	Yes	No	Yes	N/A	-
Implications for this BMP: To be developed alongside this BMP.					
Bushfire Risk Assessment and Management Report	No	N/A	N/A	N/A	No
Environmental Asset or Vegetation Survey	No	N/A	N/A	N/A	-
Landscaping and Revegetation Plan	No	N/A	N/A	N/A	-
Land Management Agreement	No	N/A	N/A	N/A	-

2 BUSHFIRE PRONE VEGETATION – ENVIRONMENTAL & ASSESSMENT CONSIDERATIONS

2.1 Environmental Considerations – 'Desktop' Assessment

This 'desktop' assessment must not be considered as a replacement for a full Environmental Impact Assessment. It is a summary of potential environmental values at the subject site, inferred from information contained in listed datasets and/or reports, which are only current to the date of last modification.

These data sources must be considered indicative where the subject site has not previously received a site-specific environmental assessment by an appropriate professional.

Many bushfire prone areas also have high biodiversity values. Consideration of environmental priorities within the boundaries of the land being developed can avoid excessive or unnecessary modification or clearing of vegetation. Approval processes (and exemptions) apply at both Commonwealth and State levels.

Any 'modification' or 'clearing' of vegetation to reduce bushfire risk is considered 'clearing' under the ***Environmental Protection Act 1986*** (EP Act) and requires a clearing permit under the ***Environmental Protection (Clearing of Native Vegetation) Regulations 2004*** (Clearing Regulations) – unless for an exempt purpose.

Clearing native vegetation is an offence, unless done under a clearing permit or the clearing is for an exempt purpose. Exemptions are contained in the EP Act or are prescribed in the Clearing Regulations (note: these do not apply in environmentally sensitive areas).

The ***Department of Water and Environmental Regulation*** (DWER) is responsible for issuing 'clearing' permits and the framework for the regulation of clearing. Approvals under other legislation, from other agencies, may also be required, dependent on the type of flora or fauna present.

Local Planning Policy or Local Biodiversity Strategy: Natural areas that are not protected by the above Act and Regulation (or any other National or State Acts) may be protected by a local planning policy or local biodiversity strategy. Permission from the local government will be required for any modification or removal of native vegetation in these Local Natural Areas (LNA's). Refer to the relevant local government for detail.

For further Information refer to Guidelines v1.4, the Bushfire and Vegetation Factsheet - WAPC, Dec 2021 and https://www.der.wa.gov.au/our-work/clearing-permits

Figure 2.1

Environmental Considerations Map

Lot 180 on Plan 074459, Area : 4408 sq m
26 Marri Crescent
LESMURDIE
CITY OF KALAMUNDA

------ LEGEND ------

- Subject Site
- Suburb
- Hydrants
- Reserves

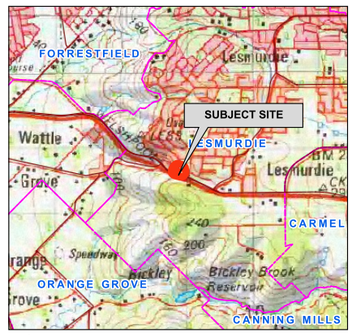
Environmentally Sensitive Areas
- Declared Rare Fauna

DBCA Legislated Lands and Waters
- Crown Freehold - Dept Managed
- National Park

0 50 100 150 200

Metres

------ LOCALITY ------



AERIAL IMAGERY: Landgate/SLIP

Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Merctaor Units: Metre
Map by: Selina Hutcheon 11-03-2024
SCALE (A3): 1 : 5000

240028_Fig2-1_ENV - Lot 180 (26) Marri Crescent Lesmurdie.qgz

2.1.1 Declared Environmentally Sensitive Areas (ESA)

IDENTIFICATION OF RELEVANT ENVIRONMENTALLY SENSITIVE AREAS							
ESA Class	Relevant to Proposal	Influence on Bushfire Threat Levels and / or Application of Bushfire Protection Measures	Relevant Dataset	Information Source(s) Applied to Identification of Relevant Vegetation			Further Action Required
				Dataset	Landowner or Developer	Environmental Asset or Vegetation Survey	
Wetlands and their 50m Buffer (Ramsar, conservation category and nationally important)	No	No	DBCA-010 and 011, 019, 040, 043, 044	☒	☐	☐	None
Bush Forever	No	No	DPLH-022, SPP 2.8	☒	☐	☐	None
Threatened and Priority Flora + 50m Continuous Buffer	Unknown	Unknown	DBCA-036	Restricted Scale of Data Available (security)	☐	☐	Data not available - confirm with relevant agency
Threatened Ecological Community	No	No	DBCA-038		☐	☐	None
Heritage Areas National / World	No	No	Relevant register or mapping	☐	☐	☐	None
Environmental Protection (Western Swamp Tortoise) Policy 2002	No	No	DWER-062	☐	☐	☐	None

2.1.2 Other Protected Vegetation on Public Land

IDENTIFICATION OF PROTECTED VEGETATION ON PUBLIC LAND							
Land with Environmental, Biodiversity, Conservation and Social Values	Relevant to Proposal	Influence on Bushfire Threat Levels and / or Application of Bushfire Protection Measures	Relevant Dataset	Information Source(s) Applied to Identification of Relevant Vegetation			Further Action Required
				Dataset	Landowner or Developer	Environmental Asset or Vegetation Survey	
Legislated Lands (tenure includes national park/reserve, conservation park, crown reserve and state forest)	Yes	Yes - Significant	DBCA-011	☒	☐	☐	None
Conservation Covenants	Unknown	Unknown	DPIRD-023	Only Available to Govt.	☐	☐	Data not obtained - confirm with relevant agency
National World Heritage Areas	No	No	-	☒	☐	☐	None
Designated Public Open Space	No	No	-	☒	☐	☐	None

DESCRIPTION OF THE IDENTIFIED AREA(S) OF VEGETATION

Vegetation on the neighbouring reserve to the east is class A forest within 21m, imposing a BAL- 40 on the property. Other vegetation on the verges makes a BAL-29 impossible.

2.1.3 Locally Significant Conservation Areas – Local Natural Areas (LNA)

IDENTIFICATION OF LOCALLY SIGNIFICANT CONSERVATION AREAS							
Land with Environmental, Biodiversity and Conservation Values	Relevant to Proposal	Influence on Bushfire Threat Levels and / or Application of Bushfire Protection Measures	Relevant Dataset	Information Source(s) Applied to Identification of Relevant Vegetation			Further Action Required
				Dataset	Landowner or Developer	Environmental Asset or Vegetation Survey	
Native Vegetation / Remnant Vegetation	No	No	City of Kalamunda intramaps	☒	☐	☐	None
Riparian Zones / Foreshore Areas	No	No		☒	☐	☐	None
Habitat Vegetation and Wildlife Corridors	No	No		☒	☐	☐	None

2.1.4 Response of Proposed Development to Identified Environmental Limitations

Consideration of the implications that identified protected areas of vegetation (i.e., those with environmental and subject to conservation) have for the proposed development.

PROPOSED DEVELOPMENT RESPONSE TO IDENTIFIED 'PROTECTED' VEGETATION	
The existence of 'protected' areas of vegetation has implications for the ability of the proposed development to reduce potential bushfire impact through modification or removal of vegetation.	No
Application of Design and/or Construction Responses to Limit Vegetation Modification or Removal	
Modify the development location to reduce exposure by increasing separation distance.	No
Redesign development, structure plan or subdivision.	No
Reduction of lot yield where this can increase available separation distances.	No
Cluster development to limit modification or removal of vegetation.	No
Construct building(s) to the requirements corresponding to higher BAL ratings to reduce required separation distances.	No

The dwelling is an existing building and therefore cannot be altered to be within BAL-29 or less. The reserves and verge areas impose BAL-FZ conditions on the existing building.

2.2 Bushfire Assessment Considerations

2.2.1 Planned Onsite Vegetation Landscaping

Identification of areas of the subject site planned to be landscaped, creating the potential for increased or decreased bushfire hazard for proposed development.

PLANNED LANDSCAPING	
Relevant to Proposal:	No

2.2.2 Planned / Potential Offsite Rehabilitation or Re-Vegetation

Identification of areas of land adjacent to the subject site on which re-vegetation (as distinct from natural re-generation) will or may occur and is likely to present a greater bushfire hazard for proposed development.

POTENTIAL RE-VEGETATION PROGRAMS		
Land with Environmental, Biodiversity, Conservation and Social Values	Relevant to Proposal	Description
Riparian Zones / Foreshore Areas	No	
Wetland Buffers	No	
Legislated Lands	No	The reserve across the road is already vegetated.
Public Open Space	No	
Road Verges	No	Road verges are already vegetated.
Other	No	

2.2.3 Identified Requirement to Manage, Modify or Remove Onsite or Offsite Vegetation

Identification of native vegetation subject to management, modification or removal.

REQUIREMENT TO MANAGE, MODIFY OR REMOVE NATIVE VEGETATION	
Has a requirement been identified to manage, modify or remove **onsite** native vegetation to establish the required bushfire protection measures on the subject site?	No
Is approval, from relevant state government agencies and/or the local government, to modify or remove **onsite** native vegetation required? (Note: if 'Yes' evidence of its existence should be provided in this BMP).	No
Has a requirement been identified to manage, modify or remove **offsite** native vegetation to establish the required bushfire protection measures on the subject site?	No
Is written approval required, from relevant state government agencies and/or the local government, that permits the landowner, or another identified party, to modify or remove **offsite** bushfire prone vegetation and/or conduct other works, to establish an identified bushfire protection measure(s)? If 'Yes', appropriate evidence of the approval or how it is to be established, shall be provided in this BMP as an addendum.	No

Is a written management agreement required that states the obligation of the landowner, or another responsible party, to manage defined areas of **offsite** bushfire prone vegetation, in perpetuity, to ensure the conditions of no fire fuels and/or low threat vegetation and/or vegetation managed in a minimal fuel condition, continue to be met? If 'Yes', appropriate evidence of the agreement or how it is to be established, shall be provided in this BMP as an addendum.	No

2.2.4 Variations to Assessed Areas of Classified Vegetation to be Applied

FOR THE PROPOSED DEVELOPMENT SITUATIONS TO BE ACCOUNTED FOR IN ASSESSING THE POTENTIAL BUSHFIRE IMPACT (BAL)	
Area(s) of land will be subject to future vegetation rehabilitation or re-vegetation that will require a change to a higher threat classification of vegetation on that land to. (Note: this is not regeneration to the mature natural state which is accounted for in the 'existing state' assessment in accordance with AS 3959:2018).	No
Modification of existing area(s) of classified vegetation due to the implementation of the proposed development and/or prior to the site's occupancy or use. This modification will require a change to a lower threat classification (or exclusion from classification) for that area of vegetation.	No
Complete removal of existing area(s) of classified vegetation due to the implementation of the proposed development and/or prior to the site's occupancy or use. This modification will require an exclusion from classification for that area of vegetation.	No

3 BUSHFIRE ATTACK LEVEL (BAL) ASSESSMENT

BUSHFIRE ATTACK LEVELS (BAL) - UNDERSTANDING THE RESULTS

The potential transfer (flux/flow) of radiant heat from the bushfire to a receiving object is measured in kW/m^2. The AS 3959:2018 BAL determination methodology establishes the ranges of radiant heat flux that correspond to each bushfire attack level. These are identified as BAL-LOW, BAL-12.5, BAL-19, BAL-29, BAL-40 and BAL-FZ.

The bushfire performance requirements for certain classes of buildings are established by the Building Code of Australia (Vol. 1 & 2 of the NCC). The BAL will establish the bushfire resistant construction requirements that are to apply in accordance with AS 3959:2018 - *Construction of buildings in bushfire prone areas* and the NASH Standard – *Steel framed construction in bushfire areas (NS 300 2021)*, whose solutions are deemed to satisfy the NCC bushfire performance requirements.

DETERMINED BAL RATINGS

A BAL Certificate can be issued for a determined BAL. A BAL can only be classed as 'determined' for an existing or future building/structure when:

1. It's final design and position on the lot are known and the stated separation distance from classified bushfire prone vegetation exists and can justifiably be expected to remain in perpetuity; or

2. It will always remain subject to the same BAL regardless of its design or position on the lot after accounting for any regulatory or enforceable building setbacks from lot boundaries as relevant and necessary (e.g., R-codes, restrictive covenants, defined building envelopes) or the retention of any existing classified vegetation either onsite or offsite.

If the BMP derives determined BAL(s), the BAL Certificate(s) required for submission with building applications can be provided, using the BMP as the assessment evidence.

INDICATIVE BAL RATINGS

A BAL Certificate cannot be issued for an indicative BAL. A BAL will be classed as 'indicative' for an existing or future building/structure when the required conditions to derive a determined BAL are not met.

This class of BAL rating indicates what BAL(s) could be achieved and the conditions that need to be met are stated.

Converting the indicative BAL into a determined BAL is conditional upon the currently unconfirmed variable(s) being confirmed by a subsequent assessment and evidential documentation. These variables will include the future building(s) location(s) being established (or changed) and/or classified vegetation being modified or removed to establish the necessary vegetation separation distance. This may also be dependent on receiving approval from the relevant authority for that modification/removal.

BAL RATING APPLICATION – PLANNING APPROVAL VERSUS BUILDING APPROVAL

1. **Planning Approval**: SPP.3.7 establishes that where BAL- LOW to BAL-29 will apply to relevant future construction (or existing structures for proposed uses), the proposed development may be considered for approval (dependent on the other requirements of the relevant policy measures being met). That is, BAL40 or BAL-FZ are not acceptable on planning grounds (except for certain limited exceptions).

   Because planning is looking forward at what can be achieved, as well as looking at what may currently exist, both determined and indicative BAL ratings are acceptable assessment outcomes on which planning decisions can be made (including conditional approvals).

2. **Building Approval:** The Building Code of Australia (Vol. 1 & 2 of the NCC) establishes that relevant buildings in bushfire prone areas must be constructed to the bushfire resistant requirements corresponding to the BAL rating that is to apply to that building. Consequently, a determined BAL rating and the BAL Certificate is required for a building permit to be issued - an indicative BAL rating is not acceptable.

3.1 BAL Assessment Summary (Contour Map Format)

INTERPRETATION OF THE BAL CONTOUR MAP

The BAL contour map is a diagrammatic representation of the results of the bushfire attack level assessment.

The map presents different coloured contours extending out from the areas of classified vegetation. Each contour represents a set range of radiant heat flux that potentially will transfer to an exposed element (building, person or other defined element), when it is located within that contour.

Each of the set ranges of radiant heat flux corresponds to a different BAL rating as defined by the AS 3959:2018 BAL determination methodology.

The width of each shaded BAL contour will vary dependant on both the BAL rating and the relevant parameters (calculation inputs) for the subject site. Their width represents the minimum and maximum vegetation separation distances that correspond to each BAL rating (refer to the relevant table below for these distances).

The areas of classified vegetation to be considered in developing the BAL contours, are those that will remain at the intended end state of the subject development once earthworks, clearing and/or landscaping and re-vegetation have been completed. Variations to this statement that may apply include:

- Both pre and post development BAL contour maps are produced; and/or
- Each stage of a development is assessed independently.

3.1.1 BAL Determination Methodology and Location of Data and Results

LOCATION OF DATA & RESULTS					
BAL Determination Methodology		Location of the Site Assessment Data			Location of the Results
AS 3959:2018	Applied to Assessment	Classified Vegetation and Topography Map(s)	Calculation Input Variables		Assessed Bushfire Attack Levels and/or Radiant Heat Levels
			Summary Data	Detailed Data with Explanatory and Supporting Information	
Method 1 (Simplified)	Yes	Figure 3.1	Table 3.2	Appendix A1	Table 3.1 Table 3.3 / BAL Contour Map
Method 2 (Detailed)	No	N/A	N/A	N/A	

3.1.2 BAL Ratings Derived from the Contour Map

Table 3.1: Indicative and determined BAL(s) for existing and/or proposed building works.

BUSHFIRE ATTACK LEVEL FOR EXISTING/PLANNED BUILDINGS/STRUCTURE [1]		
Building/Structure Description	Indicative BAL [2]	Determined BAL [2]
Dwelling	N/A	BAL-FZ

[1] The assessment data used to derive the BAL ratings is sourced from Table 3.1 and Figure 3.2 'BAL Contour Map'.

[2] Refer to the start of Section 3 for an explanation of indicative versus determined BAL ratings.

3.1.3 Site Assessment Data Applied to Construction of the BAL Contour Map(s)

RELEVANT CLASSIFIED VEGETATION	
Identification of Classified Vegetation that is Relevant to the Production of the BAL Contour Map(s)	Relevant Vegetation Map
The relevant vegetation will be all areas of classified vegetation that exist at the time of the site assessment – both within the subject site (onsite) and external to the subject site (offsite).	Figure 3.1.
Supporting Assessment Details: None Required.	

Table 3.2: The calculation inputs applied to determining the site specific separation distances corresponding to levels of potential radiant heat transfer (including BAL's).

SUMMARY OF CALCULATION INPUT VARIABLES APPLIED TO THE DETERMINATION OF SEPARATION DISTANCES CORRESPONDING TO RADIANT HEAT LEVELS [1]												
Applied BAL Determination Method		METHOD 1 - SIMPLIFIED PROCEDURE (AS 3959:2018 CLAUSE 2.2)										
The Calculation Variables Corresponding to the BAL Determination Method Applied												
Methods 1 and 2		Method 1	Method 2									
Vegetation Classification		FDI	Effective Slope		Site Slope	FFDI or GFDI	Flame Temp.	Elevation of Receiver	Flame Width	Fireline Intensity	Flame Length	Modified View Factor
			Applied Range	Determined								
Area	Class		degree range	degrees	degrees		K	metres	metres	kW/m	metres	% Reduction
1	(A) Forest	80	Upslope or flat 0	flat 0								
2	(C) Shrubland	80	Upslope or flat 0	upslope 9								
3	(D) Scrub	80	Upslope or flat 0	flat 0								
4	Excluded cl 2.2.3.2(e & f)	80	N/A	-								
5	(A) Forest	80	Downslope >0-5	d/slope 3								
[1] All data and information supporting the determination of the classifications and values stated in this table and any associated justification, is presented in Appendix A.												

Table 3.3: Vegetation separation distances corresponding to the radiant heat levels illustrated as BAL contours in Figure 3.2.

THE CALCULATED VEGETATION SEPARATION DISTANCES (METRES) CORRESPONDING TO THE STATED LEVEL OF RADIANT HEAT FLUX [1]									
Vegetation Classification		Bushfire Attack Levels						Specific Values	
		BAL-FZ	BAL-40	BAL-29	BAL-19	BAL12.5	BAL-LOW		
		Maximum Radiant Heat Flux							
Area	Class	>40 kW/m^2	40 kW/m^2	29 kW/m^2	19 kW/m^2	12.5 kW/m^2	N/A [2]	10 kW/m^2	2 kW/m^2
1	(A) Forest	<16	16-<21	21-<31	31-<42	42-<100	>100		
2	(C) Shrubland	<7	7-<9	9-<13	13-<19	19-<100	>100		
3	(D) Scrub	<10	10-<13	13-<19	19-<27	27-<100	>100		
4	Excluded cl 2.2.3.2(e & f)	-	-	-	-	-	-		
5	(A) Forest	<20	20-<27	27-<37	37-<50	50-<100	>100		

[1] All calculation input variables are presented in Table 3.2.

[2] The BAL-LOW rating is not defined by the level of radiant heat flux. It applies when the vegetation separation distance is 100m or 50m for the Grassland vegetation classification.

