FPA AUSTRALIA
Fire Protection Association Australia

BPAD Bushfire Planning & Design

Bushfire Attack Level (BAL) Certificate

Determined in accordance with AS 3959-2018

This Certificate has been issued by a person accredited by Fire Protection Association Australia under the Bushfire Planning and Design (BPAD) Accreditation Scheme. The certificate details the conclusions of the full Bushfire Attack Level Assessment Report (full report) prepared by the Accredited Practitioner.

Property Details and Description of Works

Address Details	Unit no	Street no 32	Lot no 103	Street name / Plan Reference Keirnan Street		
	Suburb Whitby				State WA	Postcode 6123
Local Government	Shire of Serpentine-Jarrahdale					
Main BCA class of the building	Class 1a	Use(s) of the building	Private dwelling			
Description of the building or works	New home construction					

Determination of Highest Bushfire Attack Level

AS 3959 Assessment Procedure	Vegetation Classification	Effective Slope °	Separation Distance (m)	BAL Rating
Method 1	Class G Grassland	0°	17	BAL – 12.5

BPAD Accredited Practitioner Details

Name: David Deeley

I hereby certify that I have undertaken the assessment of the above site and determined the Bushfire Attack Level stated above in accordance with the requirements of AS 3959-2018.

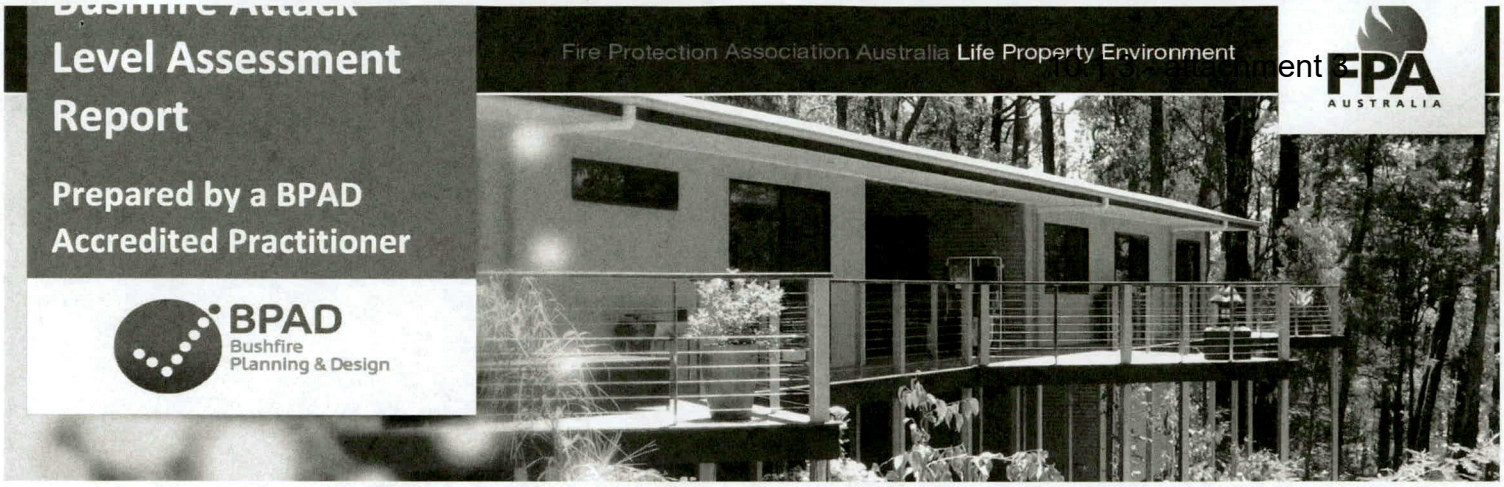
Company Details

WORKING ON FIRE PLANNING
INTEGRATED FIRE MANAGEMENT
Working On Fire Planning Pty Ltd
ABN: 42 623 954 316
PO Box 1249, Bibra Lake DC, WA 6965
planning.australia@workingonfire.com
www.workingonfireplanning.com.au

I hereby declare that I am a BPAD Accredited bushfire practitioner.
Accreditation No. 37575
Signature
Date 9/12/2019

Authorised Practitioner Stamp

Reliance on the assessment and determination of the Bushfire Attack Level contained in this certificate should not extend beyond a period of 12 months from the date of issue of the certificate. If this certificate was issued more than 12 months ago, it is recommended that the validity of the determination be confirmed with the Accredited Practitioner and where required an updated certificate issued.



