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# Bushfire Management Plan (Hazard Level Assessment)

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West Mundijong Industrial Precinct

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Shire of Serpentine - Jarrahdale

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Project Number: 168900

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Assessment Date: 11 November 2016

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Report Date: 23 November 2016

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# Plan Details


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Plan Version	Submitted to	Submitted Date
v1.0	Proponent	30-Nov-16
Plan Version	Amendment Record	Submitted Date
-		

## Compliance Statement

This Bushfire Management Plan (the Plan) meets the requirements of both the *State Planning Policy No. 3.7: Planning in Bushfire Prone Areas (SPP 3.7)* and the supporting *Guidelines for Planning in Bushfire Prone Areas (WAPC 2015; the 'Guidelines')*.

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## **Disclaimer**

*The measures contained in this Bushfire Management Plan are considered to be minimum standards and they do not guarantee that a building will not be damaged in a bushfire. This is substantially due to the unpredictable nature and behaviour of fire and extreme weather conditions. Additionally, the achievement of and level of implementation of bushfire management measures will depend, among other things, on the actions of the landowners or occupiers over which Bushfire Prone Planning has no control.*

*All surveys, forecasts, projections and recommendations made in this report associated with the project are made in good faith on the basis of 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.*

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# 1 Executive Summary

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This Bushfire Management Plan (the Plan) has been prepared to support a proposed Scheme Amendment for the West Mundijong Industrial Precinct as part of the Town Planning Scheme No. 2 Amendment 187 within the Shire of Serpentine - Jarrahdale.

The scheme amendment subject site of approximately 474ha 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.

This bushfire hazard level assessment demonstrates that compliance against the four elements of the Bushfire Protection Criteria can be achieved in subsequent planning stages. As the future land use will comprise of industrial uses such as fuel stations and other high risk land uses there are areas where it is proposed to exclude or limit the development in areas in or adjacent to extreme or moderate bushfire hazard.

In future planning stages, all proposed developments or subdivisions will be able to comply with the bushfire protection criteria with the design and construction of vehicle access, water supply and building location appropriately to reduce the effects of the bushfire risk.

Future buildings within 100 metres of classified vegetation will be constructed to standards which correspond to the determined BALs, as required by *AS 3959-2009 Construction of buildings in bushfire prone areas*.

If there are any future proposed 'high-risk' or 'vulnerable' land uses within the scheme amendment area and the assessed BAL is greater than BAL-12.5 an Emergency evacuation and/or emergency risk management plan will be required to specifically address the risk of a bushfire event impacting on the development.

## 2 Application of SPP 3.7

The *State Planning Policy No. 3.7: Planning in Bushfire Prone Areas* (SPP 3.7) provides the foundation for land use planning to address bushfire risk in Western Australia.

This Proposal must consider SPP 3.7 and, if required, comply with its policy measures. The determination of this requirement is presented below.

### Application of SPP 3.7 Policy Measures – Primary Triggers

The subject Proposal is a higher order strategic planning document, a strategic planning proposal or a subdivision or development application: ✓

The project site is in a designated bushfire prone area on the WA Map of Bushfire Prone Areas: ✓

The project site is not located in a designated bushfire prone area on the WA Map of Bushfire Prone Areas but the existing vegetation type and condition dictate that it should be:

The project site is in an area not yet designated as bushfire prone but is proposed to be developed in a way that introduces a bushfire hazard (*Guidelines for Planning in Bushfire Prone Areas WAPC 2015 s3.2.2*):

### Application of SPP 3.7 Policy Measures – Secondary Trigger/s

The Proposal is a strategic planning proposal, subdivision or development application relating to land that has or will have a Bushfire Hazard Level above low and/or where a Bushfire Attack Level rating above BAL-LOW applies (SPP 3.7 s6.2): ✓

The subject Proposal is a development application for the construction or/and use of a single house or ancillary dwelling on a lot or lots greater than 1100m<sup>2</sup> and subject to BAL-40 or BAL-FZ (LPS Amendment Regulations 2015):

The subject Proposal is a development application for the construction or/and use of a habitable building (other than a single house or ancillary dwelling), or a specified building on any lot size and subject to a BAL rating above BAL-LOW (LPS Amendment Regulations 2015):

### 3 Commissioning and the Land Use Proposal

Bushfire Prone Planning (BPP Group Pty Ltd) has been commissioned to carry out the assessments and prepare the required bushfire planning documentation to accompany the proponent’s planning submission associated with their proposed land use project.

#### Commissioning Record

Landowner / Proponent: Shire of Serpentine - Jarrahdale

BPP Commissioned by: Robert Casella- Shire of Serpentine - Jarrahdale

Purpose: To support a proposed local structure plan

#### Project Location

Subject Site and Address: Area bordered by Kargotich Road, Bishop Road, Mundijong Road and future Tonkin Highway extension

Local Government: Shire of Serpentine Jarrahdale

Zoning and R-Code: Rural, Farmlet

#### Project Description

Description: Land use rezoning of area from Rural and Farmlet to Urban Development including General Industry and Light Industry

Building Class: -







Lot Areas: Overall area 474 ha



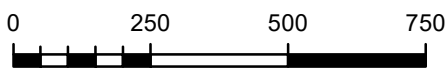
Figure 3.1  
Proposed Development

West Mundijong Industrial Precinct  
Jarrahdale

**LEGEND**

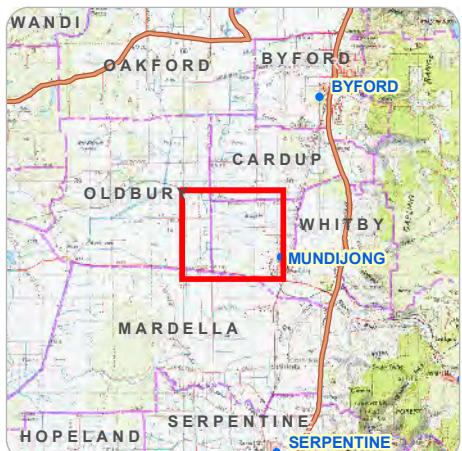

-  Subject Lots
-  Other Lots
- Green Corridors
-  Retained Vegetation
-  Wetland
-  Wetland Buffer
-  Proposed Roads

SCALE (A3)

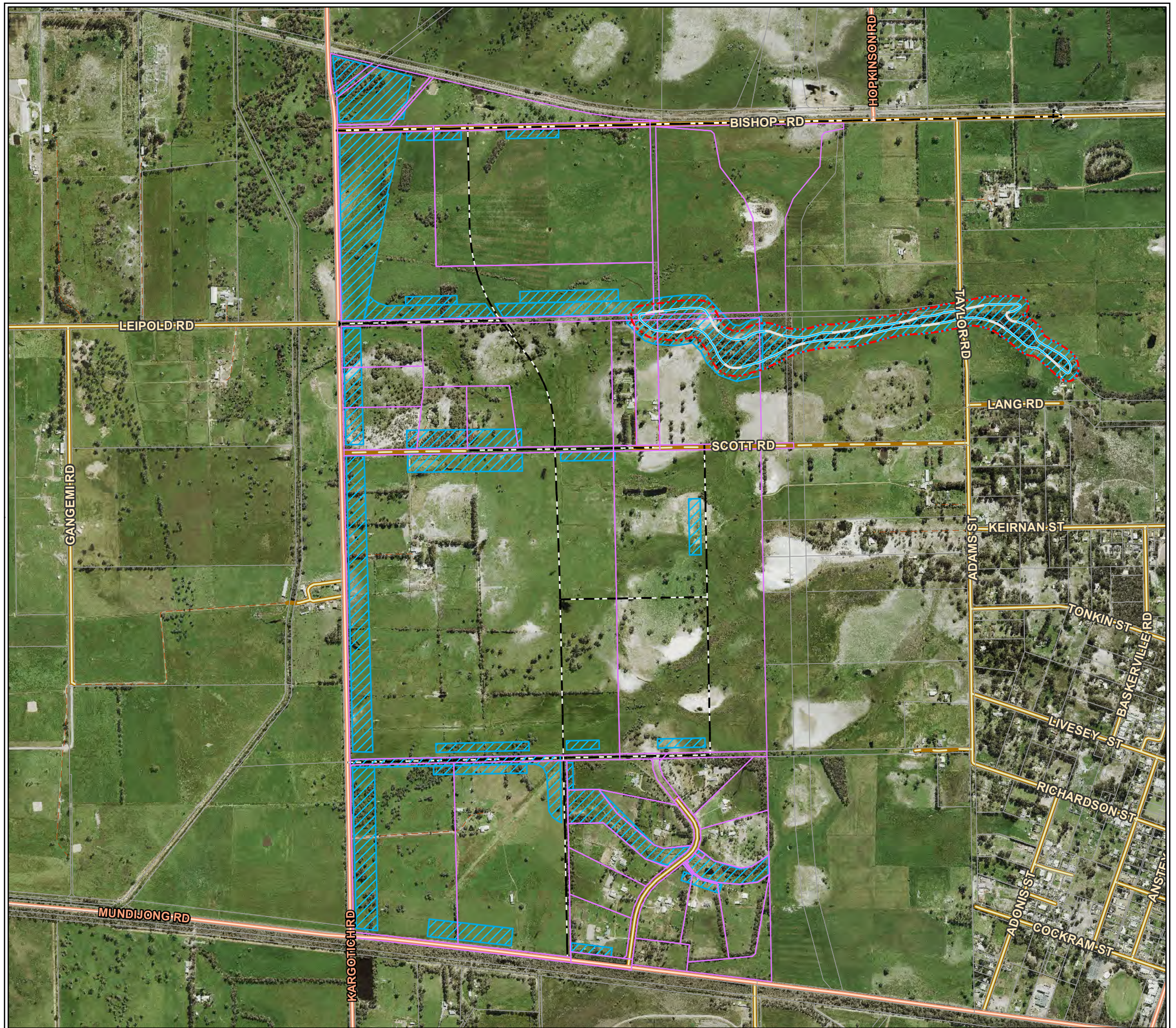


0 250 500 750  
Metres

**LOCALITY**

Aerial Image: Landgate Aug 2016



## 4 The Planning Submission and the Documents Required

Policy measures in *SPP 3.7* (and further instruction in the associated document *Guidelines for Planning in Bushfire Prone Areas WAPC 2015*) set out the bushfire planning information (including bushfire risk assessments) that are to accompany a planning submission. It is dependent on the type of proposal and stage of the development process. In most circumstances this information is to be presented in the form of a Bushfire Management Plan (BMP).

### The Planning Submission – Stage and Specific Land Use or Development

Planning Stage:	Strategic - local planning scheme or amendment
For Submission to:	WA Planning Commission (WAPC)
Project Type:	Change of land use
'Vulnerable' Land Use:	Yes
'High Risk' Land Use:	Yes
'Minor' Development:	No
'Unavoidable' Development:	No

This Bushfire Management Plan will include the information indicated by the check mark. If an item is checked it is required by either: *SPP 3.7* or by a local government variation. It may also have been prepared at an earlier planning stage and therefore re-included or included by the assessor as it improves the information presented in this Bushfire Management Plan.

Bushfire Hazard Level Assessment	Bushfire Attack Level Contour Map	Bushfire Attack Level Assessment	Identify any issues arising from the BAL contour map or BAL assessment	Identify and specifically address the list of issues related to strategic level planning and defined in the <i>Guidelines</i> s5.2	Demonstrate compliance with the Bushfire Protection Criteria can be achieved in subsequent planning stages	Demonstrate compliance with the Bushfire Protection Criteria
✓				✓	✓	

For vulnerable and high risk land use and development in areas with an extreme bushfire hazard level and/or areas where BAL-40 or BAL-FZ applies, the following additional bushfire planning information will accompany and/or be included in this Bushfire Management Plan.

Vulnerable Land Use		High Risk Land Use	Minor Development	Unavoidable Development
Provision for Emergency Evacuation	Emergency Evacuation Plan for Proposed Occupants	Risk Management Plan for Flammable On-site Hazards	Statements Against SPP 3.7 s6.7.1 items (a) to (d)	Statements Against SPP 3.7 s6.7.2 items (b) and (d)
✓		✓		

Note that for vulnerable and high risk land uses involving Class 4 to Class 9 buildings, the planning process focuses on location, siting, vehicular access and firefighting water supply and not building construction requirements - as the Building Code of Australia only applies to Classes 1, 2, 3 and associated Class 10a buildings or decks. However, the construction requirements as set out in AS 3959 – 2009 can be utilised voluntarily to enhance a buildings survivability if it is subject to a bushfire.

## 5 Assessment of Bushfire Risk

### 5.1 Vegetation Identification and Classification

#### 5.1.1 Existing Vegetation

All vegetation within 100 metres of the subject site has been identified and classified or excluded and presented in Table 5.1.1. This has been done with accordance with *AS 3959-2009* and reference to the *Visual Guide for Bushfire Risk Assessment in WA* (WAPC February 2016).

The vegetation has been assessed as it will be in its mature state and where deemed appropriate, in its unmanaged state. The areas of classified vegetation that will determine bushfire risk are defined on the topography and vegetation map Figure 5.1. Representative photos of each vegetation area is presented after the table.

**Table 5.1.1:** Vegetation types identified, the applied classification and effective slope

All Vegetation Within 100 metres of Subject Site			
Vegetation Area	Identified Types (AS3959) or Description if 'Excluded'	Applied Classification	Effective Slope Under Classified Vegetation (degrees)
1	Offsite Open Woodland B-06	Class B Woodland	0-5
2	Offsite Woodland B-05	Class B Woodland	0-5
3	Onsite Open Woodland B-06	Class B Woodland	0-5
4	Onsite Grassland	Class G Grassland	0-5
5	Offsite Grassland	Class G Grassland	0-5

Note: When more than one vegetation type is present each type is classified separately with the worst case scenario being applied. The predominant vegetation is not necessarily the worst case scenario.

**Vegetation Area 1**

**Classification Applied:** Class B Woodland

**Assessment Comment:** offsite open woodland, eucalypt, sheoak, grass understorey



**Photo ID: 1a**



**Photo ID: 1b**

**Vegetation Area 2**

**Classification Applied:** Class B Woodland

**Assessment Comment:** offsite woodland, shrub & grass understorey



**Photo ID: 2a**



**Photo ID: 2b**

**Vegetation Area 3**

**Classification Applied:** Class B Woodland

**Assessment Comment:** onsite open woodland, eucalypt and sheoak groves, grass understorey



**Photo ID: 3a**



**Photo ID: 3b**

**Vegetation Area 3**

**Classification Applied:** Class B Woodland

**Assessment Comment:** onsite open woodland, partly managed farmlot lots, various eucalypt species and grass understorey



**Photo ID: 3c**

**Vegetation Area 4**

**Classification Applied:** Class G Grassland

**Assessment Comment:** onsite grassland, crops, unmanaged grass, grazed pasture



**Photo ID: 4a**



**Photo ID: 4b**

**Vegetation Area 4**

**Classification Applied:** Class G Grassland

**Assessment Comment:**



**Photo ID: 4c**



**Photo ID: 4d**

## Vegetation Area 5

**Classification Applied:** Class G Grassland

**Assessment Comment:** offsite grassland, cropping, grazing pasture



Photo ID: 5a



Photo ID: 5b

### 5.1.2 Vegetation Excluded from Classification

Certain areas and vegetation within 100m of the subject site may be assessed as 'low threat or non-vegetated'. These are to be excluded from classification and are therefore rated BAL-LOW. They must be managed to maintain the specifications set out in AS3959-2009 s2.2.3.2 in perpetuity (refer to Appendix 3 'Vegetation Classification Exclusions').

Managed gardens surrounding private property have been excluded from classification as presenting a low bushfire threat as per AS 3959-2009s2.2.3.2 (f).

### 5.1.3 Expected On-site Vegetation Changes Due to Proposed Subdivision or Development

In assessing vegetation for bushfire threat, consideration must be given to possible future vegetation changes likely on the site that is being assessed, particularly those that would have the potential to increase the bushfire risk.

This may be due to growth of existing vegetation or growth of planned landscape plantings, including future roadside or water course re-vegetation. There must be careful consideration of the creation of vegetation corridors where they join offsite vegetation and may provide a route for fire to enter an area of future development.

For this Bushfire Management Plan, the future vegetation within the subject lots has been considered. Existing onsite vegetation is sown pasture and is classified Grassland. It is expected that in the future this will be maintained as low threat vegetation. It will meet AS 3959-2009 s2.2.3.2 requirements (refer Appendix 3 'Vegetation Classification Exclusions').

The proposal currently retains some areas of native vegetation adjacent to Manjedal Creek and several ecological corridors within the subject site. These ecological corridors may be revegetated or maintained as the existing classified vegetation. See Figure 3.1 for areas of retained vegetation.



Figure 5.1  
Topography &  
Classified Vegetation

West Mundijong Industrial Precinct  
Jarrahdale

**LEGEND**

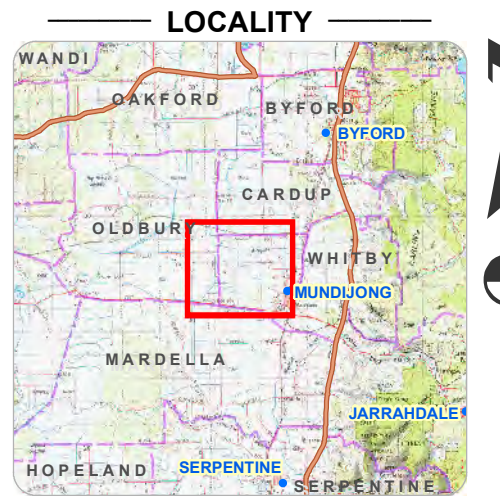
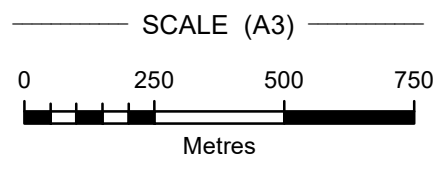
- Subject Lots
- Other Lots
- Photo Locations
- Area of Interest - 100m extent
- Existing Hydrant

Classified Vegetation

- Class (B) Woodland
- Class (G) Grassland

Green Corridors

- Retained Vegetation
- Wetland
- Wetland Buffer
- Proposed Roads



Aerial Image: Landgate Aug 2016

Coordinate System: GDA 1994 MGA Zone 50  
Projection: Universal Transverse Mercator  
Map created on: 28-Nov-16  
Map compiled by: Bruce Greentree



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.

