



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 2 - 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: | 2211-68 | Report Version | 1.0 |
| Assessment Date: | 24/11/2022 | Report Date | 12/12/2022 |
| Assessor Details | | | |
| Name: | Rohan Carboon | | |
| Accredited Practitioner | Rohan Carboon Level 3 - BPAD 23160 | | |

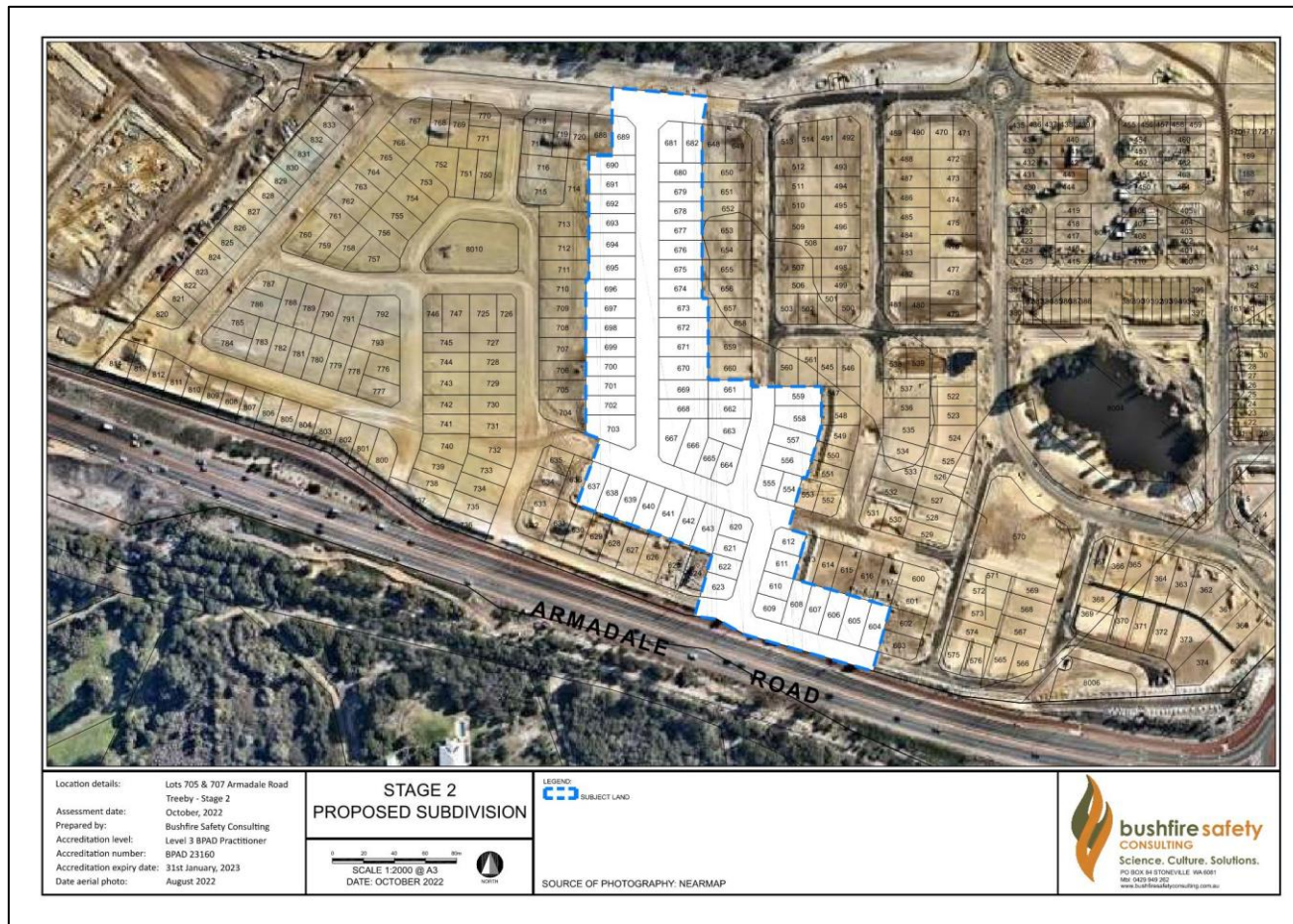
Disclaimer:

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 24/11/2022 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 2 subdivision development creates a further 63 urban residential lots, one POS area and internal roads adjacent to an existing developed area. 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. Roads and lots are nearing completion. Classified vegetation within 100 metres only occurs north of the stage and south of the site.

