Bushfire Management Plan Coversheet

This Coversheet and accompanying Bushfire Management Plan has been prepared and issued by a person accredited by Fire Protection Association Australia under the Bushfire Planning and Design (BPAD) Accreditation Scheme.

Bushfire Management Plan and Site Details

Site Address / Plan Reference: Lot 1871 Ayres Road and Lot 86 Richardson Road			
Suburb: Stoneville		**State:** WA	**P/code:** 6081
Local government area: Shire of Mundaring			
Description of the planning proposal: Subdivision			
BMP Plan / Reference Number: 168593	**Version:** v1.2	**Date of Issue:** 19/10/2021	
Client / Business Name: Chris and Bernie Schelfhout			

Reason for referral to DFES	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 BPC elements)?	☐	☒
Is the proposal any of the following special development types (see SPP 3.7 for definitions)?		
Unavoidable development (in BAL-40 or BAL-FZ)	☐	☒
Strategic planning proposal (including rezoning applications)	☐	☒
Minor development (in BAL-40 or BAL-FZ)	☐	☒
High risk land-use	☐	☒
Vulnerable land-use	☐	☒

If the development is a special development type as listed above, explain why the proposal is considered to be one of the above listed classifications (E.g. considered vulnerable land-use as the development is for accommodation of the elderly, etc.)?

Note: The decision maker (e.g. local government or the WAPC) should only refer the proposal to DFES for comment if one (or more) of the above answers are ticked "Yes".

BPAD Accredited Practitioner Details and Declaration

Name	Accreditation Level	Accreditation No.	Accreditation Expiry
Kathy Nastov	Level 3	BPAD27794	01/08/2022
Company Bushfire Prone PLanning		**Contact No.** 64771144	

I declare that the information provided within this bushfire management plan is to the best of my knowledge true and correct

Signature of Practitioner  **Date** 19/10/2021

Bushfire Management Plan

Address: Lot 1871 Ayres Road and Lot 86 Richardson Road, Stoneville

Shire of Mundaring

Planning Stage:	Subdivision Application
Planning Development Type:	Subdivision - Small Number of Lots
Bushfire Policy – Specific Development or Use Type:	N/A

Job Number:	168593
Assessment Date:	30 October 2020
Report Date:	19 October 2021

BPP Group Pty Ltd t/a Bushfire Prone Planning
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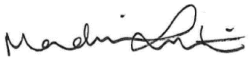
DOCUMENT CONTROL

PREPARATION		
Author:	Sarina Gorman (BPAD Level 2 - No. 42204)	
Co-Author:	Madison Smith (BPAD Level 1 - No. 56399)	
Review/Authorise:	Kathy Nastov (BPAD Level 3 - No. 27794)	

VERSION HISTORY		
Version	**Version Details**	**Date**
1.0	Original Document Issue	18 March 2021
1.1	Updated Maps	23 March 2021
1.2	Updated Site Plan and Responsibilities	19 October 2021

DISTRIBUTION				
Destination	**Version**	**No. Copies**	**Hard Copy**	**Electronic Copy**
Person/Business: Chris and Bernie Schelfhout Email: 1bestbet@westnet.com.au	v1.2		☐	☒

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EXECUTIVE SUMMARY

This Bushfire Management Plan has been prepared to accompany the subdivision application for Lot 1871 Ayres Road and Lot 86 Richardson Road, Stoneville within the Shire of Mundaring.

The subdivision site comprising Lots 1871 and 86, of approximately 3.1843 Hectares in total area (10 proposed residential Lots) is within a designated bushfire prone area and the proposal requires the application of State Planning Policy No. 3.7: Planning in Bushfire Prone Areas (SPP 3.7). The assessed bushfire risk is considered to be manageable and will be achieved by the identified stakeholders implementing and maintaining the bushfire risk management measures that are presented in this Plan.

The proposal, as set out in this Plan has addressed the applicable legislation, policy, standards and guidelines including the four elements of the Bushfire Protection Criteria of Location, Siting and Design, Vehicular Access and Water Supply. The determination is that the proposal can meet all the requirements. Against the Bushfire Protection Criteria, the decision maker's assessment of this proposal is to be on the basis of it being able to meet the acceptable solutions for all four elements once construction of any applicable structures and roads along with any associated landscaping is complete.

The vegetation within the proposed development boundary (predominantly Forest and Grassland) has been considered and it is expected that in the future, this vegetation will be maintained in a low threat state. It will meet AS3959-2018 s2.2.3.2 requirements and will continue to be maintained in a low threat state as stipulated in the Shire of Mundaring Firebreak and Fuel Load Notice.

Furthermore, it is expected that any future structures will comply with a maximum BAL rating of BAL-29. The construction of an internal public road will provide access to Richardson Road which in turn will provide safe vehicle access and egress to two different destinations and as a sealed public road, it will be available to all of the public at all times and under all weather conditions. A reticulated water supply is available to the subject site. This proposal is able to achieve the acceptable solution (access to a designated water supply for firefighting that meets the parameters for the proposed land-use).

Future buildings within 100 metres of classified vegetation will be required to be constructed to standards which correspond to the determined BAL's, as required by AS 3959-2018 Construction of buildings in bushfire prone areas. As this proposal does not identify the actual location of building works within each Lot, there may be a requirement to determine the BAL ratings for individual building works once a building site has been identified.

1 PROPOSAL DETAILS

1.1 Description and Associated Plans and Maps

Landowner / Proponent:	Chris and Bernie Schelfhout
Bushfire Prone Planning Commissioned to Produce the Bushfire Management Plan (BMP) By:	Chris and Bernie Schelfhout
For Submission To:	Shire of Mundaring
Purpose of the BMP:	To accompany a planning application
'Development' Site Total Area:	3.1843 hectares
No. of Existing/Proposed Lots:	Existing lot(s) = 2, Proposed lot(s) = 10 (Residential)
Description of the Proposed Development/Use:	
Subdivision of 2 large existing lots into 10 smaller residential lots.	
Staged Development and Management of Potential Bushfire Hazard Issues	
Post subdivision and development works, all lots are able to achieve a sufficient area within each Lot for future dwellings not exceeding a BAL-29 construction rating.	

Figure 1.1

Proposed Subdivision

Lot 1871 on Diagram 76164, Area : 18,119 sq m
and Lot 86 on Plan 107919, Area : 13,724 sq m
Ayres Road and Richardson Road
STONEVILLE
SHIRE OF MUNDARING

NARLA RTT
AYRES RD
GRENVILLE RD
PAW
RICHARDSON RD
Lot 86
Lot 1871
1
2
3
4
5
6
7
8
9
10
43
42
31
32
33
34
28
1
40
24
27
37
4
36
22
9
21
20
16
8
5
7

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

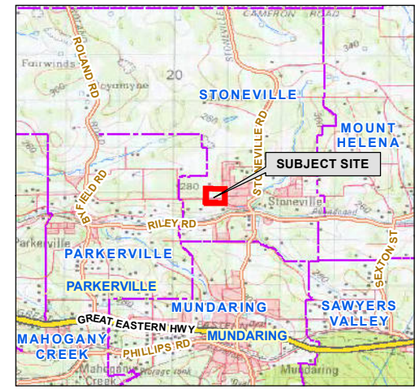
- Subject Site
- Other Lots
- Hydrant
- Indicative New Hydrant Location
- Habitat Trees
- Proposed Subdivision
- Proposed Carriageway

Existing Building

- Dwelling
- Shed
- Granny Cottage

20 0 20 40
Metres

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



Aerial Imagery : Landgate/SLIP
Image Date : Feb 2021

Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Mercator Units: Metre
Map compiled by: M.McVee 18/10/2021
Map updated by: M.McVee 18/10/2021

BUSHFIRE PRONE PLANNING

Map Document Path / Name: K:\Projects\Jobs 2016\168593 Lot 1871 Ayres Road and Lot 86 Richardson Road, Stoneville (BMP)\Mapping\MXD\168593_Fig1-1_SUB_Ayres Road and Richardson Road Stoneville.mxd

Figure 1.2

Location Plan

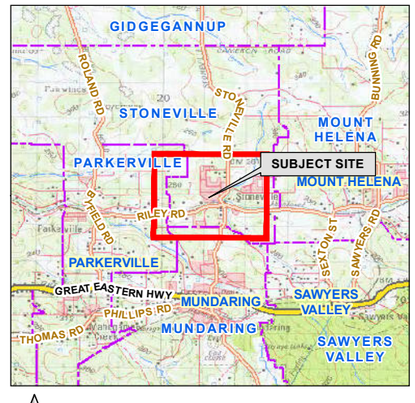
Lot 1871 on Diagram 76164, Area : 18,119 sq m
and Lot 86 on Plan 107919, Area : 13,724 sq m
Ayres Road and Richardson Road
STONEVILLE
SHIRE OF MUNDARING

------ **LEGEND** ------

- Subject Site
- Other Lots
- Local Government Authority
- Locality / Suburb
- Bush Fire Brigade
- Reserves

100 0 100 200 300 400
Metres

------ **LOCALITY** ------



Aerial Imagery : Landgate/SLIP
Image Date : Feb 2021

BUSHFIRE PRONE PLANNING

Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Mercator Units: Metre
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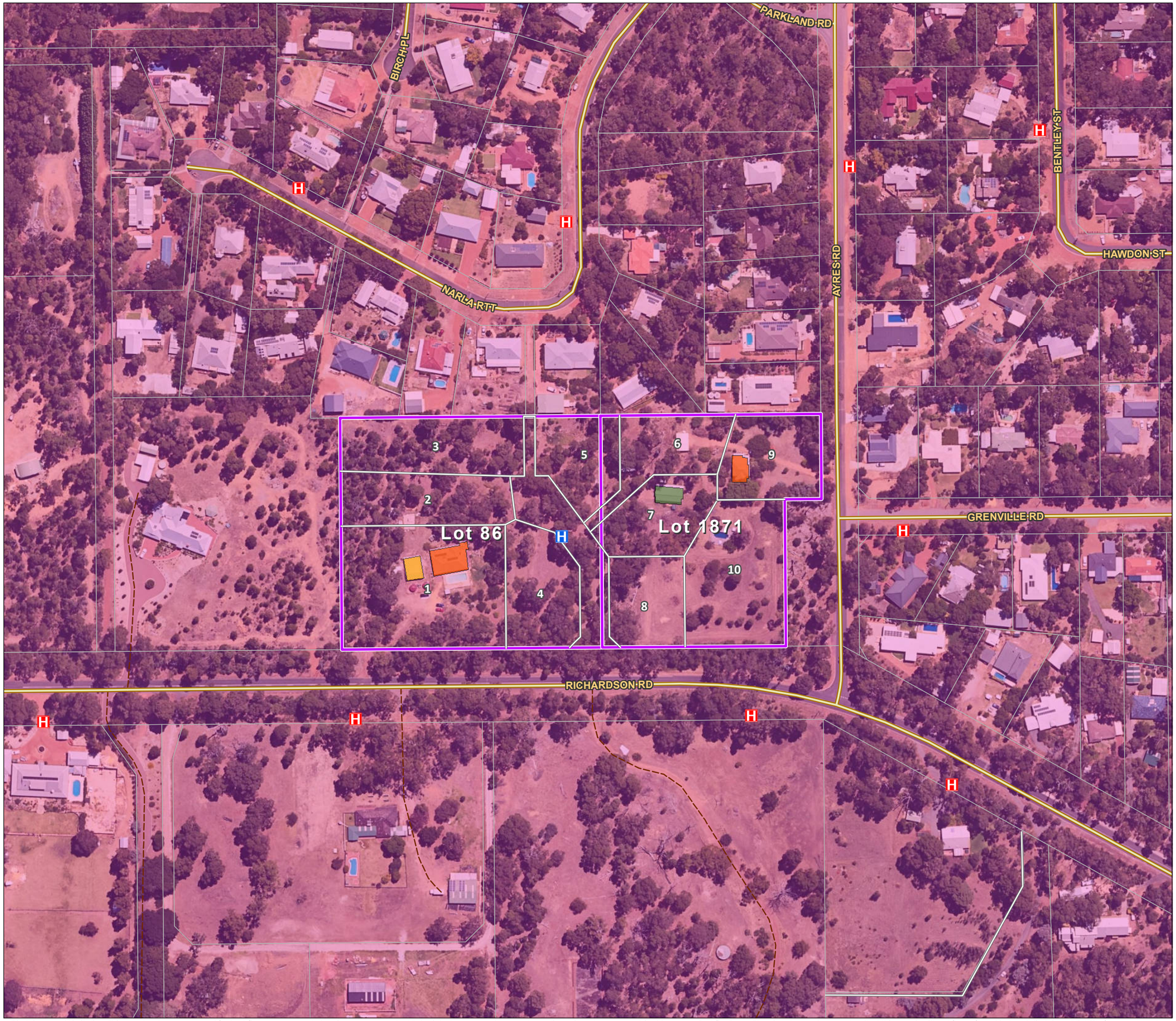
Map updated by: M.McVee 18/10/2021

