

Bushfire Management Plan Coversheet

This Coversheet and accompanying Bushfire Management Plan has been prepared and issued by a person accredited by Fire Protection Association Australia under the Bushfire Planning and Design (BPAD) Accreditation Scheme.

Bushfire Management Plan and Site Details

Site Address / Plan Reference:	Lot 68 High Road		
Suburb:	Wanneroo	State:	WA
		P/code:	6065
Local government area:	Wanneroo		
Description of the planning proposal:	Structure Plan Amendment		
BMP Plan / Reference Number:	190504	Version:	2.0
		Date of Issue:	12 Sept 2019
Client / Business Name:	Gabriel and Jilyan Morrow		

Reason for referral to DFES	Yes	No
Has the BAL been calculated by a method other than method 1 as outlined in AS3959 (tick no if AS3959 method 1 has been used to calculate the BAL)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Have any of the bushfire protection criteria elements been addressed through the use of a performance principle (tick no if only acceptable solutions have been used to address all of the BPC elements)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is the proposal any of the following special development types (see SPP 3.7 for definitions)?		
Unavoidable development (in BAL-40 or BAL-FZ)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Strategic planning proposal (including rezoning applications)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Minor development (in BAL-40 or BAL-FZ)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
High risk land-use	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Vulnerable land-use	<input type="checkbox"/>	<input checked="" type="checkbox"/>

If the development is a special development as listed above, explain why the proposal is considered to be one of the above listed classifications (E.g. considered vulnerable land-use as the development is for accommodation of the elderly, etc.)?

Structure Plan Amendment

Note: The decision maker (e.g. the local government or the WAPC) should only refer the proposal to DFES for comment if one (or more) of the above answers are ticked "Yes".

BPAD Accredited Practitioner Details and Declaration

Name	Accreditation Level	Accreditation No.	Accreditation Expiry
Jeremy Durston	Level 2	BPAD 36525	April 2020
Company	Contact No.		
Bushfire West Pty Ltd	0403 328 835		

I declare that the information provided in this bushfire management plan is to the best of my knowledge true and correct.

Signature of Practitioner



Date

12 Sept 2019

BUSHFIRE MANAGEMENT PLAN

Structure Plan Amendment

Lot 68 High Road, Wanneroo



Bushfire West Pty Ltd
12 Davidson Road, Attadale WA 6156
0403 328 835



Ref: 190504
Version: 2.0
Sept 2019

REPORT DETAILS

Subject Land

Street No.	Lot No.	Plan	Street Name
71	68	8238	High Road
Locality		Wanneroo (6065)	
Local Government		Wanneroo	
Proposal description		Structure Plan Amendment	

Document Reference

Version	Date	Purpose
1.0	5 June 2019	Bushfire Management Plan – structure plan amendment
2.0	12 Sept 2019	Updates & amendments as per DFES referral comments, including: <ul style="list-style-type: none">• Vegetation plots 1 – 5 have been re-assessed and Class A Forest (i.e. the worst-case scenario) applied where appropriate.• Exclusions on Lot sizes of 4000m² or greater have been limited to the extent of 20m Asset Protection Zones as per Firebreak Notice. Vegetation plots 7, 8 and 13 amended accordingly.• Indicative BAL ratings have been provided for the subdivision concept plan.

Author

Practitioner	Accreditation Level	Accreditation No.
Jeremy Durston	Level 2	BPAD 36525

Report Limitations

The measures contained in this report are considered to be minimum standards only. Bushfire West Pty Ltd and the author do not guarantee that if such standards are complied with a building or property will not be damaged or that lives will not be harmed or lost during a bush fire event.

Bushfire and weather conditions can be extremely dangerous and unpredictable. The management of bushfire risk will depend on, among other things, the actions of property owners and/or occupiers over which the author has no control.

All surveys, forecasts, projections and recommendations made in this report are made in good faith on the basis of information available at the time. All maps included herein are indicative in nature and are not to be used for accurate calculations.

Notwithstanding anything contained therein, the author will not, except as the law may require, be liable for any loss or other consequences arising out of the services provided.

Jeremy Durston
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Bushfire West Pty Ltd

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1.0 Summary

This Bushfire Management Plan (the Plan) has been prepared to accompany the proposed Structure Plan Amendment for Lot 68 High Road, Wanneroo located in the City of Wanneroo (the Proposal).

The site of approximately 2 ha is within a designated bushfire prone area and the Proposal requires the application of *State Planning Policy No. 3.7: Planning in Bushfire Prone Areas (SPP 3.7)*.

The aim of this Plan is to reduce the threat to people, property and infrastructure in the event of a bushfire. The Plan includes how the identified bushfire threat will be managed, and how the Bushfire Protection Criteria in the Guidelines will be addressed.

This report determines the following compliance of the Proposal with the objectives of State Planning Policy 3.7:

1. It avoids any increase in the threat of bushfire to people, property and infrastructure.

The bushfire threat can be managed to an acceptable level. The site is capable of avoiding unacceptable bushfire hazard to people, property and infrastructure.

2. It reduces vulnerability to bushfire through the identification and consideration of bushfire risks in the design of the development and the decision-making process.

The bushfire hazards have been identified, assessed and considered for the proposal, as described within this report.

3. The final subdivision design will take into account the bushfire protection requirements and will include specific bushfire protection measures.

Compliance with the Bushfire Protection Criteria of the Guidelines may be achieved as follows:

- The BAL Contour assessment illustrates that all future allotments on the subdivision concept plan will be developable to BAL-29 or lower. Lots 17,21,22, 23, 24, 25, 26, 27, 28 and 29 will require minimum 1m building setbacks from the southern boundaries to achieve BAL-29, while the entire areas of all other Lots will be subject to ratings of BAL-29 or lower.
- An area surrounding the site, including maintained road reserves and existing residential development, represents a low-threat Asset Protection Zone.
- High Road provides two-way access and egress (i.e. in east and west directions), and additional access is available via Amos Road (i.e. to and from the north).
- A reticulated water supply including existing hydrants is available to the site.

4. Achieves an appropriate balance between bushfire risk management measures and biodiversity, conservation values, and environmental protection.

An Ecological Survey Report has been prepared for the site (Coterra Environment, Rev 0, May 2018), which details the vegetation species and fauna habitat prioritised for retention.

At the subdivision stage, the site will necessarily require substantial clearing. However, the proposal is to avoid impact to any vegetation designated for retention. Any vegetation retained within the final subdivision will need to be maintained in a low threat condition in future.

2.0 Proposal Details

2.1 Subject Site

The subject site of this report is Lot 68 High Road, Wanneroo located in the City of Wanneroo. Figure 2A illustrates the subject site and immediate surrounds.

The site is identified as being Bushfire Prone on the Map of Bush Fire Prone Areas 2019 (OBRM, 2019), as illustrated in Figure 2B.

The site is 2.0386ha (20,386m²) and current development includes a residential dwelling and outbuilding with surrounding landscaped garden. The remainder of the site comprises native vegetation.

2.2 Proposal Description

The proposed Structure Plan Amendment is to increase the residential density coding of the subject site from Residential R20 to Residential R40, and to modify the proposed road layout.

