



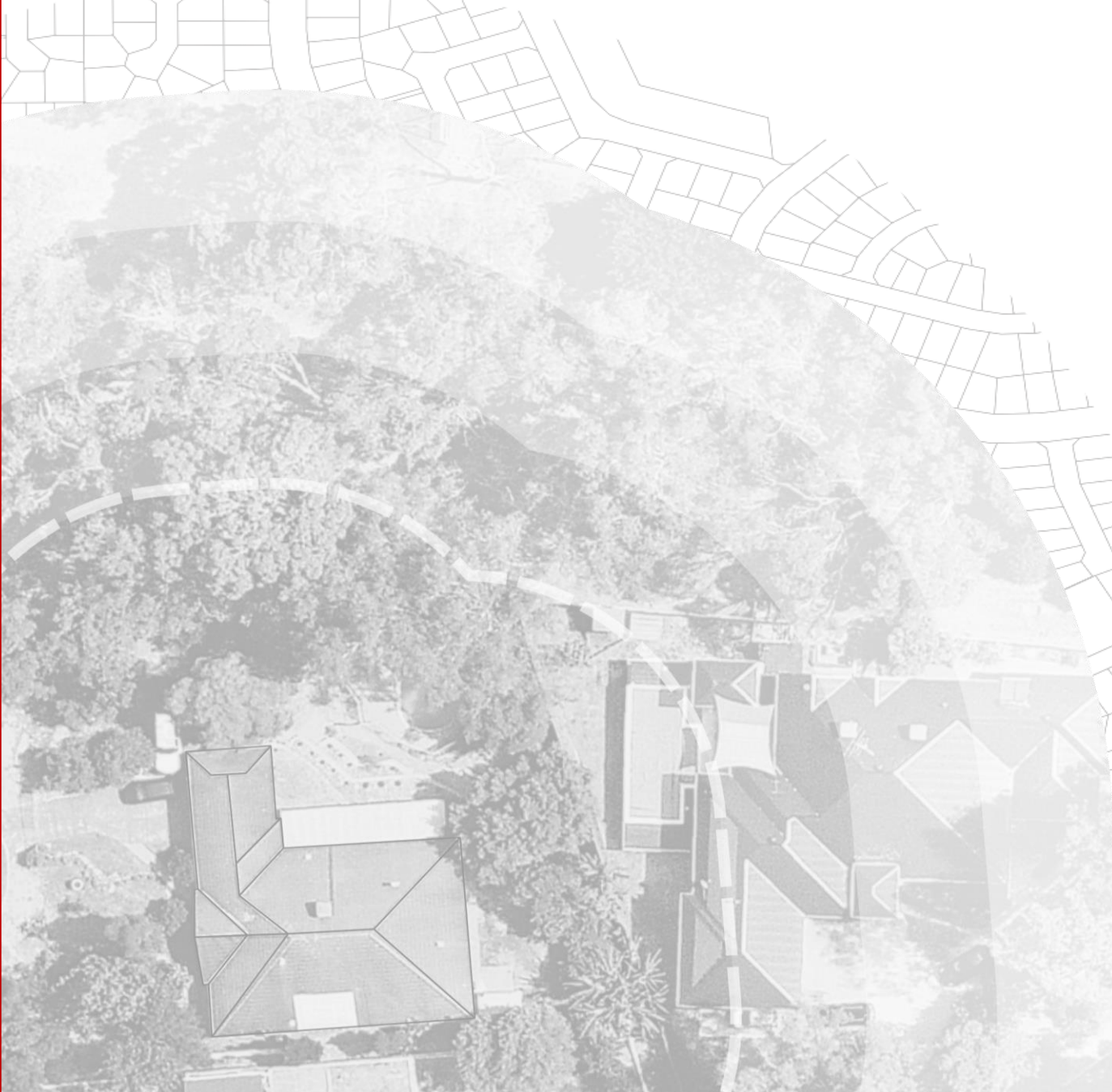
# BUSHFIRE MANAGEMENT PLAN

**State Planning Policy 3.7**

(Subdivision Development)

Lot 499 St Andrews Dr, Yanchep

Version: 1.0 Reference: 5143 April 2016



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Further, the growth, planting or removal of vegetation; poor maintenance of any fire prevention measures; addition of structures not included in this report; or other activity can and will change the bushfire threat to all properties detailed in the report. Further, the achievement of the level of implementation of fire precautions will depend on the actions of the landowner or occupiers of the land, over which RUIC Fire has no control. If the proponent becomes concerned about changing factors then a new Fire Risk Management Plan should be requested.

