



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:	Subdivision Stage 6 - Lake Treeby
Suburb:	Treeby WA 6164
Local Government Area	City of Cockburn
State:	Western Australia
Description of Building Works	Residential lots for Class 1 Dwellings

Report Details			
Report / Job Number:	2310-38	Report Version	1.0
Assessment Date:	15/08/2023	Report Date	11/10/2023
Assessor Details			
Name:	Rohan Carboon		
Accredited Practitioner	Rohan Carboon Level 3 - BPAD 23160		

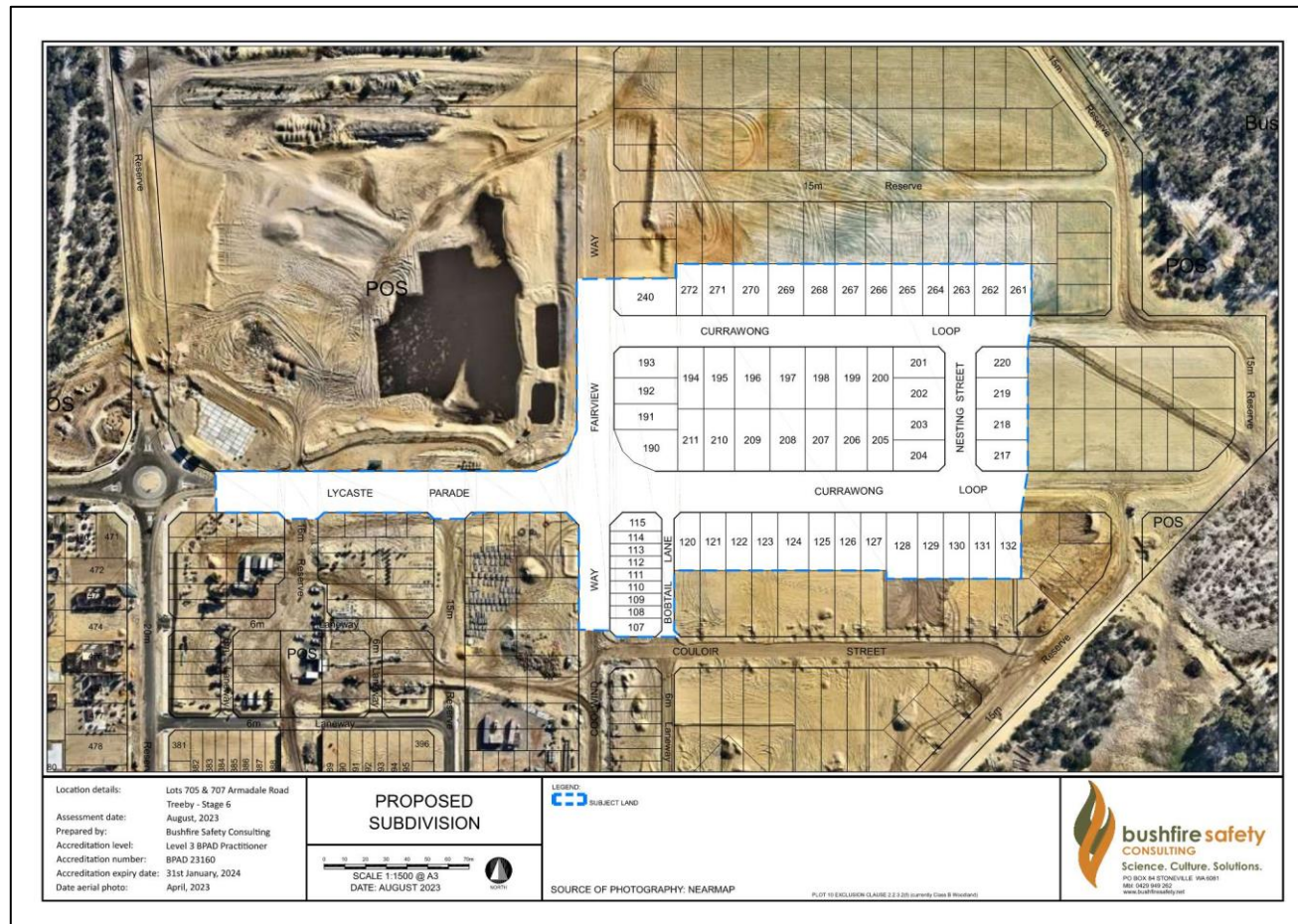
Disclaimer:

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 15/08/2023 by Bushfire Safety Consulting Pty Ltd for the purposes of determining the Bushfire Attack Level for each lot and dwelling in accordance with AS 3959 – 2018 Simplified Procedure (Method 1). The Stage 6 subdivision development creates a further 61 urban residential lots and internal roads adjacent to an existing developed area and future subdivision stages. This assessment has been undertaken to provide BAL ratings for each lot and dwellings in the subdivision stage (below) as outlined in the vegetation classification map.



