



# AS3959 Bushfire Attack Level Assessment Report

This report has been prepared using the Simplified Procedure (Method 1) as detailed in Section 2 of AS3959-2018.

Site Details	
Address:	Baldivis Grove Subdivision Stage 5
Suburb:	Baldivis WA 6171
Local Government Area	City of Rockingham
State:	Western Australia
Description of Building Works	Residential lots for Class 1 Dwellings

Report Details			
Report / Job Number:	2404-90	Report Version	2.0
Assessment Date:	02/04/2024	Report Date	08/04/2024
Assessor Details			
Name:	Rohan Carboon		
Accredited Practitioner	Rohan Carboon Level 3 - BPAD 23160		

*Disclaimer:*

*This report has been prepared in good faith and is derived from sources believed to be reliable and accurate at the time of publication. Nevertheless, this publication is distributed on the terms and understanding that the author is not responsible for results of any actions taken based on information in this publication or for any error in or omission from this publication.*

*Notwithstanding the precautions adopted in this report, it should always be remembered that bushfires burn under a wide range of conditions. An element of risk, no matter how small always remains. The objective of the standard (AS 3959:2018) is 'to prescribe particular construction details for buildings to reduce the risk of ignition from a bushfire while the front passes' (Standards Australia, 2018). Building to the standard (AS 3959:2018) does not guarantee a building will survive a bushfire.*

**Site Assessment and Site Plans**





The assessment of this development was undertaken on 02/04/2024 by Bushfire Safety Consulting Pty Ltd for the purposes of determining the Bushfire Attack Level for each lot in accordance with AS 3959 – 2018 Simplified Procedure (Method 1). The subdivision development creates 26 urban residential lots and internal roads. This assessment has been undertaken to provide BAL ratings for each lot in the subdivision stage (below) as outlined in the vegetation classification map.



## Vegetation Classification

All vegetation within 150m of the subdivision stage was classified in accordance with Clause 2.2.3 of AS 3959-2018. There is no vegetation on the lots, the entire area has been cleared, roads and lots are under construction. Some classified vegetation within 100 metres occurs west of the site.

Each distinguishable vegetation plot with the potential to determine the Bushfire Attack Level is identified below and outlined in the Vegetation Classification Plan.

<p><b>Photo ID: 1</b></p> <p><b>Plot Number: 1</b></p> <p><b>Vegetation classification or exclusion clause:</b></p> <p>Class A Forest</p> <p><b>Description/justification of classification:</b></p> <p>Overstorey of connected mature Eucalypt trees with canopy foliage cover 30-70% and grass and shrubs in the understorey.</p>	
<p><b>Photo ID: 2</b></p> <p><b>Plot Number: 1</b></p> <p><b>Vegetation classification or exclusion clause:</b></p> <p>Class A Forest</p> <p><b>Description/justification of classification:</b></p> <p>Overstorey of connected mature Eucalypt trees with canopy foliage cover 30-70% and grass and shrubs in the understorey.</p>	
<p><b>Photo ID: 3</b></p> <p><b>Plot Number: 1</b></p> <p><b>Vegetation classification or exclusion clause:</b></p> <p>Class A Forest</p> <p><b>Description/justification of classification:</b></p> <p>Mature eucalypt trees to 30m high; 30 -70% foliage cover, shrubs and grass on ground level.</p>	
<p><b>Photo ID: 4</b></p> <p><b>Plot Number: 1</b></p> <p><b>Vegetation classification or exclusion clause:</b></p> <p>Class A Forest</p> <p><b>Description/justification of classification:</b></p> <p>Eucalypt and Melaleuca trees to 30m high; 30-70% foliage cover, understorey of sedges and shrubs.</p>	



