

Bushfire Management Plan - BP Service Station and
Convenience Store on Future Lot 1 Wanneroo Road,
Tapping

BP Australia

DOCUMENT TRACKING

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Template 2.8.1

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1. Introduction

1.1 Proposal details

Eco Logical Australia (ELA) was commissioned by BP Australia to prepare a Bushfire Management Plan (BMP) to support a development application (DA) being prepared for the development of a service station and convenience store at future Lot 1 Wanneroo Road, Tapping WA (herein referred to as the subject site, Figure 1).

The proposed development will include:

- Clearing of existing vegetation; and
- Construction of a convenience store fuel, canopies, fuel bowsers, underground fuel tanks, parking areas and access way to Wanneroo Road as per Figure 1 and Figure 2.

The proposed development will result in an intensification of land use.

The entirety of the subject site is within a designated bushfire prone area as per the Western Australia State Map of Bush Fire Prone Areas (DFES 2018; Figure 3), which triggers bushfire planning requirements under State Planning Policy 3.7 Planning in Bushfire Prone Areas (SPP 3.7; WAPC 2015) and reporting to accompany submission of the DA in accordance with the associated *Guidelines for Planning in Bushfire Prone Areas v 1.3* (the Guidelines; WAPC 2017). It is important to note that vegetation surrounding the subject site will be cleared in the near future as part of an approved subdivision (WAPC approval 156082; Figure 1). Consequently, the bushfire prone status of the subject site and management measures prescribed in the BMP are temporary in nature.

This assessment has been prepared by ELA Bushfire Consultant Ian Mullins and Senior Bushfire Consultant, Daniel Panickar (FPAA BPAD Certified Practitioner No. BPAD37802-L2.) with quality assurance undertaken by Senior Bushfire Consultant, Bruce Horkings (FPAA BPAD Level 3 Certified Practitioner No. BPAD29962-L3).

1.2 Purpose and application of the plan

The primary purpose of this BMP is to act as a technical supporting document to inform planning assessment.

This BMP is also designed to provide guidance on how to plan for and manage the bushfire risk to the subject site through implementation of a range of bushfire management measures in accordance with the Guidelines.

1.3 Environmental considerations

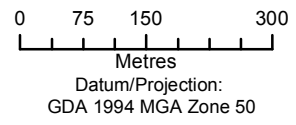
Clearing of native vegetation is proposed for this development and has been approved under a previous subdivision approval which covers a larger area than the subject site (WAPC approval 156082; Figure 1).

No revegetation is proposed as part of the development and landscaping will be maintained in a low-threat state.

Figure 1 - Site Overview



- Legend**
- Subject site
 - 100m site assessment
 - 150m site assessment
 - WAPC Subdivision Approval No. 156082
 - Building / above ground structure