Figure 3.1

Classified Vegetation & Topography (Existing)

Lot 180 on Plan 074459, Area : 4408 sq m
26 Marri Crescent
LESMURDIE
CITY OF KALAMUNDA

------ LEGEND ------

- Subject Site
- Cadastral
- Elevation (5m)
- Photo and Direction
- Hydrants
- 150m Assessment Area
- 100m Assessment Area

Existing Buildings

- Dwelling
- Car Port

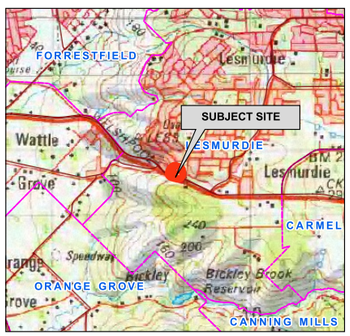
Classified Vegetation

- Class A - Forest
- Class C - Shrubland
- Class D - Scrub
- Exclusion 2.2.3.2

0 20 40 60 80

Metres

------ LOCALITY ------



AERIAL IMAGERY: Landgate/SLIP

Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Merctaor Units: Metre
Map by: Selina Hutcheon 26-06-2024
SCALE (A3): 1 : 1250

BUSHFIRE PRONE PLANNING

240028_Fig3-1_VEG - Lot 180 (26) Marri Crescent Lesmurdie.qgz

Disclaimer and Limitation: This map has been prepared for bushfire management planning purposes only. All depicted areas, contours and any dimensions shown are subject to survey. Bushfire Prone Planning does not guarantee that this map is without flaw of any kind and disclaims all liability for any errors, loss or other consequence which may arise from relying on any information depicted.

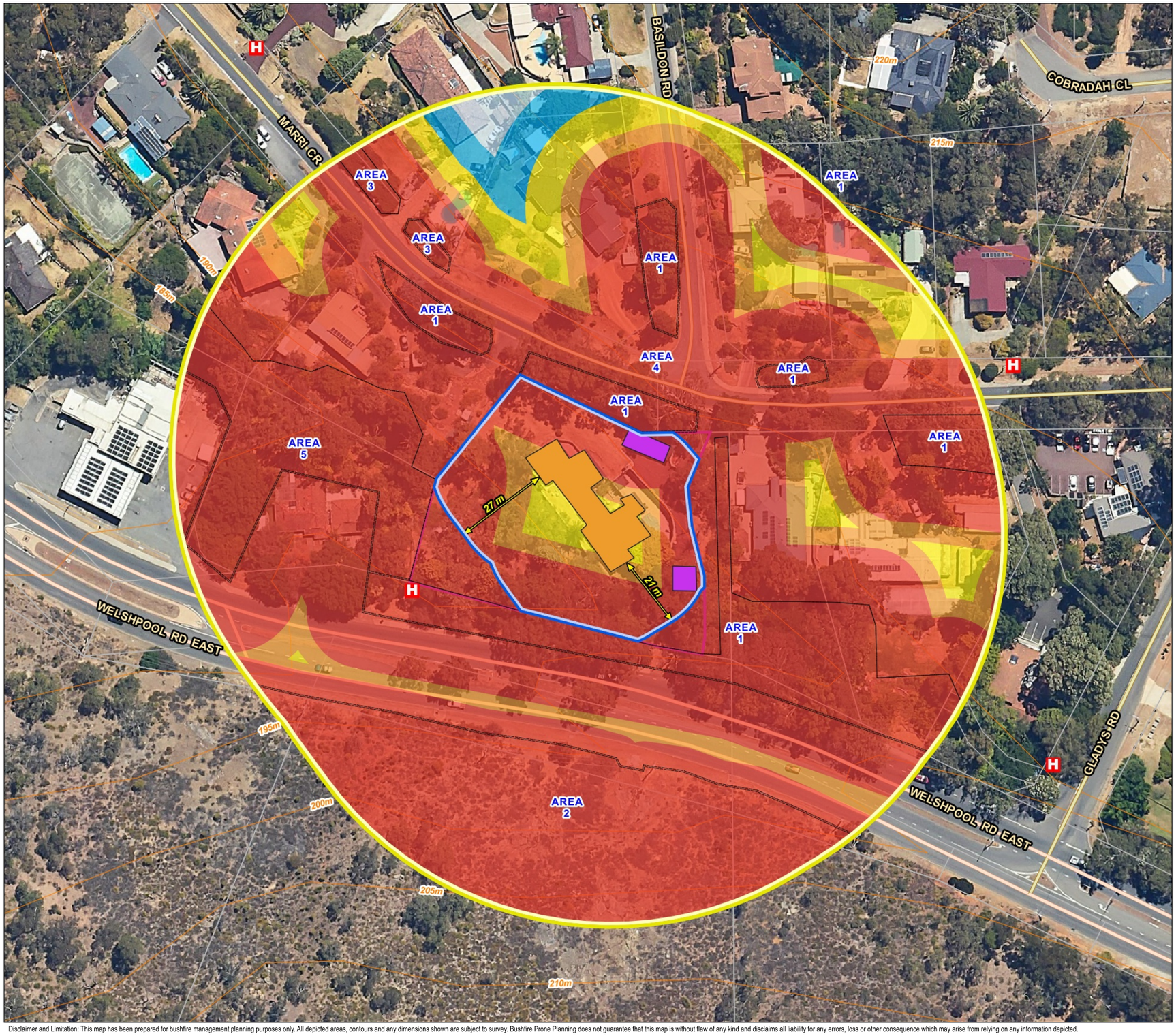


Figure 3.2

BAL Contour Map

Lot 180 on Plan 074459, Area : 4408 sq m
26 Marri Crescent
LESMURDIE
CITY OF KALAMUNDA

------ LEGEND ------

- Subject Site
- Cadastral
- Hydrants
- 100m Assessment Area
- APZ
- APZ Distance (m)

Existing Buildings

- Dwelling
- Car Port

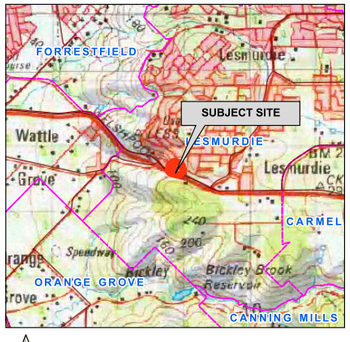
Bushfire Attack Levels

- BAL-FZ
- BAL-40
- BAL-29
- BAL-19
- BAL-12.5
- BAL-LOW

0 20 40 60

Metres

------ LOCALITY ------



AERIAL IMAGERY: Landgate/SLIP

Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Merctaor Units: Metre
Map by: Selina Hutcheon 26-06-2024
SCALE (A3): 1 : 1000

BUSHFIRE PRONE PLANNING

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240028_Fig3-2_BAL - Lot 180 (26) Marri Crescent Lesmurdie.qgz

4 IDENTIFICATION OF BUSHFIRE HAZARD ISSUES

The Guidelines for Planning in Bushfire Prone Areas (WAPC 2021 v1.4), Appendix 5, establish that the application of this section of the BMP is intended to support ***strategic planning*** proposals. At the strategic planning stage there will typically be insufficient proposed development detail to enable all required assessments, including the assessment against the bushfire protection criteria.

Strategic Planning Proposals

For strategic planning proposals this section of the BMP will identify:

- Issues associated with the level of the threats presented by any identified bushfire hazard;
- Issues associated with the ability to implement sufficient and effective bushfire protection measures to reduce the exposure and vulnerability levels (of elements exposed to the hazard threats), to a tolerable or acceptable level; and
- Issues that will need to be considered at subsequent planning stages.

All Other Planning Proposals

For all other planning stages, this BMP will address what are effectively the same relevant issues but do it within the following sections:

- Section 2 – Bushfire Prone Vegetation - Environmental and Assessment Considerations: Assess environmental, biodiversity and conservation values;
- Section 3 – Potential Bushfire Impact: Assess the bushfire threats with the focus on flame contact and radiant heat; and
- Section 5 – Assessment Against the Bushfire Protection Criteria (including the guidance provided by the *Position Statement: 'Planning in bushfire prone areas – Demonstrating Element 1: Location and Element 2'):* Assess the ability of the proposed development to apply the required bushfire protection measures thereby enabling it to be considered for planning approval for these factors.

Is the proposed development a strategic planning proposal?	No

5 ASSESSMENT AGAINST THE BUSHFIRE PROTECTION CRITERIA (GUIDELINES V1.4)

5.1 Bushfire Protection Criteria Elements Applicable to the Proposed Development/Use

APPLICATION OF THE CRITERIA, ACCEPTABLE SOLUTIONS AND PERFORMANCE ASSESSMENT

The criteria are divided into five elements – location, siting and design, vehicular access, water and vulnerable tourism land uses. Each element has an intent outlining the desired outcome for the element and reflects identified planning and policy requirements in respect of each issue.

The example acceptable solutions (bushfire protection measures) provide one way of meeting the element's intent. Compliance with these automatically achieves the element's intent and provides a straightforward pathway for assessment and approval.

Where the acceptable solutions cannot be met, the ability to develop design responses (as alternative solutions that meet bushfire performance requirements) is an alternative pathway that is provided by addressing the applicable performance principles (as general statements of how best to achieve the intent of the element).

A merit based assessment is established by the SPP 3.7 and the Guidelines as an additional alternative pathway along with the ability of using discretion in making approval decisions (sections 2.5, 2.6 and 2.7). This is formally applied to certain development (minor and unavoidable – sections 5.4.1 and 5.7). Relevant decisions by the State Administrative Tribunal have also supported this approach more generally.

Elements 1 – 4 should be applied for all strategic planning proposals, subdivision or development applications, except for vulnerable tourism land uses which should refer to Element 5. Element 5 incorporates the bushfire protection criteria in Elements 1 – 4 but caters them specifically to tourism land uses. (Guidelines DPLH 2021v1.4)

The Bushfire Protection Criteria	Applicable to the Proposed Development/Use
Element 1: Location	No
Element 2: Siting and Design	No
Element 3: Vehicular Access	No
Element 4: Water	No
Element 5: Vulnerable Tourism Land Uses	Yes

5.2 Local Government Variations to Apply

Local governments may add to or modify the acceptable solutions to recognise special local or regional circumstances (e.g., topography / vegetation / climate). These are to be endorsed by both the WAPC and DFES before they can be considered in planning assessments. (Guidelines DPLH 2021v1.4).	
Do endorsed regional or local variations to the acceptable solutions apply to the assessments against the Bushfire Protection Criteria for the proposed development /use?	None known or identified

5.3 Assessment Statements for Element 5: Vulnerable Tourism Land Uses

5.3.1 B&B / Holiday House Within Built-Out Area

VULNERABLE TOURISM					
Element Intent	To provide bushfire protection for tourism land uses relevant to the characteristics of the occupants and/or the location, to preserve life and reduce the impact of bushfire on property and infrastructure.				
Proposed Development/Use – Relevant Type	**Bed and breakfast and holiday house within a residential built out area.**				
Element Compliance Statement	The proposed development/use cannot fully comply with all applicable acceptable solutions. An alternative solution(s) is provided.				
Pathway Applied to Provide an Alternative Solution	Merit based assessment - identified as 'minor' development (Guidelines s4.5.3). Details in BMP s5.4.				
Acceptable Solutions - Assessment Statements *All details of acceptable solution requirements are established in the Guidelines for Planning in Bushfire Prone Areas, DPLH v1.4 (Guidelines) and apply the guidance established by the 'Bushfire Management Plan Guidance for the Dampier Peninsula' (WA Department of Planning, Lands and Heritage, 2021 Rev B) as relevant. These documents are available at https://www.wa.gov.au/government/document-collections/state-planning-policy-37-planning-bushfire-prone-areas.* *The technical construction requirements for access types and components, and for each firefighting water supply component, are also presented in Appendices C and D. The local government will advise the proponent where different requirements are to apply and when any additional specifications such as those for signage and gates are to apply (these are included in the relevant appendix if requested by the local government).*					
Solution Component Check Box Legend	☑ Relevant & met	☒ Relevant & not met	⃠ Not relevant		
A5.1 Siting and Design					
A5.1 Siting and Design				**Compliant:**	No
A5.1a Asset protection zone (APZ)			**Applicable:** Yes	**Compliant:**	No

APZ DIMENSIONS – DIFFERENCES IN REQUIREMENTS FOR PLANNING ASSESSMENTS COMPARED TO IMPLEMENTATION

A key required bushfire protection measure is to reduce the exposure of buildings/infrastructure (as exposed vulnerable elements at risk), to the direct bushfire threats of flame contact, radiant heat and embers and the indirect threat of consequential fires that result from the subsequent ignition of other combustible materials that may be constructed, stored or accumulate in the area surrounding these structures. This reduces the associated risks of damage or loss.

This is achieved by separating buildings (and consequential fire fuels as necessary) from areas of classified bushfire prone vegetation. This area of separation surrounding buildings is identified as the Asset Protection Zone (APZ) and consists of no vegetation and/or low threat vegetation or vegetation continually managed to a minimal fuel condition. The required separation distances will vary according to the site specific conditions and local government requirements.

The APZ dimensions stated and/or illustrated in this Report can vary dependent on the purpose for which they are being identified.

> *Note: Appendix B 'Onsite Vegetation Management' provides further information regarding the different APZ dimensions that can be referenced, their purpose and the specifications of the APZ that are to be established and maintained on the subject lot.*

THE 'PLANNING BAL-29' APZ DIMENSIONS

Purpose: To provide evidence of the development or use proposal's ability to achieve minimum vegetation separation distances. To achieve 'acceptable solution' planning approval for this factor, it must be demonstrated that the minimum separation distances corresponding to a maximum level of radiant transfer to a building of 29 kW/m^2, either exist or can be implemented (with certain exceptions). These separation distances are the 'Planning BAL-29' APZ dimensions.

The 'Planning BAL-29' APZ is not necessarily the size of the APZ that must be physically implemented and maintained by a landowner. Rather, its sole purpose is to identify if an acceptable solution for planning approval can be met.

THE 'REQUIRED' APZ DIMENSIONS

Purpose: Establishes the dimensions of the APZ to be physically implemented by the landowner on their lot: These will be the minimum required separation distances from the subject building(s) to surrounding bushfire prone vegetation (identified by type and associated ground slope). These are established by:

A. The 'BAL Rating APZ' of the subject building(s) when distances are greater than 'B' below (except when 'B' establishes a maximum distance); or

B. The 'Local Government' APZ' derived from the Firebreak/Hazard Reduction Notice when distances are greater than 'A' above, other than when a maximum distance is established, in which case this will apply; or

C. A combination of 'A' and 'B'.

> *Within this Report/Plan it is the **'Planning BAL-29' APZ** that will be identified on maps, diagrams and in tables as necessary – unless otherwise stated.*
>
> *The **'Required' APZ** dimension information will be presented in Appendix B1.1 and on the Property Bushfire Management Statement, when required to be included for a development application.*

☐ ☒ ☐	**APZ Width:** The proposed (or a future) habitable building(s) on the lot(s) of the proposed development - or an existing building for a proposed change of use – can be (or is) located within the developable portion of the lot and be surrounded by a 'Planning BAL-29' APZ of the required dimensions (measured from any external wall or supporting post or column to the edge of the classified vegetation), that will ensure their exposure to the potential radiant heat impact of a bushfire does not exceed 29 kW/m^2.
☐ ☐ ⃠	**Restriction on Building Location:** It has been identified that the current developable portion of a lot(s) provides for a future building location that will result in that building being subject to a BA-40 or BAL-FZ rating. Consequently, it may be considered necessary to impose the condition that a restrictive covenant to the benefit of the local government pursuant to section 129BA of the Transfer of Land Act 1893, is to be placed on the certificate(s) of title of the proposed lot(s) advising of the existence of a restriction on the use of that portion of land (refer to Code F3 of Model Subdivision Conditions Schedule, WAPC June 2021 and Guidelines s5.3.2).
☐ ☒ ☐	**APZ Location:** The required dimensions for a 'Planning BAL-29' APZ can be contained solely within the boundaries of the lot(s) on which the proposed (or a future) habitable building(s) - or an existing building(s) for a proposed change of use – is situated.
☐ ☒ ☐	**APZ Location:** The required dimensions for a 'Planning BAL-29' APZ can be partly established within the boundaries of the lot(s) on which the proposed (or a future) habitable building(s) - or an existing building(s) for a proposed change of use – is situated. The balance of the APZ would exist on adjoining land that

	satisfies the exclusion requirements of AS 3959:2018 cl 2.2.3.2 for non-vegetated areas and/or low threat vegetation and/or vegetation managed in a minimal fuel condition.
☐ ☒ ☐	**APZ Location:** It can be justified that any adjoining (offsite) land forming part of a 'Planning BAL-29' APZ will: • If non-vegetated, remain in this condition in perpetuity; and/or • If vegetated, be low threat vegetation or vegetation managed in a minimal fuel condition in perpetuity.
☑ ☐ ☐	**APZ Management:** The area of land (within each lot boundary), that is to make up the required 'Landowner' APZ dimensions (refer to Appendix B, Part B1), can and will be managed in accordance with the requirements of the Guidelines Schedule 1 'Standards for Asset Protection Zones' (refer to Appendix B).
☐ ☐ ⊘	**Subdivision Staging:** There are undeveloped future stages of subdivision, containing bushfire prone vegetation, that have been taken into consideration for their potentially 'temporary' impact on the ability to establish a 'Planning BAL-29 APZ' on adjoining developed lots. A staging plan is developed to manage this.
☑ ☐ ☐	**Firebreak/Hazard Reduction Notice:** Any additional requirements established by the relevant local government's annual notice to install firebreaks and manage fuel loads (issued under s33 of the Bushfires Act 1954), can and will be complied with.
Supporting Assessment Details: The planning BAL-29 APZ cannot be implemented for the existing house as the relevant vegetation includes vegetation on the verges directly north and south of the property, as well as vegetation in a creek running alongside a vegetation pathway, located directly east of the property. The vegetation on the lot is managed in a minimal fuel condition, with managed grasses, vegetation which is irrigated by the stream running through the backyard, and trees which have been managed to remove lower branches. The proposal was assessed as minor development in section 5.4 of this report.	

A5.2 Vehicular Access				
A5.2 Vehicular Access			**Compliant**:	Yes
A5.2a Private driveway - technical requirements	**Applicable**:	Yes	**Compliant**:	Yes
☑ ☐ ☐	The private driveway length is no greater than 70m. No technical requirements need to be met.			
☐ ☐ ⊘	The technical construction requirements for widths, clearances, capacity, gradients and curves (Guidelines, Table 6. Refer also to Appendix C in this BMP), can and will be complied with.			
☐ ☐ ⊘	Passing bays can and will be installed every 200m with a minimum length of 20m and a minimum additional trafficable width of 2m.			
☐ ☐ ⊘	The turnaround area requirements (Guidelines, Figure 28, and within 30m of the habitable building) can and will be complied with.			
Supporting Assessment Details: The private driveway is approximately 45m to the furthest point. There is also space for vehicle turnaround using the driveway along the northern carport.				

A5.2b Signage	**Applicable**:	Yes	**Compliant**:	Yes
☑ ☐ ☐	The required information to inform the actions of those persons onsite in the event of a bushfire will be prominently displayed within the site.			
☑ ☐ ☐	This information will include evacuation routes and distance and the site specific procedural detail that will be established by the Bushfire Emergency Plan (or Information) that is required to be developed for the proposed use.			
Supporting Assessment Details: A Bushfire Emergency Plan is being created alongside this BMP. The Bushfire Emergency Poster is required to be displayed within the premises.				
A5.3 Provision of Water for Firefighting Purposes				
A5.3 Provision of Water for Firefighting Purposes			**Compliant**:	Yes
A5.3a Reticulated supply	**Applicable**:	Yes	**Compliant**:	Yes
☑ ☐ ☐	A reticulated water supply is available to the proposed development. The existing hydrant connection(s) are provided in accordance with the specifications of the relevant water supply authority.			
☐ ☐ ⦸	A reticulated water supply is available to the proposed development. Hydrant connection(s) can and will be provided in accordance with the specifications of the relevant water supply authority.			
Supporting Assessment Details: A fire hydrant is located directly south of the property which could be used by firefighters to fight the rear of the property from beyond the fence line. The hydrant nearest to the driveway is 90m to the east along Marri Crescent. Refer to information contained in Appendix D for the firefighting water supply specifications and technical requirements.				