Working on Fire Planning Pty Ltd
Bushfire Attack Level (BAL) Assessment Report

This report has been prepared by an Accredited BPAD Practitioner using the Simplified Procedure (Method 1) as detailed in Section 2 of AS 3959 – 2018. All enquiries related to the information and conclusions presented in this report must be made to the BPAD Accredited Practitioner.

Property Details and Description of Works

Job Details	**Unit no**	**Street no**	**Lot no**	**Street name / Plan Reference**	
		32	103	Keirnan Street	
	Suburb			**State**	**Postcode**
	Whitby			WA	6123
Local government area	**Shire/City.** Shire of Serpentine-Jarrahdale				
Main BCA class of the building	Class 1a	**Use(s) of the building**		Private dwelling	
Description of the building or works	New Home Construction				

Report Details

Report / Job Number	Report Version	Assessment Date	Report Date
2019	1.0	2 December 2019	9 December 2019

BPAD Accredited Practitioner Details

Name: David Deeley 0438 527 446

Company Details

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INTEGRATED FIRE MANAGEMENT
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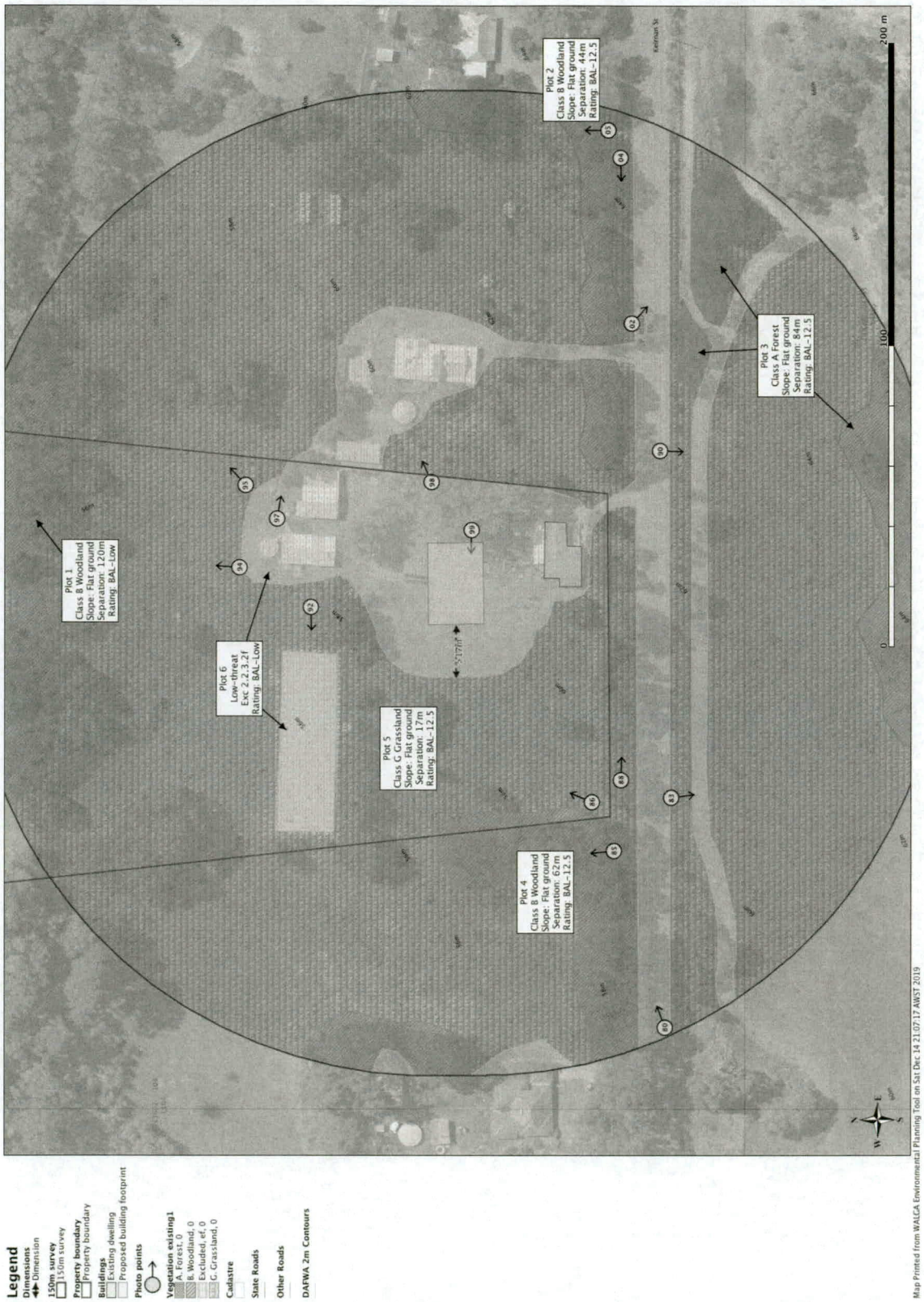
Site Assessment & Site Plans - The assessment of this site was undertaken on 2 December 2019 by a BPAD Accredited Practitioner for the purpose of determining the Bushfire Attack Level in accordance with AS 3959 - 2018 Simplified Procedure (Method 1).