## 5.2 Bushfire Hazard Level (BHL) Assessment

“A Bushfire Hazard Level assessment provides a ‘broad-brush’ means of determining the potential intensity of a bushfire for a particular area. The Bushfire Hazard Level assessment assists in informing the suitability of land contained within strategic planning proposals for future subdivision and development.

The Bushfire Hazard Level assessment categorises land within a designated bushfire prone area as having a low, moderate or extreme bushfire hazard level. Different hazard levels may be assigned to different parts of individual lots.

Bushfire Hazard Level assessments allow for early strategic consideration of bushfire risk which can then be used to inform the more detailed stages that follow, ensuring all issues are considered, identified and properly addressed at the earliest possible time (‘Guidelines’ s4.1)”.

For a summary of the assessment methodology refer to Appendix 2. BHL assessments are required to accompany all strategic planning proposals unless the future lot layout of the Proposal is known in which case a BAL Contour Map is more appropriate (SPP 3.7 s6.3).

### Assessment Results

The results of the Bushfire Hazard Level assessment detailing the vegetation type, class and the hazard levels assigned, are presented in Table 5.2.1 and visually in Figure 5.2 as a bushfire hazard level map pre development and then Figure 5.2.1 as a post development bushfire hazard level map. If additional assessment inclusions are required in this Plan, they are identified in Table: 5.2.2.

**Table 5.2.1:** BHL assessment

Bushfire Hazard Level Assessment	
Data Used (methodology as per the ‘Guidelines’ Appendix 2):	site inspection + aerial map data
Assessed Area	Bushfire Hazard Level
Land inside the external boundary of the subject site:	<b>Moderate + Extreme</b>
Land within 100 metres of external boundary of the subject site:	<b>Moderate + Extreme</b>

The Bushfire Hazard Level mapping demonstrates that the Bushfire Hazard Level to which future and existing buildings will be exposed, will be reduced after development.

**Table 5.2.2:** Required additional assessment.

<b>Required Additional Assessment</b>	
If any of the assessed area is determined to have an Extreme BHL this will trigger further considerations. Can the extreme hazard level be initially reduced to low or moderate and then maintained for the life of the development?	<b>No</b>
A 'Yes' response requires that Section 7 of this Plan 'Bushfire Risk Management Measures' will outline how this will be achieved. A 'No' response requires that the indicative Bushfire Attack Levels for the subject site will need to be BAL-29 or lower in order to be considered suitable for development – unless the development meets the definition of 'unavoidable' development.	
Are the indicative Bushfire Attack Levels for the subject site BAL-29 or lower?	<b>Yes</b>
Is this proposal for 'minor' or 'unavoidable' development?	<b>No</b>

### 5.2.1 Identification of Specific Issues Arising from BHL Assessment

As this proposal is for a scheme amendment there are no specific proposed plans with respect to new development or subdivision the future bushfire hazard levels are proposed to be reduced as any future developments will manage the unmanaged grassland and therefore reduce the overall bushfire risk to the area.











The proposed public open space as part of Manjedal Creek and the ecological corridors will be retained and maintained as native vegetation will require buffers to the areas limiting the developments. These areas will be highlighted in the BAL Contour map that will indicate a post development bushfire risk from surrounding and internal retained vegetation.

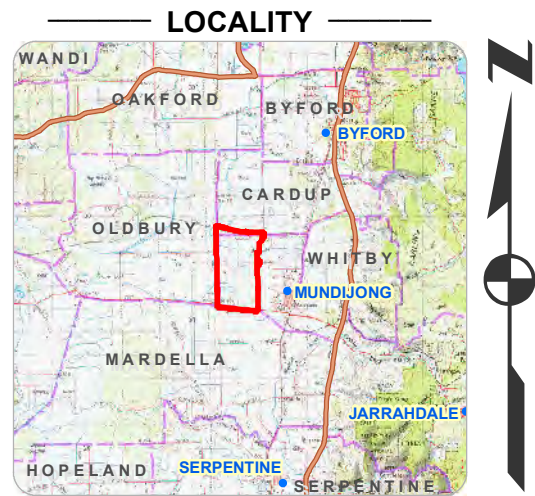
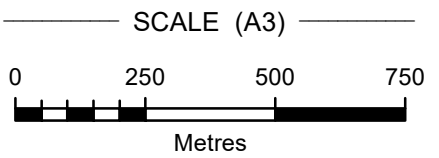
The post development bushfire hazard level Figure 5.2.1 shows the hazard level with the assumption that the internal areas with the development will be maintained as low bushfire hazard level with the moderate and extreme hazards associated with the retained native vegetation and external vegetation.

Figure 5.2  
**Bushfire Hazard Level**  
*Pre Development*


West Mundijong Industrial Precinct  
 Jarrahdale

**LEGEND**

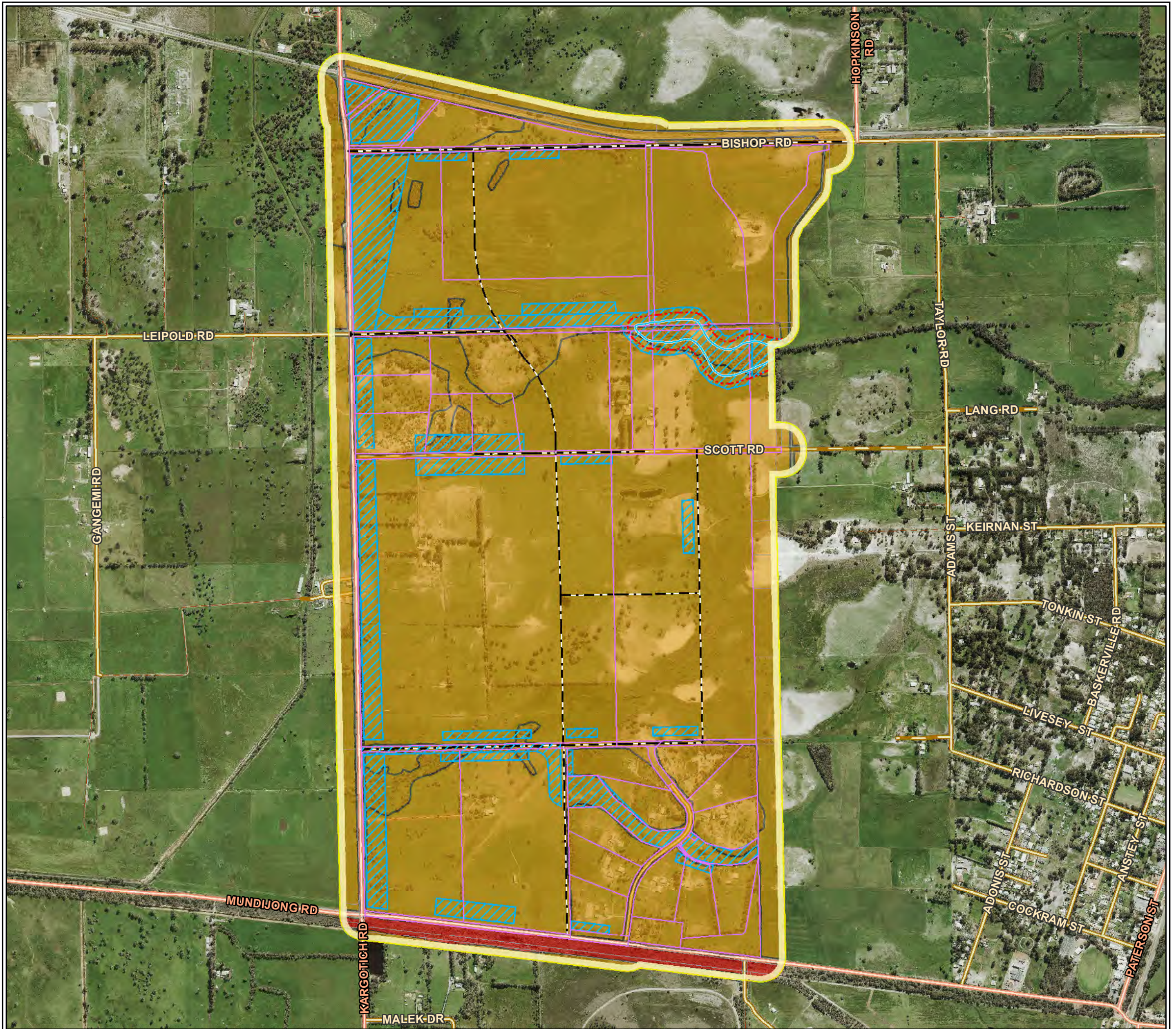
-  Subject Lots
-  Other Lots
-  Area of Interest - 100m extent
- Green Corridors**
-  Retained Vegetation
-  Wetland
-  Wetland Buffer
-  Proposed Roads
- Bushfire Hazard Mapping**
-  Extreme Bushfire Hazard
-  Moderate Bushfire Hazard
-  Low Bushfire Hazard



Aerial Image: Landgate Aug 2016



Coordinate System: GDA 1994 MGA Zone 50  
 Projection: Universal Transverse Mercator  
 Map created on: 28-Nov-16  
 Map compiled by: Bruce Greentree














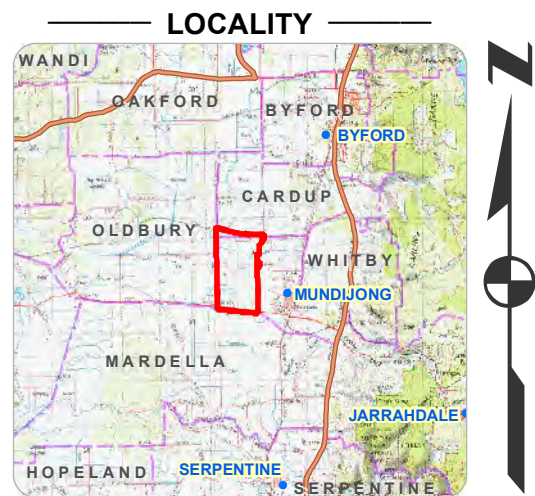
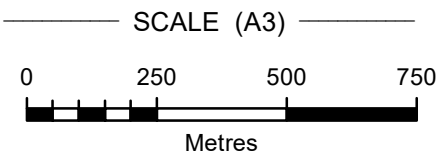
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Figure 5.2.1  
**Bushfire Hazard Level**  
 Post Development

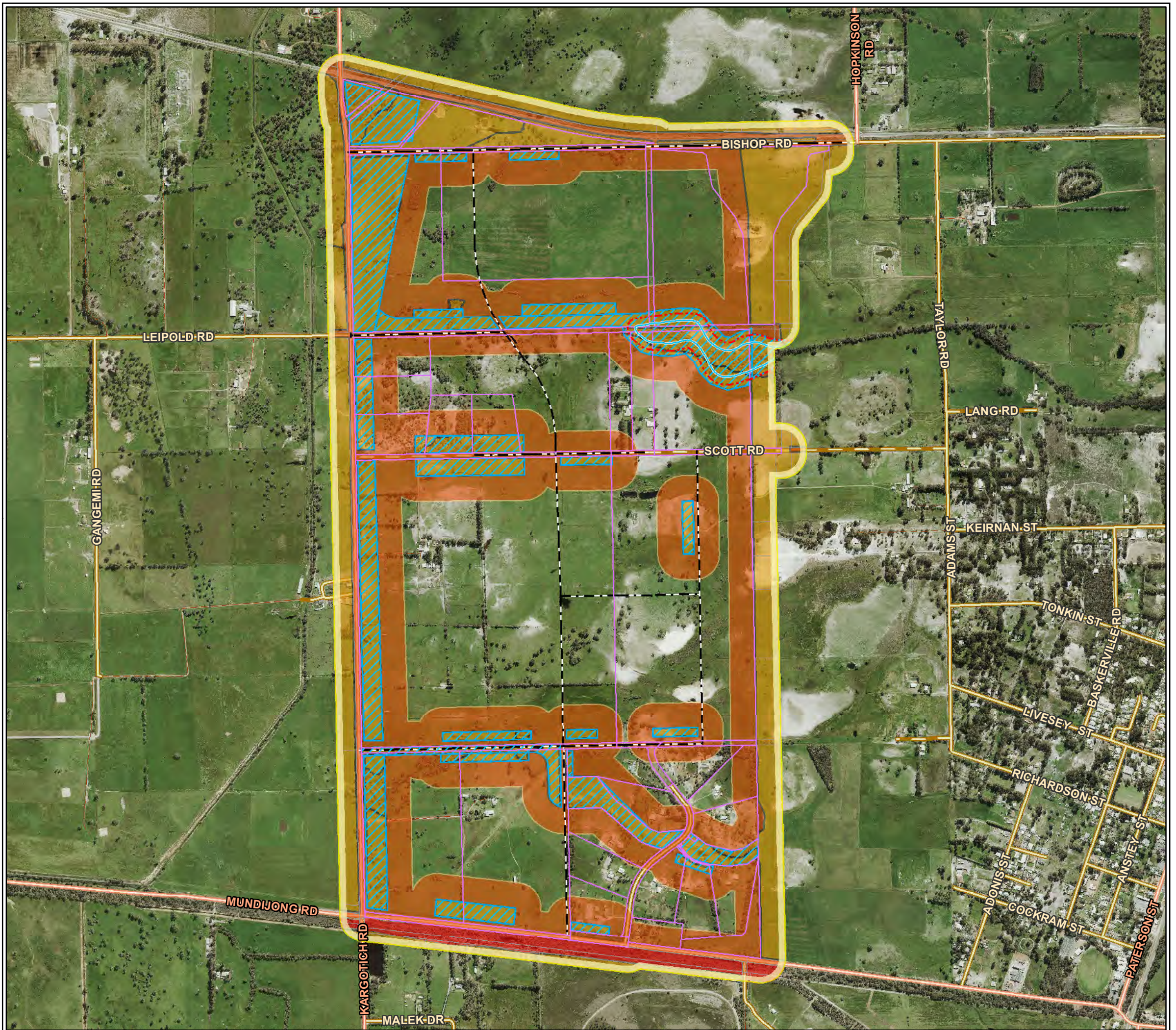
West Mundijong Industrial Precinct  
 Jarrahdale


**LEGEND**

-  Subject Lots
-  Other Lots
-  Area of Interest - 100m extent
- Green Corridors**
-  Retained Vegetation
-  Wetland
-  Wetland Buffer
-  Proposed Roads
- Bushfire Hazard Mapping**
-  Extreme Bushfire Hazard
-  Moderate Bushfire Hazard
-  Moderate 100m Buffer
-  Low Bushfire Hazard



Aerial Image: Landgate Aug 2016



 Coordinate System: GDA 1994 MGA Zone 50  
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## 5.3 Bushfire Attack Level (BAL) Assessment – BAL Contour Map

<b>BAL assessment procedure applied to this assessment:</b>	<b>Simplified procedure 'Method 1' (AS 3959-2009)</b>
<b>Vegetation assessment:</b>	<b>Physical site inspection</b>

Refer to Appendix 2 'Bushfire Risk Management – Understanding the Methodology', for a summary of the BAL assessment procedures.

### Description and Purpose of the BAL Contour Map

A Bushfire Attack Level (BAL) Contour Map identifies land suitable and unsuitable for development and guides the location of building envelopes within a development site. The BAL Contour Map is a scale map of a development site (which can include proposed or an existing lot layout), which identifies indicative BAL ratings across the development site and within the immediate surrounding area. The map illustrates potential bushfire attack levels and radiant heat impacts in relation to any classified vegetation that will remain within 100 metres of the assessment area once development is constructed i.e. when the land has been cleared and all the subdivision works have been undertaken. It needs to take into account any vegetation that will remain or will be introduced when the works are complete (source: *WAPC Factsheet "BAL Contour Maps" Version 2 January 2016*).

### BAL Contour Map Interpretation

The contour map will present different coloured contour intervals constructed around the classified bushfire prone vegetation. These represent the different Bushfire Attack Levels (BAL's) that exist as the distance increases away from the classified vegetation. Each BAL represents a set range of radiant heat flux (refer to Appendix 2) that can be generated by the bushfire in that vegetation. The width of each shaded contour interval is determined by calculations involving vegetation type, fuel structure, ground slope, and climatic conditions (i.e. the expected fire behaviour) and are unique to a site and can vary across a site.

### BAL Contour Map and 'Class G Grassland'

Grassland vegetation types may have been identified and classified on the subject site (refer to the Vegetation and Topography Map in Figure 5.1). Where this is the situation for the subject Proposal, and it is considered appropriate by the assessor, the BAL contour map produced for this Plan will exclude the area of Class G Grassland. Therefore, the displayed BAL contours will exist for all classified vegetation types except Grassland.

The rationale for this approach is to be able to derive meaningful information from the contour map. If Grassland was to be contoured the entire mapped area could potentially be BAL-FZ and therefore be presented as a sole colour – providing no useful information.

Grassland is commonly not native vegetation. From a practical perspective, it can be easily managed to a low bushfire threat state and generally will not require approval for its removal. Section 7.3 of this Plan details the management measure required to reduce any classified Grassland to a BAL rating of BAL-LOW.

