

Bushfire management plan/Statement addressing the Bushfire Protection Criteria coversheet

Site address:

Site visit: Yes No

Date of site visit (if applicable): Day Month Year

Report author or reviewer:

WA BPAD accreditation level (please circle):

Not accredited Level 1 BAL assessor Level 2 practitioner Level 3 practitioner

If accredited please provide the following.

BPAD accreditation number: Accreditation expiry: Month Year

Bushfire management plan version number:

Bushfire management plan date: Day Month Year

Client/business name:

	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)?		
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 bushfire protection criteria elements)?		

Is the proposal any of the following (see [SPP 3.7 for definitions](#))?

	Yes	No
Unavoidable development (in BAL-40 or BAL-FZ)		
Strategic planning proposal (including rezoning applications)		
High risk land-use		
Vulnerable land-use		

None of the above

Note: Only if one (or more) of the above answers in the tables is yes should the decision maker (e.g. local government or the WAPC) refer the proposal to DFES for comment.

Why has it been given one of the above listed classifications (E.g. Considered vulnerable land-use as the development is for accommodation of the elderly, etc.)?

The information provided within this bushfire management plan to the best of my knowledge is true and correct:

Signature of report author or reviewer

Jan Macleod

Date



Bushfire Management Plan

Lot 9001 (#30) Capri Leone Way, Sinagra

City of Wanneroo

Planning Stage: Subdivision Application

Planning Development Type: Subdivision - Large Number of Lots

Bushfire Policy – Specific Development or Use Type: N/A

Job Number: 220158

Assessment Date: 5 April 2022

Report Date: 11 April 2022

BPP Group Pty Ltd t/a Bushfire Prone Planning
ACN: 39 166 551 784 | ABN: 39 166 551 784

Level 1, 159-161 James Street
Guildford WA 6055

PO Box 388
Guildford WA 6935

08 6477 1144 | admin@bushfireprone.com.au



DOCUMENT CONTROL

PREPARATION				
Author:	Ian Macleod (BPAD Level 2 - No. 39131)			
Co-Author:	Select.			
Review/Authorise:	Kathy Nastov (BPAD Level 3 - No. 27794)			
VERSION HISTORY				
Version	Version Details	Date		
1.0	Original Document Issue	11 April 2022		
1.1	Revised Subdivision Plan	14 April 2022		
BMP (Subdivision) Template v8.4				
DISTRIBUTION				
Destination	Version	No. Copies	Hard Copy	Electronic Copy
Person/Business: Nita Subramaniam/Jardim Property Email: nita@jardimproperty.com.au	1.0		<input type="checkbox"/>	<input checked="" type="checkbox"/>
Person/Business: Email:			<input type="checkbox"/>	<input type="checkbox"/>
<p>Limitation of Liability: The measures contained in this Bushfire Management Plan, are considered to be minimum requirements and they do not guarantee that a building will not be damaged in a bushfire, persons injured, or fatalities occur either on the subject site or off the site while evacuating. This is substantially due to the unpredictable nature and behaviour of fire and fire weather conditions. Additionally, the correct implementation of the required bushfire protection measures will depend upon, among other things, the ongoing actions of the landowners and/or operators over which Bushfire Prone Planning has no control.</p> <p>All surveys, forecasts, projections and recommendations made in this report associated with the proposed development are made in good faith based on information available to Bushfire Prone Planning at the time. All maps included herein are indicative in nature and are not to be used for accurate calculations.</p> <p>Notwithstanding anything contained therein, Bushfire Prone Planning will not, except as the law may require, be liable for any loss or other consequences whether or not due to the negligence of their consultants, their servants or agents, arising out of the services provided by their consultants.</p> <p>Copyright ©2020 BPP Group Pty Ltd: All intellectual property rights, including copyright, in format and proprietary content contained in documents created by Bushfire Prone Planning, remain the property of BPP Group Pty Ltd. Any use made of such format or content without the prior written approval of Bushfire Prone Planning, will constitute an infringement on the rights of the Company which reserves all legal rights and remedies in respect of any such infringement.</p>				

TABLE OF CONTENTS

EXECUTIVE SUMMARY	2
1 PROPOSAL DETAILS	4
1.1 DESCRIPTION AND ASSOCIATED PLANS AND MAPS.....	4
1.2 EXISTING DOCUMENTATION RELEVANT TO THE CONSTRUCTION OF THIS PLAN	8
2 ENVIRONMENTAL CONSIDERATIONS	9
2.1 NATIVE VEGETATION – RESTRICTIONS TO MODIFICATION AND/OR CLEARING	9
2.2 RETAINED VEGETATION / RE-VEGETATION / LANDSCAPE PLANS (INCLUDING POS)	10
3 POTENTIAL BUSHFIRE IMPACT ASSESSMENT	11
3.1 ASSESSMENT INPUT.....	11
3.1.1 Fire Danger Index (FDI) Applied	11
3.1.2 Vegetation Classification and Effective Slope	11
3.1.3 Vegetation Separation Distance	22
3.2 ASSESSMENT OUTPUT	23
3.2.1 Bushfire Attack Level Results - BAL Contour Map Format	24
3.2.2 Bushfire Attack Level Results - Derived from The BAL Contour Map	28
4 IDENTIFICATION OF BUSHFIRE HAZARD ISSUES	29
5 ASSESSMENT AGAINST THE BUSHFIRE PROTECTION CRITERIA ESTABLISHED BY THE GUIDELINES	30
5.1 LOCAL GOVERNMENT VARIATIONS TO APPLY.....	30
5.2 SUMMARY OF ASSESSMENT AGAINST THE BUSHFIRE PROTECTION CRITERIA	31
5.3 ASSESSMENT DETAIL	32
Element 1: Location	32
Element 2: Siting and Design of Development.....	34
Element 3: Vehicular Access.....	36
Element 4: Water	38
5.4 RECOMMENDED ADDITIONAL BUSHFIRE PROTECTION MEASURES	39
5.4.1 Recommended Additional Measures to Improve Bushfire Performance.....	39
6 RESPONSIBILITIES FOR IMPLEMENTATION AND MANAGEMENT OF THE BUSHFIRE PROTECTION MEASURES	40
6.1 DEVELOPER (LANDOWNER) - PRIOR TO ISSUE OF TITLES	40
6.2 LANDOWNER (DEVELOPER) - PRIOR TO SALE OF LOT(S), OCCUPANCY OR BUILDING	41
6.3 LANDOWNER/OCCUPIER - ONGOING	42
6.4 LOCAL GOVERNMENT - ONGOING.....	42
APPENDIX 1: TECHNICAL REQUIREMENTS FOR ONSITE VEGETATION MANAGEMENT	43
APPENDIX 2: TECHNICAL REQUIREMENTS FOR VEHICULAR ACCESS	50
APPENDIX 3: TECHNICAL REQUIREMENTS FOR FIREFIGHTING WATER	51

LIST OF FIGURES

Figure 1.1: Proposed subdivision map	5
Figure 1.2: Location map (spatial context).....	6
Figure 1.3: Map of Bushfire Prone Areas (DFES)	7
Figure 3.1: Vegetation classification and topography map.....	21
Figure 3.2: Post Development Vegetation Map.....	26
Figure 3.3: BAL Contour Map.....	27
Figure 5.1: Road Layout Map	37

EXECUTIVE SUMMARY

This Bushfire Management Plan is to accompany a subdivision application for Pt Lot 9500 and Lot 9001 (#30) Capri Leone Way, Sinagra in the City of Wanneroo. The subdivision will create 34 residential lots along with associated roads and services.

The assessments and bushfire protection measures detailed the Bushfire Management Plan, assume that environmental approval will be achieved or clearing permit exemptions will apply.

The whole of the abutting Lot 9500, to the east, is currently being cleared for subdivision development. Some vegetation remains uncleared on the lot at the time of assessment but will be removed shortly. The whole of Lot 9001 will be cleared of vegetation during development of the proposed subdivision.

The proposed subdivision will provide an area of land within each proposed lot that can be considered suitable for development as BAL-40 or BAL-FZ construction standards will not be required to be applied. This meets the requirements established by Acceptable Solution A1.1 and its associated explanatory note.

Future buildings on the lot(s) of the proposed subdivision can be surrounded by an APZ that will ensure the potential radiant heat impact of a bushfire does not exceed 29 kW/m² (BAL-29). The required APZ specifications of width, location and management can be achieved. For this proposed subdivision the Asset Protection Zones extend to the boundaries of each lot and includes road verges.

The BAL Assessment for each lot is the highest BAL rating that applies to the lot. For some lots it is likely that a lower BAL rating can be achieved for future buildings, depending upon the size and location of the building on the lot.

Indicative BAL ratings for lots within the subdivision range between BAL-LOW and BAL-29. The exception is Lot 20 which, if the proposed road adjoining the southern boundary of the development is not built prior to the construction of the proposed subdivision, will have a small portion of the lot assessed as BAL-40.

Where the proposed road, adjoining the southern boundary of the subject lot, is not built prior to the construction of the proposed subdivision, then building will be restricted on proposed Lot 20 by the application of a restrictive covenant (129BA Transfer of Land Act 189) as per the WAPC Model Subdivision Conditions Schedule (April 2020) Code F3.

All existing and proposed roads abutting or within the proposed subdivision will comply with the construction requirements of the IPWEA Subdivision Guidelines.

It is expected by the proponent that the proposed road abutting the southern boundary of the subject subdivision will be constructed prior to the construction of this development. This road will provide access for proposed lots 15 to 19 and allow multiple access/egress routes for all lots within the subdivision.