Note: All diagrams are indicative only. They are not intended to represent a building's shape or scale.

Vegetation Classification All vegetation within 150 m of the site was classified in accordance with Clause 2.2.3 of AS 3959-2018. Each distinguishable vegetation plot determining the Bushfire Attack Level is identified below.

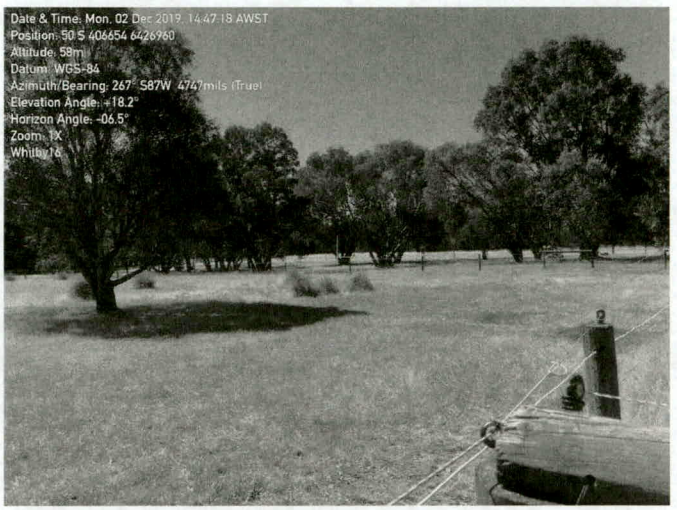
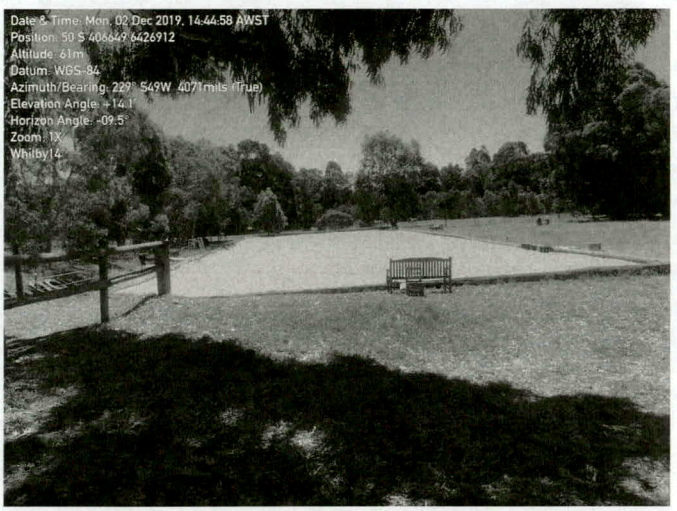
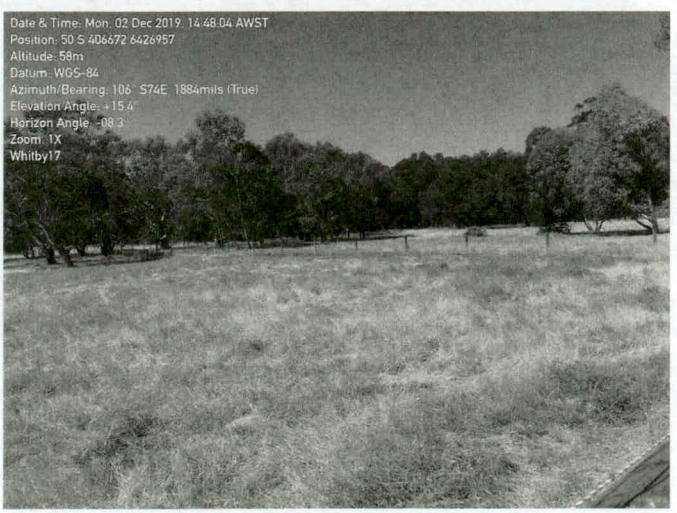
Photo ID: 94 **Plot:** 1 **Vegetation Classification or Exclusion Clause** Class B Woodland - Woodland B-05 **Description / Justification for Classification** Trees 10 m-30 m high; 10%-30% foliage cover dominated by *Eucalypts* and/or *Callitris,* with a prominent grassy understory. May contain isolated shrubs.	
Photo ID: 92 **Plot:** 6 **Vegetation Classification or Exclusion Clause** Excludable - 2.2.3.2(f) Low Threat Vegetation **Description / Justification for Classification** Bare ground, irrigated and mown turf, slashed pasture grasses.	
Photo ID: 95 **Plot:** 5 **Vegetation Classification or Exclusion Clause** Class G Grassland – Sown pasture G-26 **Description / Justification for Classification** Sown grazing pastures	