Map Document Path / Name: K:\Projects\Jobs 2016\168593 Lot 1871 Ayres Road and Lot 86 Richardson Road, Stoneville (BMP)\Mapping\MXD\168593_Fig1-2_LOC_Ayres Road and Richardson Road Stoneville.mxd

Figure 1.3

Bushfire Prone Area

Lot 1871 on Diagram 76164, Area : 18,119 sq m
and Lot 86 on Plan 107919, Area : 13,724 sq m
Ayres Road and Richardson Road
STONEVILLE
SHIRE OF MUNDARING



------ **LEGEND** ------

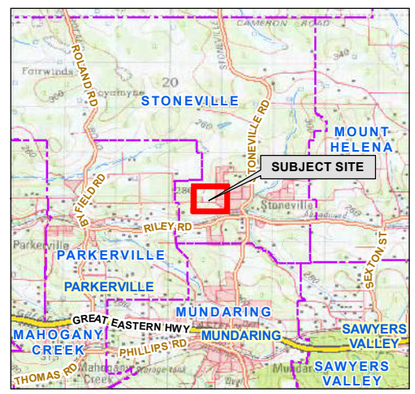
- Subject Site
- Other Lots
- Hydrant
- Indicative New Hydrant Location
- Proposed Subdivision

Existing Building

- Dwelling
- Shed
- Granny Cottage
- Bushfire Prone Areas (2019)

20 0 20 40 60 80 100
Metres

------ **LOCALITY** ------



Aerial Imagery : Landgate/SLIP
Image Date : Feb 2021

Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Mercator Units: Metre
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Map updated by: M.McVee 18/10/2021

BUSHFIRE PRONE PLANNING

Map Document Path / Name: K:\Projects\Jobs 2016\168593 Lot 1871 Ayres Road and Lot 86 Richardson Road, Stoneville (BMP)\Mapping\MXD\168593_Fig1-3_BPA_Ayres Road and Richardson Road Stoneville.mxd

1.2 Existing Documentation Relevant to the Construction of this Plan

This section acknowledges any known reports or plans that have been prepared for previous planning stages, that refer to the subject area and that may or will impact upon the assessment of bushfire risk and/or the implementation of bushfire protection measures and will be referenced in this Bushfire Management Plan.

Table 1.1: Existing relevant documentation.

RELEVANT EXISTING DOCUMENTS		
Existing Document	Copy Provided by Client	Title
Structure Plan	No	-
Environmental Report	Yes	Targeted Flora and Vegetation Survey and Black Cockatoo Habitat Assessment of Proposed Subdivision at Lot 86 Richardson Road and Lot 1871 Ayres Road, Stoneville Terratree – October 2020
Landscaping (Revegetation) Plan	No	-
Bushfire Risk Assessments	Yes	Bushfire Management Plan (Rezoning Application) – Completed August 2016

2 ENVIRONMENTAL CONSIDERATIONS

2.1 Native Vegetation – Restrictions to Modification and/or Clearing

Many bushfire prone areas also have high biodiversity values. SPP 3.7 policy objective 5.4 recognises the need to consider bushfire risk management measures alongside environmental, biodiversity and conservation values (Guidelines s2.3).

There is a requirement to identify any need for onsite modification and/or clearing of native vegetation and whether this may trigger potential environmental impact/referral requirements under State and Federal environmental legislation. Confirmation that any proposed native vegetation modification and/or clearing is acceptable, should be received from the relevant agencies by the proponent and provided to the bushfire consultant for inclusion in the Bushfire Management Plan if it will influence the required bushfire planning assessments and outcomes. The following table details any potential environmental restrictions of which the author of this report is aware.

Table 2.1: Native vegetation and potential environmental considerations and restrictions.

NATIVE VEGETATION MODIFICATION / CLEARING - POTENTIAL ENVIRONMENTAL RESTRICTIONS IDENTIFIED				
Environmental Considerations / Features	Potential Mapping Data Source (SLIP / Local Planning)	Relevant to Proposed Development	Data Applied	Action Required
Onsite clearing of native vegetation is required.		Yes		
Environmental impact/referral requirements under State and Federal environmental legislation may be triggered.		Possible		
National Park / Nature Reserve	DBCA-011	No- Confirmed by Bushfire Consultant	Relevant Database Reviewed by Bushfire Consultant	None
Conservation Covenant	DPIRD-023	Not Known	Data Not Readily Available to Bushfire Consultant	Proponent to Seek Advice
Bush Forever Site	DPLH-019	No- Confirmed by Bushfire Consultant	Relevant Database Reviewed by Bushfire Consultant	None
RAMSAR Wetland	DBCA-010	No- Confirmed by Bushfire Consultant	Relevant Database Reviewed by Bushfire Consultant	None
Geomorphic and Other Wetland	DBCA-011-019, 040, 043, 044	No- Confirmed by Bushfire Consultant	Relevant Database Reviewed by Bushfire Consultant	None
Threatened and Priority Ecological Communities (TECs or PECs)	DBCA-038	No- Confirmed by Bushfire Consultant	Relevant Database Reviewed by Bushfire Consultant	None
Threatened and Priority Flora including Declared Rare Flora (DRFs)	DBCA-036	No- Confirmed by Bushfire Consultant	Relevant Database Reviewed by Bushfire Consultant	None

Land Identified as significant through a Local Biodiversity Strategy	LG - Intramaps	Yes- Confirmed by Bushfire Consultant	Relevant Database Reviewed by Bushfire Consultant	Proponent to Seek Advice

Statement of how the identified environmental feature(s) is dealt with in this Bushfire Management Plan (and the location of relevant information):

The assessments and bushfire protection measures detailed the BMP, assume that environmental approval will be achieved or clearing permit exemptions will apply.

It is advised that the proponent seek further advice from an Environmental Consultant or the WA Department of Biodiversity Conservation and Attractions for further information on the condition and species contained within the proposed development area and the requirement for referral of the proposal.

The Flora report by Terratree indicates habitat trees are present on the subject site. These trees will be retained (see Fig 1.1)

Development Design Considerations

Establishing development in bushfire prone areas can adversely affect the retention of native vegetation through clearing associated with the creation of lots and/or asset protection zones. Where loss of vegetation is not acceptable or causes conflict with landscape or environmental objectives, it will be necessary to consider available design options to minimise the removal of native vegetation.

Table 2.2: Development design.

MINIMISE THE REMOVAL OF NATIVE VEGETATION	
Design Option	Assessment / Action
Reduction of lot yield	Considered and the subdivision plan has been modified. See comments below.
Cluster development	N/A
Construct building to a standard corresponding to a higher BAL as per BCA (AS 3959:2018 and/or NASH Standard)	N/A
Modify the development location	N/A
Subject to any applicable Environmental Survey Works and approval from the Local Government Authority, the proposed development can achieve asset protection zone development and maintenance of vegetation on the development site in a low threat state, which will ensure the bushfire risk will be reduced to the immediate surrounding properties due to the continued ongoing management of vegetation. There was a reduction in the public open space area to enable a maximum BAL-29 across the western Lots. This decreased the number of Lots of the subdivision from 11 residential Lots and public open space to 10 residential Lots.	
IMPACT ON ADJOINING LAND	
Is this planning proposal able to implement the required bushfire protection measures within the boundaries of the land being developed so as not to impact on the bushfire and environmental management of neighbouring reserves, properties or conservation covenants?	Yes
The required Asset Protection Zones (APZ) can be established within the extents of the subject lot. The construction of the proposed development and the ongoing management of onsite vegetation will reduce the threat of bushfire.	

2.2 Retained Vegetation / Re-vegetation / Landscape Plans (including POS)

Riparian zones, wetland/foreshore buffers, road verges and public open space may have plans to re-vegetate or retain vegetation as part of the proposed development. Vegetation corridors may be created between offsite and onsite vegetation and provide a route for fire to enter a development area.

All retained/planned vegetation and its management will be considered in the development of this Bushfire Management Plan.

Is re-vegetation of riparian zones and/or wetland or foreshore buffers and/or public open space a part of this Proposal?	No
Is the requirement for ongoing maintenance of existing vegetation in riparian zones and/or wetland or foreshore buffers and/or public open space a part of this Proposal?	No
Has a landscape plan been developed for the proposed development?	No

2.3 Shire of Mundaring – Local Natural Areas (LNA)

The Shire of Mundaring has a Local Biodiversity Strategy that requires natural areas should be conserved, protected or retained wherever practicable to maintain the Shire's current levels of biodiversity, unless the area is already committed to development through zoning. To achieve this intention formal protection is put in place through the Local Planning Strategy and Town Planning Scheme No. 4 which specify controls and recommendations relating to each of these categories.