If the road adjoining the southern extents of the subdivision is not constructed before the proposed subdivision of Lot 9001 is under construction:

1. Proposed Lots 15 to 19 will remain as a balance lot for the subdivision until such time as compliant road access is made available to those lots.
2. Floresta Street will remain as a cul-de-sac.
3. The no through road portion of Floresta Street will be approximately 150 metres in length which is compliant with the requirements of the acceptable solutions.

A reticulated water supply is available to the proposed subdivision. The closest existing fire hydrant is located on Floresta Street at the front of proposed Lot 7. Further hydrants will be installed as required by the relevant authorities.

Where the proposed development is staged each stage must comply with the requirements of the Guidelines for Planning in Bushfire Prone Areas and this Bushfire Management Plan. This may require the creation of roads, temporary emergency access ways, management of land or installation of water supply lines outside that particular stage to achieve compliance.

Vegetation on balance lot(s) may adversely affect the indicative BAL ratings of lots being developed. This should be assessed prior to the sale of the lots and the required vegetation on the balance lot managed and maintained until developed, or the indicative BAL ratings for the affected lots amended.

Some future buildings on lots within the proposed subdivision will be subject to a BAL rating of BAL-LOW, and these buildings will not be required to be constructed to bushfire standards. However, as these buildings may still be subject

to ember attack during a bushfire event, Bushfire Prone Planning recommends that some form protection be considered such as construction to BAL-12.5 standards (i.e. ember protection).

1 PROPOSAL DETAILS

1.1 Description and Associated Plans and Maps






Landowner / Proponent:	Jardim Property
Bushfire Prone Planning Commissioned to Produce the Bushfire Management Plan (BMP) By:	Jardim Property
For Submission To:	WA Planning Commission (WAPC)
Purpose of the BMP:	To accompany a planning application
No. of Existing/Proposed Lots:	Existing lot(s) = 2 / Proposed lot(s) = 34
Description of the Proposed Development/Use:	
<p>This Bushfire Management Plan is to accompany a subdivision application for Pt Lot 9500 and Lot 9001 (#30) Capri Leone Way, Sinagra in the City of Wanneroo. The subdivision will create 34 residential lots along with associated roads and services.</p>	

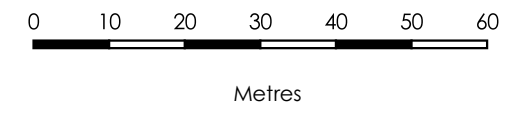
Figure 1.1

Proposed Subdivision Lot Layout Map

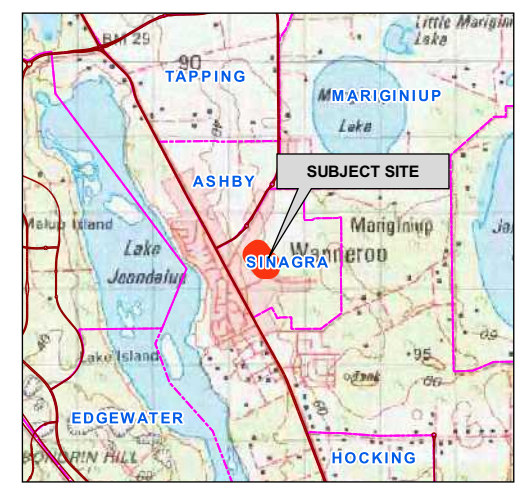
Lot 9001 on Plan 65974
Pt Lot 9500 on Plan 49784
30 Capri Leone Way
SINAGRA
CITY OF WANNEROO

----- LEGEND -----

-  Hydrant
-  Proposed Subdivision
-  Subject Site
-  Subdivision - Under Construction
-  Cadastral



----- LOCALITY -----



AERIAL IMAGERY: Landgate/SLIP



Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Mercator Units: Metre
Map by: 13-04-2022
SCALE (A3): 1 : 1000



Disclaimer and Limitation: This map has been prepared for bushfire management planning purposes only. All depicted areas, contours and any dimensions shown are subject to survey. Bushfire Prone Planning does not guarantee that this map is without flaw of any kind and disclaims all liability for any errors, loss or other consequence which may arise from relying on any information depicted.

Figure 1.2

Proposed Subdivision Location Map

Lot 9001 on Plan 65974
 Pt Lot 9500 on Plan 49784
 30 Capri Leone Way
 SINAGRA
 CITY OF WANNEROO

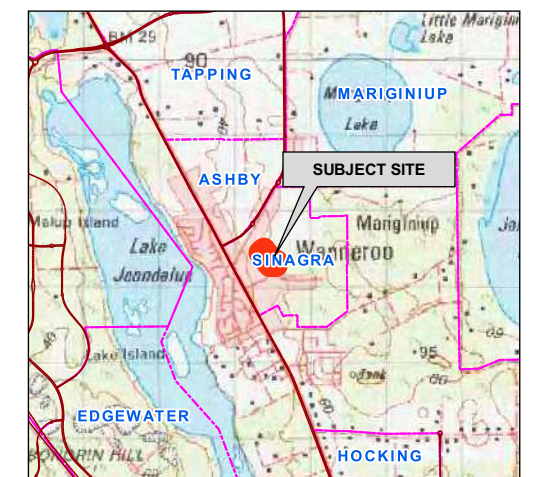
----- LEGEND -----

- ◆ DFES Stations
- Subject Site
- Locality
- Cadastral
- Bush Forever Areas 2000
- DEC Managed Lands Waters
- Regional Parks
- Reserves UCL**
- Reserve
- Unallocated Crown Land

0 200 400 600 800 1,000 1,200

Metres

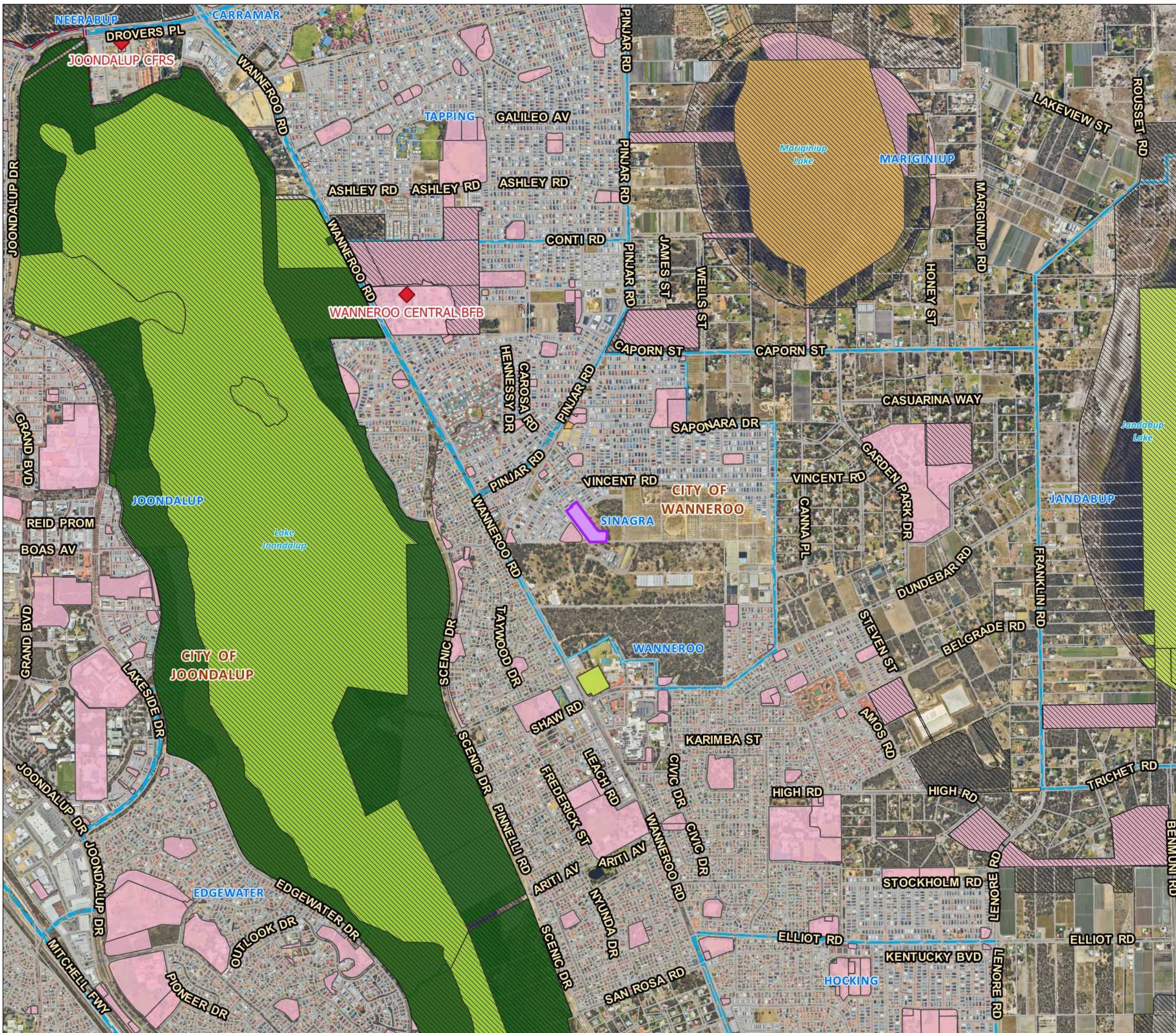
----- LOCALITY -----



AERIAL IMAGERY: Landgate/SLIP



Coordinate System: GDA 1994 MGA Zone 50
 Projection: Universal Transverse Mercator Units: Metre
 Map by: 13-04-2022
 SCALE (A3): 1 : 20000



Disclaimer and Limitation: This map has been prepared for bushfire management planning purposes only. All depicted areas, contours and any dimensions shown are subject to survey. Bushfire Prone Planning does not guarantee that this map is without flaw of any kind and disclaims all liability for any errors, loss or other consequence which may arise from relying on any information depicted.