Photo ID:	97	Plot:	6

Vegetation Classification or Exclusion Clause

Excludable - 2.2.3.2(f) Low Threat Vegetation

Description / Justification for Classification

Bare ground, irrigated and mown turf, slashed pasture grasses, exotic vegetation.

Photo ID:	98	Plot:	5

Vegetation Classification or Exclusion Clause

Excludable - 2.2.3.2(f) Low Threat Vegetation

Description / Justification for Classification

Bare ground, irrigated and mown turf, slashed pasture grasses managed fuel load <2t/ha.

Photo ID:	99	Plot:	6

Vegetation Classification or Exclusion Clause

Excludable - 2.2.3.2(f) Low Threat Vegetation

Description / Justification for Classification

Bare ground, irrigated and mown turf, slashed pasture grasses managed fuel load <2t/ha.

Photo ID:	05	Plot:	2

Vegetation Classification or Exclusion Clause

Class B Woodland - Woodland B-05

Description / Justification for Classification

Trees 10 m-30 m high; 10%-30% foliage cover dominated by *Eucalypts* and/or *Callitris,* with a prominent grassy understory. May contain isolated shrubs.

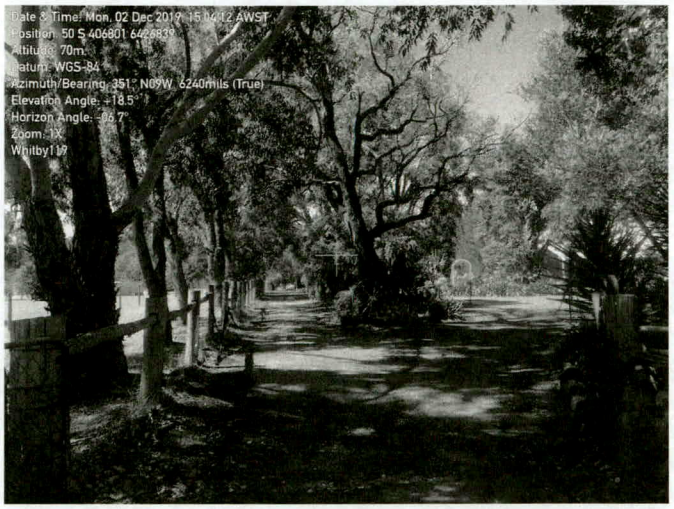


Photo ID:	04	Plot:	2

Vegetation Classification or Exclusion Clause

Class B Woodland - Woodland B-05

Description / Justification for Classification

Trees 10 m-30 m high; 10%-30% foliage cover dominated by *Eucalypts* and/or *Callitris,* with a prominent grassy understory. May contain isolated shrubs.

Photo ID:	02	Plot:	3

Vegetation Classification or Exclusion Clause

Class A Forest - Open forest A-03

Description / Justification for Classification

Trees 30 m high; 30%-70% foliage cover (may include understorey of sclerophyllous low trees or shrubs). Typically dominated by *Eucalypts*, *Melaleuca* or *Calistimon* (may include riverine and wetland environments) and *Callitris*. Includes *Eucalypt* plantations.