Datum/Projection:
GDA 1994 MGA Zone 50



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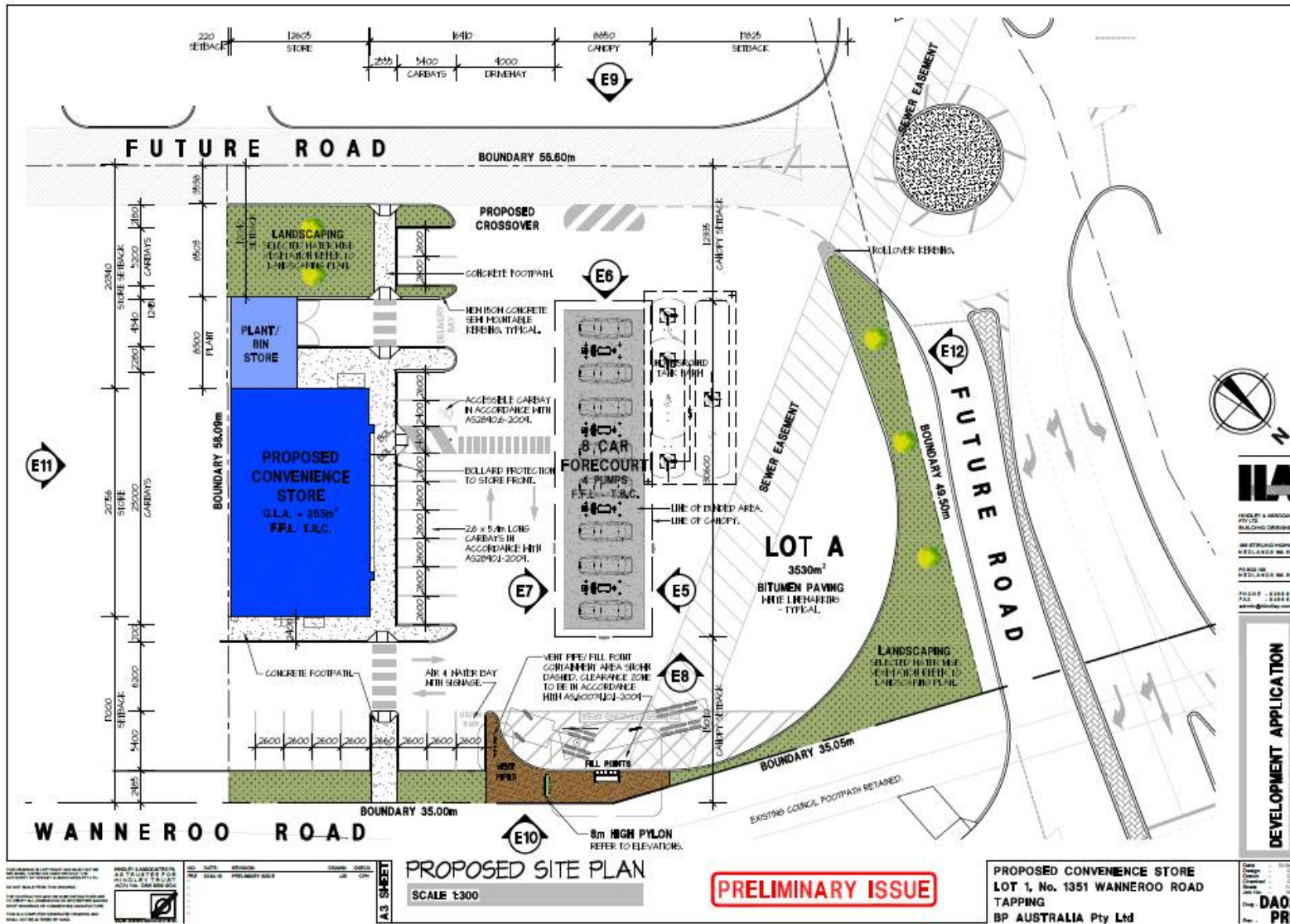




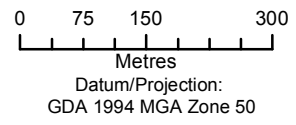


Figure 2: Proposed development

Figure 3 - Bushfire Prone Areas



- Legend**
-  Subject site
 -  100m site assessment
 -  150m site assessment
 -  Bushfire Prone Mapping (DFES 2018)



Datum/Projection:
GDA 1994 MGA Zone 50



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2. Bushfire assessment results

2.1 Bushfire assessment inputs

The following section is a consideration of spatial bushfire risk and has been used to inform the bushfire assessment in this report.

2.1.1 General

The subject site is located in the City of Wanneroo and is bound by: Wanneroo Road and residential development to the east; native and exotic vegetation to the north and west; and cleared land for construction to the south associated with newly subdivided lots (Figure 1).

Visual assessment of surrounding vegetation did not identify any recent fire scars and fire history was not able to be determined. Accumulation of vegetative matter over time, combined with the moderate to high risk of ignition associated with high levels of public access would potentially facilitate a bushfire occurrence in this area.

2.1.2 Fire Danger Index

A blanket rating of FDI 80 is adopted for Western Australian environments, as outlined in AS 3959–2009 and endorsed by Australasian Fire and Emergency Service Authorities Council (AFAC).

2.1.3 Vegetation classification

Vegetation within the subject site and surrounding 150 m (the assessment area) was assessed in accordance with the Guidelines and AS 3959-2009 *Construction of Buildings in Bushfire Prone Areas* (SA 2009) with regard given to the *Visual guide for bushfire risk assessment in Western Australia* (DoP 2016). The site inspection was undertaken on 11 February 2019.