Vegetation Classification

All vegetation within 150m of the subdivision 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 and adjacent subdivision stages have also been cleared including the adjacent development. Classified vegetation within 100 metres occurs east and west of the stage where some remnant vegetation and revegetation of the landscape is occurring in the adjacent Bush Forever reserve. Class D Scrub is the dominant vegetation, but there are also remnant areas of forest, woodland and shrubland.

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



<p>Photo ID: 1</p> <p>Plot Number: 1</p> <p>Vegetation classification or exclusion clause: Class A Forest</p> <p>Description/justification of classification: Open forest 30 – 70% foliage cover with eucalypts and banksia trees and shrubland understorey.</p>	
<p>Photo ID: 2</p> <p>Plot Number: 1</p> <p>Vegetation classification or exclusion clause: Class A Forest</p> <p>Description/justification of classification: Open forest 30 – 70% foliage cover with eucalypts and banksia trees and shrubland understorey.</p>	

Photo ID: 3

Plot Number: 3

Vegetation classification or exclusion clause:
Class B Woodland

Description/justification of classification: Low
Low banksia trees and low shrubs that mature
less than 6 m in height and open canopy.



Photo ID: 4

Plot Number: 3

Vegetation classification or exclusion clause:
Low banksia trees and low shrubs that mature
less than 6 m in height and open canopy.



Photo ID: 5




Plot Number: 5

Vegetation classification or exclusion clause:
Class D Scrub

Description/justification of classification:
Mixed species of scrub vegetation 2-4m high.



<p>Photo ID: 6</p> <p>Plot Number: 5</p> <p>Vegetation classification or exclusion clause: Class: D Scrub</p> <p>Description/justification of classification: Mixed species of scrub vegetation 2-4m high.</p>	<p>North West Elevation 160°SE (T) ±5 m ▲ 0 m 15 Aug 2023, 4:51:23 pm</p>
<p>Photo ID: 7</p> <p>Plot Number: 6</p> <p>Vegetation classification or exclusion clause: Class: D Scrub</p> <p>Description/justification of classification: Revegetation of scrub species in the foreground to 6 m high maximum.</p>	<p>73°NE (T) ±4 m ▲ 0 m 15 Aug 2023, 4:18:01 pm</p>
<p>Photo ID: 8</p> <p>Plot Number: 6</p> <p>Vegetation classification or exclusion clause: Class: D Scrub</p> <p>Description/justification of classification: Cleared area to be revegetated into mixed species of scrub vegetation 2-6m high.</p>	<p>242°SW (T) ±4 m ▲ 0 m 15 Aug 2023, 4:18:25 pm</p>

<p>Photo ID: 9</p> <p>Plot Number: 6</p> <p>Vegetation classification or exclusion clause: Class: D Scrub</p> <p>Description/justification of classification Mixed species of scrub vegetation 2-6m high in old sand extraction area.</p>	
<p>Photo ID: 10</p> <p>Plot Number: 6</p> <p>Vegetation classification or exclusion clause: Class: D Scrub</p> <p>Description/justification of classification: Mixed species of scrub vegetation 2-6m high in old sand extraction area.</p>	
<p>Photo ID: 11</p> <p>Plot Number: 6</p> <p>Vegetation classification or exclusion clause: Class: D Scrub</p> <p>Description/justification of classification Mixed species of scrub vegetation 2-6m high in old sand extraction area.</p>	




<p>Photo ID: 12</p> <p>Plot Number: 7</p> <p>Vegetation classification or exclusion clause: Class: C Shrubland</p> <p>Description/justification of classification: Sparse banksia shrubs in dominant low shrubland area.</p>	
<p>Photo ID: 13</p> <p>Plot Number: 9</p> <p>Vegetation classification or exclusion clause: Exclusion Clause 2.2.3.2(f)</p> <p>Description/justification of classification: Landscaping under construction in public open space to be re-vegetated with low threat vegetation, lawns and park area.</p>	
<p>Photo ID: 14</p> <p>Plot Number: 9</p> <p>Vegetation classification or exclusion clause: Exclusion Clause 2.2.3.2(f)</p> <p>Description/justification of classification: Future public open space; to have low threat vegetation.</p>	

Photo ID: 15
Plot Number: 9
Vegetation classification or exclusion clause:
Exclusion Clause 2.2.3.2(f)
Description/justification of classification:
Low threat vegetation; lawns and maintained gardens in public open space.