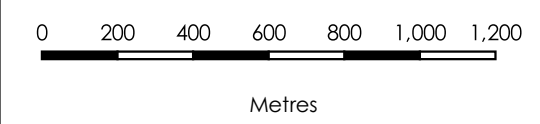
Figure 1.3

Proposed Subdivision Bushfire Prone Areas

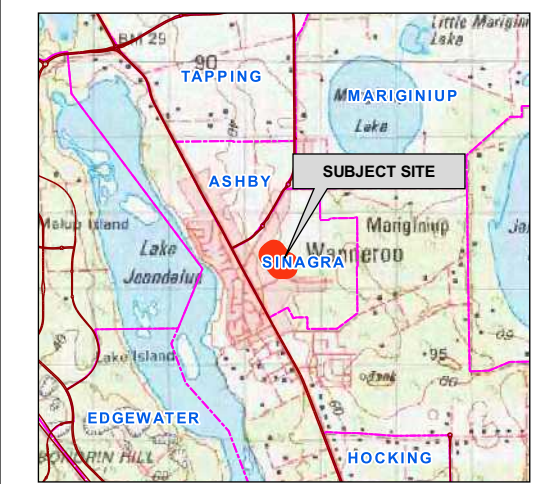
Lot 9001 on Plan 65974
Pt Lot 9500 on Plan 49784
30 Capri Leone Way
SINAGRA
CITY OF WANNEROO

----- LEGEND -----

- ◆ DFES Stations
- Bush Fire Prone Areas 2021
- Subject Site
- Local Government Area
- Locality
- Cadastral

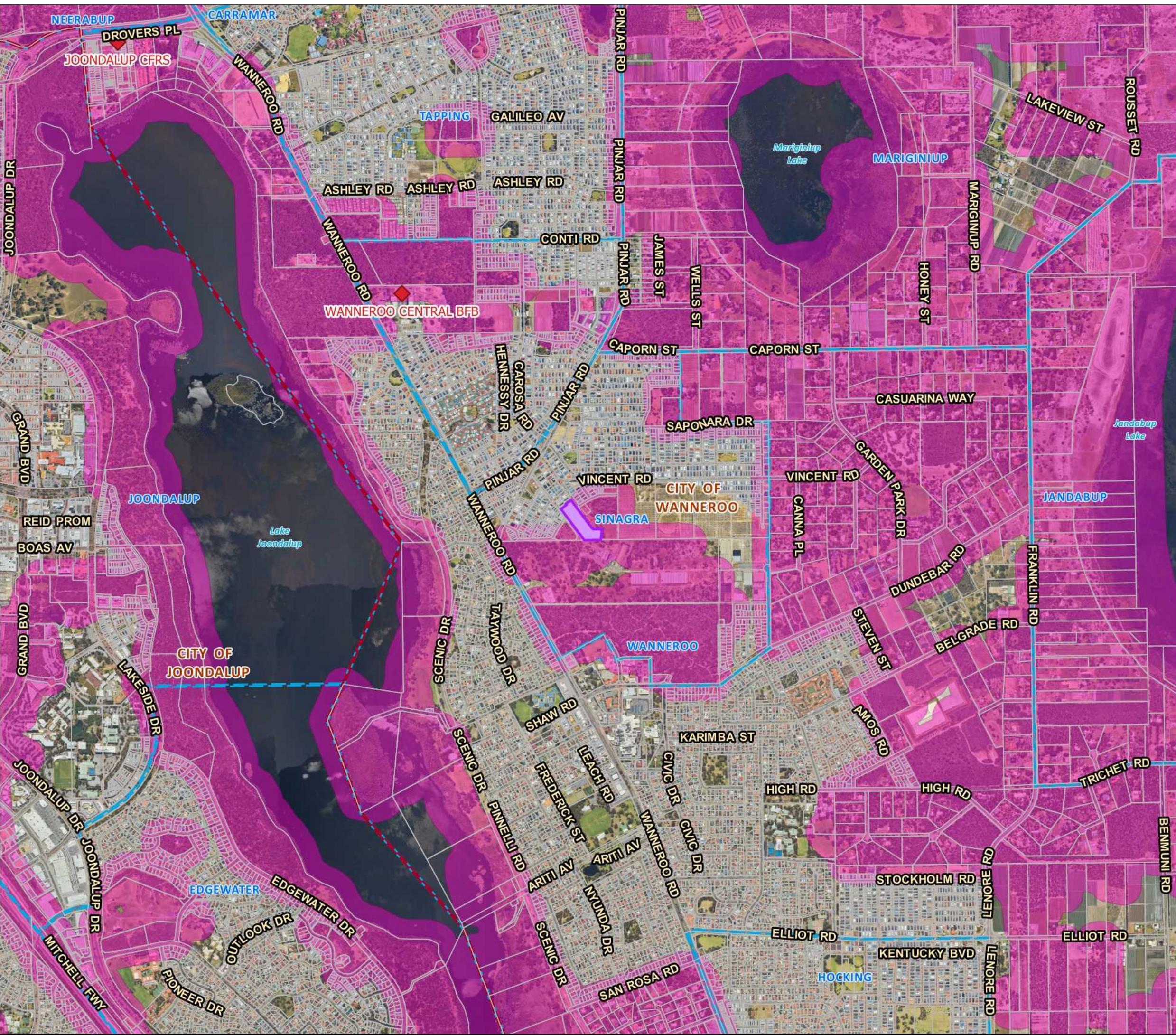


----- LOCALITY -----



AERIAL IMAGERY: Landgate/SLIP

Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Mercator Units: Metre
Map by: 13-04-2022
SCALE (A3): 1 : 20000



Disclaimer and Limitation: This map has been prepared for bushfire management planning purposes only. All depicted areas, contours and any dimensions shown are subject to survey. Bushfire Prone Planning does not guarantee that this map is without flaw of any kind and disclaims all liability for any errors, loss or other consequence which may arise from relying on any information depicted.

1.2 Existing Documentation Relevant to the Construction of this Plan

This section acknowledges any known reports or plans that have been prepared for previous planning stages, that refer to the subject area and that may or will impact upon the assessment of bushfire risk and/or the implementation of bushfire protection measures and will be referenced in this Bushfire Management Plan.

Table 2.1: Existing relevant documentation.

RELEVANT EXISTING DOCUMENTS		
Existing Document	Copy Provided by Client	Title
Structure Plan	No	
Environmental Report	No	
Landscaping (Revegetation) Plan	No	
Bushfire Risk Assessments	Yes	BAL Contour Report Lot 9500 Torrenova Way, Sinagra v2 Dec 2020 (Natural Area Consulting Management Services).

A BAL Contour Assessment for the subdivision of the abutting lot 9500 has been supplied by the proponent.

2 ENVIRONMENTAL CONSIDERATIONS

2.1 Native Vegetation – Restrictions to Modification and/or Clearing

Many bushfire prone areas also have high biodiversity values. SPP 3.7 policy objective 5.4 recognises the need to consider bushfire risk management measures alongside environmental, biodiversity and conservation values (Guidelines s2.3).

There is a requirement to identify the need for onsite modification and/or clearing of native vegetation and whether this might trigger potential environmental impact/referral requirements under State and Federal environmental legislation. Confirmation that any proposed native vegetation modification and/or clearing is acceptable, should be received from the relevant agencies by the proponent and provided to the bushfire consultant for inclusion in the Bushfire Management Plan if it will influence the required bushfire planning assessments and outcomes. The following table details any potential environmental restrictions of which the author of this report is aware.

Table 2.2: Native vegetation and potential environmental considerations and restrictions.

NATIVE VEGETATION MODIFICATION / CLEARING - POTENTIAL ENVIRONMENTAL RESTRICTIONS IDENTIFIED				
Environmental Considerations / Features	Potential Mapping Data Source (SLIP / Local Planning)	Relevant to Proposed Development	Data Applied	Action Required
Onsite clearing of native vegetation is required.		Yes		
Environmental impact/referral requirements under State and Federal environmental legislation may be triggered.		Unlikely		
National Park / Nature Reserve	DBCA-011	No-Confirmed by Proponent	Relevant Database Reviewed by Bushfire Consultant	None
Conservation Covenant	DPIRD-023	Not Known	Data Not Readily Available to Bushfire Consultant	Proponent to Seek Advice
Bush Forever Site	DPLH-019	No-Confirmed by Bushfire Consultant	Relevant Database Reviewed by Bushfire Consultant	None
RAMSAR Wetland	DBCA-010	No-Confirmed by Bushfire Consultant	Relevant Database Reviewed by Bushfire Consultant	None
Geomorphic and Other Wetland	DBCA-011-019, 040, 043, 044	No-Confirmed by Bushfire Consultant	Relevant Database Reviewed by Bushfire Consultant	None
Threatened and Priority Ecological Communities (TECs or PECs)	DBCA-038	Not Known	Data Not Readily Available to Bushfire Consultant	Proponent to Seek Advice
Threatened and Priority Flora including Declared Rare Flora (DRFs)	DBCA-036	Not Known	Data Not Readily Available to Bushfire Consultant	Proponent to Seek Advice
Land Identified as significant through a Local Biodiversity Strategy	LG - Intramaps	Possible	Data Not Readily Available to Bushfire Consultant	Proponent to Seek Advice

Statement of how the identified environmental feature(s) is dealt with in this Bushfire Management Plan (and the location of relevant information):

The assessments and bushfire protection measures detailed the BMP, assume that environmental approval will be achieved or clearing permit exemptions will apply.