Figure 5.3  
BAL Contour Map  
Overview

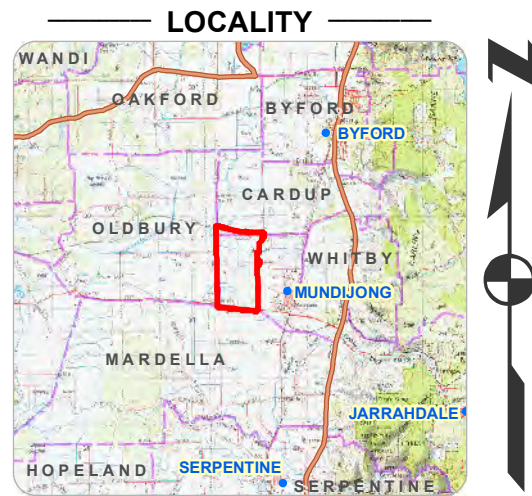
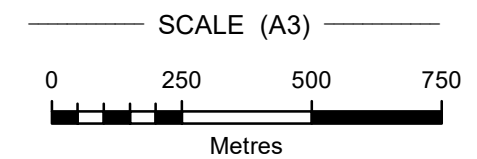
West Mundijong Industrial Precinct  
Jarrahdale

**LEGEND**

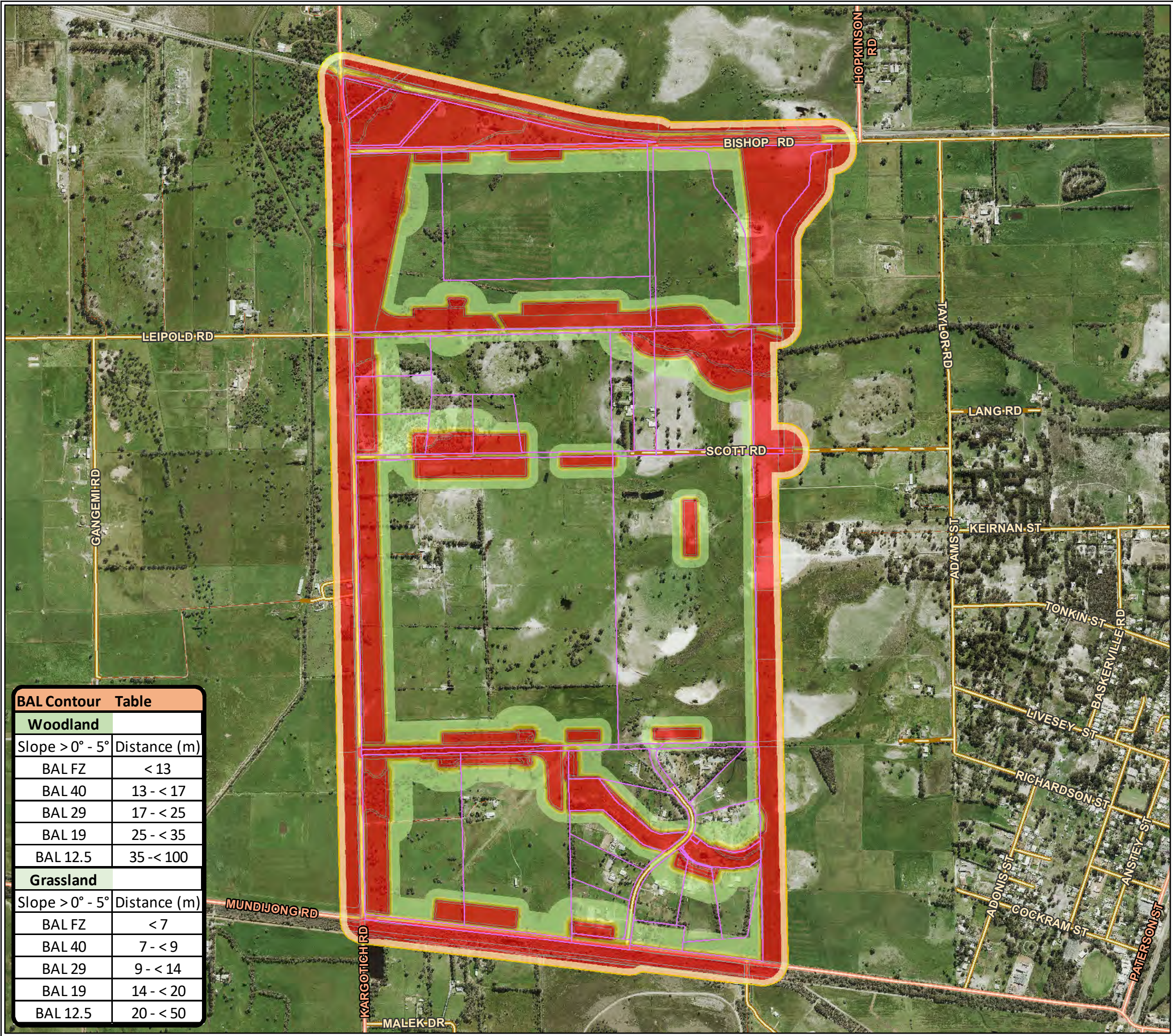
- Subject Lots
- Other Lots
- Area of Interest - 100m extent

Bushfire Attack Levels (Method 1)

- BAL FZ (Indicative only)
- BAL 40 (Indicative only)
- BAL 29 (Indicative only)
- BAL 19 (Indicative only)
- BAL 12.5 (Indicative only)
- BAL LOW (Indicative only)



Aerial Image: Landgate Aug 2016



BAL Contour Table	
<b>Woodland</b>	
Slope > 0° - 5°	Distance (m)
BAL FZ	< 13
BAL 40	13 - < 17
BAL 29	17 - < 25
BAL 19	25 - < 35
BAL 12.5	35 - < 100
<b>Grassland</b>	
Slope > 0° - 5°	Distance (m)
BAL FZ	< 7
BAL 40	7 - < 9
BAL 29	9 - < 14
BAL 19	14 - < 20
BAL 12.5	20 - < 50




Coordinate System: GDA 1994 MGA Zone 50  
Projection: Universal Transverse Mercator  
Map created on: 28-Nov-16  
Map compiled by: Bruce Greentree

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Figure 5.3.1  
**BAL Contour Map**  
 North

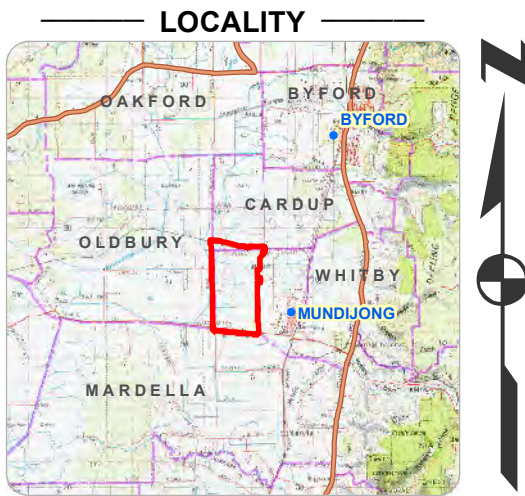
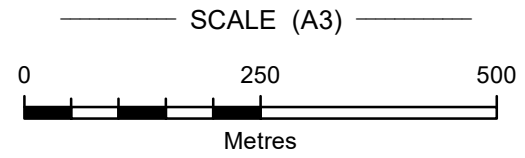
West Mundijong Industrial Precinct  
 Jarrahdale

**LEGEND**

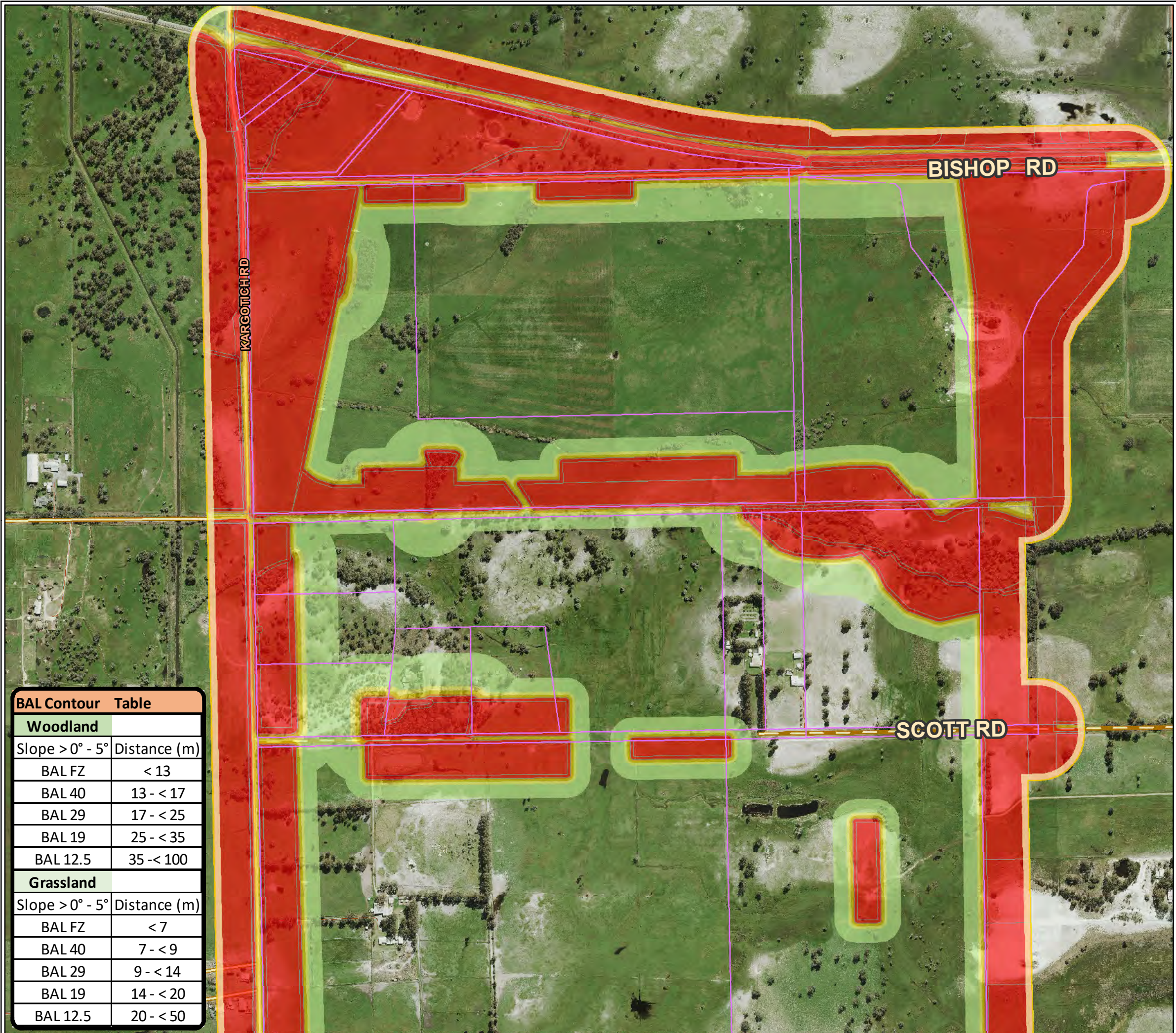
-  Subject Lots
-  Other Lots
-  Area of Interest - 100m extent

Bushfire Attack Levels (Method 1)

-  BAL FZ (Indicative only)
-  BAL 40 (Indicative only)
-  BAL 29 (Indicative only)
-  BAL 19 (Indicative only)
-  BAL 12.5 (Indicative only)
-  BAL LOW (Indicative only)



Aerial Image: Landgate Aug 2016



BAL Contour Table	
<b>Woodland</b>	
Slope > 0° - 5°	Distance (m)
BAL FZ	< 13
BAL 40	13 - < 17
BAL 29	17 - < 25
BAL 19	25 - < 35
BAL 12.5	35 - < 100
<b>Grassland</b>	
Slope > 0° - 5°	Distance (m)
BAL FZ	< 7
BAL 40	7 - < 9
BAL 29	9 - < 14
BAL 19	14 - < 20
BAL 12.5	20 - < 50

Coordinate System: GDA 1994 MGA Zone 50  
 Projection: Universal Transverse Mercator  
 Map created on: 28-Nov-16  
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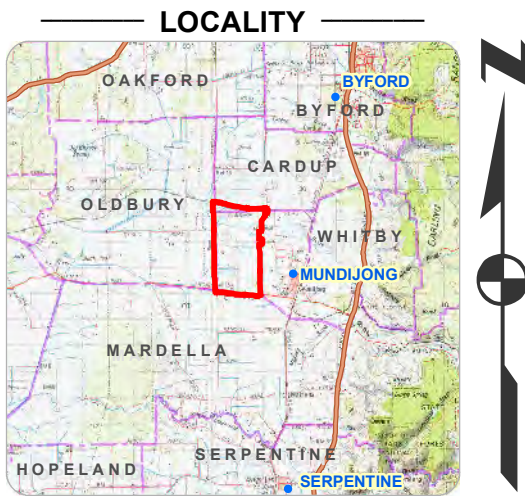
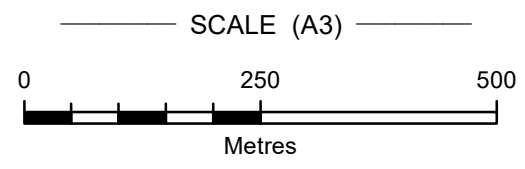


Figure 5.3.2  
BAL Contour Map  
South

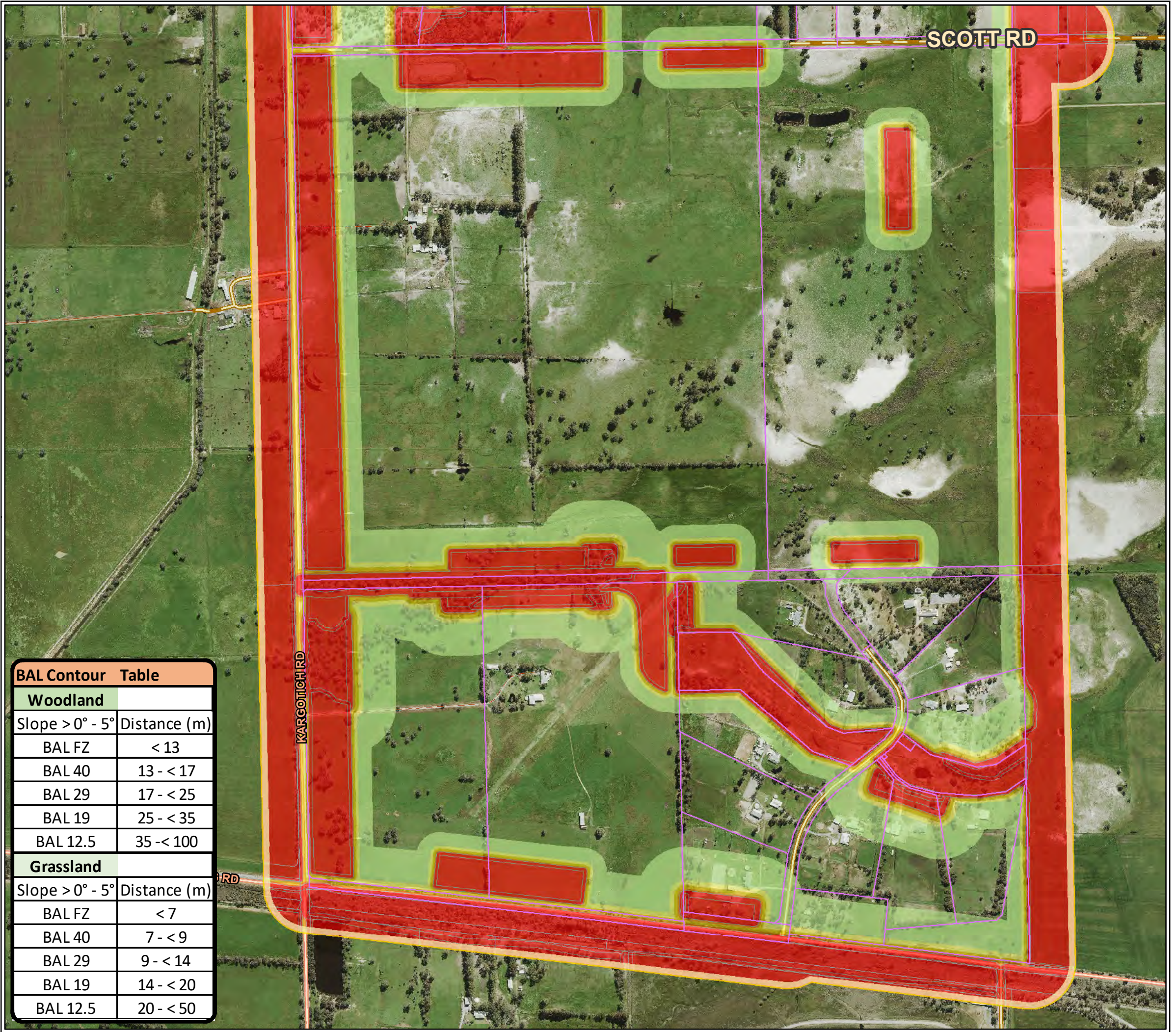
West Mundijong Industrial Precinct  
Jarrahdale

**LEGEND**

-  Subject Lots
-  Other Lots
-  Area of Interest - 100m extent
- Bushfire Attack Levels (Method 1)**
-  BAL FZ (Indicative only)
-  BAL 40 (Indicative only)
-  BAL 29 (Indicative only)
-  BAL 19 (Indicative only)
-  BAL 12.5 (Indicative only)
-  BAL LOW (Indicative only)



Aerial Image: Landgate Aug 2016



BAL Contour Table	
<b>Woodland</b>	
Slope > 0° - 5°	Distance (m)
BAL FZ	< 13
BAL 40	13 - < 17
BAL 29	17 - < 25
BAL 19	25 - < 35
BAL 12.5	35 - < 100
<b>Grassland</b>	
Slope > 0° - 5°	Distance (m)
BAL FZ	< 7
BAL 40	7 - < 9
BAL 29	9 - < 14
BAL 19	14 - < 20
BAL 12.5	20 - < 50

Coordinate System: GDA 1994 MGA Zone 50  
Projection: Universal Transverse Mercator  
Map created on: 28-Nov-16  
Map compiled by: Bruce Greentree

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### 5.3.1 BAL's as Indicated / Determined by the Contour Map

#### BUSHFIRE PRONE PLANNING'S INTERPRETATION AND USE GUIDE (of information derived from the BAL Contour Map)

##### The Primary Use of BAL Contour Mapping - Planning

BAL contour mapping is primarily a planning tool that can give an overview as to the suitability of a site for development with respect to the extent to which bushfire is a potential threat to future buildings and persons on the subject land.

The mapping considers the development site (i.e. all existing or proposed lots) and does not consider the bushfire risk at an individual lot level and over different development time frames. Rather it is assessing the situation that will exist when the entire development has been completed, including any vegetation management that would reasonably be expected to take place as part of establishing buildings on the lots. On this basis, it helps decision makers determine the suitability of the proposed development for planning approval.

As a result, there will be situations where, for the purposes of planning, classifiable vegetation is not contoured. However, at a specific point in time (prior to full completion of a development) this vegetation may impact on a proposed buildings BAL rating.

##### A Secondary Use of BAL Contour Mapping - Building

Building approval (and the issue of a building permit) requires that a BAL rating is determined for an actual building and not just a lot or a building envelope (i.e. an 'area'). Determination of this BAL rating must consider the actual location of a building within an individual lot and its separation distance from any classified vegetation at the actual time of applying for building approval. It is a site-specific assessment based on the buildings design and location at a given point in time.

