BUSHFIRE PRONE PLANNING

Bushfire Management Plan

(Subdivision Application)

Moore River South

Lots 2424, 2802, 2914, 2593, 3099 & 3156
Barragoon Road

CARABAN

Shire of Gingin

Job Number:	170905
Assessment Date:	1 March 2018
Report Date:	14 May 2018

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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, persons injured, or fatalities occur either on the subject site or off the site while evacuating. This is substantially due to the unpredictable nature and behaviour of fire and extreme weather conditions. Additionally, the correct implementation of the required bushfire protection measures (and any associated response/evacuation plan if applicable) 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 based on information available to Bushfire Prone Planning at the time.

All maps included herein are indicative in nature and are not to be used for accurate calculations.

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

Document Control

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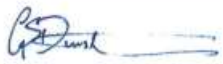
Author	Accreditation	Signature
Greg Dunstan	BPAD Level 1 - No. 16382	
Co-author		
Gary Fawell	-	
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Mike Scott	BPAD Level 3 - No. 27795	

Document Content Compliance Statement

This Bushfire Management Plan (the Plan) provides the required information to address State Planning Policy No. 3.7: Planning in Bushfire Prone Areas - December 2015 (SPP 3.7), the associated Guidelines for Planning in Bushfire Prone Areas - WAPC 2017 v1.3 (Guidelines), and any additional information as directed by the WA Planning Commission (WA Department of Planning, Lands and Heritage). It is fit for accompanying a planning application.

Structure Plan / Subdivision BMP Template v7.3

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Executive Summary

Bushfire Prone Planning (BBP Group Pty Ltd) has been commissioned by Moore River Company Pty Ltd to prepare a Bushfire Management Plan to accompany subdivision application for the Moore River South Development area. The Moore River South subdivision will be developed in stages, with each stage incorporating the necessary bushfire protection criteria and bushfire management planning reviewed at the subsequent stages. The Bushfire Management Plan is to determine viable and appropriate bushfire protection measures that are to be implemented in the design and appropriate staging of the subdivision. Areas adjacent to and within the assessed site are within a designated bushfire prone area and future development within the proposed town site requires the application of *State Planning Policy No. 3.7: Planning in Bushfire Prone Areas* (SPP 3.7).

This document has been prepared to provide strategies and bushfire protection measures that are to be incorporated into the staged development, within the context of the bushfire planning requirements in WA. There is a need to provide to the decision maker detailed supporting information where the intensification of land use may result in an increase risk to future occupants residing in a bushfire prone area. This has been undertaken as concisely as possible to demonstrate how planning compliance can be met, as well as supporting the stated expert opinion and judgement.

Contained within the Bushfire Management Plan, contour mapping is utilised to visually show the potential radiant heat impacts (from bushfire prone vegetation), as separate Bushfire Attack Level contours across the site. The indicative BAL's have been derived for proposed Lots within the assessed area. The purpose is to inform future development planning by determining or indicating the Bushfire Attack Levels (BAL's) that future Lots and buildings, within the proposed town site, are potentially subject to.

Against the Bushfire Protection Criteria, the decision maker's assessment of the Proposal will be on the basis of it being able to meet the Acceptable and any Alternative Solutions, once construction and landscaping is complete, as follows:

- For Element 1 'Location', the Proposal is able to achieve the acceptable solution (by being located in an area that will on completion be subject to BAL-29 or less);
- For Element 2 'Siting and Design' the Proposal is able to meet the acceptable solutions by every habitable building being able to achieve an APZ of sufficient size to ensure the radiant heat impact does not exceed BAL-29;
- For Element 4 'Water', the Proposal is able to achieve the acceptable solution (it will be able to provide the specified water supply for fire-fighting).
- For Element 3 'Vehicular Access', the Proposal cannot meet the current acceptable solutions A3.1 and A3.3 (provision of two access routes to different destinations). The current bushfire protection criteria only provide for the safe location of persons subject to any level of threat from a bushfire, by requiring that they leave via a 'safe' route. Current acceptable solutions consider that two routes provide the required level of safety. Development of an alternative solution, based on the provision of a single access route, is problematic given the intent of Element 3 is based on the qualitative requirement of being 'safe' and therefore subject to opinion. Nonetheless, the proposal considers the application of protection measures to improve the level of safety able to be provided by the single route.

Also, the proposal identifies bushfire mitigation measures which work together to provide for safe location of persons by providing both a safe leaving option (i.e. using the single access route early) and safe stay on site options, for all residents and visitors.

The proposed designed solutions for this subdivision will use bushfire protection measures that include:

- Subdivision design to reduce the potential bushfire impact on dwellings. The intention is to reduce the maximum BAL rating to BAL-12.5 by incorporating appropriate design including incorporating road reserves – to improve the protection provided by this design element;
- Using construction standards for buildings that will account for the potential bushfire impact on the site (primarily embers resulting from bushfire) and provide shelter for occupants during the passage of a bushfire front;
- Designing and incorporating a designated bushfire assembly area for visitors, campers and other such transient persons who are not residents and do not have immediate access to dwellings constructed to AS3959-2009 or NASH Standard;
- Modify the single access route to provide greater safety to persons in vehicles;
- Appropriate onsite landscaping design; and
- The implementation of a subdivision stage Response to Bushfire Plan and spatial representation, with sign posting of this detail at key entry and exit points to the town-site.

Key design parameters for the assembly building for persons who are not residents include:

- Constructed according to the requirements (and the concept) contained in the *NASH Standard for Steel Framed Construction in Bushfire Areas (2014) and the ABCB Information Handbook - Design* and *Construction of Community Bushfire Refuges (2014)* – as applicable to the site;
- The building is to be located so that it is subject to a maximum of 10kW/m^2 of radiant heat flux which requires a separation distance from the Class C Shrubland on the site of 32.5m;
- An outside area adjacent to the refuge building for excess numbers of persons which would be required to be subject to a maximum of 1kW/m^2 of radiant heat flux. A separation distance of 130m from the Class C Shrubland on the site required.

This designed solution provides for a much lower risk to dwelling occupants in most situations compared to being on the road when a bushfire is in the vicinity. The designed solution effectively creates a tenable environment for occupants within a building when the entire non-combustible roof, wall and floor structure acts together to protect the habitable space. Also, a suitable Occupant Response to Bushfire Plan, is required before assembly buildings are occupied.

An assessment of the site indicates that selective removal and subsequent management of existing on-site vegetation (primarily shrubland and grassland) can be implemented to result in the achievable BAL rating for proposed buildings being no greater than BAL-12.5 (and in some cases, BAL-LOW). Landscaping and subsequent ongoing vegetation management programs will be implemented to ensure all relevant vegetation will be maintained in a low threat condition as per clause 2.2.3.2 of *AS 3959-2009 Construction of buildings in bushfire prone areas* and the Standards for APZ's *(Appendix 4 Schedule 1 Guidelines WAPC)*, to provide appropriate APZ separation distances around all buildings or cells of buildings.

It is also necessary to remove the potential for direct flame contact scenarios and minimise radiant heat impact within the subdivision site, therefore identifying that the primary threat to the subdivision is from ember attack. Further to the above, the layout of structural components within the proposed subdivision are optimized from a bushfire threat mitigation perspective. The application and robustness of the bushfire protection measures therefore are improved by the design of these structures.

1 The Proposal and Purpose of the Plan

1.1 Details

Landowner / Proponent:	Moore River Company Pty Ltd
Site Address:	Lot No. 2424, 2802, 2914, 2593, 3099 & 3156, Barragoon Road
Local Government:	Shire of Gingin
Site Area:	1216.3111 hectares
No. of Proposed Lots:	(Refer to Table 1.1)
Planning Stage:	Subdivision
Subdivision Type:	Subdivision - Large number of lots
Overview of the Proposal:	Future town-site Moore River South, staged development. Comprising of residential land use, mixed business, tourism, caravan and camping grounds, primary school, community facilities and parks and recreation.
Bushfire Prone Planning Commissioned to Produce the Plan by:	Moore River Company Pty Ltd
Purpose of the Plan:	To accompany a planning application
For Submission to:	WA Planning Commission (WAPC)

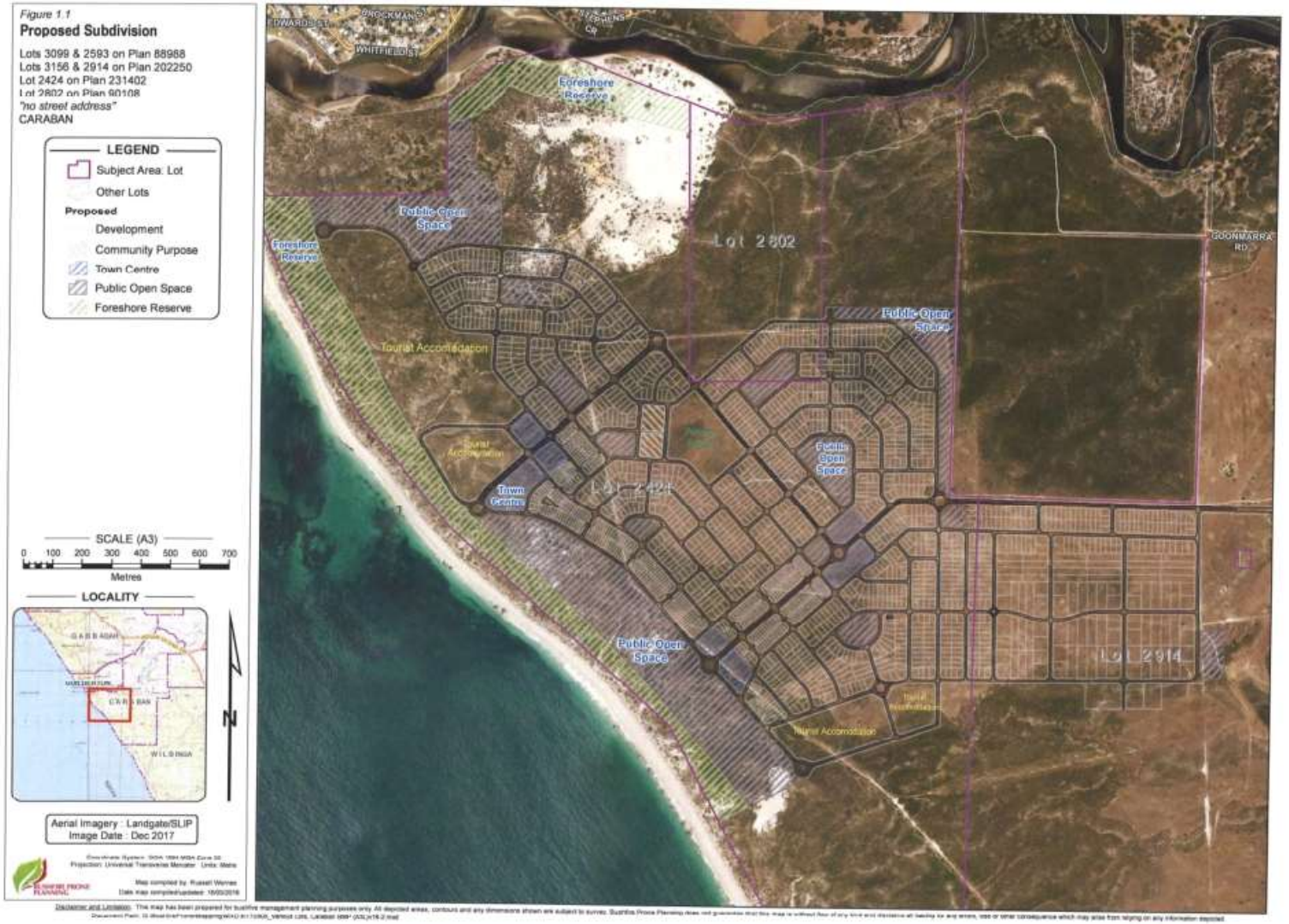


Figure 1.1
Proposed Subdivision
Lots 3099 & 2593 on Plan 88968
Lots 3156 & 2914 on Plan 202250
Lot 2424 on Plan 231402
Lot 2802 on Plan 90108
"no street address"
CARABAN
LEGEND
Subject Area: Lot
Other Lots
Proposed
Development
Community Purpose
Town Centre
Public Open Space
Foreshore Reserve
SCALE (A3)
0 100 200 300 400 500 600 700
Metres
LOCALITY
Aerial Imagery : Landgate/SLIP
Image Date : Dec 2017
Foreshore Reserve
Public Open Space
Lot 2802
GOONMARRA RD
Tourist Accomodation
Town Centre
Lot 2424
Lot 2914