It is advised that the proponent seek further advice from an Environmental Consultant or the WA Department of Biodiversity Conservation and Attractions for further information on the condition and species contained within the proposed development area and the requirement for referral of the proposal.

Development Design Considerations

Establishing development in bushfire prone areas can adversely affect the retention of native vegetation through clearing associated with the creation of lots and/or asset protection zones. Where loss of vegetation is not acceptable or causes conflict with landscape or environmental objectives, it will be necessary to consider available design options to minimise the removal of native vegetation.

Table 2.3: Development design.

MINIMISE THE REMOVAL OF NATIVE VEGETATION	
Design Option	Assessment / Action
Reduction of lot yield	N/A
Cluster development	N/A
Construct building to a standard corresponding to a higher BAL as per BCA (AS 3959:2018 and/or NASH Standard)	N/A
Modify the development location	N/A
The whole of the subject lot is to be cleared during the construction phase of the proposed subdivision.	
IMPACT ON ADJOINING LAND	
Is this planning proposal able to implement the required bushfire protection measures within the boundaries of the land being developed so as not to impact on the bushfire and environmental management of neighbouring reserves, properties or conservation covenants?	Yes
It is expected by the proponent that the proposed road abutting the southern boundary of the subject subdivision will be constructed prior to the construction of the subdivision. This road will provide access for proposed lots 15 to 19. In the event that the proposed road is not constructed prior to the development of the subdivision, then proposed lots 15 to 19 will remain as a balance lot until such time that road access is provided.	

2.2 Retained Vegetation / Re-vegetation / Landscape Plans (including POS)

Riparian zones, wetland/foreshore buffers, road verges and public open space may have plans to re-vegetate or retain vegetation as part of the proposed development. Vegetation corridors may be created between offsite and onsite vegetation and provide a route for fire to enter a development area.

All retained/planned vegetation and its management will be considered in the development of this Bushfire Management Plan.

Is re-vegetation of riparian zones and/or wetland or foreshore buffers and/or public open space a part of this Proposal?	No
N/A	
Is the requirement for ongoing maintenance of existing vegetation in riparian zones and/or wetland or foreshore buffers and/or public open space a part of this Proposal?	No
N/A	
Has a landscape plan been developed for the proposed development?	No
N/A	

3 POTENTIAL BUSHFIRE IMPACT ASSESSMENT

3.1 Assessment Input

3.1.1 Fire Danger Index (FDI) Applied

AS 3959:2018 Table 2.1 specifies the fire danger index values to apply for different regions. The values used in the model calculations are for the Forest Fire Danger Index (FFDI) and for which equivalent representative values of the Grassland Fire Danger Index (GFDI) are applied as per Appendix B. The values can be modified if appropriately justified.

Table 3.1: Applied FDI Value

FDI VALUE			
Vegetation Areas	As per AS 3959:2018 Table 2.1	As per DFES for the Location	Value Applied
All Vegetation Areas	80	N/A	80

3.1.2 Vegetation Classification and Effective Slope

Classification: Bushfire prone vegetation identification and classification has been conducted in accordance with AS 3959:2018 s2.2.3 and the Visual Guide for Bushfire Risk Assessment in WA (DoP February 2016).

When more than one vegetation type is present, each type is identified separately, and the applied classification considers the potential bushfire intensity and behaviour from the vegetation types present and ensures the worst case scenario is accounted for – this may not be from the predominant vegetation type.

The vegetation structure has been assessed as it will be in its mature state (rather than what might be observed on the day). Areas of modified vegetation are assessed as they will be in their natural unmodified state (unless maintained in a permanently low threat, minimal fuel condition, satisfying AS 3959:2018 s2.2.3.2(f) and asset protection zone standards). Vegetation destroyed or damaged by a bushfire or other natural disaster has been assessed on its revegetated mature state.

Effective Slope: Refers to the ground slope under each area of classified vegetation and is described in the direction relative to the view from the building or proposed development site. Effective slope is not the same as 'average slope', rather it is the slope which most significantly influences fire behaviour. This slope has a direct and significant influence on a bushfire's rate of spread and intensity.

Where there is a significant change in effective slope under an area of classified vegetation, that will cause a change in fire behaviour, separate vegetation areas will be identified to enable the correct assessment.

When the effective slope, under a given area of bushfire prone vegetation, will be different relative to multiple proposed development sites, then the effective slopes corresponding to the different locations, are separately identified.

Table 3.2: Vegetation classification and effective slope.

ALL VEGETATION WITHIN 150 METRES OF THE PROPOSED DEVELOPMENT				
Vegetation Area	Identified Vegetation Types ¹ or Description if 'Excluded'	Applied Vegetation Classification ¹	Effective Slope (degrees) ² (AS 3959:2018 Method 1)	
			Assessed	Applied Range
1	Open forest A-03	Class A Forest	2	downslope >0-5
2	Tussock grassland G-22	Class G Grassland	0	upslope or flat
3	Woodland B-05	Class B Woodland	0	upslope or flat
4	Sown pasture G-26	Class G Grassland	0	upslope or flat
5	Open forest A-03	Class A Forest	0	upslope or flat
6	Tussock grassland G-22	Class G Grassland	10	downslope >5-10
7	Tussock grassland G-22	Class G Grassland	5	downslope >0-5
8	Woodland B-05	Class B Woodland	2	downslope >0-5
9	Managed parks and private gardens, non vegetated areas.	Excluded as per Section 2.2.3.2 (e) & (f)	N/A	N/A
Representative photos of each vegetation area, descriptions and classification justification, are presented on the following pages. The areas of classified vegetation are defined, and the photo locations identified on Figure 3.1, the vegetation and topography map.				
Note ¹ : Described and classified as per AS 3959:2018 Table 2.3 and Figures 2.3 and 2.4 (A)-(H)				
Note ² : Effective slope measured as per AS 3959:2018 Section 2.2.5 and Appendix B Part B4				

Additional Supporting Information

- Vegetation Areas 5 and 6, and portion of vegetation Area 1 are currently being cleared to accommodate the construction of a subdivision on the neighbouring Lot 9500 to the east.
- The whole of Lot 9001 will be cleared prior to construction of the proposed subdivision.

These areas will be excluded when considering Bushfire Attack Levels for the proposed lots.

VEGETATION AREA 1	
AS 3959:2018 Vegetation Classification Applied:	Class A Forest
Vegetation Types Present:	Open forest A-03
Description/Justification:	Marri and jarrah and other eucalypts to 12 metres tall, some banksia and sheoak. Scrub, shrubs and grass trees, grass understorey.
Post Dev. Assumptions:	Those portions of Vegetation Area 1 that are located on Lots 9001 and 9500 will be removed prior to the construction of the proposed subdivision of Lot 9001.
	
Photo ID: 1a	Photo ID: 1b
	
Photo ID: 1c	Photo ID: 1d
	
Photo ID: 1e	Photo ID: 1f

VEGETATION AREA 2

AS 3959:2018 Vegetation Classification Applied:	Class G Grassland
Vegetation Types Present:	Tussock grassland G-22
Description/Justification:	Photo 2a: Partly managed tussock grasses, firebreak along fence line. Photo 2b: Single row of trees underpruned to above 2 metres, assessed as windbreak and excluded from classification. Partly managed tussock grasses, firebreak along fence line.
Post Dev. Assumptions:	It is expected that a road, by others will be constructed along this area of vegetation. However, as a precautionary measure, this is not taken into account when calculating the BAL ratings of propose lots within the proposed subdivision of Lot 9001.



Photo ID: 2a



Photo ID: 2b

VEGETATION AREA 3

AS 3959:2018 Vegetation Classification Applied:	Class B Woodland
Vegetation Types Present:	Woodland B-05
Description/Justification:	Marri and jarrah to 15 metres, partly managed grass understorey. Firebreak along fence line.
Post Dev. Assumptions:	Nil



Photo ID: 3a



Photo ID: 3b

VEGETATION AREA 4

AS 3959:2018 Vegetation Classification Applied:	Class G Grassland
Vegetation Types Present:	Sown pasture G-26
Description/Justification:	Open partly managed grassland areas. Isolated olive trees.
Post Dev. Assumptions:	Nil



Photo ID: 4a



Photo ID: 4b

VEGETATION AREA 5

AS 3959:2018 Vegetation Classification Applied:	Class A Forest
Vegetation Types Present:	Open forest A-03
Description/Justification:	Marri and jarrah, banksias, sheoak, shrubs, grass trees, grassy understorey.
Post Dev. Assumptions:	Area is currently being cleared for construction of a subdivision on Lot 9500.



Photo ID: 5a



Photo ID: 5b

VEGETATION AREA 6

AS 3959:2018 Vegetation Classification Applied:	Class G Grassland
Vegetation Types Present:	Tussock grassland G-22
Description/Justification:	Drainage sump, unmanaged tussock grasses.
Post Dev. Assumptions:	Area is to be cleared and backfilled for construction of subdivision on neighbouring Lot 9500.