This specific assessment (BAL report and BAL certificate) required for a building application cannot always be derived from an assessment that is primarily designed to inform planning decisions. As a result, there are limitations to obtaining a single BAL rating for a future building of unknown location, from a BAL contour map assessment.

Nonetheless, there are limited specific situations where the required building application information (i.e. a BAL Certificate) might be obtained quickly and cost effectively from a BAL contour map assessment. When these 'determined' BAL's can be derived is explained on the following page.

### Indicative BAL's

If the assessed BAL for a lot or building envelope (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 'area' or as a range of achievable BAL's within the 'area' – 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 an 'area' with an indicative BAL until the location of any future building has been determined. It usually requires an onsite visit and a BAL assessment report to be produced before the certificate can be issued.

### Determined BAL's

If the assessed BAL for a Lot or building envelope (the 'area') or existing building, is stated as being 'determined' it is because that 'area' or building is impacted by a single BAL contour interval. This has been determined by offsite classified vegetation, and no classifiable vegetation currently exists on the lot or on adjacent lots (i.e. it has been cleared to a minimal fuel, low bushfire threat state).

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 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 'area' 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.

A BAL Certificate (referring to the BAL Contour Map assessment) can be provided for a future building on those 'areas' assessed as having a determined BAL.

(Note: The only limitation to a BAL Certificate being derived from a BAL contour map is if significant time has passed since the original assessment and the vegetation needs to be reassessed and the BAL contour map updated. If a BAL Certificate has previously been issued, it will only remain valid for one year).

### 5.3.2 Identification of Specific Issues Arising from BAL Contour Map

The proposed BAL contour map presented in Figure 5.3 (overview plan) is based on the future developments. Classified vegetation within the development area will be managed as low threat areas with the main areas of BAL 12.5 or greater rated lots to be on the external boundaries and those adjacent to the retained native vegetation and ecological corridors.

Figures 5.3.1 and 5.3.2 show enlarged maps of the northern and southern areas to indicate the details of indicative BAL ratings for the areas associated with the retained native vegetation and ecological corridors. The BAL contours show only indicative BAL ratings and any new development will require further assess to determine any future development BAL ratings.

### 5.4 Existing Habitable Buildings on Subject Site – Assessed BAL's

The existing building within the subject site have not been assessed as part of the Bushfire hazard level assessment as this proposal is for the strategic level scheme amendment proposed by the Shire of Serpentine – Jarrahdale.

## 6 Environmental Considerations

“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).

“Clearing of native vegetation in Western Australia requires a clearing permit under Part V, Division 2 of the Environmental Protection Act 1986 unless clearing is for an exempt purpose. Exemptions from requiring a clearing permit are contained in Schedule 6 of the Act or are prescribed in the Environmental Protection Regulations” (‘Guidelines’ s2.3).

### 6.1 Native Vegetation and Re-vegetation

Establishing development in bushfire prone areas can adversely affect the retention of native vegetation through clearing associated with the creation of Asset Protection and Hazard Separation Zones. Where loss of vegetation is not acceptable or causes conflict with landscape or environmental objectives, it will be necessary to consider available options to minimise the removal of native vegetation.

Options to Minimise Removal of Native Vegetation	Considered and Implemented in this Proposal
Reduce lot yield	N/A
Cluster development	Yes
Construct building to a higher standard as per BCA and AS 3959-2009	Yes
Modify the development location	Yes

**Comments:**

Does this planning proposal satisfy bushfire protection requirements 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

Where, as part of the Proposal, revegetation of waterway foreshore, wetland or coastal buffers is necessary for their protection or management, this bushfire management plan will need to assess the ability and practicality of maintaining vegetation separation distances corresponding to determined BAL's.

Re-vegetation of riparian and/or coastal areas is part of this Proposal. Can the required BAL separation distance be maintained into the future?	Yes
Have any other landscape plans applying to this Proposal been considered in assessing the potential change in bushfire risk into the future	Yes

If any of the above applies, further information is presented in Section 7 'Bushfire Risk Management Measures'.

The retained native vegetation and ecological corridors that will be proposed as public open space should be managed so not increase the bushfire risk to any adjacent properties.

## 7 Bushfire Risk Management Measures

### 7.1 The Bushfire Protection Criteria – Assess and Demonstrate Compliance

*State Planning Policy 3.7 Planning in Bushfire Prone Areas (Dept. of Planning and WAPC 2015)* requires an assessment against the bushfire protection criteria requirements contained in the *Guidelines for Planning in Bushfire Prone Areas (WAPC 2015 s4.5 and Appendix 4)*.

This assessment is to accompany any strategic planning proposal, subdivision application or development application.

Strategic planning proposals need to demonstrate that compliance can be achieved in subsequent planning stages. Subdivision and development applications must demonstrate compliance within the boundary of the subject site or provide justification for those criteria that are not able to be fully met.

The bushfire protection criteria are divided into four elements location, siting and design, vehicular access and water.

For each element, there is:

1. An intent stating the required outcome (overall aim);
2. A performance principle that is a general statement of how best to achieve the intent; and
3. One or more specific criteria to be addressed and for which an acceptable solution is provided as an example of one way of meeting the criteria (and therefore the elements intent).

A proposals compliance with each element is determined by either one or a combination of the following:

1. For each relevant criterion, fully meeting the requirements of the acceptable solution (which automatically achieves the intent for that criteria); and/or
2. For one or more relevant criteria, not fully meeting the requirements of the acceptable solution but achieving the requirements of the performance principle by employing a relatively minor variation on the acceptable solution; and/or
3. For one or more relevant criteria, developing an alternative solution that will achieve the performance principle.

Bushfire Prone Planning presents the required assessment against all the bushfire protection criteria as a separate table for each element and includes the intent, the performance principle and acceptable solution examples, for convenient reference.

## Summarised Outcome for the Proposal of the Assessment Against the Bushfire Protection Criteria

Element  <i>each element consists of one or more criteria</i>	Complies With the Acceptable Solution for ALL Relevant Criteria  <i>or will comply</i>	Achieves the Intent of the Element for ALL Relevant Criteria  <i>or will achieve</i>	Required Basis of the Planning Assessment			Notes
			Acceptable Solutions  Complies with the Acceptable Solution for ALL Relevant Criteria  <i>or will comply</i>	Performance Principle  Achieves the Intent of the Element (or will achieve)		
				<i>For one or more criterion, the given acceptable solution is not fully met. A variation of the solution is provided and justified.</i>	<i>An Alternative Solution is Developed</i>	
Location	Will in the Future	Will in the Future	✓			N/A
Siting and Design of Development	Will in the Future	Will in the Future	✓			
Vehicular Access	Will in the Future	Will in the Future	✓			
Water	Will in the Future	Will in the Future	✓			



## Bushfire Protection Criteria - 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.

**Performance Principle P1 (to be complied with to meet the intent and used to develop alternative solutions):** The intent may be achieved where the strategic planning proposal, subdivision or development application is located in an area where the bushfire hazard assessment is or will, on completion, be moderate or low **OR** a BAL-29 or below applies **AND** the risk can be managed. For minor or unavoidable development in areas where BAL-40 or BAL-FZ applies, demonstrating that the risk can be managed to the satisfaction of DFES and the decision maker.

Acceptable Solution	Further Explanation	Compliance	Assessment Statements
<p><b>A1.1 Development Location</b></p> <p>The strategic planning proposal, subdivision and development application is located in an area where the bushfire hazard assessment is or will, on completion, be moderate or low</p> <p><b>OR</b></p> <p>The development is subject to BAL-29 or below.</p>	<p>Land is most suitable for land use intensification where hazard levels are low. Where there is an extreme bushfire hazard level or requirements for use of BAL-40 or BAL-FZ construction standards, the land is not considered suitable for development unless it meets the definition of minor or unavoidable development (which requires WAPC, DFES and local planning approval).</p>	<p>Will Fully Comply with the Acceptable Solution</p>	<p>The subject site is located within a designated bushfire prone area.</p> <p>By implementing the positioning and vegetation management measures identified in this Plan the proposed scheme amendment can meet the acceptable solution of being subject to BAL-29 or below. It does not require the use of BAL-40 or BAL-FZ construction standards.</p>

## Bushfire Protection Criteria - 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.

**Performance Principle P2 (to be complied with to meet the intent and used to develop alternative solutions):** The intent may be achieved where the siting and design of the strategic planning proposal, subdivision or development application, including roads, paths and landscaping, is appropriate to the level of bushfire risk that applies to the site. That it minimises the bushfire risk to people, property and infrastructure, including compliance with AS3959 if appropriate.

<b>Acceptable Solution</b> Either or both solutions to be met to the extent that it satisfies Element 1.	<b>Further Explanation</b>	<b>Compliance</b>	<b>Assessment Statements</b>
<p><b>A2.1 Asset Protection Zone (APZ)</b></p> <p>Every building is surrounded by an Asset Protection Zone (minimum of twenty metres wide), depicted on submitted plans, which meets the defined requirements.</p> <p><b>OR</b></p> <p>Where a full 20 metre APZ is not possible the APZ should be sufficient enough to ensure the potential radiant heat impact of a fire does not exceed 29 kW/m<sup>2</sup>.</p> <p>The specifications for the establishment and maintenance of the APZ are stated in Appendix 3 and Appendix 4.</p>	<p>The APZ is a low fuel area immediately surrounding a habitable or specified building.</p> <p>All requirements in A2.1 are essential and must be achieved to ensure compliance.</p> <p>If the implementation of protection zones was to result in the loss of vegetation that is not acceptable or causes conflict with landscape and environmental objectives, then the development may need to be modified.</p>	<p>Will Fully Comply with the Acceptable Solution</p>	<p>The proposed scheme amendment can meet the acceptable solution: This is achieved by:</p> <ul style="list-style-type: none"> <li>• Incorporating an APZ, to the extent possible within the boundary of the lot, into the landscaping surrounding the any future building work and maintaining it to comply with specified requirements into the future;</li> <li>• The extent of the APZ being established within the boundary of the lot results in the potential radiant heat impact of a fire on the proposed building work not exceeding 29kW/m<sup>2</sup></li> </ul>

## Bushfire Protection Criteria - Element 2 - Siting and Design of Development (continued)

<b>Acceptable Solution</b> Either or both solutions to be met to the extent that it satisfies Element 1.	<b>Further Explanation</b>	<b>Compliance</b>	<b>Assessment Statements</b>
<p><b>A2.2 Hazard Separation Zone (HSZ)</b>            Every building and its contiguous APZ is surrounded by a Hazard Separation Zone (minimum of 80 metres wide), depicted on submitted plans, that meets the defined requirements.</p> <p><b>OR</b></p> <p>A HSZ may not be required if the proposed construction meets the standard appropriate to the BAL for that location and the determined BAL does not exceed BAL-29.</p> <p>The specifications for the establishment and maintenance of the HSZ are stated in Appendix 4.</p>	<p>Hazard separation should be provided between extreme bushfire hazards and buildings to create a combined separation distance of 100m (50m for unmanaged grassland) in order to protect them from burning embers, radiant heat and direct flame contact.</p> <p>The minimum hazard separation distance may be reduced by compliance with AS 3959 which requires that as the distance from the vegetation is reduced, the construction standard must be increased.</p>	<p>Will Fully Comply with the Acceptable Solution</p>	<p>The proposed scheme amendment can meet the acceptable solution by:</p> <ul style="list-style-type: none"> <li>• Establishing and maintaining a HSZ that meets all defined requirements, or</li> <li>• A determined BAL not exceeding BAL-29;</li> <li>• Applying the construction standard corresponding to a determined BAL rating as per AS 3959-2009; and</li> <li>• Any future buildings that are Class 4-9 buildings are not required under the Building Code of Australia to be constructed to the standard corresponding to the determined BAL rating as set out in AS3959-2009.</li> </ul>

## Bushfire Protection Criteria - Element 3 - Vehicular Access

**Intent:** To ensure that the vehicular access serving a subdivision/development is available and safe during a bushfire event.

**Performance Principle P3 (to be complied with to meet the intent and used to develop alternative solutions):** The intent may be achieved where the internal layout, design and construction of public and private vehicular access and egress in the subdivision /development allow emergency and other vehicles to move through it easily and safely at all times.

Acceptable Solution	Further Explanation	Compliance	Assessment Statements
<p><b>A3.1 Two access routes</b> Two different vehicular access routes are provided, both of which connect to the public road network, provide safe access and egress to two different destinations and are available to all residents and the public at all times and under all weather conditions.</p>	<p>This is to apply to access routes leading into a subdivision as well as those within a subdivision. All access should accommodate type 3.4 fire appliances (4WD 7t chassis). Two-way access should be provided as a public road, however, where a public road cannot be provided (and this will need to be demonstrated by the proponent providing justification), an emergency access way may be considered.</p>	<p>Will Fully Comply with the Acceptable Solution</p>	<p>Access and egress to two different locations will be incorporated in the design of any future developments.</p> <p>The current scheme amendment provides safe access and egress to two different destinations via the proposed road network. As a sealed public roads they will be available to all residents and the public at all times and under all weather conditions.</p>

## Bushfire Protection Criteria - Element 3 - Vehicular Access (continued)

**Intent:** To ensure that the vehicular access serving a subdivision/development is available and safe during a bushfire event.

**Performance Principle P3 (to be complied with to meet the intent and used to develop alternative solutions):** The intent may be achieved where the internal layout, design and construction of public and private vehicular access and egress in the subdivision /development allow emergency and other vehicles to move through it easily and safely at all times.

Acceptable Solution	Further Explanation	Compliance	Assessment Statements
<p><b>A3.2 Public Road</b> Minimum trafficable surface of 6m. Constructed to meet the technical requirements stated in Appendix 5.</p>	<p>In special circumstances, where <math>\leq 8</math> lots serviced, a minimum 4m trafficable surface for a maximum of 90 might be approved.</p>	<p>Will Fully Comply with the Acceptable Solution</p>	<p>Existing and future public roads will meet the technical requirements of the guidelines</p>
<p><b>A3.3 Cul-de-sacs</b> - (includes dead-end roads). A maximum length of 200m with a 17.5m turnaround. 600m length if cul-de-sacs services <math>\leq 8</math> lots and is joined to another cul-de-sac by an emergency access way of <math>&lt; 600</math>m). Constructed to meet the technical requirements stated in Appendix 5.</p>	<p>Should be avoided in bushfire prone areas as they do not provide access/egress in different directions. Where no alternative exists this will need to be demonstrated by the proponent including if the lot layout already exists. Cul-de-sac is to connect to a public road.</p>	<p>N/A</p>	
<p><b>A3.4 Battle-axe</b> Maximum length 600m, minimum width 6m, passing bays @ 200m, turnaround area @ 500m and at house site. Constructed to a minimum of private driveway standards. Constructed to meet the technical requirements stated in Appendix 5.</p>	<p>Should be avoided in bushfire prone areas If no alternative exists this will need to be demonstrated by the proponent.</p>	<p>N/A</p>	

### Bushfire Protection Criteria - Element 3 - Vehicular Access (continued)

Acceptable Solutions	Further Explanation	Compliance	Assessment Statements
<p><b>A3.5 Private Driveways</b> Are required where a house is &gt;50m from a public road. Passing bays @ 200m, turnaround area @ 500m and within 50m of house. Bridges/culverts to support 15t. All weather surface. Constructed to meet the technical requirements stated in Appendix 5.</p>		Will Fully Comply with the Acceptable Solution	All private driveways that are >50m in length will be required to comply with the technical requirements of the guidelines
<p><b>A3.6 Emergency Access Way</b> Provided as a right of way or public access easement in gross (maximum length of 600m) to ensure accessibility to the public and fire services in emergencies. It should comply with minimum standards for a public road and be signposted. Constructed to meet the technical requirements stated in Appendix 5.</p>	An access way that does not provide through access to a public road is to be avoided in bushfire prone areas. Where no alternative exists this will need to be demonstrated by the proponent. It is to be provided as an alternative link to a public road during emergencies.	N/A	
<p><b>A3.7 Fire Service Access Routes - (perimeter roads)</b> Provided as rights of way or public access easements in gross; all weather surface and allow for two-way traffic; dead-end roads not permitted; turnarounds every 500m; less than 600m to a public road and be signposted. Constructed to meet the technical requirements stated in Appendix 5.</p>	Fire service access routes should be established to separate bushfire prone areas from developed areas and to provide access within and around the edge of the subdivisions and related development. To be used during bushfire suppression operations and prevention work.	N/A	
<p><b>A3.8 Firebreak Width</b> Lots greater than 0.5 hectares must have an internal perimeter firebreak of a minimum width of three metres or to the level prescribed in the local firebreak notice issued by the local government.</p>		Will Fully Comply with the Acceptable Solution	The lots will comply with the requirements of the local government annual firebreak notice issued under s33 of the Bush Fires Act 1954.

## Bushfire Protection Criteria - 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.

**Performance Principal P4 (to be complied with to meet the intent and used to develop alternative solutions):** The intent may be achieved where the subdivision, development or land use is provided with a permanent and secure supply that is sufficient for firefighting purposes.

Acceptable Solution	Further Explanation	Compliance	Assessment Statements
<p><b>A4.1 Reticulated Areas</b> The subdivision, development or land use is provided with a reticulated water supply, in accordance with the specifications of the relevant water supply authority and DFES. Constructed to meet the technical requirements stated in Appendix 6.</p>	<p>The Water Corporations 'No 63 Water Reticulation Standard' is deemed to be the baseline criterion for developments and should be applied unless local water supply authorities' conditions apply. Additionally, any local government variation must be met (s8.4).</p>	<p>Will Fully Comply with the Acceptable Solution</p>	<p>A reticulated water supply is not currently available to the site and future provision to install hydrants may be required. Hydrants will be required to be installed to Water Corp and DFES standard DS63.</p>
<p><b>A4.2 Non-Reticulated Areas</b> Water tanks for firefighting purposes with a hydrant or standpipe are provided. Minimum of 50,000l/tank; minimum 1 tank/25 lots (or part thereof); house ≤2km from a tank; 20min turnaround time for 2.4 appliance; hardstand area suitable for 3.4 appliance within 3m of tank Must meet the technical requirements stated in Appendix 6. Any local government variation must also be met (s8.4).</p>	<p>The specification of the requirements for the proposal being assessed will be set by the water supply authority and DFES. A procedure must be in place to ensure that water tanks are maintained at or above the designated capacity at all times, including home tanks on single lots. This could be in the form of an agreement with the local government and the fire service. Water tanks and associated facilities are vested in the relevant local government</p>	<p>Will Fully Comply with the Acceptable Solution</p>	<p>If a reticulated water source is not installed to the subject site several strategic water tanks could be installed to the specifications of the Guidelines.</p>
<p><b>A4.3 Non-reticulated Areas (Individual Lots)</b> Single lots above 500 m<sup>2</sup> need a dedicated static water supply on the lot that has the effective capacity of 10,000 litres. Must meet the technical requirements stated in Appendix 6.</p>	<p>A4.3 is only for use if creating one additional lot and cannot be applied cumulatively.</p>	<p>N/A</p>	

## 7.2 Location of Buildings and Applicable BAL's

Future buildings on the proposed lots are to be located in areas where an appropriate Bushfire Attack Level rating can be achieved and where minimal removal of valuable existing native vegetation is required to achieve this rating. The intent is to have the subject land of this Proposal located in an area where the bushfire hazard level is, or will on completion, be moderate or low or be subject to a maximum Bushfire Attack Level of BAL-29.