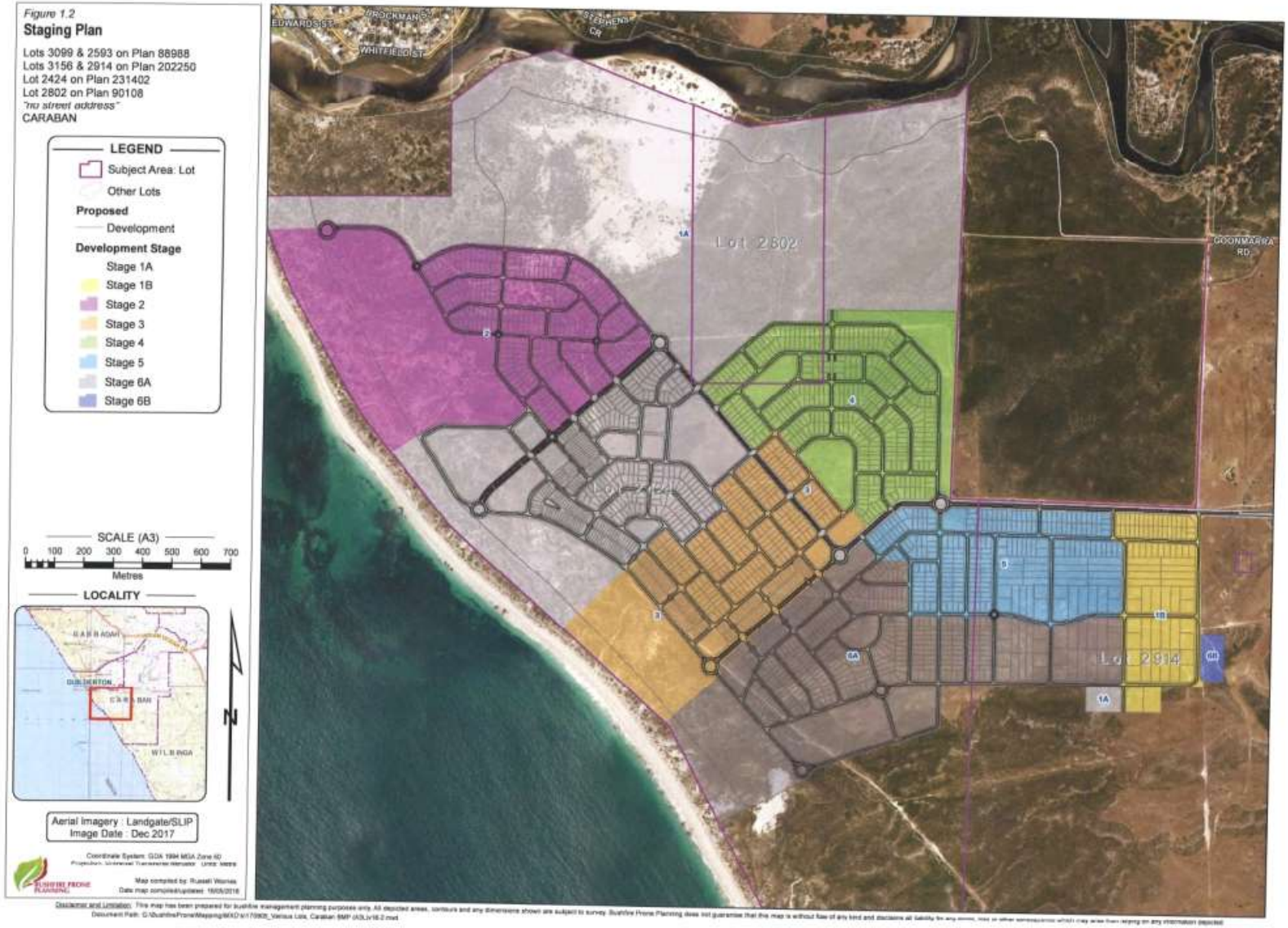


Figure 1.2
Staging Plan
Lots 3099 & 2593 on Plan 88988
Lots 3156 & 2914 on Plan 202250
Lot 2424 on Plan 231402
Lot 2802 on Plan 90108
"no street address"
CARABAN
LEGEND
Subject Area: Lot
Other Lots
Proposed
Development
Development Stage
Stage 1A
Stage 1B
Stage 2
Stage 3
Stage 4
Stage 5
Stage 6A
Stage 6B
SCALE (A3)
0 100 200 300 400 500 600 700
Metres
LOCALITY
Aerial Imagery : Landgate/SLIP
Image Date : Dec 2017
EDWARDS ST
BROCKMAN ST
WHITFIELD ST
STEPHENS DR
GOONMARRA RD
Lot 2802
Lot 2914

Table 1.1: Details of proposed lots

Original Lots	
Lot No.	Total Area
2424	452.69 ha
2802	40.53 ha
2914	652.19 ha
2593	94.64 ha
3099	99.76 ha
3156	93.18 ha

Proposed Lot Size	Average Size	Lot Yield
235m² – 319m²	259m²	18
320m² – 449m²	360m²	307
450m² – 499m²	477m²	3
500m² – 549m²	525m²	8
550m² – 599m²	581m²	59
600m² – 699m²	645m²	1060
700m² – 5000m²	1227m²	461
5000m² +	430317m²	25

Total Number of Lots
1941 + 1 Balance Lot

Lot Summary			
Minimum Lot Size	Maximum Lot Size	Average Lot Size	Total Lot Area
241m²	4894000m²	6266m²	12163111m²

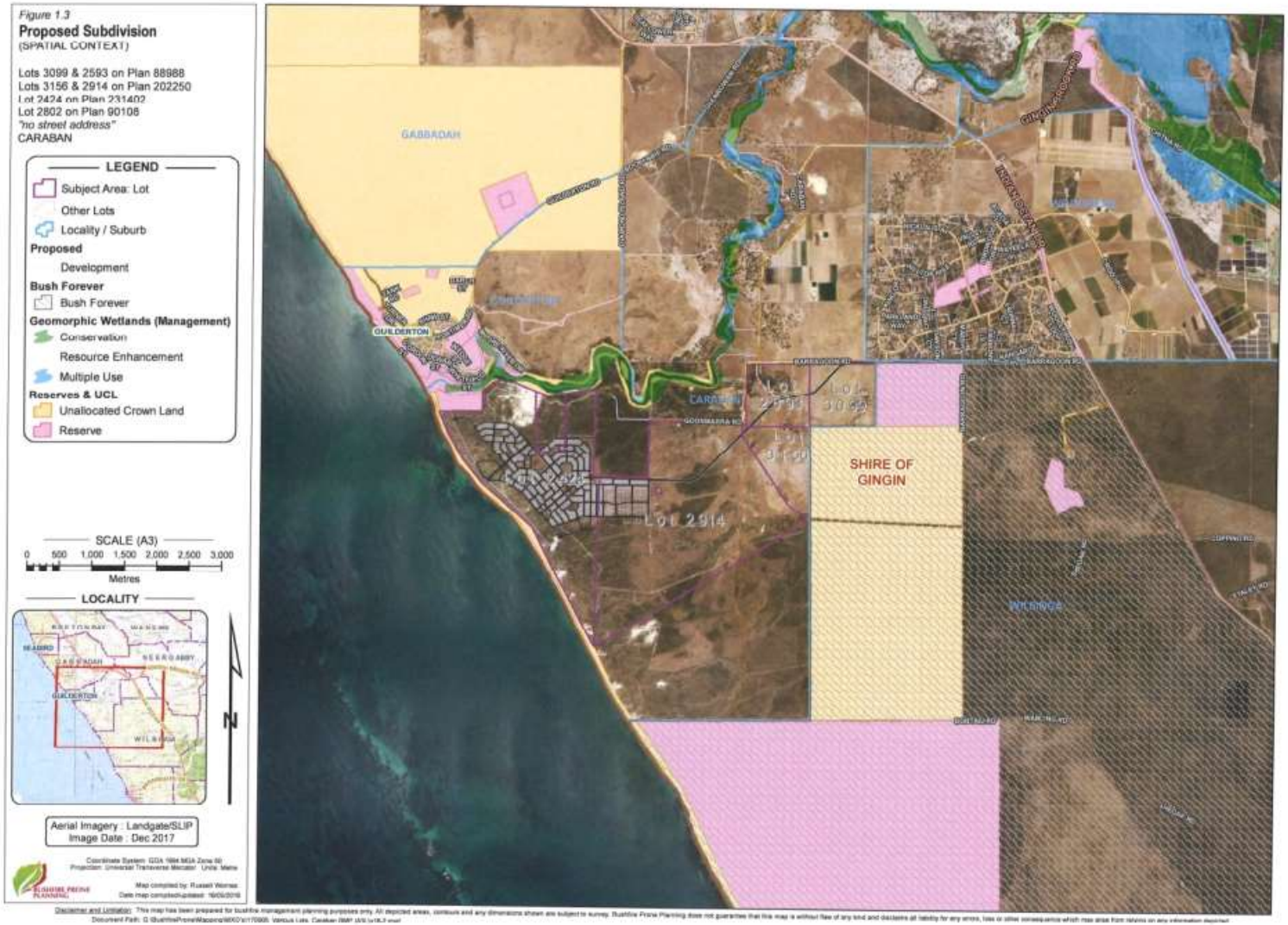


Figure 1.3
Proposed Subdivision
(SPATIAL CONTEXT)
Lots 3099 & 2593 on Plan 88988
Lots 3156 & 2914 on Plan 202250
Lot 2424 on Plan 231402
Lot 2802 on Plan 90108
"no street address"
CARABAN
LEGEND
Subject Area: Lot
Other Lots
Locality / Suburb
Proposed
Development
Bush Forever
Bush Forever
Geomorphic Wetlands (Management)
Conservation
Resource Enhancement
Multiple Use
Reserves & UCL
Unallocated Crown Land
Reserve
SCALE (A3)
0 500 1,000 1,500 2,000 2,500 3,000
Metres
LOCALITY
N
Aerial Imagery : Landgate/SLIP
Image Date : Dec 2017
GABBADAH
GUILDERTON
CARABAN
SHIRE OF GINGIN
Lot 2914
Lot 2424
Lot 3099
Lot 2593

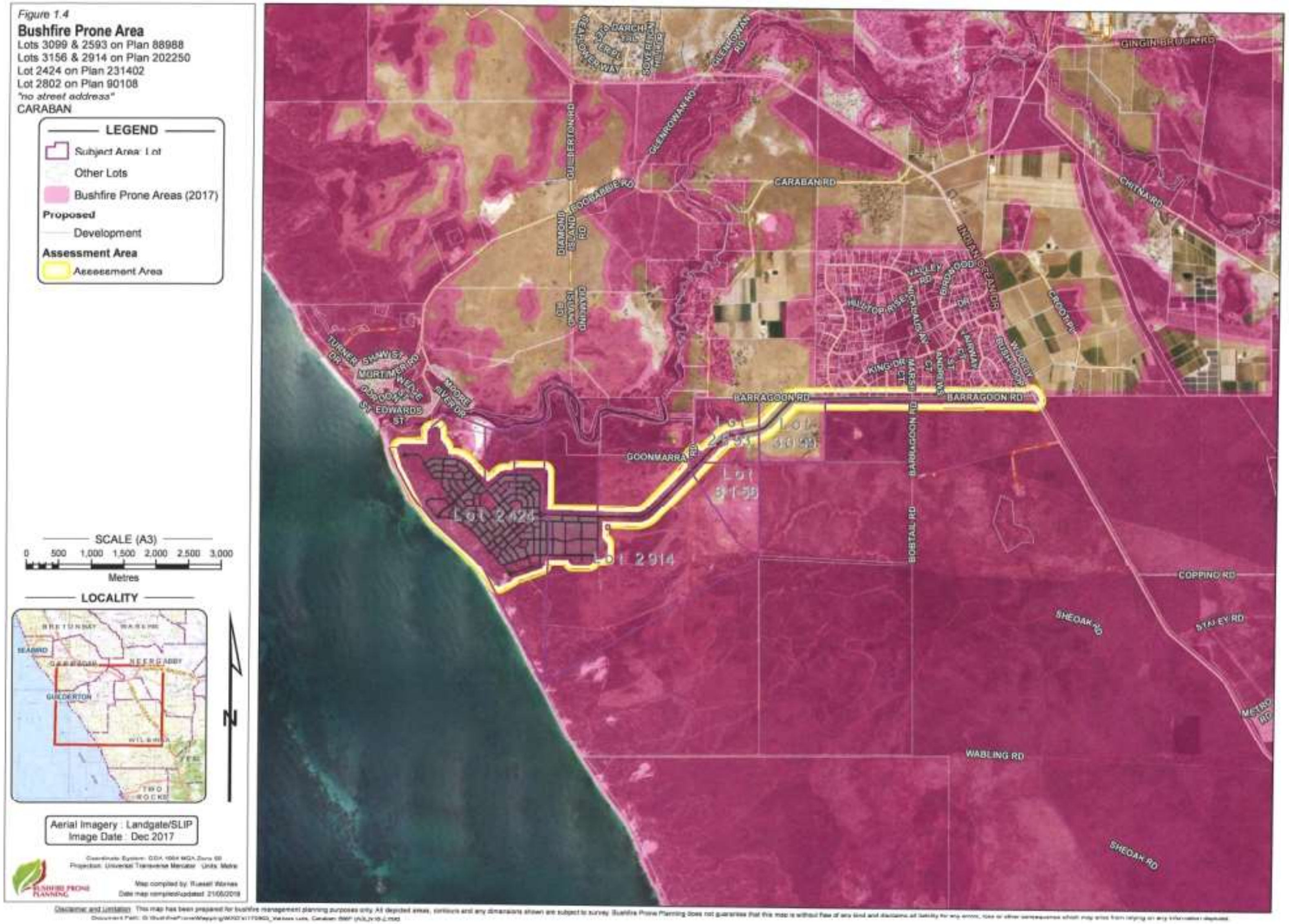


Figure 1.4
Bushfire Prone Area
Lots 3099 & 2593 on Plan 88988
Lots 3156 & 2914 on Plan 202250
Lot 2424 on Plan 231402
Lot 2802 on Plan 90108
"no street address"
CARABAN
LEGEND
Subject Area: Lot
Other Lots
Bushfire Prone Areas (2017)
Proposed
Development
Assessment Area
Assessment Area
SCALE (A3)
0 500 1,000 1,500 2,000 2,500 3,000
Metres
LOCALITY
Aerial Imagery : Landgate/SLIP
Image Date : Dec 2017
CARABAN RD
BARRAGOON RD
GOONMARRA RD
BOBTAIL RD
COPPINO RD
SHEOAK RD
WABLING RD
GINGIN BROOK RD
CHITNA RD
Lot 2424
Lot 2914
Lot 2593
Lot 3099
Lot 3156

1.2 Existing Documentation Relevant to the Construction of this Plan

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

Relevant Documents

Existing Document	Copy Provided by Client	Title
Structure Plan	N/A	-
Environmental Report	Yes	Moore River South Foreshore Management Plan (Cardno - Sept 2014).
Landscaping Plan	Yes	Preliminary Landscape Concepts (Cardno – May 2013).
Bushfire Risk Assessments	N/A	Previous bushfire assessment not undertaken.