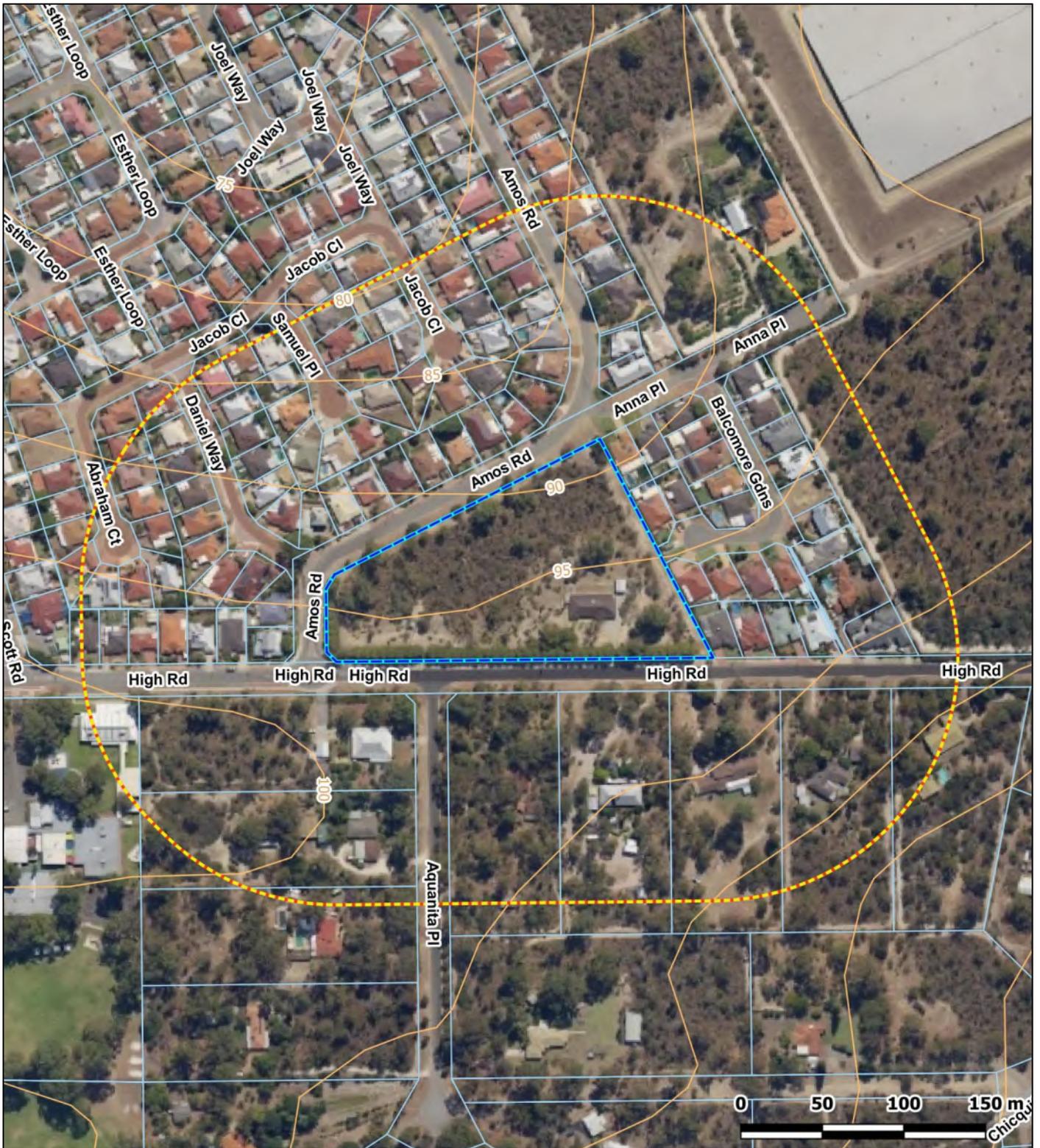
The Structure Plan Amendment plan is illustrated in Figure 2C

A Subdivision Concept plan with indicative lot numbers is illustrated in Figure 2D.

2.3 Previous Bushfire Assessments

This Bushfire Management Plan updates the original plan, version 1.0 dated 5th June 2019, prepared by Bushfire West Pty Ltd. This plan incorporates amendments with respect to the referral comments by the Department of fire & Emergency Services, specifically:

- Vegetation plots 1 – 5 have been re-assessed and Class A Forest (i.e. the worst-case scenario) applied where appropriate.
- Exclusions on Lot sizes of 4000m² or greater have been limited to the extent of 20m Asset Protection Zones as per the City of Wanneroo Firebreak Notice. Vegetation plots 7, 8 and 13 have been amended accordingly.
- Indicative BAL ratings have been provided for the subdivision concept plan.



Area Context Map

- Cadastre
- 150m perimeter
- Site
- Colours (5m)

Size: A4
Scale: 1:3000



Site: Lot 68 High Rd, Wanneroo

Assessed by: Jeremy Durston
BPAD: No.36525, Level 2
CRS: GDA 2020 Zone 50
Aerial imagery: April 2019

Figure 2A: Area Map

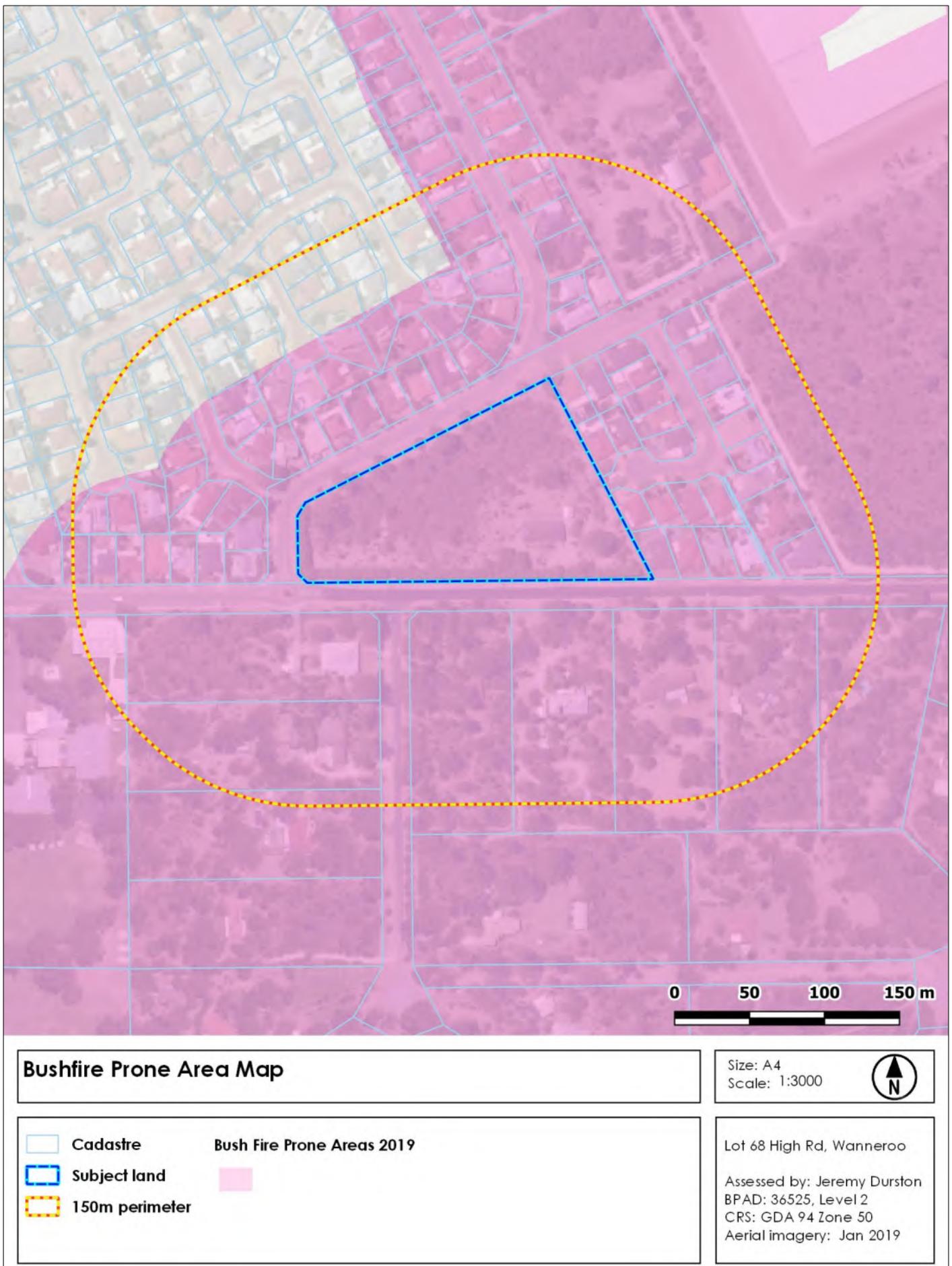
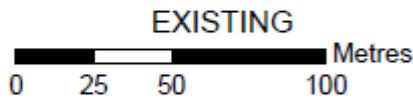