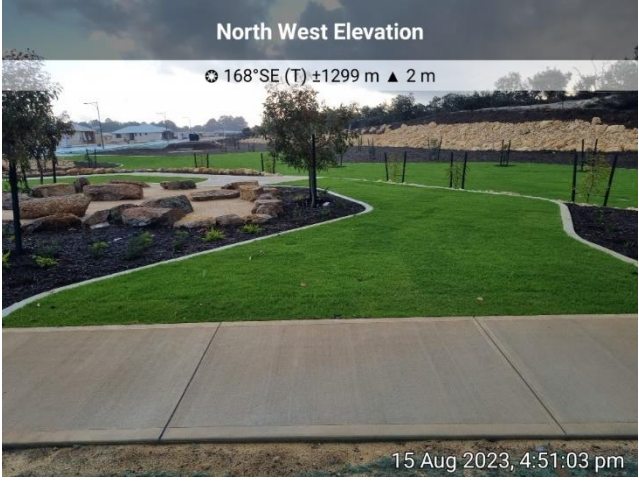
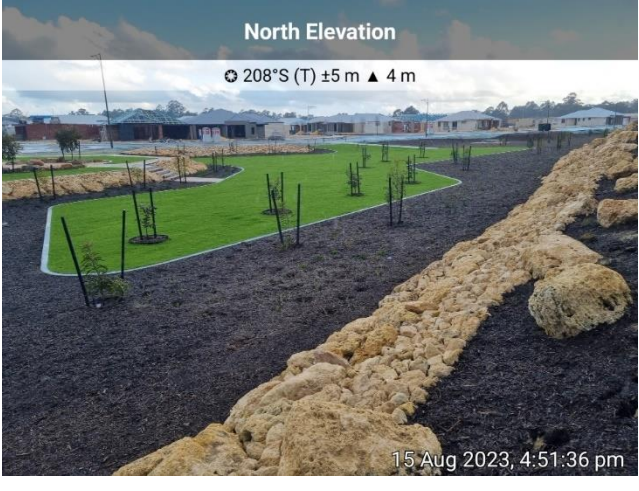


Photo ID: 16
Plot Number: 9
Vegetation classification or exclusion clause:
Exclusion Clause 2.2.3.2(f)
Description/justification of classification:
Low threat vegetation; future lawns and maintained gardens in public open space.



Photo ID: 17
Plot Number: 9
Vegetation classification or exclusion clause:
Exclusion Clause 2.2.3.2(f)
Description/justification of classification:
Low threat vegetation; lawns and maintained gardens in public open space.



<p>Photo ID: 18</p> <p>Plot Number: 9</p> <p>Vegetation classification or exclusion clause: Exclusion Clause 2.2.3.2(f)</p> <p>Description/justification of classification: Low threat vegetation; lawns and maintained gardens in public open space.</p>	
<p>Photo ID: 19</p> <p>Plot Number: 10</p> <p>Vegetation classification or exclusion clause: Exclusion Clause 2.2.3.2(e)</p> <p>Description/justification of classification: Cleared development stages for residential lots – non vegetated area – minimal vegetation proposed in urban landscape.</p>	<p style="text-align: center;">East Elevation</p> <p style="text-align: center;">📍 292°W (T) ±5 m ▲ 6 m</p>  <p style="text-align: right;">15 Aug 2023, 4:40:43 pm</p>
<p>Photo ID: 20</p> <p>Plot Number: 10</p> <p>Vegetation classification or exclusion clause: Exclusion Clause 2.2.3.2(e)</p> <p>Description/justification of classification: Cleared development stages for residential lots – non vegetated area – minimal vegetation proposed in urban landscape.</p>	<p style="text-align: center;">North Elevation</p> <p style="text-align: center;">📍 196°S (T) ±6 m ▲ 5 m</p>  <p style="text-align: right;">15 Aug 2023, 4:41:16 pm</p>