Class D Scrub, Class A Forest and Class B Woodland is found in the Bushforever Reserve north of the subdivision and is the dominant vegetation.

The small Public Open Space (POS) reserve will be developed into a pocket park with turf and fuel low maintained vegetation.

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: 2</p> <p>Vegetation classification or exclusion clause: Class A Forest</p> <p>Description/justification of classification: Remnant euclaypts, banksia trees and middle storey scrub vegetation with canopy exceeding 30% foliage cover.</p> | |
| <p>Photo ID: 2</p> <p>Plot Number: 2</p> <p>Vegetation classification or exclusion clause: Class A Forest</p> <p>Description/justification of classification: Remnant euclaypts, banksia trees and middle storey scrub vegetation with canopy exceeding 30% foliage cover.</p> | |
| <p>Photo ID: 3</p> <p>Plot Number: 4</p> <p>Vegetation classification or exclusion clause: Class B Woodland</p> <p>Description/justification of classification: Remnant banksia and allocasuarina trees with low shrubs vegetation with canopy foliage cover 10 - 30%.</p> | |

| | |
|--|---|
| <p>Photo ID: 4</p> <p>Plot Number: 4</p> <p>Vegetation classification or exclusion clause: Class B Woodland</p> <p>Description/justification of classification: Remnant banksia and allocasuarina trees with low shrubs vegetation with canopy foliage cover 10 - 30%.</p> |  |
| <p>Photo ID: 5</p> <p>Plot Number: 5</p> <p>Vegetation classification or exclusion clause: Class D Scrub</p> <p>Description/justification of classification: Mixed species of shrubs greater than 2m high, 10-30% foliage cover.</p> |  |
| <p>Photo ID: 6</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: Cleared area to be revegetated into managed parkland as per approved landscape plans</p> |  |
| <p>Photo ID: 7</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: Cleared development stages for residential lots – no threat vegetation – minimal vegetation proposed in urban landscape.</p> |  |
| <p>Photo ID: 8</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 – no threat vegetation – minimal vegetation proposed in urban landscape.</p> |  |

| | |
|---|---|
| <p>Photo ID: 9</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 – no threat vegetation – minimal vegetation proposed in urban landscape.</p> |  |
| <p>Photo ID: 10</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 – no threat vegetation – minimal vegetation proposed in urban landscape.</p> |  |
| <p>Photo ID: 11</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 – no threat vegetation – minimal vegetation proposed in urban landscape.</p> |  |
| <p>Photo ID: 12</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 – no threat vegetation – minimal vegetation proposed in urban landscape.</p> |  |
| <p>Photo ID: 13</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 – no threat vegetation – minimal vegetation proposed in urban landscape.</p> |  |

Photo ID: 14
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 – no threat vegetation – minimal vegetation proposed in urban landscape.



Photo ID: 15
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 – no threat vegetation – 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.