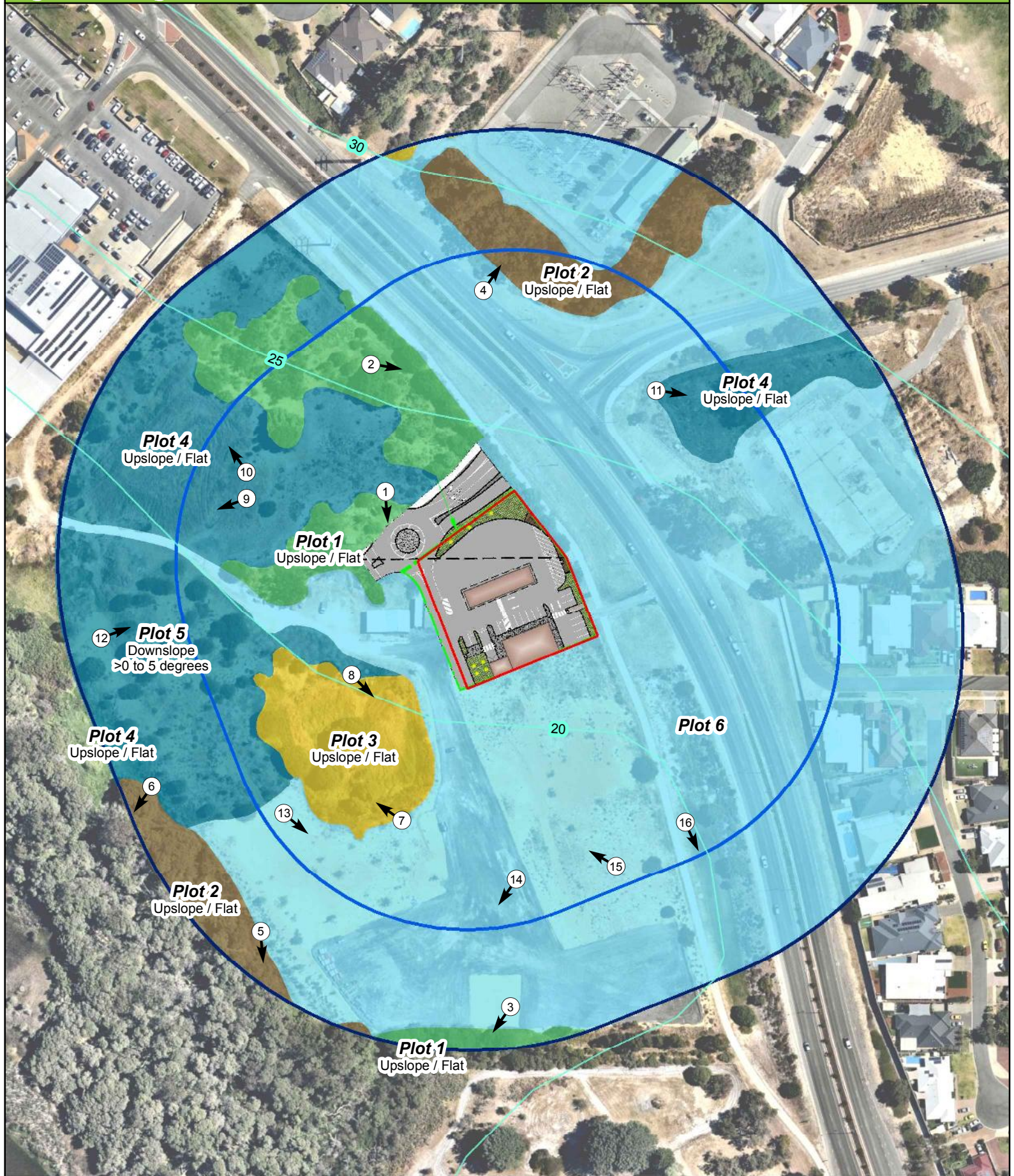
The following vegetation classes and exclusions were identified within the assessment area as depicted in Figure 4 and listed below. Photographs relating to each vegetation type are included in Appendix A:

- Class A forest
- Class B woodland;
- Class D scrub;
- Class G grassland; and
- Exclusions as per clause 2.2.3.2 (e) and (f) (i.e. non-vegetated areas and low-threat vegetation).

2.1.4 Topography and slope under vegetation

Effective slope under vegetation was assessed for a distance of 150 m from the subject site in accordance with the Guidelines and AS 3959-2009 and is depicted in Figure 4. Slope under classified vegetation was assessed as upslope / flat for all plots except a plot of grassland to the west of the subject site (Plot 5) which was assessed as >0 to 5 degrees downslope.