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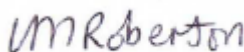
## Contents Page

<b>1.0 Document Details</b>	<b>4</b>
1.1 Background Information	4
1.2 Development Description	4
1.3 Vulnerable / High Risk Land Use	4
1.4 Unavoidable Development	4
1.5 Minor Development	5
1.6 Environmental Considerations	5
1.7 Risk Assessment	5
1.8 Bushfire Design Criteria:	6
1.9 Specific Bushfire Planning requirements:	6
<b>2.0 Spatial consideration of bushfire threat</b>	<b>10</b>
2.1 Bushfire Fuels and Potential Bushfire Impact	10
<b>3.0 Proposal compliance and justification</b>	<b>17</b>
3.1 Compliance with the objectives of SPP 3.7	17
3.2 SPP 3.7 Policy Measures applicable to the proposal	18
3.3 Guidelines for Planning in Bushfire Prone Areas Compliance	20
3.4 Areas of non-compliance with other relevant documents	20
<b>4.0 Bushfire Risk Management Measures</b>	<b>21</b>
4.1 Element 1 - Location	21
4.2 Element 2 - Siting and design of Development	21
4.3 Element 3 - Vehicular Access	22
4.4 Element 4 – Water	25
<b>5.0 Implementation and Enforcement</b>	<b>26</b>
<b>6.0 References</b>	<b>27</b>

## 1.0 Document Details

### 1.1 Background Information

**Project Number:** 5143  
**Project Name:** Lot 499 St Andrews, Yanchep  
**Author:** Louisa Robertson, BPAD36748, Level 1  
**Approved by:** Darrel Krammer, Grad Cert Bushfire Protection, BPAD33412, Level 1  
**Version:** 1.0  
**Date of issue:** 13<sup>th</sup> April 2016



Author:

Date: 13/4/2016



Approved by:

Date: 13/4/2016

In the signing the above, the author declares that this Bushfire Management Plan meets the requirements of State Planning Policy 3.7.

### 1.2 Development Description

The development involves the subdivision (the development) of a portion of Lot 499 St Andrews Rd, Yanchep (the site), to create 14 strata lots, 15 traditional lots, 3 duplex lots and 3 grouped housing lots. The site is located within the municipality of the City of Wanneroo.

The site and overall development plan is illustrated in Figures 1A&1B on pages 7 & 8 of this report.

The site is identified as Bushfire Prone through the State Bushfire Prone Maps triggering the application of AS 3959 in accordance with the Building Code of Australia.

### 1.3 Vulnerable / High Risk Land Use

The development does not contain any vulnerable or high risk land uses as defined in SPP 3.7.

### 1.4 Unavoidable Development

The development is not considered unavoidable development as defined in SPP 3.7.

## 1.5 Minor Development

The development is not considered minor development as defined in SPP 3.7.

## 1.6 Environmental Considerations

The proponent has not identified any relevant environmental considerations (wetlands, foreshores, Bush Forever sites, remnant vegetation, threatened species, ecological communities, nature reserves or coastal reserves) within the site or being affected by the development.

## 1.7 Risk Assessment

Risk assessment was completed in accordance with ISO31000:2009 (Standards Australia, 2009) and COAG's National Inquiry on Bushfire Mitigation and Management (Ellis, Kanowski & Whelan, 2004) (Table 1A). The risk assessment demonstrates that after application of the risk management strategies incorporated into the design of the development, the residual bushfire related risk post subdivision is significantly reduced compared to the current state.

Table 1A: Risk assessment of development

Risk Number	Risk Statement	Impact Category	Pre-development Risk Level	Prevention Controls (Planning Specific)	Post-development Residual Risk Level
1.	There is the potential that a bushfire will impact the proposed development which in turn will cause death or injury to persons.	People	<b>Moderate</b>	<ul style="list-style-type: none"> <li>Enhanced construction in accordance with AS 3959 to provide shelter during passage of the fire front.</li> <li>Multiple egress routes for residents to evacuate to areas greater than 100m from the vegetation interface.</li> <li>Reticulated firefighting water supply</li> </ul>	<b>Low</b>
2.	There is the potential that a bushfire will impact the proposed development, which in turn will cause destruction of or damage to the proposed habitable buildings.	Infrastructure	<b>Moderate</b>	<ul style="list-style-type: none"> <li>Enhanced construction in accordance with AS 3959.</li> <li>Dwelling setbacks ensures maximum BAL-29 rating.</li> <li>Reticulated firefighting water supply</li> </ul>	<b>Low</b>

3.	There is the potential that a bushfire will impact the proposed development, which in turn will cause destruction of or damage to environmental assets.	Environment	<b>Low</b>	<ul style="list-style-type: none"> <li>Development does not include the removal of any environmentally significant vegetation.</li> </ul>	<b>Low</b>
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**1.8 Bushfire Design Criteria:**

All bushfire related design criteria are addressed in Section 3 of this report. The Bushfire Management Plan Strategies Map is illustrated in Figure 1C on page 9 of this report.

**Acceptable Solutions applied:** A1.1, A2.1, A3.1, A3.2, A3.3, A4.1

**Acceptable Solutions not applicable:** A2.2, A3.4, A3.5, A3.6, A3.7, A3.8, A4.2, A4.3

**Non-compliances:** Nil

**Performance Based Solution Summary** None

**1.9 Specific Bushfire Planning requirements:**

Required bushfire planning design requirements are summarised as:

- (i) *Future habitable buildings to be constructed in accordance with AS 3959;*
- (ii) *A S70A Notification on each title stating: "This lot is subject to a Bushfire Management Plan".*
- (iii) *Lots 14 and 887 are to be excluded from sale and development until such a time that the trees bordering the north lot boundary are removed.*



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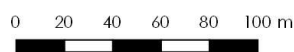
**BUSHFIRE MANAGEMENT PLAN MAP**  
**Lot 499 St Andrews, Yanchep**