<p>Photo ID: 21</p> <p>Plot Number: 10</p> <p>Vegetation classification or exclusion clause: Exclusion Clause 2.2.3.2(e)</p> <p>Description/justification of classification: Cleared development stages for residential lots – non vegetated area – minimal vegetation proposed in urban landscape.</p>	 <p>North East Elevation 217°SW (T) ±86 m ▲ 5 m</p> <p>15 Aug 2023, 4:42:44 pm</p>
<p>Photo ID: 22</p> <p>Plot Number: 10</p> <p>Vegetation classification or exclusion clause: Exclusion Clause 2.2.3.2(e)</p> <p>Description/justification of classification: Cleared residential lots – non vegetated area.</p>	 <p>South East Elevation 308°NW (T) ±24 m ▲ 1 m</p> <p>15 Aug 2023, 4:32:30 pm</p>
<p>Photo ID: 23</p> <p>Plot Number: 10</p> <p>Vegetation classification or exclusion clause: Exclusion Clause 2.2.3.2(e)</p> <p>Description/justification of classification: Cleared development stages for residential lots – non vegetated area – minimal vegetation proposed in urban landscape.</p>	 <p>West Elevation 100°E (T) ±5 m ▲ 4 m</p> <p>15 Aug 2023, 4:47:15 pm</p>

Photo ID: 24

Plot Number: 10

Vegetation classification or exclusion clause:

Exclusion Clause 2.2.3.2(e)

Description/justification of classification:

Cleared development stages for residential lots – non vegetated area – minimal vegetation proposed in urban landscape.



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.

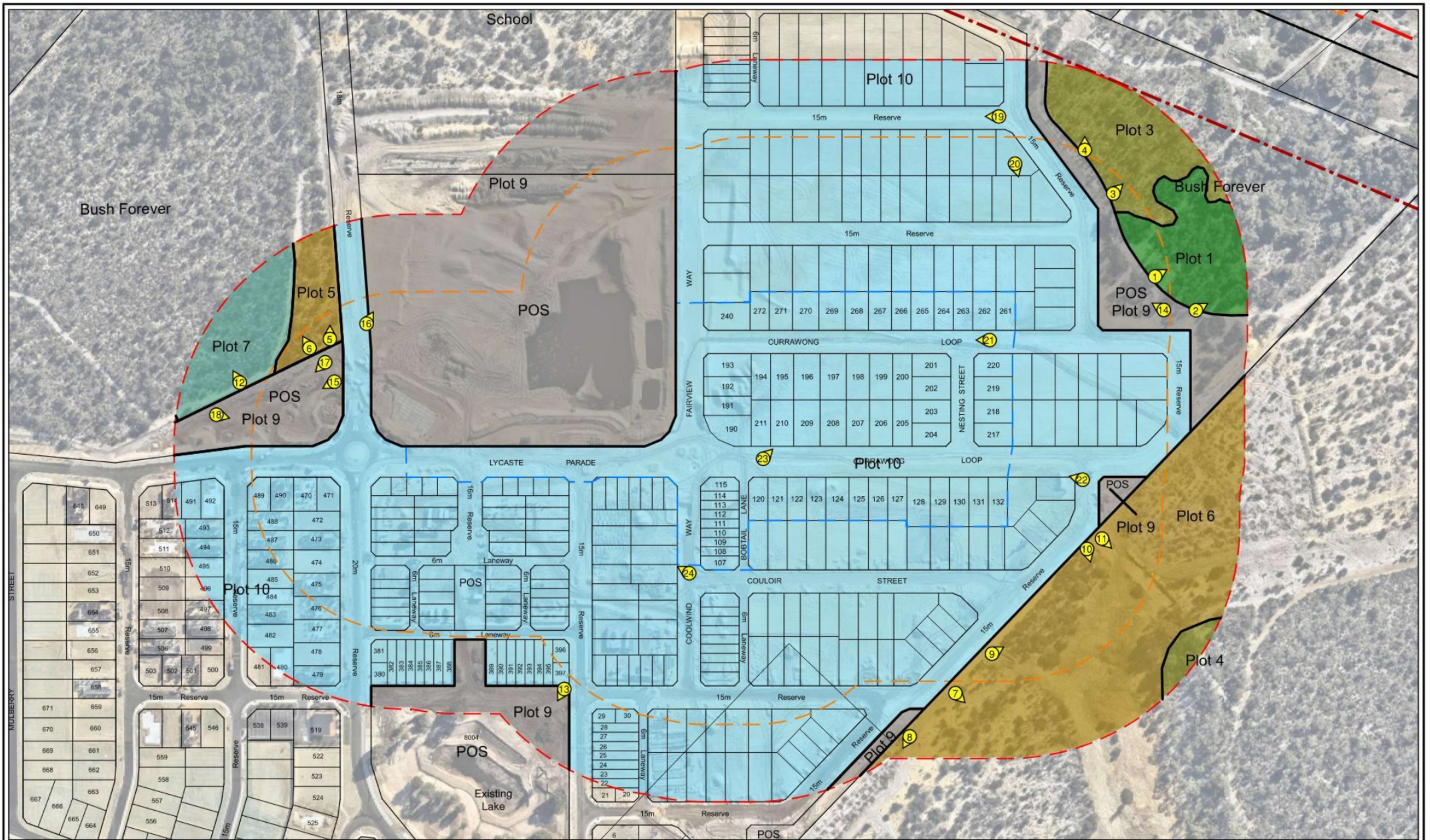
Plot No.	Classified Vegetation	Effective slope
1	Class A Forest	Downslope 0-5°
3	Class B Woodland	Downslope 0-5°
5	Class D Scrub	Downslope 0-5°
6	Class D Scrub	Flat/Upslope
7	Class C Shrubland	Flat/Upslope
9	Exclusion Clause 2.2.3.2 (f)	N/A
10	Exclusion Clause 2.2.3.2(e)	N/A