The development at Moore River South is subject to a number of legislative and policy requirements. The Foreshore Management Plan provides details of flora and fauna survey, stages and node development and associated management measures. The Moore River Company is responsible for implementation of the Foreshore Management Plan including monitoring of the coastal and river foreshore works for the periods established within the 'Plan' or subsequent arrangements with the relevant authority, until such time as these areas become the responsibility of the Shire of Gingin.

1.3 Vulnerable Land Use

Definition and Application

A 'vulnerable land use' is defined as "a land use where persons may be less able to respond in a bushfire emergency". The Guidelines provide examples of what constitutes a vulnerable land use. Information, additional to the Bushfire Management Plan, is required to accompany applications involving a vulnerable land use.

Required Additional Information – Emergency Evacuation

Development applications for a vulnerable land use are to provide actionable information for persons that will occupy or visit that site with respect to their preparedness, awareness and response to a bushfire potentially impacting the property. The development application must:

1. "Include an emergency evacuation plan for proposed occupants"; unless
2. The proposal is to be treated as a 'residential-based minor development'. In which case "consideration should be given to emergency evacuation" within the Bushfire Management Plan, with the content "to reflect the nature and scale of the development".

Subdivision applications, scheme amendments or structure plans "should make provision for emergency evacuation".

Required Additional Information - Inability to Comply with SPP 3.7

Development applications for vulnerable land uses that cannot achieve full compliance with SPP 3.7 and cannot fully comply with the bushfire protection criteria contained in the Guidelines, including if the proposed site is subject to BAL-40 or BAL-FZ, will generally not be supported unless:

1. Sufficient justification can be provided for support as 'Minor Development'; or
2. Sufficient justification can be provided for support as 'Residential-based Minor Development'; or
3. Sufficient justification can be provided for support as 'Unavoidable Development'.

(Source: State Planning Policy No. 3.7: Planning in Bushfire Prone Areas - December 2015 (SPP 3.7) s7 and pm6.6 and Guidelines for Planning in Bushfire Prone Areas - WAPC 2017 v1.3 (Guidelines) s5.4 and s5.5.

As part of the Proposal it is recognised that an emergency evacuation plan for visitors, campers and other such transient persons is required to be created. However, there is specific information (such as exact location/design details for future nominated buildings for emergency assembly/refuge) that is required to be included in the future Bushfire Evacuation (Response) Plan, that is not available at this stage of the subdivision application.

Staging of the subdivision will address vulnerable land use where it is identified, through updating the Bushfire Management Plan and subsequent Evacuation Plan to ensure that the bushfire risk management measures remain effective. Bushfire plans do not expire and should be a 'living document'. Updating is required 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).

Determination of Vulnerable Land Use - Category Applied	
It has been determined that the proposed subdivision identifies 'vulnerable land use' pending final determined location/s, based on fitting the following category of future land use. Future stages of development are likely to incorporate additional 'vulnerable land use'. The appropriate emergency planning documentation will be required at that time.	
Category 1: Land uses and associated infrastructure that are designed to accommodate groups of people with reduced physical or mental ability.	
Not identified at this stage.	
Category 2: Facilities that, due to building or functional design, offer limited access or the number of people accommodated may present evacuation challenges.	✓
Primary School.	
Category 3: Short stay accommodation or visitation uses that involve people who are unaware of their surroundings and who may require assistance or direction in the event of a bushfire.	✓
Tourism – caravan, camping grounds and short term stay accommodation.	
Justification for Assessment as 'Minor' or 'Unavoidable' Development	
The proposed development of land or land use cannot achieve full compliance with SPP 3.7 and cannot fully comply with the bushfire protection criteria contained in the Guidelines (including if the proposed site is subject to BAL-40 or BAL-FZ).	N/A
The development can be assessed as 'Minor Development': *Because the planning application is for a class of development that is "a single house and/or an ancillary building on an existing lot of 1,100 m² or greater, in a predominantly residential built out area .... where typically the development will be constrained by pre-existing lot layout and nearby existing land uses." [Note: this is referring to the construction of a building and LPS Amendment Regulations 2015 exclude development applications for such development on lots less than 1,100 m²].*	N/A
The development can be assessed as 'Residential-based Minor Development': *Because the planning application is for a proposed vulnerable land use that "will be contained within an existing single residential development or ancillary dwelling or associated outbuilding, and at a scale consistent with that of a typical existing residential building."*	N/A
The development is required to be assessed as 'Unavoidable Development': *Because the planning application is for a proposed development that "represents exceptional circumstances where full compliance with SPP 3.7 would be unreasonable as no alternative location exists and it can be proven that it is not contrary to the public interest."*	N/A

Required Additional Information and its Location within this BMP		
A detailed and site-specific Bushfire Response/Evacuation Plan for occupants. *For any vulnerable land use <u>not</u> identified as a residential-based land use to be treated as minor development.*	N/A	To be provided as a separate document to accompany the planning application at the applicable subdivision stage.
Bushfire response/evacuation advice relevant to the site with content and format to reflect the nature and scale of the development. *For a vulnerable land use identified as a residential-based land use to be treated as 'minor development'.*	N/A	To be provided as a separate document to accompany the planning application at the applicable subdivision stage.
For the proposed subdivision it is demonstrated that in the event of a bushfire, emergency evacuation will be possible. This includes consideration of the of the wider road network and remoteness.	Provided relevant to the subdivision planning stage	Section 5.3.3 'Element 3: Vehicular Access'
Supporting statements that justify why the proposed development should be supported as minor development by providing justification for the bushfire protection criteria that cannot be met and provide an assessment of the relative bushfire risks to the site and movement of persons from the site. This includes a risk analysis to determine appropriate bushfire response/evacuation advice. *For vulnerable land uses - identified as either 'Minor Development' or 'Residential-based Minor Development'.*	N/A for this stage of subdivision	-
Supporting statements that justify why the proposed development should be supported as unavoidable development.	N/A for this stage of subdivision	-
Create a responsibility for the landowner/occupier to inform occupants of the existence and application of either the Bushfire Response/Evacuation Plan or the bushfire response/evacuation advice provided.	Provided relevant to the subdivision planning stage	Within Section 6

1.4 High Risk Land Use

Definition and Application

A 'high risk land use' is defined 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 what constitutes a high-risk land use.

Required Additional Information – Flammable On-site Hazards

Development applications for a high-risk land use are to include a risk management plan that addresses the required bushfire risk management measures for any flammable onsite-hazards.

Determination of High-Risk Land Use

It has been determined that the proposed development may incorporate 'high-risk land use' at future subdivision stages, such as service stations or other such uses that may require specific consideration of the risk associated with the land use and potential hazard management and response requirement. Bushfire risk management measures for any flammable on-site hazards and asset protection zone development considerations, will be required at the development stage.

Required Additional Information for future High-Risk Land Use	
A risk management plan that addresses bushfire risk management measures for any flammable onsite-hazards to support the 'high-risk' land use.	To be provided as bushfire specific content by the proponent/s of 'high-risk' land use at the applicable development stage.
The high-risk land use has also been identified as a 'vulnerable land use. The required information for a 'vulnerable land use' also applies.	N/A for this planning stage of subdivision
Supporting statements that justify why the proposed development should be supported as 'unavoidable development'.	N/A for this planning stage of subdivision
Create a responsibility for the landowner/occupier to inform persons on site of the existence and application of a Risk Management Plan containing bushfire risk management measures for any flammable onsite-hazards. Also to create a responsibility update the plan and continue to comply with the requirements	Provided relevant to the subdivision planning stage - Within Section 6

Proponents of 'high risk' land use will be required to provide information as to how the risk is to be mitigated through a management plan. The 'high risk' land use will require:

- A stand-alone plan or incorporated into an existing emergency management plan;
- Bushfire management is to be addressed within the risk management plan;
- The risk management plan is to be developed prior to submitting the application for the 'high risk' land use.

2 Environmental Considerations

2.1 Native Vegetation – Modification and Clearing

'Guidelines' s2.3: "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."

Existing conservation areas that are potentially affected by the development proposal are required to be identified. This may result in vegetation removal/modification prohibition or limitations. These areas include National Parks, Nature Reserves, Wetlands and Bush Forever sites.

Environmental Protection Act 1986: "Clearing of native vegetation in Western Australia requires a clearing permit under Part V, Division 2 of the Act 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).

The Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act): This Act administered by the Australian Government Department of Environment, provides a national scheme of environment and heritage protection and biodiversity conservation. Nationally threatened species and ecological communities are a specific matter of significance. Areas of vegetation can be classified as a Threatened Ecological Community (TEC) under the EPBC Act and consequently have removal restrictions imposed.

Vegetation Modification and Clearing Assessment

Will on-site clearing of native vegetation be required?	Yes
Does this have the potential to trigger environmental impact/referral requirements under State and Federal environmental legislation?	Yes
Identified environmental legislation applicable to the Proposal site - No.1:	Refer Foreshore Management Plan
Identified environmental legislation applicable to the Proposal site - No.2:	-
For the proposed development site, have any areas of native vegetation been identified as species that might result in the classification of the area as a Threatened Ecological Community (TEC)?	No
Potential TEC species identified:	N/A

The Foreshore Management Plan, or subsequent versions of this document, or studies, should be referred to for vegetation retention and clearing parameters. The bushfire assessment and management strategies contained in the BMP, assume that environmental approval will be achieved or clearing permit exemptions will apply. It is advised that the proponent seek further advice from an Environmental Consultant or the WA Department of Parks and Wildlife for further information on the condition and species contained within the proposed development area and the requirement for referral of the proposal.

2.2 Re-vegetation / Retained Vegetation / Landscape Plans

Riparian zones, wetland/foreshore buffers, road verges and public open space may have plans to re-vegetate or retain vegetation as part of the Proposal.
Vegetation corridors may join offsite vegetation and provide a route for fire to enter a development area.
When applicable, any such area will be identified in this Bushfire Management Plan and their impact on the assessment and future management accounted for.

Is re-vegetation of riparian zones and/or wetland or foreshore buffers and/or public open space a part of this Proposal?	Yes
Is the requirement for ongoing maintenance of existing vegetation in riparian zones and/or wetland or foreshore buffers and/or public open space a part of this Proposal?	Yes

In assessing vegetation for bushfire threat, consideration must be given to possible future vegetation changes likely on the site that is being assessed and in particular 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 re-vegetation. There must be careful consideration of the creation of vegetation corridors where they join offsite vegetation and which may provide a route for fire to enter an area of future development.

Landscaping or revegetation within the subdivision site will be undertaken as to align with the bushfire management plan requirements to ensure an increase in bushfire hazards does not occur, nor alter the indicative bushfire attack levels indicated for the site. Where an environmental report or landscaping/revegetation plan is to be implemented or required as a condition of subdivision, the bushfire management plan may require updating at the subsequent subdivision stages to addresses bushfire impacts arising from these reports or plans, relevant to the bushfire protection criteria requirements at that time.

The Bushfire Management Plan:

- Requires that the bushfire protection measures are satisfied within the boundaries of the land being developed (or under the control of the landowner/proponent) so as not to impact on the bushfire and environmental management of neighbouring reserves, properties or conservation covenants;
- Foreshore reserve areas/coastal buffers are necessary as part of this proposal and for their protection and management the planning considers the ability and practicality of maintaining vegetation separation distances such that BAL ratings within the subdivision do not increase above BAL-12.5;
- Identifies that the configuration of the retained vegetation, in particular reserve areas adjoining the subdivision site and public open space within the site, are to be separated by roads, low threat vegetation buffer zones or design features that provide separation (pathways, crushed limestone areas, non-combustible structures or landscapes);

- Ensures the ongoing management of vegetation in perpetuity, which includes the requirement for the developer and in the future local government, to allocate resources to and plan the maintenance of the vegetation within the subdivision in a low threat state. This may also include the planning of prescribed burning for some areas external to the subdivision;
- For this Plan, these considerations would need to be accounted for in any later stage planning applications.

Future buildings within the subdivision will be separated from unmanaged vegetation to distances appropriate to the BAL-12.5 rating to mitigate the impact of the vegetation types. In assessing vegetation for bushfire threat, consideration has been given to possible future vegetation changes likely on and in proximity to the site that is being assessed, particularly those vegetation types 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.

All onsite landscape planting is to be managed in a low threat state as per the criteria detailed in AS3959-2009 s2.2.3(f) "Low threat vegetation" and all other vegetation remaining on Lots managed in accordance with the annual Shire of Gingin Firebreak and Fuel Load Notice (Firebreak Notice). This ensures BAL separation distances can be effectively maintained and bushfire hazards on-site are reduced and maintained at low threat levels.

Landscaping within the subdivision shall reflect the bushfire considerations and take a logical approach as to not increase the risk and limit potential ignition sources (primarily from ember attack). The design of any structures with landscaping areas such as public open space, are to factor that material that potentially would melt (potential for injury from possible molten material, particularly where used as overhead shade structures) due to radiant heat or ignite from embers landing on them, will be avoided and alternative materials incorporated into the structure.

Trees within managed public open space areas and any windbreak/tree rows, that border the boundaries of these landscaping areas will be planted in the single line, this includes street scape planting along road reserves.

Landscaping and Screening Planting:

- Limited as far as reasonably practicable to grasses or low ground covers with separation between canopy trees (avoid medium to tall shrub understorey) and maintain widths of these areas to <20m wide where possible. Create 20m separation between these screening planting/native gardens bed areas, by using features such as the local play spaces road reserves and managed grass areas;

- Structures within these areas, will consider building materials that are non-combustible or alternative materials that increase the resilience to fire.

Beach Access Nodes:

- Emergency vehicle access to least two points along the coastal interface to be constructed to the standard for emergency access ways (this may require limestone hardstand and turn around points and vehicle access gates to restrict general public access);

- Structures within the beach access node areas require consideration of separation from the remnant vegetation to minimise impact form bushfire and will consider building materials that are non-combustible or alternative materials that increase the resilience to fire.

3 Potential Bushfire Impact Assessment

3.1 Assessment Input

The preliminary bushfire impact assessment is based on 'worst case' scenario modelling. The applied vegetation classification of 'Shrubland' ensures the strategic planning considers extreme fire behaviour conditions to identify how bushfire protection requirements are able to be satisfied within the boundaries of the land being developed.