PROTECTION LEVELS Based a range of factors including land tenure, specific purpose of Crown reserves, existing lot sizes, subdivision potential and relative conservation priority, all LNA's in the Shire have been assigned a Protection Level.	
Map Shading	Level
Green	Conservation
Blue	Protection
Orange	Retention
Beige	Limited Protection – already committed by zoning

CONSERVATION PRIORITIES To assist in with making decisions on planning proposals affecting LNA's and the allocation of resources to managing them, conservation priorities have been determined. LNA's are identified as having one of three conservation priorities (P1, P2 or P3) based on a range of ecological values. Refer to Shire of Mundaring Local Biodiversity Strategy and Local Planning Strategy)			
Map Shading	Priority	Intention	Conservation Assets
Green	1	To be conserved or protected and receive active management	Rare vegetation complexes / At risk vegetation complexes / Within 20 m of a watercourse Regional linkage over special features / Regional linkage over habituate
Brown	2	To be conserved or protected and receive active management	Habitat / Special features / Regional linkages Within 20-50m off watercourse
Yellow	3	To be retained and where possible receive active management	Every other LNA

Assessment Result

Has the proposed development area (lot(s)) been identified as being subject to a Local Natural Area classification over any portion?	Yes

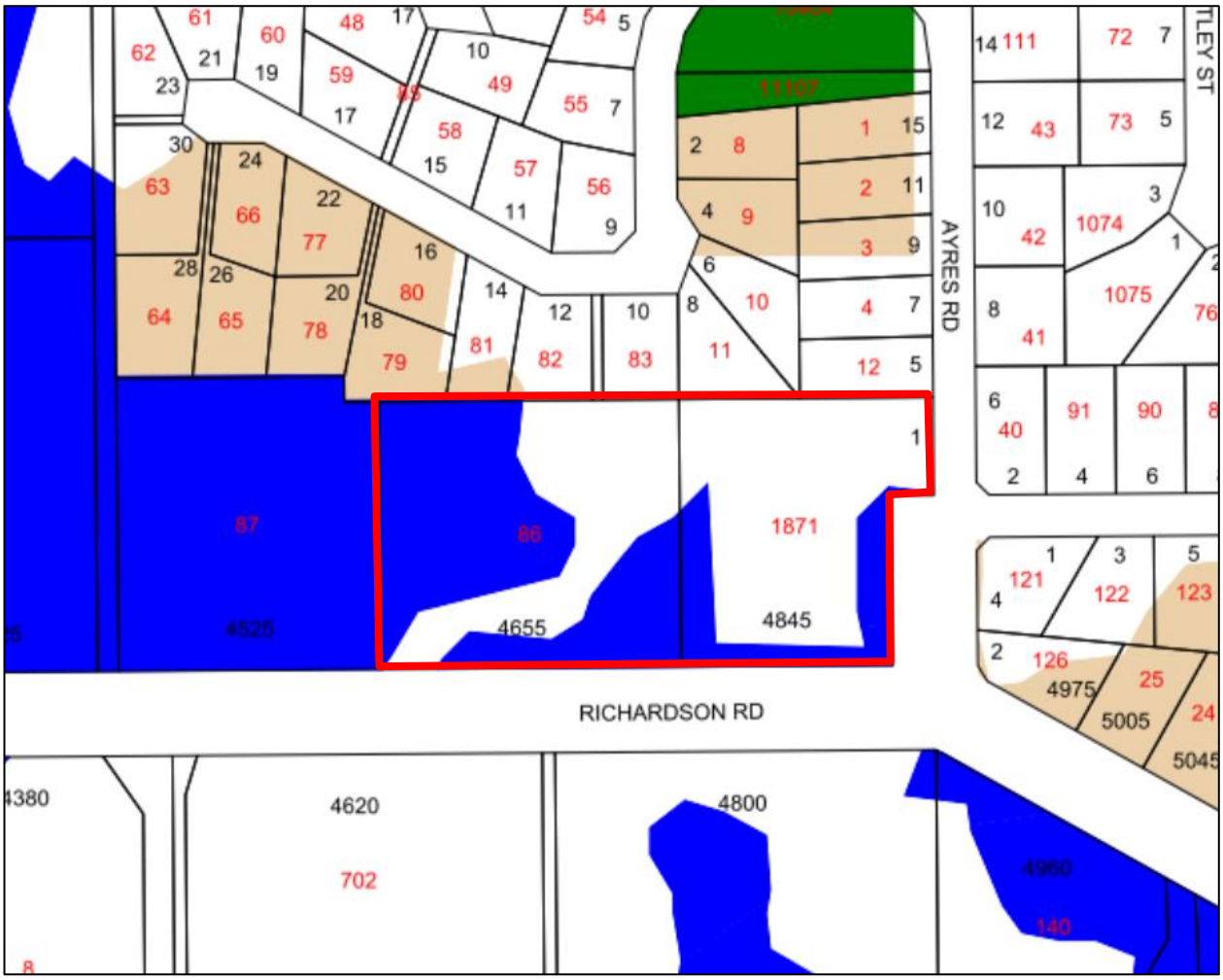
Mapping

The following map (screen shots) show the Protection Levels and Conservation Priorities for the identified Local Natural Areas on the subject area.

There are significant areas of existing vegetation on the subject lot classified as a Local Natural Area (LNA). Approval will be required from the Shire of Mundaring prior to any native vegetation clearing.

In consideration of the existing vegetation classified as an LNA, the lowest BAL recommended for the subject site / lot is BAL-29 (this is also the highest acceptable BAL). This will result in minimal existing vegetation being removed compared to targeting a lower BAL.

Figure 2.1: Subject Site (outlined in red) – LNA Map – Protection Level (Source: Shire of Mundaring Intramaps)



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Map Shading	Level
Green	Conservation
Blue	Protection
Orange	Retention
Beige	Limited Protection – already committed by zoning

Figure 2.2: Subject Site (outlined in red) – LNA Map – Conservation Priority (Source: Shire of Mundaring Intramaps)

CONSERVATION PRIORITIES To assist in with making decisions on planning proposals affecting LNA's and the allocation of resources to managing them, conservation priorities have been determined. LNA's are identified as having one of three conservation priorities (P1, P2 or P3) based on a range of ecological values. Refer to Shire of Mundaring Local Biodiversity Strategy and Local Planning Strategy)			
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Yellow	3	To be retained and where possible receive active management	Every other LNA

3 POTENTIAL BUSHFIRE IMPACT ASSESSMENT

3.1 Assessment Input

3.1.1 Fire Danger Index (FDI) Applied

AS 3959:2018 specifies the fire danger index values to apply for different regions as per Table 2.1. The values used in the model calculations are for the Forest Fire Danger Index (FFDI) and for which equivalent representative values of the Grassland Fire Danger Index (GFDI) are applied as per Appendix B. The values can be modified if appropriately justified.

Table 3.1: Applied FDI Value

FDI VALUE			
Vegetation Areas	As per AS 3959:2018 Table 2.1	As per DFES for the Location	Value Applied
1-6	80	N/A	80

3.1.2 Vegetation Classification and Effective Slope

Classification: Bushfire prone vegetation identification and classification has been conducted in accordance with AS 3959:2018 s2.2.3 and the Visual Guide for Bushfire Risk Assessment in WA (DoP February 2016).

When more than one vegetation type is present, each type is identified separately, and the applied classification considers the potential bushfire intensity and behaviour from the vegetation types present and ensures the worst case scenario is accounted for – this may not be from the predominant vegetation type.

The vegetation structure has been assessed as it will be in its mature state (rather than what might be observed on the day). Areas of modified vegetation are assessed as they will be in their natural unmodified state (unless maintained in a permanently low threat, minimal fuel condition, satisfying AS 3959:2018 s2.2.3.2(f) and asset protection zone standards). Vegetation destroyed or damaged by a bushfire or other natural disaster has been assessed on its revegetated mature state.

Effective Slope: Refers to the ground slope under each area of classified vegetation which most influences the bushfire attack (and is described in the direction relative to the view from the building or proposed development site). This slope has a direct and significant influence on the fire's rate of spread and intensity.

Where there is a significant change in effective slope under an area of classified vegetation, that will cause a change in fire behaviour, separate vegetation areas will be identified to enable the correct assessment.

When the effective slope, under a given area of bushfire prone vegetation, will be different relative to multiple proposed development sites, then the effective slopes corresponding to the different locations, are separately identified.

Table 3.2: Vegetation classification and effective slope.

ALL VEGETATION WITHIN 150 METRES OF THE PROPOSED DEVELOPMENT				
Vegetation Area	Identified Vegetation Types [1] or Description if 'Excluded'	Applied Vegetation Classification [1]	Effective Slope (degrees)[2]	
			Assessed	Applied Range
1	Woodland – B-05	Class B Woodland	0	upslope or flat
2	Forest – A-03	Class A Forest	0	upslope or flat
3	Excluded – Low Threat Vegetation	Excluded as per Section 2.2.3.2 (f) Low Threat	N/A	N/A
4	Forest – A-03	Class A Forest	4	downslope >0-5
5	Grassland – G-25 Grassland – G-26	Class G Grassland	4.7	downslope >0-5
6	Woodland – B-05	Class B Woodland	2.9	downslope >0-5
Representative photos of each vegetation area, descriptions and classification justification, are presented on the following pages. The areas of classified vegetation are defined, and the photo locations identified on Figure 3.1, the Existing Vegetation and Topography map.				
Note[1]: Described and classified as per AS 3959:2018 Table 2.3 and Figures 2.3 and 2.4 (A)-(H)				
Note[2]: It is assumed for the purposes of assessment that Area 3 will continue to be managed in a low threat state in perpetuity. (Established residential area, maintained private gardens and buildings. Cleared bitumen/hardstand areas/roads.				

VEGETATION AREA 1	
AS 3959:2018 Vegetation Classification Applied:	Class B Woodland
Vegetation Types Present:	Woodland B-05
Description/Justification:	Jarrah and Marri dominant area/s with average heights of 15-20 metres at maturity. Canopy coverage approximately 30%. Understorey consists of predominantly low grasses and leaf litter.
Post Dev. Assumptions:	Vegetation offsite is not able to be managed and is classified as worst-case scenario.

Photo ID: 4

Photo ID: 6

VEGETATION AREA 2	
AS 3959:2018 Vegetation Classification Applied:	Class A Forest
Vegetation Types Present:	Open forest A-03
Description/Justification:	Jarrah and Marri dominant area/s with average heights of 15-20 metres at maturity. Understorey consists of unmanaged grasses, low shrub and low trees. Canopy coverage greater than 50%.
Post Dev. Assumptions	Vegetation offsite is not able to be managed and is classified as worst-case scenario.

Photo ID: 39

Photo ID: 42

Photo ID: 22

VEGETATION AREA 3	
AS 3959:2018 Vegetation Classification Applied:	Excluded as per Section 2.2.3.2 (f) Low Threat Vegetation
Vegetation Types Present:	Low Threat Vegetation
Description/Justification:	Mixed vegetation to be removed during subdivision works and maintained gardens that are expected to be managed by landowner in perpetuity.
Post Assumptions:	Vegetation can reasonably be expected to be modified as part of subdivision works.

Photo ID: 3

Photo ID: 5

Photo ID: 9

Photo ID: 10

Photo ID: 12

Photo ID: 13

VEGETATION AREA 3	
	
Photo ID: 14	Photo ID: 15
	
Photo ID: 20	

VEGETATION AREA 3	
AS 3959:2018 Vegetation Classification Applied:	Excluded as per Section 2.2.3.2 (f) Low Threat Vegetation
Vegetation Types Present:	Low Threat Vegetation
Description/Justification:	An established residential area. Maintained private properties and gardens with a mix of exotic plants and trees. Grasses maintained to less than 50mm in height. Hardstand/turn-around areas cleared of unmanaged vegetation. Slight residual winter growth present.