Determined Bushfire Attack Level

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

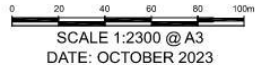
Potential Bushfire Impacts

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



Location details: Lots 705 & 707 Armadale Road
 Treeby - Stage 6
 Assessment date: August, 2023
 Prepared by: Bushfire Safety Consulting
 Accreditation level: Level 3 BPAD Practitioner
 Accreditation number: BPAD 23160
 Accreditation expiry date: 31st January, 2024
 Date aerial photo: April, 2023

VEGETATION CLASSIFICATION MAP (BAL CONTOUR MAP)



- 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

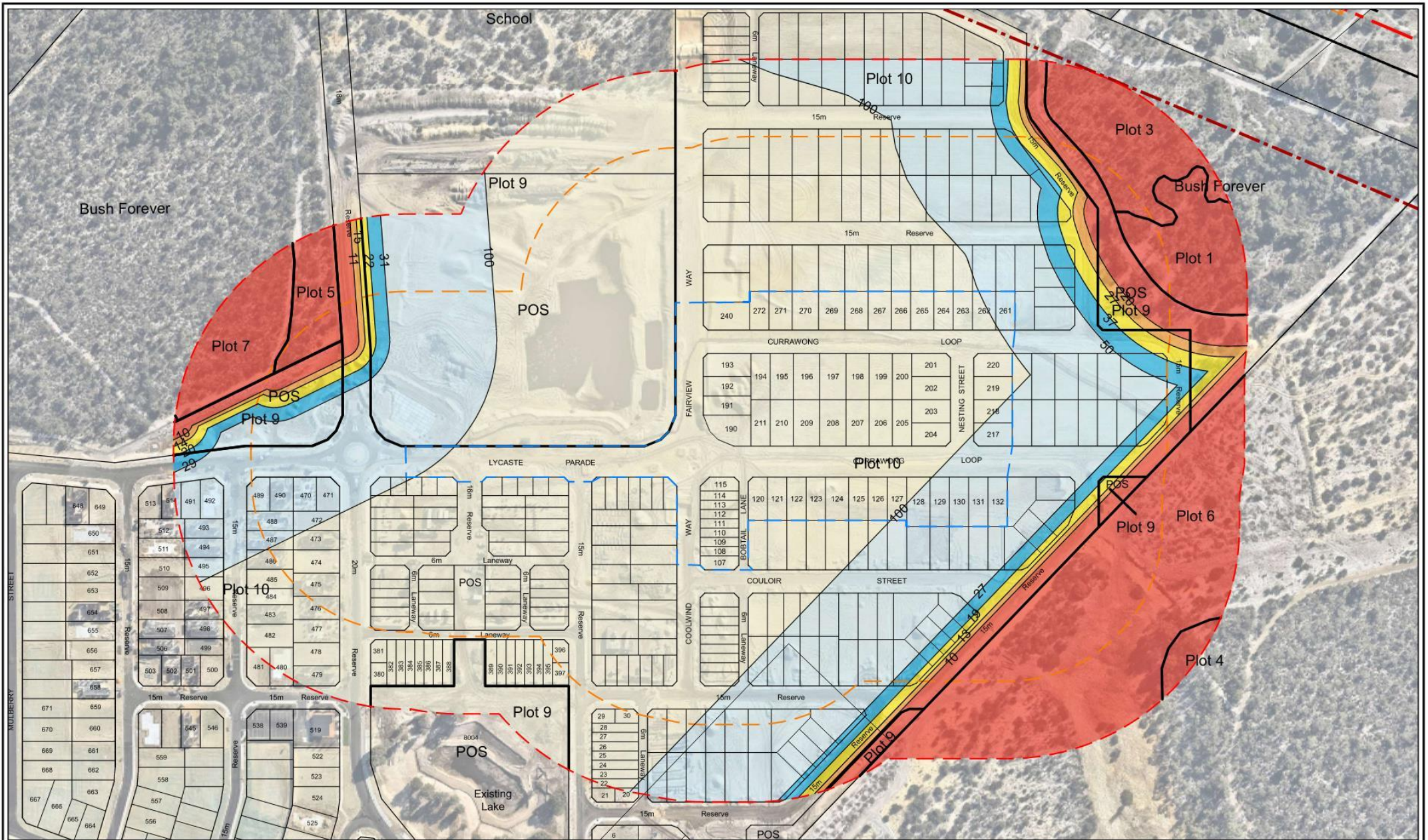
SOURCE OF PHOTOGRAPHY: NEARMAP

- PLOT 1 CLASS A FOREST - DOWNSLOPE 0-5
- PLOT 2 CLASS A FOREST - FLAT/UPSLOPE
- PLOT 3 CLASS B WOODLAND - DOWNSLOPE 0-5
- PLOT 4 CLASS B WOODLAND - FLAT/UPSLOPE
- PLOT 5 - CLASS D SCRUB - DOWNSLOPE 0-5
- PLOT 6 - CLASS D SCRUB - FLAT/UPSLOPE
- PLOT 7 - CLASS C SHRUBLAND - FLAT/UPSLOPE
- PLOT 8 CLASS G GRASSLAND - FLAT/UPSLOPE
- PLOT 9 EXCLUSION CLAUSE 2.2.3.2(f)
- PLOT 10 - EXCLUSION CLAUSE 2.2.3.2(e)

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Table 1: BAL Inputs and BAL Ratings

Lots	Vegetation Class	Plot No.	Slope	Setback Distance	BAL Rating
				external	
107 – 115	Class D Scrub	6	Flat / upslope	>100 metres	BAL-LOW
120 – 126	Class D Scrub	6	Flat / upslope	>100 metres	BAL-LOW
127	Class D Scrub	6	Flat / upslope	92 metres	BAL-12.5
128	Class D Scrub	6	Flat / upslope	78.6 metres	BAL-12.5
129	Class D Scrub	6	Flat / upslope	70 metres	BAL-12.5