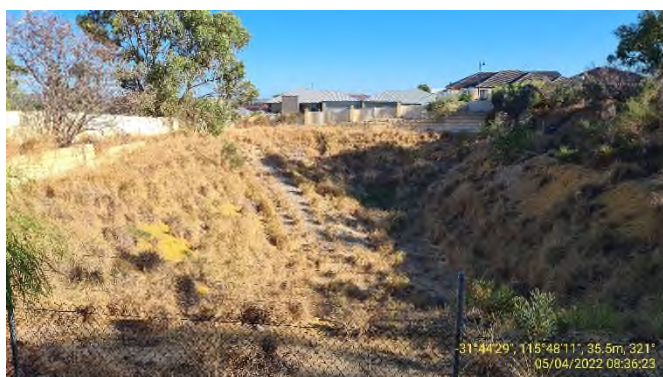


Photo ID: 6a

Photo ID: 6b

VEGETATION AREA 7

AS 3959:2018 Vegetation Classification Applied:	Class G Grassland
Vegetation Types Present:	Tussock grassland G-22
Description/Justification:	Onsite area of unmanaged tussock grassland.
Post Dev. Assumptions:	Area will be cleared for construction of proposed subdivision.



Photo ID: 7a

Photo ID: 7b

VEGETATION AREA 8

AS 3959:2018 Vegetation Classification Applied:

Class B Woodland

Vegetation Types Present:

Woodland B-05

Description/Justification:

Sheoaks, banksia, occasional tuart. Isolated grass trees and zamias. Grass understorey.

Post Dev. Assumptions:

Nil



Photo ID: 8a



Photo ID: 8b



Photo ID: 8c

VEGETATION AREA 9

AS 3959:2018 Vegetation Classification Applied:	Excluded as per Section 2.2.3.2 (e) & (f)
Vegetation Types Present:	Low bushfire threat vegetation
Description/Justification:	Photos 9a to 9d: Onsite orchard. Photos 9e and 9f: Managed parkland and private gardens.
Post Dev. Assumptions:	Onsite vegetation will be removed during construction of the proposed subdivision.



Photo ID: 9a



Photo ID: 9b



Photo ID: 9c



Photo ID: 9d



Photo ID: 9e



Photo ID: 9f

VEGETATION AREA 9

AS 3959:2018 Vegetation Classification Applied:	Excluded as per Section 2.2.3.2 (e) & (f)
Vegetation Types Present:	Low bushfire threat vegetation
Description/Justification:	Photos 9g to 9i: Managed private gardens and street verges. Photos 9e and 9f: Areas being cleared on neighbouring Lot 9500.
Post Dev. Assumptions:	Nil



Photo ID: 9g



Photo ID: 9h

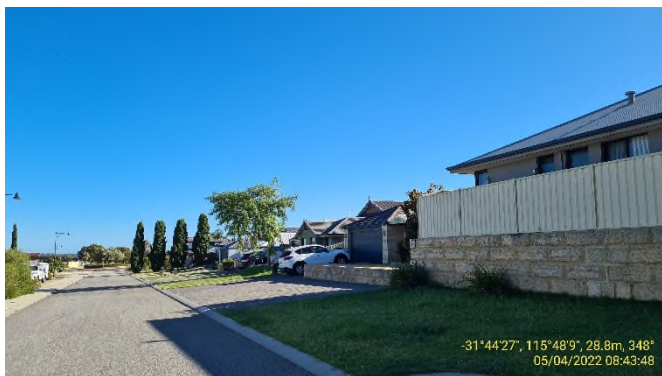


Photo ID: 9i




Photo ID: 9j



Photo ID: 9k



Photo ID: 9l

VEGETATION AREA9	
AS 3959:2018 Vegetation Classification Applied:	Excluded as per Section 2.2.3.2 (e) & (f)
Vegetation Types Present:	Low bushfire threat vegetation
Description/Justification:	Area being cleared on neighbouring Lot 9500.
Post Dev. Assumptions:	Nil
	
Photo ID: 9m	

Vegetation Area	Vegetation Class	Vegetation Type	Effective Slope
1	A	Forest	>0-5
2	G	Grassland	0
3	B	Woodland	0
4	G	Grassland	0
5	A	Forest	0
6	G	Grassland	>5-10
7	G	Grassland	>0-5
8	B	Woodland	>0-5
9	Ex	Excluded	

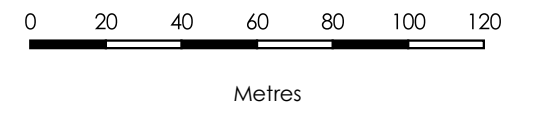
Figure 3.1

Existing Topography & Classified Vegetation

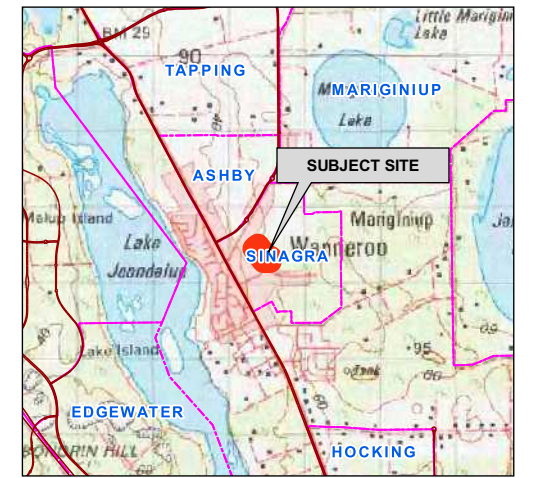
Lot 9001 on Plan 65974
 Pt Lot 9500 on Plan 49784
 30 Capri Leone Way
 SINAGRA
 CITY OF WANNEROO

----- LEGEND -----

- Photos
- Hydrants
- Elevation (m)
- Subject Site
- 150m Assessment Area
- Cadastral
- Classified Vegetation**
- Class A - Forest
- Class B - Woodland
- Class G - Grassland
- Exclusion 2.2.3.2



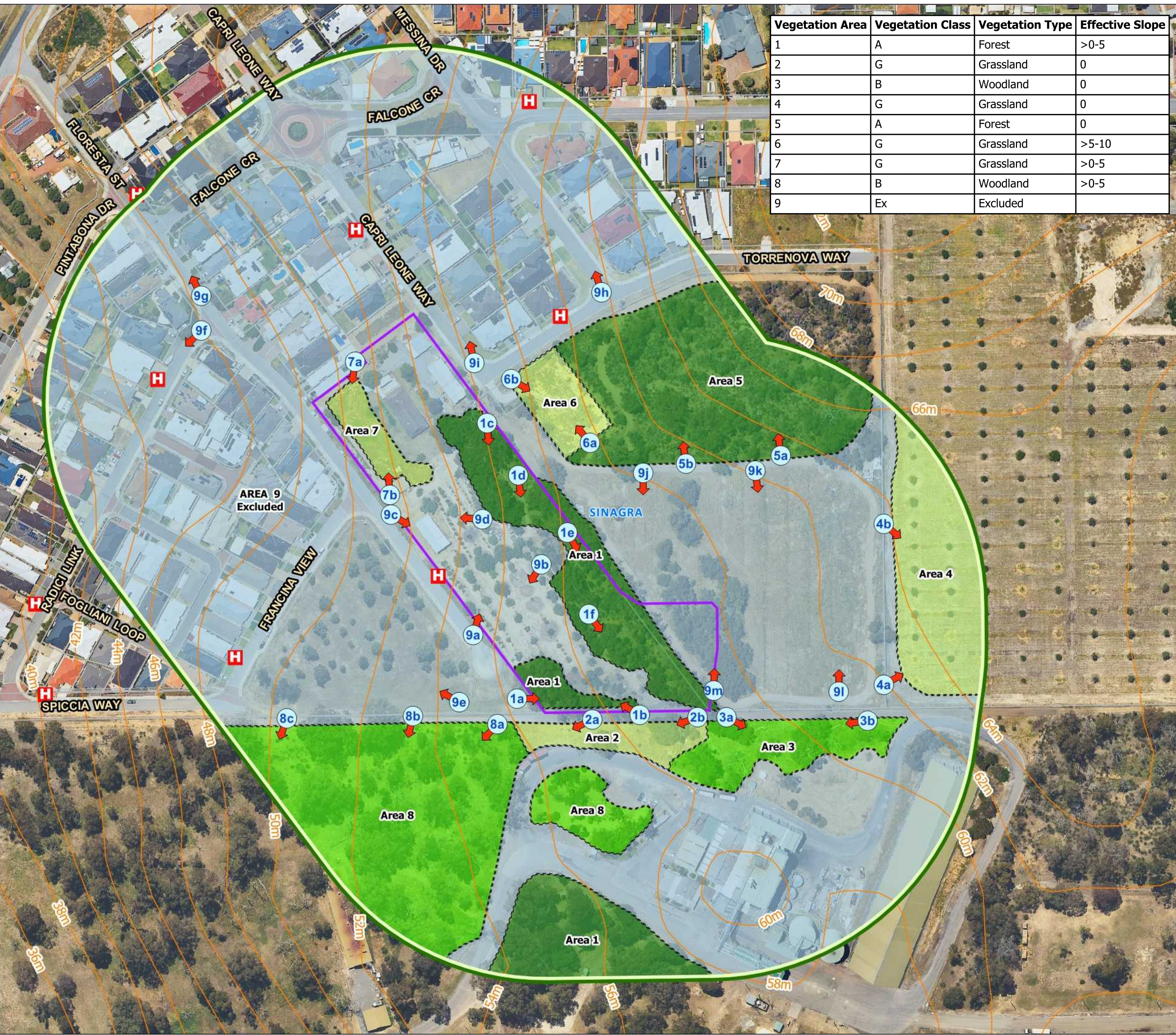
----- LOCALITY -----



AERIAL IMAGERY: Landgate/SLIP



Coordinate System: GDA 1994 MGA Zone 50
 Projection: Universal Transverse Mercator Units: Metre
 Map by: 13-04-2022
 SCALE (A3): 1 : 2000



Disclaimer and Limitation: This map has been prepared for bushfire management planning purposes only. All depicted areas, contours and any dimensions shown are subject to survey. Bushfire Prone Planning does not guarantee that this map is without flaw of any kind and disclaims all liability for any errors, loss or other consequence which may arise from relying on any information depicted.