Figure 2B: Designated Bushfire Prone Area Map

**AGREED STRUCTURE PLAN No. 5
EAST WANNEROO CELL 3
AMENDMENT No. 4**

Lot 68 (71) High Road
WANNEROO



LEGEND
 ROAD RESERVE
REALIGNMENT

AMENDMENT MAP

 City of
Wanneroo
Produced by Planning & Sustainability
24/04/2015

Figure 2C: Structure Plan Amendment Map

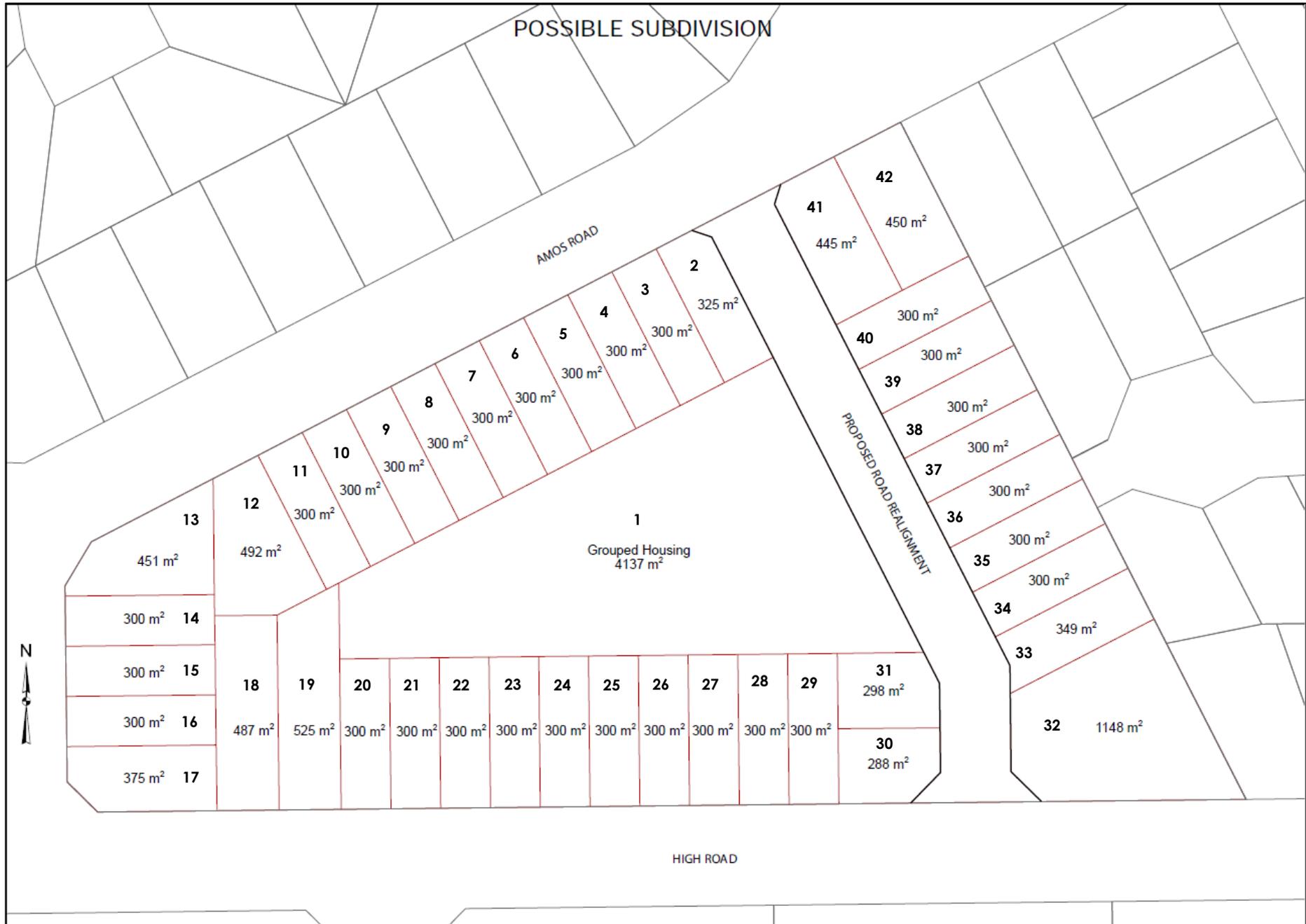


Figure 2D: Subdivision Concept Plan

3.0 Environmental Considerations

The following environmental considerations have been identified and addressed with the aid of the WALGA Environmental Planning Tool, and with reference to the Ecological Survey Report (Coterra Environment, May 2018).

Figure 3A illustrates the identified environmental considerations for the site.

Figure 3B illustrates the vegetation characteristics identified by the Ecological Survey Report.

3.1 Native Vegetation – Modification & Clearing

Native vegetation within the site generally comprises Banksia Woodland with shrub and grass understoreys. The area of remnant native vegetation is categorised as a Local Natural Area (LNA) for planning purposes. While isolated Tuart trees are identified, the site is not a designated Tuart Woodland.

Subdivision of the site will entail clearing of most of the onsite vegetation. Further, reduction in fuel-loads across the site will be required to achieve the low-threat condition required for future Residential R40 density.

The native vegetation prioritised for conservation by the Ecological Survey Report may potentially be managed in future for low bushfire threat, subject to the following recommendations for the final subdivision design:

- Remnant tree canopy cover should remain less than 15% of the site area.
- Trees should be trimmed or thinned so no canopy overhangs any future dwelling within the subdivision, and a minimum separation of 5m is maintained between individual canopies.
- Any remaining understoreys will need to be maintained for low threat.

Prior to any clearing of native vegetation, all required approvals must be obtained.

3.2 Re-vegetation & Landscaping

At this stage of planning, no areas of the site are known to require re-vegetation or landscaping that may potentially impact the future bushfire threat.

Environmental Considerations Map

Legend

Subject Site

boundaries

Banksia Woodlands of the Swan Coastal Plain (ec131 Public Version)

Community likely to occur within area

Community may occur within area

Tuart Woodlands

Environmentally Sensitive Area

Cadastre Address

Cadastre

Administrative Planning Categories

Bush Forever (BF)

Bush Forever, DPaW Conservation (BFDPWCON)

Bush Forever, DPaW Conservation, Reg Park (BFDPWCONREG)

Bush Forever, DPaW State Forest (BFDPWFSF)

Bush Forever, DPaW Other (BFDPWOTH)

Bush Forever, DPaW Other, Reg Park (BFDPWOTHREG)

Bush Forever, Reg Park (BFREG)

DPaW Conservation (DPWCON)

DPaW Conservation, Reg Park (DPWCONREG)

DPaW State Forest (DPWSF)

DPaW State Forest, Reg Park (DPWSFREG)

DPaW Other (DPWOTH)

DPaW Other, Reg Park (DPWOTHREG)

Regional Park (REG)

Local Natural Area (LNA)



Map Printed from WALGA Environmental Planning Tool on Thu May 23 11:10:01 AWST 2019

Figure 3A: Environmental Considerations Map (WALGA)



Figure 5

Figure 3B: Vegetation Survey Map (Coterra Environment)

4.0 Bushfire Assessment Inputs

4.1 Effective Slope

Effective slope under each vegetation area was assessed in accordance with the methodology detailed in AS 3959-2018 *Construction of buildings in bushfire prone areas (AS 3959)* (Standards Australia, 2018). Slope data was measured on site and cross referenced with Landgate elevation data.

The assessment area was found to exhibit minor slopes generally from both the north and south-east upwards towards High Road. The effective slope of each vegetation area is listed in the tables provided in Section 4.2 below.