Figure 4 - Vegetation Classification



- Legend**
- Subject site
 - 100m site assessment
 - 150m site assessment
 - Contour (5m)
 - Building / above ground structure
 - Photo location

- Vegetation classification**
- Class A forest
 - Class B woodland
 - Class D scrub
 - Class G grassland
 - Excluded as per clause 2.2.3.2 (e) and (f)

0 15 30 60
Metres
Datum/Projection:
GDA 1994 MGA Zone 50



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Prepared by: SM Date: 19/11/2019

2.2 Bushfire assessment outputs

A Bushfire Attack Level (BAL) assessment has been undertaken in accordance with SPP 3.7, the Guidelines, AS 3959-2009 and the bushfire assessment inputs in Section 2.1.

2.2.1 Bushfire Attack Level (BAL) assessment

All land located within 100 m of the classified vegetation depicted in Figure 4 is considered bushfire prone and is subject to a BAL assessment in accordance with AS 3959 2009.

A Method 1 BAL assessment (as outlined in AS 3959 2009) has been completed for the proposed development and incorporates the following factors:

- State adopted Fire Danger Index (FDI) rating;
- Vegetation class;
- Slope under classified vegetation; and
- Distance between proposed development area and the classified vegetation.

Based on the identified BAL, construction requirements for proposed buildings can then be assigned. The BAL rating gives an indication of the expected level of bushfire attack (i.e. radiant heat flux, flame contact and ember penetration) that may be received by proposed buildings and subsequently informs the standard of construction required to increase building survivability.

2.2.2 Method 1 BAL assessment

Table 1 and Figure 5 display the Method 1 BAL assessment (in the form of BAL contours) undertaken for the proposed development in accordance with AS 3959-2009 methodology. The results show that the entire subject site is located in an area subject to a BAL rating of BAL-29 or lower, and all new structures (i.e. Canopies, Browsers, Retail store etc.) are located in areas subject to a BAL rating of BAL-12.5 or lower.

The Guidelines state;

The bushfire construction requirements of the Building Code of Australia only apply to certain types of residential buildings (being Class 1, 2 or 3 buildings and/or Class 10a buildings or decks associated with a Class 1, 2 or 3 building) in designated bushfire prone areas. As such, AS 3959 does not apply to all buildings. Only vulnerable or high-risk land uses that fall within the relevant classes of buildings as set out in the Building Code of Australia will be required to comply with the bushfire construction requirements of the Building Code of Australia. As such, the planning process focuses on the location and siting of vulnerable and high risk land uses rather than the application of bushfire construction requirements.

As none of the proposed structures is a Class 1, 2 or 3 buildings and/or Class 10a buildings or decks associated with a Class 1, 2 or 3 building, construction to AS 3959-2009 is not required for this proposal. However, in consideration of Section 3 and 5 of AS 3959-2009, it is recommended that the following elements are considered during construction for bushfire protection:

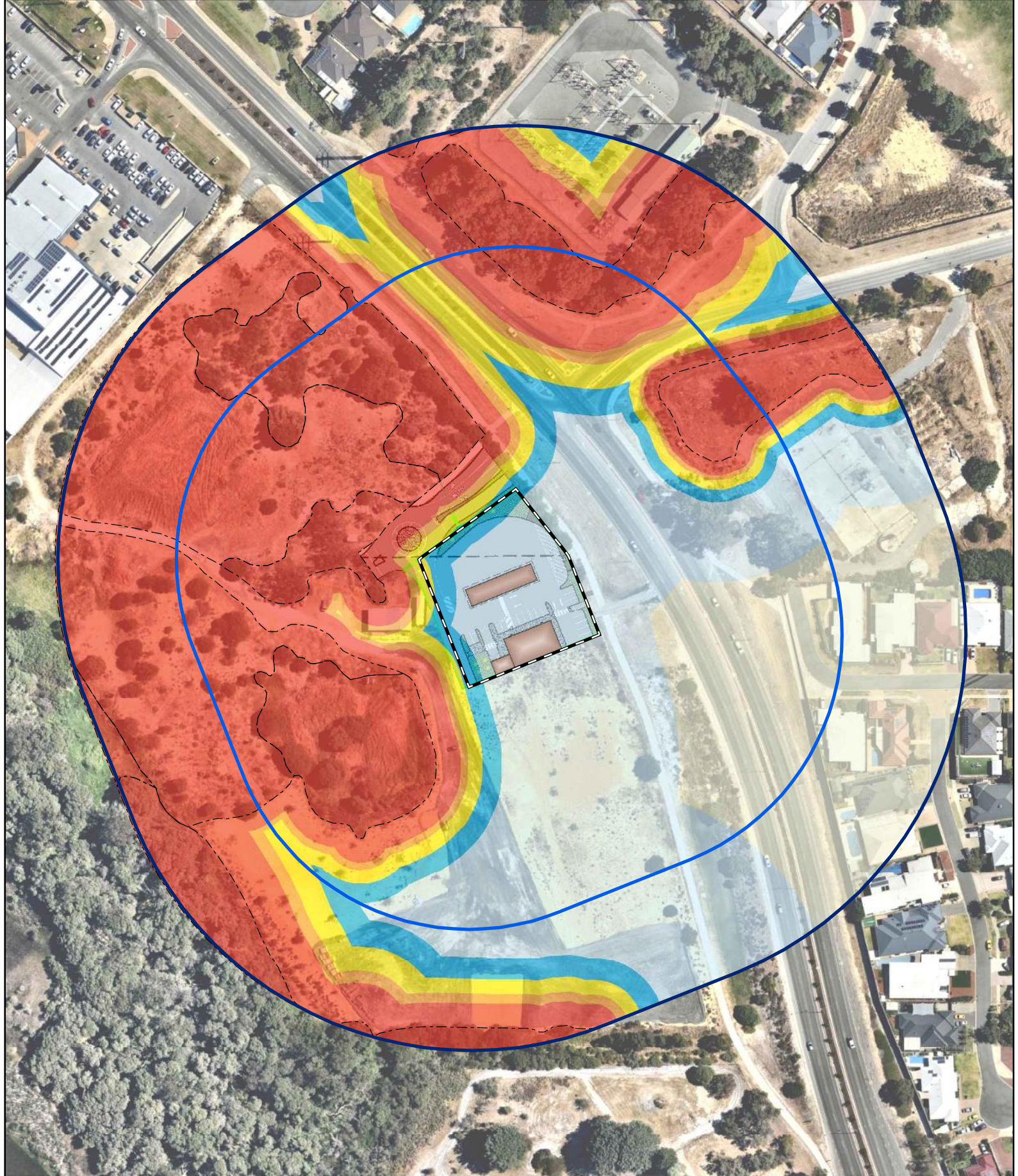
- Walls - constructed from non-combustible material to a height of 400 mm;
- Joints, vents, weepholes – no gaps greater than 3 mm;
- Window assemblies - constructed from non-combustible material;

- Window glazing - Grade A safety glass minimum 4 mm thickness for windows less than 400 mm from the ground;
- Any openable windows to be fitted with screening that is made from mesh (maximum aperture of 2 mm), corrosion-resistant steel, bronze or aluminium. The gap between the screen and the building element is to be a maximum aperture of 3 mm;
- Side hung doors to be constructed from non-combustible material such as solid timber, a protected externally by a screened door made from mesh (maximum aperture of 2 mm), corrosion-resistant steel, bronze or aluminium or a hollow core-door with non-combustible kickplate on the outside;
 - The side hung doors should be within a tight-fitting door frame and with weather strips/ draught excluders/ draught seals installed at the bottom;
 - If the side hung doors incorporate glazing in the design, the windows are to be a minimum 4 mm thickness;
- Sliding doors – door frames to be constructed from metal and glazing to be minimum 5 mm thickness; and
- Roof – constructed from non-combustible material and all junctions/penetrations sealed to prevent gaps greater than 3 mm;
- All roofing must be sarked with non-combustible material on top of the roof framing and cover the entire roof area, including ridges, hips and extended into gutters and valleys;
- Roof ventilation openings, such as gable and roof vents, shall be fitted with ember guards made of a non-combustible material or a mesh or perforated sheet with a maximum aperture of 2 mm, made of corrosion-resistant steel, bronze or aluminium;
- No evaporative air conditioning units to be installed; and
- Above ground exposed water and gas supply pipes to be metal.

Table 1: Method BAL Calculation (BAL contours)