<p><b>Photo ID:</b> 5</p> <p><b>Plot Number:</b> 2</p> <p><b>Vegetation classification or exclusion clause:</b> Exclusion Clause 2.2.3.2 (f)</p> <p><b>Description/justification of classification:</b> Low threat vegetation; maintained gardens and lawns</p>	 <p>11 Aug 2021, 15:18:40</p>
<p><b>Photo ID:</b> 6</p> <p><b>Plot Number:</b> 2</p> <p><b>Vegetation classification or exclusion clause:</b> Exclusion Clause 2.2.3.2 (f)</p> <p><b>Description/justification of classification:</b> Low threat vegetation; maintained road verge, gardens and lawns.</p>	 <p>11 Aug 2021, 15:18:30</p>
<p><b>Photo ID:</b> 7</p> <p><b>Plot Number:</b> 2</p> <p><b>Vegetation classification or exclusion clause:</b> Exclusion Clause 2.2.3.2 (f)</p> <p><b>Description/justification of classification:</b> Low threat vegetation; maintained gardens and lawns</p>	 <p>11 Aug 2021, 15:17:28</p>
<p><b>Photo ID:</b> 8</p> <p><b>Plot Number:</b> 2</p> <p><b>Vegetation classification or exclusion clause:</b> Exclusion Clause 2.2.3.2 (f)</p> <p><b>Description/justification of classification:</b> Low threat vegetation; maintained gardens, lawns and road verge.</p>	 <p>11 Aug 2021, 15:18:50</p>
<p><b>Photo ID:</b> 9</p> <p><b>Plot Number:</b> 2</p> <p><b>Vegetation classification or exclusion clause:</b> Exclusion Clause 2.2.3.2 (f)</p> <p><b>Description/justification of classification:</b> Low threat vegetation; maintained garden and lawns</p>	 <p>11 Aug 2021, 15:44:45</p>
<p><b>Photo ID:</b> 10</p> <p><b>Plot Number:</b> 2</p> <p><b>Vegetation classification or exclusion clause:</b> Exclusion Clause 2.2.3.2 (f)</p> <p><b>Description/justification of classification:</b> Low threat vegetation; maintained road verge</p>	 <p>11 Aug 2021, 15:44:52</p>



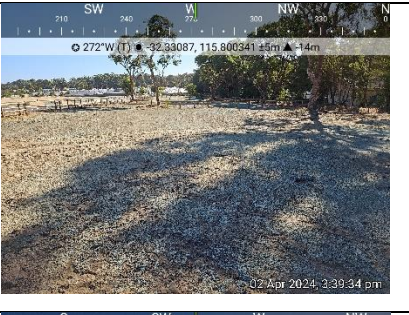
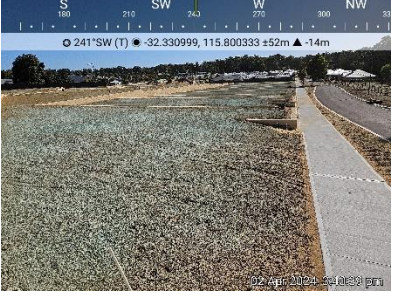
<p><b>Photo ID:</b> 11</p> <p><b>Plot Number:</b> 2</p> <p><b>Vegetation classification or exclusion clause:</b> Exclusion Clause 2.2.3.2 (f)</p> <p><b>Description/justification of classification:</b> Low threat vegetation; maintained road verge</p>	
<p><b>Photo ID:</b> 12</p> <p><b>Plot Number:</b> 2</p> <p><b>Vegetation classification or exclusion clause:</b> Exclusion Clause 2.2.3.2 (f)</p> <p><b>Description/justification of classification:</b> Low threat vegetation; maintained road verge</p>	
<p><b>Photo ID:</b> 13</p> <p><b>Plot Number:</b> 2</p> <p><b>Vegetation classification or exclusion clause:</b> Exclusion Clause 2.2.3.2 (f)</p> <p><b>Description/justification of classification:</b> Low threat vegetation; maintained road verge</p>	
<p><b>Photo ID:</b> 14</p> <p><b>Plot Number:</b> 2</p> <p><b>Vegetation classification or exclusion clause:</b> Exclusion Clause 2.2.3.2 (f)</p> <p><b>Description/justification of classification:</b> Low threat vegetation; maintained lawns and garden</p>	
<p><b>Photo ID:</b> 15</p> <p><b>Plot Number:</b> 2</p> <p><b>Vegetation classification or exclusion clause:</b> Exclusion Clause 2.2.3.2 (f)</p> <p><b>Description/justification of classification:</b> Low threat vegetation; maintained lawns and garden</p>	
<p><b>Photo ID:</b> 16</p> <p><b>Plot Number:</b> 2</p> <p><b>Vegetation classification or exclusion clause:</b> Exclusion Clause 2.2.3.2 (f)</p> <p><b>Description/justification of classification:</b> Low threat vegetation; maintained lawns and garden</p>	