5.4 Non-Compliance – Additional Assessments

5.4.1 Merit Based Assessment – Considering the Proposal as 'Minor' Development

THE MERIT BASED ASSESSMENT ESTABLISHED BY SPP 3.7 SECTION 6.7.1: MINOR DEVELOPMENT
Minor development refers to development of land on an existing lot in a predominantly residential built-out area, that may or may not have been subject to consideration of bushfire in the past and is at a scale which may not require full compliance with the relevant policy measures. Classes of development considered under this definition, with the exclusion of applications for unavoidable development, are (a) a single house on an existing lot 1,100m^2 or greater; (b) an ancillary dwelling on a lot of 1,100m^2 or greater; and a change to a vulnerable land use in an existing residential development (Guidelines).
6.7.1(a) Where full compliance with the Bushfire Protection Criteria requirements cannot be achieved within the boundary of the development site, evidence must be provided demonstrating to the greatest extent possible how the criteria have been addressed and provide justification for those that have not been met.
Full compliance cannot be achieved with A.5.1a Siting and Design – Asset Protection Zone (APZ). The vegetation imposing the BAL-FZ on the dwelling are offsite, and therefore cannot be managed by the landowner, including verge areas and a small reserve area on the lot directly to the east. As the dwelling is existing, it cannot be re-positioned within BAL-29. The vegetation on the site is and will continue to be managed to low-threat by the landowner.
6.7.1(b) Ensure that the bushfire hazard level is not increased and/or the ability to manage bushfire hazards on adjoining lands is not otherwise adversely affected.
The proposal does not include any new building or revegetation plans which will increase the hazard to the surrounding area. The vegetation on the property is, and will continue to be, managed to low-threat by the landowner, which will aid to reduce the impact on neighbouring properties during a bushfire.
6.7.1(c) Ensure that the siting of the buildings within the boundary of the development site has been optimised to reduce bushfire impact.
The existing building is located in BAL-FZ. This cannot be altered as the vegetation imposing the BAL-FZ are not located on the property. The building is existing and therefore cannot be repositioned.

6.7.1(d) Give holistic consideration to existing emergency services in the area, existing road networks, water provision, existing places that could function as emergency evacuation centres in a bushfire event, the surrounding landscape, issues that may arise in the course of a bushfire both during and post event, and any contextual issues relevant to the application of bushfire risk management measures.
The area is serviced by the Kalamunda Bushfire Brigade and Kalamunda State Emergency Services Unit located 7 minutes drivetime from the property, and the Kalamunda Volunteer Fire and Rescue Services located 8 minutes' drive time from the property. The nearest hospital with an emergency department is St. John of God Midland with a drive time of 23 minutes. The proposal is located very close to Welshpool Road East, a major road travelling East and West with a speed limit of 70/80 in the relevant areas. The road network to the north consists of various routes to the north travelling through residential built out areas. Bushfire Emergency Information will be provided to the occupants and will outline appropriate evacuation locations and routes. Sufficient water is provided to the area via hydrants. Three hydrants are located within 150m of the driveway to the east and west along Marri Crescent and to the north along Basildon St. Another hydrant is located outside the property fence line to the southwest which could be used to fight fires from the rear of the property through or over the fence. The property also includes a pool which is likely to be kept full due to its proposed use as short-term accommodation. The water will be available for use by firefighters or by occupants on the property. The property is located 1.6km (3 minutes' drive time) from Ray Owen Sports Centre which could be used as a refuge/evacuation centre in case of an emergency. The property is also located 800m (1 minutes' drive time) to Mazenod College. A Bushfire emergency plan is being created alongside this BMP which will be displayed within the premises. Occupants will be able to use the BEP Poster to guide themselves out of Lesmurdie into lower threat areas. Fire in the landscape is most likely to come from the large area of bushland to the south/east. The landscape in this area is upslope from the proposal and separated from the property via Welshpool Rd East. There is also a large area of downslope vegetation located to the west of the property. The fire would be slowed by the residential area between the property and the downslope area. Sufficient evacuation routes in multiple directions exist for occupants to escape potential bushfires.

5.5 Additional Bushfire Protection Measures to be Implemented

The following bushfire protection measures are recommended to be implemented and maintained. They are additional to, or a variation of, those established by the relevant acceptable solutions applied to the proposed development/use within Sections 5 of this BMP (as applicable to the proposed development).

The intent of their application is to improve the bushfire performance of the proposed development/use and reduce residual risk levels to persons and property from a bushfire event.

The development of these additional and/or varied protection measures originates the following potential sources (not exhaustive):

1. Out of the relevant merit based assessment when the Section titled 'Non-compliance – Additional Assessments' has been used in this BMP;
2. Out of the relevant performance based assessment when Section titled 'Non-compliance – Additional Assessments' has been used in this BMP;
3. Out of the development of any other required bushfire planning documents. These include a Bushfire Emergency Plan and the Bushfire Risk Assessment and Management Report;
4. Out of any additional bushfire planning guidance documents or position statements issued by the WA Department of Planning, Lands and Heritage;
5. From any 'Conditions' which may be applied to a 'Planning Approval' or a 'Notice of Determination; or
6. As a recommendation from the bushfire consultant.

The following table summarises the requirements/recommendations with the detail provided in the following sections.

When necessary, the implementation responsibility for these additional protection measures will be stated in Section 6 of this BMP and included in other operational documents as relevant.

Additional Protection Measure No. 1: Bushfire Resilient Construction – Existing Buildings/Structures

The existing dwelling is not required to be retrofitted to comply with the bushfire performance requirements established by the Building Code of Australia (Vol. 1 & 2 of the National Construction Code) that are referenced by the Building Regulations 2012 (WA Building Act 2011).

However, it is suggested (by the bushfire consultant) that retrofitting works be done to these buildings/structures that will apply the construction requirements corresponding to BAL-12.5. This will increase their resistance to ember entry into internal spaces and the subsequent ignition of combustible materials.

Where construction requirements corresponding to higher BAL ratings can be afforded and practically implemented, these should be considered.

The bushfire construction requirements corresponding to BAL ratings are established by AS 3959:2018 – Construction of buildings in bushfire prone areas and/or the NASH Standard (NS 300 2021) – Steel framed construction in bushfire areas (for Class 1 buildings).

6 RESPONSIBILITY CHECKLISTS FOR THE IMPLEMENTATION AND MANAGEMENT OF BUSHFIRE PROTECTION MEASURES

The following sections and their associated tables establish:

- The bushfire protection measures that shall be initially implemented and those requiring ongoing maintenance to the stated requirements;
- The persons responsible for the implementation and maintenance of the required bushfire protection measures; and
- The persons responsible and the timing for compliance certification when required.

The necessity for the BMP to contain this information is established by the *Guidelines for Planning in Bushfire Prone Areas* (Version 1.4, WAPC 2021) in Appendices 3 and 5.

6.1 Landowner Responsibilities Prior To Commencement of Operation

TABLE 6.1(A) REQUIRED BUSHFIRE PROTECTION MEASURES - IMPLEMENTATION ACTIONS (SUBJECT TO COMPLIANCE CHECK TO BE CONDUCTED BY A BUSHFIRE CONSULTANT)	
1	Prior to occupancy/operation establish the 'Required' Asset Protection Zone (APZ) around habitable buildings (and other structures as required) to satisfy: • The minimum required dimensions established in Appendix B1; and • The standards established by the *Guidelines for planning in bushfire prone areas,* DPLH, 2021 v1.4, Schedule 1; or • The standards established for an Asset Protection Zone (APZ) by the relevant local government's requirements set out in a section 33 notice under the Bush Fires Act 1954 (annual firebreak/fuel load notice); or • An alternative standard in a gazetted local planning scheme; or If native vegetation is required to be modified or removed, ensure that approval has been received from the relevant authority (refer to the applicable local government for advice).
2	Prior to occupancy, for the 'vulnerable' land use, there is an outstanding obligation, created by this Bushfire Management Plan, for a Bushfire Emergency Plan for proposed occupants to be developed and approved.
3	Prior to occupancy, signage must be prominently displayed within the site that informs the actions of those persons onsite in the event of a bushfire. This will include evacuation route information, site procedures – as per the instructions within the Bushfire Emergency Plan developed for the site and use.
4	Prior to occupancy, all actions contained within the 'Pre-Season Preparation Procedure' established by the Bushfire Emergency Plan, must be completed.

TABLE 6.1(B) REQUIRED BUSHFIRE PROTECTION MEASURES - IMPLEMENTATION ACTIONS (SUBJECT TO COMPLIANCE BEING ESTABLISHED BY THE WAPC AND/OR LOCAL GOVERNMENT)	
1	[Relevant when stated as a condition of planning approval] The landowner/proponent is to register a notification onto the certificate of title and deposited plan (with the required wording stated by the local government). This will be done pursuant to *Section 70A Transfer of Land Act 1893 (as amended) as per 'Factors affecting use and enjoyment of land, notification on title'*. This is to notify owners and prospective purchasers of the land that: 1. The land is in a designated bushfire prone area as designated by an Order made by the Fire and Emergency Services Commissioner; 2. The land is subject to a Bushfire Management Plan that establishes certain protection measures to manage bushfire risk that are to be implemented and continue to be applied at the owner's cost; and 3. That additional planning and building requirements may apply to development on this land.

6.2 Landowner Responsibilities – Ongoing Management

TABLE 6.2 REQUIRED BUSHFIRE PROTECTION MEASURES – ONGOING MANAGEMENT ACTIONS	
1	Maintain the 'Required' Asset Protection Zone (APZ) around habitable buildings (and other structures as required) to satisfy: • The minimum required dimensions established in Appendix B1; and • The standards established by the *Guidelines for planning in bushfire prone areas,* DPLH, 2021 v1.4, Schedule 1; or • The standards established for an Asset Protection Zone (APZ) by the relevant local government's requirements set out in a section 33 notice under the Bush Fires Act 1954 (annual firebreak/fuel load notice); or • An alternative standard in a gazetted local planning scheme; or
2	Comply with the City of Kalamunda Fire Hazard Reduction Notice issued under s33 of the Bush Fires Act 1954. Check the notice annually for any changes.
3	Maintain vehicular access routes within the lot to comply with the technical requirements referenced in the BMP and the relevant local government's annual firebreak / hazard reduction notice.
4	Ensure that builders engaged to construct dwellings/additions and/or other relevant structures on the lot, are aware of the existence of this approved Bushfire Management Plan (BMP). The plan identifies that the development site is within a designated bushfire prone area and states the indicative (or determined) BAL rating(s) that may (or will) be applied to buildings/structures. A BAL assessment report may be required to confirm determined ratings and will be required when ratings are indicative. BAL certificates will need to be issued to accompany building applications. Compliance with the Building Code of Australia (Volumes 1 and 2 of the National Construction Code), will require certain bushfire resistant construction requirements be applied to residential buildings in bushfire prone areas (i.e., Class 1, 2 and 3 and associated Class 10a buildings and decks). The deemed to satisfy solutions that will meet the relevant bushfire performance requirements are found in AS 3959 – Construction of Building in Bushfire Prone Areas (as amended) and the NASH Standard - Steel Framed Construction in Bushfire Areas (as amended). As an additional bushfire protection measure, other classes of buildings may also be required to comply with these construction requirements when established by the relevant authority or if identified as an additional bushfire protection measure within the BMP. The BMP may also establish that construction requirements to be applied will be those corresponding to a specified higher BAL rating. When applicable, these requirements will be identified in Section 5.7.
5	Ensure all future buildings the landowner has responsibility for, are designed and constructed in full compliance with: • The bushfire resistant construction requirements of the Building Code of Australia (Volumes 1 and 2 of the National Construction Code), as established by the Building Regulations 2012 (WA Building Act 2011); and • Any additional bushfire protection measures this Bushfire Management Plan has established are to be implemented.

6	Annually review the Bushfire Emergency Plan and complete all actions contained within the 'Pre-Season Preparation Procedure' and the 'In-Season Preparation Procedure' at the appropriate times of the year.
7	Ensure the ongoing implementation of the BMP, including providing successive landowners with a copy of the BMP and making them aware of the responsibilities it contains.

6.3 Local Government Responsibilities – Ongoing Management

TABLE 6.3 REQUIRED BUSHFIRE PROTECTION MEASURES – ONGOING MANAGEMENT ACTIONS	
1	To be aware of the potential consequences of any significant changes in the local government's management of land, of which they have vested control (including re-vegetation), that could have an adverse impact on the determined BAL ratings that apply to adjacent existing or future buildings and where: • The determined BAL ratings have been established by an existing BMP or a BAL Assessment; and • The BAL has been correctly determined with appropriate consideration of what might reasonably be expected to potentially change in the future with regards to the classification of the vegetation being altered and/or management of the relevant area of vegetation.

APPENDIX A: DETAILED BAL ASSESSMENT DATA AND SUPPORTING INFORMATION

A1: BAL Assessment Inputs Common to the Method 1 and Method 2 Procedures

A1.1: FIRE DANGER INDICES (FDI/FDI/GFDI)

When using Method 1 the relevant FDI value required to be applied for each state and region is established by AS 3959:2018, Table 2.1. Each FDI value applied in Tables 2.4 – 2.7 represents both the Forest Fire Danger Index (FFDI) and a deemed equivalent for the Grassland Fire Danger Index (GFDI), as per Table B2 in Appendix B. When using Method 2, the relevant FFDI and GFDI are applied.

The values may be able to be refined within a jurisdiction, where sufficient climatological data is available and in consultation with the relevant authority.

Relevant Jurisdiction:	WA	Region:	Whole State	Method 1	Applied FDI:	80
				Method 2	Applied FFDI:	N/A
					Applied GFDI:	N/A

A1.2: VEGETATION ASSESSMENT AND CLASSIFICATION

Vegetation Types and Classification

In accordance with AS 3959:2018 Clauses 2.2.3 and C2.2.3.1, all vegetation types within 100 metres of the 'site' (defined as "the part of the allotment of land on which a building stands or is to be erected"), are identified and classified. Any vegetation more than 100 metres from the site that has influenced the classification of vegetation within 100 metres of the site, is identified and noted. The maximum excess distance is established by AS 3959: 2018 Clause 2.2.3.2 and is an additional 100 metres.

Classification is also guided by the Visual Guide for Bushfire Risk Assessment in WA (WA Department of Planning February 2016) and any relevant FPA Australia practice notes.

Modified Vegetation

The vegetation types have been assessed as they will be in their natural mature states, rather than what might be observed on the day. Vegetation destroyed or damaged by a bushfire or other natural disaster has been assessed on its expected re-generated mature state. Modified areas of vegetation can be excluded from classification if they consist of low threat vegetation or vegetation managed in a minimal fuel condition, satisfying AS 3959:2018 Clause 2.2.3.2(f), and there is sufficient justification to reasonable expect that this modified state will exist in perpetuity.

The Influence of Ground Slope

Where significant variation in effective slope exists under a consistent vegetation type, these will be delineated as separate vegetation areas to account for the difference in potential bushfire behaviour, in accordance with AS 3959:2018 Clauses 2.2.5 and C2.2.5.

THE INFLUENCE OF VEGETATION GREATER THAN 100 METRES FROM THE SUBJECT SITE	
Vegetation area(s) within 100m of the site whose classification has been influenced by the existence of bushfire prone vegetation from 100m – 200m from the site:	None
Assessment Statement:	No vegetation types exist close enough, or to a sufficient extent, within the relevant area to influence classification of vegetation within 100 metres of the subject site.

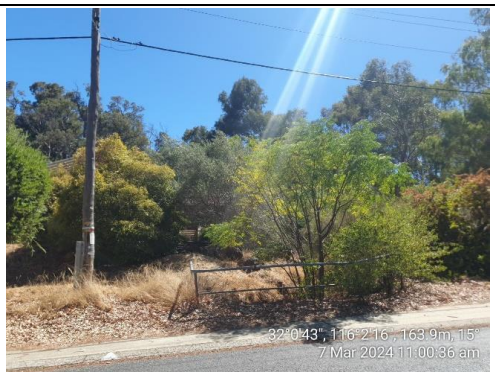
VEGETATION AREA 1						
Classification	**A. FOREST**					
Types Identified	Open forest A-03					
Exclusion Clause	N/A					
Effective Slope	Determined	flat 0 degrees	Applied Range (Method 1)	Upslope or flat 0 degrees		
Foliage Cover of Tallest Plant Layer	30-70%	Shrub/Heath Height	<2m	Tree Height	Up to 30m	
Dominant & Sub-Dominant Layers	Mixed tree species of varying heights, average height 10-15m. Dense shrub understoreys.					
Understorey:	Tropical species located along waterways.					
Justification Comments	Areas of dense vegetation mostly along small waterways (Photo ID's 2, 3, 12), neighbouring gardens with dense vegetation (Photo ID's 1, 6, 7, 10), areas which are lightly vegetated but likely to experience regrowth (Photo ID 11), and unmanaged verge areas (Photo ID's 4, 5, 9). Verge areas include short steep slopes.					
Post Development Assumptions:	To remain vegetated in perpetuity.					

PHOTO ID: 1

PHOTO ID: 2

PHOTO ID: 3

PHOTO ID: 4

	
PHOTO ID: 5	PHOTO ID: 6
	
PHOTO ID: 7	PHOTO ID: 8
	
PHOTO ID: 9	PHOTO ID: 10
	
PHOTO ID: 11	PHOTO ID: 12

VEGETATION AREA 2						
Classification	**C. SHRUBLAND**					
Types Identified	Open heath C-11					
Exclusion Clause	N/A					
Effective Slope	Determined	u/slope 9 degrees	Applied Range (Method 1)	Upslope or flat 0 degrees		
Foliage Cover of Tallest Plant Layer	10-30%	Shrub/Heath Height	<2m	Tree Height	N/A	
Dominant & Sub-Dominant Layers	Heath species <2m in height with grasstrees.					
Justification Comments	Area of shrubs on a steep upslope. Grass tree stems reaching above 2m. Trees in the background are >150m from the dwelling. A3 clipboard for scale in Photo ID 16.					
Post Development Assumptions:	Assumed to be at mature state. Areas of granite outcrop suggest shallow soils which cannot support larger vegetation.					

PHOTO ID: 13

PHOTO ID: 14

PHOTO ID: 15

PHOTO ID: 16

VEGETATION AREA 3						
Classification	**D. SCRUB**					
Types Identified	Open scrub D-14					
Exclusion Clause	N/A					
Effective Slope	Determined	flat 0 degrees	Applied Range (Method 1)	Upslope or flat 0 degrees		
Foliage Cover of Tallest Plant Layer	30-70%	Shrub/Heath Height	Up to 6m	Tree Height	Up to 6m	
Dominant & Sub-Dominant Layers	Small areas of dense vegetation below 6m in height on verges.					
Understorey:	Unmanaged grasses.					
Justification Comments	Height limited by power lines.					
Post Development Assumptions:	Will experience management to remain below 6m in height.					
						