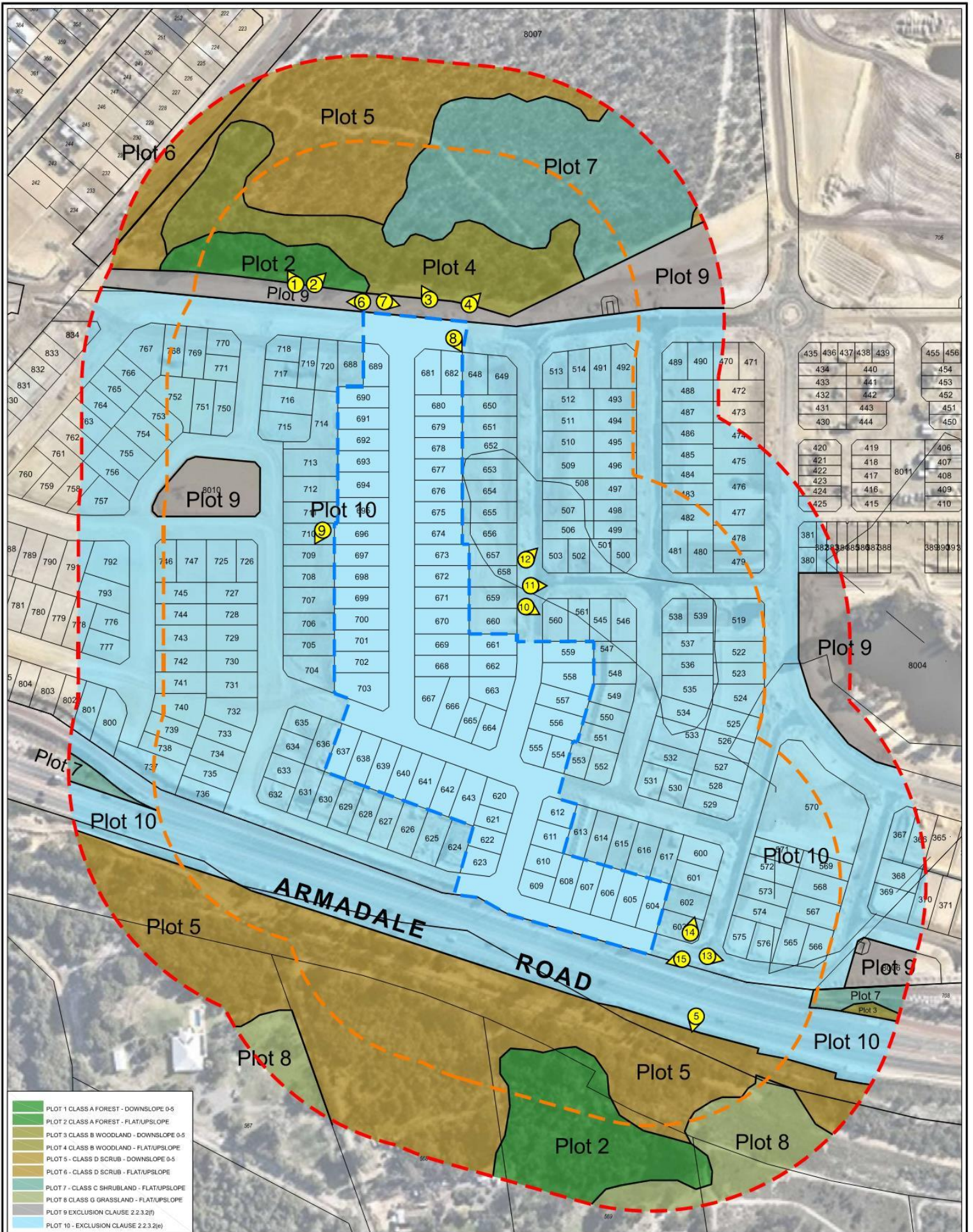
| Plot No. | Classified Vegetation | Effective slope |
|----------|------------------------------|-----------------|
| 1 | Class A Forest | Downslope 0-5° |
| 2 | Class A Forest | Flat/Upslope |
| 3 | Class B Woodland | Downslope 0-5°3 |
| 4 | Class B Woodland | Flat/Upslope |
| 5 | Class D Scrub | Downslope 0-5° |
| 6 | Class D Scrub | Flat/Upslope |
| 7 | Class C Shrubland | Flat/Upslope |
| 8 | Class G Grassland | 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 2

Assessment date: October, 2022

Prepared by: Bushfire Safety Consulting

Accreditation level: Level 3 BPAD Practitioner

Accreditation number: BPAD 23160

Accreditation expiry date: 31st January, 2023

Date aerial photo: August 2022

FIGURE 4 - VEGETATION CLASSIFICATION MAP (BAL CONTOUR MAP)