**Site Overview**

- Site Boundary
- Cadastre
- Proposed Site Plans
- Main Road



Size: A4  
 Scale: 1:2,500



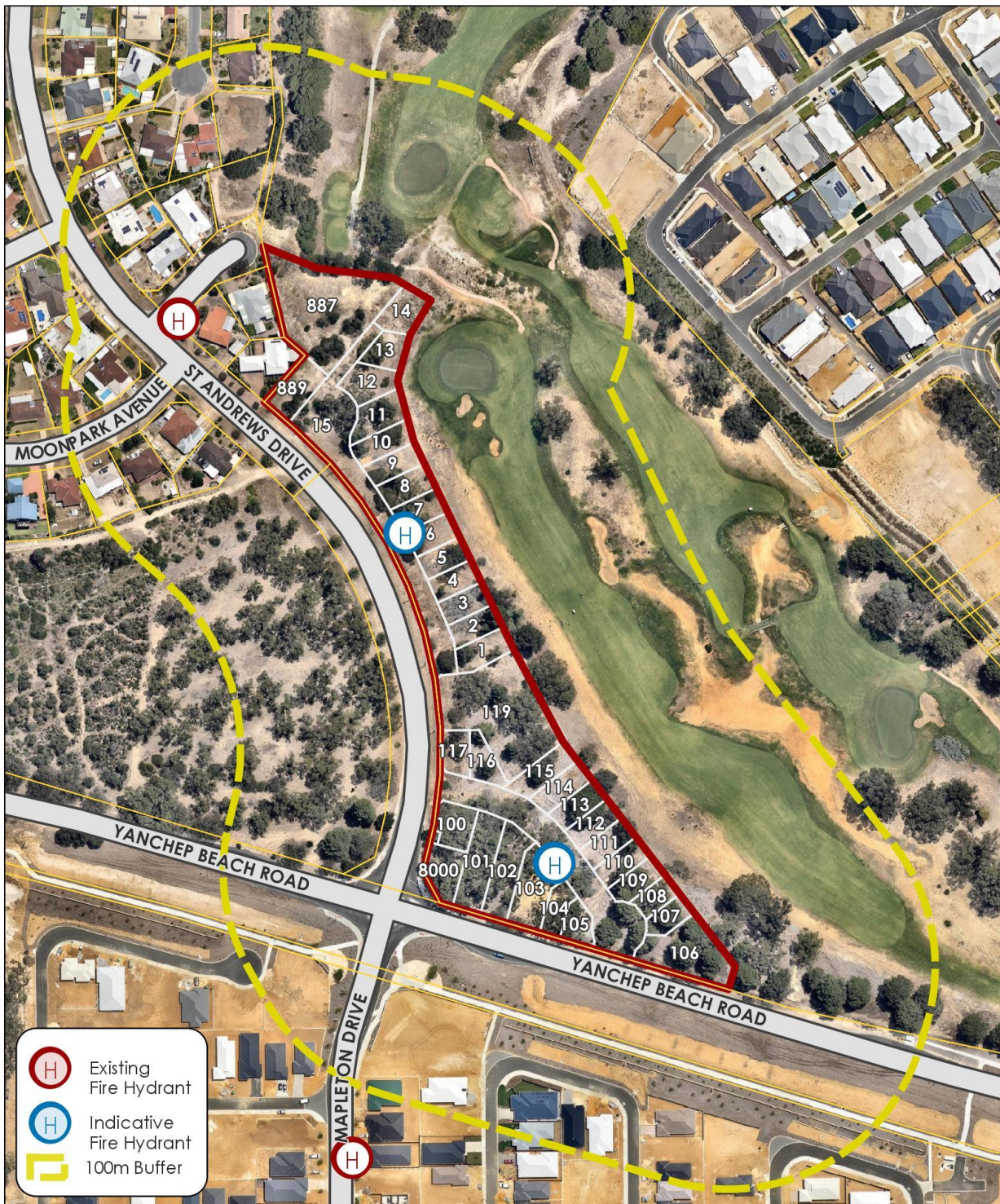
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Figure 1A: Site Overview







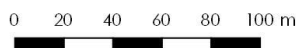
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**BUSHFIRE MANAGEMENT PLAN MAP**  
 Lot 499 St Andrews, Yanchep

- Site Boundary
- Cadastre
- Proposed Site Plans
- Main Road

**Bushfire Management Strategies**

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 Projection: GDA94 MGA50  
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Figure 1C: Bushfire Management Strategies Map

## 2.0 Spatial consideration of bushfire threat

### 2.1 Bushfire Fuels and Potential Bushfire Impact

The location and extent of AS 3959 vegetation structures, including low fuel areas, within 100m of the site are mapped in Figure 2A and illustrated in the associated plates. Bushfire fuel loads are identified as consistent with AS 3959 Table B2 for radiant heat flux modelling purposes. All bushfire structures and fuel loads are assessed in their mature states (including revegetation and rehabilitation areas) unless otherwise identified. Trees within the Golf Course along the northern boundary of the development will be removed by the golf course prior to the subdivision development proceeding. Should the trees not be removed, Lots 14 & 887 are not to be sold or developed until the tree removal works are completed due to BAL ratings exceeding BAL-29.

In accordance with SPP 3.7, a BAL Contour Map is utilised as opposed to a Bushfire Hazard Level Map. Potential bushfire impact analysis was undertaken in accordance with AS 3959 Methodology 1, Table 2.4.3 (Plots 1 and 3) and Methodology 2 (Plot 2) to determine the potential worst case scenario radiant heat impact on each of the building envelopes in the proposed development in the event of bushfire within vegetation classifiable in accordance with AS 3959.