4.2 Bushfire Fuels

The location and extent of classified vegetation structures, including low-threat exclusions, within 150 metres of the site are mapped in Figure 4A and illustrated in the photos below. All bushfire structures and fuel loads are assessed in their mature states unless otherwise identified. The areas of classified vegetation are summarised in Table 4A

Area 1	
AS3959-2018 Classification	Class A Forest
Bushfire Hazard Level	Extreme
Effective Slope	Upslope
<i>Area 1 comprises the wooded area to the south-west of the site and south of High Road. Vegetation consists of trees with understories of shrubs and grass. The worst-case scenario (Forest classification) has been applied.</i>	
<div style="border: 1px solid black; padding: 5px;"> <div style="font-size: 8px; margin-bottom: 5px;"> DIRECTION 158 deg(T) -31.75560 ACCURACY 5 m +115.81835 DATUM WGS84 </div>  <div style="font-size: 8px; margin-top: 5px;"> 15 High Rd Wanneroo 20/5/19, 1:38:04 pm </div> </div> <p>Photo ID: 1a</p>	<div style="border: 1px solid black; padding: 5px;"> <div style="font-size: 8px; margin-bottom: 5px;"> DIRECTION 186 deg(T) -31.75564 ACCURACY 5 m +115.81881 DATUM WGS84 </div>  <div style="font-size: 8px; margin-top: 5px;"> 13 High Rd Wanneroo 20/5/19, 1:35:18 pm </div> </div> <p>Photo ID: 1b</p>

Area 2

AS3959-2018 Classification	Class A Forest
Bushfire Hazard Level	Extreme
Effective Slope	Upslope

Area 2 comprises the vegetation to the south of the site and south of High Road, and outside of the 20m building APZs required by the City of Wanneroo Fire Break Notice. Vegetation consists of trees with understories of shrubs and grass. The worst-case scenario (Forest classification) has been applied.



Photo ID: 2a



Photo ID: 2b

Area 3

AS3959-2018 Classification	Class A Forest
Bushfire Hazard Level	Extreme
Effective Slope	Downslope 3.5°

Area 3 comprises the pocket of vegetation to the south-east of the site and south of High Road, and outside of the 20m building APZs required by the City of Wanneroo Fire Break Notice. Vegetation consists of trees with understories of shrubs and grass. The worst-case scenario (Forest classification) has been applied.



Photo ID: 3a



Photo ID: 3b

Area 4

AS3959-2018 Classification	Class A Forest
Bushfire Hazard Level	Extreme
Effective Slope	Upslope

Area 4 comprises the substantial area of vegetation in the eastern extent of the assessment area. Vegetation consists of trees with understories of shrubs and grass. The worst-case scenario (Forest classification) has been applied.



Photo ID: 4a



Photo ID: 4b

Area 5

AS3959-2018 Classification	Pre-development: Class A Forest Post-development: Exclusions 2.2.3.2 (e) & (f)
Bushfire Hazard Level	Pre-development: Extreme Post-development: Low
Effective Slope	Downslope 3.0°

Area 5 comprises the native vegetation within the boundaries of the site. Vegetation consists of trees with understories of shrubs and grass. The worst-case scenario (Forest classification) has been applied pre-development. Post-development this area is required to be modified for low threat.



Photo ID: 5a



Photo ID: 5b

Area 5



Photo ID: 5c



Photo ID: 5d

Area 6

AS3959-2018 Classification	Exclusions cl.2.2.3.2(e) and (f)
Bushfire Hazard Level	Low
Effective Slope	n/a

Area 6 comprises the area of the subject site maintained for low threat, including landscaped garden, lawns and screening vegetation. The ongoing maintenance of this area to the extent of 20m around buildings is in accordance with the City of Wanneroo Fire Break Notice, which specifies for land with buildings and an area of 4000m² or more - "Install and maintain a twenty (20) metre building protection zone surrounding all buildings, large haystacks and fuel storage areas."



Photo ID: 6a



Photo ID: 6b

Area 6



Photo ID: 6C

Area 7

AS3959-2018 Classification	Exclusions cl.2.2.3.2(e) and (f)
Bushfire Hazard Level	Low
Effective Slope	n/a

Area 7 comprises the low threat areas of the residential properties to the south-west of the site and south of High Road, including landscaped gardens and lawns. The ongoing maintenance of this area to the extent of 20m around buildings is in accordance with the City of Wanneroo Fire Break Notice, which specifies for land with buildings and an area of 4000m² or more - "Install and maintain a twenty (20) metre building protection zone surrounding all buildings, large haystacks and fuel storage areas."



Photo ID: 7a



Photo ID: 7b

Area 7



Photo ID: 7C

Area 8

AS3959-2018 Classification	Class B Woodland
Bushfire Hazard Level	Extreme
Effective Slope	Upslope

Area 8 comprises the vegetation within the residential properties to the south-east of the site and south of High Road, and outside of the 20m building APZs required by the City of Wanneroo Fire Break Notice. Vegetation consists of trees with canopy cover less than 30% and understories of grass with isolated shrubs. This area has been partially cleared of trees and substantially cleared of understories. The area clearly lacks the tree density and understory vegetation required for Forest classification.



Photo ID: 8a



Photo ID: 8b

Area 9

AS3959-2018 Classification	Exclusions cl.2.2.3.2(e) and (f)
Bushfire Hazard Level	Low
Effective Slope	n/a

Area 9 comprises the residential properties to the east of the site, including landscaped gardens and lawns all managed for low threat.



Photo ID: 9a



Photo ID: 9b



Photo ID: 9c

Area 10

AS3959-2018 Classification	Exclusions cl.2.2.3.2(e) and (f)
Bushfire Hazard Level	Low
Effective Slope	n/a

Area 10 comprises the residential properties to the west and north of the site, including landscaped gardens, lawns and road verge vegetation all managed for low threat.



Photo ID: 10a



Photo ID: 10b



Photo ID: 10c



Photo ID: 10d



Photo ID: 10e

Area 11

AS3959-2018 Classification	Exclusions cl.2.2.3.2(e) and (f)
Bushfire Hazard Level	Low
Effective Slope	n/a

Area 11 comprises the Amos Road and Anna Place road reserves, including non-vegetated paving, trimmed street trees and maintained grass in low threat condition.



Photo ID: 11a



Photo ID: 11b



Photo ID: 11c

Area 12

AS3959-2018 Classification	Exclusions cl.2.2.3.2(e) and (f)
Bushfire Hazard Level	Low
Effective Slope	n/a

Area 12 comprises the High Road reserve, including non-vegetated paving, trimmed street trees and maintained grass in low threat condition.



Photo ID: 12a



Photo ID: 12b



Photo ID: 12c



Photo ID: 12d

Area 13	
AS3959-2018 Classification	Class B Woodland
Bushfire Hazard Level	Extreme
Effective Slope	Upslope
<p>Area 13 comprises the vegetation within the property in the northern extent of the assessment area and north of Amos Road, and outside of the 20m building APZ required by the City of Wanneroo Fire Break Notice. Vegetation consists of trees with canopy cover less than 30% and understories of grass with isolated shrubs.</p>	
 <p>Photo ID: 13a</p>	

Table 4A Areas of classified vegetation, exclusions and hazard levels:

Vegetation Area	Vegetation Classification	Hazard Level	Effective Slope
Area 1	Class A Forest	Extreme	Upslope
Area 2	Class A Forest	Extreme	Upslope
Area 3	Class A Forest	Extreme	Downslope 3.5°
Area 4	Class A Forest	Extreme	Upslope
Area 5	Class A Forest	Extreme	Downslope 3.0°
Area 6	Exclusions 2.2.3.2 (e) & (f)	Low	n/a
Area 7	Exclusions 2.2.3.2 (e) & (f)	Low	n/a
Area 8	Class B Woodland	Extreme	Upslope
Area 9	Exclusions 2.2.3.2 (e) & (f)	Low	n/a
Area 10	Exclusions 2.2.3.2 (e) & (f)	Low	n/a
Area 11	Exclusions 2.2.3.2 (e) & (f)	Low	n/a
Area 12	Exclusions 2.2.3.2 (e) & (f)	Low	n/a
Area 13	Class B Woodland	Extreme	Upslope



Vegetation Classification Map, pre-development

Size: A4
Scale: 1:3000



Cadastre	Vegetation areas	Classified vegetation:
Subject land	Photo points	
150m perimeter		
Contours (2m)		
		Forest
		Woodland
		Excluded 2.2.3.2 (e) & (f)

Lot 68 High Rd, Wanneroo

Assessed by: Jeremy Durston
BPAD: 36525, Level 2
CRS: GDA 94 Zone 50
Aerial imagery: Jan 2019

Figure 4A: Pre-development Vegetation Classifications

5.0 Bushfire Assessment Outputs

5.1 Potential Bushfire Impact, Pre-development

In accordance with SPP 3.7 Guidelines and AS3959 vegetation classifications, a Bushfire Hazard Level Map has been prepared to illustrate the pre-development bushfire hazards (see Figure 5A).