Photo ID:	90	Plot:	3

Vegetation Classification or Exclusion Clause

Class A Forest - Open forest A-03

Description / Justification for Classification

Trees 30 m high; 30%-70% foliage cover (may include understorey of sclerophyllous low trees or shrubs). Typically dominated by *Eucalypts*, *Melaleuca* or *Calistimon* (may include riverine and wetland environments) and *Callitris*. Includes *Eucalypt* plantations.

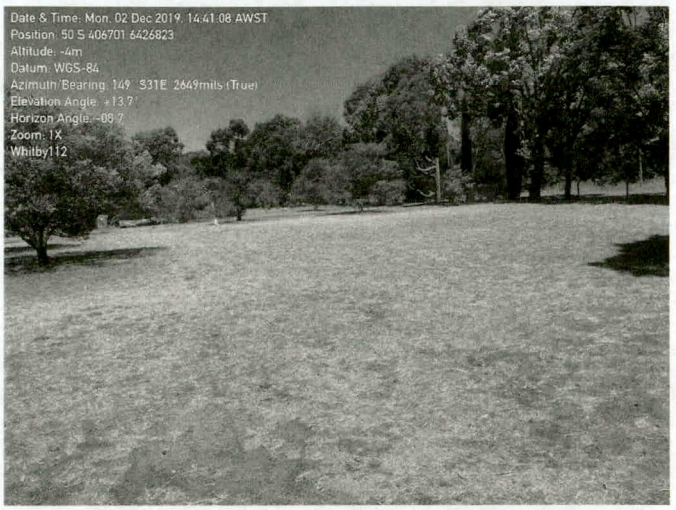


Photo ID:	83	Plot:	3

Vegetation Classification or Exclusion Clause

Class A Forest - Open forest A-03

Description / Justification for Classification

Trees 30 m high; 30%-70% foliage cover (may include understorey of sclerophyllous low trees or shrubs). Typically dominated by *Eucalypts*, *Melaleuca* or *Calistimon* (may include riverine and wetland environments) and *Callitris*. Includes *Eucalypt* plantations.

Note: Grassland in foreground

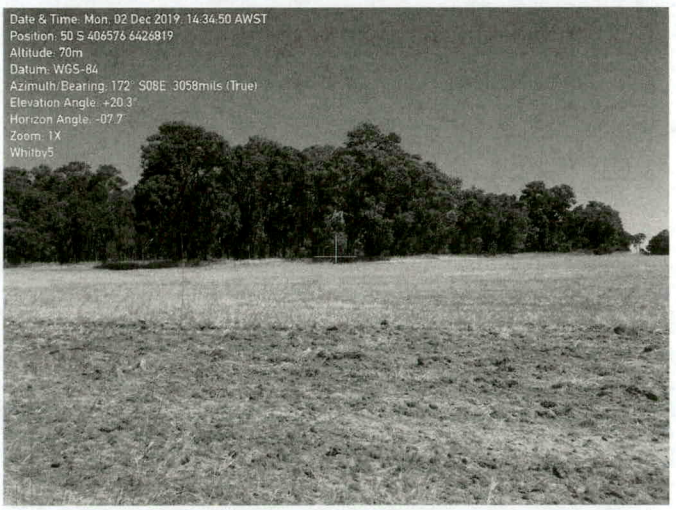


Photo ID:	88	Plot:	5

Vegetation Classification or Exclusion Clause

Class G Grassland - Open woodland B-06

Description / Justification for Classification

Trees 10 m-30 m high; 10% foliage cover, with a prominent grassy understory. May contain isolated shrubs.