Standard inputs are identified in Table 2A, specific threat scenario inputs are identified in Table 2B.

Table 2A: Standard inputs

Design Bushfire Inputs		Reference
FDI:	80	AS3959:2009 Table 2.4.1
Heat of combustion	18600kj/kg	AS3959:2009 Table 2.4.1
Flame temperature	1090K	AS3959:2009 Table 2.4.1
Ambient temperature	308K	AS3959:2009 Table 2.4.1
Mean humidity	25%	AS3959:2009 Table 2.4.1

Table 2B: Site specific inputs

Design Bushfire Input	Plot 8	Reference
Vegetation Classification:	Class D Scrub	AS3959:2009 Table 2.3
Understory Fuel Load (t/ha)	25	AS3959:2009 Table B2
Total Fuel Load (t/ha)	25	AS3959:2009 Table B2
Effective Slope (°)	4	Site assessment & Landgate Data
Site Slope (°)	0	Site Assessment & Landgate data
Flame Width (m)	10	Site assessment

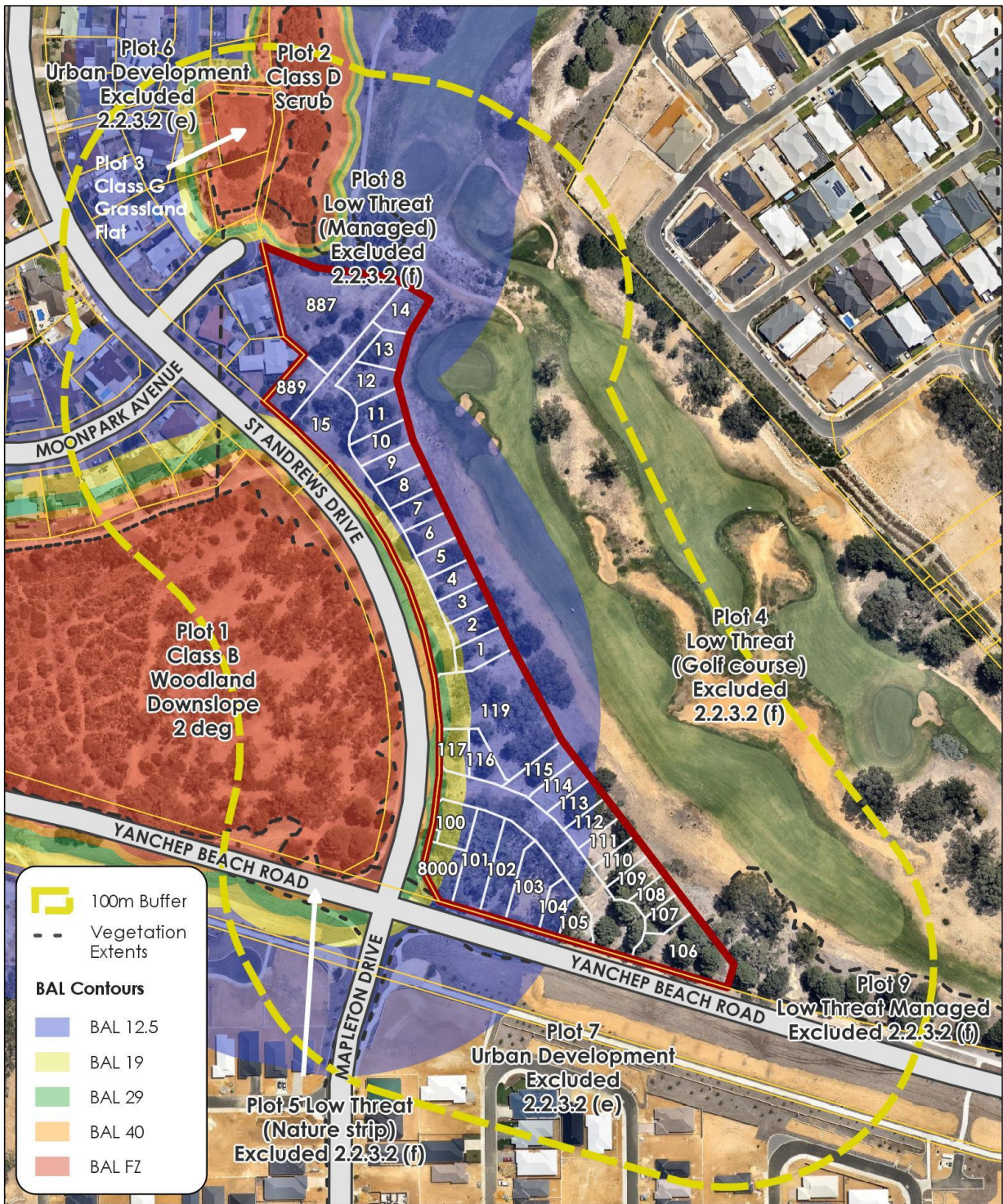
Table 2C: Separation distances and BAL ratings – Plot 8

Plot 8	
<b>Vegetation Classification</b>	Class D Scrub
<b>Effective Slope</b>	Downslope 4°
Separation Distance	BAL Rating
0 to less than 9.5m	BAL-FZ
9.5 to less than 11.5m	BAL-40
11.5 to less than 13.5m	BAL-29
13.5 to less than 16m	BAL-19
16 to less than 100m	BAL-12.5
100m and greater	BAL-LOW

The BAL Contour Map (Figure 2A, Table 2A) identifies that through the implementation of the required Asset Protection Zone and separation afforded by structures satisfying AS 3959 c2.2.3.2, the maximum potential radiant heat impact for any lot boundary in the proposed development is BAL-29. This satisfies GPBPA Element 1: Location, A1.1.