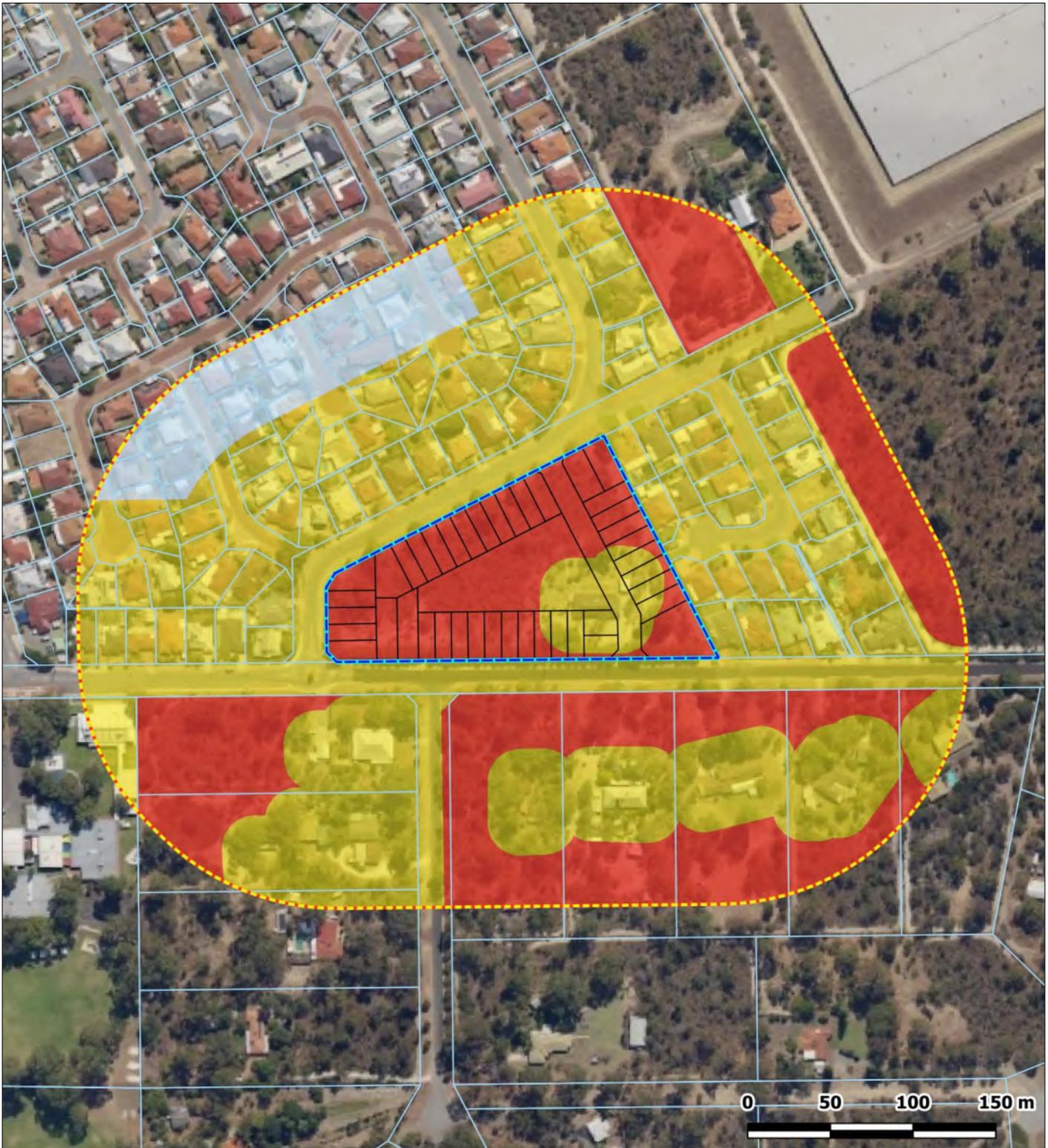
Areas that in isolation would have a Low Bushfire Hazard Level have been classified as having a Moderate Hazard Level where located within 100 metres of vegetation having either Moderate or Extreme Hazard Levels.

5.2 Bushfire Hazard Issues

The identified bushfire hazard issues are as follows:

- **Hazard Vegetation:** the remnant vegetation within the boundaries of the subject site represents the major bushfire hazard. The onsite vegetation will need to be cleared or modified to a low threat condition in order to support Residential R40 subdivision that is not exposed to Extreme Hazard.
- **Off-site Hazard Separation:** offsite hazard vegetation is separated from the site by existing road reserves and residential development maintained in low-threat condition.
- **Access:** two-way access is available on both the existing High Road and Amos Road routes that service the site.
- **Water:** the site is within an existing reticulated area serviced by hydrants.

The identified bushfire hazard issues are illustrated in Figure 5B.



Bushfire Hazard Level Map, pre-development

Size: A4
Scale: 1:3000



- | | |
|-------------------|-----------------|
| Cadastre | Low Hazard |
| Subject land | Moderate Hazard |
| 150m perimeter | Extreme Hazard |
| Proposed cadastre | |

Lot 68 High Rd, Wanneroo

Assessed by: Jeremy Durston
BPAD: 36525, Level 2
CRS: GDA 94 Zone 50
Aerial imagery: Jan 2019

Figure 5A: Bushfire Hazard Level Map, Pre-development



Bushfire Hazard Issues Map

Size: A4
Scale: 1:3000



- | | | |
|-------------------|---------------------------|-------------------|
| Cadastre | Hazard vegetation | Two-way Access |
| Subject land | Vegetation to be modified | Dead end road |
| Proposed cadastre | 150m perimeter | existing Hydrants |

Lot 68 High Rd, Wanneroo
Assessed by: Jeremy Durston
BPAD: 36525, Level 2
CRS: GDA 94 Zone 50
Aerial imagery: Jan 2019

Figure 5B: Bushfire Hazard Issues Map

5.3 Potential Bushfire Impact, Post-development

After the required modification of the onsite vegetation to low threat, the location and extent of remaining classified vegetation structures and excluded areas within 150 metres of the site are mapped in Figure 5C.

In accordance with SPP 3.7 and using AS3959 Method 1 analysis, BAL Contour Maps have been prepared to illustrate the potential radiant heat impacts and associated BAL ratings for the concept subdivision design post-development (see Figures 5D to 5G). The resulting indicative BAL ratings for the allotments proposed by the concept subdivision design are presented in the following table (Table 5A):

Table 5A: Maximum BAL ratings that apply to the proposed lot boundaries (AS3959 Method 1)