Plot and vegetation classification	Effective slope	Hazard separation distance	BAL rating	Comment
Plot 1 Class B woodland	Upslope/flat	0-<10	BAL-FZ	No new structures proposed in this area
		10-<14	BAL-40	No new structures proposed in this area
		14-<20	BAL-29	No new structures proposed in this area
		20-<29	BAL-19	No new structures proposed in this area
		29-<100	BAL-12.5	Development proposed in this area
Plot 2 Class A forest	Upslope/flat	0-<16	BAL-FZ	No new structures proposed in this area
		16-<21	BAL-40	No new structures proposed in this area
		21-<31	BAL-29	No new structures proposed in this area
		31-<42	BAL-19	No new structures proposed in this area
		42-<100	BAL-12.5	Development proposed in this area
Plot 3 Class D scrub	Upslope/flat	0-<10	BAL-FZ	No new structures proposed in this area
		10-<13	BAL-40	No new structures proposed in this area
		13-<19	BAL-29	No new structures proposed in this area
		19-<27	BAL-19	No new structures proposed in this area
		27-<100	BAL-12.5	Development proposed in this area
Plot 4 Class G grassland	Upslope/flat	0-<6	BAL-FZ	No new structures proposed in this area
		6-<8	BAL-40	No new structures proposed in this area
		8-<12	BAL-29	No new structures proposed in this area
		12-<17	BAL-19	No new structures proposed in this area
		17-<50	BAL-12.5	Development proposed in this area
Plot 5 Class G grassland	Downslope >0 to 5 degrees	0-<7	BAL-FZ	No new structures proposed in this area
		7-<9	BAL-40	No new structures proposed in this area
		9-<14	BAL-29	No new structures proposed in this area
		14-<20	BAL-19	No new structures proposed in this area
		20-<50	BAL-12.5	Development proposed in this area
Plot 6 Excluded as per clause 2.2.3.2 (e) and (f) of AS3959- 2009		N/A		

Figure 5 - Bushfire Attack Level (BAL) Contours



- Legend**
- Subject site
 - 100m site assessment
 - 150m site assessment
 - Bushfire hazard interface
 - Building / above ground structure

Bushfire attack level (BAL)

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

0 15 30 60
Metres
Datum/Projection:
GDA 1994 MGA Zone 50

3. Assessment against the Bushfire Protection Criteria

3.1 Compliance

The proposed development is required to comply with policy measures 6.2, 6.5 and 6.6 of SPP 3.7 and the Guidelines.

In response to the above requirements of SPP 3.7 and the Guidelines, bushfire management measures have been devised for the proposed development in accordance with Guideline acceptable solutions where possible to meet compliance with bushfire protection criteria.

Table 2 outlines the Acceptable Solutions (AS) that are relevant to the proposal and summarises how the intent of each Bushfire Protection Criteria has been achieved. No Performance Solutions (PS) have been used for this proposal. These management measures are depicted in Figure 6 where relevant.

Table 2: Summary of solutions used to achieve bushfire performance criteria

Bushfire Performance Criteria	AS	PS	N/A	Comment
Element 1: Location A1.1 Development location	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	All proposed above-ground assets (i.e. Canopies, Browsers, Retail Store etc.) are located in areas subject to BAL ratings of BAL-12.5 or lower. The proposed development is considered compliant with A1.1.
Element 2: Siting and design of development A2.1 Asset Protection Zone (APZ)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	APZs will be implemented between all proposed buildings and classified vegetation in the form of bitumen paved hardstand areas, landscaping beds (maintained as low-threat vegetation) and bitumen roads which will service the development from Wanneroo Road (refer to Figure 6; Appendix C). The proposed development is considered compliant with A2.1.
Element 3: Vehicular access A3.1 Two access routes	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The subject site is serviced by a 100 m long cul-de-sac that provides access onto Wanneroo Road (a main road allowing travel in two directions). Until future development within the subdivision takes place, the road network will be limited to this cul-de-sac (Figure 6). A secondary access point onto Wanneroo Avenue is not possible due to WAPC conditions of approval (i.e. Condition 4 of Subdivision Approval 156082), however as Wanneroo Road provides access in two directions, two access routes are available. The proposed development is considered compliant with A3.1.
Element 3: Vehicular access A3.2 Public road	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The proposed public road (cul-de-sac) will comply with the minimum requirements for public roads in the Guidelines (reproduced in Appendix D). The proposed development is considered compliant with A3.2.

Bushfire Performance Criteria	AS	PS	N/A	Comment
Element 3: Vehicular access A3.3 Cul-de-sac	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The proposed cul-de-sac is 100 m long and will comply with the minimum requirements for cul-de-sacs in the Guidelines (reproduced in Appendix D). The proposed development is considered compliant with A3.3.
Element 3: Vehicular access A3.4 Battle-axe	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No battle-axe lots proposed.
Element 3: Vehicular access A3.5 Private Driveway longer than 50 m	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No private driveways longer than 50 m are proposed. The greatest distance from a building in the subject site to a public road is 25 m (Figure 6).
Element 3: Vehicular access A3.6 Emergency Access Ways	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No Emergency Access Ways proposed.
Element 3: Vehicular access A3.7 Fire service access routes	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No fire service access routes proposed.
Element 3: Vehicular access A3.8 Firebreak width	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No firebreaks required or proposed.
Element 4: Water A4.1 Reticulated Areas	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The subject site has a reticulated water supply which will be extended to all relevant areas of development. The proposed development is considered to be compliant with A4.1. A4.2 and A4.3 are not applicable to this proposed development. .