The proposed subdivision is unlikely to be approved if the indicative BAL rating for future buildings on any proposed lots is either BAL-40 or BAL-FZ as it is unacceptable on planning grounds. The exception will be if it meets the definition of unavoidable development ('Guidelines' s5.4 and s5.7). If this applies the appropriate additional assessment and input from the relevant authorities, if required, is included in this Plan.

Any future buildings within the scheme amendment area may be required to comply with AS3959-2009 construction standards dependent on a determined BAL being undertaken on the development. As the whole site is currently within a bushfire prone area as per the Map of Bushfire prone Areas (DFES) a BAL assessment will be required.

If future buildings are Class 4-9 these may not be required to comply with AS3959-2009 but will be required to undertake some bushfire mitigation and comply with the Guidelines for planning in bushfire prone areas.

Any future high risk land uses that are proposed within the West Mundijong Industrial Precinct are advised to be located greater than 100m from the retained vegetation associated with Manjedal Creek or the ecological corridors proposed as part of this scheme amendment. By developing outside of these areas the risk of bushfire will be reduced to these high risk developments. This is based on the proviso that all the existing unmanaged grassland will be managed.



## 7.3 Vegetation Management

### Ongoing Maintenance of Assessed Vegetation

1. Where any existing or planned re-vegetation has been assessed as “low threat” (meeting AS 3959-2009 Section 2.2.3.2 requirements) and excluded from classification then this area will be managed to continue to meet those requirements (refer to Appendix 3) and enable the buildings to retain their determined BAL ratings;
2. Any classified vegetation onsite (i.e. within a subject lot) that has directly contributed to the determined BAL rating for a given building, will be managed such as to not change that vegetation to a higher risk classification; and
3. Where a local government issues an annual firebreak notice under s33 of the Bush Fires Act 1954, this will be complied with.

### Bushfire Protection Zones

The *Guidelines for Planning in Bushfire Prone Areas (WAPC 2015)* set out the requirements to create an Asset Protection Zone (APZ) and a Hazard Separation Zone (HSZ). The aim of these bushfire protection zones is to have a fire of diminishing intensity and flame length as it approaches development. These reduced fuel loads will reduce the intensity of radiant heat onto the buildings, thereby increasing their survivability. This will also be important for firefighter and occupant’s safety during fire suppression activities.

**Asset Protection Zone (APZ)** – This is to be established, within a subject lot’s boundary such that a building will not be subject to a BAL rating greater than BAL-29. On a lot size where it is possible to achieve, it is to be a minimum width of 20 metres and increased when directed to the width required such that such that a building will not be subject to a BAL rating greater than BAL-29.

The APZ must be maintained as either a non-vegetated area or as low threat vegetation managed in a minimal fuel condition as per AS 3959-2009 s2.2.3.2 (e) and (f). A minimal fuel condition is stated in the standard as meaning “there is insufficient fuel available to significantly increase the severity of the bushfire attack” and being “recognisable as short cropped grass for example to a nominal height of 100mm.”

**Hazard Separation Zone (HSZ)** - Where the lot size permits, a Hazard Separation Zone (HSZ) should also be established.

Refer to Appendix 3 and Appendix 4 for specific technical requirements.

### Establishing the APZ

An Asset Protection Zone (APZ) creating a low fuel area will be required to be incorporated into the landscaping surrounding current and any future buildings on the proposed lots.

Vegetation will be removed from this site to enable construction to take place. It is proposed to clear this vegetation to the extent that it achieves either the minimum width of 20m, as specified in the Guidelines for an APZ, or the minimum required separation distances based on a Determined BAL on any future buildings/development.

### Minimum Vegetation Separation Distances

The future development within the subject area will need to be maintain a separation distance from any classified vegetation associated with any future development to meet the BAL assessed at a later stage. The minimum distances for the existing classified vegetation is shown in Table 7.3.1.

This minimum separation distance from any classified vegetation, that corresponds to the proposed building's assessed BAL will be maintained as either a non-vegetated area or as low threat vegetation managed in a minimal fuel condition as per AS 3959-2009 s2.2.3.2 (e) and (f). A minimal fuel condition is stated in the standard as meaning "there is insufficient fuel available to significantly increase the severity of the bushfire attack" and being "recognisable as short cropped grass for example to a nominal height of 100mm." Refer to Appendix 3 of this Plan for further detail.

It is also recognised that the local government issues an annual firebreak notice under s33 of the Bush Fires Act 1954 and this will be complied with.

**Table 7.3.1:** Minimum separation distance for classified vegetation

Relevant Fire Danger Index (AS3959-2009 Table 2.1)			80				
BAL Determination Method			Method 1 as per AS 3959-2009 s2.2.6 and Table 2.4.3. Refer to Appendix 2 this Plan				
Vegetation Area	Applied Vegetation Classification	Effective Slope Under the Classified Vegetation (degrees)	Achievable BAL's				Risk of Ember Attack
			BAL-29	BAL-19	BAL-12.5	BAL-LOW	
Identified by stating the separation distance (in metres) to classified vegetation that is required to achieve the corresponding BAL rating. (Refer below Table for further explanation)							
1	Class B Woodland	0-5	17-<25	25-<35	35-<100	Risk of Ember Attack	
2	Class B Woodland	0-5	17-<25	25-<35	35-<100	Risk of Ember Attack	
3	Class B Woodland	0-5	17-<25	25-<35	35-<100	Risk of Ember Attack	
4	Class G Grassland	0-5	9-<14	14-<20	20-<100	Risk of Ember Attack	
5	Class G Grassland	0-5	9-<14	14-<20	20-<100	Risk of Ember Attack	
6	Class B Woodland	0-5	17-<25	25-<35	35-<100	Risk of Ember Attack	

## 7.4 Vehicular Access

The internal layout, design and construction of public and private vehicular access and egress in the subdivision/development must allow emergency and other vehicles to move through it safely at all times and specifically during a bushfire event.

It is the developer's responsibility to ensure that subdivision and development design allow for the bushfire protection criteria for vehicular access be met as per the 'Guidelines'. How this Proposal complies with the bushfire protection criteria is set out in s7.1 with additional information and justification presented below if necessary.

The current proposed road network will be designed and constructed to provide public and emergency service vehicles access and egress to two different destinations with the public roads to be compliant with the technical requirements of the Guidelines. If any future private driveways are to greater than 50m from the public road, the driveway will be required to comply with the guidelines.

In future planning stages the vehicle access will be achieved to comply with the requirements of the Guidelines.

## 7.5 Firefighting Water Supply

The intent is to ensure water is available to the subdivision, development or land use to enable people, property and infrastructure to be defended from bushfire. This intent may be achieved where the subdivision, development or land use is provided with a permanent and secure supply that is sufficient for firefighting purposes.

A reticulated water supply does not exist within the structure plan area but is proposed to be installed as part of the redevelopment. As the area is to be General Industry and Light Industry to comply with the WaterCorp DS63 standard hydrants will be required to be installed every 100m.

The required hydrants, water tanks, couplings and access will be installed as per the technical requirements detailed in Appendix 6 and DFES standards.

## 7.6 Building Construction Standards

### 7.6.1 Future Habitable Buildings on the Subject Site

#### Building Classes 1, 2, 3 and 10a

The Building Code of Australia (BCA) contains bushfire construction requirements that are applied to residential buildings of Class 1, 2 or 3 and associated Class 10a buildings and decks. These are required by the BCA to be constructed to reduce the risk of ignition from a bushfire at a level that corresponds to the potential risk for a given situation (determined as a BAL rating). The BCA references AS3959-2009 *Construction of buildings in bushfire prone areas* or the (NASH) Standard – *Steel Framed Construction in Bushfire Prone Areas* (for Class 1a and 1b buildings only) as deemed to satisfy solutions that provide one way of complying with the Building Code’s bushfire performance requirements.

(Note: Higher construction standards can be applied by a local government or as a part of an alternative solution that might be presented in this Plan to enable compliance with the Bushfire Protection Criteria).

#### Building Classes 4 - 9

The BCA bushfire performance requirements do not apply to Class 4 – Class 9 buildings unless imposed by the relevant local government (or voluntarily adopted).

However, determining the BAL ratings of proposed Class 4-9 buildings allows for them to be:

- Sited appropriately and have classified vegetation removed and /or managed such that their exposure to flames, radiant heat and embers is as low as is practically possible.
- Constructed to the standard corresponding to the BAL rating if the developer, owner or local government deem it is prudent and necessary.

*Bushfire Prone Planning Recommendation - When the subject site is in a designated bushfire prone area and the determined BAL is BAL-LOW, AS3959-2009 does not provide construction requirements. However, Bushfire Prone Planning considers a building in this situation to still be at some risk of an ember attack. Therefore, to improve the protection for occupants as well as the building itself, we recommend that consideration be given to constructing the proposed building works to the standard corresponding to a BAL of BAL-12.5.*

## 7.6.2 Existing Habitable Buildings on the Subject Site

Class 1, 2 and 3 buildings and Class 10a associated buildings and decks, constructed prior to the requirement to comply with bushfire performance requirements, do not need to meet these requirements.

Buildings of Class 4 to Class 9 are not required by the Building Code of Australia (BCA) to be constructed to comply with bushfire performance requirements.

The *Guidelines for Planning in Bushfire Prone Areas (WAPC 2015)* state, “The policy measures of SPP 3.7 and these Guidelines are not to be applied retrospectively” (Guidelines s2.2). Further, the WA Building Commission ‘Building in Bushfire Prone Areas’ information note states “Building standards and regulations are generally not retrospective”.

Therefore, retrospectively upgrading a building to comply with the bushfire performance requirements can only be a recommendation.

***Bushfire Prone Planning Recommendation:*** *As the existing buildings exist in a bushfire prone area and may be subject to a bushfire attack, Bushfire Prone Planning recommended that some degree of upgrading be considered to improve the protection for occupants and the building’s survivability. At a minimum protection from ember attack should be considered (i.e. constructed to the standard required for BAL-12.5).*

The existing buildings within the study site have not been assessed as part of this bushfire management plan.

## 8 Specific Land Uses

*State Planning Policy 3.7 Planning in Bushfire Prone Areas (Department of Planning and WAPC 2015)* sets out in policy measure 6.6 what is required for ‘vulnerable’ or ‘high risk’ land uses to be supported in bushfire prone areas subject to BAL-12.5 or higher.

### 8.1 Vulnerable Land-Use – Definition / Application / Requirements

Is this Bushfire Management Plan (BMP) to accompany a development application for building work associated with a land use that is considered a ‘vulnerable’ land use?	No
Is a Bushfire Evacuation Plan for Proposed Occupants to be provided as a separate document and be considered as forming a part of this Bushfire Management Plan?	No
Is the required content of a Bushfire Evacuation Plan for Proposed Occupants to be provided as an addition to the proponents existing emergency evacuation plan?	No
In certain circumstances the required information to fully compile the Bushfire Evacuation Plan (e.g. position, names and contact numbers for responsible persons) is not available at the development application stage. In such a situation the responsibility to complete the required details prior to occupancy of the subject building will noted in the Landowner/Proponent Responsibilities section of this BMP. Does this situation apply to this application?	Yes

Information reference: SPP 3.7 *Planning in Bushfire Prone Areas* (Department of Planning and WAPC 2015 s6.6 and s7) and the *Guidelines for Planning in Bushfire Prone Areas* (WAPC 2015 s5.5):

#### Definition and Application

SPP 3.7 defines vulnerable land use as a land use where persons may be less able to respond in a bushfire emergency. The ‘Guidelines expand this and state that vulnerable uses of land are typically those that are considered to have occupants with a lesser capacity to respond in the event of a bushfire and that may present evacuation challenges.

The intent of the policy measure “is to recognise that such sites require special consideration when located in bushfire prone areas. This will ensure that bushfire risk management is sufficiently addressed in the planning assessment of these land uses”.

Examples of ‘vulnerable’ land uses include (but are not limited to) hospitals, nursing homes and retirement villages, tourist accommodation including camping grounds and ecotourism, childcare centres, educational establishments, places of worship and corrective institutions. The definition may also encompass places of assembly, retail and office premises, as well as subsidiary uses of residential development, such as family day care centres or home businesses, and essential infrastructure such as energy, transport, telecommunications and other utilities.

In general terms the following scenarios might need to be considered as vulnerable land uses:

- a. Where persons are present that have a lesser physical/mental capacity to respond to emergencies;
- b. Where occupancy might be transient in nature;
- c. Where greater numbers of persons may be present at certain times;
- d. Where occupants are typically not fully familiar with the building or area.

## Required Information

1. In areas where BAL-12.5 to BAL-29 applies, a subdivision or development application will not be supported unless it is accompanied by a Bushfire Management Plan (BMP) jointly endorsed by the relevant local government and the State authority for emergency services;
2. The BMP is to include an assessment against the bushfire protection criteria requirements demonstrating compliance within the boundary of the development site.
3. Subdivision applications are to make provision for emergency evacuation;
4. Development applications should include a bushfire evacuation plan for proposed occupants; and
5. Where BAL-40 or BAL-FZ applies, applications will not be supported unless they meet the definition of 'minor' or 'unavoidable' development.

This proposal for the scheme amendment does not currently propose any 'vulnerable' land uses but in the future, there may be development that is categorised as vulnerable and if in a BAL-12.5 to BAL-29 area an Emergency Evacuation plan will be required to be developed for this future development.



## 8.2 High Risk Land Use – Definition / Application / Requirements

Is this Bushfire Management Plan (BMP) to accompany a development application for building work associated with a land use that is considered a 'high risk' land use?	Yes
Is a Risk Management Plan for flammable on-site hazards to be provided as a separate document and be considered as forming a part of this Bushfire Management Plan?	Yes
Is the required content of the Risk Management Plan for flammable on-site hazards to be provided as an addition to the proponents existing emergency planning?	Yes
	-

Information reference: SPP 3.7 *Planning in Bushfire Prone Areas* (Dept. of Planning and WAPC 2015 s6.6 and s7) and the *Guidelines for Planning in Bushfire Prone Areas* (WAPC 2015 s 5.6).

### Definition and Application

SPP 3.7 defines high risk land use as a land use which may lead to the potential ignition, prolonged duration and/or increased intensity of a bushfire. Such uses may also expose the community, firefighters and the surrounding environment to dangerous, uncontrolled substances during a bushfire event. The 'Guidelines' provide examples of such uses including (but not limited to) service stations, landfill sites, bulk storage of hazardous materials, fuel depots and certain heavy industries as well as military bases, power generating land uses, saw-mills, highways and railways.

### Required Information

1. In areas where BAL-12.5 to BAL-29 applies that a subdivision or a development application will not be supported unless it is accompanied by a Bushfire Management Plan (BMP) jointly endorsed by the relevant local government and the State authority for emergency services;
2. The BMP is to include an assessment against the bushfire protection criteria requirements demonstrating compliance within the boundary of the development site.
3. Development applications should include a Risk Management Plan for any flammable on-site hazards. This may include establishing an appropriate Asset Protection Zone (APZ) or Hazard Separation Zone (HSZ). It may determine that a reduction in on-site flammable material or appropriate storage of such material, would be required to reduce the threat, among other considerations.; and
4. Where BAL-40 or BAL-FZ applies, applications will not be supported unless they meet the definition of 'minor' or 'unavoidable' development.

As this proposal is for the scheme amendment to be rezoned as General Industry and Light Industry this could include high risk developments such as fuel depots and service stations, there will be a requirement for these high risk developments to have an Emergency Risk Management plan to address the specific risk that bushfire incidents will have on the future development. As there are no specific high risk land uses proposed as part of this proposal this will need to be addressed at a later planning stage.

## 9 Compliance Statements - of the Proposal and this Plan

This section of the Plan makes statements with respect to the Proposal’s compliance against the components of the WA framework for bushfire risk management. It also states how the content of this BMP satisfies the requirements of SPP 3.7.

The key components of the WA framework for bushfire risk management are summarised in Appendix 1.

### 9.1 State Planning Policy No. 3.7: Planning in Bushfire Prone Areas

SPP 3.7 Policy Objectives - Proposal Compliance Statement		The Proposal Meets Objectives
s5.1	Avoid any increase in the threat of bushfire to people property and infrastructure	Yes
Implementation of the bushfire risk management measures as set out in this Plan, including meeting the requirements of the bushfire protection criteria; will avoid any increase in the threat of bushfire.		
s5.2	Identify and consider bushfire risks in decision-making at all stages of the planning and development process (to reduce vulnerability to bushfire).	Yes
The bushfire risks have been identified and assessed, as relevant for the stage of this planning submission, using the tools prescribed in <i>SPP 3.7</i> (and the associated document <i>Guidelines for Planning in Bushfire Prone Areas WAPC 2015</i> ). Refer to Section 5 ‘Assessment of Bushfire Risk’.		
s5.3	Ensure that all stages of planning submissions take into account bushfire protection requirements and include specified bushfire protection methods.	Yes
The bushfire protection requirements and any specified protection methods, relevant for the stage of this planning submission, have been taken into account and presented in Section 7 ‘Bushfire Risk Management Measures’.		
s5.4	Achieve an appropriate balance between bushfire risk management measures; biodiversity conservation values; environmental protection and biodiversity management; and landscape amenity, with consideration of climate change.	Yes
The components of this objective have been considered along with the requirements set out in the ‘Guidelines’ s2.3. Identifying and addressing issues relevant for the stage of this planning submission is presented in this Plan in Section 6 ‘Environmental Considerations’.		