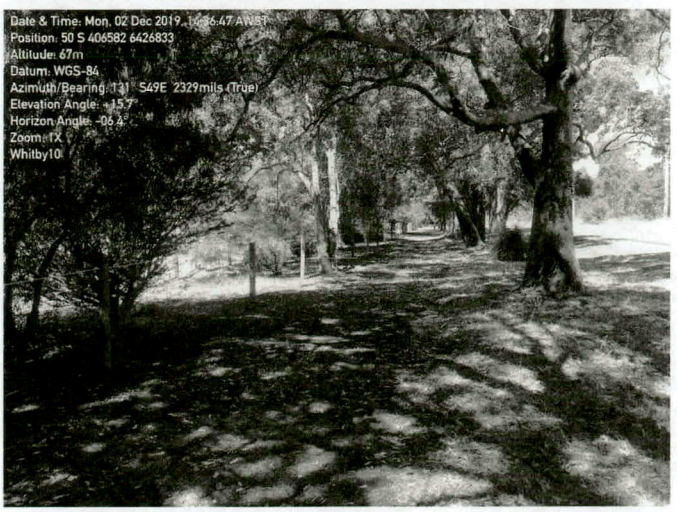


Photo ID:	86	Plot:	5

Vegetation Classification or Exclusion Clause

Class G Grassland – Sown pasture G-26

Description / Justification for Classification

Sown grazing pastures

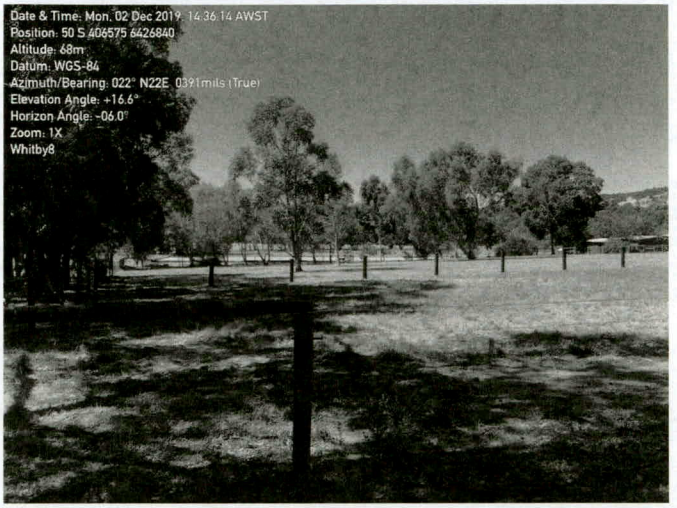


Photo ID:	85	Plot:	4

Vegetation Classification or Exclusion Clause

Class B Woodland - Woodland B-05

Description / Justification for Classification

Trees 10 m-30 m high; 10%-30% foliage cover dominated by *Eucalypts* and/or *Callitris,* with a prominent grassy understory. May contain isolated shrubs.

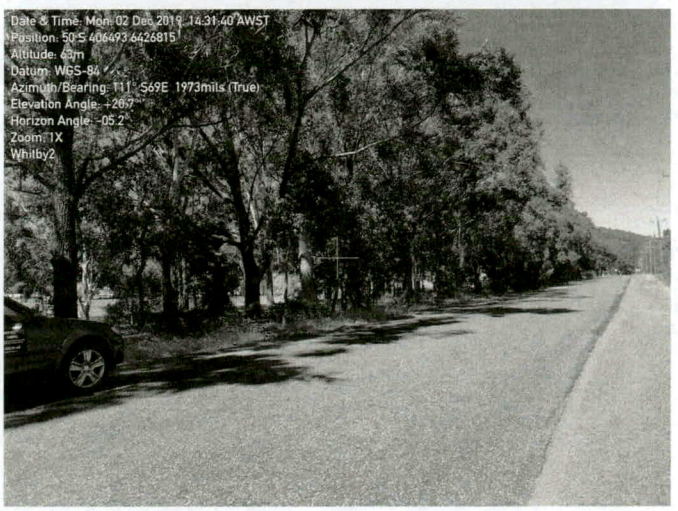
Photo ID:	80	Plot:	4

Vegetation Classification or Exclusion Clause

Class B Woodland - Woodland B-05

Description / Justification for Classification

Trees 10 m-30 m high; 10%-30% foliage cover dominated by *Eucalypts* and/or *Callitris,* with a prominent grassy understory. May contain isolated shrubs.



Relevant Fire Danger Index The fire danger index for this site has been determined in accordance with Table 2.1 or otherwise determined in accordance with a jurisdictional variation applicable to the site.

Fire Danger Index			
FDI 40 ☐	FDI 50 ☐	FDI 80 ☒	FDI 100 ☐
Table 2.4.5	*Table 2.4.4*	*Table 2.4.3*	*Table 2.4.2*

Potential Bushfire Impacts

The potential bushfire impact to the site / proposed development from each of the identified vegetation plots are identified below.