0 20 40 60 80m

SCALE 1:2000 @ A3
DATE: OCTOBER 2022

NORTH

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

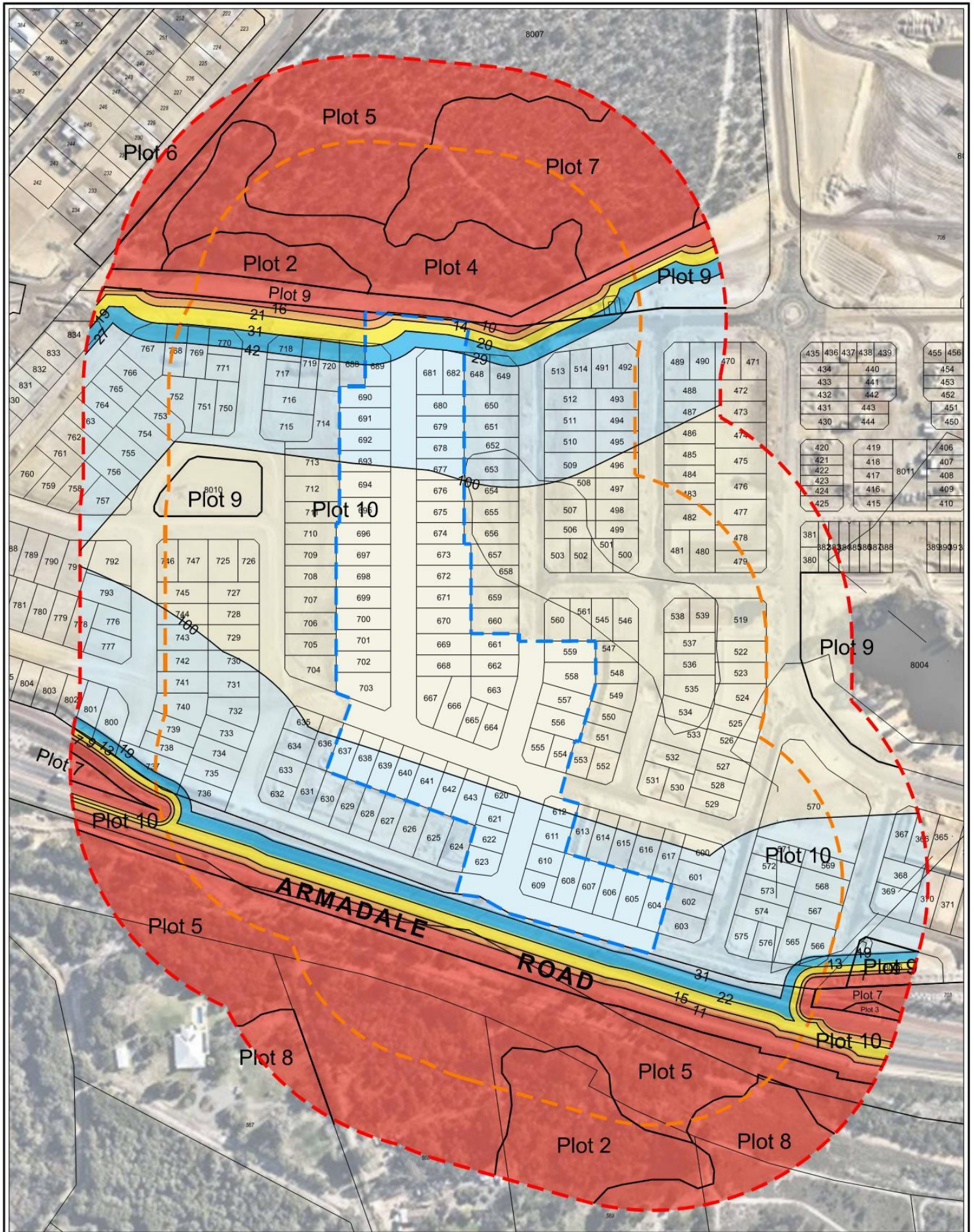
Photo Location & Direction

SOURCE OF PHOTOGRAPHY: NEARMAP

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| Table 1: BAL Inputs and BAL Ratings | | | | | | |
|-------------------------------------|------------------|----------|----------------|------------------|--------------|------------|
| Lots | Vegetation Class | Plot No. | Slope | Setback Distance | | BAL Rating |
| | | | | external | Internal lot | |
| 554-559 | Class D Scrub | 5 | Downslope 0-5° | >100 metres | | BAL-LOW |
| 604 | Class D Scrub | 5 | Downslope 0-5° | 47 metres | | BAL-12.5 |
| 605 - 607 | Class D Scrub | 5 | Downslope 0-5° | 48 metres | | BAL-12.5 |
| 608 - 609 | Class D Scrub | 5 | Downslope 0-5° | 46.9 metres | | BAL-12.5 |
| 610 | Class D Scrub | 5 | Downslope 0-5° | 76.9 metres | | BAL-12.5 |
| 611 | Class D Scrub | 5 | Downslope 0-5° | 92 metres | | BAL-12.5 |
| 612 | Class D Scrub | 5 | Downslope 0-5° | 92 metres | | BAL-12.5 |
| 620 | Class D Scrub | 5 | Downslope 0-5° | 89 metres | | BAL-12.5 |
| 621 | Class D Scrub | 5 | Downslope 0-5° | 77 metres | | BAL-12.5 |
| 622 | Class D Scrub | 5 | Downslope 0-5° | 64 metres | | BAL-12.5 |
| 623 | Class D Scrub | 5 | Downslope 0-5° | 48 metres | | BAL-12.5 |
| 637 - 639 | Class D Scrub | 5 | Downslope 0-5° | 78 metres | | BAL-12.5 |
| 640 - 643 | Class D Scrub | 5 | Downslope 0-5° | 77 metres | | BAL-12.5 |
| 554 - 559 | Class D Scrub | 5 | Downslope 0-5° | >100 metres | | BAL-LOW |