3.2 Additional management strategies

A Bushfire Risk Management Plan (BRMP) has been prepared for the proposed development in accordance with Policy measure 6.6 of SPP 3.7. This plan (provided in Appendix B) details how high-risk components of the proposed development will be managed to reduce bushfire risk.

All landscaping areas within the subject site will be maintained in accordance with Standards for Asset Protection Zones (Appendix C).

Figure 6 - Spatial representation of the bushfire management strategies



- Legend**
- Access point *(Refer to inset)
 - Subject site
 - APZ
 - Building / above ground structure
 - Access / egress route

0 75 150 300
Metres
Datum/Projection:
GDA 1994 MGA Zone 50

4. Implementation and enforcement

Implementation of the BMP applies to BP Australia and the City of Wanneroo to ensure bushfire management measures are adopted and implemented on an ongoing basis. A summary of the bushfire management measures described in Section 3, as well as a works program, is provided in Table 3.

These measures will be implemented to ensure the ongoing protection of life and property assets is achieved. Timing and responsibilities are also defined to assist with implementation of each measure.

Table 3: Proposed work program

No	Bushfire management measure	Responsibility
Prior to occupancy		
1	Ensure all new structures are located outside of areas subject to BAL-FZ and BAL-40 as per the design in Figure 6.	BP Australia
2	Design, plant and maintain landscaping in accordance with Appendix C.	BP Australia
3	Extend reticulated water supply to appropriate areas	BP Australia
4	Construct public roads to specifications outlined in the Guidelines	BP Australia
Ongoing management		
5	Comply with Bushfire Risk Management Plan	BP Australia
6	Compliance with fire break order	BP Australia and the City of Wanneroo (within public reserves)

Conclusion

In the author's professional opinion, the bushfire protection requirements listed in this assessment provide an adequate standard of bushfire protection for the proposed development. As such, the proposed development is consistent with the aim and objectives of SPP 3.7 and associated guidelines and is recommended for approval.



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5. References

City of Wanneroo (CoW). 2019. *Fire Breaks / Fuel Hazard Reduction / Fire Break Examples*. Available from: http://www.wanneroo.wa.gov.au/info/20035/community_health_and_safety/195/firebreaks

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Standards Australia. 2009. Construction of buildings in bushfire-prone areas, AS 3959-2009. SAI Global, Sydney.

Western Australian Planning Commission (WAPC). 2015. State Planning Policy 3.7 Planning in Bushfire Prone Areas. WAPC, Perth.

Western Australian Planning Commission (WAPC). 2017. Guidelines for Planning in Bushfire Prone Areas Version 1.3 (including appendices). WAPC, Perth.

Appendix A - Plates

Plot	Photo ID	Photo and vegetation classification
1	1	 <p>Class B woodland – upslope/ flat land</p>
1	2	 <p>Class B woodland – upslope/ flat land</p>

Plot	Photo ID	Photo and vegetation classification
------	----------	-------------------------------------

1	3	
---	---	--



Class B woodland – upslope/ flat land

2	4	
---	---	--



Class A forest – upslope/ flat land

Plot	Photo ID	Photo and vegetation classification
------	----------	-------------------------------------

2	5	
---	---	--



Class A forest (background) – upslope/ flat land

2	6	
---	---	--



Class A forest (background) – upslope/ flat land

Plot Photo ID Photo and vegetation classification

3 7



Class D scrub – upslope/ flat land

3 8



Class D scrub – upslope/ flat land

Plot	Photo ID	Photo and vegetation classification
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4	9	
---	---	--



Class G grassland – upslope/ flat land

4	10	
---	----	--



Class G grassland – upslope/ flat land

Plot	Photo ID	Photo and vegetation classification
------	----------	-------------------------------------

4	11	
---	----	--



Class G grassland – upslope/ flat land

5	12	
---	----	--



Class G grassland – downslope >0-5 degrees

Plot	Photo ID	Photo and vegetation classification
------	----------	-------------------------------------

6 13



Excluded under clause 2.2.3.2 (e) – this is a non-vegetated area

6 14



Excluded under clause 2.2.3.2 (e) – this is a non-vegetated area

Plot	Photo ID	Photo and vegetation classification
------	----------	-------------------------------------

6 15



Excluded under clause 2.2.3.2 (f) – this is an area cleared for construction and managed in a low threat state

6 16



Excluded under clause 2.2.3.2 (f) – this is an area of low threat, managed vegetation with reticulation

Appendix B - Bushfire Risk Management Plan

Appendix C - Standards for Asset Protection Zones

The following standards have been extracted from the *Guidelines for Planning in Bushfire Prone Areas v 1.3* (WAPC 2017).