3.1.1 Fire Danger Index (FDI) Applied

AS 3959-2009 specifies the fire danger index values to apply for different regions as per Table 2.1. The values used in the model calculations are for the Forest Fire Danger Index (FFDI) and for which equivalent representative values of the Grassland Fire Danger Index (GFDI) are applied as per Appendix B. The values can be refined if appropriately justified.

Table 3.1.1: Applied FDI Value

	FDI Value		
Vegetation Area	As per AS 3959 - 2009 Table 2.1	As per DFES for the Location	Value Applied
All external vegetation	80	N/A	80

3.1.2 Existing Vegetation Identification, Classification and Effective Slope

Vegetation identification and classification has been conducted in accordance with AS 3959-2009 s2.2.3 and the Visual Guide for Bushfire Risk Assessment in WA (DoP February 2016).

When more than one vegetation type is present, each type is identified separately with the worst-case scenario being applied as the classification. The predominant vegetation is not necessarily the worst-case scenario.

The vegetation structure has been assessed as it will be in its mature state (rather than what might be observed on the day). Areas of modified vegetation are assessed as they will be in their natural unmodified state (unless maintained in a permanently low threat, minimal fuel condition, satisfying AS 3959-2009 s2.2.3.2-f and asset protection zone standards). Vegetation destroyed or damaged by a bushfire or other natural disaster has been assessed on its revegetated mature state.

Effective Slope: Is the ground slope under the classified vegetation and is determined for each area of classified vegetation. It is the measured or determined slope which will most significantly influence the bushfire behaviour in that vegetation as it approaches a building or site. Where there is a significant change in effective ground slope under an area of classified vegetation, that will cause a change in fire behaviour, separate vegetation areas will be identified, based on the change in effective slope, to enable the correct assessment.

Table 3.1.2: Vegetation identification and classification

All Vegetation Within 150 metres of the Proposed Development (Subdivision Area)				
Vegetation Area	Identified Classification Types [1] or Description if 'Excluded'	Applied Classification[2]	Effective Slope Under Classified Vegetation (Refer Note[3])	
			degrees	description
1	Open Shrubland B-09	Class B Woodland	>5° to 10°	Downslope
2	Open heath C-11 & Closed heath C-10	Class C Shrubland	>5° to 10°	Downslope
3	Open tussock G-23 & Open heath C-11	Class C Shrubland	>5° to 10°	Downslope
4	Open tussock G-23	Class G Grassland	>5° to 10°	Downslope

Representative photos of each vegetation area, descriptions and classification justification, are presented on the following pages. The areas of classified vegetation are defined, and the photo locations identified on the topography and classified vegetation map, Figure 3.1.

Note[1]: As per AS 3959-2009 Table 2.3 and Figures 2.3 and 2.4 a-g
Note[2]: As per AS 3959-2009 Table 2.3.

All vegetation within 150 metres of the subdivision boundary have been identified and classified or excluded and presented in Table 3.1.2. 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).

Vegetation areas outside of the proposed subdivision boundaries (access road) do not impact building construction components and therefore are not included in Table 3.1.2.

Note[3]: The characteristics of the site and surrounding area comprise undulating land (sand dunes) and flat grassland and shrubland areas. Consideration to the multiple slope variation created by the landscape has been factored ranging from 0° to 10° as a result of the on-site assessment work and the slope survey undertaken at multiple locations. The subsequent BAL Contour mapping utilises a slope range of downslope >5° to 10° to ensure setbacks from unmanaged vegetation can achieve a BAL-12.5.

Vegetation Area 1 **Classification Applied:** Class B Woodland - Open shrubland B-09

Classification Justification: Open Shrubland. Overstorey foliage cover <10%. Tree height ~4m. Low shrubs understorey.

Photo ID: 1a

Photo ID: 1b

Vegetation Area 2 **Classification Applied:** Class G Grassland – Open tussock G-23 & Class C Shrubland - Open heath C-11

Classification Justification: (2a) Tussock grasses. Shrub overstorey foliage cover <10%. (2b) Open heath. Shrubs 1-2m high.

Photo ID: 2a

Photo ID: 2b

Vegetation Area 2 **Classification Applied:** Class G Grassland – Open tussock G-23

Classification Justification: Tussock grasses. Shrub overstorey foliage cover <10%.

Photo ID: 2c

Photo ID: 2d

Vegetation Area 2 **Classification Applied:** Class C Shrubland - Closed heath C-10

Classification Justification: Off-site Open heath. Shrubs 1-2m high, comprising scattered Banksia.

Photo ID: 2e

Photo ID: 2f

Vegetation Area 2 **Classification Applied:** Class C Shrubland - Open heath C-11

Classification Justification: Off-site Open heath. Shrubs 1-2m high.

Photo ID: 2g

Photo ID: 2h

Vegetation Area 2 **Classification Applied:** Class C Shrubland - Open heath C-11

Classification Justification: Off-site Open heath. Shrubs 1-2m high.

Photo ID: 2i

Photo ID: 2j

Vegetation Area 3 **Classification Applied:** Class G Grassland – Open tussock G-23 & Class C Shrubland – Open heath C-11

Classification Justification: Tussock grasses. Shrub overstorey foliage cover <10% and Open heath. Shrubs 1-2m high.

Photo ID: 3a

Photo ID: 3b

Vegetation Area 3 **Classification Applied:** Class G Grassland – Open tussock G-23 & Class C Shrubland – Open heath C-11

Classification Justification: Open heath. Shrubs 1-2m high. Tussock grasses. Shrub overstorey foliage cover <10%.

Photo ID: 3c

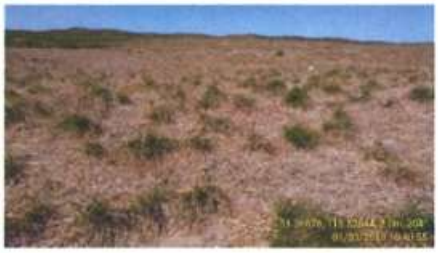


Photo ID: 3d

Vegetation Area 3 **Classification Applied:** Class G Grassland – Open tussock G-23

Classification Justification: Tussock grasses. Shrub overstorey foliage cover <10%.

Photo ID: 3e

Photo ID: 3f

Vegetation Area 4 **Classification Applied:** Class G Grassland – Open tussock G-23

Classification Justification: Tussock grasses. Shrub overstorey foliage cover <10%.

Photo ID: 4a

Photo ID: 4b

Vegetation Area 4 **Classification Applied:** Class G Grassland – Open tussock G-23

Classification Justification: Tussock grasses. Shrub overstorey foliage cover <10%.

Photo ID: 4c

Photo ID: 4d

Vegetation Area 4 **Classification Applied:** Class G Grassland – Open tussock G-23

Classification Justification: Tussock grasses. Shrub overstorey foliage cover <10%.

Photo ID: 4e

Photo ID: 4f

Vegetation Area 4 **Classification Applied:** Class G Grassland – Open tussock G-23 & Class G Grassland – Open herbfield G-27

Classification Justification: Tussock grasses & open herbfield. Shrub overstorey foliage cover <10%.

Photo ID: 4g

Photo ID: 4h

Vegetation Area 5 **Classification Applied:** Class B Woodland - Open woodland B-06

Classification Justification: Off-site scattered trees with grass/pasture understorey. Overstorey foliage cover 30%. Tree height ~20m.

Photo ID: 5a

Photo ID: 5b

Vegetation Area 6 **Classification Applied:** Class G Grassland – Open tussock G-23 & Class G Grassland – Tussock grassland G-22

Classification Justification: Off-site grasses grazed and non-grazed. Shrub & overstorey foliage cover <10%.

Photo ID: 6a

Photo ID: 6b

Vegetation Area 7 **Classification Applied:** Class C Shrubland - Open heath C-11

Classification Justification: Off-site Open heath. Shrubs 1-2m high.

Photo ID: 7a

Photo ID: 7b

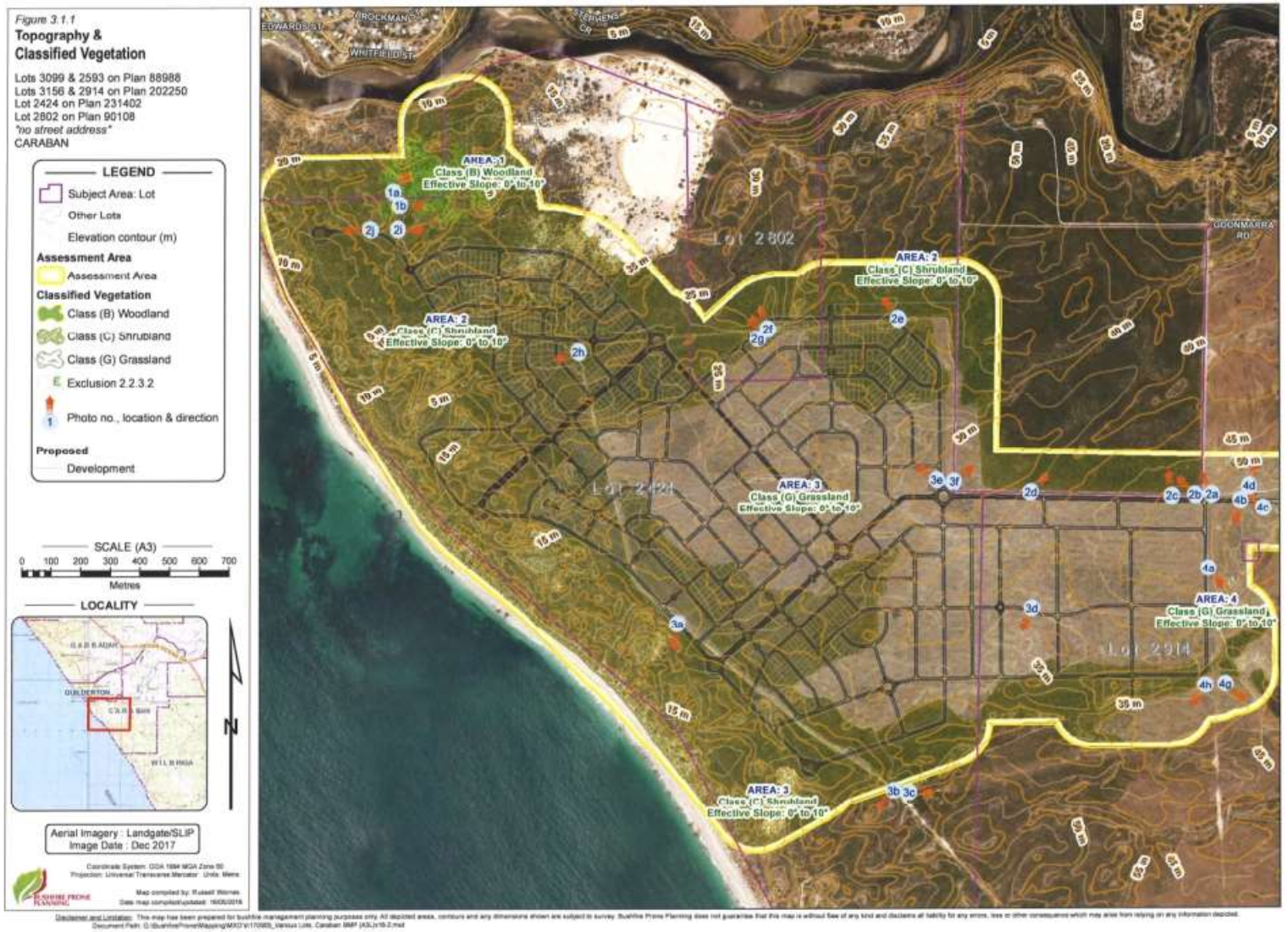


Figure 3.1.1
Topography &
Classified Vegetation
Lots 3099 & 2593 on Plan 88988
Lots 3156 & 2914 on Plan 202250
Lot 2424 on Plan 231402
Lot 2802 on Plan 90108
no street address
CARABAN
LEGEND
Subject Area: Lot
Other Lots
Elevation contour (m)
Assessment Area
Assessment Area
Classified Vegetation
Class (B) Woodland
Class (C) Shrubland
Class (G) Grassland
Exclusion 2.2.3.2
Photo no., location & direction
Proposed
Development
SCALE (A3)
0 100 200 300 400 500 600 700
Metres
LOCALITY
Aerial Imagery : Landgate/SLIP
Image Date : Dec 2017
AREA: 1
Class (B) Woodland
Effective Slope: 0° to 10°
AREA: 2
Class (C) Shrubland
Effective Slope: 0° to 10°
AREA: 3
Class (G) Grassland
Effective Slope: 0° to 10°
AREA: 4
Class (G) Grassland
Effective Slope: 0° to 10°
Lot 2802
Lot 2424
Lot 2914
EDWARDS CT
ROCKMAN CT
WHITE HOST ST
GOONMARRA RD

3.2 Assessment Output

Understanding the Bushfire Assessment Results - Application of Bushfire Attack Levels (BAL)

The BAL rating has a different application in the building environment compared to the planning environment and the BAL assessment can result in a determined BAL or an indicative BAL which have different implications.

Building versus Planning Applications

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

In the planning environment, assessing the ability of a proposed development site to achieve BAL-29 or less is the objective (as one of the bushfire protection criteria being assessed). The 'development site' is defined by the LPS Amendment Regulations 2015 as "that part of a lot on which a building that is the subject of development stands or is to be constructed".

Therefore, being able to show that a BAL rating of BAL-29 or lower is achievable for a proposed development site (i.e. the building footprint) is an acceptable outcome for that criteria, as established by the bushfire provisions, SPP 3.7 and the associated Guidelines. For planning purposes, this BAL rating could be either indicative or determined.

Determined BAL Ratings

A determined BAL rating is to apply to an existing or proposed construction site (building) and not to a lot or envelope. Its purpose is to state the potential radiant heat flux to which the building will be exposed.

A determined BAL cannot be given for a future building whose location, elevation design and footprint (on a given lot) are unknown. It is not until these variables have been fixed that a BAL can be determined (typically at the development application or building application stage).