| 661 -669 | Class D Scrub | 5 | Downslope 0-5° | >100 metres | | BAL-LOW |
| 670 - 675 | Class B Woodland | 4 | Flat/upslope | >100 metres | | BAL-LOW |
| 676 | Class B Woodland | 4 | Flat / upslope | 99 metres | | BAL-12.5 |
| 677 | Class B Woodland | 4 | Flat/upslope | 87.5 metres | | BAL-12.5 |
| 678 | Class B Woodland | 4 | Flat / upslope | 75.5 metres | | BAL-12.5 |
| 679 | Class B Woodland | 4 | Flat / upslope | 64 metres | | BAL-12.5 |
| 680 | Class B Woodland | 4 | Flat / upslope | 54 metres | | BAL-12.5 |

| Lot | Vegetation Class | Wind Speed (km/h) | Slope | Distance to Nearest Structure (metres) | Distance to Nearest Road (metres) | BAL Rating |
|----------|------------------|-------------------|----------------|--|-----------------------------------|------------|
| 681 | Class B Woodland | 4 | Flat / upslope | 29 metres | | BAL-12.5 |
| 682 | Class B Woodland | 4 | Flat / upslope | 27 metres | 2 metres | BAL-12.5 |
| 689 | Class A Forest | 2 | Flat / upslope | 29 metres | 2 metres | BAL-19 |
| 690 | Class A Forest | 2 | Flat / upslope | 53 metres | | BAL-12.5 |
| 691 | Class A Forest | 2 | Flat / upslope | 66 metres | | BAL-12.5 |
| 692 | Class A Forest | 2 | Flat / upslope | 78 metres | | BAL-12.5 |
| 693 | Class A Forest | 2 | Flat / upslope | 92 metres | | BAL-12.5 |
| 694 -696 | Class A Forest | 2 | Flat / upslope | >100 metres | | BAL-LOW |
| 697 -703 | Class D Scrub | 5 | Downslope 0-5° | >100 metres | | BAL-LOW |



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FIGURE 5
BAL CONTOUR PLAN

0 20 40 60 80m
 SCALE 1:2000 @ A3
 DATE: OCTOBER 2022



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 |