Photo ID: 7

Photo ID: 8

Photo ID: 36

Photo ID: 37

Photo ID: 38

Photo ID: 40

VEGETATION AREA 3	
	
Photo ID: 41	Photo ID: 43

VEGETATION AREA 4	
AS 3959:2018 Vegetation Classification Applied:	Class A Forest
Vegetation Types Present:	Open forest A-03
Description/Justification:	Jarrah and Marri dominant area/s with average heights of 15-20 metres at maturity. Understorey consists of unmanaged grasses, low shrub and low trees. Canopy coverage greater than 50%.
Post Dev. Assumptions:	Vegetation offsite is not able to be managed and is classified as worst-case scenario.

	
Photo ID: 1	Photo ID: 11
	
Photo ID: 16	Photo ID: 17

VEGETATION AREA 4

Photo ID: 18

Photo ID: 19

Photo ID: 21

Photo ID: 23

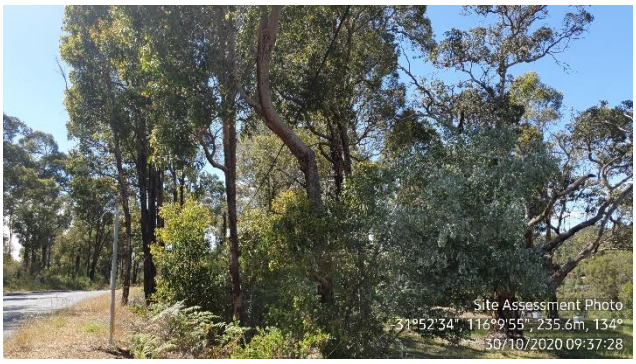


Photo ID: 24

Photo ID: 26

VEGETATION AREA 4	
	
Photo ID: 27	Photo ID: 34
	
Photo ID: 35	

VEGETATION AREA 5	
AS 3959:2018 Vegetation Classification Applied:	Class G Grassland
Vegetation Types Present:	Dense sown pasture G-25; Sown pasture G-26
Description/Justification:	Assessed as Grassland due to areas of grasses present in paddock/open areas. Although grasses may appear to be in a managed state or sparse in some sections, other sections do appear unmanaged. As such, the entire area/s have been classified as a precautionary measure with a worst-case scenario approach. There is the potential to become significantly unmanaged in the future. Foliage cover less than 10%.

Photo ID: 25

Photo ID: 28

Photo ID: 29

Photo ID: 32

VEGETATION AREA 6	
AS 3959:2018 Vegetation Classification Applied:	Class B Woodland
Vegetation Types Present:	Woodland B-05
Description/Justification:	Jarrah and Marri dominant area/s with average heights of 15-20 metres at maturity. Understorey consists of predominantly low grasses and leaf litter. Approximately 30% canopy coverage. NOTE: It is recognised that some maintenance has previously taken place in some sections within in these area/s. As other sections do appear unmanaged, the entire area/s have been classified as a precautionary measure with a worst-case scenario approach.

Photo ID: 2

Photo ID: 30

Photo ID: 31

Photo ID: 33

Figure 3.1

Topography & Classified Vegetation

Lot 1871 on Diagram 76164, Area : 18,119 sq m
and Lot 86 on Plan 107919, Area : 13,724 sq m
Ayres Road and Richardson Road
STONEVILLE
SHIRE OF MUNDARING

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

- Subject Site
- Other Lots
- Photo & Direction
- Hydrant
- Indicative New Hydrant Location
- Proposed Subdivision

Existing Building

- Dwelling
- Shed
- Granny Cottage

Vegetation Assessment Area

- 150m from Subject Site

Vegetation Assessment Area

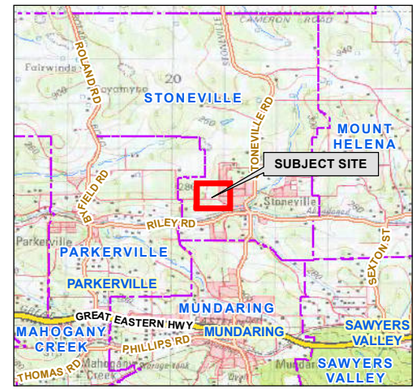
- 100m from Subject Site

Classied Vegetation

- Class (A) Forest
- Class (B) Woodland
- Class (G) Grassland
- Exclusion 2.2.3.2
- Habitat Trees

20 0 20 40 60 80 100
Metres

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



Aerial Imagery : Landgate/SLIP
Image Date : Feb 2021

Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Mercator Units: Metre
Map compiled by: M.McVee 18/10/2021
Map updated by: M.McVee 18/10/2021

BUSHFIRE PRONE PLANNING

Map Document Path / Name: K:\Projects\Jobs 2016\168593 Lot 1871 Ayres Road and Lot 86 Richardson Road, Stoneville (BMP)\Mapping\MXD\168593_Fg3-1_VEG_Ayres Road and Richardson Road Stoneville.mxd

3.1.3 Vegetation Separation Distance

The vegetation separation distance is the horizontal distance measured from the relevant parts of an existing building or a future building's planned location (within a lot), to the determined edge of an area of classified vegetation.

This separation distance applied to determining a Bushfire Attack Level (BAL) can be either:

- The *measured distance* – for which the location of the building relative to the edge of classified vegetation must be known. This will result in single determined BAL that will apply to a building. (The measured distance is a required calculation input); or
- A *calculated minimum and maximum distance (range)* that will correspond to each individual BAL. The calculated distances provide an indicative (or achievable) BAL for which the determined BAL will be dependent on the known location of the building relative to the edge of classified vegetation.

  The calculated range of distances corresponding to each BAL can be presented in different formats (tables or a BAL contour map), dependent on the form of information that is most appropriate for the proposed development/use. These distance ranges corresponding to BAL(s) will be presented in Section 3.2: 'Assessment Output".

For the proposed development/use, the applicable vegetation separation distances will be presented within the Bushfire Management Plan in this location:	In Section 3.2 'Assessment Output' as a table containing the calculated ranges of distance corresponding to each BAL and illustrated as a BAL Contour Map.

3.2 Assessment Output

UNDERSTANDING THE RESULTS OF THE BUSHFIRE IMPACT ASSESSMENT

Bushfire Attack Levels (BALs) – Their Application in the Building Environment is Different to the Planning Environment

In the building environment, a ***determined BAL*** is required for the proposed construction at the building application stage. This is to inform approval considerations and establish the bushfire construction standards that are to apply. An indicative BAL is not acceptable for a building application.

In the planning environment, through the application of SPP 3.7 and associated Guidelines, the deemed to satisfy requirement for a proposed 'development site' or sites (defined by the LPS Amendment Regulations 2015 as "that part of a lot on which a building that is the subject of development stands or is to be constructed"), is that a BAL-29 or lower rating can be achieved once all works associated with the proposal are completed. For planning approval purposes, an ***indicative BAL*** can provide the required information.

Determined Bushfire Attack Level

A determined BAL is to apply to an existing building or the 'development site' on which the building is to be constructed and not to a lot or building envelope. Its purpose is to state the potential radiant heat flux to which the building will be exposed, thereby determining the construction standard to be applied.

A determined BAL cannot be given for a future building whose design and position on the lot are unknown or the vegetation separation distance has not been established. It is not until these variables have been fixed that a determined BAL can be stated, and a BAL Certificate can be issued.

The one exception is when a building ***of any dimension*** can be ***positioned anywhere*** on a proposed lot (within R-Code building setbacks) or within a defined building envelope, and always remain subject to the same BAL, regardless of the retention of any existing classified vegetation either onsite or offsite.

Indicative Bushfire Attack Level

If a BAL is not able to achieve 'determined' status it will be an indicative BAL. It indicates the BAL that can be achieved by the proposed development/use. However, it is conditional upon an assessment variable(s) being confirmed at a later stage (e.g. the building location is established/changed, or vegetation is removed to establish the vegetation separation distance).

A BAL certificate cannot be issued for an indicative BAL – unless that BAL cannot vary (refer to 'Determined BAL' above).

In table form, a single or a range of indicative BAL(s) may be presented. If a single indicative BAL is stated for a defined area (i.e. the lot or building envelope), this will be the highest indicative BAL impacting the defined area.

In BAL contour map form (refer to Section 3.2.2), the illustrated BAL contours visually identify areas of land for which if any part of an existing or proposed building is located on that land and within the BAL contours, then the highest BAL affecting that building (or part of the land on which the building will be constructed), will be the indicative BAL that is to apply.

The BAL can only become a determined BAL once the actual location of that building on the land is known and/or the required minimum vegetation separation distance corresponding to the relevant BAL contour is established (refer to Table 3.2.6).

Table 3.2.1: Indicative BAL ratings (post development)

MINIMUM SEPARATION DISTANCES REQUIRED TO RETAIN INDICATIVE, MAXIMUM, ACCEPTABLE BAL RATING – POST DEVELOPMENT				
Vegetation Area	Vegetation Classification	Effective Slope (degrees)	Maximum Acceptable BAL Rating	Required Separation Distances (metres)
1	Class B Woodland	upslope or flat	**BAL-29**	14
2	Class A Forest	upslope or flat		21
3	Excluded AS3959:2018 2.2.3.2 (f)	N/A		N/A
4	Class A Forest	downslope >0-5		27
5	Class G Grassland	downslope >0-5		9
6	Class B Woodland	downslope >0-5		17
Note[1]: It is assumed for the purposes of assessment that Area 1 will continue to be managed in a low threat state in perpetuity. (Established and Developing Residential Area, maintained POS/Nature Strips, private gardens and buildings. Cleared bitumen/hardstand areas/roads.				

3.2.1 Bushfire Attack Level Results - BAL Contour Map Format

INTERPRETATION OF THE BUSHFIRE ATTACK LEVEL (BAL) CONTOUR MAP

The contour map will present different coloured contour intervals extending from the areas of classified bushfire prone vegetation. These represent the different bushfire attack levels that will exist at varying distances away from the classified vegetation in the event of a bushfire in that vegetation.

The areas of classified vegetation are those that will remain as the intended end state of the subject development once earthworks, clearing and/or landscaping and re-vegetation have been completed (or each stage completed).

Each bushfire attack level corresponds to a set range of radiant heat flux that is generated by a bushfire. That range is defined by the AS 3959:2018 BAL determination methodology.

The width of each shaded BAL contour is a diagrammatic representation of the separation distances from the classified vegetation that correspond to each BAL for each separately identified area of classified vegetation. They have been calculated by the application of the unique site variables including vegetation types and structure, ground slope and applied fire weather.

(Refer to Section 3.2 'Understanding the Results of the Bushfire Impact Assessment' for the explanation of how BAL(s) for buildings will be assessed from the BAL Contour Map).