The one exception is when a building of ***any dimension*** can be ***positioned anywhere*** on a proposed lot or within defined limits within the lot (i.e. building setbacks or building envelope) and always remain subject to the same BAL rating. For this to be the case, there needs to be no classified vegetation either onsite or offsite that if retained could impact upon the determined BAL rating.

Indicative BAL Ratings

When this Plan presents a single indicative BAL rating for a proposed construction site (building), this will be because the construction is still subject to a location within the lot being confirmed and/or a vegetation separation distance being achieved. That is, it will be conditional upon some factor being confirmed at a later stage.

For planning applications associated with proposed lots, the building location, elevation design and footprint have typically not been established. Therefore, indicative rather than determined BAL rating/s will be presented for each lot (with the exception as noted above under 'Determined BAL Ratings').

When this Plan presents a single indicative BAL rating for a lot or building envelope (i.e. an 'area' that is not a located building footprint) it will represent the highest BAL rating affecting that 'area'. The BAL rating of a future building on that 'area' will be dependent on its eventual location. Otherwise, this Plan will present all BAL ratings for each lot and for each BAL rating, the vegetation separation distances from each area of classified vegetation that are to apply. These distances will be presented as either figures in a table or as a BAL contour map. From this indicative BAL information, it can be assessed if acceptable BAL ratings (≤ BAL-29) can be achieved for future buildings.

3.2.1 Assessment Summary

The following table provides a summary of the achievable Bushfire Attack Levels incorporating a minimum 25m low threat buffer for each stage.

Table 3.2.1: Summary BAL results.

BAL Results – Summary of Assessment
(Detail of assessment and determination is presented in the following sections of this report)

Subdivision Stage	BAL Status	Highest Bushfire Attack Level
1A	Indicative Only	BAL-12.5
1B	Indicative Only	BAL-12.5
2	Indicative Only	BAL-12.5
3	Indicative Only	BAL-12.5
4	Indicative Only	BAL-12.5
5	Indicative Only	BAL-12.5
6A	Indicative Only	BAL-12.5
6B	Indicative Only	BAL-12.5

3.2.2 Indicative BAL Results Presented as a BAL Contour Map

Interpretation of the Bushfire Attack Level (BAL) Contour Map

The contour map will present different coloured contour intervals constructed around the classified bushfire prone vegetation. These represent the different Bushfire Attack Levels that exist at varying distances away from the classified vegetation.

Each BAL represents a set range of radiant heat flux (as defined by AS 3959-2009) that can be generated by the bushfire in that vegetation at that location.

The width of each shaded contour (i.e. the distance interval) will vary and is determined by consideration of variables including vegetation type, fuel structure, ground slope, climatic conditions. They are unique to a site and can vary across a site. The width of each contour is a diagrammatic expression of the separation distances from the classified vegetation that apply for each BAL rating, for that site.

A building (or 'area') located within any given BAL contour will be subject to that BAL rating and potentially multiple BAL ratings of which the highest rating will be applied.

Separation Distances Calculated to Construct the BAL Contours

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

Calculated Vegetation Separation Distances

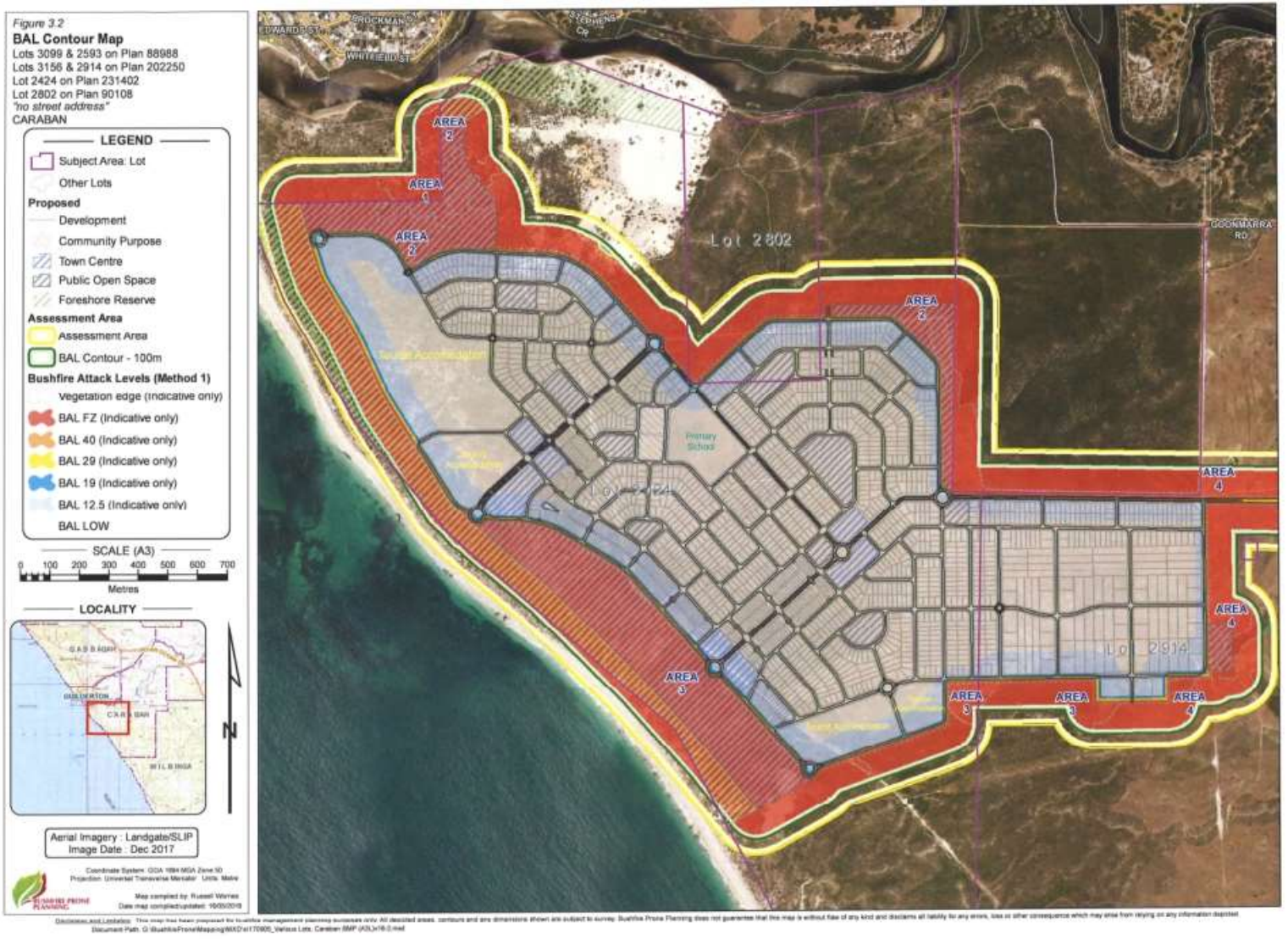
Vegetation Area	Vegetation Classification	Effective Slope Degrees	BAL Assessment Method Applied[1]	BAL Rating and Corresponding Separation Distance (metres)					
				BAL-FZ	BAL-40	BAL-29	BAL-19	BAL-12.5	BAL-LOW
1	Class C Shrubland	Downslope >5 to 10 degrees	Method 1	<8	8-<11	11-<17	17-<25	25-<100	>100
2	Class C Shrubland	Downslope >5 to 10 degrees	Method 1	<8	8-<11	11-<17	17-<25	25-<100	>100
3	Class C Shrubland	Downslope >5 to 10 degrees	Method 1	<8	8-<11	11-<17	17-<25	25-<100	>100
4	Class C Shrubland	Downslope >5 to 10 degrees	Method 1	<8	8-<11	11-<17	17-<25	25-<100	>100

[1] Method 1 as per *AS 3959-2009 Table 2.4.3*. The input variables applied, other than the calculation model defaults, are presented in Section 3.1 of this Plan.

Figure 3.2

BAL Contour Map

Lots 3099 & 2593 on Plan 88988
Lots 3156 & 2914 on Plan 202250
Lot 2424 on Plan 231402
Lot 2802 on Plan 90108
"no street address"
CARABAN



3.2.3 Bushfire Attack Levels (BAL) Derived from The Contour Map

Deriving a BAL Rating for a Future Construction Site (Building) from the BAL Contour Map Data

(Capacity to Issue a BAL Certificate)

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

The BAL Rating is Assessed as Indicative

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

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

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

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

A BAL Certificate cannot be provided for future buildings, within a lot or envelope with an indicative BAL, until the building location and in some instances building design (elevation), have been established and any required and approved vegetation modification/removal has been confirmed. Once this has occurred a report confirming the building location and BAL rating will be required to submit with the BAL certificate. The required confirmation of the BAL rating must be done by a bushfire practitioner with the same level of accreditation as has been required to compile this Bushfire Management Plan. This is dependent on the type of calculations utilised (e.g. if performance based solutions have been used in the Plan BPAD Level 3 accreditation is required)

The BAL Rating is Assessed as Determined

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

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

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

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

Table 3.2.3: Indicative Bushfire Attack Levels for future Lots for Proposed Stages

Indicative Bushfire Attack Levels for the Proposed Stages *(BAL assessed as per AS 3959-2009 Method 1 and Table 2.4.3)*					
Proposed Stage			Applied APZ	Indicative BAL	
Grouped as being subject to the stated classified vegetation on the lot or at the lot boundary (this being the 'worst case' applicable vegetation)			It is assumed that the APZ will comply with fuel load specifications. The extent of the APZ able to be achieved within the subdivision area or including external land owned by the Proponent is stated below. (Figures 5.1.1 & 5.1.2)	The indicative BAL takes into account temporary APZ buffers of no less than 25m, constructed between stages.	
Proposed Stage (Number)	Applied Vegetation Classification	Applied Downslope Range (degrees)		Lots located 25m - <100m from Classified Vegetation	Lots located >100m from Classified Vegetation
1A	Class C Shrubland	Downslope >5 to 10 degrees	25m APZ	BAL-12.5	BAL-LOW
1B	Class C Shrubland	Downslope >5 to 10 degrees	25m APZ	BAL-12.5	BAL-LOW
2	Class C Shrubland	Downslope >5 to 10 degrees	25m APZ	BAL-12.5	BAL-LOW
3	Class C Shrubland	Downslope >5 to 10 degrees	25m APZ	BAL-12.5	BAL-LOW
4	Class C Shrubland	Downslope >5 to 10 degrees	25m APZ	BAL-12.5	BAL-LOW
5	Class C Shrubland	Downslope >5 to 10 degrees	25m APZ	BAL-12.5	BAL-LOW
6A	Class C Shrubland	Downslope >5 to 10 degrees	25m APZ	BAL-12.5	BAL-LOW
6B	Class C Shrubland	Downslope >5 to 10 degrees	25m APZ	BAL-12.5	BAL-LOW

4 Identification of Bushfire Hazard Issues

This subdivision proposal is required to show that the Bushfire Protection Criteria can be complied with in the future. The intent is to ensure this Proposal is located where the bushfire hazard level is (or will on completion be) moderate or low and subject to a maximum Bushfire Attack Level of BAL-29. This can be achieved for this proposal as detailed below.

Onsite Vegetation

The key factor to facilitate the determining of Indicative Bushfire Attack Levels on the Proposed Subdivision site is that vegetation onsite is under the control of the landowner/proponent. Vegetation onsite, including a number of the external Lots, is within the control of the subject site's landowner/proponent and therefore can potentially be removed, modified or buffers created to lower the bushfire risk and therefore can be removed or modified to present a low bushfire threat. (Note: any proposed vegetation removal may be subject to local government approval, dependent on the lot's specific condition with respect to any identified environmental constraints).

Areas within the subdivision site but not part of the proposed stage have been factored for the BAL Contour mapping over that particular stage, as the vegetation is to be removed or modified to a low threat state to construct buffer zones of a determined distance corresponding to the bushfire attack level stated, until such time as the next stage of development progresses.

Offsite Vegetation

Areas of vegetation offsite that are not within the control of the subject site's landowner/proponent cannot be removed or modified by the landowner and as a result the assessed BAL's determined by the proximity of this vegetation are unable to be further reduced. Where adjacent land is owned or under the control of the landowner/proponent, interface hazard management is achievable and appropriate level of construction of low threat buffers incorporated into the subdivision asset protection zone.

5 Assessment Against the Bushfire Protection Criteria (BPC)

The situations of compliance, non-compliance or presentation of an alternative solution to meet the criteria, are identified under the four elements of the Bushfire Protection Criteria. These being 1) Location 2) Siting and Design 3) Vehicular Access and 4) Water.

5.1 Bushfire Protection Criteria - Assessment Summary

Summarised Outcome of the Assessment Against the Bushfire Protection Criteria (BPC)

Element	Basis for the Assessment of Achieving the Intent of the Element			
	Achieves compliance with the Element through meeting Acceptable Solutions		Achieves compliance with the Element by application of a Performance Based Solution	Minor or Unavoidable Development
	Meets all relevant acceptable solutions.	One or more relevant Acceptable Solutions are not fully met. A variation of the solution is provided and justified.	One or more applicable Acceptable Solutions are not met. A solution is developed with the summary presented in this Plan in Section 5.4.2.	The required supporting statements are presented in this Plan.
Location	✓			N/A
Siting and Design of Development	✓			
Vehicular Access			✓	
Water	✓			

The subject Proposal has been assessed against:

1. The requirements established in Appendix 4 of the Guidelines for Planning in Bushfire Prone Areas, WAPC 2017 v1.3 (the 'Guidelines'). The detail, including technical construction requirements, are found at https://www.planning.wa.gov.au/8194.aspx. A summary of relevant information is provided in the appendices of this Plan; and

2. Any endorsed variations to the Guideline's acceptable solutions and associated technical requirements that have been established by the relevant local government. If known and applicable these have been stated in Section 5.2 of this Plan with the detail included as an appendix if required by the relevant local government.