Table 2A: Maximum BAL rating that applies to each lot boundary

Lot/s	Vegetation Classification	Effective Slope	Separation (m)	BAL Rating Achievable
Lots 1 - 3	Class B Woodland	Downslope >0 to 5°	25 to less than 35m	BAL-19
Lots 4 - 14	Class B Woodland	Downslope >0 to 5°	35 to less than 100m	BAL-12.5
Lot 100	Class B Woodland	Downslope >0 to 5°	17 to less than 25m	BAL-29
Lots 101 - 105	Class B Woodland	Downslope >0 to 5°	35 to less than 100m	BAL-12.5
Lots 106 - 110	Class B Woodland	Downslope >0 to 5°	>100m	BAL-LOW
Lots 111- 115	Class B Woodland	Downslope >0 to 5°	35 to less than 100m	BAL-12.5
Lot 116	Class B Woodland	Downslope >0 to 5°	25 to less than 35m	BAL-19
Lot 117	Class B Woodland	Downslope >0 to 5°	17 to less than 25m	BAL-29
Lot 119	Class B Woodland	Downslope >0 to 5°	17 to less than 25m	BAL-29
Lot 887	Class D Scrub	Downslope 4°	16 to less than 100m	BAL-12.5
Lot 889	Class D Scrub	Downslope 4°	16 to less than 100m	BAL-12.5
Lot 8000	Class B Woodland	Downslope >0 to 5°	17 to less than 25m	BAL-29



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**BUSHFIRE MANAGEMENT PLAN MAP**  
 Lot 499 St Andrews, Yanchep

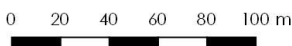
**BAL Contours**

- Site Boundary
- Proposed Site Plans

- Cadastre
- Main Road



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 Scale: 1:2,500



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Figure 2A: BAL Contour Map



*Plate i: Plot 1 Class B Woodland*



*Plate ii: Plot 1 Class B Woodland*



*Plate iii: Plot 2 Class B Woodland*



*Plate iv: Plot 3 Class B Woodland*



*Plate v: Plot 3 Class G Grassland(behind fence line)*



*Plate vi: Plot 4 Low Threat Golf Course*



*Plate vii: Plot 4 Low Threat Golf Course*



*Plate viii: Plot 5 Low Threat Managed Strip*



*Plate ix: Plot 5 Low Threat Managed Strip*



*Plate x: Plot 8 Class D Scrub*



*Plate xi: Plot 9 Low Threat*



**BUSHFIRE MANAGEMENT PLAN MAP**  
**Lot 499 St Andrews, Yanchep**

- Site Boundary
- Direction
- Proposed Site Plans
- Main Road

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**Access Map**

Size: A4  
 Scale: 1:2,500

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 Projection: GDA94 MGA50  
 Author: MM - RUIC | Date: 2016-03-15  
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Figure 2B: Site Access



## 3.0 Proposal compliance and justification

### 3.1 Compliance with the objectives of SPP 3.7

**Objective 1:** Avoid increasing the threat of bushfire to people, property, and infrastructure. The preservation of life and management of bushfire impact is paramount.

*Objective 1 is satisfied through the compliance of the proposed development with all required Policy Principles as detailed in Table 3A and all GPBPA Performance Principles as detailed in section 4 of this report.*

**Objective 2:** Reduce vulnerability of bushfire through the identification and assessment of bushfire hazards in decision-making at all of stages of the planning and development process.

*Objective 2 is satisfied through the appropriate identification and assessment of all relevant bushfire hazards as detailed in section 2 of this report, specifically the BAL Contour Mapping.*

**Objective 3:** Ensure that planning proposals and development applications take into account bushfire protection requirements and include specified bushfire protection measures where land has or will have a moderate or extreme bushfire hazard level, and or where a rating higher than Bushfire Attack Level (BAL)- LOW applies.

*Objective 3 is satisfied through the compliance of the proposed development with all required Policy Principles as detailed in Table 3A and all GPBPA Performance Principles as detailed in section 4 of this report.*

**Objective 4:** Achieve a responsible approach between bushfire management measures and landscape amenity and biodiversity conservation values, with consideration of the potential impacts of climate change.

*Objective 4 is satisfied through the appropriate consideration of all biodiversity and environmental assets as detailed in section 1 of this report in the development of bushfire related risk mitigation strategies detailed in section 4 of this report.*

### 3.2 SPP 3.7 Policy Measures applicable to the proposal

Table 3A: Compliance of the proposed development with the Policy Measures of SPP 3.7.