Construction of the BAL Contours

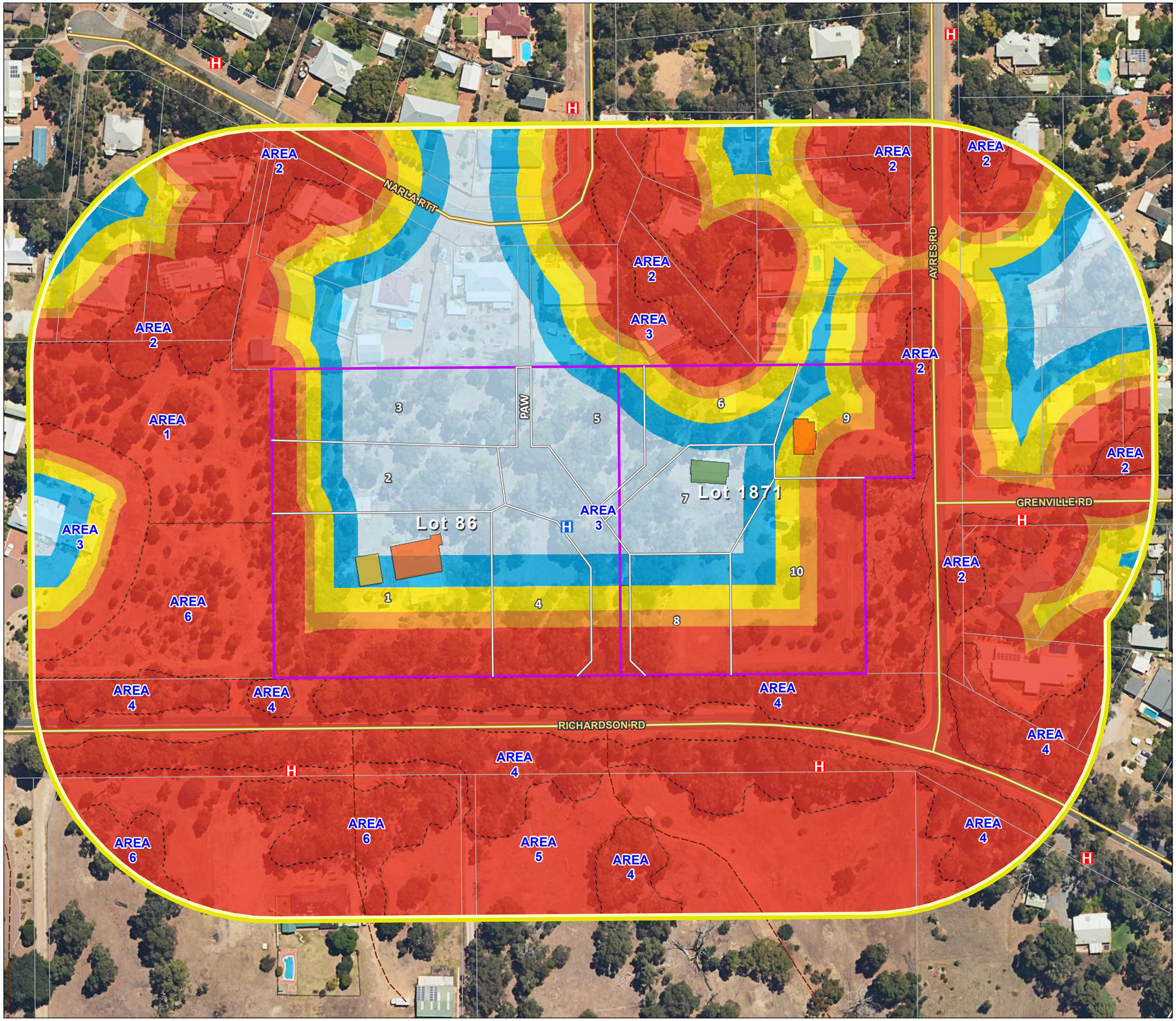
Table 3.2.2: Vegetation separation distances applied to construct the BAL contours.

BAL CONTOUR MAP – APPLIED VEGETATION SEPARATION DISTANCES								
Derived from the Application of Method 1 BAL Determination Methodology (AS 3959:2018 Section 2, Table 2.5)[1]								
Vegetation Area	Vegetation Classification	Effective Slope (degrees)	BAL and Corresponding Separation Distance (m)					
			BAL-FZ	BAL-40	BAL-29	BAL-19	BAL12.5	BAL-LOW
1	Class B Woodland	upslope or flat	<10	10-<14	14-<20	20-<29	29-<100	>100
2	Class A Forest	upslope or flat	<16	16-<21	21-<31	31-<42	42-<100	>100
3	Excluded AS3959:2018 2.2.3.2 (f)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
4	Class A Forest	downslope >0-5	<20	20-<27	27-<37	37-<50	50-<100	>100
5	Class G Grassland	downslope >0-5	<7	7-<9	9-<14	14-<20	20-<50	>50
6	Class B Woodland	downslope >0-5	<13	13-<17	17-<25	25-<35	35-<100	>100
Note[1]: It is assumed for the purposes of assessment that Area 1 will continue to be managed in a low threat state in perpetuity. (Established and Developing Residential Area, maintained POS/Nature Strips, private gardens and buildings. Cleared bitumen/hardstand areas/roads.								

Figure 3.2

BAL Contour Map

Lot 1871 on Diagram 76164, Area : 18,119 sq m
and Lot 86 on Plan 107919, Area : 13,724 sq m
Ayres Road and Richardson Road
STONEVILLE
SHIRE OF MUNDARING



------ **LEGEND** ------

- Subject Site
- Other Lots
- Hydrant
- Indicative New Hydrant Location
- Proposed Subdivision

Existing Building

- Dwelling
- Shed
- Granny Cottage

Vegetation Assessment Area

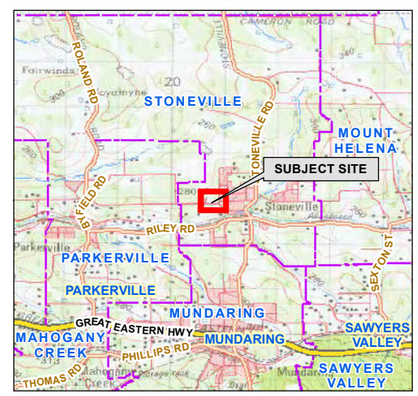
- 100m from Subject Site
- Classified Vegetation Boundary

Indicative Bushfire Attack Levels

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

20 0 20 40 60
Metres

------ **LOCALITY** ------



Aerial Imagery : Landgate/SLIP
Image Date : Feb 2021

Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Mercator Units: Metre
Map compiled by: M.McVee 18/10/2021
Map updated by: M.McVee 18/10/2021

BUSHFIRE PRONE PLANNING

Map Document Path / Name: K:\Projects\Jobs 2016\168593 Lot 1871 Ayres Road and Lot 86 Richardson Road, Stoneville (BMP)\Mapping\MXD\168593_Fig3-2_BAL_Ayres Road and Richardson Road Stoneville.mxd

3.2.2 Bushfire Attack Level Results - Derived from The BAL Contour Map

DERIVING A BAL RATING FOR A FUTURE CONSTRUCTION SITE (BUILDING) FROM THE BAL CONTOUR MAP DATA

(Capacity to Issue a BAL Certificate)

Key Assumptions: The actual location of a building within a lot or envelope (an 'area') may not have been determined at this stage of planning; and the BAL ratings represent the BAL of an 'area' not a building.

The BAL Rating is Assessed as Indicative

If the assessed BAL for the 'area' is stated as being 'indicative', it is because that 'area' is impacted by more than one BAL contour interval and/or classifiable vegetation remains on the lot, or on adjacent lots, that can influence a future building's BAL rating (and this vegetation may have been omitted from being contoured for planning purposes e.g. Grassland or when the assumption is made that all onsite vegetation can be removed and/or modified).

In this report the indicative BAL is presented as either the highest BAL impacting the site or as a range of achievable BAL's within the site – whichever is the most appropriate.

The BAL rating that will apply to any future building within that 'area' will be dependent on:

1. vegetation management onsite; and/or
2. vegetation remaining on adjacent lots; and/or
3. the actual location of the future building within that 'area'.

A BAL Certificate cannot be provided for future buildings, within a lot or envelope with an indicative BAL, until the building location and in some instances building design (elevation), have been established and any required and approved vegetation modification/removal has been confirmed. Once this has occurred a report confirming the building location and BAL rating will be required to submit with the BAL certificate.

The required confirmation of the BAL rating must be done by a bushfire practitioner with the same level of accreditation as has been required to compile this BAL Contour report or subsequent Bushfire Management Plan. This is dependent on the type of calculations utilised (e.g. if performance-based solutions have been used in the Plan BPAD Level 3 accreditation is required).

The BAL Rating is Assessed as Determined

If the assessed BAL for the lot or envelope is stated as being 'determined' it is because that lot or envelope is impacted by a single BAL contour interval. This BAL has been determined by the existence (or non-existence) of classified vegetation outside the lot or envelope, and no classifiable vegetation currently exists on the lot or envelope (i.e. it has been cleared to a minimal fuel, low bushfire threat state). In the situation where the BAL Contour Map has been constructed around multiple lots, there also needs to no classifiable vegetation on an adjacent lot if this vegetation has not already been incorporated into the creation of the BAL Contour Map.

As a result, a determined BAL can be provided in this limited situation because:

1. No classified vegetation is required to be removed or modified to achieve the determined BAL, either within the lot/envelope or on adjacent lots (or if vegetation is excluded from classification, it is reasonable to assume it will be maintained in this state into the future); and
2. A future building can be located anywhere within the 'site' and be subject to the determined BAL rating; and
3. The degree of certainty is more than sufficient to allow for any small discrepancy that might occur in the mapping of the BAL contours.

For a determined BAL rating for a lot/envelope, A BAL Certificate (referring to the BMP) can be provided for a future building, if the BMP remains current.

4 IDENTIFICATION OF BUSHFIRE HAZARD ISSUES

In response to the Bushfire Management Plan requirements established by Appendix 5 of the Guidelines for Planning in Bushfire Prone Areas (WAPC 2017 v1.3), the following statements are made to assist in the understanding of whether the proposal is likely to be able to comply with the bushfire protection criteria now or in subsequent planning stages.

Spatial Context - Broader Landscape Considerations	
Wider road network and access constraints	The surrounding area has an extensive public road network at the larger scale associated with the rural residential zoning and corresponding large lot sizes. At a more local level access options can be limited to a single road in two directions for a short distance where other options are available. There is no access constraint for the subject site with regard to what is considered acceptable from a planning perspective, however, where development opportunities can increase local access options within the surrounding area, this would have merit that should be considered as benefiting a greater number of residents.
Proximity of settlements and emergency services	The subject site is part of a large area of urban/semi-rural settlement. The Mundaring townsite is 3.4 km and 4 minutes travel time. The nearest emergency services are located in Stoneville and Parkerville (900 m 1 minute travel, and 3.2 km 3 minutes travel respectively).
Bushfire prone vegetation types and extent (including conserved vegetation)	Significant extents of bushfire prone vegetation exist across the broader landscape as retained native vegetation (jarrah/marri forest) but interspersed with improved pastures (grassland) and asset protection zones around existing dwellings. Most of the vegetation is on private land and subject to various levels of fuel load management. Nearby forest vegetation will produce significant embers and firebrands in a bushfire event primarily due to the type of bark.
Topography and fire behaviour interactions.	The topography is undulating rather than rugged. Some areas of flat land but most has slopes of zero to five degrees over significant areas. Bushfire rates of spread can double for every ten degrees of upslope while downslopes will slow the rate of spread.
Potential for extreme fire behaviour and pyro convective events.	Possible but limited likelihood due to the fragmentation of areas of bushfire prone vegetation due to cleared areas, pastured areas, fuel load management by landowners and the availability of emergency services (including being a part of the greater Perth metropolitan area).
Environmental Considerations	
Constraints to implementing required and/or additional bushfire protection measures	The environment considerations have not identified any issues primary bushfire hazard identified
Provision of Access Within the Subject Site	
Potential constraints	No constraints to establishing the required access will exist.
Potential Bushfire Impacts	
Flame and radiant heat and ability to establish an APZ	The proposed lot sizes will allow a BAL-29 dimensioned APZ to be established within each lot. This will prevent flame contact from the classified vegetation. Some classified vegetation within the lot boundary will need to be removed and managed to achieve the required maximum BAL-29 APZ. Application of the BAL-29 bushfire construction standard will mitigate the risks from radiant heat impact to what is considered an acceptable level.
Embers/firebrands, smoke and fire-driven wind	These will be the major impacts to the subject site. The appropriate protection measures of building construction and strict management of the APZ will mitigate the risk to what is considered an acceptable level.