PHOTO ID: 17						

VEGETATION AREA 4	
Classification	**EXCLUDED**
Exclusion Clause	2.2.3.2 (e) non-vegetated areas and (f) vegetation managed in a minimal fuel condition.
Justification Comments	Areas of managed vegetation. The garden on the property consists of low threat managed grasses (<10cm in height) and a tree area with managed shrubs, lower branches removed. Neighbouring properties with managed gardens/verges, and unvegetated areas including roads, buildings and driveways. Refer also to 1 and 2 – vegetation area 1 to see the non-vegetated sections.
Post Development Assumptions:	Garden area around the house to be maintained in perpetuity, required under the local government firebreak notice but also can be reasonably expected to be maintained year-round due to its use as short-term accommodation. Dead materials to be removed.

PHOTO ID: 18

PHOTO ID: 19

PHOTO ID: 20

PHOTO ID: 21

PHOTO ID: 22

PHOTO ID: 23

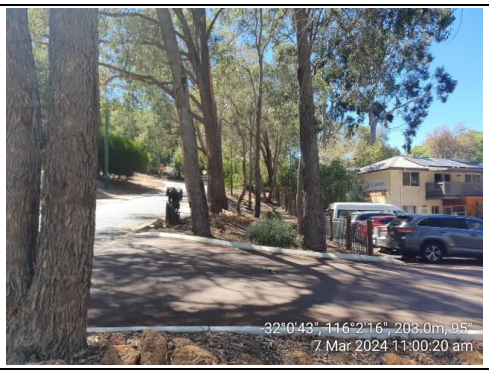
	
PHOTO ID: 24	PHOTO ID: 25
	
PHOTO ID: 26	PHOTO ID: 27
	
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PHOTO ID: 30	PHOTO ID: 31

	
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PHOTO ID: 34	PHOTO ID: 35
	
PHOTO ID: 36	PHOTO ID: 37
	
PHOTO ID: 38	PHOTO ID: 39

VEGETATION AREA 5						
Classification	**A. FOREST**					
Types Identified	Open forest A-03					
Exclusion Clause	N/A					
Effective Slope	Determined	d/slope 3 degrees	Applied Range (Method 1)	Downslope >0-5 degrees		
Foliage Cover of Tallest Plant Layer	30-70%	Shrub/Heath Height	<2m	Tree Height	Up to 30m	
Dominant & Sub-Dominant Layers	Mixed tree species of varying heights, average height 10-15m. Dense shrub understoreys.					
Understorey:	Tropical species located along waterways.					
Justification Comments	Areas which are classified as worst case scenario as they cannot be seen, neighbouring backyards with high canopy cover.					
Post Development Assumptions:	To remain vegetated in perpetuity.					

PHOTO ID: 40

PHOTO ID: 41

A1.3: EFFECTIVE SLOPE

EXPLAINING THE ASSESSMENT METHODOLOGY APPLIED BY BUSHFIRE PRONE PLANNING

DEFINITION: Effective slope is "the slope under that classified vegetation which most influences the bushfire attack" (AS 3959:2018, Clause 1.5.11).

"The effective slope under the classified vegetation is not the same as the average slope for the land surrounding the site of the proposed building. The effective slope is that slope which most significantly influences bushfire behaviour" (AS 3959:2018, Clause CB4).

The slope is described as upslope, flat or downslope when viewed from an exposed element (e.g., building) and looking towards the vegetation. It is measured in degrees.

[Note: Additional relevant guidance provided by AS 3959:2018 and NSW RFS, Planning for Bushfire Protection (2019) is incorporated into the applied assessment methodology and is presented at the end of this explanation.]

COMPOUND SLOPES UNDER VEGETATION AND DETERMINING SLOPE SIGNIFICANCE

Non-Linear Slopes: When the slope of ground under the vegetation out to the distance to be assessed (100 m or further if necessary), is not a straight line or nearly straight line slope, then it is made up of several different slopes i.e., it is a compound slope. The different slope angles and lengths must be factored into the determination of the effective slope value to be applied. Different slopes will potentially influence the bushfire rate of spread and intensity, both increasing and decreasing it.

Significant Slope: The AS 3959:2018 bushfire attack level determination methodology, with default inputs, models a fully developed bushfire. Therefore, a 'significant' slope is one that will significantly influence bushfire behaviour. To be 'significant' the length of the slope must be 'sufficient' to support a fully developed fire on that slope. The angle of a significant slope could be the determined effective slope for the area of classified vegetation if it is the one that 'most influences the bushfire attack'.

Sufficient Slope Length: Is a slope that will, as a minimum, allow the entire flame depth (flaming zone) of a fully developed fire (100m flame width) to exist on that slope.

The expected flame depth of a fully developed bushfire is a function of the length of time the flaming phase will exist on a section of the fuel bed (the 'residence time') and the bushfire's 'rate of spread'. For a given rate of spread, longer residence times result in greater flame depths. Greater flame depths are correlated with greater flame temperatures and greater flows of radiant heat.

The primary factors that will increase the residence time are:

- Heavier fine fuel loads of grass, leaf litter, twigs, bark etc less than 6mm in width and existing within the surface and near surface layers (and elevated fuel layers when contiguous with the base layers); and
- A greater percentage of larger fine fuels within the fuel load.

The primary factors that increase the rate of spread (apart from fire weather factors), include finer fuels, drier fuels, horizonal continuity of fuel and steeper upward ground slope in the direction of fire travel.

Example values:

- Residence Time: Grassfire 5 – 15 seconds, Forest fire 25 -50 seconds.
- Rate of Spread: Grassfires of a few km/hr are considered fast moving, 5-10 km/hr is common and fastest in the order of 25km/hr. Forest fire typically recorded in metres/hour with 1-1.5 km/hr being considered fast moving and fastest in the order of 3–4 km/hr.
- Flame Depth: More typically, a few metres for grasses to tens of metres for forest fires.

An Isolated Slope: For scenarios where there is a single significant slope (based on the above criteria) additional consideration would need to be given to the time and distance consumed by a bushfire still in its 'developing' phase. This will require due consideration be given to how it is potentially ignited i.e., from a single or multiple points, as this will influence the time and distance required to fully develop. For such scenarios, a normally significant slope may not be sufficiently long. It may be necessary to determine the potential bushfire impact more accurately by

justifying the application of a lesser effective slope, or a lower threat vegetation classification, or calculating a reduced head fire width (using short fire run modelling).

Determined Effective Slope: Only a 'significant' slope can potentially be the effective slope by itself. In which case, for a defined area of classified vegetation area, the worst significant slope under that vegetation is to apply.

The table below presents Bushfire Prone Planning's considerations applied to assessing short and/or compound slopes in determining the effective slope.

Slope Length (m)	Considered a Significant Slope	Considerations in Determining the Effective Slope
< 5	No	Where these short slopes exist as part of a compound slope under an area of classified vegetation, they can be ignored as they will not influence the fire behaviour in that vegetation.
5-20	No	These slopes will have a range of influence on fire behaviour from very little to a degree of influence that must be accounted for to some extent by the determined effective slope that is applied (i.e., with a greater length apply to a greater extent). But the actual slope of these shorter slopes is likely not to be applied as it is not a 'significant' length.
20-30	Maybe	The same considerations applied to the 5-20m slope lengths should be applied here. However, more justification would need to be presented to support their assessment as not being 'significant' slopes. For these slope lengths, consideration must be given more broadly to the potential level of risks associated with a bushfire event in this location. The risk level will be a function of the bushfire hazard threat levels (direct attack mechanisms) within the immediate and broader assessment area as influenced by local topography, vegetation extents and types and the exposure and vulnerability of persons and/or buildings/structures to these threats. Higer risk levels require greater precaution meaning these slopes should be considered 'significant', and vice versa. Consider the potential for a bushfire on adjoining or nearby land be a source of ignition and/or pre-heating to vegetation on the subject slope. Consider if vegetation on the slope is likely be ignited by a single ignition point or is multipoint ignition possible from bushfire an adjoining slopes or the surrounding area. Single point ignition will require a fire to travel further before being fully developed (DFES considers less than 100m fire runs may be considered a short fire run for forest, woodland and scrub vegetation classifications, RFS NSW applies 150m). Isolated slopes of this length are less likely to be considered significant as compared to when part of a compound slope.
>30	Yes	Likely to always be a significant slope unless isolated (i.e., exists alone) – in which case, justifying the application of a lesser effective slope, or a lower threat vegetation classification, or calculating a reduced head fire width, are approaches that may need to be applied.

BPP Approach - Slope Variation Within Areas of Vegetation

When multiple 'significant' slope lengths with large differences in degrees of effective slope (or different applicable slope ranges when AS 3959:2018 Method 1 is applied), exists under a single vegetation classification, these will be delineated as separate vegetation areas of classified vegetation to account for the difference in potential bushfire behaviour and impact, in accordance with AS 3959:2018 clauses 2.2.5 and C2.2.5.

Effective Slope Variation Due to Multiple Development Sites

When the effective slope, under a single area of bushfire prone vegetation, will vary significantly relative to multiple proposed development sites (exposed elements), then the effective slopes corresponding to each of the different

locations, are separately identified. The relevant (worst case) effective slope is determined in the direction corresponding to the potential directions of fire spread towards the subject building(s).

AS 3959:2018 EFFECTIVE SLOPE DETERMINATION - GUIDANCE

The Standard presents a broad set of guidance statements that indicate the intent of deriving an effective slope value for use in calculations, rather than detailing the 'in the field' determination process. These include:

- Highlighting the importance of the value by stating "The slope of the land under the classified vegetation has a direct influence on the rate of fire spread, the severity of the fire and the ultimate level of radiant heat flux" (Clause C2.2.5). [Note: A common rule of thumb is that for every 10 degrees of upslope, a fire will double its rate of spread if moving in the direction of the prevailing wind].
- It may be necessary to consider the slope under the classified vegetation for distances greater than 100 m in order to determine the effective slope for that vegetation classification.
- "Where there is more than one slope within the classified vegetation, each slope shall be individually assessed, and the worst case Bushfire Attack Level shall apply" (Clause 2.2.5).

NSW RFS 2019, PLANNING FOR BUSHFIRE PROTECTION - APPENDIX A1.5 - ADDITIONAL DETERMINATION GUIDANCE

- "In identifying the effective slope - it may be found that there are a variety of slopes covering different distances within the vegetation. The effective slope is considered to be the slope under the vegetation which will most significantly influence the bushfire behaviour for each aspect. This is usually the steepest slope. In situations where this is not the case, the proposed approach must be justified".
- "Vegetation located closest to an asset may not necessarily be located on the effective slope".

SITE ASSESSMENT DETAILS - EXPLANATION & JUSTIFICATION

The effective slopes determined from the site assessment are recorded in Table 3.2 of this Bushfire Management Plan.

A1.4: SEPARATION DISTANCE

Measuring

The separation distance is the distance in the horizontal plane between the receiver (building/structure or area of land being considered) and the edge of the classified vegetation (AS 3959:2018, clause 2.2.4)

The relevant parts of a building/structure from which the measurement is taken is the nearest part of an external wall or where a wall does not exist, the supporting posts or columns. Certain parts of buildings are excluded including eaves and roof overhangs.

The edge of the vegetation, for forests and woodlands, will be determined by the unmanaged understorey rather than either the canopy (drip line) or the trunk (AS 3959:2018, clause C2.2.5).

Measured Separation Distance as a Calculation Input

If a separation distance can be measured because the location of the building/structure relative to the edge of the relevant classified vegetation is known, this figure can be entered into the BAL calculation. The result is a determined BAL rating.

Assumed Separation Distance as a Calculation Input

When the building/structure location within the lot is not known, an assumed building location may be applied that would establish the closest positioning of the building/structure relative to the relevant area of vegetation.

The assumed location would be based on a factor that puts a restriction on a building location such as:

- An established setback from the boundary of a lot, such as a residential design code setback or a restrictive covenant; or
- Within an established building envelope.

The resultant BAL rating would be indicative and require later confirmation (via a Compliance Report) of the building/structure actual location relative to the vegetation to establish the determined BAL rating.

Separation Distance as a Calculation Output

With the necessary site specific assessment inputs and using the AS 3959:2018 bushfire modelling equations, the range of separation distances that will correspond to each BAL rating (each of which represents a range of radiant heat flux), can be calculated. This has application for bushfire planning scenarios such as:

- When the separation distance cannot be measured because the exact location of the exposed element (i.e., the building, structure or area), relative to classified vegetation, is yet to be determined.

  In this scenario, the required information is the identification of building locations onsite that will correspond to each BAL rating. That is, indicative BAL ratings can be derived for a variety of potential building/structure locations; or

- The separation distance is known for a given building, structure or area (and a determined BAL rating can be derived), but additional information is required regarding the exposure levels (to the transfer of radiant heat from a bushfire), of buildings or persons, that will exist at different points within the subject site.

The calculated range of separation distances corresponding to each BAL rating can be presented in a table and/or illustrated as a BAL Contour Map – whichever is determined to best fit the purpose of the assessment.

For additional information refer to the information boxes in Section 3 'Bushfire Attack Levels (BAL) - Understanding the Results and Section 3.2. 'Interpretation of the BAL Contour Map'.

SITE ASSESSMENT DETAILS - EXPLANATION & JUSTIFICATION

For the subject development/use the applicable separation distances values are derived from calculations applying the assessed site data. They are an output value, not an input value and therefore are not presented or justified in this appendix.

The derived values are presented in Section 3, Table 3.1 and illustrated as a BAL contour map in Figure 3.2.

APPENDIX B: ADVICE - ONSITE VEGETATION MANAGEMENT - THE APZ

THE ASSET PROTECTION ZONE (APZ) – DESCRIPTION AND OBJECTIVES

Description: The asset protection zone (APZ) is the area of land surrounding a building or structure on which any combustible materials will be located and/or managed to reduce the potential impact of the direct and indirect attack mechanisms (threats) of bushfire, and therefore reduce the associated risks of building/structure damage or loss, to acceptable levels.

When cultivated and/or natural vegetation exists within the zone it must present low potential threat levels from the direct fire attack mechanisms of flame contact, radiant heat and ember attack and fire driven wind, and the indirect attack mechanisms of debris accumulation, surface fire, tree strike and consequential fire.

The required low threat levels will be achieved as the result of factors that include persistent higher fuel moisture contents, lower flammability and/or minimal fuel loads, due to either limiting the existence of these fuels through removal and/or modification, and the subsequent ongoing management (reduction) of fuel loads.

When a bushfire attack level (BAL) is required to be determined for a building/structure to establish its bushfire construction requirements, the condition of the vegetation within the APZ must satisfy the requirements established by *clause 2.2.3.2 of AS 3959:2018 Construction of buildings in bushfire prone areas* - to be excluded from classification.

For other combustible structures/materials within the APZ, lower threat levels will be the result of factors such as their appropriate use, lowered vulnerability and location relative to the primary building/structure to be protected.

Objectives: The primary objectives of establishing a low threat area surrounding buildings/structures are to create that performs the following functions:

1. To establish an APZ of specified dimensions ensure the building is sufficiently separated from the identified bushfire hazard to limit the impact of its direct attack mechanisms. The required dimensions of the APZ must:
    - Remove the potential for direct flame contact on the building;
    - Reduce the level of radiant heat to which the building is exposed. The APZ dimensions should ensure that the potential level of radiant heat impact corresponds to the level of vulnerability of the building/structure - as determined by the degree to which bushfire resistant construction has been applied (or not). For example, when constructed to the requirements corresponding to its determined exposure to radiant heat (measured as a bushfire attack level) in accordance with AS 3959 or the NASH Standard.
    - Ensure some reduction in the threat level of the ember/burning debris attack mechanism when higher threat vegetation types are present in the vicinity. Note, the reduction in some scenarios will be minimal given the produced quantity, type, survival time and consequent distance that certain embers/burning debris can travel.

      Be aware of that research has identified that consequential fire, ignited by embers, is the primary cause (>80%) of building loss in past Australian bushfire events. In bushfire prone areas, the importance of applying protection measures to prevent ember entry to buildings/structures and minimising the existence of consequential fire fuels cannot be overstated.
2. To ensure any combustible fuels (debris and structures) or trees that remain within the APZ will be managed and located to limit the potential impact of the indirect attack mechanisms of bushfire by:
    - Minimising the accumulation of debris on, within and around buildings/structures to limit this source of fuel for consequential fires that will result in the direct fire attack mechanisms of flames and greater radiant heat existing closer to the buildings/structures, even though the bushfire hazard exists at a greater distance away;
    - To prevent surface fire moving through the APZ and closer to buildings/structures than the fire in the bushfire hazard itself can;

- Prevent fire weakened or windblown trees/branches impacting buildings/structures and allowing ember/burning debris entry;

- To ensure other combustible materials that can result in a consequential fire ignited by embers/burning debris), within both the APZ and parts of the building, are eliminated, minimised and/or appropriately located or protected (the explanatory notes in the Guidelines provide some guidance for achieving this objective and other sources are available); and

3. To provide a defendable space for firefighting activities.

B1: Asset Protection Zone (APZ) Dimensions

APZ DIMENSIONS – DIFFERENCES IN REQUIREMENTS FOR PLANNING ASSESSMENTS COMPARED TO IMPLEMENTATION

THE 'PLANNING BAL-29' APZ DIMENSIONS

The 'Planning BAL-29' APZ is not necessarily the size of the APZ that must be physically implemented and maintained by a landowner. Rather, its purpose is to identify if an acceptable solution for planning approval can be met i.e., can a specified minimum separation distance from bushfire prone vegetation exist.

An assessment against the Bushfire Protection Criteria is conducted for planning approval purposes. To satisfy 'A2.1: Asset Protection Zone', it must be demonstrated that certain minimum separation distances between the relevant building/structure and different classes of bushfire prone vegetation, either exist or can be created and will remain in perpetuity. These minimum separation distances determine the 'Planning BAL-29' APZ dimensions.

Dimensions: The minimum dimensions are those that will ensure the potential radiant heat impact on subject buildings does not exceed 29 kW/m^2. These dimensions will vary dependent on the vegetation classification, the slope of the land they are growing on and certain other factors specific to the subject site.

Note: For certain purposes associated with vulnerable land uses, the 'Planning BAL-29' APZ may be replaced with dimensions corresponding to radiant heat impact levels of 10 kW/m^2 and 2 kW/m^2 and calculated using 1200K flame temperature.

Location: The identified 'Planning BAL-29' APZ must not extend past lot boundaries onto land the landowner has no control over either now or potentially at some point in the future. Limited exceptions include:

- When adjoining land is not vegetated (e.g., built out, roads, carparks, drainage, rock, water body etc.);
- When adjoining land currently or, will in the short term, contain low threat vegetation and or vegetation managed in a minimal fuel condition as per AS 3959:2018 cl. 2.2.3.2. It must be reasonable (justifiable) to expect this low threat vegetation and/or level of management will continue to exist or be conducted in perpetuity and require no action from the owner of the subject lot.

  Such areas of land include formally managed areas of vegetation (e.g., public open space / recreation areas / services installed in a common section of land). For specific scenarios, evidence of the formal commitment to manage these areas to a certain standard may be required and would be included in the BMP.

  These areas of land can also be part of the required APZ on a neighbouring lot for which the owner of that lot has a recognised responsibility to establish and maintain; and
- When there is a formalised and enforceable capability and responsibility created for the subject lot owner, or any other third party, to manage vegetation on land they do not own in perpetuity. This would be rare, and evidence of the formal authority would be included in the BMP.

The bushfire consultant's 'Supporting Assessment Detail', that is presented in the assessment against the acceptable solution A2.1, will identify and justify how any adjoining land within the 'Planning BAL-29 APZ will meet the APZ standards. Or otherwise, explain how this condition cannot be met.

THE 'BAL RATING' APZ DIMENSIONS

The applicable BAL rating will have been stated in the BAL Assessment Data section of the BAL Assessment Report or BMP (as relevant). The BAL rating can be assessed as 'determined' or 'indicative' or be 'conditional', dependent of the specific conditions associated with the site and the stage of assessment or planning. It is the eventual assessment of the 'Determined' BAL that will establish both the BAL rating that is to apply and its corresponding 'BAL Rating' APZ dimensions.