Policy Measure	Description		Compliance
6.1	Higher order strategic planning	<input checked="" type="checkbox"/>	Site has been identified as being subject to potential bushfire impact. This Bushfire Management Plan demonstrates compliance of the development with all bushfire related planning requirements
6.2	Application of Policy Measures	<input checked="" type="checkbox"/>	Site has a BAL rating above BAL-LOW. Policy Measures 6.4 and 6.5 apply.
6.3	Supporting information for Strategic Planning Proposals	<input checked="" type="checkbox"/>	N/A – Development is at a detailed level
6.4	Supporting information for Subdivision Applications	<input checked="" type="checkbox"/>	This BMP supports the proposed development. BAL Contour Map is provided in Section 2.1 of this report identifying all bushfire hazard issues. Compliance against GPBPA detailed in section 3.3 of this report.
6.5	Supporting information for Development Applications	<input checked="" type="checkbox"/>	This BMP supports the proposed development. BAL Contour Map is provided in Section 2.1 of this report identifying all bushfire hazard issues. Compliance against GPBPA detailed in section 3.3 of this report.
6.6	Vulnerable / High Risk Land Use	<input checked="" type="checkbox"/>	N/A – development does not propose vulnerable land use
6.7	Minor / Unavoidable Development in BAL-40 and BAL-FZ areas	<input checked="" type="checkbox"/>	N/A – BAL ratings do not exceed BAL-29
6.8	Advice of State/relevant Authorities for Emergency Services to be sought where Policy Measures are not achieved or where development includes Unavoidable, Vulnerable or High Risk Land Use	<input checked="" type="checkbox"/>	N/A
6.9	Advice of State/relevant Authorities for Environmental Protection sought	<input checked="" type="checkbox"/>	N/A
6.10	Bushfire conditions may be imposed	<input checked="" type="checkbox"/>	An s70A notification on the title is to advise all future owners that this Bushfire Management Plan is applicable to the site and may be enforced through the Local Government Firebreak Notice

			or other statutory avenue. All additional bushfire conditions imposed by the relevant authorities have been addressed in section 1.4 of this report.
6.11	Precautionary Principle	<input checked="" type="checkbox"/>	Precautionary principles have been adopted throughout this report. The relevant decision maker is encouraged to adopt an informed precautionary approach in accordance with SPP 3.7

### 3.3 Guidelines for Planning in Bushfire Prone Areas Compliance

Table 3B: Compliance with Guidelines for Planning in Bushfire Prone Areas (GPBPA)

Element	BMP section	Acceptable Solution (A) or Performance Based (PB) Solution	Compliance	Notes
1. Location	4.1	A1.1 Development location	✓	BAL Rating post development does not exceed BAL-29
2. Siting and Design of Development	4.2	A2.1 Asset Protection Zone (APZ)	✓	APZ to extend across lot boundary
		A2.2 Hazard Separation Zone (HSZ)	✓	Proposed dwellings to be constructed to AS3959 construction standards
3. Vehicular Access	4.3	A3.1 Two access routes	✓	Refer to Figure 2B
		A3.2 Public road	✓	Public roads to meet standards of section 4 of this report
		A3.3 Cul-de-sac	✓	Cul-de-sac to meet standards of Section 4 of this report
		A3.4 Battle-axe	✓	N/A
		A3.5 Private driveway longer than 50m	✓	N/A
		A3.6 Emergency access way	✓	N/A
		A3.7 Fire service access routes	✓	N/A
		A3.8 Firebreak width	✓	N/A
4. Water	4.4	A4.1 Reticulated areas	✓	Fire hydrants to be installed to Water Corp. and DFES standards
		A4.2 Non-reticulated areas	✓	N/A
		A4.3 Individual lots within non-reticulated areas	✓	N/A

### 3.4 Areas of non-compliance with other relevant documents

This report has also been developed in order to comply with the requirements of all referenced and applicable documents. No non-compliances have been identified.

## 4.0 Bushfire Risk Management Measures

The bush fire risk mitigation strategies detailed in this report are designed to comply with the Bushfire Protection Criteria detailed in Guidelines for Planning in Bushfire Prone Areas (GPBPA) Appendix 4 (2015).

- i. The notation (P3) refers to Performance Principle 3 of GPBPA Appendix 4. Where a Performance Based Solution is offered detailed justification is provided in Appendix 1 of this report.
- ii. The notation (A3.1) refers to Acceptable Solution 3.1 of GPBPA Appendix 4.
- iii. The notation (E3.1) refers to Explanatory Note 3.1 of GPBPA Appendix 4.
- iv. Where discrepancy occurs between State and Local bushfire planning provisions the higher standard of mitigation has been selected.

### 4.1 Element 1 - Location

**Intent:** To ensure that the subdivision, development or land use is located in areas with the least possible risk of bushfire, to facilitate the protection of people, property and infrastructure.

**Performance Principle (P1):** The subdivision, development or land use is located in an area where the bushfire hazard assessment is or will, on completion, be moderate or low, or a BAL-29 or below, and the risk can be managed. For minor or unavoidable development in areas where BAL-40 or BAL-FZ applies, demonstrating that the risk can be managed to the satisfaction of the Department of Fire and Emergency Services and the decision-maker.

#### Acceptable Solution A1.1 Development location

The strategic planning proposal, subdivision and development application is located in an area that on completion will be subject to a BAL-29 or below for all habitable buildings.

No lots exceed BAL-29 as determined through the BAL modelling and BAL Contour map.

### 4.2 Element 2 - Siting and design of Development

**Intent:** To ensure that the siting of development minimises the level of bushfire impact.

**Performance Principle (P2):** The siting and design of the strategic planning proposal, subdivision or development application, including roads, paths and landscaping, is appropriate to the level of bushfire threat that applies to the site. That it minimises the bushfire risk to people, property and infrastructure, including compliance with AS 3959 if appropriate.