<b>SPP 3.7 Policy Measures – BMP Compliance Statement</b>		<b>This BMP is Compliant</b>
s6.1	Higher order strategic planning documents in bushfire prone areas	<b>Yes</b>
The requirements stated in SPP 3.7 s6.3 include provision of high level consideration of relevant bushfire hazards when identifying or investigating land for future development.		
s6.2	Strategic planning proposals, subdivision and development applications	<b>N/A</b>
s6.3	Information to accompany strategic planning proposals	<b>Yes</b>
The requirements stated in SPP 3.7 s6.3 include provision of a Bushfire Hazard Level assessment (or a BAL contour map if lots are known), identify issues arising from the relevant assessment and demonstrate that compliance with the Bushfire Protection Criteria can be achieved in subsequent planning stages. Refer to Section 5 of this Plan.		
s6.4	Information to accompany subdivision applications	<b>N/A</b>
s6.5	Information to accompany development applications	<b>N/A</b>
s6.6	Vulnerable or high risk land uses (subdivision and development applications).	<b>Yes</b>
In areas where BAL-12.5 to BAL-29 applies, subdivision applications should make provision for emergency evacuation (presented in this Section 7 of this Plan). Development applications should include an emergency evacuation plan for proposed occupants and/or a risk management plan for any flammable on-site hazards (presented as a separate document). In areas where BAL-40 or BAL-FZ applies, development applications will additionally require statements against the items of SPP 3.7 s6.7.1 and s6.7.2 (included in Section 7 of this Plan).		

<b>SPP 3.7 Policy Measures – BMP Compliance Statement</b>		<b>This BMP is Compliant</b>
s6.7	Strategic planning proposals, subdivision or development applications in areas where an extreme BHL and/or BAL-40 or BAL-FZ applies	<b>N/A</b>
<p>These will not be supported unless the proposal is considered to be</p> <ul style="list-style-type: none"> <li>• Minor development (for specific development applications only, refer to s5.2 5.3) and requiring statements against the items of SPP 3.7 s6.71 (included in Section 7 of this Plan); or</li> <li>• Unavoidable development and requiring statements against the items of SPP 3.7 s6.72 (included in Section 7 of this Plan).</li> </ul>		
s6.8	Advice of State/relevant authority/s for emergency services to be sought	<b>Yes</b>
<p>For all stages of planning proposals, advice from relevant authorities has been sought, considered and is referenced in Section 7 of this Plan where:</p> <ul style="list-style-type: none"> <li>• compliance with SPP 3.7 policy measures is unlikely to be achieved;</li> <li>• additional/alternative measures are proposed; and/or</li> <li>• this application contains unavoidable development or vulnerable or high-risk land uses</li> </ul>		
s6.9	Advice of State/relevant agencies/authorities for environmental protection to be sought	<b>N/A</b>
<p>For all stages of planning proposals, advice from relevant authorities has been sought, considered and is referenced in Section 7 of this Plan where:</p> <ul style="list-style-type: none"> <li>• The clearing of vegetation within protected environmentally sensitive areas is proposed</li> <li>• Substantial clearing of native vegetation is proposed</li> <li>• Development abuts land managed by a State or Federal authority</li> </ul>		
s6.10	Bushfire conditions may be imposed by the decision maker (detailed requirements including modifications and/or conditions)	<b>N/A</b>
<p>WAPC and/or the local government may, as a condition of approval, require that a notification be placed on certificates of title and notice of the notification on the deposited plan advising that the lots are in a designated bushfire prone area and subject to a Bushfire Management Plan. This is noted in Section 10 ‘Responsibilities for Implementation and Maintenance’.</p>		

## 9.2 Guidelines for Planning in Bushfire Prone Areas (WAPC 2015 as amended)

The ‘Guidelines’ are designed to assist in the interpretation of SPP3.7’s objectives and policy measures. As such they have been referenced and complied with in compiling this Bushfire Management Plan which is to accompany the planning submission. This Plan contains, as a minimum, the information required as per the ‘Guidelines’ checklist.

## 9.3 Bushfire Protection Criteria (WAPC 2015 ‘Guidelines’)

The proposed land use has been assessed against the bushfire protection criteria. The assessment of the bushfire risk management measures (i.e. those relevant to each element) and the demonstration of how the proposal meets the criteria are presented in Section 7.1 of this Plan - ‘Bushfire Protection Criteria - Assess and Demonstrate Compliance’.

Where the proposal has not been able to fully meet an acceptable solution for a given element or an alternative solution is proposed, then the appropriate sub section of Section 7 ‘Bushfire Risk Management Measures’, demonstrates how the Proposal will comply with the performance principle and the intent of that element. Any required advice and recommendations from DFES and other referral authorities will be included.

## 9.4 Local Variations to Bushfire Protection Criteria

Are there any endorsed local variations to the bushfire protection criteria (e.g. through a local planning policy) that are to apply to the proposed land use and therefore addressed in Section 7 ‘Bushfire Risk Management Measures’ of this Plan?	No
Does the proposal satisfy the local variations to the bushfire protection criteria?	N/A

## 9.5 WA Building Act 2011

Relevant regulations associated with the Act are the *Building Regulations 2012* and the *Building Amendment Regulations (No 3) 2015*. The legislation adopts the Building Code of Australia as the minimum technical requirement for the design and construction of buildings and certain other structures in WA and prescribes applicable building standards for certain classes of buildings located in areas designated by the Fire and Emergency Services Commissioner as bushfire prone areas (identified on the Map of Bushfire Prone Areas).

Is this land use proposal at a planning stage at which lot layout is known and construction of buildings (any class) is being proposed?	No
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If the response is ‘No’, then this Proposal is at a planning stage where specific compliance with the Building Act 2011 is not required – rather it will apply at future planning stages. However, if a BAL Contour Map and/or BAL assessment has been provided as part of this Plan, they can apply and may be able to be used for any future planning application (at the applicable planning stage involving construction of buildings).

If the response is ‘Yes’, then one of the situations below will apply to this proposal.

The Nature of this Land Use Proposal	Applicable
A proposal for a single house or ancillary dwelling (Class 1); or a specified building located in a bushfire prone area on a lot less than 1100m <sup>2</sup> or on a lot equal to or greater than 1100m <sup>2</sup> but subject to a BAL of BAL-29 or less, does not need to lodge a development application (but will require a building permit application). However, the relevant local government can additionally require that a development application is submitted for planning approval. Bushfire construction requirements will apply in both cases.	N/A
A proposal for a single house or ancillary dwelling (i.e. Class 1); or a specified building located in a bushfire prone area on a lot equal to or greater than 1100m <sup>2</sup> but subject to BAL-40 or BAL-FZ must lodge a development application and bushfire construction requirements will apply.	N/A
A proposal, regardless of lot size, for a habitable building other than a single house or ancillary dwelling (i.e. Class 2 or 3 residential or accommodation buildings); or a specified building, located in a bushfire prone area, must lodge a development application and bushfire construction requirements will apply.	N/A
A proposal, regardless of lot size, for mixed use, commercial, industrial buildings or public facilities (i.e. Class 4-9 buildings), located in a bushfire prone area, and must lodge a development application. Bushfire construction requirements will not apply (unless the local government additionally requires them to apply).	N/A

This Proposal is for a planning stage that does not yet require compliance with the *WA Building Act 2011*. However, the obligation for future buildings to be constructed to the standard corresponding to the determined bushfire attack levels is noted in Section 10 of this Plan ‘Responsibilities for Implementation and Maintenance’.

## 9.6 AS 3959 Construction of Buildings in Bushfire Prone Areas (2009 as amended)

This Proposal complies with the methodology set out in AS 3959 to classify vegetation that is a bushfire threat and to calculate the bushfire attack levels presented as a BAL Contour Map and/or a BAL assessment in Section 5 of this Plan 'Assessment of Bushfire Risk'.

For the construction of any Class 1, 2, 3 buildings and associated Class 10a buildings and decks, this land use proposal will comply with the construction requirements, set out in AS 3959, that correspond to the determined bushfire attack level/s for the subject site. This obligation is stated in Section 9 of this Plan 'Responsibilities for Implementation and Maintenance'.

## 9.7 Local Government Firebreak Notice

This Proposal complies with the requirements of the relevant local government notice by stating the landowner's obligations in Section 10 of this Plan 'Responsibilities for Implementation and Maintenance.' Additionally, the obligation is noted in Section 7.3 'Vegetation Management'.

## 9.8 Other Applicable Local Government Documents

This Plan provides the required information such that this Proposal can comply with the requirements of:

- Scheme Amendment Report, Shire of Serpentine - Jarrahdale, Town Planning Scheme No. 2 Amendment No. 187 (March 2016)
- West Mundijong Industrial Area, Bushfire Hazard Assessment, Prepared by Calibre Consulting for the Shire of Serpentine Jarrahdale (July 2015)

# 10 Responsibilities for Implementation & Maintenance

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This section sets out the responsibilities of landowners/proponents (including future landowners), builders and local government in relation to the implementation and maintenance of the requirements of SPP 3.7 and the 'Guidelines'.

## 10.1 Landowner / Proponent Responsibilities (and those acting on their behalf)

### Implementation

- Ensure anyone listed as having responsibility under the Plan has endorsed it and is provided with a copy for their information. This includes the landowners/proponents, local government and any other authorities or referral agencies ('Guidelines' s4.6.3).
- Construction of public roads and cul-de-sacs must comply with the standards (Appendix 5 'Vehicular Access').
- Construction of emergency access ways, fire service access routes and associated signs and gates must comply with the standards (Appendix 5 'Vehicular Access').
- Construction of private driveways and battle axes must comply with the standards (Appendix 5 'Vehicular Access').
- Installation of a reticulated water supply must comply with the standards (Appendix 6 'Water') or the requirements set out by the relevant local government.
- For a non-reticulated water supply, ensure that the emergency water supply structure for firefighting purposes (tanks, couplings and access) is constructed to comply with the standards (s7.5 'Fire Fighting Water Supply' and Appendix 6 'Water') or to the standard set out by the relevant local government.
- A procedure must be in place to ensure that the emergency water supply tanks are maintained at or above designated capacity, including home tanks on single lots, at all times ('Guidelines Appendix 4 'Bushfire Protection Criteria').
- Implement the low fuel Asset Protection Zone (APZ) and where applicable the Hazard Separation Zone (HSZ) as per s7.3 'Vegetation Management' and Appendix 4 'APZ and HSZ'.



- Ensure all future buildings the landowner/proponent has responsibility for, are designed and constructed in full compliance with the requirements of the WA Building Act 2011 and the referenced Building Code of Australia (BCA), and with any identified additional requirements of the relevant local government. This should include due consideration of constructing any Class 4-9 buildings to the standard corresponding to their determined BAL even though not required by the BCA.

For any Class 1, 2, or 3 buildings and associated Class 10a buildings or decks this will include compliance with AS 3959-2009 *Construction of Buildings in Bushfire Prone Areas* (2009 as amended) and/or the National Association of Steel Housing – (NASH) *Standard – Steel Framed Construction in Bushfire Prone Areas*, whereby construction standards corresponding to the assessed BAL will be applied (Appendix 2 ‘Bushfire Risk Assessment – Methodology Explained’).

- Any future ‘high-risk’ or ‘vulnerable’ land uses proposed within the scheme amendment area will require to have emergency evacuation plans and/or emergency risk management plans if in an area where the determined BAL is >BAL-12.5

#### **Deposited Plan and Certificate of Title – Potential Obligation**

The WAPC may condition a subdivision application approval with a requirement for the landowner / proponent to place a notification onto the certificate(s) of title and a notice of the notification onto the diagram or plan of survey (deposited plan). This will be done pursuant to Section 165 of the Planning and Development Act 2005 (‘Hazard etc. affecting land, notating titles as to:’) and applies to lots with a determined BAL rating of BAL-12.5 or above.

The notification will be required to state: ‘This land is within a bushfire prone area as designated by an Order made by the Fire and Emergency Services Commissioner and may be subject to a Bushfire Management Plan. Additional planning and building requirements may apply to development on this land’.

The local government may condition a development application approval with a requirement for the landowner/proponent to register a notification onto the certificate of title (and may need to be included on the deposited plan). This will be done pursuant to Section 70A Transfer of Land Act 1893 as amended (‘Factors affecting use and enjoyment of land, notification on title:’). This is to give notice of the bushfire hazard and any restrictions and/or protective measures required to be maintained at the owner’s cost.

This condition ensures that:

1. Landowners/proponents are aware their lot is in a designated bushfire prone area and of their obligations to apply the stated bushfire risk management measures; and

2. Ensures that potential purchasers are alerted to the Bushfire Management Plan so that future landowners/proponents can continue to apply the bushfire risk management measures that have been established in the Plan.

## Maintaining Compliance

- Current and future landowners/proponents must continue to apply the bushfire management measures set out in this Plan. They must inform any builders (of future structures on a Lot) of the existence of the Plan and the responsibilities it contains.
- The landowner/proponent is responsible for the ongoing review and implementation of the Bushfire Management Plan to ensure that the bushfire risk management measures remain effective. Bushfire plans do not expire and should be seen as a ‘living document’. They may require updating in certain circumstances, including (but not limited to) if site conditions change, if further details are required at subsequent stages of the planning process or to reflect new technologies or methodologies in best practice bushfire risk management (‘Guidelines’ s4.6.4 and s4.6.5).
- Respond to and comply with fire protection or hazard management notices issued by the local government. This includes compliance with the Shire of Serpentine – Jarrahdale Annual Fire Break Notice (the current requirements can be found on the Shire of Serpentine – Jarrahdale website), issued under s33 of the Bush Fires Act 1954 as directed by the ‘Guidelines’ s6.1 and referenced in this Plan s7.3 ‘Vegetation Management’, s9.7 ‘Local Government Firebreak Notice’ and Appendix 4 ‘APZ and HSZ’.
- Maintain the low fuel Asset Protection Zone (APZ) within the Lot boundary and where applicable the Hazard Separation Zone (HSZ) as per s7.2 ‘Vegetation Management’ and Appendix 4 ‘APZ and HSZ’.
- The stated minimum separation distance (refer to s7.3 Table 7.3.1) from any classified vegetation, that corresponds to a future assessed BAL, must be maintained as either a non-vegetated area or as low threat vegetation managed in a minimal fuel condition as per AS 3959-2009 s2.2.3.2 (e) and (f). A minimal fuel condition is stated in the standard as meaning “there is insufficient fuel available to significantly increase the severity of the bushfire attack” and being “recognisable as short cropped grass for example to a nominal height of 100mm.” Refer to Appendix 3 of this Plan for further detail.
- Where any existing or planned re-vegetation has been assessed as “low threat” (meeting AS 3959-2009 Section 2.2.3.2 requirements) and excluded from classification then this area will be managed to continue to meet those requirements and enable the buildings to retain their determined BAL ratings.

- The landowner/occupier has responsibility for the emergency water supply tank on a single lot for the purposes of firefighting. They must ensure that the tank is maintained in good condition and has the specified couplings. A procedure must be in place to ensure that water tanks are maintained at or above designated capacity at all times (refer to s7.5 'Fire Fighting Water Supplies' and Appendix 6 'Water')
- For the emergency water supply tank/s that have been installed to service multiple lots, be aware of the arrangement that is in place regarding who has the responsibility for maintaining the emergency water supply tank at or above designated capacity at all times. This could be in the form of an agreement with the local government and the fire service. Check that this is being complied with (refer to s7.5 'Fire Fighting Water Supplies' and Appendix 6 'Water').

## 10.2 Builder Responsibilities

The builder (generally named on the building permit) is responsible for ensuring that the building or incidental structure to which a building permit applies is, on completion, compliant with the Building Code of Australia (BCA).

For Classes 1a, 1b, 2, 3 and associated 10a buildings or decks located in a designated bushfire prone area, compliance with the BCA requires that these buildings are constructed to the requirements corresponding to their bushfire attack level rating.

The construction standards for Class 1a and 1b buildings are contained in:

- *AS 3959 - 2009 Construction of buildings in bushfire prone areas; or*
- *National Association of Steel Housing – (NASH) Standard – Steel Framed Construction in Bushfire Prone Areas.*

The construction standards for Classes 2, 3 and associated 10a buildings or decks are contained in:

- *AS 3959 - 2009 Construction of buildings in bushfire prone areas.*

The building/s must also comply with any additional local government requirements.

For any Class 4-9 buildings the builder must comply with any construction requirements that are additional to those contained in the BCA. Of particular issue is any requirement, made by the relevant local government or the owner, to construct to the standard corresponding to the determined BAL for proposed buildings.

## 10.3 Local Government Responsibilities

### Implementation

- Provide advice where the clearing of locally significant vegetation is proposed.
- Register this Bushfire Management Plan and keep a record of the sites referred to for the purpose of identify servicing and infrastructure gaps ('Guidelines' s4.6.4).

### Maintaining Compliance

- Develop and maintain district bushfire fighting services and facilities.
- Monitor landowner compliance with the annual firebreak notice issued under s33 of the Bush Fires Act 1954.
- For firefighting water tanks and associated facilities vested in the relevant local government a procedure must be in place to ensure that water tanks are maintained in good operational condition and at or above designated capacity at all times. This could be in the form of an agreement with the fire service ('Guidelines' Appendix 4, this Plan s7.5 'Fire Fighting Water Supply').

On land vested in their control, the local government must give due consideration to future actions that have the potential of changing the BAL ratings that an existing habitable building (or existing assessed development site) is subject to. Broadly these actions include:

1. Any planned revegetation of an area; and/or
2. The reduction of any vegetation management over an area that has in the past been actively managed to a minimal fuel condition and would most reasonably be expected to continue to be managed this way.

Specifically, the local government should:

1. Not revegetate an area/s to the extent that it would increase the BAL rating an existing neighbouring habitable building (or assessed development site) is subject to. The area (ha) and location (relative to any classified vegetation) of any revegetation with respect to how it would be assessed from a bushfire perspective (as per AS 3959-2009), must be considered.
2. Continue to manage vegetation to a minimum fuel condition on areas that have been assessed as low threat vegetation in a Bushfire Attack Level assessment if:
  - a. The area has been correctly excluded from classification as per AS 3959-2009 s2.2.3.2 (f); and
  - b. The exclusion of this area from classification has directly resulted in a neighbouring existing habitable building (or assessed development site), being subject to a BAL-Low rating.