Dimensions: The minimum dimensions of the 'BAL Rating' APZ to be established and maintained will be those that correspond to the determined BAL rating for the subject building/structure that has accounted for surrounding vegetation types, the slope of the land they are growing on and certain other factors specific to the subject site and surrounding land.

Establishing the 'BAL Rating' APZ will ensure that the potential radiant heat exposure of the building/structure will be limited to the level that the applied construction requirements are designed to resist when that building/structure is required to be constructed to the standard corresponding to the Determined BAL.

Note: For certain purposes associated with vulnerable land uses, the 'BAL Rating' APZ dimensions may be replaced with dimensions corresponding to the specific radiant heat impact levels of 10 kW/m^2 and 2 kW/m^2 and calculated using 1200K flame temperature.

Location: The same conditions will apply as for the 'Planning BAL-29' APZ.

THE 'LOCAL GOVERNMENT' APZ DIMENSIONS

Some Local Government's establish the dimensions of the APZ that must be established surrounding buildings in their annual Firebreak/Hazard Reduction Notice. Or for a specific site they may establish a maximum allowable dimension (typically that corresponding to BAL-29). When established, the landowner will need to be comply with these.

THE 'REQUIRED' APZ DIMENSIONS

This is the APZ that is to be established and maintained by the landowner within the subject lot and surrounding the subject building(s). It will be identified on the Property Bushfire Management Statement when it is required to be included in this Report/Plan.

Dimensions: The 'Required APZ' dimensions are the minimum (or maximum when relevant) distances away from the subject building(s) that the APZ must extend. These distances will not necessarily be the same all around the building(s). They can vary and are dependent on the different vegetation types (and their associated ground slope) that can exist around the building(s), and specific local government requirements. The dimensions to implement are determined by:

A. The 'BAL Rating APZ' of the subject building(s) when distances are greater than 'B' below (except when 'B' establishes a maximum distance); or

B. The 'Local Government' APZ' derived from the Firebreak/Hazard Reduction Notice when distances are greater than 'A' above, other than when a maximum distance is established, in which case this will apply; or

C. A combination of 'A' and 'B'.

Location: The same conditions will apply as for the 'Planning BAL-29' APZ.

B1.1: THE APZ DIMENSIONS REQUIRED TO BE IMPLEMENTED BY THE LANDOWNER

DETERMINATION OF THE 'REQUIRED' APZ DIMENSIONS TO BE IMPLEMENTED AND MAINTAINED BY LANDOWNER WITHIN THEIR LOT									
Relevant Buildings(s)	Vegetation Classification [Refer to Fig 3.1]		Minimum Required Separation Distances from Building to Vegetation (metres)						
			Established by the 'BAL Rating' APZ Dimension					Established by the "Local Government' APZ Dimension	The 'Required' APZ Dimensions [see note]
			Determined Radiant Heat Impact	Stated 'Indicative' or 'Conditional' BAL				Firebreak / Hazard Reduction Notice	
	Area	Class		BAL-29	BAL-19	BAL-12.5	BAL-LOW		
Dwelling	1	(A) Forest	BAL-FZ	21-<31	31-<42	42-<100	>100	20m	21
	2	(C) Shrubland		9-<13	13-<19	19-<100	>100		20
	3	(D) Scrub		13-<19	19-<27	27-<100	>100		20
	4	Excluded cl 2.2.3.2(e & f)		-	-	-	-		-
	5	(A) Forest		27-<37	37-<50	50-<100	>100		27

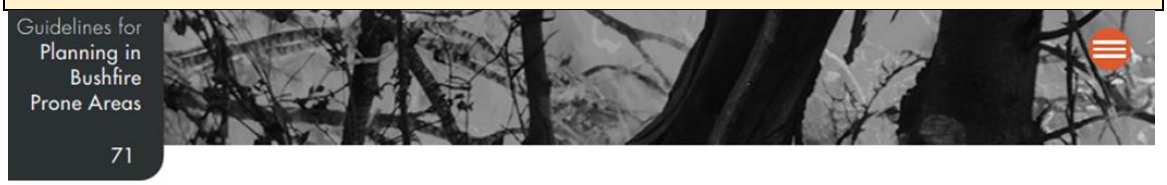
Note: The 'Required' APZ Dimension corresponding to each area of vegetation is the greater of the 'BAL Rating' or the 'Firebreak/Hazard Reduction Notice' APZ dimensions - unless a local government maximum distance(s) is established as a result of their environmental assessment of the subject site. The area of the APZ will also be limited to the subject lot boundary unless otherwise justified in this Report/Plan. Final determination of the dimensions will require that any indicative or conditional BAL becomes a 'Determined' BAL.

Comments: The City of Kalamunda Fire Hazard Reduction Notice states that a 20m APZ must be maintained around the dwelling with a fuel load of less than 2 tonnes per hectare. Grasses are to be managed to a height of <50mm. The APZ is required to be maintained to a minimum of 21m or 27m downslope from the external walls within the property boundaries.

B2: The Standards for the APZ as Established by the Guidelines (DPLH, v1.4)

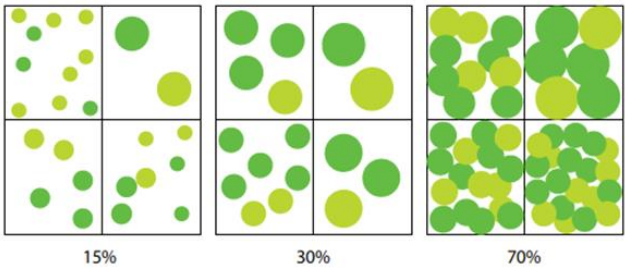
Within the Guidelines (source: https://www.wa.gov.au/government/document-collections/state-planning-policy-37-planning-bushfire-prone-areas), the management Standards are established by:

- Schedule 1: Standards for Asset Protection Zones (see extract below) established by the Guidelines; and
- The associated explanatory notes (Guidelines E2) that address (a) managing an asset protection zone (APZ) to a low threat state (b) landscaping and design of an asset protection zone and (c) plant flammability.



ELEMENT 2: SITING AND DESIGN OF DEVELOPMENT

SCHEDULE 1: STANDARDS FOR ASSET PROTECTION ZONES

OBJECT	REQUIREMENT
Fences within the APZ	• Should be constructed from non-combustible materials (for example, iron, brick, limestone, metal post and wire, or bushfire-resisting timber referenced in Appendix F of AS 3959).
Fine fuel load (Combustible, dead vegetation matter <6 millimetres in thickness)	• Should be managed and removed on a regular basis to maintain a low threat state. • Should be maintained at <2 tonnes per hectare (on average). • Mulches should be non-combustible such as stone, gravel or crushed mineral earth or wood mulch >6 millimetres in thickness.
Trees* (>6 metres in height)	• Trunks at maturity should be a minimum distance of six metres from all elevations of the building. • Branches at maturity should not touch or overhang a building or powerline. • Lower branches and loose bark should be removed to a height of two metres above the ground and/or surface vegetation. • Canopy cover within the APZ should be <15 per cent of the total APZ area. • Tree canopies at maturity should be at least five metres apart to avoid forming a continuous canopy. Stands of existing mature trees with interlocking canopies may be treated as an individual canopy provided that the total canopy cover within the APZ will not exceed 15 per cent and are not connected to the tree canopy outside the APZ. **Figure 19:** Tree canopy cover – ranging from 15 to 70 per cent at maturity  15% 30% 70%

Shrub* and scrub* (0.5 metres to six metres in height). Shrub and scrub >6 metres in height are to be treated as trees.	• Should not be located under trees or within three metres of buildings. • Should not be planted in clumps >5 square metres in area. • Clumps should be separated from each other and any exposed window or door by at least 10 metres.
Ground covers* (<0.5 metres in height. Ground covers >0.5 metres in height are to be treated as shrubs)	• Can be planted under trees but must be maintained to remove dead plant material, as prescribed in 'Fine fuel load' above. • Can be located within two metres of a structure, but three metres from windows or doors if >100 millimetres in height.
Grass	• Grass should be maintained at a height of 100 millimetres or less, at all times. • Wherever possible, perennial grasses should be used and well-hydrated with regular application of wetting agents and efficient irrigation.
Defendable space	• Within three metres of each wall or supporting post of a habitable building, the area is kept free from vegetation, but can include ground covers, grass and non-combustible mulches as prescribed above.
LP Gas Cylinders	• Should be located on the side of a building furthest from the likely direction of a bushfire or on the side of a building where surrounding classified vegetation is upslope, at least one metre from vulnerable parts of a building. • The pressure relief valve should point away from the house. • No flammable material within six metres from the front of the valve. • Must sit on a firm, level and non-combustible base and be secured to a solid structure.

** Plant flammability, landscaping design and maintenance should be considered – refer to explanatory notes*

B3: The Standards for the APZ as Established by the Local Government

Refer to the firebreak / hazard reduction notice issued annually (under s33 of the Bushfires Act 1954) by the relevant local government. It may state Standards that vary from those established by the Guidelines and that have been endorsed by the WAPC and DFES as per Section 4.5.3 of the Guidelines.

A copy of the applicable notice is not included here as they are subject to being reviewed and modified prior to issuing each year. Refer to ratepayers notices and/or the local government's website for the current version.

B4: Vegetation and Areas Excluded from Classification - Ensure Continued Exclusion

AS 3959:2018 establishes the methodology for determining a bushfire attack level (BAL). The methodology includes the classification of the subject site's surrounding vegetation according to their 'type' and the application of the corresponding relevant bushfire behaviour models to determine the BAL.

Certain vegetation can be considered as low threat or managed in a minimal fuel condition and can be excluded from classification. Where this has occurred in assessing the site, the extract from AS3959:2018 below states the requirements that must continue to exist for the vegetation on those areas of land to be excluded from classification (including the size of the vegetation area if relevant to the assessment).

2.2.3.2 *Exclusions—Low threat vegetation and non-vegetated areas*

The following vegetation shall be excluded from a BAL assessment:

(a) Vegetation of any type that is more than 100 m from the site.

(b) Single areas of vegetation less than 1 ha in area and not within 100 m of other areas of vegetation being classified vegetation.

(c) 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.

(d) 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.

(e) Non-vegetated areas, that is, areas permanently cleared of vegetation, including waterways, exposed beaches, roads, footpaths, buildings and rocky outcrops.

(f) 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.

NOTES:

1 Minimal fuel condition means there is insufficient fuel available to significantly increase the severity of the bushfire attack (recognizable as short-cropped grass for example, to a nominal height of 100 mm).

2 A windbreak is considered a single row of trees used as a screen or to reduce the effect of wind on the leeward side of the trees.

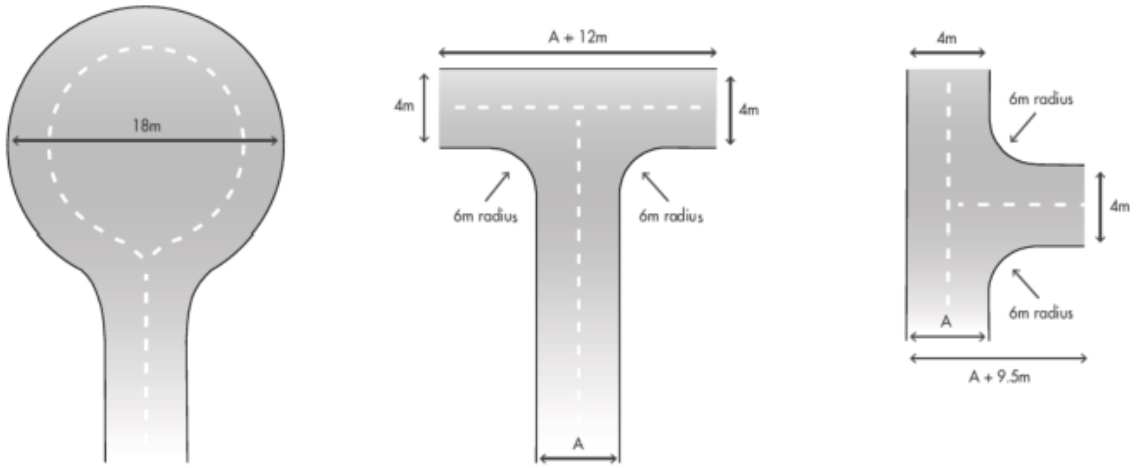
APPENDIX C: TECHNICAL REQUIREMENTS FOR VEHICULAR ACCESS

The design/layout requirements for access are established by the acceptable solutions of the Guidelines (DPLH, 2021 v1.4) Element 3 and vary dependent on the access component, the land use and the presence of 'vulnerable' persons. Consequently, the best reference source are the Guidelines. The technical requirements that are fixed for all components and uses are presented in this appendix.

GUIDELINES TABLE 6, EXPLANATORY NOTES E3.3 & E3.6 AND RELEVANT ACCEPTABLE SOLUTIONS

Technical Component	Vehicular Access Types / Components			
	Public Roads	Emergency Access Way [1]	Fire Service Access Route [1]	Battle-axe and Private Driveways [2]
Minimum trafficable surface (m)	In accordance with A3.1	6	6	4
Minimum Horizontal clearance (m)	N/A	6	6	6
Minimum Vertical clearance (m)	4.5			
Minimum weight capacity (t)	15			
Maximum Grade Unsealed Road [3]	As outlined in the IPWEA Subdivision Guidelines	1:10 (10%)		
Maximum Grade Sealed Road [3]		1:7 (14.3%)		
Maximum Average Grade Sealed Road		1:10 (10%)		
Minimum Inner Radius of Road Curves (m)		8.5		

Turnaround Area Dimensions for No-through Road, Battle-axe Legs and Private Driveways [4]



Passing Bay Requirements for Battle-axe leg and Private Driveway

When the access component length is greater than the stated maximum, passing bays are required every 200m with a minimum length of 20m and a minimum additional trafficable width of 2m (i.e. the combined trafficable width of the passing bay and constructed private driveway to be a minimum 6m).

Emergency Access Way – Additional Requirements

Provide a through connection to a public road, be no more than 500m in length, must be signposted and if gated, gates must be open the whole trafficable width and remain unlocked.

[1] To have crossfalls between 3 and 6%.

[2] Where driveways and battle-axe legs are not required to comply with the widths in A3.5 or A3.6, they are to comply with the Residential Design Codes and Development Control Policy 2.2 Residential Subdivision.

[3] Dips must have no more than a 1 in 8 (12.5% or 7.1 degree) entry and exit angle.

[4] The turnaround area should be within 30m of the main habitable building.

APPENDIX D: TECHNICAL REQUIREMENTS FOR FIREFIGHTING WATER SUPPLY

D1: Reticulated Areas – Hydrant Supply

The Guidelines state "where a reticulated water supply is existing or proposed, hydrant connection(s) should be provided in accordance with the specifications of the relevant water supply authority."

The main scheme water suppliers / authorities in WA are The Water Corporation, AqWest – Bunbury Water Corporation and Busselton Water Corporation. Various local authority exists in other non-scheme and regional areas. However, most existing fire hydrants are connected to Water Corporation water mains.

Consequently, the hydrant location specifications from The Water Corporation's 'No 63 Water Reticulation Standard' (Ver 3 Rev 15) are provided in the extract below with the key distances relevant to bushfire planning assessments being highlighted. This Standard is deemed to be the baseline criteria for developments and should be applied unless different local water supply authority conditions apply. Other applicable specification will be found in the Standard.

Note: The maximum distance from a hydrant to the rear of a lot/building is generally interpreted as not applicable to large lot sizes where the maximum distance becomes an impractical limitation i.e., typically rural residential areas.

Design Standard DS 63
Water Reticulation Standard

2.2.1.5 Appurtenances

c. Hydrants

Hydrants shall be screw-down hydrant with built-in isolation valve and installed only on DN100 or larger pipes. Hydrants shall be located:

- so that the maximum distance between a hydrant and the rear of a building envelope, (or in the absence of a building envelope the rear of the lot) shall be 120m;
- so that spacing (as measured by hose-run) between hydrants in non-residential or mixed use areas shall be maximized and no greater than 100m;
- so that spacing (as measured by hose-run) between hydrants in residential areas with lots per dwelling <10,000m² shall be maximized and no greater than 200m;
- so that spacing between hydrants (as measured by hose-run) in rural residential areas where minimum lots per dwelling is >10,000 m² (1ha) shall be maximized and no greater than 400m;
- centrally along the frontage of a lot to avoid being under driveways, unless the lot features a frontage 6m or less, in which case it shall be placed to the side opposite the driveway;
- at lots that have the widest frontage in the local area;
- where appropriate at the truncation of road junctions or intersections so that they can serve more than one street and can be readily located;
- on both sides of the major roads at staggered intervals where there are mains on both sides of the road;
- at major intersections on dual multi-lane roads, where two hydrants are to be sited on diagonally opposite corners;
- hydrants should be located at least 20m from traffic calming devices i.e., median slow points or chokers, chicanes, mini traffic circles, and intersection 'pop-outs' to ensure traffic is not impeded;
- in a position not less than 10m from any high voltage main electrical distribution equipment such as transformers and distribution boards, liquefied petroleum gas or other combustible storage;
- directly on top of the main using a tee unless proved to be impractical.

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APPENDIX E: ADVICE - BAL RATINGS – CORRESPONDING THREATS AND CONSTRUCTION REFERENCES

BAL [1]	DESCRIPTION OF PREDICTED BUSHFIRE DIRECT ATTACK MECHANISMS (THREATS) AND LEVELS OF EXPOSURE	REFERENCES FOR CONSTRUCTION REQUIREMENTS	
		AS 3959:2018 Construction of Buildings in Bushfire Prone Areas	**The NASH Standard (2021) – Steel Framed Construction in Bushfire Areas**
		Referenced by the Building Code of Australia for Building Classes 1, 2, 3 & 10a	Referenced by the Building Code of Australia for Building Classes 1 & 10a
BAL – LOW	There is insufficient risk to warrant specific construction requirements but there is still some risk. *(Note: DFES recommend that ember attack protection features be incorporated into the design where practicable).*	Section 4. No Requirements	No Requirements
BAL – 12.5	There is a risk of ember attack. Construction elements are expected to be exposed to heat flux not greater than 12.5 kW/m^2	Sections 3 & 5.	All construction requirements for BAL-12.5 to BAL-40 are the same except for windows and external doors, which must comply with AS 3959. The construction requirements are set out as essentially non-combustible construction systems for each of the following building elements: Section 1.4: General Requirements Section 2: Roof and Ceiling System Section 3: External Wall System Section 4: Floor System Section 5: Carports Verandahs and Decks.
BAL – 19	There is a risk of ember attack and burning debris ignited by windborne embers and a likelihood of exposure to radiant heat. The construction elements are expected to be exposed to a heat flux not greater than 19 kW/m^2.	Sections 3 & 6	
BAL – 29	There is an increased risk of ember attack and burning debris ignited by windborne embers and a likelihood of exposure to an increased level radiant heat. The construction elements are expected to be exposed to a heat flux not greater than 29 kW/m^2.	Sections 3 & 7.	
BAL – 40	There is a much increased risk of ember attack and burning debris ignited by windborne embers, a likelihood of exposure to a high level of radiant heat and some likelihood of direct exposure to flames from the fire front. The construction elements are expected to be exposed to a heat flux not greater than 40kW/m^2.	Sections 3 & 8.	
BAL – FZ (Flame Zone)	There is an extremely high risk of ember attack and burning debris ignited by windborne embers, and a likelihood of exposure to an extreme level of radiant heat and direct exposure to flames from the fire front. The construction elements are expected to be exposed to a heat flux greater than 40 kW/m^2.	Sections 3 & 9.	The construction requirements are set out in Sections 1-5 and differ from the requirements for all other BAL ratings.