Issues to be Considered at Subsequent Planning Stages (additional assessments/documents)	
Specific land uses to be addressed	N/A
Additional assessments	N/A
Additional documents	N/A
Discretionary Decision Making and the Precautionary Principle (SPP 3.7 and Guidelines)	
Does the bushfire consultant consider there are issues that need to be addressed in this space?	No.

5 ASSESSMENT AGAINST THE BUSHFIRE PROTECTION CRITERIA ESTABLISHED BY THE GUIDELINES

For a subdivision application to be considered compliant with SPP 3.7, it must satisfy (achieve) the intent of each of the four elements of the bushfire protection criteria. These criteria are established by the *Guidelines for Planning in Bushfire Prone Areas WAPC 2017 v1.3*). Compliance can be achieved by either:

- Meeting all applicable acceptable solutions corresponding to each element (i.e. the minimum bushfire protection measures that are deemed to satisfy planning requirements); or
- Where an acceptable solution cannot be met, by developing a performance solution that satisfies the established requirements.

5.1 Local Government Variations to Apply

Local governments may add to or modify the acceptable solutions of the Bushfire Protection Criteria (BPC) and/or apply technical requirements that vary from those specified in the Guidelines for Planning in Bushfire Prone Areas (WAPC). In such instances, this Proposal will be assessed against these variations and/or any specific local government technical requirements for emergency access and water. Refer to Appendices 2 and 3 for relevant technical requirements.

Will local or regional variations (endorsed by WAPC / DFES) to the applicable acceptable solutions established by the *Guidelines* or the *Position Statement: Tourism land uses in bushfire prone areas WAPC October 2019,* apply to this Proposal?	N/A

5.2 Summary of Assessment Against the Bushfire Protection Criteria

SUMMARISED OUTCOME OF THE ASSESSMENT AGAINST THE BUSHFIRE PROTECTION CRITERIA					
Element of the Bushfire Protection Criteria	Basis for the Proposal Achieving Full Compliance with SPP 3.7			The Proposal Cannot Achieve Full Compliance with SPP 3.7	
	Acceptable Solutions Met	Achieves the Intent of the Element			
	All applicable solutions are fully met	All applicable solutions are not fully met. A merit based assessment and/or a bushfire performance comparison of the proposals residual risk with that of the residual risk of the acceptable solution is conducted (refer Note 4)	A performance principle-based solution is applied	Bushfire planning development type that may not require full compliance is applied	An improvement in bushfire performance compared to the existing development is detailed (refer Note 4)
1. Location	✓			N/A	
2. Siting and Design of Development	✓				
3. Vehicular Access	✓				
4. Water	✓				

Note: The development proposal has been assessed:

1. Against the requirements established in Appendix 4 of the *Guidelines for Planning in Bushfire Prone Areas, WAPC 2017 v1.3 (Guidelines)*. The Guidelines are found at https://www.planning.wa.gov.au/8194.aspx; and
2. Applying the interpretation guidance provided in *Position Statement: Planning in bushfire prone areas – Demonstrating Element 1: Location and Element 2: Siting and design (WAPC Nov 2019)*.
3. Applying any endorsed variations to the Guideline's acceptable solutions and associated technical requirements that have been established by the relevant local government. If known and applicable these have been stated in Section 5.1 with the detail included as an appendix if required by the relevant local government.
4. When non-compliant with SPP 3.7 and when appropriate, by utilising additional compliance pathways that include the application of merit based assessment and comparative bushfire performance. The validity of this approach is derived from relevant decisions made by the responsible authorities (refer Appendix 2).

5.3 Assessment Detail

Element 1: Location	
Intent: To ensure that strategic planning proposals, subdivision and development applications are located in areas with the least possible risk of bushfire to facilitate the protection of people, property and infrastructure.	
Compliance: How the proposed development achieves the intent of Element 1:	By fully meeting all applicable acceptable solutions established by the bushfire protection criteria (Guidelines v1.3 WAPC 2017)

ASSESSMENT (COMPLIANCE) STATEMENTS

For each applicable acceptable solution, the following statements present the results of the assessment of the proposed development/use against the requirements established by the *Guidelines (WAPC 2017 v1.3)* and apply the interpretation guidance established by the *Position Statement: Planning in bushfire prone areas – Demonstrating Element 1: Location and Element 2: Siting and design (WAPC Nov 2019)*.

Acceptable Solution: A1.1: Development Location

Broader Landscape Context (Vegetation and Topography)

Onsite (areas within the subject site):

The proposal is for the subdivision of two existing allotments into 10 smaller, residential allotments. The subject lots currently lie within a bushfire prone area as defined by the OBRM map of Bushfire Prone Areas. It exists in a residential area (Zoned R5) (suburb of Stoneville). It is surrounded by predominantly large residential allotments and native vegetation. The removal or modification of classifiable vegetation will be required within the boundaries of the subject site.

The current onsite vegetation consists of predominantly Class A Forrest and Class G Grassland.

Post development – No bushfire prone vegetation will remain within the development site boundary. The proposed lot sizes and associated roads ensures the entire site will be built out. Vegetation onsite is within the control of the subject site's landowner/s and therefore can be removed and or maintained to mitigate the bushfire risk subject to any approval required by the Local Government.

Offsite (areas adjoining the subject site):

The current offsite areas of bushfire prone vegetation for this proposal consist of a mix of Class A - Forest, Class B – Woodland, and Class G - Grassland. All areas of classified vegetation are located within 150 m of this proposal.

Where future development is proposed on the original allotments, it will be subject to potential radiant heat from a bushfire not exceeding 29kW/ m^2 (i.e. a BAL-29 rating or less will apply) (Refer to Figures 3.2 of this plan). This can be achieved by using positioning, design, and appropriate vegetation modification (if applicable); and managing the remaining bushfire risk to an acceptable level by the existence/implementation and ongoing maintenance measure as identified in this plan. These measures include the requirements for vegetation management, vehicular access and firefighting water supply.

Element 2: Siting and Design of Development

Intent: To ensure that the siting and design of development (note: not building/construction design) minimises the level of bushfire impact.

Compliance: How the proposed development achieves the intent of Element 2:	By fully meeting all applicable acceptable solutions established by the bushfire protection criteria (Guidelines v1.3 WAPC 2017)

ASSESSMENT (COMPLIANCE) STATEMENTS

For each applicable acceptable solution, the following statements present the results of the assessment of the proposed development/use against the requirements established by the *Guidelines (WAPC 2017 v1.3)* and apply the interpretation guidance established by the *Position Statement: Planning in bushfire prone areas – Demonstrating Element 1: Location and Element 2: Siting and design (WAPC Nov 2019)*.

Acceptable Solution: A2.1: Asset Protection Zone

DEVELOPMENT SITING AND DESIGN:

The necessary outcome of bushfire planning for development siting and design is to ensure that a building can be located within the developable portion of any lot (i.e. excluding those areas that are subject to R-Code building setbacks or any other excluded zones), and be subject to potential radiant heat from a bushfire not exceeding 29 kW/m^2 (i.e. maximum BAL of BAL-29).

This will be achieved when the size of the "low fuel area immediately surrounding a building" (the asset protection zone) is large enough. This requires a certain separation distance between the building and areas of classified vegetation – which for the subject development/use is stated below as the BAL-29 APZ dimensions.

The required low fuel area within a lot and surrounding a building can be reduced in dimensions by the incorporation, through planning, of siting and design elements of non-vegetated (e.g. roads/parking/services/drainage) and/or formally managed areas of vegetation (public open space/recreation), to make up at least part of the required separation distances. This creates more robust and easier managed asset protection zones.

Future buildings on the lot(s) of the proposed subdivision can be surrounded by an APZ that will ensure the potential radiant heat impact of a bushfire does not exceed 29 kW/m^2 (BAL-29).

ASSET PROTECTION ZONE (APZ) – ATTRIBUTES TO SATISFY BUSHFIRE PLANNING REQUIREMENTS:

Width: The required APZ dimensions to ensure buildings are subject to a maximum BAL of BAL-29 (measured from any external wall or supporting post or column to the edge of the classified vegetation), has been determined in Section 3.2 of this BMP and are:

BAL-29 APZ Dimensions		
Applicable to Following Lot(s): 1-10	Building to Vegetation Area 1	Minimum 14 metres
	Building to Vegetation Area 2	Minimum 21 metres
	Building to Vegetation Area 4	Minimum 27 metres
	Building to Vegetation Area 5	Minimum 9 metres
	Building to Vegetation Area 6	Minimum 17 metres

Location: The BAL-29 APZ will exist solely within the boundaries of each lot, except in instances where the neighbouring lot(s) will be managed in a low-fuel state on an ongoing basis, in perpetuity.

Management: Where any part of the required APZ dimension is vegetated, it will be managed in accordance with the technical requirements established by the Schedule 1: 'Standards for Asset Protection Zones (Guidelines). The APZ specifications are also detailed in Appendix 1.

Element 2: Siting and Design of Development

The subject site (10 proposed residential lots) will be required to be maintained in accordance with the Shire of Mundaring Firebreak Notice. The notice specifies hazard reduction requirements. This notice may be subject to change in the future. Vegetation management described in the Shire of Mundaring Firebreak Notice and the existing bushfire management plan for the development area is required for the subject site at this time.

Vegetation offsite that is not within the control of the subject site's landowner/s cannot be removed or modified by the landowner/s.

Future Development: Where any Landscaping or Revegetation areas are scheduled to occur as a result of ongoing development within the Subdivision, consideration must be given as to not increase the bushfire risk and does not alter the indicative BAL ratings indicated in this plan.