3.1.3 Vegetation Separation Distance

The vegetation separation distance is the horizontal distance measured from the relevant parts of an existing building or a future building's planned location (within a lot), to the determined edge of an area of classified vegetation.

This separation distance applied to determining a Bushfire Attack Level (BAL) can be either:

- The measured distance – for which the location of the building relative to the edge of classified vegetation must be known. This will result in single determined BAL that will apply to a building. (The measured distance is a required calculation input); or
- A calculated minimum and maximum distance (range) that will correspond to each individual BAL. The calculated distances provide an indicative (or achievable) BAL for which the determined BAL will be dependent on the known location of the building relative to the edge of classified vegetation.

The calculated range of distances corresponding to each BAL can be presented in different formats (tables or a BAL contour map), dependent on the form of information that is most appropriate for the proposed development/use. These distance ranges corresponding to BAL(s) will be presented in Section 3.2: 'Assessment Output'.

For the proposed development/use, the applicable vegetation separation distances will be presented within the Bushfire Management Plan in this location:

In Section 3.2 'Assessment Output' as a table containing the calculated ranges of distance corresponding to each BAL and illustrated as a BAL Contour Map.

3.2 Assessment Output

UNDERSTANDING THE RESULTS OF THE BUSHFIRE IMPACT ASSESSMENT

Bushfire Attack Levels (BALs) – Their Application in the Building Environment is Different to the Planning Environment

In the building environment, a **determined BAL** is required for the proposed construction at the building application stage. This is to inform approval considerations and establish the bushfire construction standards that are to apply. An indicative BAL is not acceptable for a building application.

In the planning environment, through the application of SPP 3.7 and associated Guidelines, the deemed to satisfy requirement for a proposed 'development site' or sites (defined by the LPS Amendment Regulations 2015 as "that part of a lot on which a building that is the subject of development stands or is to be constructed"), is that a BAL-29 or lower rating can be achieved once all works associated with the proposal are completed. For planning approval purposes, an **indicative BAL** can provide the required information.

Determined Bushfire Attack Level

A determined BAL is to apply to an existing building or the 'development site' on which the building is to be constructed and not to a lot or building envelope. Its purpose is to state the potential radiant heat flux to which the building will be exposed, thereby determining the construction standard to be applied.

A determined BAL cannot be given for a future building whose design and position on the lot are unknown or the vegetation separation distance has not been established. It is not until these variables have been fixed that a determined BAL can be stated, and a BAL Certificate can be issued.

The one exception is when a building **of any dimension** can be **positioned anywhere** on a proposed lot (within R-Code building setbacks) or within a defined building envelope, and always remain subject to the same BAL, regardless of the retention of any existing classified vegetation either onsite or offsite.

Indicative Bushfire Attack Level

If a BAL is not able to achieve 'determined' status it will be an indicative BAL. It indicates the BAL that can be achieved by the proposed development/use. However, it is conditional upon an assessment variable(s) being confirmed at a later stage (e.g. the building location is established/changed, or vegetation is modified/removed to establish the vegetation separation distance).

A BAL certificate cannot be issued for an indicative BAL – unless that BAL cannot vary (refer to 'Determined BAL' above).

In table form, a single or a range of indicative BAL(s) may be presented. If a single indicative BAL is stated for a defined area (i.e. the lot or building envelope), this will be the highest indicative BAL impacting the defined area.

In BAL contour map form (refer to Section 3.2.1), the illustrated BAL contours visually identify areas of land for which if any part of an existing or proposed building is located on that land and within the BAL contours, then the highest BAL affecting that building (or part of the land on which the building will be constructed), will be the indicative BAL that is to apply.

The BAL can only become a determined BAL once the actual location of that building on the land is known and/or the required minimum vegetation separation distance corresponding to the relevant BAL contour is established (refer to Table 3.3).

3.2.1 Bushfire Attack Level Results - BAL Contour Map Format

INTERPRETATION OF THE BUSHFIRE ATTACK LEVEL (BAL) CONTOUR MAP

The contour map will present different coloured contour intervals extending from the areas of classified bushfire prone vegetation. These represent the different bushfire attack levels that will exist at varying distances away from the classified vegetation in the event of a bushfire in that vegetation.

The areas of classified vegetation to be considered in developing the BAL contours, are those that will remain as the intended end state of the subject development once earthworks, clearing and/or landscaping and re-vegetation have been completed (or each stage completed).

Each bushfire attack level corresponds to a set range of radiant heat flux that is generated by a bushfire. That range is defined by the AS 3959:2018 BAL determination methodology.

The width of each shaded BAL contour is a diagrammatic representation of the separation distances from the classified vegetation that correspond to each BAL for each separately identified area of classified vegetation. They have been calculated by the application of the unique site variables including vegetation types and structure, ground slope and applied fire weather.

(Refer to Section 3.2 'Understanding the Results of the Bushfire Impact Assessment' for the explanation of how BAL(s) for buildings will be assessed from the BAL Contour Map).

Construction of the BAL Contours

VEGETATION AREAS APPLIED TO THE DEVELOPMENT OF THE BAL CONTOUR MAP

All identified areas of classified vegetation have been applied with the following exceptions:

1. All classifiable vegetation within Lots 9001 and 9500 are excluded as these areas will be cleared during construction of the subdivisions on these lots (See Figure 3.2 Post Development Classified Vegetation Map).

The BAL Contour Map assumes the worst case scenario, where the proposed road, by others, adjoining the southern boundary of the development is not built prior to construction of the subdivision.

This approach is applied to indicate the achievable bushfire attack levels within the specified lot and the resultant area of developable land (i.e. subject to BAL-29 or less).

VEGETATION SEPARATION DISTANCES APPLIED

The distances that have been applied to illustrate the width of each BAL contour shown in Figure 3.3 are stated in Table 3.3. These correspond to each Bushfire Attack Level and are specific to the proposed development site.

Table 3.3: Vegetation separation distances applied to construct the BAL contours.

BAL CONTOUR MAP – APPLIED VEGETATION SEPARATION DISTANCES								
Derived from the Application of Method 1 BAL Determination Methodology (AS 3959:2018 Section 2, Table 2.5) ¹								
Vegetation Area	Vegetation Classification	Effective Slope (degree range)	BAL and Corresponding Separation Distance (m)					
			BAL-FZ	BAL-40	BAL-29	BAL-19	BAL12.5	BAL-LOW
1	Class A Forest	downslope >0-5	<20	20-<27	27-<37	37-<50	50-<100	>100
2	Class G Grassland	upslope or flat	<6	6-<8	8-<12	12-<17	17-<50	>50
3	Class B Woodland	upslope or flat	<10	10-<14	14-<20	20-<29	29-<100	>100
4	Class G Grassland	upslope or flat	<6	6-<8	8-<12	12-<17	17-<50	>50
8	Class B Woodland	downslope >0-5	<13	13-<17	17-<25	25-<35	35-<100	>100

Note¹ All the assessment inputs applied are presented in Section 3.1.

Vegetation Area	Vegetation Class	Vegetation Type	Effective Slope
1	A	Forest	>0-5
2	G	Grassland	0
3	B	Woodland	0
4	G	Grassland	0
8	B	Woodland	>0-5
9	Ex	Excluded	

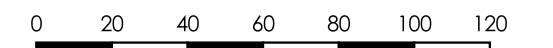
Figure 3.2

Post Development Classified Vegetation

Lot 9001 on Plan 65974
 Pt Lot 9500 on Plan 49784
 30 Capri Leone Way
 SINAGRA
 CITY OF WANNEROO

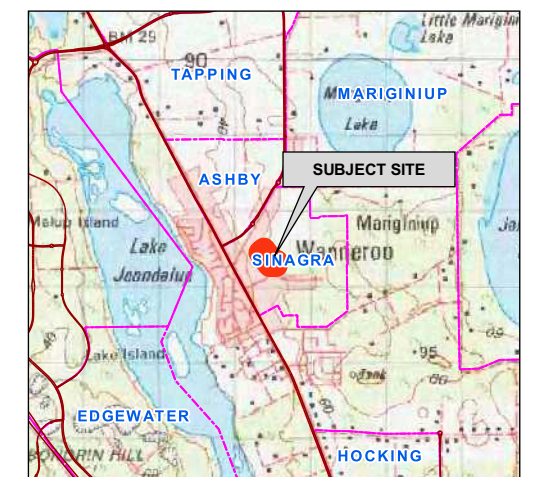
----- LEGEND -----

- Hydrants
 - Subject Site
 - 150m Assessment Area
 - Cadastral
- Classified Vegetation**
- Class A - Forest
 - Class B - Woodland
 - Class G - Grassland
 - Exclusion 2.2.3.2