[1] AS 3959:2018 *Construction of buildings in bushfire prone areas,* defines a Bushfire Attack Level (BAL) as a *"means of measuring the severity of a building's potential exposure to ember attack, radiant heat and direct flame contact, using increments of radiant heat flux expressed in kW/m^2, and is the basis for establishing the requirements for construction to improve protection of building elements from attack by bushfire."*

BUSHFIRE PRONE PLANNING

Suite 11, 36 Johnson Street Guildford WA 6055
PO Box 388 Guildford WA 6935
T: 08 6477 1144 | E: admin@bushfireprone.com.au

DFES Ref: 240028
Your Ref: DA24/0107

26/06/2024

Tracey Cooney Walshe
City of Kalamunda
Tracey.CooneyWalshe@kalamunda.wa.gov.au

Dear Ms Cooney Walshe

RE: VULNERABLE TOURISM LAND USE – LOT NUMBER 180, NUMBER 26 MARRIE CRESCENT, LESMURDIE – PROPOSED UNHOSTED HALIDAY HOUSE

Please find my response to the DFES comments, as requested, on the following pages.

If you wish to discuss these further, please do not hesitate to contact this office.

Yours sincerely

Kathy Nastov

Director

BPP RESPONSE TO DFES COMMENTS	
Relevant Authority and Reference Number:	City of Kalamunda DA24/0107
Relevant Application:	Lot 180 (26) Marri Crescent, Lesmurdie Proposed Unhosted Holiday House
Relevant Document:	240028 - 26 Marri Crescent Lesmurdie (BMP) v1.0
DFES Comments - Date and Reference Number:	DA34701
DFES Comments – Subject Matter(s)	Policy Measure 6.5 a) BAL Contour Map Policy Measure 6.5 c) Compliance with the Bushfire Protection Criteria Policy Measure 6.6.2 Vulnerable land uses in areas where BAL-40 or BAL-FZ applies.
Bushfire Prone Planning (BPP) – Response Date and Reference Number:	26/06/2024 240028

DFES Assessment Note:

- DFES acknowledges that a residential dwelling currently exists on the subject site and the development application seeks a change of use to short term accommodation.
- The City have considered this to be a tourism activity and required planning approval, the change to a vulnerable land use would constitute an intensification of development and trigger application of SPP 3.7.
- The BMP states that the proposal is considered as 'minor development' as per SPP 3.7 and the Guidelines. DFES note that 'minor development' does not provide a compliant pathway for assessment under Element 5 – Vulnerable Tourism Land Uses.
- Further clarification is required within the BMP of the requirements of SPP 3.7 and the supporting Guidelines as outlined in our assessment below.

BPP Comment:

- A response to each DFES comment has been prepared by BPP below.

Subject Matter 1	Policy Measure 6.5 a) BAL Contour Map		
DFES Comments			BPP Response
Issue	**Assessment**	**Action**	
Vegetation Classification	**Item 1:** Portions of Area 1 to the west of site appear to be subject to downslope from the building, however the overall plot has been classified as flat/upslope. DFES acknowledge that the dwelling is already classified as BAL-FZ, however the BMP should be updated for accuracy.	Modification to the BMP is required for accuracy.	**Item 1:** The vegetation was assessed as across slope in relation to the building, which generally reflects outcomes of other similar BAL's where slope is not clear. In this instance, BPP acknowledge that the vegetation could be interpreted as downslope and the BMP has been updated, noting this presents no material implication on the BAL determined. **Other Action Taken** The report has been updated to include Area 5 (0-5° Forest) vegetation. The subsequent BAL contours have also been updated to reflect the classification change. Refer to Figures 3.1 and 3.2.

Subject Matter 1	Policy Measure 6.5 a) BAL Contour Map		
DFES Comments			BPP Response
Issue	**Assessment**	**Action**	
Vegetation Exclusion	**Item 2:** Evidence to support the exclusion of Public Open Space (POS), road reserves and nearby lots as managed to low threat in accordance with AS3959 is required. Alternatively, the vegetation classification should be classified as per AS3959. DFES Acknowledge that the dwelling is already classified as BAL-FZ, however the BMP should be updated for accuracy.	Modification to the BMP is required for accuracy.	**Item 2:** Evidence to support the exclusion of the POS, road reserves and nearby lots as managed to low threat has been included in Appendix A – Vegetation Area 4. Additionally, excluded areas can be seen in photos which identify other vegetation areas such as Photo ID:2 which shows a pathway clear of vegetation (excluded) next to the classified vegetation. **Other Action Taken** Additional photographic evidence has been added to Appendix A – Vegetation area 4 to further justify the exclusion of the mentioned areas.

Subject Matter 1	Policy Measure 6.5 a) BAL Contour Map		
DFES Comments			BPP Response
Issue	Assessment	Action	
Construction to AS3959 Building Standards	**Item 3**: DFES acknowledges that AS3959 does not apply retrospectively to existing buildings if the use does not change. However, the decision maker should consider upgrading the dwelling to utilise all the elements of AS3959 that apply to the appropriate Bushfire Attack Level (BAL). This is consistent with Clause 78E(i) Schedule 2 of the Planning and Development (Local Planning Schemes) Regulations 2015 that requires the local government to have regard to the bushfire resistant construction requirements of the Building Code of Australia. Although BAL construction standards do not guarantee the survival of the occupants or building, DFES supports the improved bushfire resilience provided by AS 39592018 construction standards.	Comment only.	**Item 3:** DFES are correct – AS3959 does not apply. The building cannot be located in BAL-29 or below, nor was it constructed to an appropriate BAL rating. As it is only a minor proposal, in the vicinity of a built-up area, the intensification / change of use is negligible and for these reasons, significantly retrofitting the existing building was not recommended. DFES acknowledge that retrofitting will not guarantee the survival of the occupants or building. It is at the discretion of the decision maker as DFES outline, noting that conditions imposed will need to be proportionate to the proposal. **Other Action Taken** The report has been updated to include section 5.5 of the report: additional protection measures.

Subject Matter 2	Policy Measure 6.5 c) Compliance with the Bushfire Protection Criteria		
DFES Comments			BPP Response
Issue	Assessment	Action	
Vulnerable Tourism Land Uses – Siting and Design	**Item 4:** **A5.1– does not comply** The BMP incorrectly states that compliance with A5.1 is achieved. The Acceptable Solution for A5.1 references Element 2, which in turn requires an APZ to ensure that a building achieves BAL-29. For a proposal to be considered compliant with SPP 3.7, compliance with either the acceptable solutions or performance principle must be demonstrated. This has not been demonstrated in this case. It is noted, however, that the BMP acknowledges at section 3.1.2 that the building cannot achieve a rating of less than BAL-FZ and seeks to address SPP 3.7 clause 6.7.1, which relates to minor development. The decision maker may consider that the proposal constitutes minor development and conduct an assessment against those provisions.	Does not comply	**Item 4:** DFES comments are not supported. The BMP clearly and correctly states that compliance is not achieved for Element A5.1. Details are contained within the Bushfire Planning Compliance Summary table (page 5) and The Bushfire Protection Criteria (Section 5.3, page 30). A Minor Development Statement has been provided as a Merit Based Assessment (refer to section 5.4). Contrary to DFES's statement, SPP3.7 contains no performance or acceptable solutions; it is assumed DFES are referring to the Guidelines. BPP confirm that, as per the BMP, the proposal can be considered a minor development under SPP3.7, and relevant provisions of SPP 3.7 are addressed in 5.4.1. These are matters that require the decision maker to exercise discretion. The assessment of A5.1 identifies that a BAL-29 or below cannot be achieved for the existing building, however, the APZ can and will be maintained within the subject lot and the local government Firebreak Notice can and will be complied with where possible within the lot boundaries. **Other Action Taken** The "applicable" box has been changed to be red to avoid confusion.

Subject Matter 3	Policy Measure 6.6.2 Vulnerable land uses in areas where BAL-40 or BAL-FZ applies		
DFES Comments			BPP Response
Issue	Assessment	Action	
Extreme bushfire hazard and/or BAL-40/BAL-FZ applies	**Item 5:** Development applications for vulnerable land uses in areas of BAL-40/BAL-FZ will not be supported unless they comply with policy measure 6.7.2 of SPP 3.7. Notwithstanding the above, should the City be of a mind to approve the proposal it is suggested that the decision maker consider the building be retrospectively upgraded to utilize all practical elements of AS3959 that apply to the appropriate bushfire Attack Level (BAL) as discussed above Although BAL construction standards do not guarantee the survival of the occupants or building, DFES does support the improved bushfire resilience provided by AS 3959-2018 construction standards.	Comment only.	**Item 5:** The building exists, and cannot be located in BAL-29 or below, nor was it constructed to an appropriate BAL rating. The building is exposed to FZ and there is no practical building upgrade. Critically, for this minor development, a BEP has been prepared and prioritises evacuation to nearby built-out areas. **Other Action Taken** The report has been updated to include section 5.5 of the report: additional protection measures to be implemented.

Subject Matter 3	Policy Measure 6.6.2 Vulnerable land uses in areas where BAL-40 or BAL-FZ applies		
DFES Comments			BPP Response
Issue	Assessment	Action	
Bushfire Emergency Evacuation Plan (BEEP)	**Item 6:** The referral has included a 'Bushfire Emergency Evacuation Plan' for the purposes of addressing the policy requirements. Consideration should be given to the Guidelines Section 5.5.4 'Developing a Bushfire Emergency Evacuation Plan'. This contains detail regarding what should be included in a BEEP and will ensure the appropriate content is detailed when finalising the BEEP to the satisfaction of the Shire/City.	Comment only.	**Item 6:** A bushfire emergency plan has been prepared for the proposed development that considers the minor scale of the development. The terminology difference between a Bushfire Emergency Plan (BEP) and a Bushfire Emergency Evacuation Plan (BEEP) is not dissimilar. The Bushfire Emergency Plan (BEP) developed for the proposed development is specific to the short stay accommodation/visitation 'vulnerable' land use (as defined by State Planning Policy 3.7 Planning in Bushfire Prone Areas). Consequently, the BEP developed establishes the seasonal preparation and other operational procedures with which the property owner or manager is required to know and comply. "Developing tourism land uses within remote and/or heavily vegetated areas comes with an inherent risk of bushfire, which can be reduced but never fully eliminated." The relevant information for occupants/visitors is derived from this BEP and provided as the Bushfire Emergency Information poster that is to be displayed for the occupants of or visitors to the premises. The primary emergency procedure is safe (early) evacuation as detailed with the bushfire emergency plan (BEP).

BUSHFIRE EMERGENCY INFORMATION

26 Marri Crescent, Lesmurdie

Produced by Bushfire Prone Planning March 2024. Additional procedure details and information are contained in the Bushfire Emergency Plan developed for the premesis.

In Emergency Dial 000

or use the EMERGENCY PLUS phone app

EMERGENCY INFORMATION SOURCES

emergency.wa.gov.au | 13 DFES (13 33 37)

@dfeswa | @dfes_wa | Local ABC Radio

EVACUATION DESTINATION(S)

1. **Heading towards Maida Vale** (10.8km, 13 minutes)

Turn right onto Marri Crescent, left onto Gladys Road. (Travel 2.6km)
Turn right onto Grove Road (Travel 800m)
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Turn left onto Kalamunda Road (Travel approx. 4km)

2. **Heading towards Welshpool** (10.3km, 15 minutes)

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A FIRE EXISTS - BROADCAST BUSHFIRE WARNINGS

EMERGENCY WARNING
There is a threat to lives or homes. You are in danger and need to take immediate action to survive.

WATCH AND ACT
There is a possible threat to lives or homes. You need to leave or get ready to defend – do not wait and see.

ADVICE
A fire has started but there is no immediate threat to lives or homes. Be aware and keep up to date.

FORECAST FIRE DANGER (FDR) RATINGS

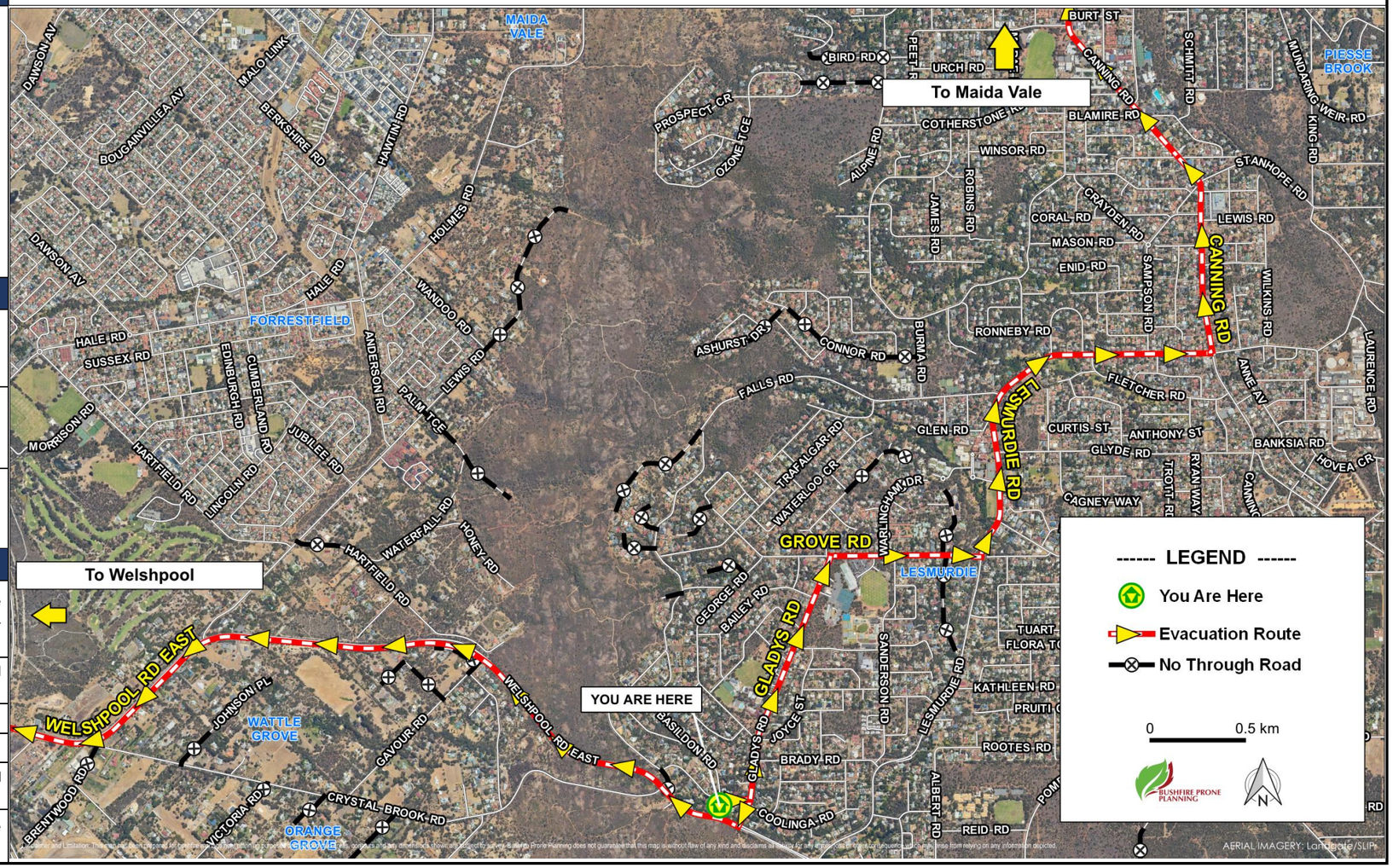
The higher the rating, the more dangerous the conditions and the greater the consequences if a fire starts.

No Rating	No action required. Remain alert and abide by local seasonal laws and regulations.
Moderate	Plan and prepare. Most fires can be controlled.
High	Be ready to act. Fires can be dangerous.
Extreme	Act now to protect your life and property. Fires will spread quickly and be extremely dangerous.
Catastrophic	For your survival, leave bush fire risk areas. If a fire starts and takes hold, lives are likely to be lost.

SCENARIO 1: A BUSHFIRE EXISTS A CONSIDERABLE DISTANCE AWAY; A BUSHFIRE ADVICE WARNING MAY OR MAY NOT BE ISSUED; YOU ARE CONCERNED FOR YOUR SAFETY; IMPLEMENT THE ELEVATED THREAT PROCEDURE ➔ Check for bushfire warning & if none, call 000 to report; Ensure all persons at the premises are aware of the situation; Monitor the sources of emergency information and the situation outside for changes; Consider relocating to a lower threat area for the day If the current FDR is Extreme or Catastrophic or persons have health conditions.

SCENARIO 2: A BUSHFIRE EXISTS RELATIVELY CLOSE; A BUSHFIRE EMERGENCY OR WATCH AND ACT WARNING MAY OR MAY NOT BE ISSUED; IMPLEMENT THE EVACUATION PROCEDURE ➔ Check for bushfire warning & if none, call 000 to report; Shut all doors/windows, turn off bottled (or mains) gas & any evaporative air cooler fans (not water); Gather belongings & prepare vehicles; Check emergency information sources for latest updates; Assess the situation to ensure an evacuation route (see map) remains available; If none available apply the Shelter in Place actions (refer to Scenario 3) otherwise evacuate using the evacuation route & destination identified as the most appropriate.

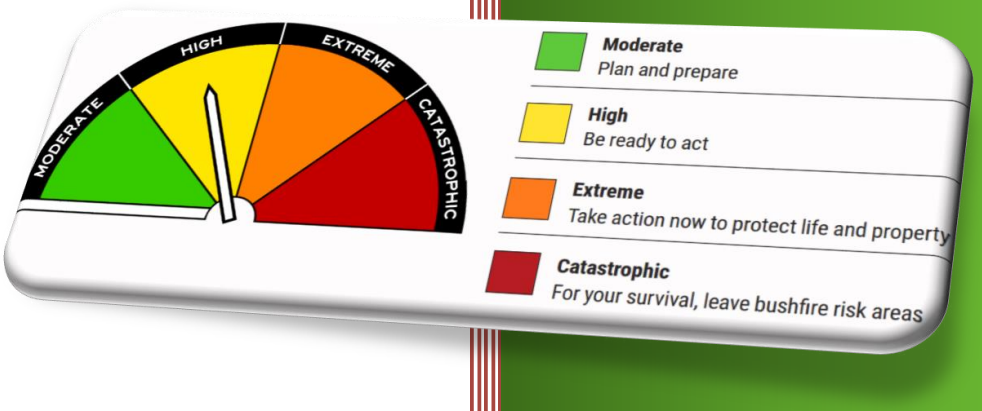
SCENARIO 3: IMPACT FROM A BUSHFIRE IS IMMINENT; EVACUATION ROUTES ARE THREATENED; THERE IS NO TIME TO PERFORM A SAFE (EARLY) EVACUATION OR EMERGENCY SERVICES HAVE INSTRUCTED YOU TO SHELTER IN PLACE; IMPLEMENT THE SHELTER IN PLACE PROCEDURE ➔ stay in the Onsite Shelter Building Call 000 to inform them you are sheltering in place; Shut all doors/windows, turn off bottled (or mains) gas & any evaporative air cooler fans (not water); Outside - move all combustible materials (mats, outdoor furniture, rubbish bins well away from the building; Block gaps around doors to prevent ember entry with wet cloth materials; Stay hydrated and aware of what is happening; Monitor emergency information sources; Move outside after the fire front has passed and conditions outside are tenable; Continually check for spot fires involving the building or nearby materials and extinguish if possible.