5.2 Local Government Variations to Apply

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

Will local or regional variations to the acceptable solutions (endorsed by WAPC / DFES) and/or the technical requirements contained in the Guidelines, apply to this Proposal.	Yes

The Gingin annual Firebreak Order (Firebreak Notice) may require a variation to the BPC acceptable solutions, in particular, firebreaks or asset protection zones, due to changes in local requirements from time to time. The annual 'Notice' should be reviewed for the most recent detail and full list of requirements for that time.

'Local Government Firebreak Notice APZ'

Required Minimum Dimensions for the Subject Site

Requirement Set By:	Local Government
Minimum Dimensions:	20m
Maximum height inflammable materials within APZ (E.g. Grasses)	Maintain to a height not more than **50mm** (Excluding well maintained gardens) and remove all inflammable materials from the property.
Trees within the APZ	Prune all lower tree branches & ensure 3m spacing between tree canopies.
Other Conditions:	If Asset Protection Zone technical requirements are defined in the Notice, the standards and dimensions may differ from the Guideline's APZ Standards, with the intent to better satisfy local conditions. When these are more stringent than those created by the Guidelines, or less stringent and endorsed by the WAPC and DFES, they must be complied with. Refer to Appendix 1.

This requirement has been established through the stated local government's annual fire break notice issued under the Bushfires Act 1954 s33.

5.3 Bushfire Protection Criteria – Acceptable Solutions Assessment Detail

5.3.1 Element 1: Location

Bushfire Protection Criteria Element 1: Location
Assessment Statements and Bushfire Protection Measures to be Applied

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.

Acceptable Solution:	A1.1: Development Location	Method of achieving Element compliance and/or the Intent of the Element:	The acceptable solution can be fully met in the future (at a later planning stage).

The proposed subdivision achieves compliance by:

- By ensuring future building work on the lot/s can be located on an area that will be subject to potential radiant heat from a bushfire not exceeding 29 kW/m² (i.e. a BAL rating of BAL-29 or less will apply). This can be achieved by using positioning, design and appropriate vegetation removal/modification; and
- Managing the remaining bushfire risk to an acceptable level by the existence/implementation and ongoing maintenance of all required bushfire protection measures, as identified within this Plan. These measures include the requirements for vegetation management, vehicular access and firefighting water supply.

5.3.2 Element 2: Siting and Design of Development

Bushfire Protection Criteria Element 2: Siting and Design of Development
Assessment Statements and Bushfire Protection Measures to be Applied

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

Acceptable Solution:	A2.1: Asset Protection Zone	Method of achieving Element compliance and/or the Intent of the Element:	The acceptable solution can be fully met in the future (at a later planning stage).

The proposed subdivision achieves compliance by:

- Ensuring future building work on the lot/s can have established around it an APZ of the required dimensions - to ensure that the potential radiant heat from a bushfire to impact future building/s, does not exceed 29 kW/m² (i.e. a BAL rating of BAL-29 or less will apply to determine building construction standards);
- The APZ/s can be partially established within the/each lot boundaries. The balance of the APZ's required dimensions are being contributed by an area on adjoining land within the subdivision that is either non-vegetated or assessed as being managed in a low-fuel state and which can most reasonably be expected to be managed this way in perpetuity.
- The landowner/s having the responsibility of continuing to manage the required APZ as low threat vegetation in a minimal fuel state, by maintaining the APZ to the required dimensions and standard, including compliance with the local government's annual firebreak notice.

5.3.3 Element 3: Vehicular Access

Bushfire Protection Criteria Element 3: Vehicular Access Assessment Statements and Bushfire Protection Measures to be Applied			
Intent: To ensure that the vehicular access serving a subdivision/development is available and safe during a bushfire event.			
Acceptable Solution:	A3.1: Two access routes	Method of achieving Element compliance and/or the Intent of the Element:	The intent of the element cannot be achieved.

For this scenario where the acceptable solution cannot be met, the application of a variation can be justified. The application of the designed solution "Safe to Stay (Safe movement and/or location of persons on property subject to bushfire) is to be implemented. (Refer section 5.4.2)

Acceptable Solution:	A3.2 Public Road	Method of achieving Element compliance and/or the Intent of the Element:	The acceptable solution will be fully met in the future (at a later planning stage).
The construction technical requirements established by the Guidelines and/or the local government can and will be complied with. These requirements are set out in Appendix 2.			

Bushfire Protection Criteria Element 3: Vehicular Access (continued)
Assessment Statements and Bushfire Protection Measures to be Applied

Acceptable Solution:	A3.3 Cul-de-sacs (including a dead-end road)	Method of achieving Element compliance and/or the Intent of the Element:	The acceptable solution will be fully met in the future (at a later planning stage).
The construction technical requirements established by the Guidelines and/or the local government can and will be complied with. These requirements are set out in Appendix 2.			
Acceptable Solution:	A3.4: Battle-axe	Method of achieving Element compliance and/or the Intent of the Element:	N/A
The construction technical requirements established by the Guidelines and/or the local government can and will be complied with. These requirements are set out in Appendix 2.			
Acceptable Solution:	A3.5: Private Driveways	Method of achieving Element compliance and/or the Intent of the Element:	The acceptable solution will be fully met in the future (at a later planning stage).
The construction technical requirements established by the Guidelines and/or the local government can and will be complied with. These requirements are set out in Appendix 2.			
Acceptable Solution:	A3.6 Emergency Access Way	Method of achieving Element compliance and/or the Intent of the Element:	N/A
The construction technical requirements established by the Guidelines and/or the local government can and will be complied with. These requirements are set out in Appendix 2.			
Acceptable Solution:	A3.7 Fire Service Access Routes	Method of achieving Element compliance and/or the Intent of the Element:	N/A
The construction technical requirements established by the Guidelines and/or the local government can and will be complied with. These requirements are set out in Appendix 2.			
Acceptable Solution:	A3.8 Firebreak Width	Method of achieving Element compliance and/or the Intent of the Element:	The acceptable solution will be fully met in the future (at a later planning stage).
The proposed lots will comply with the requirements of the local government annual firebreak notice issued under s33 of the Bush Fires Act 1954. Firebreaks to be installed prior to subdivision clearance.			

5.3.4 Element 4: Water

Bushfire Protection Criteria Element 4: Water
Assessment Statements and Bushfire Protection Measures to be Applied

Intent: To ensure water is available to the subdivision, development or land use to enable people, property and infrastructure to be defended from bushfire.

Acceptable Solution:	A4.1 Reticulated Areas	Method of achieving Element compliance and/or the Intent of the Element:	The acceptable solution will be fully met in the future (at a later planning stage).

A reticulated water supply is available to the subject site and hydrants will be installed as required. Hydrant separation distances – 100m commercial, 200m residential, 400m rural residential >1ha)

The construction technical requirements established by the Guidelines and/or the local government can and will be complied with. These requirements are set out in Appendix 3.

Acceptable Solution:	A4.2 Non-Reticulated Areas	Method of achieving Element compliance and/or the Intent of the Element:	N/A

The construction technical requirements established by the Guidelines and/or the local government can and will be complied with. These requirements are set out in Appendix 3.

Acceptable Solution:	A4.3 Non-reticulated Areas (Individual Lots)	Method of achieving Element compliance and/or the Intent of the Element:	N/A

The construction technical requirements established by the Guidelines and/or the local government can and will be complied with. These requirements are set out in Appendix 3.

5.4 Additional Information for Required Bushfire Protection Measures

The purpose of this section of the Plan is:

- As necessary, to provide additional detail (to that provided in the tables of Section 5.3) regarding the implementation of the acceptable solutions for those persons who will have the responsibility to apply the stated requirements;
- As necessary, to detail specific onsite vegetation management requirements such as the APZ dimensions, management of Public Open Space or application of landscaping plans for onsite vegetation;
- To discuss how staged development will be handled, if applicable; and
- As relevant, for future planning stages, consider and discuss the requirements that may apply to future planning applications and the content of the associated BMP. In particular:
    - Any potential Vulnerable or High-Risk Land Uses.
    - Any additional content that will be required in the future BMP.

5.4.1 Vegetation Management

For this Proposal, the future vegetation within Public Open Space, the holiday resort and caravan park has been considered. Onsite vegetation is currently a combination of Shrubland and 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) through landscape treatments and that Asset Protection Zones created by this landscaping design will be maintained to ensure proposed buildings will meet the distance requirements of a minimum of BAL-12.5.

Implementation of Public Open Space Management, Landscape Plans & Staged Development

Public Open Space and Landscape areas within the stages of subdivision are required to have formal and funded vegetation management in Perpetuity.

The requirement is for fuel loads to be monitored and for all onsite vegetation to be maintained in a low bushfire threat state. This is proposed to be managed initially by the landowner/proponent (the developer) for an agreed period, established via the Landscape Management Plan, then transfer of maintenance and subsequently responsibility of these areas for management in the future to the Shire of Gingin (funded via specified area rates), formally ensuring the targeted low fuel loads are achieved and landscaping maintained in perpetuity.

Asset Protection Zone (APZ) Dimensions that are to Apply

The required dimensions of the APZ will vary dependent upon the purpose for which the APZ has been defined. There are effectively three APZ dimensions that can apply:

1. An application for planning approval will be required to show that an APZ can be created which is of sufficient size to ensure the potential radiant heat impact of a fire does not exceed 29kW/m² (BAL-29); and
2. If the assessment has determined a BAL rating for an existing or future building is less than BAL-29, the APZ must be of sufficient size to ensure the potential radiant heat impact of a fire does not exceed the kW/m² corresponding to the lower assessed BAL rating; or
3. Complying with the relevant local government's annual firebreak notice may require an APZ of greater size than that defined by the two previous parameters.

The dimensions (vegetation separation distances) for the APZ's that have been applied to reduce the impact of bushfire to ember attack or lower, specific to this Proposal are presented in the table below.

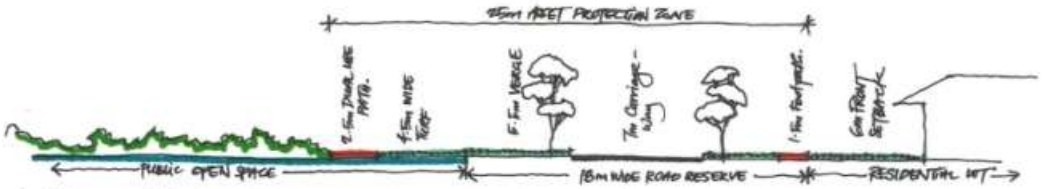
Implemented APZ Dimensions for the Subject Site 'BAL-12.5'

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)			
Vegetation Area	Applied Vegetation Classification	Effective Slope (degrees)	Maximum Acceptable 'Planning' BAL	Maximum 'Achievable' BAL	Required Separation Distance (metres)
1	Class C Shrubland	Downslope >5 to 10 degrees	BAL-29	BAL-12.5	25m
2					
3					
4					

This requirement has been established for the site to reduce the maximum allowable BAL rating to BAL-12.5.

Individual lots crated as part of this subdivision within the subject site, are to comply with the asset protection zone criteria and associated land management requirements of the Shire of Gingin Firebreak Order.

Figure 5.1.1: Interface Hazard Management - Subdivision Asset Protection Zones (cross sections)



A - Adjacent to Public Open Space

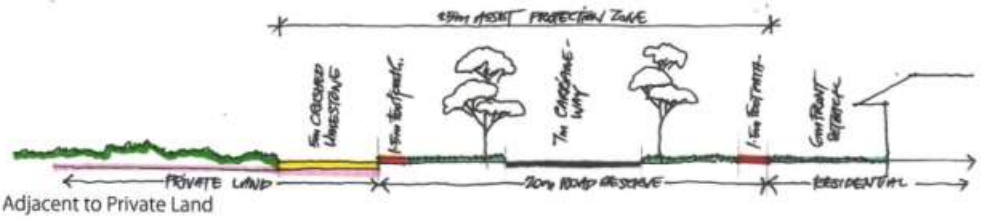
Road reserves will separate unmanaged Public Open Space from the Lots within the subdivision and incorporate low threat vegetation planting (managed turf, low shrub, street trees with canopy separation).

B - Adjacent to Public Open Space

Road reserves will separate unmanaged Public Open Space from the Lots within the subdivision and incorporate low threat vegetation planting (managed turf, low shrub, street trees with canopy separation).

C - Adjacent to Private Land

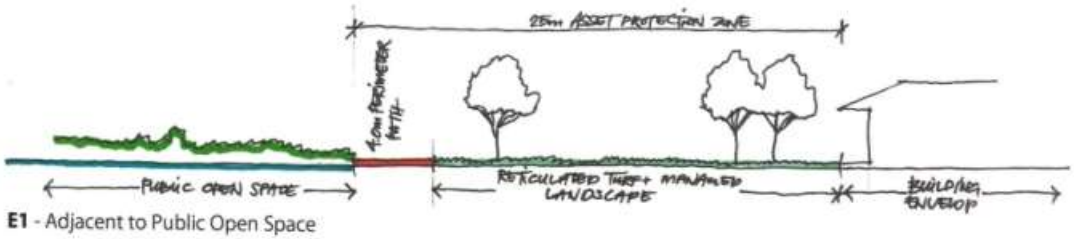
Managed low threat vegetation to a distance not less than 25m to ensure BAL-12.5 is achievable and can be maintained. Crushed limestone in private land under the control of the landowner/proponent forms part of the Asset Protection Zone, allowing for potential future subdivision of adjoining land and considers potential reduction in road reserve for the future development.