The following Acceptable Solutions are not applicable to this development:

- A2.2 Hazard Separation Zone (dwellings will be constructed to the applicable AS3959 to account for reduced HSZ)

#### Acceptable Solution A2.1 Asset protection zone (APZ)

The asset protection zone (APZ) is a low fuel area immediately surrounding a building and is designed to minimise the likelihood of flame contact with buildings.

Features such as driveways, footpaths, roads, vegetable patches, lawn or landscaped garden (including deciduous trees and fire resistant plant species) may form part of asset protection zones. Areas of vegetation deemed Low Threat Vegetation and managed in a reduced fuel state inclusive of Public Open Space and nature strips may form part of a buildings defendable space. Isolated shrubs and trees may be retained within asset protection zones.

a) Standard:

- i. Location: within the boundaries of the lot on which the building is situated. Where a full 20 metre APZ is not possible within the lot boundaries, the APZ should be sufficient enough to ensure the potential radiant heat impact of a fire does not exceed 29 kW/m<sup>2</sup>;
- ii. Fine fuel load: reduced to and maintained at 2 tonnes per hectare and maintained in accordance with AS 3959-2009 s2.2.3.2 (f) stated here as:  
“Including grassland managed in a minimal fuel condition, maintained lawns, golf courses, maintained public reserves and parklands, vineyards, orchards, cultivated gardens, commercial nurseries, nature strips and windbreaks. NOTE: Minimal fuel condition means there is insufficient fuel available to significantly increase the severity of the bushfire attack (recognizable as short-cropped grass for example, to a nominal height of 100 mm.”;
- iii. Trees (crowns) are a minimum distance of ten metres apart. A small group of trees within close proximity to one another may be treated as one crown provided the combined crowns do not exceed the area of a large or mature crown size for that species;
- iv. No tall shrubs or trees located within 2 metres of a building;
- v. No tree crowns overhanging the building;
- vi. Fences and sheds within APZ are constructed using non-combustible materials (eg. iron, brick, limestone, metal post and wire); and
- vii. Sheds within the APZ should not contain flammable materials.

b) Specific considerations

- i. Prior to clearance of the BMP conditions.
- ii. It is the responsibility of the developer to ensure the APZ standard is established.
- iii. It is the responsibility of the individual property owner to ensure the APZ standard continues to be achieved post completion of the construction.

### **4.3 Element 3 - Vehicular Access**

**Intent:** To ensure that the vehicular access serving a subdivision/ development is safe in the event of a bush fire occurring.

**Performance Principle (P3):** The internal layout, design and construction of public and private vehicular access in the subdivision/development allows emergency and other vehicles to move through it easily and safely at all times.

The following Acceptable Solutions are not applicable to this development:

- A3.4 Battle-axe (No battle-axe lots are proposed for the development)
- A3.5 Private driveway longer than 50m
- A3.6 Emergency Access Way
- A3.7 Fire Service Access Route
- A3.8 Firebreak width (Lot sizes not >0.5ha)

**Acceptable Solution A3.1 Two access routes**

As detailed in Figure 2B, two different vehicular access routes are provided, both of which connect to the public road network, provide safe access and egress to two different destinations and are available to all residents/the public at all times and under all weather conditions.

**Acceptable Solution A3.2 Public roads**

All new public roads meet the minimum requirements of Acceptable Solution A3.2 as detailed in Table 4A, Column 1.

a) Specific Considerations

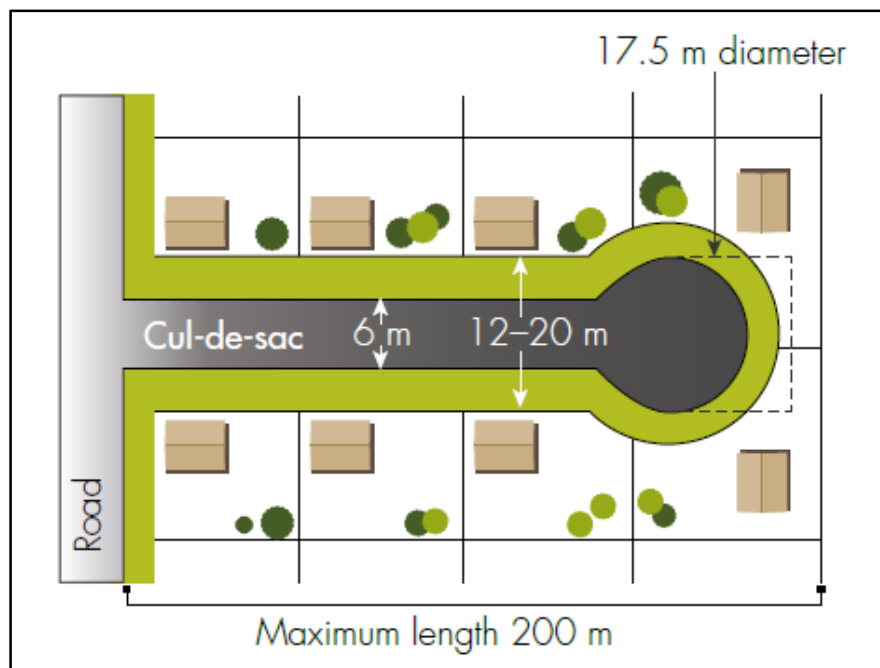
- i. Construction is required prior to the habitation of the any habitable buildings serviced by the public road.
- ii. It is the responsibility of the developer to ensure the public road standard is established.
- iii. It is the responsibility of Local and State Government (as appropriate) to ensure the maintenance of public roads vested within their jurisdiction