BUSHFIRE PRONE PLANNING

Bushfire Emergency Plan

An Information Document for Premises Without Onsite Personnel Responsible for Emergency Management



PREVENT | PREPARE | RESPOND

26 Marri Crescent Lesmurdie

City of Kalamunda

Facility/Premises Use: **Bed and breakfast accommodation**

15 March 2024

Associated BMP: **BPP Ref. No. 240028**

BPP GROUP PTY LTD T/A BUSHFIRE PRONE PLANNING

ACN: 39 166 551 784 | ABN: 39 166 551 784

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DOCUMENT CONTROL

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Co-Author:	Kathy Nastov (BPAD Level 3 No. 27794)	

VERSION HISTORY		
Version	Details	Date
1.0	Original	15 March 2024
-	-	

DISTRIBUTION					
Destination		Version	No. Copies	Hard Copy	Electronic Copy
Person	Email				
Peter Ng	Peter@parpdconsultants.com	1.0		☐	☒
		-		☐	☐

Limitation of Liability: *The procedures and their associated actions contained in this Bushfire Emergency Plan do not guarantee that, in the event of a bushfire, buildings or infrastructure will not be damaged, persons injured, or fatalities occur either on the subject site or off the site while evacuating. This is substantially due to the unpredictable nature and behaviour of fire and fire weather conditions. Additionally, the correct implementation of the required procedures will depend upon, among other things, the ongoing actions of the landowners and/or operators over which Bushfire Prone Planning has no control.*

Any representation, statement, opinion, or advice expressed or implied in this document is made in good faith based on information available to Bushfire Prone Planning at the time. Bushfire Prone Planning will not, except as the law may require, be liable for any loss or other consequences whether or not due to the negligence, lack of care or otherwise of their consultants, their servants or agents, arising out of the services provided by their consultants.

BEP Template (Unsupervised Site) v9.5

THE BUSHFIRE EMERGENCY PLAN – ITS PURPOSE AND APPLICATION

The purpose of this Bushfire Emergency Plan (BEP) is to provide usable bushfire emergency management information that is relevant and targeted to the different types of persons who will be associated with the subject premises.

There will be two distinct types of persons who will have different reasons for being onsite and will typically not be on site together at the same time (although for some uses this may occur). These persons are:

1. The owner and/or operator of the premises, who, in most cases, will not reside or work on the site and will have no responsibility for actively managing the safety of occupants during a bushfire emergency event; and
2. Those persons who will typically be short stay occupants of the premises.

To best support the purpose, this BEP is constructed as an **INFORMATION DOCUMENT** to provide the most relevant required information independently to each type of person.

FOR THE OWNER/OPERATOR

This BEP provides the 'Prevention' and 'Preparation' procedures and their associated actions that must be conducted prior to and during the bushfire season. Additional reference information is included as appendices.

FOR THE SHORT STAY OCCUPANTS

This BEP provides a 'Bushfire Emergency Information Poster' that will be displayed within the premises to inform the occupants, in the event of a bushfire emergency, of the appropriate 'Response' procedure (and associated actions), for a given scenario, along with the safer locations for relocation when necessary to reduce their exposure to bushfire threats.

When necessary, the specific site/use data and consultant considerations applied in developing the BEP are included as an addendum to explain and justify the actions established by this BEP.

TABLE OF CONTENTS

LIST OF ADDITIONAL INFORMATION

1. APPLYING THE BUSHFIRE EMERGENCY PLAN

FOR THE OWNER OPERATOR OF THE PREMISES

- **Be familiar with all content in this Bushfire Emergency Plan, including the Appendices.**
- **Prior to and during the bushfire season (October to April) conduct the Pre-Season Prepare and Maintenance procedures.**

FOR THE SHORT STAY OCCUPANTS

- **Refer to the displayed Bushfire Emergency Information Poster**

2. EMERGENCY CONTACTS

2.1. EMERGENCY SERVICES

AGENCY/AUTHORITY	SERVICES	CONTACT
Department of Fire and Emergency Services / Police / Ambulance	Will respond to life threatening emergencies. Use to report a fire.	**Phone call: triple zero '000'** **Phone app: EMERGENCY PLUS**
State Emergency Service (SES)	Emergency assistance - securing your property, rescuing persons.	13 2500

2.2. UTILITIES / MEDICAL / ASSISTANCE

AGENCY/ORGANISATION	SERVICES	CONTACT
St John of God Midland	Emergency medical services	(08) 9462 4000
Royal Perth Hospital	Emergency medical services	(08) 9224 2244
Western Power	Response to electricity supply outages and damage.	13 1351
Crisis Care	Crisis accommodation	1800 199 008
Australian Red Cross	Humanitarian assistance	1800 733 276 **Website:** redcross.org.au/emergencies
Salvation Army	Social services care	13 72 58 (13 SALVOS) **Website:** salvationarmy.org.au/need-help/disasters-and-emergencies/

3. EMERGENCY INFORMATION SOURCES

THE IMPORTANCE OF BEING AWARE OF YOUR SURROUNDINGS

Know the types of vegetation that grow on surrounding land. Be aware of the potential behaviour of a fire in this vegetation and the threats it can present under different conditions. Relevant information is included in **Appendix 6**.

Knowledge and awareness of the local environment and immediate past and current conditions is a valuable source of information that will assist with decision making – with hot/dry/windy weather presenting the worst conditions.

Lookout for smoke (i.e., evidence of fire) within your surrounding landscape, for as far as you can see. Be aware of the current and forecast wind direction as any fire will be likely to spread in the direction to which the wind is blowing.

YOUR FIRE WEATHER DISTRICT (BOM)	**Swan Inland South**
SOURCE	INFORMATION
Emergency WA emergency.wa.gov.au	This is the primary and most up to date source of information (maps and lists) for: • Current warnings and incidents. • Designated bushfire evacuation centre. • Fire Danger Ratings (FDR) • Total Fire Bans (TFB)
Bureau of Meteorology (BOM) bom.gov.au/wa/forecasts/fire-danger-ratings.shtml	Fire Danger Ratings (FDR) and the corresponding Fire Behaviour Index (FBI).
WA Department of Fire & Emergency Services (DFES) Information Line: 13 3337 (13 DFES) dfes_wa dfeswa dfes.wa.gov.au/hazard-information/bushfire	Republishing of Emergency WA Warnings. General emergency information. Provides overviews of bushfire hazard educational information, including bushfire behaviour and preparation, response, recovery information, and FAQ.
Local Radio Stations ABC (AM/digital) or 6PR (882) abc.net.au/radio/stations	Current bushfire warnings, designated bushfire evacuation centre and other relevant information.
Emergency Alerts – through automated government telephone warning system	Voice messages (landline) and text messages (mobile) can be sent within a defined area under an immediate threat.
Bushfire.IO bushfire.io	Map based bushfire warnings, bushfire incidents and wind forecasts. A visual tool run privately – crosscheck with other sources.
WA Parks and Wildlife Service dpaw.wa.gov.au Website	Bushfire alerts and warnings, current prescribed burns in national parks.
Main Roads WA Phone: 13 8138 travelmap.mainroads.wa.gov.au/Home/Map	Road alerts and closures (incidents and roadworks).

4. PRE-SEASON PREPARE PROCEDURE – ACTIONS TO IMPLEMENT

1. ANNUAL REVIEW OF THE BUSHFIRE EMERGENCY PLAN

Prior to the bushfire season (October to April), update and amend the Bushfire Emergency Plan as required. Assistance from a bushfire consultant is advised.

☐ Make required changes to emergency contacts and emergency information sources. Ensure that any changes are also applied to the bushfire emergency information displayed within the premises.

☐ Ensure the designated assembly area, shelter-in-place building/area and the off-site safer locations and nominated evacuation routes are still the best options. Incorporate any changes into the Bushfire Emergency Plan and the information displayed within the premises.

☐ Account for any change to buildings or equipment onsite that has implications for emergency management.

☐ Incorporate any improvements or additions to the emergency management procedures/actions that have been identified through experience with a bushfire event or changes in best practice bushfire emergency management that are developed over time.

☐ In the event any part of this BEP is amended as part of its annual review, replace old copies and destroy them.

2. DISPLAY & AVAILABILITY OF BUSHFIRE EMERGENCY INFORMATION

☐ Ensure the Display Poster 'Bushfire Emergency Information' (updated as necessary) is displayed (framed or laminated), in a prominent and accessible position within the premises.

Additional information can be displayed when considered appropriate. Examples are contained within the appendices. Copies of these resources are available for download on the DFES website.

3. BUILDING PREPARATION

These actions address the required maintenance of premises buildings, prior to and during the bushfire season to ensure:

- Continued compliance with the construction standards that correspond to its Bushfire Attack Level (as determined in the Bushfire Management Plan);
- The vulnerability of buildings and other consequential fire fuels, to the direct and indirect attack mechanisms of bushfire is minimised; and
- The operational readiness of any installed firefighting equipment and infrastructure.

☐ If the premises is constructed to BAL-12.5 requirements or higher, ensure any external gaps continue to be blocked or screened with non-combustible material (e.g. rock wool, sealant, mesh – maximum aperture of 2mm) to prevent ember entry. This includes under eaves, external cladding, roofs, external vents, skylights etc. Otherwise it is recommended that this action is applied.

☐ Check that all required window and door screening is in place (prevents ember entry to internal spaces and reduces radiant heat load on the glass).

☐ If there is recent construction or planned construction of attached structures (decks, stairs, patio, carport etc.) or adjacent structures (dwelling, shed, carport etc.), ensure bushfire resistant materials (including non-combustible) have been used to the greatest extent possible.

☐ If an evaporative air cooler is installed ensure it is either constructed to the required BAL rating or is fitted with an appropriate ember protection screen.

☐ All gas cylinders to be installed and maintained in accordance with AS 1596. This standard includes requirements for small portable cylinders and larger cylinders used for domestic house supply. These include:

- Safety release valve shall be directed away from the building and persons access/egress routes;
- Metal piping and fittings shall be used on all piping inside the building's cavities and enclosable occupied spaces and the high pressure side of any gas regulators; and
- Tethers securing cylinders are to be non-combustible.

This is to limit the potential for flames and high levels of radiant heat from gas flaring or explosion, to directly impact a building. The heat from the bushfire or a closer consequential fire can cause gas cylinder pressures to reach critical levels beyond which their pressure release valve releases large quantities of LP gas. If these gas cylinders fall over, this pressure release valve may no longer function correctly, and internal pressures continue to rise with continued heating until the cylinder ruptures. The resulting explosion includes a pressure wave and large ball of flame which can threaten nearby life and buildings. Flared or ruptured gas bottles are commonly found in post bushfire surveys.

☐ Remove and maintain at low levels, accumulated vegetation debris (fine fuels) near, on, in and against buildings and structures, including:

- In construction crevices, gaps, on horizontal / shallow angle surfaces and at re-entrant corners in access ways, at wall/floor, wall/ground, roof/wall junctions and around doors, vents, windows;
- In roof gutters and valleys; and
- Adjoining/adjacent drains, culverts and pits.

☐ Around building(s), including verandahs and decks, remove or relocate away from the premises those combustible items that may be seldom used or able to be stored more appropriately in the bushfire season. This includes furniture and mats. Refer to Appendix 7 'LANDSCAPING DESIGN & CONSTRUCTION PRINCIPLES TO APPLY' for further information regarding consequential fire fuels and recommended separation distances.

4. GROUNDS PREPARATION

These actions address the required management of onsite combustible items/materials (fuels) around, on or in buildings. By removing or reducing fuels, the likelihood and intensity of consequential fire is significantly reduced.

Consequential (local) fire which is the most significant cause of building/structure damage/loss in bushfire events.

Fuel management must be completed prior to the start of the bushfire season and maintained during the season.

For additional guidance, refer to:

- The *Guidelines for Planning in Bushfire Prone Areas within the Explanatory Notes for Element 2 of the Bushfire Protection Criteria and Schedule 1: Standards for Asset Protection Zones (WAPC 2021);*
- The DFES '*Bushfire Preparation Toolkit*' publication. Website: publications.dfes.wa.gov.au/?hazard=Bushfire; and
- Where initial or renovation landscaping of grounds surrounding the premises is being conducted, apply the directions and principles of the measures presented in Appendix 7 to the greatest extent possible.

☐ **The Firebreak Notice:** Maintain compliance with the City of Kalamunda Fire Hazard Reduction Notice issued under section 33 of the Bush Fires Act 1954. Where the requirements are additional to or provide a greater level of bushfire protection than those established in this Emergency Plan, they must be complied with.

☐ **Accessibility:** Ensure all property access/egress routes are kept clear and easily trafficable.

☐ **The Asset Protection Zone (APZ) Dimensions:** Ensure the APZ dimensions stated below (established by the associated Bushfire Management Plan for the premises), are installed and maintained. (entire property)

☐ **Asset Protection Zone Management:**

Trees (greater than 6 metres in height):

- Remove branches overhanging buildings and powerlines;
- Remove lower branches to a height of 2m above the ground or any surface vegetation; and
- Remove loose bark (rake) to at least a height of 2m above the ground or any surface vegetation.

Shrubs (0.5 metres to 5 metres in height) and ground covers (greater than 0.5 metres in height):

- Ensure location and clump sizes remain in accordance with guidance in Appendix 7; and
- Remove all dead plant material.

Grass to be reduced and maintained at a height of 50 mm.

Fine Fuels (i.e., less than 6 mm in thickness):

- Ensure combustible dead vegetation matter is reduced to and maintained at less than 2 t/ha on average. Collecting and weighing an indicative 1m^2 of this litter above the mineral earth will indicate the fuel load (100g/m^2 = 1 t/ha); and
- Remove all debris piles.

Heavy Fuels (i.e., greater than 6 mm in thickness):

- Such as fallen branches, timber, firewood, packaging materials, building materials, outdoor furniture, garbage bins, debris piles.
- To be removed from the APZ or be separated from buildings/structures in accordance with guidance in Appendix 7.

Applied mulches:

- Should be non-combustible e.g., stone, gravel and crushed rock. Where wood mulch is used it should be greater than 6mm in thickness.

5. IN-SEASON MAINTENANCE PROCEDURE – ACTIONS TO IMPLEMENT

1. MAINTAIN BUILDINGS

☐ During the bushfire season (October to April), refer to Action List No. 3 in the 'Pre-Season Prepare Procedure' and ensure all actions applicable to management during the bushfire season are implemented.

2. MAINTAIN ASSET PROTECTION ZONES

☐ During the bushfire season (October to April), refer to Action List No. 4 in the 'Pre-Season Prepare Procedure' and ensure all actions applicable to management during the bushfire season are implemented.

BUSHFIRE EMERGENCY INFORMATION

26 Marri Crescent, Lesmurdie

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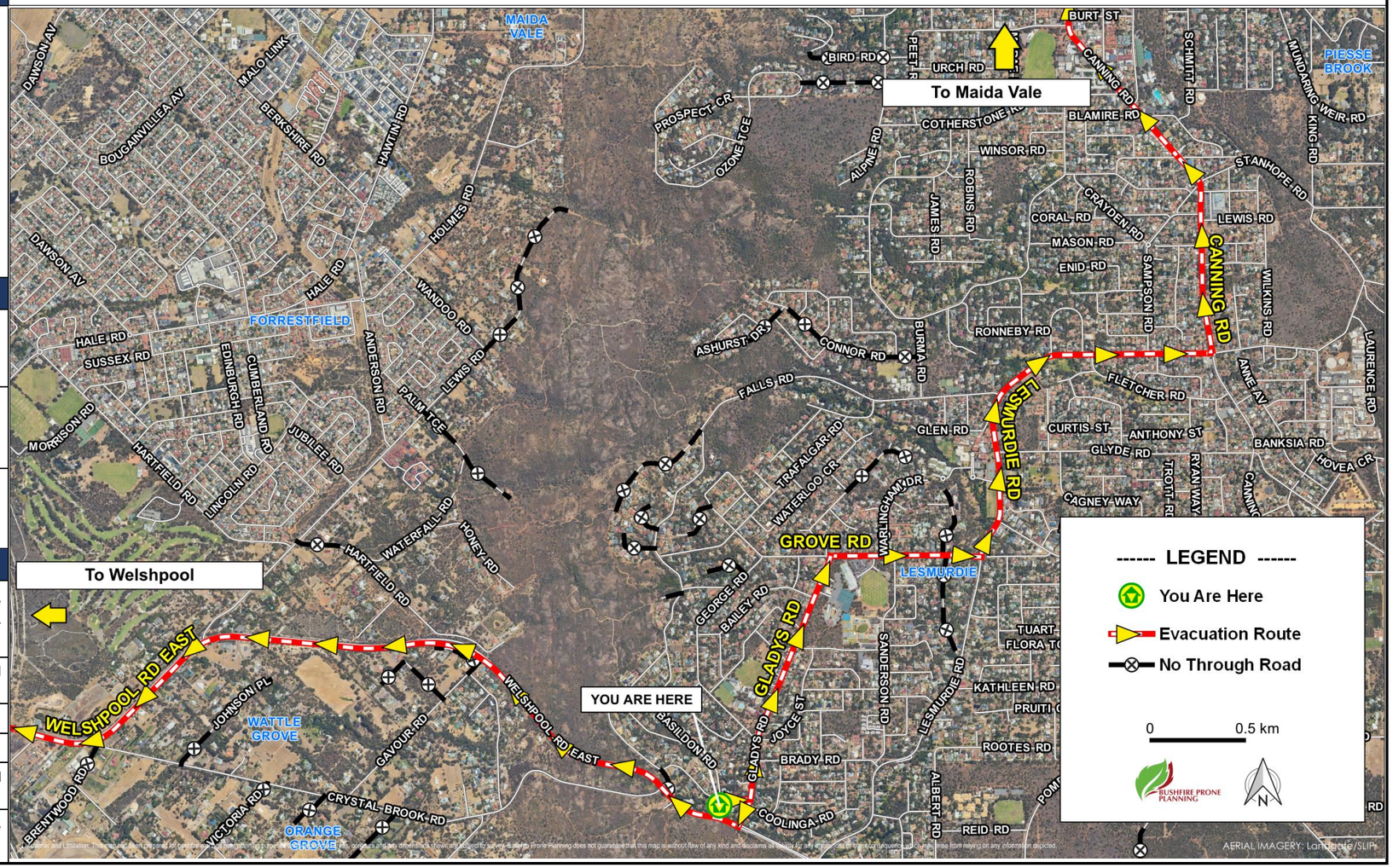


APPENDIX 1: BUSHFIRE WARNINGS – WHEN A BUSHFIRE IS IDENTIFIED

APPENDIX 2: FIRE DANGER RATINGS - FORECAST BUSHFIRE RISK

THE HIGHER THE RATING, THE MORE DANGEROUS THE CONDITIONS AND THE GREATER THE CONSEQUENCES IF A FIRE STARTS.

APPENDIX 3: FIRE BEHAVIOUR INDEX - FORECAST BUSHFIRE RISK

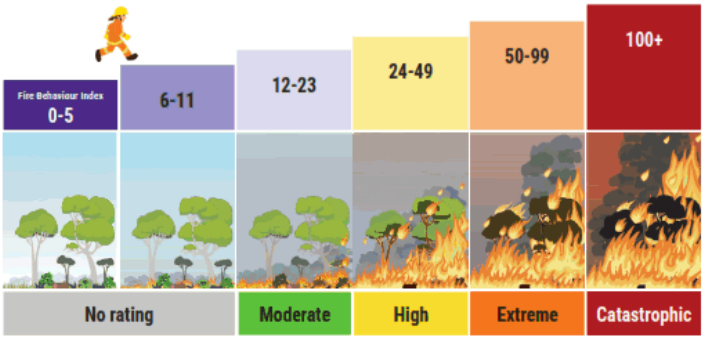
While the AFDRS Fire Danger Ratings are primarily intended for community messaging, the Fire Behaviour Index is intended to support operational fire management decision making.