Element 3: Vehicular Access	
Intent: To ensure that the vehicular access serving a subdivision/development is available and safe during a bushfire event.	
Compliance: How the proposed development achieves the intent of Element 3:	Will be able to achieve the intent of the element at a later planning stage by fully meeting all applicable acceptable solutions.
ASSESSMENT (COMPLIANCE) STATEMENTS For each applicable acceptable solution, the following statements present the results of the assessment of the proposed development/use against the requirements established by the *Guidelines (WAPC 2017 v1.3)*.	
Acceptable Solution: A3.1: Two Access Routes	
The subject site is located within an existing and developing rural residential area. The subject site will provide access to two different destinations and be available to emergency and private vehicles at all times and under all weather conditions, both during the course of construction of the subdivision and upon completion. On completion of the Subdivision, routes to two different destinations are available via Richardson Road, located to the south of the subject site and Ayres Road located to the east of the subject site. Stoneville Road is also accessible from Richardson Road. All roads will be sealed and will be available to all residents and the public at all times and under all weather conditions. The construction technical requirements established by the Guidelines and/or the Local Government can and will be complied with.	
Acceptable Solution: A3.2: Public Road	
The existing and future road network within the subdivision provide public and emergency vehicles a suitable trafficable transport route. The construction technical requirements established by the Guidelines and/or the local government can and will be complied with. These requirements are set out in Appendix 2.	
Acceptable Solution: A3.3: Cul-de-sacs (including a dead-end road)	
The proposed cul-de-sac is 108 m at its farthest point from the proposed intersection, which complies with the maximum 200 m distance. The construction technical requirements established by the Guidelines and/or the local government can and will be complied with. These requirements are set out in Appendix 2.	
Acceptable Solution: A3.4: Battle-axe	
Where the battle-axe is installed, the construction technical requirements established by the Guidelines and/or the local government can and will be complied with. These requirements are set out in Appendix 2.	
Acceptable Solution: A3.5: Private Driveways	
Where private driveways are longer than 50 m, the construction technical requirements established by the Guidelines and/or the local government can and will be complied with. These requirements are set out in Appendix 2.	
Acceptable Solution: A3.6: Emergency Access Way	
N/A	
Acceptable Solution: A3.7: Fire Service Access Routes	
N/A	
Acceptable Solution: A3.8: Firebreak Width	
The proposed lots will comply with the requirements of the local government annual firebreak notice issued under s33 of the Bush Fires Act 1954. Firebreaks to be installed prior to subdivision clearance.	

Element 4: Water	
Intent: To ensure water is available to the subdivision, development or land use to enable people, property and infrastructure to be defended from bushfire.	
Compliance: How the proposed development achieves the intent of Element 4:	By fully meeting all applicable acceptable solutions established by the bushfire protection criteria (Guidelines v1.3 WAPC 2017)
ASSESSMENT (COMPLIANCE) STATEMENTS For each applicable acceptable solution, the following statements present the results of the assessment of the proposed development/use against the requirements established by the *Guidelines (WAPC 2017 v1.3)*.	
Acceptable Solution: A4.1: Reticulated Areas	
The subject site is located within a reticulated water supply area for fire-fighting operations. The closest hydrants are located outside the subject lot on Richardson Road. Existing external hydrants are also located at regular intervals along Richardson Road and surrounding streets/roads. Refer to Figure 1.1 of this plan. An additional hydrant is to be installed along the proposed new road (see Figure 1.1). The construction technical requirements established by the Guidelines and/or the local government can and will be complied with.	
Acceptable Solution: A4.2: Non-Reticulated Areas	
N/A	
Acceptable Solution: A4.3: Non-Reticulated Areas – Individual Lots	
N/A	

6 RESPONSIBILITIES FOR IMPLEMENTATION AND MANAGEMENT OF THE BUSHFIRE PROTECTION MEASURES

Table 6.1: BMP Implementation responsibilities prior to the issue of titles.

Developer (Landowner) - Prior to Issue of Titles		
No.	Implementation Actions	Subdivision Clearance
Note: Planning approval may be conditioned with the requirements: 1. To place certain notifications on the certificates of title and the deposited plan, regarding the existence of this bushfire management plan and the obligations it creates; and 2. To provide certification of the implementation of the bushfire protection measures established by this bushfire management plan.		
1	Condition (as per Code F2 of Model Subdivision Schedule, WAPC April 2020): A notification, pursuant to Section 165 of the *Planning and Development Act 2005*, is to be placed on the certificate(s) of title of the proposed lot(s) with a Bushfire Attack Level (BAL) rating of 12.5 or above, advising of the existence of a hazard or other factor. Notice of this notification is to be included on the diagram or plan of survey (deposited plan). The notification is to state as follows: *"This land is within a bushfire prone area as designated by an Order made by the Fire and Emergency Services Commissioner and is/may be subject to a Bushfire Management Plan. Additional planning and building requirements may apply to development on this land."* (Western Australian Planning Commission).	☐
2	Construct the public road (cul-de-sac) to the standards stated in the BMP.	☐
3	Construct battle axe driveways and turnaround areas for Proposed Lot 6 to the standards stated in the BMP.	☐
4	Undertake fuel reduction works to achieve the indicative BAL reflected in the BAL contour map.	☐
5	Install a fire hydrant along the proposed new road to the standards stated in the BMP.	☐

Table 6.2: BMP Implementation responsibilities prior to lot sale, occupancy or building.

Landowner (Developer) - Prior to Lot Sale, Occupancy or Building	
No.	Implementation Actions
1	Prior to sale and post planning approval, the entity responsible for having the BMP prepared should ensure that anyone listed as having responsibility under the Plan has endorsed it and is provided with a copy for their information and informed that it contains their responsibilities. This includes the landowners/proponents (including future landowners where the Plan was prepared as part of a subdivision approval), local government and any other authorities or referral agencies ('Guidelines' s4.6.3).
2	Establish the Asset Protection Zone (APZ) surrounding all relevant existing buildings to the largest dimension as determined by either: • The dimensions corresponding to the determined BAL of a building. Once the building location and vegetation separation distances that exist are known and the building's BAL has been determined for building permit purposes, the required dimensions can be stated (refer to Section 3.2 for explanation of the 'planning' versus 'building' requirements and 'indicative' versus 'determined' BAL); or • The dimensions corresponding to the local government's Firebreak Notice. Maintain the APZ to the standards established by the Guidelines (refer to Appendix 1) or as varied by the relevant local government through their Firebreak Notice (refer to the following responsibility).
3	Prior to sale of the subject lots, each individual lot is to be compliant with the Shire of Mundaring 'Firebreak Notice' issued under s33 of the Bushfires Act 1954. This may include specifications for asset protection zones that differ from the Guideline's APZ Standards, with the intent to better satisfy local conditions. When these are more stringent than those created by the Guidelines, or less stringent and endorsed by the WAPC and DFES, they must be complied with. Refer to Appendix 1.
4	Prior to any building work, inform the builder of the existence of this Bushfire Management Plan and the responsibilities it contains, regarding the required construction standards. This will be: • The standard corresponding to the determined BAL, as per the bushfire provisions of the Building Code of Australia (BCA); and/or • A higher standard because the BMP establishes that the construction standard is to correspond to a higher BAL as an additional bushfire protection measure.

Table 6.3: Ongoing management responsibilities for the Landowner/Occupier.

Landowner/Occupier - Ongoing	
No.	Ongoing Management Actions
1	Maintain the Asset Protection Zone (APZ) surrounding all relevant buildings to the largest dimension as determined by either: • The dimensions corresponding to the determined BAL of a building. Once the building location and vegetation separation distances that exist are known and the building's BAL has been determined for building permit purposes, the required dimensions can be stated (refer to Section 3.2 for explanation of the 'planning' versus 'building' requirements and 'indicative' versus 'determined' BAL); or • The dimensions corresponding to the local government's Firebreak Notice. Maintain the APZ to the standards established by the Guidelines (refer to Appendix 1) or as varied by the relevant local government through their Firebreak Notice (refer to the following responsibility).
2	Comply with the Shire of Mundaring 'Firebreak Notice' issued under s33 of the Bush Fires Act 1954. This may include specifications for asset protection zones that differ from the Guideline's APZ Standards, with the intent to better satisfy local conditions. When these are more stringent than those created by the Guidelines, or less stringent and endorsed by the WAPC and DFES, they must be complied with. Refer to Appendix 1.
3	Construct and maintain vehicular access routes (driveways) within the lot to the required surface condition and clearances as stated in the BMP.
4	Ensure that any builders (of future structures on the lot) are aware of the existence of this Bushfire Management Plan and the responsibilities it contains regarding the application of construction standards corresponding to a determined BAL.
5	Ensure all future buildings the landowner has responsibility for, are designed and constructed in full compliance with: 1. the requirements of the WA Building Act 2011 and the bushfire provisions of the Building Code of Australia (BCA); and 2. with any identified additional requirements established by this BMP or the relevant local government.

Table 6.4: Ongoing management responsibilities for the Local Government.

Local Government - Ongoing	
No.	Ongoing Management Actions
1	Monitor landowner compliance with the Bushfire Management Plan and the annual Firebreak and Fuel Load notice.

A1.1 Requirements Established by the Guidelines – Standards for Asset Protection Zones

(Source: Guidelines for Planning in Bushfire Prone Areas - WAPC 2017 v1.3 Appendix 4, Element 2, Schedule 1 and Explanatory Note E2.1)

DEFINING THE ASSET PROTECTION ZONE (APZ)

Description: An APZ is an area surrounding a building that is managed to reduce the bushfire hazard to an acceptable level (by reducing fuel loads). The width of the required APZ varies with slope and vegetation and varies corresponding to the BAL rating determined for a building (lower BAL = greater dimensioned APZ).

For planning applications, the minimum sized acceptable APZ is that which is of sufficient size to ensure the potential radiant heat impact of a fire does not exceed 29kW/m² (BAL-29). It will be site specific.

For subdivision planning, design elements and excluded/low threat vegetation adjacent to the lot(s) can be utilised to achieve the required vegetation separation distances and therefore reduce the required dimensions of the APZ within the lot(s).

Defendable Space: The APZ includes a defendable space which is an area adjoining the asset within which firefighting operations can be undertaken to defend the structure. Vegetation within the defendable space should be kept at an absolute minimum and the area should be free from combustible items and obstructions. The width of the defendable space is dependent on the space, which is available on the property, but as a minimum should be 3 metres.

Establishment: The APZ should be contained solely within the boundaries of the lot on which the building is situated, except in instances where the neighbouring lot or lots will be managed in a low-fuel state on an ongoing basis, in perpetuity.

The APZ may include public roads, waterways, footpaths, buildings, rocky outcrops, golf courses, maintained parkland as well as cultivated gardens in an urban context, but does not include grassland or vegetation on a neighbouring rural lot, farmland, wetland reserves and unmanaged public reserves.

[Note: Regardless of whether an Asset Protection Zone exists in accordance with the acceptable solutions and is appropriately maintained, fire fighters are not obliged to protect an asset if they think the separation distance between the dwelling and vegetation that can be involved in a bushfire, is unsafe.]

Schedule 1: Standards for APZ

Fences: within the APZ are constructed from non-combustible materials (e.g. iron, brick, limestone, metal post and wire). It is recommended that solid or slatted non-combustible perimeter fences are used.

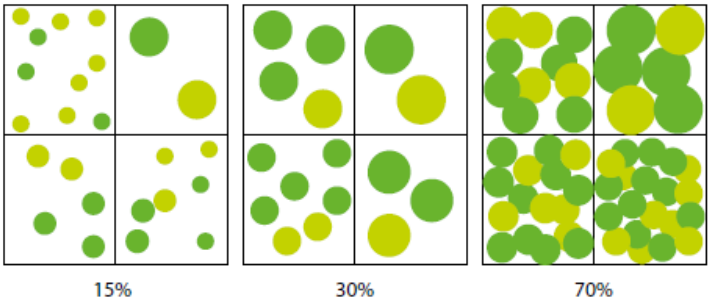
Objects: within 10 metres of a building, combustible objects must not be located close to the vulnerable parts of the building i.e. windows and doors.

Fine Fuel Load: combustible dead vegetation matter less than 6 mm in thickness reduced to and maintained at an average of two tonnes per hectare (example below).