D - Adjacent to Private Land

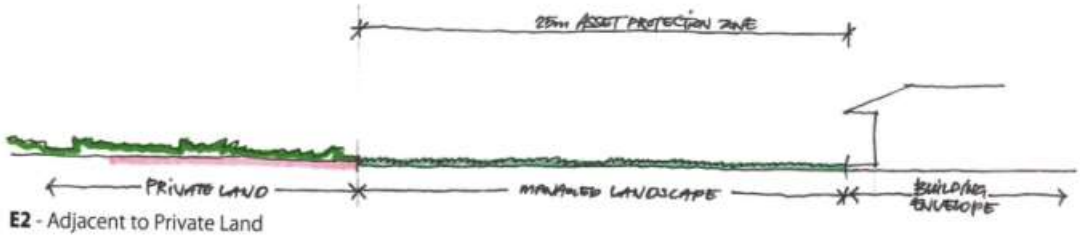
Managed low threat vegetation to a distance not less than 25m to ensure BAL-12.5 is achievable and can be maintained. Crushed limestone in private land under the control of the landowner/proponent forms part of the Asset Protection Zone, allowing for potential future subdivision of adjoining land and considers potential reduction in road reserve for the future development.

Figure 5.1.2: Interface Hazard Management - Subdivision Asset Protection Zones (cross sections)



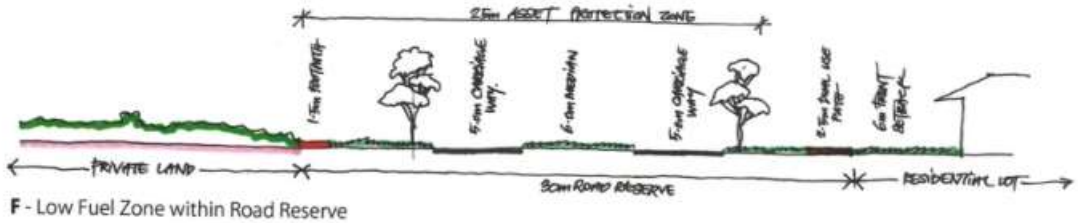
E1 - Adjacent to Public Open Space

Sealed surface 4m perimeter path, 4.5m vertical clearance and 6m horizontal clearance within the managed landscape, to enable fire appliance and other emergency service access along the foreshore reserve. The asset protection zone between unmanaged public open space and future building sites to be a minimum of 25m to ensue BAL-12.5 is achieved and can be maintained in perpetuity.



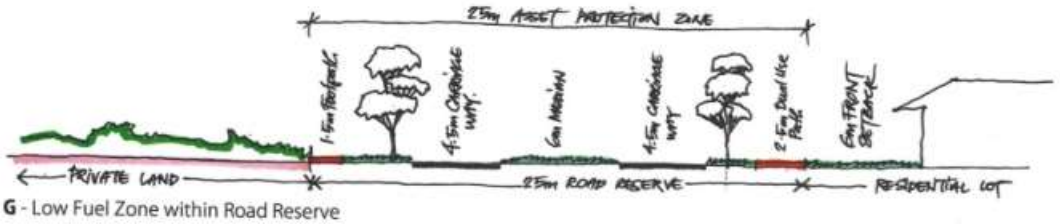
E2 - Adjacent to Private Land

Managed low threat vegetation within Lots to a distance not less than 25m to ensure BAL-12.5 is achievable and can be maintained. Landscaping may include non-vegetated areas or hardstand areas where applicable (Proposed fire station, Shire depot and 'Waste Water Treatment' sites).



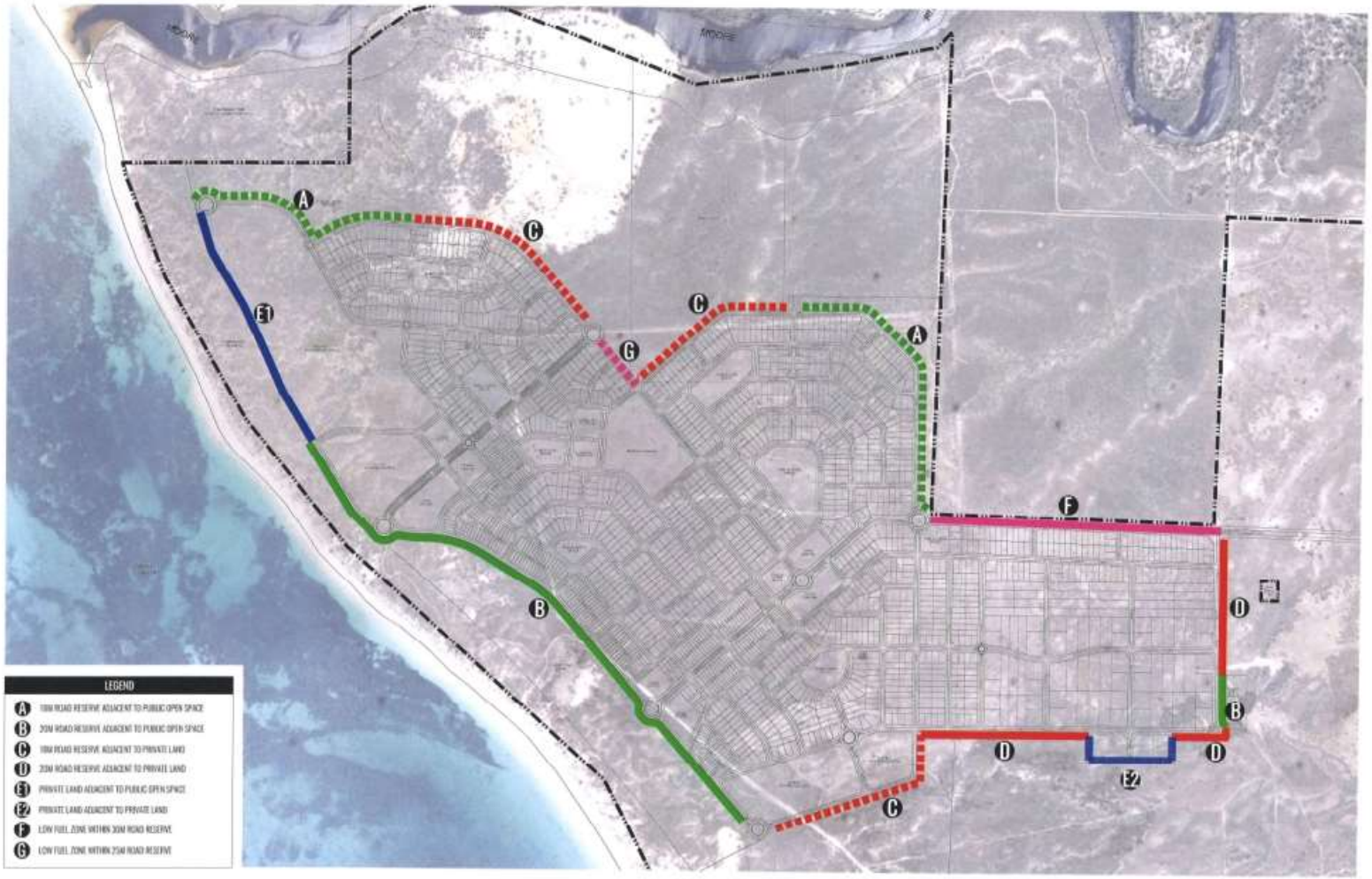
F - Low Fuel Zone within Road Reserve

Road reserves will separate unmanaged private land from the Lots within the subdivision and incorporate low threat vegetation planting (managed turf, low shrub, street trees with canopy separation).



G - Low Fuel Zone within Road Reserve

Road reserves will separate unmanaged private land from Lots within the subdivision and incorporate low threat vegetation planting (managed turf, low shrub, street trees with canopy separation).



INTERFACE HAZARD MANAGEMENT TYPOLOGIES

Moore River South

5.4.2 Vehicular Access

The subdivision design road layout provides for one main ingress and egress road connection to the Woodridge development area with connections to Indian Ocean Drive.

The bushfire management plan proposes a "Safe leave and/or Stay" option, by implementing areas with an APZ buffer that incorporates external roads and maintains the maximum rating at BAL-12.5 or lower within the development area. The BAL Contouring demonstrates that any future buildings within the proposed site will be subject to an Indicative BAL rating of BAL-12.5 or less post development works, removing the likelihood of direct flame contact on buildings and exposure to extreme levels of radiant heat. Buildings therefore could provide adequate protection for occupants during a bushfire incident.

Consideration has been given to a bushfire assembly area that would be a purpose-built building for the subdivision that provides protection from radiant heat and embers, and is equipped with drinking water and toilet facilities as a minimum. It would be designed to be a safe option where caravan park/camping ground occupants, or visitors can seek shelter if they have not left the area early prior to a known significant fire event. A bushfire assembly area would offer a greater level of protection due to the construction and location of the building that is specially built to meet performance requirements. The assembly area would provide short-term shelter from the imminent effects of a bushfire. A site for the assembly area will be identified as part of the subdivision staging and formally adopted for the Proposal. The bushfire assembly area:

- Is a safe option due to being subject to possible embers only and radiant heat of potential 1Kw/m^2 – all options carry a level of risk;
- Is not designed to replace a pre-determined response to an incident detailed within an emergency evacuation plan. Leaving early would be the primary strategy where clear and informed advice provided by DFES recommended to do so, or leaving early on high risk bushfire days, considered currently by DFES the safest option.

Leaving early means leaving the area before there are any signs of a bushfire in proximity to the subdivision, many hours before the chosen route is compromised by fire, smoke or potential blockages – not when flame and radiant heat impact is imminent. Leaving early is likely to avoid community panic, people being trapped, individuals making poor decisions resulting in risking serious injury or fatalities.

Contingency plans should include relocation to a fire safe assembly area designated for each stage of subdivision. Large scale evacuation is not a default option, mass evacuation of entire suburbs or communities requires significant lead times and to be effective bushfire evacuation or relocation must not expose people to a higher risk that that they would be exposed to if remaining within the built-out area.

Access

The purpose of the road system for bushfire protection is to, provide emergency services with unimpeded access to the subdivision area, access to the structures within the subdivision and water supplies within the subdivision. The design of the access road will enable safe access and egress for residents attempting to leave the area at the same time that emergency service personnel are arriving to undertake fire-fighting or other emergency operations.

The subdivision design is such that it includes perimeter roads separating the developable lots from bushland areas. The objective of perimeter roads is to not only provide a fuel free area adjacent to the hazard but to also ensure suitable unrestricted access for fire-fighting and fire management purposes. The internal road layout does not incorporate dead end roads, or cul-de-sac's, allowing more efficient use of resources traversing through the subdivision, providing safe connection to the evacuation route for emergency personnel and the public.

Roads will be constructed to provide sufficient width and other dimensions to ensure safe unobstructed access and allow firefighting crews to operate equipment around the appliance.

Roads for this subdivision will consider and ensure that:

- Fire-fighting vehicles are provided with safe, all-weather access to structures and hazardous vegetation;
- The capacity of access roads is adequate for emergency service and public vehicles to cater for expected volumes of traffic;
- There is appropriate access to water supply with hydrants located at regular intervals through the subdivision;
- Access roads are designed to allow safe access and egress for medium rigid fire-fighting vehicles while residents are evacuating as well as providing a safe operational environment for emergency service personnel during fire-fighting and emergency management on the interface;
- Fire-fighting vehicles can access the dwelling sites and exit safely using local roads, without restrictions;
- No trees to be retained or planted within road reserves along the main access road that could potentially block or restrict traffic flow during emergencies or other times;
- Infrastructure for power lines, street lighting or other services utilising poles along access roads will be maintained clear of flammable material in accordance with Western Power clearance requirements for overhead lines near vegetation and where practicable constructed of non-combustible material or appropriate fire-retardant treatments; and
- Evacuation route signage and location of bushfire assembly building/s is to be provided and installed and updated for each stage of subdivision. Signage information should include but is not limit to:

a) What preparations to carry out in advance (emergency go kits, family evacuation plans);
b) How an evacuation is declared;
c) Where to get information once an evacuation is declared;
d) What transport options will likely be available;
e) What evacuation routes are to be used & procedures on safely using the main evacuation route;
f) What support services are likely to be offered to evacuees;
g) Where planned assembly areas/refuges may be established;
h) Where and how to get updated information once an evacuation is underway; and
i) What services they should expect when re-located or at the assembly areas/refuges.

5.4.3 Future Stages – Additional Information Required

For future stages of the subdivision, there is a requirement to review and update the bushfire management plan and address future planning applications and the content of the associated BMP, in particular:

- Any potential Vulnerable or High-Risk Land Uses;
- Any additional content relating to landscaping and vegetation management that will be required in the future BMP; and
- Any changes to bushfire assembly areas, location or buildings and pre-determined response to emergency incidents (including emergency evacuation information signage).

6 Responsibilities for Implementation and Management of the Bushfire Protection Measures

For future later stage planning, submissions will be required to set 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'.

Table 6.1: BMP Implementation responsibilities prior to the issue of titles for the Developer (Landowner).

DEVELOPER (LANDOWNER) - PRIOR TO ISSUE OF TITLES

No.	Implementation Actions	Subdivision Clearance
1	Planning approval may be conditioned with the requirement to make appropriate notifications (on the certificates of title and the deposited plan), of the existence of this Bushfire Management Plan. 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'.*	☐
2	Construct the public roads to the standards stated in the BMP.	☐
3	Evacuation route signage and location of bushfire assembly building/s is to be provided, installed and updated for each stage of subdivision.	☐
4	Establish the Asset Protection Zones (APZ) for the 'Subdivision Stage' to the dimensions and standard stated in the BMP.	☐
5	Install the reticulated water supply (hydrants) to the standards stated in the BMP.	☐
6	Construct landscaping to ensure low threat standards stated in the BMP.	☐
7	The entity responsible for having the BMP prepared should ensure that anyone listed as having responsibility under the Plan has endorsed it and is provided with a copy for their information. This includes the landowners/proponents (including future landowners where the Plan was prepared as part of a subdivision approval), local government and any other authorities or referral agencies ('Guidelines' s4.6.3).	☐

Table 6.2: BMP Implementation responsibilities prior to lot sale, occupancy or building for the Landowner (Developer).