Features of the FBI:

A Fine Scale of Fire Behaviour	The FBI is expressed in whole numbers from 0 to100+. As the FBI rises, the more dangerous a fire that stars will become.	Takes advantage of decades of improved understanding of fire behaviour, fuels and fire weather.
Stepped Categories	Links transitions in fire behaviour to implications for operational decision making.	Turns the FBI into a powerful operational tool and takes advantage of improved understanding of relationship between fire behaviour, fire spread, suppression and impacts.
Fuel Type Specific	Eight different Fire Behaviour Indexes based on eight different fire behaviour models.	Takes advantage of decades of improved knowledge of fire behaviour in different fuels to produce more specific results.
Nationally Consistent	The index is the same anywhere in Australia.	Supports cross border operations and resource sharing.

The Stepped categories are controlled by tables that define FBI thresholds. The thresholds represent changes in the underlying fire behaviour that have consequences for fire operational decision making, including:

- Indicative fire behaviour and fire weather.
- Implications for prescribed burning.
- Fire suppression and containment strategies that are appropriate.
- Potential for impact on life, property and infrastructure.



For more information visit afac.com.au/initiative/afdrs or email AFDRS@dfes.wa.gov.au

APPENDIX 4: BUSHFIRE RISKS AND DANGERS

BUSHFIRE RISKS AND DANGERS

BUSHFIRES HAPPEN EVERY SUMMER; THEY CAN START SUDDENLY AND WITHOUT WARNING.
If you live in or near bushland you need to understand the risks and dangers that bushfires cause.
Remember that flames are not the only risk you face in a bushfire.

EMBER ATTACK

Ember attack occurs before, during and after a fire front passes.

Embers are pieces of burning bark, leaves or twigs that are carried by the wind around the main fire creating spot fires.

Spotting can be carried over half a kilometre from a fire.

Embers can land in areas around your home such as your garden, under or in the gutters of your home and on wooden decks.

If not extinguished, your house could catch fire.

RADIANT HEAT

The hotter, drier and windier the day, the more intense a bushfire will be and the more radiant heat it will generate.

Radiant heat can cause injury and death from burns and cause the body's cooling system to fail, leading to heat exhaustion and possible heart failure.

It is important that you include water and appropriate clothing in your emergency kit and consider where you will shelter during a bushfire to protect yourself from radiant heat.

SMOKE

Lung injuries and suffocation can occur where the body is exposed to smoke and super-heated air.

It is important to seek shelter when heat and smoke are most intense.

Your nose and mouth should be covered with a dust mask, wet towel or scarf.

A special filter mask should be included in your survival kit for people in your family who suffer respiratory conditions such as asthma.

For more information visit
dfes.wa.gov.au/bushfire
or contact DFES Community Preparedness:
Community.Preparedness@dfes.wa.gov.au
or **9395 9816**

DFES

HOW FIREPROOF IS YOUR PLAN?

APPENDIX 5: GUIDELINES FOR TRAVELLING IN CARS DURING A BUSHFIRE

APPENDIX 6: INDICATIVE BUSHFIRE BEHAVIOUR TO IMPACT THE PREMISES

Information Relevance: This information is included in the Bushfire Emergency Plan to inform and assist the decision making of those persons onsite who have the responsibility to manage a bushfire emergency for the subject premises.

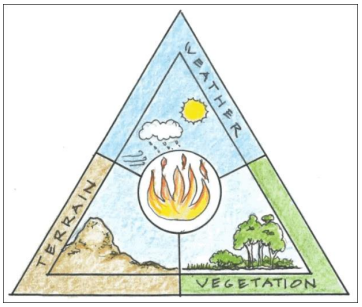
The information establishes the key factors to be considered in understanding the types and scale of key bushfire behaviours that can be expected to impact the premises on a given day. These factors are the type of vegetation that exists on the land surrounding the subject premises, the relevant surrounding terrain, and the forecast Fire Danger Rating (FDR) that applies to the locality.

Information Source: The information is taken from the bushfire behaviour modelling applied within the **Australian Fire Danger Rating System (AFDRS).** Within this system, eight accepted bushfire behaviour models, describing mathematically the way fire moves and spreads through different vegetation types, are currently available and are applied to twenty two different vegetation types across Australia.

The modelling is used to derive the Fire Behaviour Index (FBI) that assists firefighting operational decision making. From the FBI, Fire Danger Ratings (FDR) are derived which provide the broad categories needed to communicate fire danger to the community. The determination of the daily FDR considers the vegetation types present and the forecast fire weather conditions. The higher the rating, the more dangerous the conditions and the greater the consequences if a fire starts. (Source: AFDRS project led by NSW RFS, Australian Bureau of Meteorology and AFAC).

The Fire Behaviour Triangle

The behaviour of a bushfire, including the types of threats, intensity and how quickly it moves, depends on the three factors of vegetation, weather and terrain.



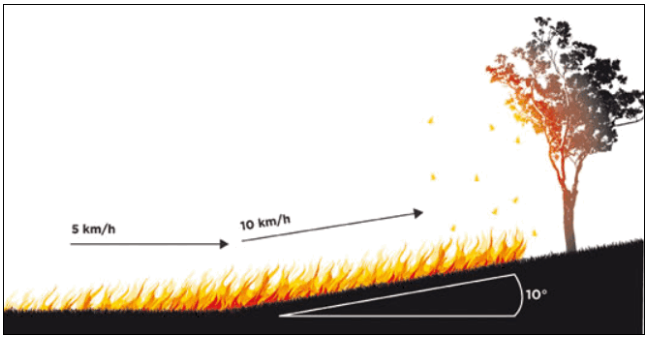
This is known as the fire behaviour triangle – because all three factors combine to shape the characteristics of the bushfire (source: CSIRO 'Bushfire best practice guide' at … research.csiro.au/bushfire/).

The influence of fire weather (FDR) and vegetation types (as per AFDRS) on the potential bushfire impact to the subject premises, can be derived from the tables presented on the following page(s). Greater fuel loads will result in behaviours at the higher end of stated values.

The influence of terrain can be derived by considering the existence and degree of sloping ground and changes in changes in relief (e.g., flat, undulating or rugged land), surrounding the subject premises and particularly under the vegetation.

The Influence of Terrain (topography)

A fire will burn faster uphill. This is because the flames can easily reach more unburnt fuel in front of the fire. Radiant heat pre-heats the fuel in front of the fire, making the fuel even more flammable.



For every 10˚ slope, the fire will double its speed. For example, if a fire is travelling at 5 km per hour along flat ground and it hits a 10˚ slope it will double in speed to 10 km per hour up the hill. By increasing in speed the fire also increases in intensity, becoming even hotter.

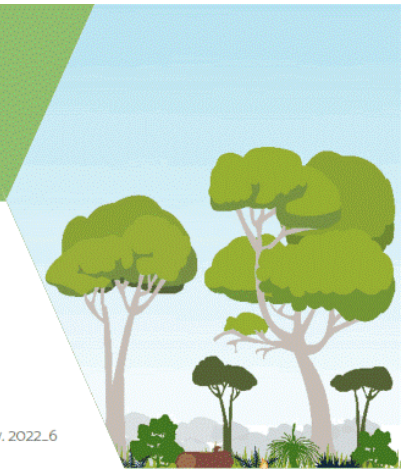
The opposite applies to a fire travelling downhill. The flames reach less fuel, and less radiant heat pre-heats the fuel in front of the fire. For every 10˚ of downhill slope, the fire will halve its speed. Fires tend to move more slowly as the slope decreases (source: Country Fire Authority, Victoria).

Terrain should be considered for its potential to increase adverse fire behaviour including flame heights, forward rates of spread and ember production (in relevant vegetation i.e., primarily bark fuels). Essentially, where vegetation exists on sloping land near your site, assume that the higher end of adverse fire behaviours is much more likely to apply.

VEGETATION TYPES IDENTIFIED SURROUNDING THE SUBJECT PREMISES		
As Applied in the AFDRS		Vegetation Location Relative to the Premises
Fire Behaviour Model (short name)	Fuel Types / Description	
Forest	Dry eucalypt forests, shrubby understorey/litter surface fuel. Forests with high moisture content due to structure, topography or inundation.	Areas on road verges, and large areas of National Park/ reserves/ unmanaged gardens. Located in all directions, with large areas to the south and west.
Shrubland	Temperate shrublands and heathlands of varying heights. Includes wet heathlands.	Areas interspersed within the Forest areas where soils are shallow, usually in areas of granite outcrop. Located on the far side of Welshpool Road East.

FOREST

THE INDICATIVE FIRE BEHAVIOUR CORRESPONDING TO THE FIRE BEHAVIOUR INDEX (0-100) AND THE ASSOCIATED FIRE DANGER RATING (FDR)



Source: AFDRS v. 2022_6

FDR	INDICATIVE BUSHFIRE BEHAVIOUR			
NO RATING	MAX FLAME HEIGHT <1 m	0-5	RATE OF SPREAD 0-40 m/hr	Fire difficult to ignite and sustain. Fires generally unlikely to spread and likely to self-extinguish.
	<4 m	6-11	20-110 m/hr	Slow spreading fires, typically involving surface and near-surface fuels and sometimes bark and elevated fuels. Spotting is sporadic and limited to short-distances.
MODERATE	2-8 m	12-23	60-600 m/hr	Actively spreading fires typically involving surface, near-surface, elevated and bark fuel layers and occasionally canopy fuels. Low-moderate spotting frequency; isolated medium range spotting can occur.
HIGH	7-14 m	24-49	0.3-1 km/hr	Rapidly spreading fires with potential for development into large burn areas within burning period. Fires typically involving most fuel layers. Short-range spotting is prevalent, with possibility of medium range and occasional long-range distance spotting.
EXTREME	11 m - approx. double forest	50-99	0.7-3 km/hr	Fires likely to quickly transition to crowning. Possibility for fire behaviour to become erratic and plume driven. Strong convective column formation. Wind speed and direction likely to be erratic at times.
CATASTROPHIC	>30 m (approx. double forest height)	100+	>2 km/hr can be expected, possibly >3 km/hr	Fires likely to quickly transition to crowning. Possibility for fire behaviour to become erratic and plume driven. Strong convective column formation. Wind speed and direction likely to be erratic at times.

SPOTTING POTENTIAL
Potential for any spotting is very limited and likely **<150 m**
Potential for spotting is limited with short distance spotting possible up to **400 m**
Short distance spotting occurring with increasing frequency with possible medium distance spotting up to **2 km**
Short and medium distance spotting occurring with increasing frequency with possible long distance spotting up to **4 km**
High ember density in short and medium range with possible long distance spotting up to **12 km**
High ember density in short and medium range with possible long distance spotting occurring **20-30 km** ahead of the main fire front

SHRUBLAND

THE INDICATIVE FIRE BEHAVIOUR CORRESPONDING TO THE FIRE BEHAVIOUR INDEX (0-100) AND THE ASSOCIATED FIRE DANGER RATING (FDR)

Source: AFDRS v. 2022_6

FDR	INDICATIVE BUSHFIRE BEHAVIOUR			
NO RATING	MAX FLAME HEIGHT <0.5 m	0-5	RATE OF SPREAD 0-20 m/hr	Flame dimensions are generally insufficient to breach sparse and discontinuous fuels or inter-hummock gaps.	**SPOTTING POTENTIAL** Potential for any spotting is extremely limited
	<0.5-1.5 m	6-11	20-150 m/hr	Sustained spread of fire.	Potential for spotting is limited
MODERATE	1-4 m	12-23	150-1300 m/hr	Fast moving, wind-driven fires that are mostly actively crowning.	Potential for spotting is limited except where eucalypt/mallee trees are present where spotting is likely to be minimal and limited
HIGH	2-8 m	24-49	up to 6.5 km/hr	Fast moving, wind-driven, crown fires with high potential for large fire areas. Mostly complete combustion of fuels and few unburnt patches.	Possible short distance spotting mostly <20 m or where eucalypt/mallee trees are present where spotting is likely to be minimal and limited to short distances (<100 m). Any spot fires are typically overrun by the main head fire
EXTREME CATASTROPHIC	>4m and likely >8m	50+	>1.5 and likely >6.5 km/hr	Rapid fire growth, extremely fast moving, wind-driven fires. High potential for large fire areas with complete combustion of fuels and few unburnt patches.	Possible short distance spotting mostly <40 m except where eucalypt/ mallee trees are present where spotting may be up to 200 m with spot fires typically quickly overrun by the main head fire

APPENDIX 7: LANDSCAPING DESIGN & CONSTRUCTION PRINCIPLES TO APPLY

Where initial or renovation landscaping of grounds surrounding the premises is being conducted, apply the directions and principles of the following measures to the greatest extent possible.

For additional guidance, refer to:

- The *Guidelines for Planning in Bushfire Prone Areas within the Explanatory Notes for Element 2 of the Bushfire Protection Criteria and Schedule 1: Standards for Asset Protection Zones (WAPC 2021); and*
- The DFES '*Bushfire Preparation Toolkit*' publication. Website: publications.dfes.wa.gov.au/?hazard=Bushfire

☐ **Use of Non-Vegetated Areas and/or Public Open Space:**

Reduce the exposure of the premises to the direct and indirect threats of bushfire by incorporating low threat uses of land adjoining the premises and/or the bushfire hazard. These uses create robust and easier managed asset protection zones and include:

- Non-vegetated areas e.g. footpaths, paved areas, roads, driveways, parking, drainage, swimming pools;
- Formally managed areas of vegetation (public open space and other recreation areas), including irrigated areas; and
- Services installed in a common section of non-vegetated land.

☐ **Landscaping – Non-Combustible Construction:** Ensure non-combustible materials are used for fencing and any other landscaping construction, including retaining walls.

☐ **Landscaping – Tree and Plant Species Selection**

Utilise trees and plants with characteristics that are more resistant to burning. Refer to *Guidelines for Planning in Bushfire Prone Areas, Appendix 4 'Explanatory Notes E2: Plant Flammability' (WAPC 2021) for initial guidance.*

Avoid planting trees with ribbon or stringy barks (ember/firebrand production). Preference for smooth bark.

☐ **Landscaping – Tree and Plant Separation from the Premises (Location):**

Trees (greater than 6 metres in height: Minimise the potential for tree strike damage (falling or blown) to the premises (allowing flame, radiant heat and ember entry to internal spaces), and debris accumulation on, in and around the premise. Principles to apply are:

- Ideally trees will be separated from buildings/structures by a distance of at least 1.5 times the height of the tallest tree;
- As a minimum, trunks at maturity should be at least 6 metres from all elevations of the building, branches at maturity should not touch or overhang a building or powerlines. Mature tree canopies should be separated at least 5m with total canopy cover not exceeding 15% and not connected to tree canopy outside the APZ;
- Species of trees that produce significant quantities of debris (fine fuels) during the bushfire season should be located a sufficient distance away from vulnerable exposed elements to ensure debris cannot drop and accumulate within at least 4m of buildings/structures or be likely to be relocated by wind to closer than 4m to buildings / structures.

Shrubs and scrub (0.5 metres to 6 metres in height):

- Should not be located under trees or within 3 metres of buildings;
- Should not be planted in clumps greater than 5m^2 in area;

- Clumps of shrubs should be separated from each other and any exposed window or door by at least 10 metres (unless they can be classified as low flammability plants); and
- Shrubs greater than 6 metres in height are to be treated as trees.

Ground covers (less than 0.5 metres in height):

- Can be planted under trees but and no closer than two metres from a structure but 3 metres from doors or windows if greater than 100 mm in height; and
- Ground covers greater than 0.5 metres in height are to be treated as shrubs.

Grass: Where possible utilise irrigated perennial species.

Mulches should be non-combustible e.g., stone, gravel and crushed rock. Where wood mulch is used it should be greater than 6mm in thickness.

☐ **Separation Between the Premises and the Consequential Fire Fuels of Stored Flammable Products (Fuels / Other Hazardous Materials):**

If applicable. establish sufficient separation distance between the consequential fire fuels and the premises. The required separation distance will be dependent on the fuel and storage type and will need to be determined.

☐ **Separation Between the Premises and the Consequential Fire Fuels of Stored and Constructed Combustible Items:**

These consequential fire fuels include:

- Stored Combustible Items - Heavy Fuels (greater than 6mm diameter) e.g. building materials, packaging materials, firewood, branches, sporting/playground equipment, outdoor furniture, garbage bins etc:
- Stored Combustible Items – Large Heavy Fuels e.g. vehicles, caravans, boats, trailers and large quantities of dead vegetation materials stored as part of site use.
- Constructed Combustible Items – Heavy Fuels e.g. landscaping structures including fences, screens, walls, plastic water tanks.
- Constructed Combustible Items – Large Heavy Fuels e.g. adjacent buildings/structures including houses, sheds, garages, carports. (Note: If the adjacent structure is constructed to BAL-29 requirements or greater and can implement a significant number of additional bushfire protection measures associated with reducing exposure and vulnerability, these minimum separation distances could be reduced by 30%).

Apply the rule of thumb "assume flames produced from a consequential fire source will be twice as high as the object itself … where the consequential fire source is a structure, then the maximum eave height is a reasonable measure of maximum height".

Apply the following separation distances from the subject building/structure as a multiple of the height of the consequential fire source and dependent on the bushfire construction standard applied to the building/structure:

- At least six times the height when the premises construction incorporates design and materials that is only intended to resist low levels of radiant heat up to 12.5 kW/m^2 and no flame contact (BAL-12.5);
- Between 4 and 6 six times the height when the premises construction incorporates design and materials intended to resist radiant heat up to 29 kW/m^2 and no flame contact (BAL-29).
- Between 2 and 4 times the height when the premises construction incorporates design and materials intended to resist up to 40kW/m^2 and potential flame contact (BAL-40).
- Less than 2 times the height when the premises construction incorporates design and materials intended to resist extreme levels of radiant heat and flame contact (BAL-FZ).
- Zero separation distance is required if the premises is separated by a non-combustible FRL 60/60/60 rated wall, or the potential consequential fire source is fully enclosed by the premises.

☐ **Constructed Barriers to Shield Premises from Bushfire:** Where applicable, install walls, fences and/or landforms to shield the premises (or any identified consequential fire fuels – refer to previous item) from direct and indirect bushfire attack mechanisms and reduce the potential impact of these threats.

These barriers should be constructed using appropriate fire resistant / non-combustible construction materials (e.g. masonry, steel, earthworks). These are to withstand the impact of direct bushfire attack mechanisms for the required period.

☐ **Constructed Barriers to Shield Premises from Consequential Fire:** Applicable to all identified consequential fire fuel sources. Install a non-combustible barrier (including complete enclosure when appropriate), of required robustness, that will reduce the exposure of the premises to the threats of consequential fire.

☐ **Planted Vegetation Barrier to Shield Premises:** Use appropriate species (lower flammability) of hedges and trees strategically to reduce the premises exposure to radiant heat, to filter/trap embers and firebrands, and to lower wind speeds (prevailing synoptic and/or fire driven).

☐ **Shield Non-Structural Essential Elements:** These are vulnerable elements essential to the continued operation of the premises which are potentially exposed to the fire attack mechanisms of both bushfire and consequential fire. They include electricity cabling and water plumbing and also applies to any installed firefighting equipment / water storage.

When the use of fire rated materials to the degree necessary is not possible or practical, the application of non-combustible shielding can be applied to reduce exposure to the bushfire threats. Shielding includes underground installation.

☐ **Constructed Barrier to Shield Persons on Pathways to Safer Onsite Area/Building:** Where possible, alongside the relevant pathways, utilise walls / fences / landforms as shielding structures constructed using fire resistant / non-combustible construction materials (e.g. masonry, steel, earthworks).

These are to withstand the impact of direct bushfire attack mechanisms for the required period and provide the required reduction in threat levels to persons (including firefighters) traversing the pathway.