## 11 Appendices – Advisory Information Only

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### Appendix 1 The WA Framework for Bushfire Risk Management

This section of the Bushfire Management Plan sets out the applicable legislation, regulations, policies, guidelines, documents, and associated bushfire risk assessments that a Bushfire Management Plan will need to reference and where applicable, comply with. Statements of compliance against these requirements, as required by the ‘Guidelines’, are presented in Section 8 of this Plan.

The state government of WA has committed to addressing bushfire through the implementation of a risk-based system of land-use planning and development that aims to reduce the risk of bushfire. The legislative means of facilitating this is through the **Planning and Development Act 2005** and its interaction with the **Fire and Emergency Services Act 1998** and the **Building Act 2011**.

#### Planning and Development (Local Planning Schemes) Amendment Regulations 2015

These regulations are given effect under the **Planning and Development Act 2005**. The *Planning and Development (Local Planning Schemes) Regulations 2015* are amended to introduce ‘Schedule 2 Part 10A ‘Bushfire Risk Management’ which establishes the *deemed provisions relating to bushfire risk management*.

“The deemed provisions relating to bushfire risk management work with the State Planning Policy 3.7: Planning in Bushfire Prone Areas (SPP 3.7) and Guidelines for Planning in Bushfire Prone Areas (Guidelines); Map of Bushfire Prone Areas; Building Regulations 2012 and Building Code of Australia to guide planning and development proposals in bushfire prone areas to ensure bushfire risk is properly managed.

The deemed provisions provide a mechanism to require a development approval, and through this the application of SPP 3.7 and the Guidelines, to development on sites where BAL-40 or BAL-Flame Zone (FZ) applies. SPP 3.7 sets out the planning hierarchy and the information required at each stage of the planning process whilst the Guidelines provide information on how SPP 3.7 should be implemented” (source: WAPC Planning Bulletin 111/2015 Planning in Bushfire Prone Areas).

#### The **deemed bushfire provisions**:

- Only apply to development that is proposed on a site in a designated bushfire prone area.
- Override any existing local planning scheme provisions relating to bushfire, including any inconsistent provisions, apart from special control areas.

- Are in addition to any provisions relating to development in a bushfire prone area that apply to a special control area.
- Can be supplemented by a local planning scheme (by implementing a special control area) but not varied or exempted.
- Are applied and work through the following legislation, regulations, policies, guidelines, and documents – each of which this Bushfire Management Plan will address.

## Map of Bushfire Prone Areas

The Map of Bushfire Prone Areas identifies land that has been designated as being bushfire prone by the Fire and Emergency Services Commissioner under the *Fire and Emergency Services (Bushfire Prone Areas) Order 2015* as part of the ***Fire and Emergency Services Act 1998***.

Designation as a bushfire prone area (highlighted as pink on the map) reflects the potential of bushfire to affect that site. It acts as a mechanism for initiating further assessment in the planning and building process. This can involve bushfire risk assessment and management measures being required in planning submissions and activation of the bushfire construction requirements of the Building Code of Australia.

## State Planning Policy No. 3.7: Planning in Bushfire Prone Areas (SPP 3.7)

This policy is made under the ***Planning and Development Act 2005*** and provides the foundation for land use planning to address bushfire risk management in Western Australia.

SPP 3.7 applies to every stage of the planning process (i.e. all higher order strategic planning documents; strategic planning proposals; subdivision and development applications) in designated bushfire prone areas. It also applies to an area not yet designated as bushfire prone but is proposed to be developed in a way that introduces a bushfire hazard (*Guidelines for Planning in Bushfire Prone Areas WAPC 2015 s3.2.2*).

The objectives of this policy are to:

- Ensure that all stages of land use planning (higher order strategic planning documents; strategic planning proposals; subdivision and development applications) identify and consider bushfire risk and apply specified bushfire protection measures; and
- To have an outcome that will avoid any increase in the threat of bushfire to people, property and infrastructure, preserve life and achieve an appropriate balance between bushfire risk management measures and all environmental conservation aspects.

Policy measures to achieve the objectives are defined and:

- They vary according to the type and scale of the planning proposal and stage of the development process;
- They set out the information to be prepared for each type of proposal; and
- They refer to the *Guidelines for Planning in Bushfire Prone Areas (WAPC 2015)* as supporting this policy and providing the procedural detail for assessment and presentation of the required information.

## Guidelines for Planning in Bushfire Prone Areas (WAPC 2015 as amended)

These Guidelines are designed to supplement and assist in the interpretation of SPP3.7's objectives and policy measures. They provide advice on how bushfire risk is to be addressed when planning, designing or assessing a planning proposal.

As an endorsed standard (by the Office of Bushfire Risk Management), these Guidelines, in conjunction with SPP 3.7, are the predominant documents in the State for use by decision making authorities and referral agencies, during the consideration of strategic planning proposals, subdivisions and development applications.

The Guidelines set out the interrelationships between, and requirements for, various assessment tools used to assess risk in the planning context, as prescribed by SPP 3.7. These include:

- A Bushfire Hazard Level assessment;
- A Bushfire Attack Level (BAL) Contour Map;
- A Bushfire Attack Level (BAL) assessment;
- The Bushfire Protection Criteria; and
- A Bushfire Management Plan

The 'Guidelines' reference the Bushfire Attack Level descriptions and assessment methodologies that are defined in AS 3959.

## Bushfire Protection Criteria

The bushfire protection criteria (set out in the 'Guidelines Appendix 4) are a performance based system of assessing bushfire risk management measures. An assessment against the criteria is to be undertaken for any strategic planning proposal, subdivision and development application for a

site that has or will on completion, have a bushfire hazard level above 'Low or a BAL rating above BAL-LOW.

The protection criteria consist of four elements: Location; Siting and Design of Development; Vehicular Access; and Water.

Each element has three components: Intent; Acceptable Solutions; and a Performance Principle. How to apply the Criteria is set out in the 'Guidelines' s4.5.2.

## Local Variations to Bushfire Protection Criteria

Local governments may seek to add or to modify the acceptable solutions to recognise special local or regional circumstances (e.g. topography / vegetation / climate which reinforce the intent of a particular bushfire protection element and apply across a defined locality.

These endorsed (by WAPC and DFES) variations will be in the form of a local planning scheme amendment /provision or special control area. Currently they may be in the form of a local planning policy.

## WA Building Regulations 2012

- These regulations exist under the **WA Building Act 2011** and adopt the **Building Code of Australia** as the minimum technical requirements for the design and construction of buildings and certain other structures in WA.
- The majority of development in WA requires a building permit before construction can commence. This process typically occurs after the planning process.
- The Regulations include the **Building Amendment Regulations (No.3) 2015** that prescribe applicable building standards for buildings located in areas designated by the Fire and Emergency Services Commissioner as bushfire prone areas (identified on the Map of Bushfire Prone Areas).

## Building Code of Australia (BCA)

- The BCA provides minimum technical requirements for the construction of buildings. These are presented as Volumes One and Two of the National Construction Code series.
- The BCA requires an assessment of the potential intensity of bushfire attack for specific classes of residential buildings located in designated bushfire prone areas (Classes 1a, 1b, 2, 3 and associated 10a buildings or decks).
- The BCA requires that these buildings are constructed to the requirements corresponding to their bushfire attack level rating.



- Compliance with BCA bushfire requirements for Class 1a and 1b buildings in designated bushfire prone areas can be demonstrated by compliance with:
  - a. Australian Standard *AS 3959 Construction of buildings in bushfire prone areas*; or
  - b. National Association of Steel Housing – (NASH) Standard – *Steel Framed Construction in Bushfire Prone Areas*.
- Compliance with BCA bushfire requirements for Classes 2, 3 and associated 10a buildings or decks in designated bushfire prone areas can be demonstrated by compliance with:
  - a. Australian Standard *AS 3959 Construction of buildings in bushfire prone areas*.

## AS 3959 Construction of Buildings in Bushfire Prone Areas (2009 as amended)

The objective of this Standard is to prescribe construction details for buildings to reduce the risk of ignition from a bushfire, appropriate to the:

- a) Potential for ignition caused by embers, radiant heat or flame generated by a bushfire; and
- b) Intensity of the bushfire attack on the building.

To achieve this, the Standard defines six categories of Bushfire Attack Level (BAL), details their assessment methodology and specifies constructions standards corresponding to each.

## Western Australia Bush Fires Act 1954 (as amended)

‘An Act to make better provision for diminishing the dangers resulting from bush fires, for the prevention, control and extinguishment of bush fires’. Matters addressed in the Act include prohibited burning times, total fire bans, bushfire control and extinguishment

The Act sets out the authority given to local government which enables them to:

- Control and extinguish bushfires
- Establish and maintain Bushfire Brigades
- Require landowners and/or occupiers to install and maintain firebreaks to their required specifications
- Require landowners and/or occupiers manage bushfire fuel loads upon the land to their required specifications

The applicable document is the annually issued **Firebreak Notice** published by the relevant local government that sets out the obligations for landowners and/or occupiers.

## Other Applicable Local Government Documents

These may include:

- Local planning scheme provisions.
- Local planning strategy references to bushfire risk management.
- Local planning strategy references to environment.
- Applicable structure plans
- Special control area provisions
- Previous planning approvals

## Other Documents

These may include:

- Any existing Bushfire Management Plan, Bushfire Hazard Level assessment or BAL assessment prepared over the site.
- Relevant landscaping plans applicable to the subject site.

## Appendix 2

### Bushfire Risk Assessment – Understanding the Methodology

In SPP 3.7 ‘bushfire risk’ is defined as “the chance of a bushfire igniting, spreading and causing damage to people, property and infrastructure.”

“Before a strategic planning proposal, subdivision or development application can be considered, it is necessary to understand the extent of the bushfire hazard and its potential to affect people, property and infrastructure. An assessment of bushfire risk is a key component of deciding whether a strategic planning proposal, subdivision or development application should be approved in an area with a potential bushfire threat (from the ‘Guidelines’).”

Policy measures in *SPP 3.7* (and the associated document *Guidelines for Planning in Bushfire Prone Areas WAPC 2015*) prescribe the various assessment tools to be used to assess bushfire risk in the planning context. These are:

- Bushfire Hazard Level assessment;
- Bushfire Attack Level (BAL) Contour Map;
- Bushfire Attack Level (BAL) assessment;
- Bushfire protection criteria; and
- Bushfire Management Plan

The intent of this Appendix ‘Bushfire Risk Assessment – Understanding the Methodology’ is to provide an overview of the methodology used in assessing the Bushfire Hazard Level and the Bushfire Attack Level.

#### Bushfire Hazard Level Assessment Methodology

Used at a strategic planning level, this methodology rates bushfire hazards into three potential categories of low, moderate and extreme by considering the following characteristics:

- Vegetation types and areas
- Effective ground slope under the vegetation threat
- Existing land use on and around the area being assessed
- Prevailing climatic conditions when appropriate

These results are then presented as a Bushfire Hazard Level Map.

## Bushfire Attack Level Assessment Methodology

The Australian Standard *AS 3959-2009 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 expressed in kilowatts per metre squared, and is the basis for establishing the requirements for construction to improve protection of building elements from attack by bushfire.”*

*AS 3959-2009* defines six categories of Bushfire Attack Level (BAL) (*AS 3959 Appendix G*); provides the assessment methodology (*AS 3959 s2 and Appendix B*); and specifies constructions standards corresponding to each BAL (*AS 3959 s3 Table 3.1*). The BAL’s and corresponding descriptions of the predicted levels of exposure and heat flux exposure thresholds are contained in the table on the following page.

*AS 3959-2009* provides two methods to calculate Bushfire Attack Levels:

1. **Method 1** - a simplified procedure that involves five procedural steps to determine the BAL. It is subject to some limitations of the circumstances in which it can be used.
2. **Method 2** - a detailed procedure using calculations to determine BALs where a more specific result is sought or site conditions are outside the scope of Method 1. In particular, the use of Method 2 is to apply if the effective slope under the classified vegetation is greater than 20<sup>0</sup> down slope (and no more than 30<sup>0</sup> down slope) and the slope of the land between the site and the classified vegetation is no more than 20<sup>0</sup> regardless of slope type.

### Method 1 – Summarised Procedure

- Determination of the area to be assessed
- Determine predominant vegetation type(s) within 100 metres of the site and classify
- Determination of distance of the site, building or building envelop from the classified vegetation type(s)
- Determination of the effective slope under the classified vegetation type(s)
- Determination of BAL’s - Forest Fire Danger Index (FFDI) of 80 is used for WA

**Separation Distance:** *The distance from a subject site (or building) to a specific area of classified vegetation (i.e. the bushfire threat) is labelled in the tables of this Plan as a separation distance. This distance is measured to a point in the vegetation area represented by the “edge of the vegetation” as per AS 3959 -2009 s2.2.4 and the “base of the bushfire prone vegetation (not the canopy)” as per the BAL Assessment [Basic] Factsheet Version 1 December 2015 WAPC. The exact point of measurement is then decided by the assessor on the basis of the fuel structure and expected fire behaviour. If a*

*precautionary approach is considered appropriate to a given situation the measurement will be taken at the canopy line.*

**Bushfire Attack Level Definitions and Corresponding Sections Specifying Construction Requirements (Source: AS 3959-2009, Appendix G and Table 3.1)**

<b>Bushfire Attack Level (BAL)</b>	<b>Description of Predicted Bushfire Attack and Levels of Heat Flux Exposure</b>	<b>Construction Section of AS 3959</b>
<b>BAL - LOW</b>	There is insufficient risk to warrant specific construction requirements but there is still some risk.	4
<b>BAL - 12.5</b>	There is risk of ember attack. The construction elements are expected to be exposed to a heat flux not greater than 12.5 kW/m <sup>2</sup>	3 and 5
<b>BAL - 19</b>	There is a risk of ember attack and burning debris ignited by wind borne 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 <sup>2</sup>	3 and 6
<b>BAL - 29</b>	There is an increased risk of ember attack and burning debris ignited by wind borne embers and a likelihood of exposure to an increased level of radiant heat. The construction elements are expected to be exposed to a heat flux not greater than 29 kW/m <sup>2</sup>	3 and 7
<b>BAL - 40</b>	There is a much increased risk of ember attack and burning debris ignited by wind borne 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 40 kW/m <sup>2</sup>	3 and 8
<b>BAL - FZ</b>	There is an extremely high risk of ember attack and burning debris ignited by wind borne embers, 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 <sup>2</sup>	3 and 9



## Method 2 – Summarised Procedure

- Determine the relevant FDI or wind speed
- Determine classified vegetation type(s), height and fuel loads
- Determine the effective slope under the classified vegetation
- Determine the slope of the land between the site and classified vegetation
- Determine the distance of the site from classified vegetation
- Calculate the flame length and determine the flame width
- Determine the elevation of receiver/buildings
- Calculate the radiant heat flux
- Determination of BAL's

## Appendix 3

### Vegetation Classification Exclusions (AS 3959-2009 s2.2.3.2)

Certain vegetation can be excluded from being classified in which case the Bushfire Attack Level shall be rated as BAL-LOW and no bushfire specific construction requirements apply. Such 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.
- c) Multiple areas of vegetation less than 0.25ha in area and not within 20m of the site or each other.
- d) Strips of vegetation less than 20m in width regardless of length and not within 20m of the site or each other, or other areas of vegetation being classified.
- e) Non-vegetated areas, including waterways, roads, footpaths, buildings, and rocky outcrops.
- f) Low threat vegetation, including grassland managed in a **minimal fuel condition** (i.e. insufficient fuel available to significantly increase the severity of a bushfire attack – recognisable as short cropped grass to a nominal height of 100mm for example), maintained lawns, golf courses, maintained public reserves and parklands, vineyards, orchards, cultivated gardens, commercial nurseries, nature strips and windbreaks.

## Appendix 4

### Technical Requirements – Bushfire Protection Criteria (APZ & HSZ)

A vital and effective component of managing the potential bushfire risk to people, property and infrastructure is creating bushfire protection zones in which fire fuel loads are reduced and maintained. They are an integral part of subdivision and development design and appropriately designed will greatly assist with bushfire prevention and suppression operations.

The *Guidelines for Planning in Bushfire Prone Areas (WAPC 2015, Appendix 4)* set out the requirements to create an Asset Protection Zone (APZ) and a Hazard Separation Zone (HSZ). The aim of these bushfire protection zones is to have a fire of diminishing intensity and flame length as it approaches development. These reduced fuel loads will reduce the intensity of radiant heat onto the buildings, thereby increasing their survivability.

The APZ is a low fuel area immediately surrounding a habitable or specified building and is designed to prevent direct flame contact with buildings and it improves safety for firefighters and occupants during fire suppression activities. Maintaining this zone in a minimal fuel condition is essential and firefighters are not obliged to protect an asset if they think the separation distance between the dwelling and vegetation is unsafe.

Note that individual local governments may vary their specifications of the APZ from those indicated below. These specifications will be contained in their Firebreak and Fuel load notices and are to be complied with.

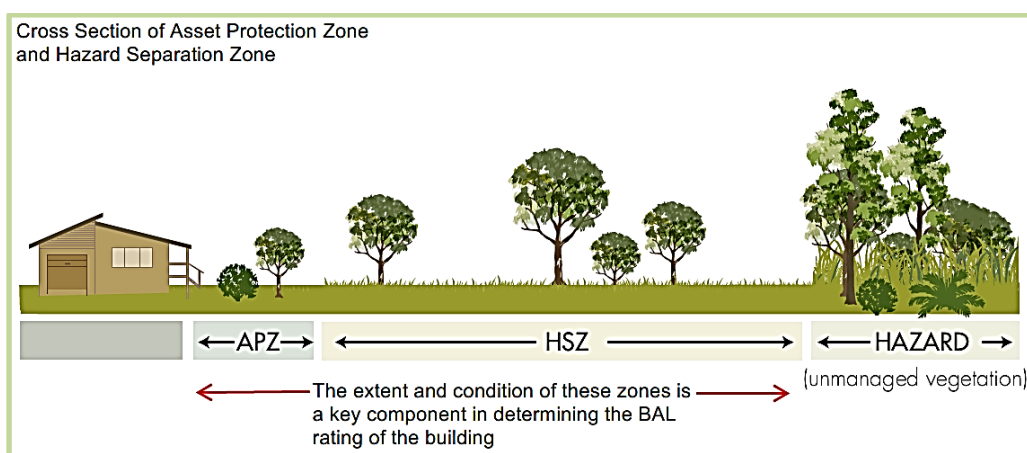
#### **Asset Protection Zone (APZ) Requirements (source: ‘WAPC Guidelines’)**

- **Width:** 20 metres measured from any external wall of the building or building envelope. Where the slope increases above 10°, the APZ should be increased to ensure the potential radiant heat impact of a fire does not exceed 29 kW/m<sup>2</sup> (i.e. a BAL-29 rating on the building).
- **Location:** the APZ should be accommodated within the boundaries of the lot on which the building is situated. Where a full 20 metre APZ is not possible the APZ should be sufficient enough to ensure the potential radiant heat impact of a fire does not exceed 29 kW/m<sup>2</sup> (i.e. a BAL-29 rating on the building).
- **Fine Fuel Load:** reduced to and maintained at 2 t/ha. (DFES guidance-keep grasses short, remove leaves, twigs, dead material within shrubs and trailing bark, and prune branches to 2 metres above the ground).
- **Trees:** crowns are a minimum distance of 10 metres apart (a small group of trees within close proximity to one another may be treated as one crown provided the combined crowns do not exceed the area of a large or mature crown size for that species) and no crowns overhang the building.
- **Shrubs/Trees:** no tall shrubs or tree foliage within two metres of a building
- **Sheds and Fences:** within the APZ are constructed using non-combustible materials (e.g. iron, brick, limestone, metal post and wire) and sheds do not contain flammable materials.