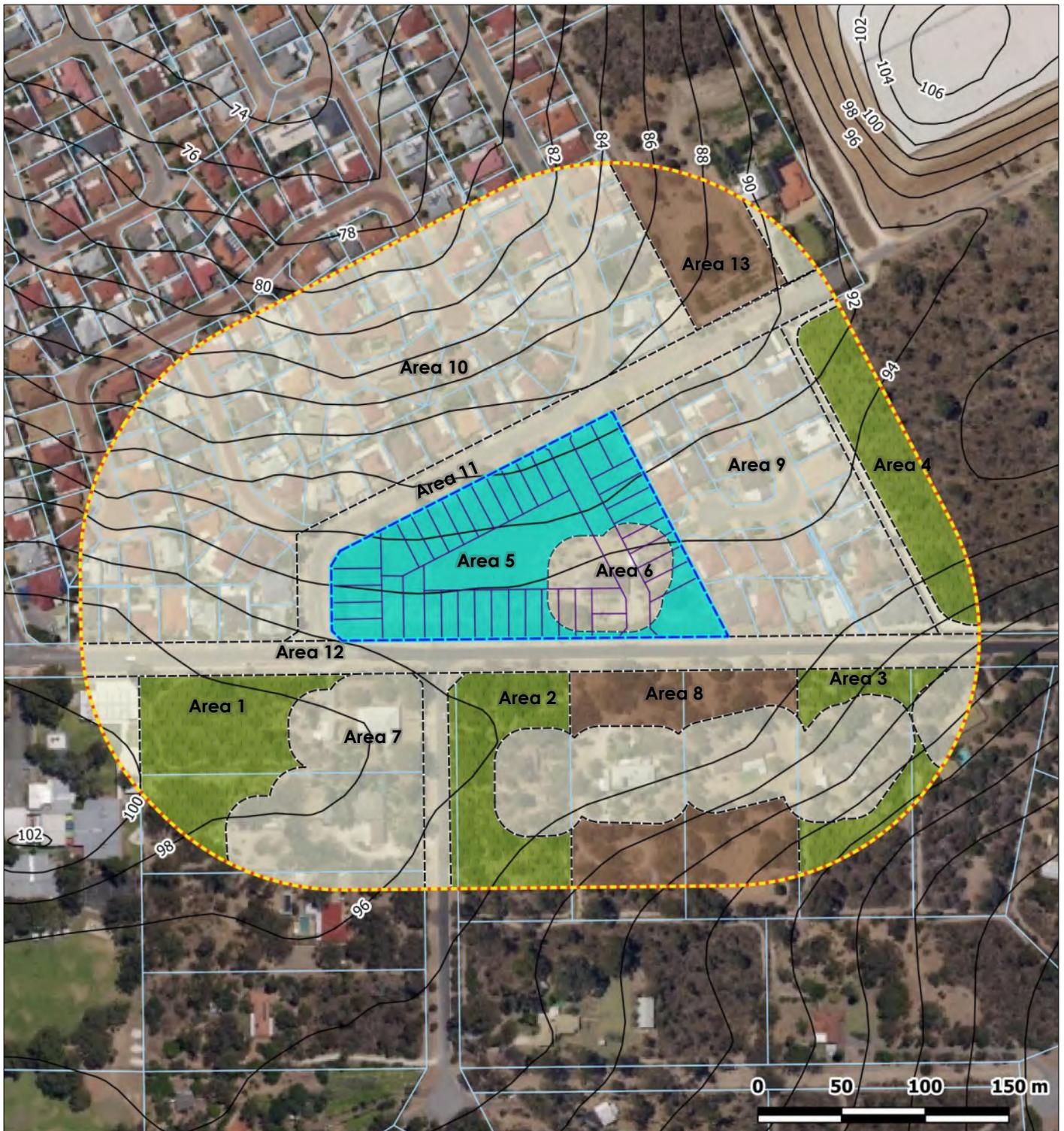
Proposed Lots	Indicative BAL Rating
n/a	BAL-FZ
17, 21, 22, 23, 24, 25, 26, 27, 28, 29	BAL-40
18, 20, 30, 32	BAL-29
16, 19, 31	BAL-19
1, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42	BAL-12.5
2, 3	BAL-LOW

As indicated above, 32 lots are rated BAL-29 or lower when assessed at the lot boundaries. However, ten lots will require any future habitable building to be sited with appropriate setbacks in order to achieve BAL-29, as required by SPP3.7. The following table (Table 5B) illustrates the indicative BAL ratings that may be achievable for future dwellings on lots that are rated BAL-40 at the boundary, subject to appropriate building setbacks.

Table 5B: Indicative BAL ratings subject to building setbacks (AS3959 Method 1)

Lot	Vegetation Classification	Effective Slope	Vegetation Separation to boundary	Building Setback from Boundary	Vegetation Separation to Building	Achievable BAL
17	Class A Forest	0°	20m from southern boundary	1m from southern boundary	21m	BAL-29
21	Class A Forest	0°	20m from southern boundary	1m from southern boundary	21m	BAL-29
22	Class A Forest	0°	20m from southern boundary	1m from southern boundary	21m	BAL-29
23	Class A Forest	0°	20m from southern boundary	1m from southern boundary	21m	BAL-29
24	Class A Forest	0°	20m from southern boundary	1m from southern boundary	21m	BAL-29
25	Class A Forest	0°	20m from southern boundary	1m from southern boundary	21m	BAL-29
26	Class A Forest	0°	20m from southern boundary	1m from southern boundary	21m	BAL-29
27	Class A Forest	0°	20m from southern boundary	1m from southern boundary	21m	BAL-29
28	Class A Forest	0°	20m from southern boundary	1m from southern boundary	21m	BAL-29
29	Class A Forest	0°	20m from southern boundary	1m from southern boundary	21m	BAL-29

As indicated above, future habitable buildings located within all allotments can achieve a rating of BAL-29 or lower.



Vegetation Classification Map, post-development

Size: A4
 Scale: 1:3000



Cadastre	Modified, low threat	Classified vegetation:
Subject land	Vegetation areas	Forest
Proposed cadastre	Contours (2m)	Woodland
150m perimeter		Excluded 2.2.3.2 (e) & (f)

Lot 68 High Rd, Wanneroo
 Assessed by: Jeremy Durston
 BPAD: 36525, Level 2
 CRS: GDA 94 Zone 50
 Aerial imagery: Jan 2019

Figure 5C: Vegetation Classification Map, Post-development



BAL Contour Map

- Cadastre
- Subject land
- Proposed cadastre
- 100m perimeter
- 150m perimeter
- Vegetation areas

- indicative BALs:**
- BAL LOW
 - BAL 12.5
 - BAL 19
 - BAL 29
 - BAL 40
 - BAL FZ

Size: A4
Scale: 1:3000



Lot 68 High Rd, Wanneroo

Assessed by: Jeremy Durston
BPAD: 36525, Level 2
CRS: GDA 94 Zone 50
Aerial imagery: Jan 2019