130	Class D Scrub	6	Flat / upslope	60.6 metres	BAL-12.5
131	Class D Scrub	6	Flat / upslope	52 metres	BAL-12.5
132	Class D Scrub	6	Flat / upslope	43 metres	BAL-12.5
190 -211	Class D Scrub	6	Flat / upslope	>100 metres	BAL-LOW
220	Class D Scrub	6	Flat / upslope	>100 metres	BAL-LOW
219	Class D Scrub	6	Flat / upslope	96 metres	BAL-12.5
218	Class D Scrub	6	Flat / upslope	88 metres	BAL-12.5
217	Class D Scrub	6	Flat / upslope	77.6 metres	BAL-12.5
263 -272	Class D Scrub	6	Flat / upslope	>100 metres	BAL-LOW
240	Class D Scrub	6	Flat / upslope	>100 metres	BAL-LOW
262	Class A Forest	1	Downslope 0-5°	90 metres	BAL-12.5
261	Class A Forest	1	Downslope 0-5°	78 metres	BAL-12.5



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FIGURE 5
BAL CONTOUR PLAN



SCALE 1:2300 @ A3
 DATE: OCTOBER 2023



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

SOURCE OF PHOTOGRAPHY: NEARMAP

INDICATIVE BUSHFIRE ATTACK LEVELS

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

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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)
BAL-LOW	See Clause 2.2.3.2	There is insufficient risk to warrant specific construction requirements	4
BAL-12.5	$\leq 12.5 \text{ kW/m}^2$	Ember attack	3 & 5
BAL-19	$> 12.5 \text{ kW/m}^2$ 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
BAL-29	$> 19 \text{ kW/m}^2$ 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
BAL-40	$> 29 \text{ kW/m}^2$ 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
BAL-FZ	$> 40 \text{ kW/m}^2$	Direct exposure to flames from fire front in addition to heat flux and ember attack	3 & 9