## Additional DFES Guidance

- Do not clump shrubs close to a building. Ensure there is a gap between shrubs and buildings of three times their mature height.
- Store firewood at least 20 metres away from the building.
- Keep gutters free of leaves and other combustible material.
- Roof mounted evaporative coolers to be fitted with ember screens.
- Gas cylinders to vent away from a building and be tethered to prevent falling over.
- Driveways and access ways must allow for safe passage of a fire appliance to all buildings on the land.
- Land owners/occupiers must maintain compliance with the local government's annual firebreak notice issued under s33 of the Bush Fires Act 1954.
- Barriers such as driveways, lawns, ovals, orchards and pathways surrounding dwellings can form part of a APZ. Locate them to maximise building protection.



## Hazard Separation Zone (HSZ) Requirements (source: 'WAPC Guidelines')

The 'Guidelines' set out the requirement for a physical separation between extreme bushfire hazard areas and development in low and moderate hazard areas both around and within subdivisions.

- Width:** a minimum of 80 metres measured from the outer edge of the APZ for any vegetation classified in AS3959 as forest, woodland, closed shrub, open shrub, mallee/mulga and rainforest OR 30 metres, measured from the outer edge of the APZ, for unmanaged grassland.
- Location:** within the boundaries of the lot on which the building is situated or, where this is not possible or desirable, within the boundaries of the development precinct in which the building is proposed to be located.
- Fine Fuel Load:** dead material <6mm diameter and live material <3mm is to be reduced to and maintained at 5 - 8 t/ha for jarrah/marri dominated forest and woodlands, below 12 -15 t/ha in mallee heath and below 15 t/ha in karri forest.
- Exception** - a HSZ may not be required if the proposed construction meets the standard appropriate to the assessed BAL for that location/building and that BAL does not exceed BAL-29.

The intent is to create a combined minimum separation distance of 100 metres between the buildings and the hazard (50 metres if unmanaged grassland). This separation distance may be reduced if the development is compliant with AS 3959 (i.e. as the distance from classified vegetation is reduced, the construction standard must be increased) or by using a performance principle assessment.

## Appendix 5

### Technical Requirements - Bushfire Protection Criteria (Vehicular Access)

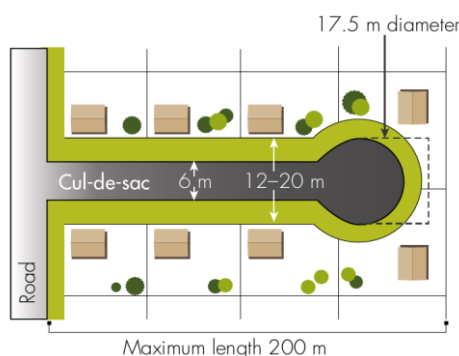
#### Vehicular Access – Technical Requirements of Acceptable Solutions - Part 1

Source: *Guidelines for Planning in Bushfire Prone Areas WAPC 2015*

##### 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:

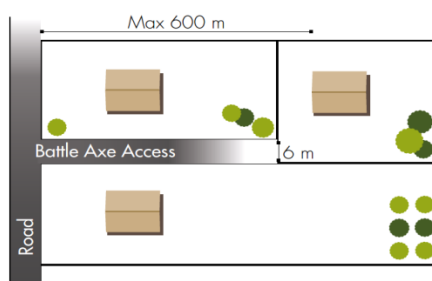
- Maximum length is 200m. If public emergency access is provided between cul-de-sac heads (as a right of way or public access easement in gross), the maximum length can be increased to 600m provided no more than 8 lots are serviced and the emergency access way is less than 600m in length;
- Turnaround 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.



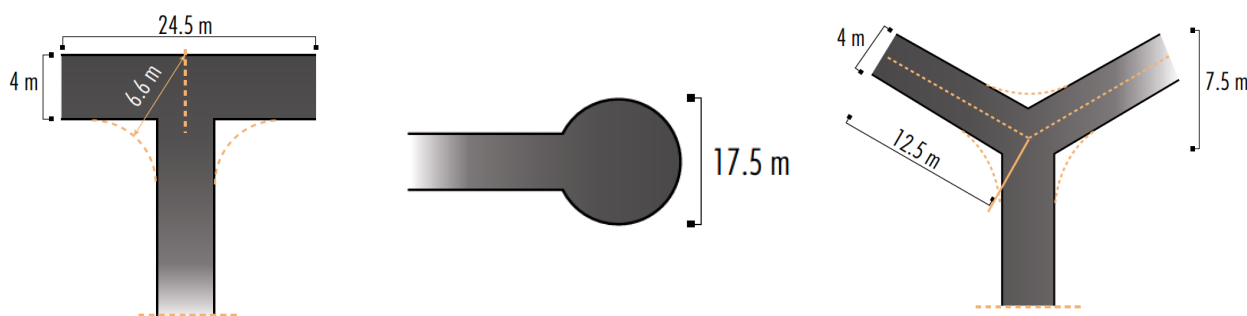
### Acceptable Solution 3.5 Private Driveways

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:

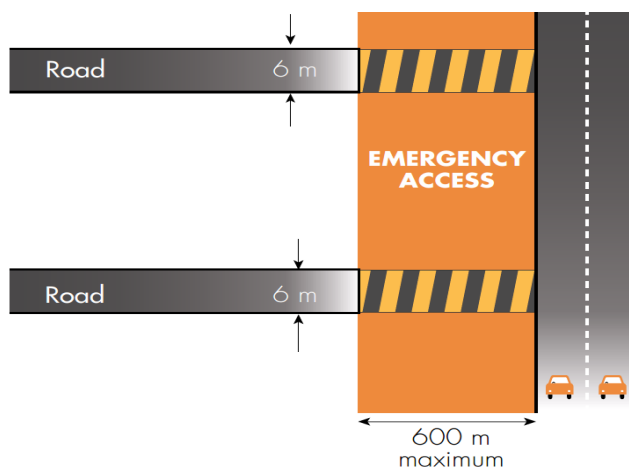
- Passing bays every 200 metres with a minimum length of 20 metres and a minimum width of two metres (ie combined width of the passing bay and constructed private driveway to be a minimum six metres);
- Turn-around areas every 500 metres and within 50 metres of a house, designed to accommodate type 3.4 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 3.6 Emergency Access Way

An access way that does not provide through access to a public road is to be avoided bushfire prone areas. Where no alternative exists, an emergency access way is to be provided as an alternative link to a public road during emergencies. The following requirements are to be achieved:

- No further than 600 metres from a public road;
- Must be signposted including where they ajoin public roads;
- Provided as a right of way or public access easement in gross;
- Where gates are used they must not be locked and they must be a minimum width of 3.6 metres with design and construction approved by local government (refer to the example in this appendix); and
- Meet the additional design requirements set out in Part 2 of this appendix.



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### **Acceptable Solution 3.7 Fire Service Access Routes (Perimeter Roads)**

Are to be established to provide access within and around the edge of subdivision and related development and to provide direct access to bushfire prone areas for firefighters and link between public road networks for firefighting purposes. Fire service access is used during bushfire suppression activities but can also be used for fire prevention work. The following requirements are to be achieved:

- No further than 600 metres from a public road (driveways may be used as part of the designated fire service access;
- Dead end roads not permitted;
- Allow for two-way traffic (i.e. two 3.4 fire appliances);
- Provide turn-around areas designed to accommodate 3.4 fire appliances and to enable them to turn around safely every 500m (i.e. kerb to kerb 17.5 metres);
- All weather surface (i.e. compacted gravel, limestone or sealed) and have erosion control measures in place;
- Must be adequately sign posted;
- Where gates are used they must be a minimum width of 3.6 metres with design and construction approved by local government (refer to the example in this appendix) and may be locked (use a common key system);
- Meet the additional design requirements set out in Part 2 of this appendix;
- Provided as right of ways or public access easements in gross; and
- Management and access arrangements to be documented and in place.

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### **A3.8 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.

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## Vehicular Access - Technical Requirements of Acceptable Solutions - Part 2

Source: *Guidelines for Planning in Bushfire Prone Areas WAPC 2015*

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.

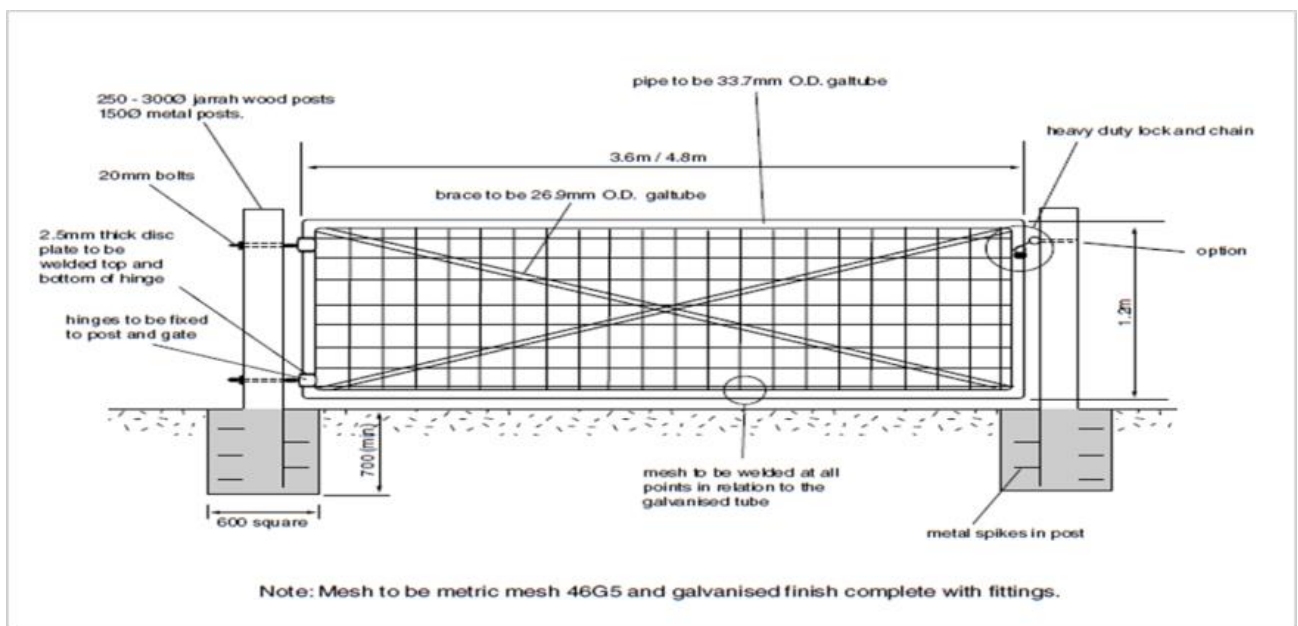
## Vehicular Access - Technical Requirements of Acceptable Solutions

### Gates and Signs

(example requirements – check with local government)

#### Gates (Bollards)

- Minimum width 3.6m
- Design and construction to be approved by relevant local government.
- Emergency access way gates must not be locked.
- Fire service access route gates may be locked but only with a common key that is available to local fire service personnel.
- Bollards will be to the relevant local government specifications



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## Signs

- Minimum height above ground of 0.9m.
- Lettering height to be 100mm.
- To display the words (as appropriate) “Emergency Access Only” or “Fire Service Access – No Public Access”.
- Design and construction to be approved by the relevant local government.
- Size 600mm x 400mm.
- Sign colour red, base (white) area is reflective background.
- Rounded corners, radius 20mm.
- White key-line 3mm wide, 3mm from outside edge.
- Suggested mounting hole six 6mm diameter.



## Appendix 6

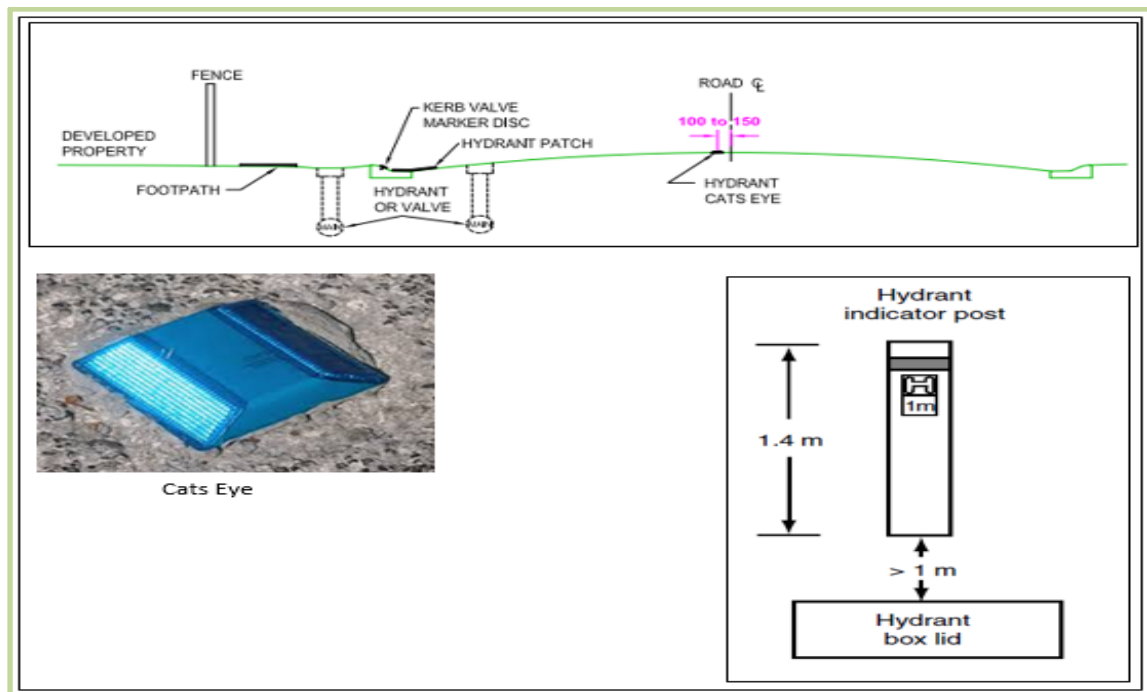
### Technical Requirements - Bushfire Protection Criteria (Water)

Source: *Guidelines for Planning in Bushfire Prone Areas WAPC 2015* and DFES website

#### Acceptable Solution 4.1 Reticulated Areas

The requirement is to supply a reticulated water supply, together with fire hydrants, in accordance with the specifications set by DFES and the relevant water supply authority (WA Water Corporation or Aqwest - Bunbury or Busselton Water). 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. 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<sup>2</sup> (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



## Acceptable Solution 4.2 Non-Reticulated Areas

Static water supplies are used by firefighters in areas where there is no reticulated water supply. Water tanks are the only acceptable static water source acceptable to meet Element 4 (Water) of the Bushfire Protection Criteria as per the *Guidelines for Planning in Bushfire Prone Areas (WAPC 2015) Appendix 4*.

The requirements for the development being assessed can be increased by the relevant local government. If a variation applies it will be noted in s7.1 and s7.4.

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Volume:	50,000 litres per tank
Ratio of tanks to lots:	1 tank per 25 lots (or part thereof)
Location:	No more than two kilometres to the furthest house site within the residential development to allow a 2.4 fire appliance to achieve a 20-minute turnaround time at legal road speeds.
Tank Construction:	Above ground tanks constructed using concrete or metal. Stands of raised tanks are constructed using non-combustible materials and heat shielding where applicable (required for metal stands).
Pipe Construction:	Galvanised or copper (PVC if buried 300mm below ground).
Access:	Hardstand and turnaround areas suitable for a 3.4 appliance (i.e. kerb to kerb 17.5metres) are provided within three metres of each tank.
Couplings:	Tanks are to be fitted with a full flow gate (not ball) valve and a 100mm cam-lock coupling of metal/alloy construction (source: DFES). Examples below:




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Ownership and Responsibility:	Water tanks and associated facilities are vested in the relevant local government. A procedure must be in place to ensure that water tanks are maintained at or above designated capacity at all times.
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## Acceptable Solution 4.3 Non-Reticulated Areas - Individual Lots

**This solution is only for use if creating one additional lot and cannot be applied cumulatively** (*Guidelines for Planning in Bushfire Prone Areas WAPC 2015 Appendix 4*).

Single lots above 500 m<sup>2</sup> need a dedicated static water supply on the lot that has an effective capacity of 10,000 litres (*Guidelines for Planning in Bushfire Prone Areas WAPC 2015*).

### An Example Local Government Requirement:

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Volume:	Minimum 10,000 litres (effective) per tank dedicated to firefighting purposes. The storage tank must not facilitate sharing the water for domestic use (danger of contamination).
Tank Construction:	Above ground tanks constructed using concrete or metal.
Pipe Construction:	Galvanised or copper (PVC if buried 300mm below ground).
Access:	Hardstand and turnaround area suitable for a 3.4 appliance (i.e. kerb to kerb 17.5metres) is provided at the tank.
Couplings:	Tanks are to be fitted with a full flow gate (not ball) valve and a 50mm or 100mm cam-lock coupling of metal/alloy construction. Examples below:
Responsibility:	A procedure must be in place to ensure that water tanks are maintained at or above designated capacity at all times.



Recommended coupling  
50mm