Figure 5D: BAL Contour Map, concept subdivision

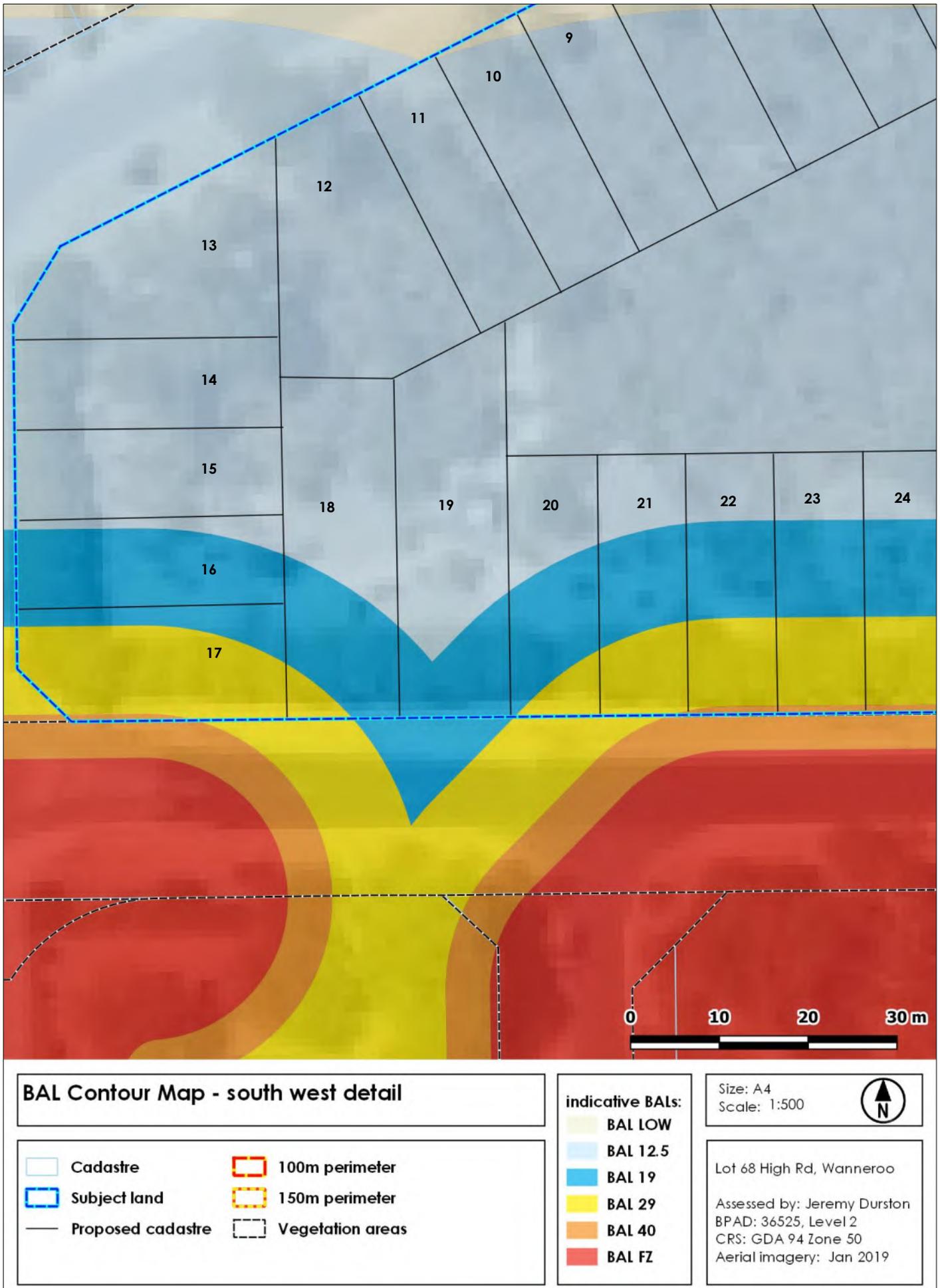


Figure 5E: BAL Contour Map, south-western section detail

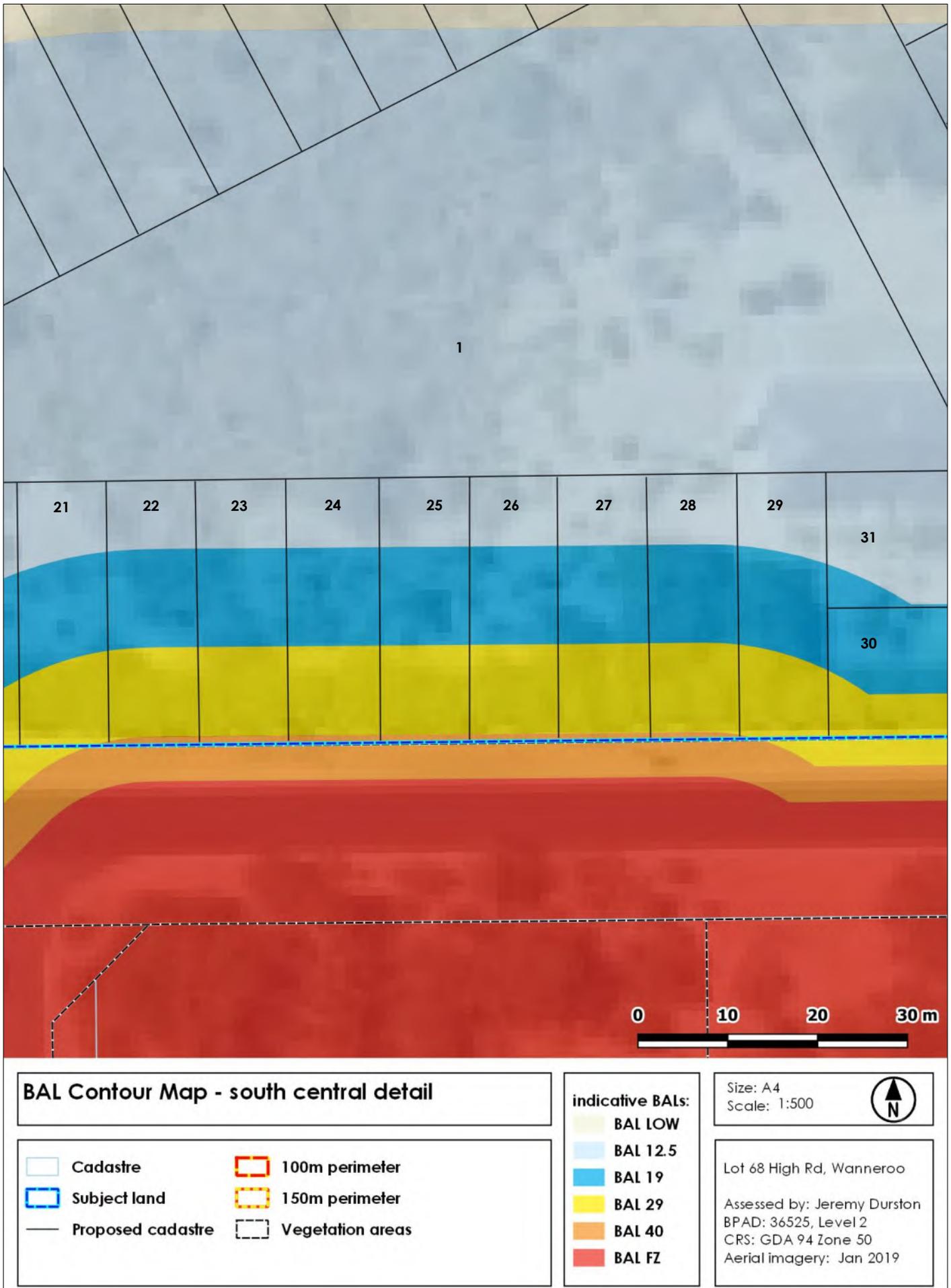
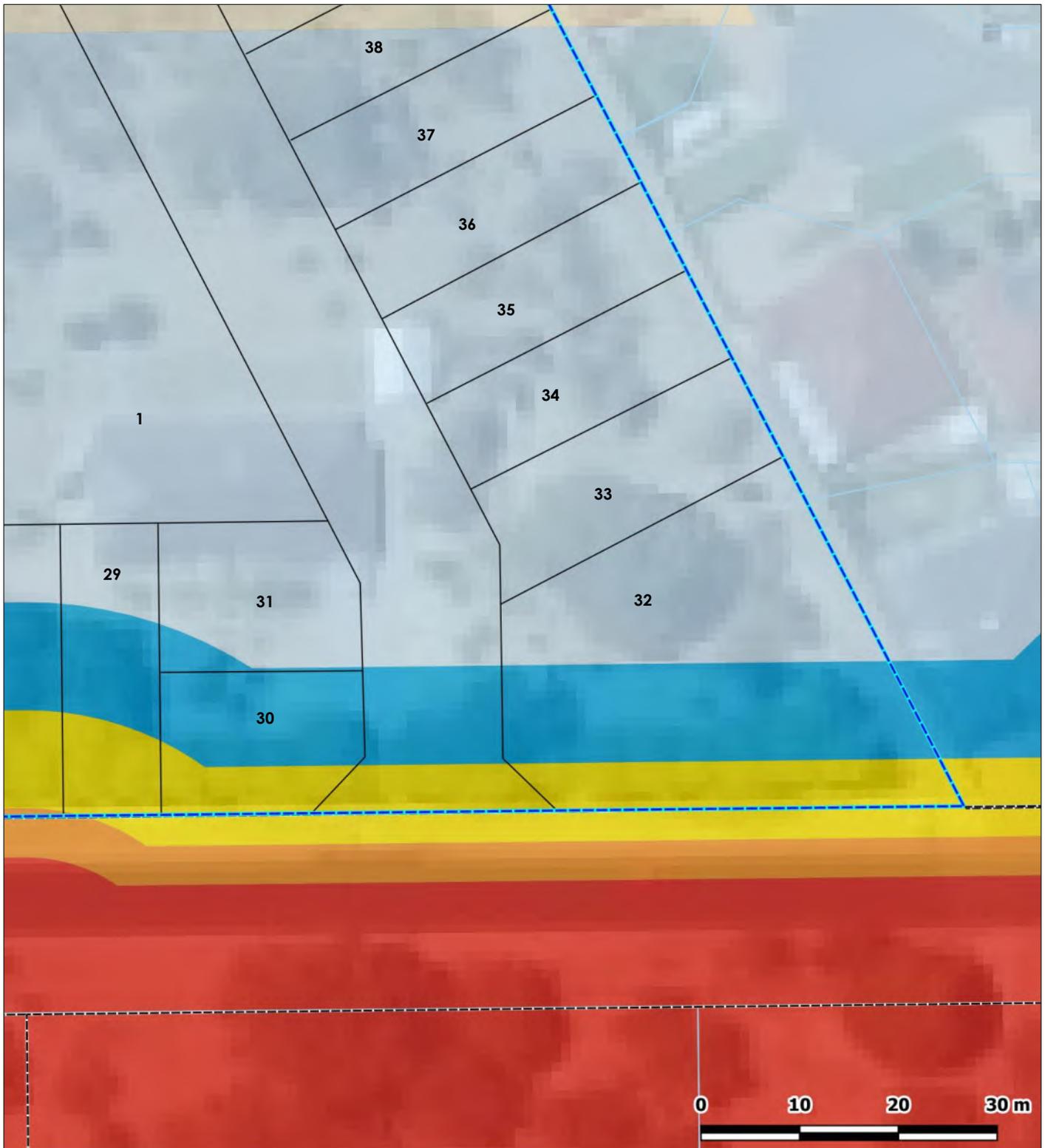