<p><b>Photo ID:</b> 17</p> <p><b>Plot Number:</b> 2</p> <p><b>Vegetation classification or exclusion clause:</b> Exclusion Clause 2.2.3.2 (f)</p> <p><b>Description/justification of classification:</b> Low threat vegetation; maintained lawns and garden</p>	
<p><b>Photo ID:</b> 18</p> <p><b>Plot Number:</b> 2</p> <p><b>Vegetation classification or exclusion clause:</b> Exclusion clause 2.2.3.2 (f)</p> <p><b>Description/justification of classification:</b> Low threat vegetation; maintained lawns and garden</p>	
<p><b>Photo ID:</b> 19</p> <p><b>Plot Number:</b> 2</p> <p><b>Vegetation classification or exclusion clause:</b> Exclusion clause 2.2.3.2 (f)</p> <p><b>Description/justification of classification:</b> Low threat vegetation; cleared for future development</p>	
<p><b>Photo ID:</b> 20</p> <p><b>Plot Number:</b> 2</p> <p><b>Vegetation classification or exclusion clause:</b> Exclusion clause 2.2.3.2 (f)</p> <p><b>Description/justification of classification:</b> Exclusion clause 2.2.3.2 (f)</p> <p><b>Description/justification of classification:</b> Low threat vegetation areas; cleared for new housing</p>	
<p><b>Photo ID:</b> 21</p> <p><b>Plot Number:</b> 3</p> <p><b>Vegetation classification or exclusion clause:</b> Exclusion clause 2.2.3.2 (e)</p> <p><b>Description/justification of classification:</b> Non-vegetated areas permanently cleared of vegetation, future subdivision area, footpath</p>	
<p><b>Photo ID:</b> 22</p> <p><b>Plot Number:</b> 3</p> <p><b>Vegetation classification or exclusion clause:</b> Exclusion clause 2.2.3.2 (e)</p> <p><b>Description/justification of classification:</b> Completed development lots.</p>	

<p><b>Photo ID:</b> 23</p> <p><b>Plot Number:</b> 3</p> <p><b>Vegetation classification or exclusion clause:</b> Exclusion clause 2.2.3.2 (e)</p> <p><b>Description/justification of classification:</b> Non-vegetated areas permanently cleared of vegetation, roads and footpath</p>	
<p><b>Photo ID:</b> 24</p> <p><b>Plot Number:</b> 3</p> <p><b>Vegetation classification or exclusion clause:</b> Exclusion clause 2.2.3.2 (e)</p> <p><b>Description/justification of classification:</b> Non-vegetated areas permanently cleared of vegetation, roads and footpath</p>	
<p><b>Photo ID:</b> 25</p> <p><b>Plot Number:</b> 3</p> <p><b>Vegetation classification or exclusion clause:</b> Exclusion Clause 2.2.3.2 (e)</p> <p><b>Description/justification of classification:</b> Non-vegetated areas permanently cleared of vegetation except for small garden beds, roads and display home</p>	
<p><b>Photo ID:</b> 26</p> <p><b>Plot Number:</b> 3</p> <p><b>Vegetation classification or exclusion clause:</b> Exclusion Clause 2.2.3.2 (e)</p> <p><b>Description/justification of classification:</b> Permanently cleared of vegetation, future sub-division area</p>	
<p><b>Photo ID:</b> 27</p> <p><b>Plot Number:</b> 3</p> <p><b>Vegetation classification or exclusion clause:</b> Exclusion Clause 2.2.3.2 (e)</p> <p><b>Description/justification of classification:</b> Permanently cleared of vegetation, future sub-division area</p>	
<p><b>Photo ID:</b> 28</p> <p><b>Plot Number:</b> 3</p> <p><b>Vegetation classification or exclusion clause:</b> Exclusion Clause 2.2.3.2 (e)</p> <p><b>Description/justification of classification:</b> Permanently cleared of vegetation, future sub-division area</p>	