Every habitable building is to be surrounded by, and every proposed lot can achieve, an APZ depicted on submitted plans, which meets the following requirements:

a. Width: Measured from any external wall or supporting post or column of the proposed building, and of sufficient size to ensure the potential radiant heat impact of a fire does not exceed 29kW/m² (BAL 29) in all circumstances.

b. Location: the APZ should be contained solely within the boundaries of the lot on which a 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 (see explanatory notes).

c. Management: the APZ is managed in accordance with the requirements of ‘Standards for Asset Protection Zones’ (below):

- 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 millimetres in thickness reduced to and maintained at an average of two tonnes per hectare
- 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 (**Figure 7**).

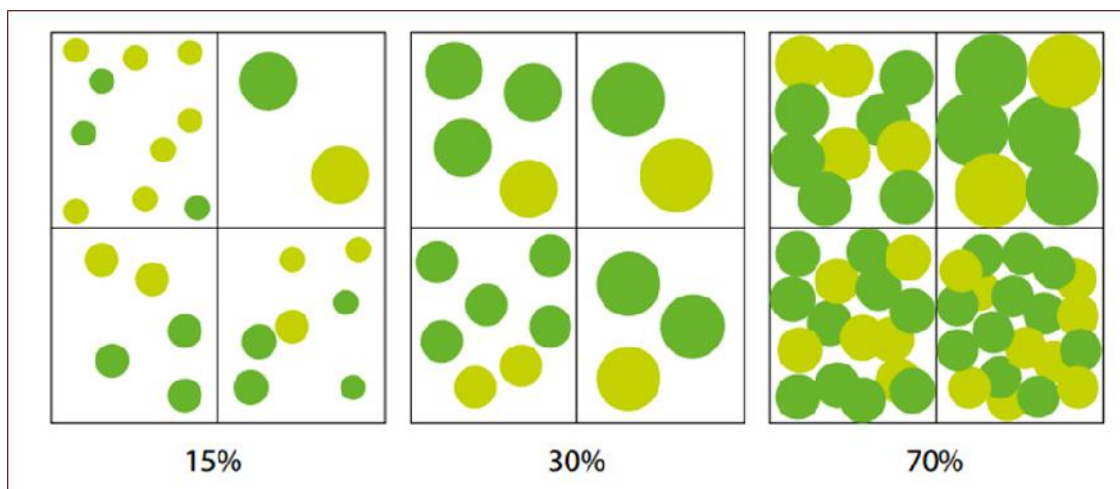


Figure 7: Illustrated tree canopy cover projection (WAPC 2017)

- **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 millimetres 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 millimetres or less.

Additional notes

The Asset Protection Zone (APZ) is an area surrounding a building that is managed to reduce the bushfire hazard to an acceptable level. Hazard separation in the form of using subdivision design elements or excluded and low threat vegetation adjacent to the lot may be used to reduce the dimensions of the APZ within the lot.

The APZ should be contained solely within the boundaries of the lot on which the building is situated, except in instances where the neighbouring lot or lots will be managed in a low-fuel state on an ongoing basis, in perpetuity. The APZ may include public roads, waterways, footpaths, buildings, rocky outcrops, golf courses, maintained parkland as well as cultivated gardens in an urban context, but does not include grassland or vegetation on a neighbouring rural lot, farmland, wetland reserves and unmanaged public reserves.

Appendix D - Vehicular access technical requirements (WAPC 2017)

Technical requirements	Public road	Cul-de-sac	Private driveway	Emergency access way	Fire service access route
Minimum trafficable surface (m)	6*	6	4	6*	6*
Horizontal distance (m)	6	6	6	6	6
Vertical clearance (m)	4.5	N/A	4.5	4.5	4.5
Maximum grade <50 m	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	8.5	8.5	8.5	8.5	8.5
* Refer to E3.2 Public roads: Trafficable surface					