Figure 5F: BAL Contour Map, central-southern section detail



BAL Contour Map - south east detail

-  Cadastre
-  Subject land
-  Proposed cadastre
-  100m perimeter
-  150m perimeter
-  Vegetation areas

- indicative BALs:**
-  BAL LOW
 -  BAL 12.5
 -  BAL 19
 -  BAL 29
 -  BAL 40
 -  BAL FZ

Size: A4
Scale: 1:500



Lot 68 High Rd, Wanneroo
Assessed by: Jeremy Durston
BPAD: 36525, Level 2
CRS: GDA 94 Zone 50
Aerial imagery: Jan 2019

Figure 5G: BAL Contour Map, south-eastern section detail

6.0 Bushfire Protection Criteria

6.1 Guidelines for Planning in Bushfire Prone Areas Version 1.3 (the Guidelines)

The Guidelines apply to site applications located within designated bushfire prone areas. The Guidelines provide supporting information for implementation of SPP 3.7. Specifically, they provide the Bushfire Protection Criteria to be addressed for all applications.

6.2 Proposal Assessment

Table 6A provides an assessment against the bushfire protection criteria detailed in Appendix 4 of the Guidelines, including the applicable Acceptable Solutions for each element.

Table 6A: Assessment against the bushfire protection criteria of the Guidelines

Element	Acceptable Solution (A)	Notes
1. Location	A1.1 Development location	The Hazard Level Assessment determines the hazard vegetation within the site will need to be modified to low threat in order to support residential R40 subdivision that is not exposed to an Extreme Hazard Level. The BAL Contour assessment illustrates that all future allotments will be developable to BAL-29 or lower. Lots 17, 21, 22, 23, 24, 25, 26, 27, 28 and 29 of the concept subdivision design will require minimum 1m building setbacks from southern boundaries to achieve BAL-29, while the entire areas of all other Lots will be BAL-29 or lower.
2. Siting of Development	A2.1 Asset Protection Zone (APZ)	R40 density subdivision cannot be expected to create lots large enough to contain an APZ within their own boundaries. As per SPP3.7 Guidelines, the APZ may include maintained public roads and cultivated gardens in an urban context. The adjacent road reserves and developed residential areas are currently maintained in low threat condition and provide the required Asset Protection Zone.
3. Vehicular Access	A3.1 Two access routes	High Road and Amos Road provide two-way access and egress with connections to the wider public road network. Any future subdivision design is to include two access routes during all stages of development.
	A3.2 Public road	Future public roads are to be constructed to the relevant standards of the Local Government Guidelines for Subdivisional Development.
	A3.3 Cul-de-sac	Cul-de-sac are to be avoided in the subdivision design.
	A3.4 Battle-axe	Battle-axe lots to be avoided in the subdivision design.
	A3.5 Private driveways longer than 50m	Any future driveway greater than 50m in length will need to comply with the Guidelines at the development stage.
	A3.6 Emergency access way	The public road design negates the need for any Emergency Access Ways.

Element	Acceptable Solution (A)	Notes
	A3.7 Fire service access routes	The public road design negates the need for any Fire Service Access Routes.
	A3.8 Firebreak	In accordance with the City of Wanneroo Firebreak notice, as applicable.
4. Water	A4.1 Reticulated areas	The site is located within an existing reticulated area. At the subdivision stage, sufficient reticulated water hydrants will be required to comply with Water Corporations DS 63.
	A4.2 Non-reticulated areas	N/A, reticulated area.
	A4.3 Individual lots within non-reticulated areas	N/A, reticulated area.

7.0 Conclusions & Future Bushfire Measures

The conclusions of the assessment of the bushfire hazard to the site of the proposed Structure Plan Amendment are as follows:

1. Pre-development, the site contains areas of extreme bushfire hazard.
2. Subject to the necessary environmental and planning approvals, all onsite vegetation will need to be cleared or modified to a low threat condition.
3. Any remnant vegetation to be incorporated into the subdivision design will need to be managed for low threat on an ongoing basis so that future development is not directly exposed to bushfire hazard.
4. Ongoing maintenance of adjacent road reserves should be confirmed so that these areas may be included in the required Asset Protection Zone for future development.
5. Subject to ongoing maintenance of the site, adjacent residential properties and adjacent road reserves in low threat condition, all allotments within the future subdivision will be developable to ratings of BAL-29 or lower.
6. Two access and egress routes are available to the site and all lots within the future subdivision are to be accessible by two routes.
7. Culs-de-sac and battle-axe lots are to be avoided.
8. Future public roads are to be constructed in accordance with the relevant standards of the Local Government Guidelines for Subdivisional Development.
9. The future subdivision of the site will require the availability of adequate fire hydrants.

In summary, the pre-development bushfire hazard levels applicable to the site are not prohibitive of future subdivision and development, provided the bushfire hazard from onsite vegetation is managed appropriately. Future planning stages are to ensure that all development is located on land having either a low or moderate bushfire hazard level with a worst-case rating of BAL-29.

An updated Bushfire Management Plan will be required to support any application for future subdivision of the site pursuant to *State Planning Policy 3.7 Planning in Bushfire Prone Areas* detailing how the Bushfire Protection Criteria are satisfied by the final subdivision design.

Further, an updated BAL Contour assessment of the final subdivision design will be required to confirm all proposed lots can be developed to a rating of BAL-29 or lower, with reference to any landscaping plans for vegetation that has been identified for retention within the site.

8.0 References

- OBRM. (2019). Map of Bush Fire Prone Areas 2019. Office of Bushfire Risk Management.
- City of Wanneroo. (2018). Annual Fire Break Notice 2018/19.
- Coterra Environment (2018). Ecological Survey Report, Rev 0.
- Standards Australia. (2018). AS 3959-2018 Construction of buildings in bushfire prone areas.
- WAPC. (2015). State Planning Policy 3.7 Planning in Bushfire Prone Areas.
- WAPC. (2016). Planning Bulletin 111/2016 Planning in Bushfire Prone Areas.
- WAPC. (2017a). Guidelines for Planning in Bushfire Prone Areas Version 1.3.
- WAPC. (2017b). Guidelines for Planning in Bushfire Prone Areas Appendices Version 1.3.