<p><b>Photo ID:</b> 29</p> <p><b>Plot Number:</b> 3</p> <p><b>Vegetation classification or exclusion clause:</b> Exclusion Clause 2.2.3.2 (e)</p> <p><b>Description/justification of classification:</b> Permanently cleared of vegetation, future sub-division area</p>	
<p><b>Photo ID:</b> 30</p> <p><b>Plot Number:</b> 3</p> <p><b>Vegetation classification or exclusion clause:</b> Exclusion Clause 2.2.3.2 (f)</p> <p><b>Description/justification of classification:</b> Permanently managed vegetation on lifestyle lots</p>	
<p><b>Photo ID:</b> 31</p> <p><b>Plot Number:</b> 3</p> <p><b>Vegetation classification or exclusion clause:</b> Exclusion Clause 2.2.3.2 (f)</p> <p><b>Description/justification of classification:</b> Permanently managed vegetation on lifestyle lots</p>	
<p><b>Photo ID:</b> 32</p> <p><b>Plot Number:</b> 3</p> <p><b>Vegetation classification or exclusion clause:</b> Exclusion Clause 2.2.3.2 (e)</p> <p><b>Description/justification of classification:</b> Permanently cleared of vegetation, future sub-division area</p>	

### Relevant Fire Danger Index

The fire danger index for this site has been determined in accordance with Table 2.1 in AS3959–2018.

Fire Danger Index:	Table
FDI : 80	2.5



### Effective Slope

The effective slope under the classified vegetation is outlined in the following table.

Plot No.	Classified Vegetation	Effective slope
1	Class A Forest	Downslope 0-5
2	Exclusion Clause 2.2.3.2(f)	N/A
3	Exclusion Clause 2.2.3.2(e)	N/A
4	Exclusion Clause 2.2.3.2(a)	N/A





Location details: Stage 5 Subdivision  
 Baldivis Grove  
 Assessment date: March, 2024  
 Prepared by: Bushfire Safety Consulting  
 Accreditation level: Level 3 BPAD Practitioner  
 Accreditation number: BPAD 23160  
 Accreditation expiry date: 31st January, 2025  
 Date aerial photo: January, 2024

**VEGETATION  
 CLASSIFICATION MAP  
 (BAL CONTOUR MAP)**



SCALE 1:2200 @ A3  
 DATE: MARCH 2024



- LEGEND**
- SUBJECT LAND
  - ASSESSMENT AREA (150m) FROM THE EXTERNAL BOUNDARY OF THE SUBJECT SITE
  - ASSESSMENT AREA (100m) FROM THE EXTERNAL BOUNDARY OF THE SUBJECT SITE

- PLOT 1 - CLASS A FOREST - DOWNSLOPE 0-5
- PLOT 2 - EXCLUSION CLAUSE 2.2.3.2(f)
- PLOT 3 - EXCLUSION CLAUSE 2.2.3.2(e)
- PLOT 4 - EXCLUSION CLAUSE 2.2.3.2(a)

SOURCE OF PHOTOGRAPHY: NEARMAP



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### Determined Bushfire Attack Level