Table 1: BAL Analysis

Plot	Vegetation Classification	Effective Slope °	Separation (m)	BAL
1	Class B Woodland	Upslope/Flat	120	BAL – LOW
2	Class B Woodland	Upslope/Flat	44	BAL – 12.5
3	Class A - Forest	Upslope/Flat	84	BAL – 12.5
4	Class B Woodland	Upslope/Flat	62	BAL – 12.5
5	Class G Grassland	Upslope/Flat	17	BAL – 12.5
6	Excludable – Clause 2.2.3.2(f)	N/A	N/A	BAL – LOW
7	Select Vegetation	-----		Select BAL
8	Select Vegetation	-----		Select BAL

Determined Bushfire Attack Level (BAL)

The Determined Bushfire Attack Level (highest BAL) for the site / proposed development has been determined in accordance with clause 2.2.6 of AS 3959-2018 using the above analysis.

Determined Bushfire Attack Level	**BAL – 12.5**

DISCLAIMER

The determinations and recommendations in this report are based on the requirements of Australian Standards 3959 – 2018, (Construction of Buildings in Bushfire prone Areas) and State Planning Policy 3.7, (Planning in Bushfire Prone Areas and appendices). This assessment has been undertaken in good faith and has been based on the site conditions apparent at the time of inspection, and other information provided by the client or their agents. Construction of the dwelling to the prescribed BAL level will not on its own guarantee that a building will not be destroyed or damaged by a bushfire. The consultant has no control over the subsequent actions of the home owner in the construction, development and maintenance of a property, which in the event of a bushfire may contribute to loss or damage. Accordingly the consultant, local government authority, their servants or agents shall not be held accountable for any damage to property, loss or other consequence as a result of the services provided or determinations in this report.

THINNING RECOMMENDATIONS

There may be an opportunity for the client to conduct vegetation thinning to achieve a lower BAL rating where this is recommended. Thinning is the modification of vegetation by minimising or removing ground fuels, understory species and trees; the intention is to maintain the aesthetic values and natural habitats whilst minimising fire risk. **Approval for vegetation modification must be sought from the responsible authorities, and can only be conducted within the boundary of the property.**

The following table indicates the vegetation modification distances (IN RED) required from the edge of the proposed building to achieve the specified BAL. Use in conjunction with attached diagram on page 10:

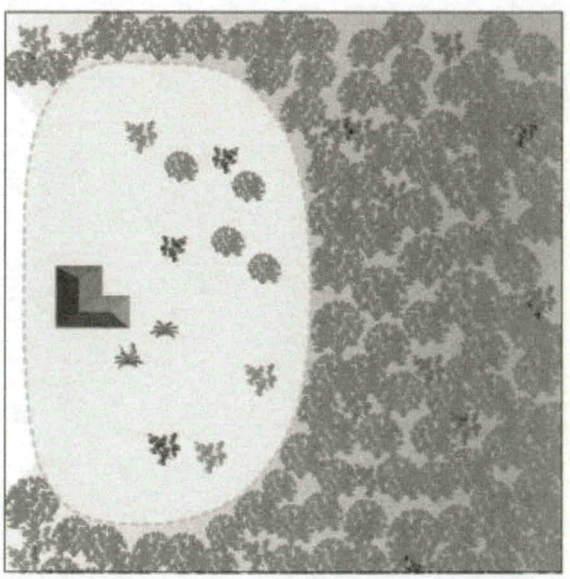
SAMPLE PLOT	ASPECT	VEGETATION CLASSIFICATION	CURRENT DISTANCE TO VEG. (m)	EFFECTIVE SLOPE °	CURRENT RATING	ACHIEVABLE RATING	TOTAL DISTANCE REQUIRED (m)
1	------	Select Classification		-----	------	------	
2	------	Select Classification		-----	------	------	
3	------	Select Classification		-----	------	------	
4	------	Select Classification		-----	------	------	
5	------	Select Classification		-----	------	------	
6	------	Select Classification		-----	------	------	
7	------	Select Classification		-----	------	------	
8	------	Select Classification		-----	------	------	

NOTE: If the option of vegetation management is exercised and completed by the client, another BAL Assessment will be required at extra cost, prior to construction commencing.

No further thinning required

Hazard on three sides

APZ



Refer to Schedule 1: Standards for Asset Protection Zones.