Metres

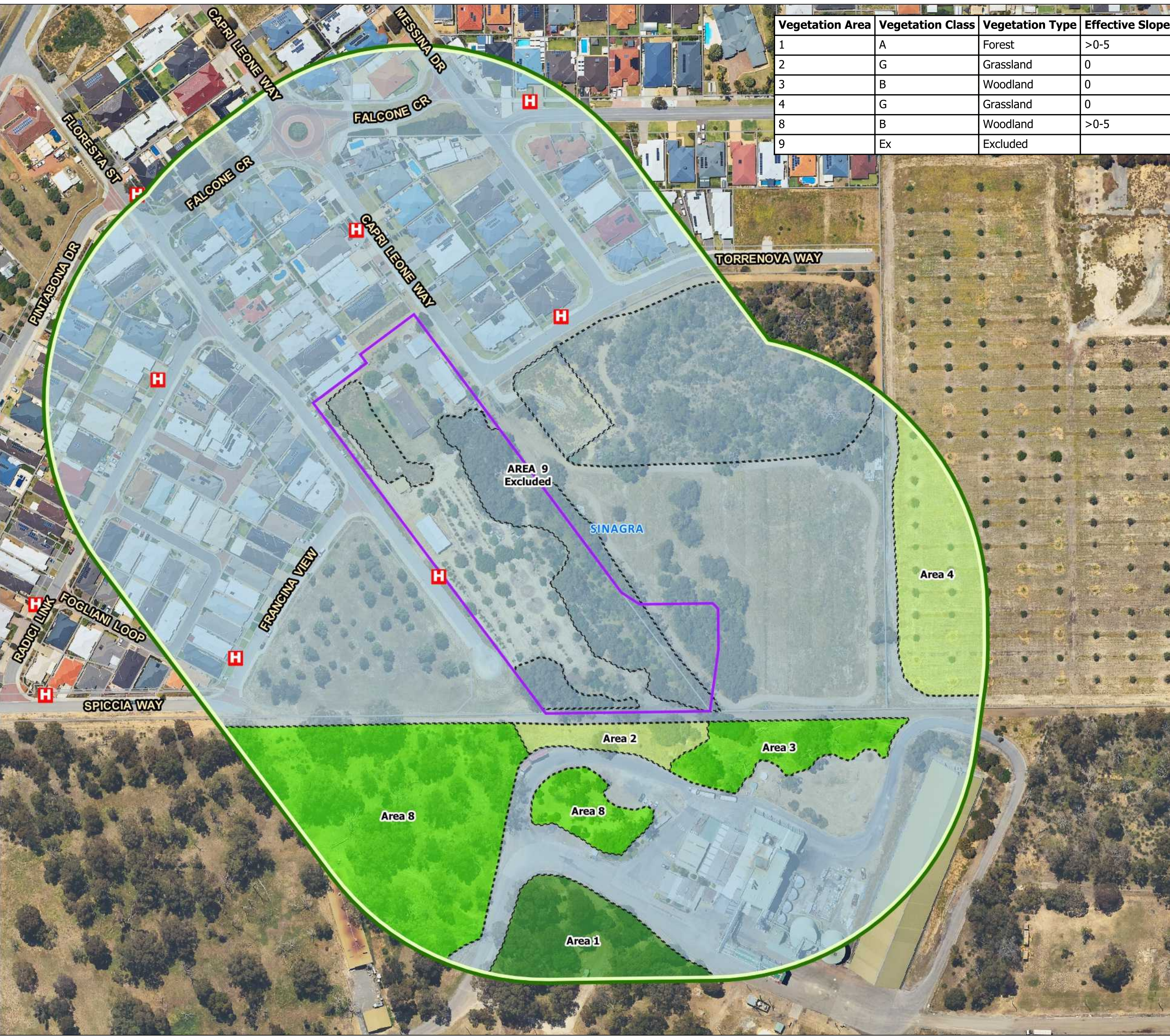
----- LOCALITY -----



AERIAL IMAGERY: Landgate/SLIP



Coordinate System: GDA 1994 MGA Zone 50
 Projection: Universal Transverse Mercator Units: Metre
 Map by: 13-04-2022
 SCALE (A3): 1 : 2000

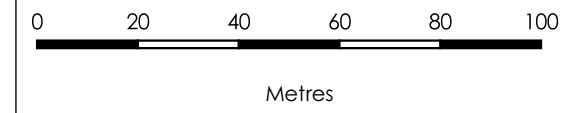


Vegetation Area	Vegetation Class	Vegetation Type	Effective Slope
1	A	Forest	>0-5
2	G	Grassland	0
3	B	Woodland	0
4	G	Grassland	0
8	B	Woodland	>0-5
9	Ex	Excluded	

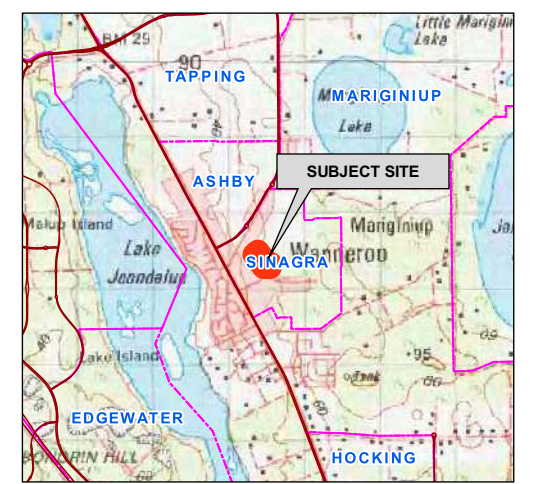
Figure 3.3
**Proposed Subdivision
 BAL Contour Map**

Lot 9001 on Plan 65974
 Pt Lot 9500 on Plan 49784
 30 Capri Leone Way
 SINAGRA
 CITY OF WANNEROO

- LEGEND -----
- Hydrants
 - Proposed Subdivision
 - Subject Site
 - Asset Protection Zone
 - 100m BAL Buffer
 - Cadastral
 - Vegetation Outline
- Bushfire Attack Levels**
- BAL-FZ
 - BAL-40
 - BAL-29
 - BAL-19
 - BAL-12.5
 - BAL-LOW

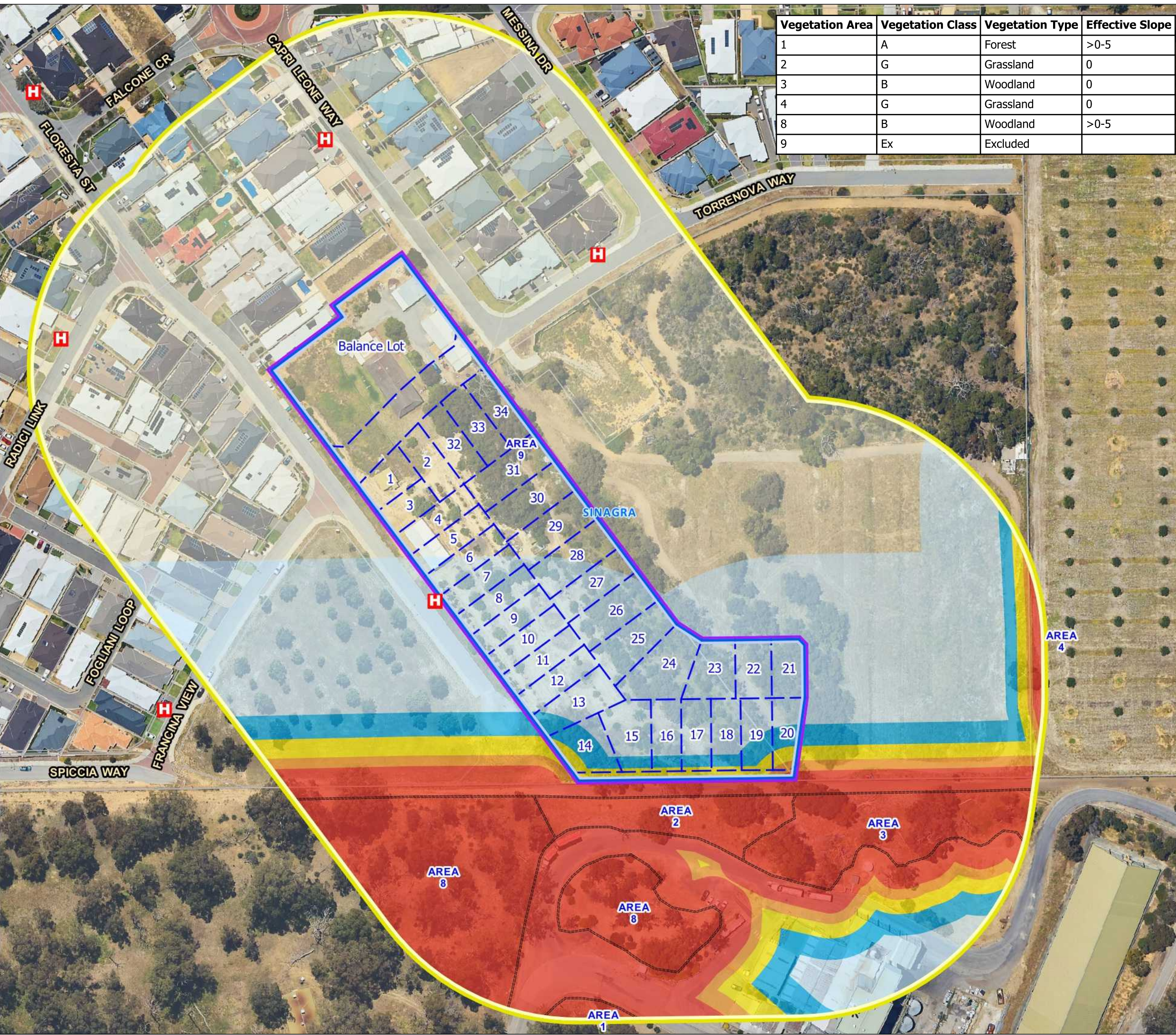


----- LOCALITY -----



AERIAL IMAGERY: Landgate/SLIP

Coordinate System: GDA 1994 MGA Zone 50
 Projection: Universal Transverse Mercator Units: Metre
 Map by: 13-04-2022
 SCALE (A3): 1 : 1500



Disclaimer and Limitation: This map has been prepared for bushfire management planning purposes only. All depicted areas, contours and any dimensions shown are subject to survey. Bushfire Prone Planning does not guarantee that this map is without flaw of any kind and disclaims all liability for any errors, loss or other consequence which may arise from relying on any information depicted.