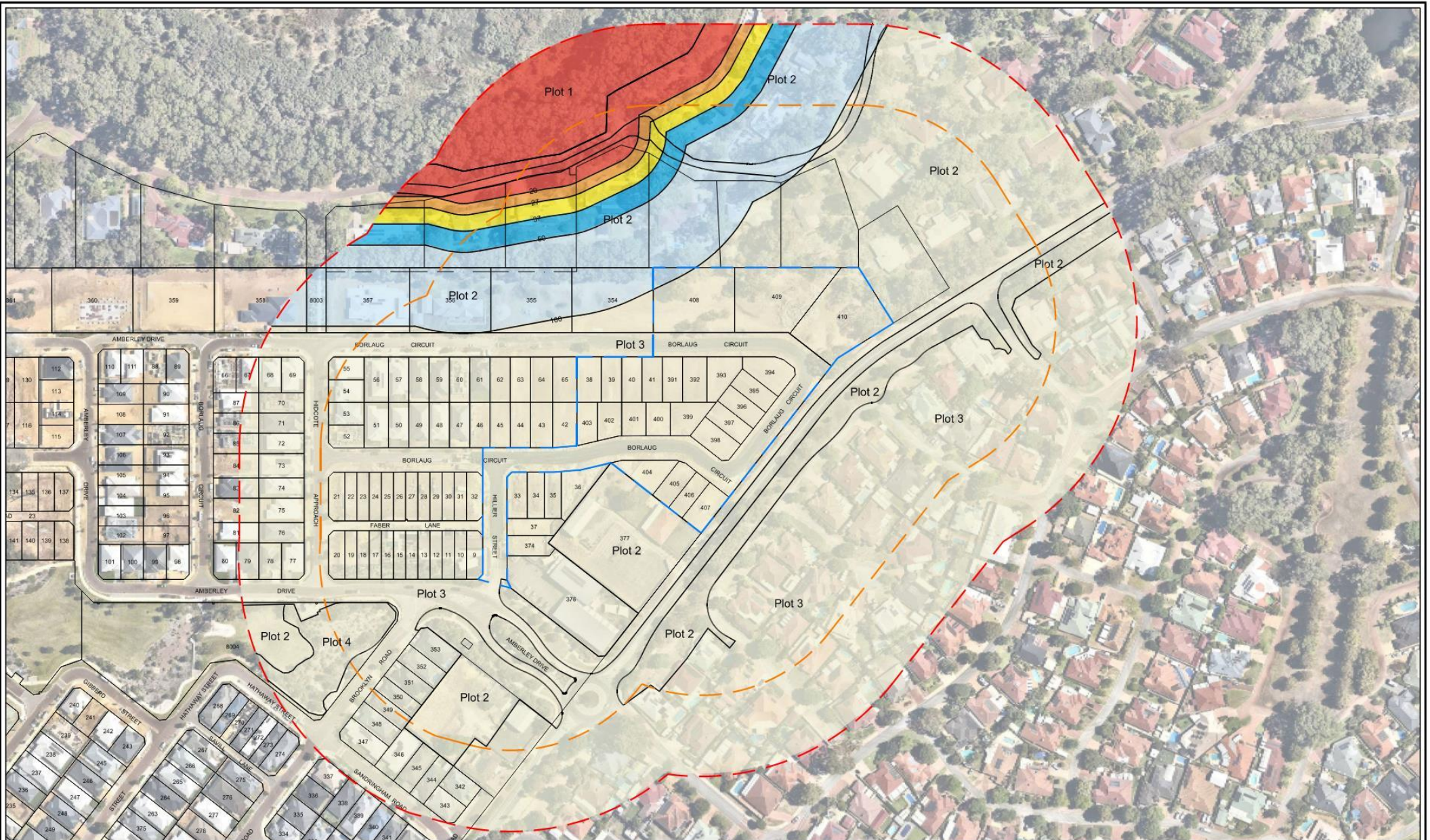
The determined Bushfire Attack Level (highest BAL) for the lots has been determined in accordance with clause 2.2.6 of AS3959-2018 using the above analysis.

### Potential Bushfire Impacts

The predicted radiant heat flux levels into the site from the assessment are outlined below in Table 1 and the BAL Contour Plan.