ADDITIONAL INFORMATION FOR THE CLIENT

BUSHFIRE ATTACK LEVELS AND CORRESPONDING SECTIONS FROM AS 3959-2018

Bushfire Attack Level (BAL)	Classified vegetation within 100 m of the site and heat flux exposure thresholds	Description of predicted bushfire attack and levels of exposure	Construction Section
BAL-LOW	See Clause 2.2.3.2	There is insufficient risk to warrant any specific construction requirements	4
BAL-12.5	≤12.5 kW/m^2	Ember attack.	3 & 5
BAL-19	>12.5 kW/m^2 ≤19 kW/m^2	Increasing levels of ember attack and burning debris ignited by wind-borne embers together with increasing heat flux	3 & 6
BAL-29	>19 kW/m^2 ≤29 kW/m^2	Increasing levels of ember attack and burning debris ignited by wind-borne embers together with increasing heat flux	3 & 7
BAL-40	>29 kW/m^2 ≤40 kW/m^2	Increasing levels of ember attack and burning debris ignited by wind-borne embers together with increasing heat flux with the increased likelihood of exposure to flames	3 & 8
BAL-FZ	>40 kW/m^2	Direct exposure to flames from fire front in addition to heat flux and ember attack	3 & 9

RADIANT HEAT THRESHOLDS OF PAIN AND IGNITION FROM AS 3959-2018

In a bushfire, radiant heat levels may be unsafe for humans and could also ignite combustible materials in the vicinity. Table G1 provides an indication of the potential effects of radiant heat levels on both humans and selected materials to assist the reader in understanding the implications of the different BALs.

TABLE G1 - TYPICAL RADIANT HEAT INTENSITIES FOR VARIOUS PHENOMENA

PHENOMENA	kW/m^2
Pain to humans after 10 s to 20 s	4
Pain to humans after 3 s	10
Ignition of cotton fabric after a long time (piloted) (see Note 2)	13
Ignition of timber after a long time 13 (piloted) (see Note 2)	13
Ignition of cotton fabric after a long time (non-piloted) (see Note 3)	25
Ignition of timber after a long time (non-piloted) (see Note 3)	25
Ignition of gabardine fabric after a long time (non-piloted) (see Note 3)	27
Ignition of black drill fabric after a long time (non-piloted) (see Note 3)	38
Ignition of cotton fabric after 5 s (non-piloted) (see Note 3)	42
Ignition of timber in 20 s (non-piloted) (see Note 3)	45
Ignition of timber in 10 s (non-piloted) (see Note 3)	55

NOTES:

1. Source AS 1530.4—2005.
2. Introduction of a small flame to initiate ignition.
3. Flame not introduced to initiate ignition.

HOW TO PROCEED WITH THIS DOCUMENT

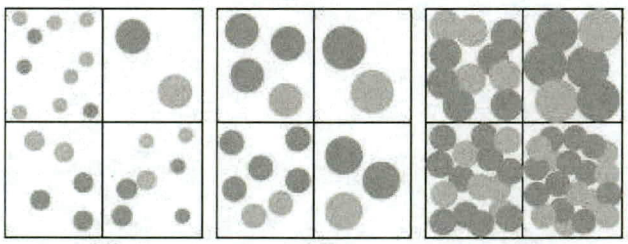
1. If you have been issued with a BAL report that requires **no further clearing / thinning**, this document can be submitted with your application for Development Approval **and** your application for Building Approval with your local authority.
2. If you need to amend the vegetation on your lot to achieve a maximum allowable BAL-29, clearing and thinning of vegetation may be required. In this case all vegetation amendments must be completed and a further site inspection carried out by the bushfire consultant. A **Final BAL Report** can then be issued **at additional cost.** The final BAL report will enable the completion of a compliance certificate by your builder / building inspector. This can then be submitted to your local authority for Building Approval.

Vegetation thinning standards outlined below provide an indication of the requirements for Asset Protection Zones as prescribed in State Planning Policy 3.7. These are the minimum standards required on sites that require vegetation amendments to achieve acceptable BAL levels. **Your Local Authority may prescribe additional or modified standards:**

SCHEDULE 1: STANDARDS FOR ASSET PROTECTION ZONES

- **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 16: Tree canopy cover – ranging from 15 to 70 per cent at maturity



- **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.

Source: WAPC Dec 2017 Guidelines for planning in bushfire prone areas. V1.3.

Appendix 1: Plans and Drawings

Plans and drawings relied on to determine the bushfire attack level showing site layout and distances to boundaries.