**Acceptable Solution A3.3 Cul-de-sac (including a dead-end road)**

The development includes one cul-de-sac that is required to meet the standard of Acceptable Solution A3.3

(a) Standard:

- i. As per Table 4A Column 2;
- ii. Maximum length: 200 metres (if public emergency access is provided between cul-de-sac heads maximum length can be increased to 600 metres provided no more than eight lots are serviced and the emergency access way is no more than 600 metres); and
- iii. Turnaround area requirements, including a minimum 17.5 metre diameter head.



Source: *Guidelines for Planning in Bushfire Prone Areas, Appendix 4, Fig. 18*

(a) Specific Considerations:

- iv. To be implemented prior to sale of the first lot within each stage that the cul-de-sac services.
- i. It is the responsibility of the developer to ensure the cul-de-sacs meets the required standard.
- ii. It is the responsibility of the Local Government to ensure the cul-de-sacs continue to meet the required standard.



Table 4A: Vehicular access technical requirements

Technical Requirement	Public road	Cul-de-sac	Private driveway	Emergency access way	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	N/A	4.5	4.5	4.5
Maximum grade over <50m	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 crossfall	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

#### 4.4 Element 4 – Water

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

**Performance Principle (P4):** The subdivision, development or land use is provided with a permanent and secure water supply that is sufficient for firefighting purposes.

The following Acceptable Solutions are not applicable to this development:

A4.2 Non-reticulated areas

A4.3 Private water tanks

#### Acceptable Solution A4.1 Reticulated areas

The site is to be serviced by reticulated scheme water and firefighting hydrants, satisfying Acceptable Solution A4.1, in accordance with Water Corporation and DFES standards.

## 5.0 Implementation and Enforcement

Table 5A summarises the responsible party for each mitigation strategy and the time frame in which it must be completed.

Table 5A: Developer Schedule of Works

Strategy	Implementation		Maintenance	
	Responsible	Time Frame	Responsible	Time Frame
Amendments to BMP	Any amendments to this BMP shall be approved by the relevant Jurisdiction Having Authority.			
Asset Protection Zone	Developer	Prior to subdivision clearance	Individual Land Owners	Ongoing
Hazard Separation Zone	NA	NA	NA	NA
Construction to AS 3959	Individual Land Owners & Local Government	On construction of all habitable buildings	Individual Land Owners	Ongoing
Cul-de-sacs	Developer	Prior to subdivision clearance	Local Government	Ongoing
Battle Axes	NA	NA	NA	NA
Private Driveways & Turnaround Area	NA	NA	NA	NA
Emergency Access Ways	NA	NA	NA	NA
Fire Service Access Routes	NA	NA	NA	NA
Firebreaks	NA	NA	NA	NA
Firefighting Water (hydrants)	Developer	Prior to subdivision clearance	Water Corporation	Ongoing
Firefighting Water (private tanks)	NA	NA	NA	NA
Firefighting Services & Response	DFES and Local Government	Ongoing	DFES and Local Government	Ongoing
Fuel Load Reduction and Fire Break Notice	Local Government	Annually	Local Government	Annually
Inspection and Issue of Works Orders or Fines.	Local Government	Ongoing	Local Government	Ongoing

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## 6.0 References

- Ellis, S., Kanowski, P., & Whelan, R. (2004). National Inquiry on Bushfire Mitigation and Management. Council of Australian Governments.
- Keelty, M. J. (2011). A Shared Responsibility: The Report of the Perth Hills Bushfire February 2011 Review. Government of Western Australia, Perth.
- RUIC Fire. (2014.) Bushfire Attack Level Calculator v7.f.
- Standards Australia. (2009). AS 3959:2009 Construction of buildings in bushfire prone areas: SAI Global.
- Standards Australia. (2009). ISO AS 31000:2009 Risk management principles and guidelines: SAI Global.
- Standards Australia. (2013). HB89:2013 Risk management - Guidelines on risk assessment techniques (Vol. HB 89:2013). Sydney: SAI Global.
- Standards Australia. (2013). HB 436:2013 Risk management guidelines - Companion to AS/NZS ISO 31000:2009 (Vol. HB436:2013). Sydney: SAI Global.
- WAPC. (2006). State Planning Policy 3.4 Natural Hazards and Disasters. State Law Publisher.
- WAPC. (2015a). State Planning Policy 3.7 Planning in Bushfire Prone Areas. Western Australian Planning Commission & Department of Planning.
- WAPC. (2015b). Guidelines for Planning in Bushfire Prone Areas. Western Australian Planning Commission, Department of Planning & Department of Fire and Emergency Services.
- WAPC. (2015c). Guidelines for Planning in Bushfire Prone Areas Appendices. Western Australian Planning Commission, Department of Planning & Department of Fire and Emergency Services.
- WAPC. (2015d). Planning Bulletin 111/2015 Planning in Bushfire Prone Areas. Western Australian Planning Commission.