Example: Fine fuel load of 2 t/ha
(Image source: Shire of Augusta Margaret River's Firebreak and Fuel Reduction Hazard Notice)

Trees (> 5 metres in height): trunks at maturity should be a minimum distance of 6 metres from all elevations of the building, branches at maturity should not touch or overhang the building, lower branches should be removed to a height of 2 metres above the ground and or surface vegetation, canopy cover should be less than 15% with tree canopies at maturity well spread to at least 5 metres apart as to not form a continuous canopy. Diagram below represents tree canopy cover at maturity.

Tree canopy cover – ranging from 15 to 70 per cent at maturity



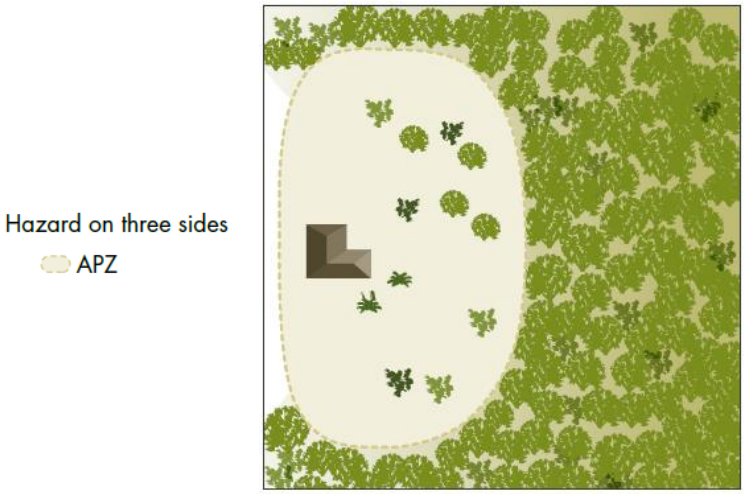
(Source: Guidelines for Planning in Bushfire Prone Areas 2017, Appendix 4)

Shrubs (0.5 metres to 5 metres in height): should not be located under trees or within 3 metres of buildings, should not be planted in clumps greater than 5m2 in area, clumps of shrubs should be separated from each other and any exposed window or door by at least 10 metres. Shrubs greater than 5 metres in height are to be treated as trees.

Ground covers (<0.5 metres in height): can be planted under trees but must be properly maintained to remove dead plant material and any parts within 2 metres of a structure, but 3 metres from windows or doors if greater than 100 mm in height. Ground covers greater than 0.5 metres in height are to be treated as shrubs.

Grass: should be managed to maintain a height of 100 mm or less.

The following example diagrams illustrate how the required dimensions of the APZ will be determined by the type and location of the vegetation.



A1.2 Requirements Established by the Local Government – the Firebreak Notice

The relevant local government's current Firebreak Notice is available on their website, at their offices and is distributed as ratepayer's information. It must be complied with.

These requirements are established by the relevant local government's Firebreak Notice created under s33 of the Bushfires Act 1954 and issued annually (potentially with revisions). The Firebreak Notice may include additional components directed at managing fuel loads, accessibility and general property management with respect to limiting potential bushfire impact.

If Asset Protection Zone (APZ) specifications are defined in the Firebreak Notice, these may differ from the Standards established by the Guideline's, with the intent to better satisfy local conditions. When these are more stringent than those created by the Guidelines, or less stringent and endorsed by the WAPC and DFES, they must be complied with.

The APZ dimensions to be physically established and maintained, will be based on which of the following establishes the larger APZ dimension:

- The dimensions corresponding to the determined BAL of a building (refer to Section 3.2 explanation of the 'planning' versus 'building' requirements and 'indicative' versus 'determined' BAL(s)); or
- The APZ dimensions established by the local government's Firebreak Notice.

A1.3 Requirements Recommended by DFES – Property Protection Checklists

Further guidance regarding ongoing/lasting property protection (from potential bushfire impact) is presented in the publication 'DFES – Fire Chat – Your Bushfire Protection Toolkit'. It is available from the Department of Fire and Emergency Services (DFES) website.

A1.4 Requirements Established by AS 3959:2018 – 'Minimal Fuel Condition'

This information is provided for reference purposes. This knowledge will assist the landowner to comply with Management Requirement No. 3 set out in the Guidance Panel at the start of this Appendix. It identifies what is required for an area of land to be excluded from classification as a potential bushfire threat.

"Australian Standard - AS 3959:2018 Section 2.2.3.2: Exclusions - Low threat vegetation and non-vegetated areas:

The Bushfire Attack Level shall be classified BAL-LOW where the vegetation is one or a combination of the following:

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

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

c) Multiple area of vegetation less than 0.25ha in area and not within 20m of the site or each other or other areas of vegetation being classified vegetation.

d) Strips of vegetation less than 20m in width (measured perpendicular to the elevation exposed to the strip of vegetation) regardless of length and not within 20m 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,*** *(means insufficient fuel available to significantly increase the severity of a bushfire attack – for example, recognisable as short cropped grass to a nominal height of 100mm), 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 (single row of trees)."*

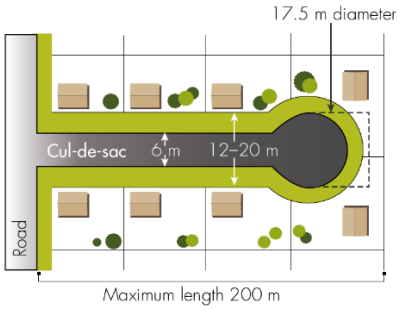
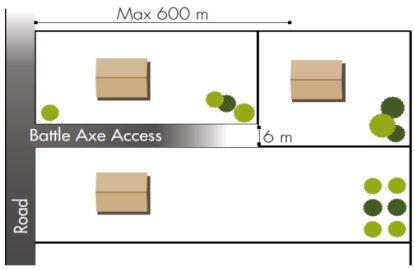
APPENDIX 2: TECHNICAL REQUIREMENTS FOR VEHICULAR ACCESS

Each local government may have their own standard technical requirements for emergency vehicular access, and they may vary from those stated in the Guidelines.

When required, these are stated in Section 5.1 of this bushfire management plan.

Requirements Established by the Guidelines – The Acceptable Solutions

(Source: Guidelines for Planning in Bushfire Prone Areas WAPC 2017 v1.3, Appendix 4)

VEHICULAR ACCESS TECHNICAL REQUIREMENTS - PART 1
Acceptable Solution 3.3: Cul-de-sacs (including a dead-end road) Their use in bushfire prone areas should be avoided. Where no alternative exists then the following requirements are to be achieved: • Maximum length is 200m. If public emergency access is provided between cul-de-sac heads (as a right of way or public access easement in gross), the maximum length can be increased to 600m provided no more than 8 lots are serviced and the emergency access way is less than 600m in length; • Turnaround area requirements, including a minimum 17.5m diameter head to allow type 3.4 fire appliances to turn around safely; • The cul-de-sac connects to a public road that allows for travel in two directions; and Meet the additional design requirements set out in Part 2 of this appendix.

Acceptable Solution 3.4: Battle-axe Their use in bushfire prone areas should be avoided. Where no alternative exists then the following requirements are to be achieved: • Maximum length 600m and minimum width 6m; and Comply with minimum standards for private driveways.


VEHICULAR ACCESS TECHNICAL REQUIREMENTS - PART 1

Acceptable Solution 3.5: Private Driveways

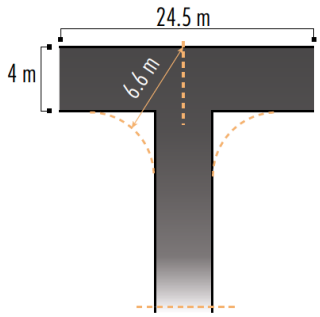
The following requirements are to be achieved:

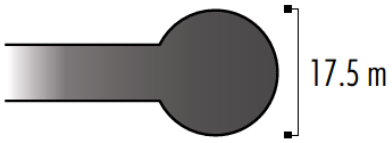
- The design requirements set out in Part 2 of this appendix; and

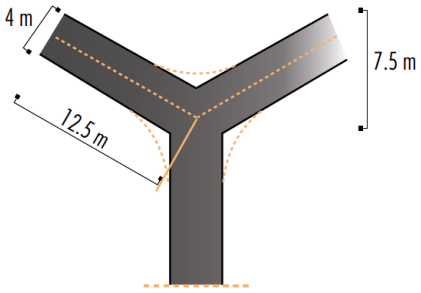
Where the house site is more than 50 metres from a public road:

- Passing bays every 200 metres with a minimum length of 20 metres and a minimum width of two metres (ie combined width of the passing bay and constructed private driveway to be a minimum six metres);
- Turn-around areas every 500 metres and within 50 metres of a house, designed to accommodate type 3.4 fire appliances to turn around safely (ie kerb to kerb 17.5 metres);
- Any bridges or culverts are able to support a minimum weight capacity of 15 tonnes; and

All weather surface (i.e. compacted gravel, limestone or sealed).







Acceptable Solution 3.8: Firebreak Width

Lots greater than 0.5 hectares must have an internal perimeter firebreak of a minimum width of three meters or to the level as prescribed in the local firebreak notice issued by the local government.

VEHICULAR ACCESS TECHNICAL REQUIREMENTS - PART 2

Technical Component	Vehicular Access Types				
	Public Roads	Cul-de-sacs	Private Driveways	Emergency Access Ways	Fire Service Access Routes
Minimum trafficable surface (m)	6*	6	4	6*	6*
Horizontal clearance (m)	6	6	6	6	6
Vertical clearance (m)	4.5	4.5	4.5	4.5	4.5
Maximum grade <50 metres	1 in 10	1 in 10	1 in 10	1 in 10	1 in 10
Minimum weight capacity (t)	15	15	15	15	15
Maximum cross-fall	1 in 33	1 in 33	1 in 33	1 in 33	1 in 33
Curves minimum inner radius (m)	8.5	8.5	8.5	8.5	8.5

* A six metre trafficable surface does not necessarily mean paving width. It could, for example, include four metres of paving and one metre of constructed road shoulders. In special circumstances, where 8 lots or less are being serviced, a public road with a minimum trafficable surface of four metres for a maximum distance of ninety metres may be provided subject to the approval of both the local government and DFES.

Reticulated Areas

[Source: Guidelines for Planning in Bushfire Prone Areas WAPC 2017 v1.3, Appendix 4, Element 4]

The Water Corporation's 'No 63 Water Reticulation Standard' is deemed to be the baseline criteria for developments and should be applied unless local water supply authority's conditions apply.

The requirement is to supply a reticulated water supply and fire hydrants, in accordance with the technical requirements of the relevant water supply authority and DFES.

Key specifications in the most recent version/revision of the design standard include:

- ***Residential Standard*** – hydrants are to be located so that the maximum distance between the hydrants shall be no more than 200 metres.
- ***Commercial Standard*** – hydrants are to be located with a maximum of 100 metre spacing in Industrial and Commercial areas.
- ***Rural Residential Standard*** – where minimum site areas per dwelling is 10,000 m^2 (1ha), hydrants are to be located with a maximum 400m spacing. If the area is further subdivided to land parcels less than 1ha, then the residential standard (200m) is to be applied.

Figure A4.1: Hydrant Location and Identification Specifications