LANDOWNER (DEVELOPER) - PRIOR TO LOT SALE, OCCUPANCY OR BUILDING	
No.	Implementation Actions
1	Prior to sale of the subject lots, each individual lot is to be compliant with the relevant local government's annual firebreak notice issued under s33 of the Bushfires Act 1954.
2	Prior to sale of the subject lots, establish the Asset Protection Zone (APZ) on each lot to the dimensions and standard stated in the BMP. This is the responsibility of the Landowner/Developer.
3	There is an outstanding obligation, created by this Bushfire Management Plan, for a Bushfire Response/Evacuation Plan for proposed occupants to be developed for future 'vulnerable' and/or 'high-risk' land use.
4	Prior to any building work, inform the builder of the existence of this Bushfire Management Plan and the responsibilities it contains, regarding the required construction standards. This will be: • The standard corresponding to the determined BAL rating, as per the bushfire provisions of the Building Code of Australia (BCA); and/or • A higher standard as a result of the BMP establishing that construction is required at a standard corresponding to a higher BAL rating.

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

LANDOWNER/OCCUPIER - ONGOING	
No.	Ongoing Management Actions
1	Comply and maintain the Asset Protection Zone (APZ) within their lot, to the dimensions and standard as stated within the Shire of Gingin's annual Firebreak Order (Firebreak Notice) issued under s33 of the Bush Fires Act 1954.
2	Ensure that any builders (of future structures on the lot) are aware of the existence of this Bushfire Management Plan and the responsibilities it contains regarding the application of construction standards corresponding to a determined BAL rating.
3	Ensure all future buildings the landowner has responsibility for, are designed and constructed in full compliance with: 1. the requirements of the WA Building Act 2011 and the bushfire provisions of the Building Code of Australia (BCA); and 2. with any identified additional requirements established by this BMP or the relevant local government.

Table 6.4: Ongoing management responsibilities for the Local Government.

LOCAL GOVERNMENT - ONGOING	
No.	Ongoing Management Actions
1	Monitor landowner compliance with the Bushfire Management Plan and the annual Firebreak Order (Firebreak Notice).
2	Where control of an area of vegetated land is vested in the control of the local government and that area of land has influenced the assessed BAL rating/s of the subject site/s – and the BAL rating has been correctly assessed - there is an obligation to consider the impact of any changes to future vegetation management and/or revegetation plans with respect to that area.

Appendix 1 - Onsite Vegetation Management Technical Requirements

It is the responsibility of the landowner to maintain the established bushfire protection measures on their property. Not complying with these responsibilities can result in buildings being subject to a greater potential impact from bushfire than that determined by the assessed BAL rating presented in this Bushfire Management Plan.

For the management of vegetation within a lot (i.e. onsite) the following technical requirements exist:

1. **The APZ:** Installing and maintaining an asset protection zone (APZ) of the required dimensions to the standard established by the Guidelines for Planning in Bushfire Prone Areas (WA Planning Commission, as amended). When, due to the planning stage of the proposal to which this Bushfire Management Plan applies, defined APZ dimensions are known and are to be applied to existing or future buildings – then these dimensions are stated in Section 5.4.1 of this Plan.

2. **The Firebreak/Fuel Load Notice:** Complying with the requirements established by the relevant local government's annual firebreak notice issued under s33 of the Bushfires Act 1954. Note: If an APZ requirement is included in the Notice, the standards and dimensions may differ from the Guideline's APZ Standard – the larger dimension must be complied with.

3. **Changes to Vegetated/Non-Vegetated Areas:**

    a. If applicable to this Plan, the minimum separation distance from any classified vegetation, that corresponds to the determined BAL for a proposed building, must be maintained as either a non-vegetated area or as low threat vegetation managed to a minimal fuel condition as per AS 3959-2009 s2.2.3.2 (e) and (f). Refer to Part 4 of this Appendix 1.

    b. Must not alter the composition of onsite areas of classified vegetation (as assessed and presented in Section 3.1.2) to the extent that would require their classification to be changed to a higher bushfire threat classification (as per AS 3959-2009); and

    c. Must not allow areas within a lot (i.e. onsite) that have been:
        i. excluded from classification by being low threat vegetation or non-vegetated; and
        ii. form part of the assessed separation distance that is determining a BAL rating -

    ...to become vegetated to the extent they no longer represent a low threat (refer to Part 4 of Appendix 1). Note: The vegetation classification exclusion specifications as established by AS 3959-2009 s2.2.3.2, are included at A1.4 below for reference.

1. Requirements Established by the Guidelines – the Asset Protection Zone (APZ) Standards

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

Defining the Asset Protection Zone (APZ)

Description: An APZ is an area surrounding a building that is managed to reduce the bushfire hazard to an acceptable level (by reducing fuel loads). The width of the required APZ varies with slope and vegetation. For planning applications, the minimum sized acceptable APZ is that which is of sufficient size to ensure the potential radiant heat impact of a fire does not exceed 29kW/m² (BAL-29). It will be site specific.

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

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

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

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

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

Schedule 1: Standards for APZ

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

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

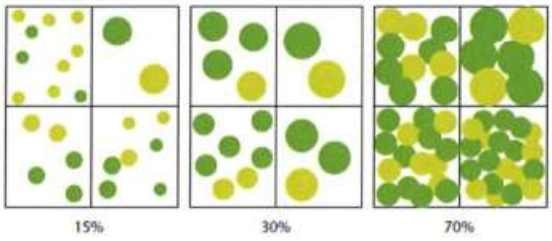
Fine Fuel Load: combustible dead vegetation matter less than 6 mm in thickness reduced to and maintained at an average of two tonnes per hectare (example below).

Example Fine Fuel Load of Two Tonnes per Hectare

(Image source: Shire of Augusta Margaret River's Firebreak and Fuel Reduction Hazard Notice)

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

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



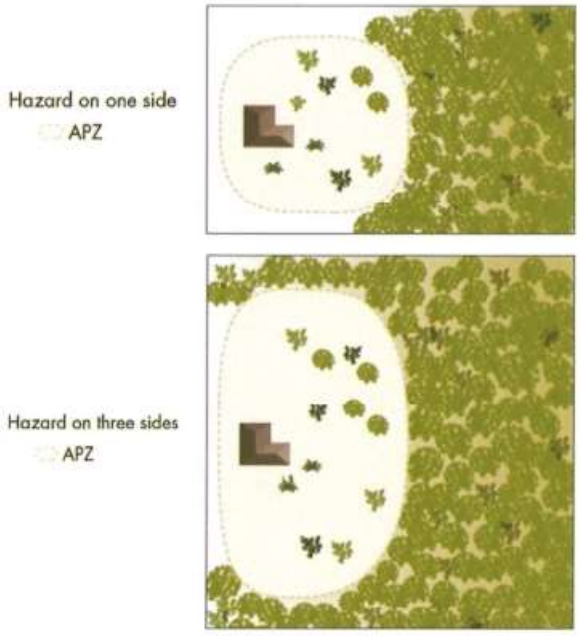
(Source: Guidelines for Planning in Bushfire Prone Areas 2017, Appendix 4)

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

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

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

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



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

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

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

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

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

When, due to the planning stage of the proposal to which this Bushfire Management Plan applies, defined APZ dimensions are known and are to be applied to existing or future buildings – then these dimensions are stated in Section 5.4.1 of this Plan.

3. Requirements Recommended by DFES – Property Protection Checklists

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

4. Requirements Established by AS 3959-2009 - Maintaining Areas within your Lot as 'Low Threat'

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

"Australian Standard - AS 3959-2009 Section 2.2.3.2: Exclusions - Low threat vegetation and non-vegetated areas:

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

a) *Vegetation of any type that is more than 100m from the site.*
b) *Single areas of vegetation less than 1ha in area and not within 100m of other areas of vegetation being classified.*
c) *Multiple area 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 (measured perpendicular to the elevation exposed to the strip of vegetation) regardless of length and not within 20m of the site or each other, or other areas of vegetation being classified.*

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 2 - Vehicular Access Technical Requirements

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

Contact the relevant local government for the requirements that are to apply in addition to the requirements set out as an acceptable solution in the Guidelines. If the relevant local government requires that these are included in the Bushfire Management Plan, they will be included in this appendix and referenced.

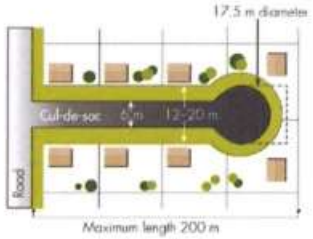
Requirements Established by the Guidelines – The Acceptable Solutions

Vehicular Access Technical Requirements - Part 1

Acceptable Solution 3.3: Cul-de-sacs (including a dead-end road)

Their use in bushfire prone areas should be avoided. Where no alternative exists then the following requirements are to be achieved:

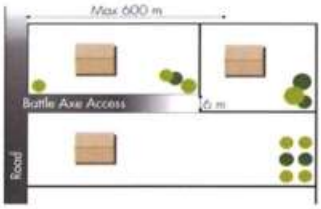
- Maximum length is 200m. If public emergency access is provided between cul-de-sac heads (as a right of way or public access easement in gross), the maximum length can be increased to 600m provided no more than 8 lots are serviced and the emergency access way is less than 600m in length;
- Turnaround area requirements, including a minimum 17.5m diameter head to allow type 3.4 fire appliances to turn around safely;
- The cul-de-sac connects to a public road that allows for travel in two directions; and
- Meet the additional design requirements set out in Part 2 of this appendix.



Acceptable Solution 3.4: Battle-axe

Their use in bushfire prone areas should be avoided. Where no alternative exists then the following requirements are to be achieved:

- Maximum length 600m and minimum width 6m; and
- Comply with minimum standards for private driveways.



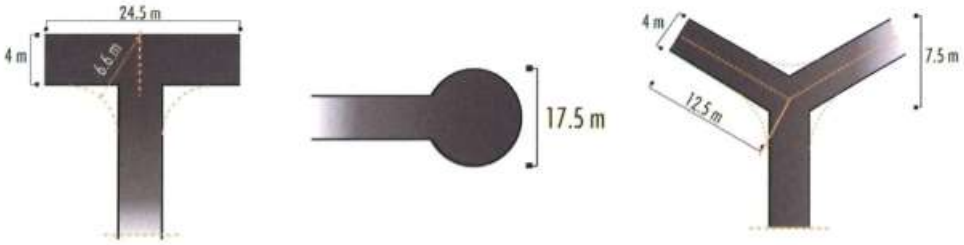
Acceptable Solution 3.5: Private Driveways

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:

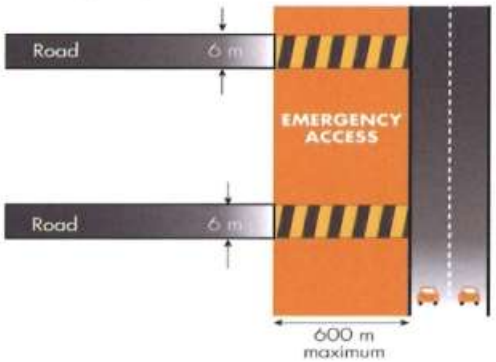
- Passing bays every 200 metres with a minimum length of 20 metres and a minimum width of two metres (ie combined width of the passing bay and constructed private driveway to be a minimum six metres);
- Turn-around areas every 500 metres and within 50 metres of a house, designed to accommodate type 3.4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



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.

Acceptable Solution 3.8: Firebreak Width

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

Vehicular Access Technical Requirements - Part 2

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

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

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

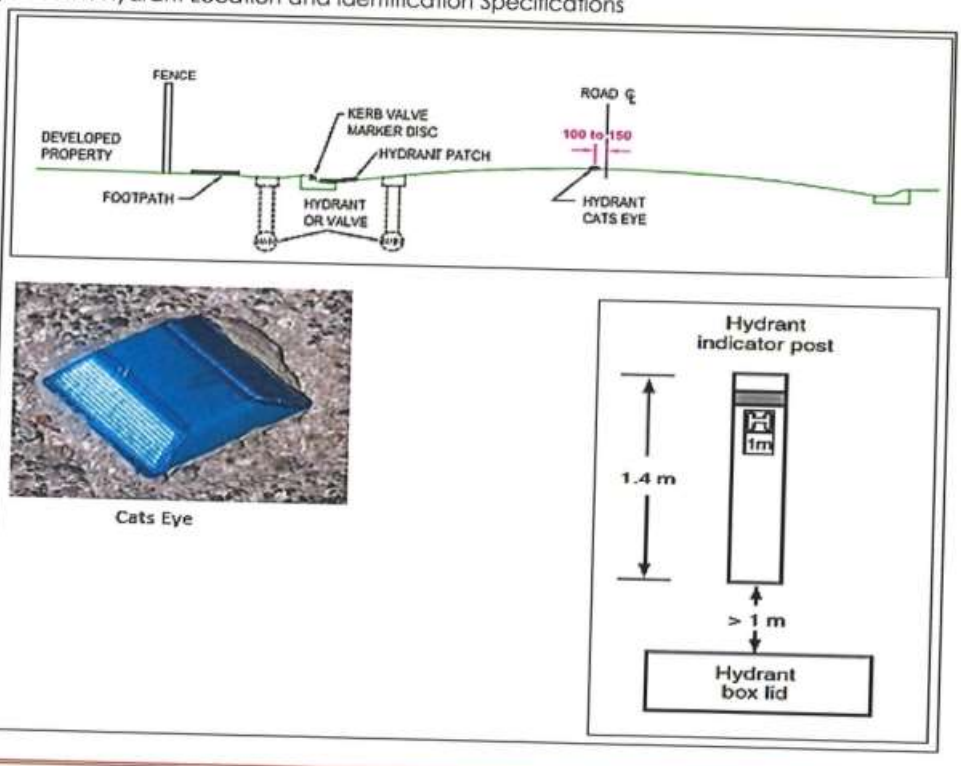
Appendix 3 - Water Technical Requirements

Requirements Established by the Guidelines - Acceptable Solution A4.1: Reticulated Areas

The requirement is to supply a reticulated water supply and fire hydrants, in accordance with the technical requirements of the relevant water supply authority and DFES. 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 m² (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



Contact the relevant water supply authority to confirm the technical requirements that are to be applied. They may differ from the minimum requirements of the 'baseline' Water Corporation's No. 63 Water Reticulation Standard.