Lot/s	Applied Vegetation Classification	Plot No. & Effective Slope	Separation distance to Classified Vegetation (metres)	Highest BAL Contour
391 -407	Class A Forest	Plot 1 – Down 0-5°	>100 metres	BAL-LOW
38 - 41	Class A Forest	Plot 1 – Down 0-5°	>100 metres	BAL-LOW
409 - 410	Class A Forest	Plot 1 – Down 0-5°	>100 metres	BAL-LOW
408	Class A Forest	Plot 1 – Down 0-5°	>100 metres with 10m rear setback	BAL-LOW
354	Class A Forest	Plot 1 – Down 0-5°	81 metres with 10m rear setback	BAL-12.5
355	Class A Forest	Plot 1 – Down 0-5°	72 metres with 10m rear setback	BAL-12.5








Location details: Subdivision Stage 5  
 Baldvis Grove  
 Assessment date: March, 2024  
 Prepared by: Bushfire Safety Consulting  
 Accreditation level: Level 3 BPAD Practitioner  
 Accreditation number: BPAD 23160  
 Accreditation expiry date: 31st January, 2025  
 Date aerial photo: January, 2024


### BAL CONTOUR MAP

0 20 40 60 80 100m  
 SCALE 1:2200 @ A3  
 DATE: MARCH 2024



LEGEND:  
 SUBJECT LAND  
 ASSESSMENT AREA (150m) FROM THE EXTERNAL BOUNDARY OF THE SUBJECT SITE  
 ASSESSMENT AREA (100m) FROM THE EXTERNAL BOUNDARY OF THE SUBJECT SITE

#### INDICATIVE BUSHFIRE ATTACK LEVELS

-  BAL LOW
-  BAL 12.5
-  BAL 19
-  BAL 29
-  BAL 40
-  BAL FLAME ZONE

SOURCE OF PHOTOGRAPHY: NEARMAP



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**Appendix 1: Additional Information / Advisory Notes**

A Bushfire Attack Level (BAL) Assessment is a means of measuring the severity of a buildings potential exposure to ember attack, radiant heat and direct flame contact from a bushfire event, and thereby determining the construction measures required for the dwelling.

The method used to determination of the BAL rating, and subsequent building construction standards, are directly referenced from Australian Standard *AS3959-2018 Construction of buildings in bushfire prone areas*.

The BAL rating is determined through the identification and assessment of the following parameters:

- Fire danger Index (FDI) rating; assumed to be FDI-80 for Western Australia
- All classified vegetation **within 100m** of the subject building
- Separation distance between the building and the classified vegetation
- Slope of the land under the classified vegetation

AS3959-2018 has six (6) levels of BAL, based on the radiant heat flux exposure to the building, and also identifies the relevant sections for building construction as detailed below;

Bushfire Attack Level (BAL)	Classified Vegetation within 100m of the site and heat flux exposure thresholds	Description of predicted bushfire attack and levels of exposure	Construction Sections (within AS3959)
<b>BAL-LOW</b>	See Clause 2.2.3.2	There is insufficient risk to warrant specific construction requirements	4
<b>BAL-12.5</b>	$\leq 12.5 \text{ kW/m}^2$	Ember attack	3 & 5
<b>BAL-19</b>	$> 12.5 \text{ kW/m}^2$ to $\leq 19 \text{ kW/m}^2$	Increasing levels of ember attack and burning debris ignited by windbourne embers together with increasing heat flux	3 & 6
<b>BAL-29</b>	$> 19 \text{ kW/m}^2$ to $\leq 29 \text{ kW/m}^2$	Increasing levels of ember attack and burning debris ignited by windbourne embers together with increasing heat flux	3 & 7
<b>BAL-40</b>	$> 29 \text{ kW/m}^2$ to $\leq 40 \text{ kW/m}^2$	Increasing levels of ember attack and burning debris ignited by windbourne embers together with increasing heat flux with the increased likelihood of exposure to flames	3 & 8
<b>BAL-FZ</b>	$> 40 \text{ kW/m}^2$	Direct exposure to flames from fire front in addition to heat flux and ember attack	3 & 9