3.2.2 Bushfire Attack Level Results - Derived from The BAL Contour Map

Table 3.4: Indicative BAL(s) for proposed lots.

BUSHFIRE ATTACK LEVEL FOR FUTURE BUILDING WORKS ON PROPOSED LOTS	
BAL Determination Methodology Applied ¹	Method 1 as per AS 3959:2018 s2.2.6 and Table 2.5.
Lot No.	Indicative BAL (refer to start of s3.2)
Lots 1 to 4	BAL-LOW
Lots 5 to 11	BAL-12.5
Lots 12 and 13	BAL-19
Lots 14 to 19	BAL-29
Lot 20	BAL-40 See Table 3.5 below
Lots 21 to 29	BAL-12.5
Lots 30 to 34	BAL-LOW
Balance Lot	BAL-LOW
<i>Note¹ Assessment inputs applied are presented in Section 3.1.</i>	

Indicative BAL ratings for lots within the subdivision range between BAL-LOW and BAL-29. The BAL Assessment for each lot is the highest BAL rating that applies to the lot. For some lots it is likely that a lower BAL rating can be achieved for future buildings, depending upon the size and location of the building on the lot.

Table 3.5: Indicative bushfire attack levels and corresponding building setbacks.

INDICATIVE BUSHFIRE ATTACK LEVELS FOR FUTURE BUILDINGS ON PROPOSED LOTS AND REQUIRED BUILDING SETBACKS							
Lot ID.	Vegetation Separation Distance to Boundaries of Proposed Lots (stated when relevant)	Relevant Vegetation Area/s ¹	Relevant Lot Boundary ²	Highest BAL Impacting the Lot	AS 3959:2018 BAL Determination Method Applied	Required Minimum Building Setback to Achieve the Stated BAL (from relevant lot boundary)	
	meters					BAL	metres
20	10.4	Area 3	Southern	BAL-40	Method 1	BAL-29	3.6
<p>Note ¹: The vegetation area(s) that generate the highest BAL for the lot.</p> <p>Note²: The lot boundary adjacent to the relevant vegetation area from which the required building setback distance to achieve the stated BAL is to be applied.</p>							

It should be noted that where the proposed road, by others, adjoining the southern boundary of the development is built prior to construction of the subdivision the BAL rating of Lot 20 will be BAL-29.

4 IDENTIFICATION OF BUSHFIRE HAZARD ISSUES

In response to the Bushfire Management Plan requirements established by Appendix 5 of the Guidelines for Planning in Bushfire Prone Areas (WAPC 2021 v1.4), the following statements are made to assist in the understanding of whether the proposal is likely to be able to comply with the bushfire protection criteria now or in subsequent planning stages.

Spatial Context - Broader Landscape Considerations	
Wider road network and access constraints	The proposed subdivision is located within a residential built up area where there are multiple access/egress routes available to the public.
Proximity of settlements and emergency services	The proposed subdivision is located in the suburb of Sinagra. The nearest commercial centre is located in Wanneroo approximately 2 kms by road to the south of the subject lot. The nearest emergency service is the Wanneroo Central Bush Fire Brigade located approximately 2.5 kms by road (3 minutes travel time) north of the subject lot.
Bushfire prone vegetation types and extent (including conserved vegetation)	There are no significant extents of bushfire prone vegetation close to the proposed subdivision. An isolated area of woodland and forest (70 ha) is located to the south of the subject lot and this would be the main bushfire threat to the site. Some retained vegetation surrounds Lake Joondalup approximately 900 meters to the west of the site.
Topography and fire behaviour interactions.	The topography rises gently from west to east with slopes of zero to five degrees. Bushfire rates of spread can double for every ten degrees of upslope while downslopes will slow the rate of spread.
Potential for extreme fire behaviour and pyro convective events.	Extreme fire behaviour is unlikely near the proposed subdivision due to large built up residential developments surrounding the site and relatively small fragmented sites of bushfire vegetation.
Environmental Considerations	
Constraints to implementing required and/or additional bushfire protection measures	The environment considerations have not identified any issues that will affect implementation of the bushfire protection measures.
Provision of Access Within the Subject Site	
Potential constraints	A road, constructed by others, is expected to be in place abutting the southern boundary of the subject site prior to the development of the proposed subdivision. Should this road not be constructed this will restrict the development of some lots within the subdivision.
Potential Bushfire Impacts	
Flame and radiant heat and ability to establish an APZ	Establishment of the required Asset Protection Zones will prevent flame contact to future dwellings from classified vegetation. Application of the bushfire construction standard will mitigate the risks from radiant heat impact to what is considered an acceptable level.
Embers/firebrands, smoke and fire-driven wind	These will be the major impacts to the subject site. The appropriate protection measures of building construction and strict management of the APZ will mitigate the risk to what is considered an acceptable level.

5 ASSESSMENT AGAINST THE BUSHFIRE PROTECTION CRITERIA ESTABLISHED BY THE GUIDELINES

For a subdivision application to be considered compliant with SPP 3.7, it must satisfy (achieve) the intent of each of the four elements of the bushfire protection criteria. These criteria are established by the *Guidelines for Planning in Bushfire Prone Areas WAPC 2021 v1.4*). Compliance can be achieved by either:

- Meeting all applicable acceptable solutions corresponding to each element (i.e. the minimum bushfire protection measures that are deemed to satisfy planning requirements); or
- Where an acceptable solution cannot be met, by developing a performance solution that satisfies the established requirements.

5.1 Local Government Variations to Apply

Local governments may add to or modify the acceptable solutions of the Bushfire Protection Criteria (BPC) and/or apply technical requirements that vary from those specified in the *Guidelines for Planning in Bushfire Prone Areas (WAPC)*. In such instances, this Proposal will be assessed against these variations and/or any specific local government technical requirements for emergency access and water. Refer to Appendices 2 and 3 for relevant technical requirements.

Will local or regional variations (endorsed by WAPC / DFES) to the applicable acceptable solutions established by the <i>Guidelines</i> or the <i>Position Statement: Tourism land uses in bushfire prone areas WAPC October 2019</i> , apply to this Proposal?	N/A
---	-----

5.2 Summary of Assessment Against the Bushfire Protection Criteria

SUMMARISED OUTCOME OF THE ASSESSMENT AGAINST THE BUSHFIRE PROTECTION CRITERIA					
Element of the Bushfire Protection Criteria	Basis for the Proposal Achieving Full Compliance with SPP 3.7			The Proposal Cannot Achieve Full Compliance with SPP 3.7	
	Acceptable Solutions Met	Achieves the Intent of the Element		Bushfire planning development type that may not require full compliance is applied	An improvement in bushfire performance compared to the existing development is detailed (refer Note 4)
	All applicable solutions are fully met	All applicable solutions are not fully met. A merit based assessment and/or a bushfire performance comparison of the proposals residual risk with that of the residual risk of the acceptable solution is conducted (refer Note 4)	A performance principle-based solution is applied		
1. Location	✓			N/A	
2. Siting and Design of Development	✓				
3. Vehicular Access	✓				
4. Water	✓				
<p>Note: The development proposal has been assessed:</p> <ol style="list-style-type: none"> Against the requirements established in Appendix 4 of the <i>Guidelines for Planning in Bushfire Prone Areas, WAPC 2021 v1.4 (Guidelines)</i>. The Guidelines are found at https://www.planning.wa.gov.au/8194.aspx; and Applying the interpretation guidance provided in <i>Position Statement: Planning in bushfire prone areas – Demonstrating Element 1: Location and Element 2: Siting and design (WAPC Nov 2019)</i>. Applying any endorsed variations to the Guideline's acceptable solutions and associated technical requirements that have been established by the local government. If known and applicable these have been stated in Section 5.1 with the detail included as an appendix if required by the local government. When non-compliant with SPP 3.7 and when appropriate, by utilising additional compliance pathways that include the application of merit based assessment and comparative bushfire performance. The validity of this approach is derived from relevant decisions made by the responsible authorities (refer Appendix 2). 					

5.3 Assessment Detail

Element 1: Location	
<p>Intent: To ensure that strategic planning proposals, subdivision and development applications are located in areas with the least possible risk of bushfire to facilitate the protection of people, property and infrastructure.</p>	
<p>Compliance: How the proposed development achieves the intent of Element 1:</p>	<p>By fully meeting all applicable acceptable solutions established by the bushfire protection criteria (Guidelines v1.4 WAPC 2021)</p>
<p>ASSESSMENT (COMPLIANCE) STATEMENTS</p>	
<p>For each applicable acceptable solution, the following statements present the results of the assessment of the proposed development/use against the requirements established by the <i>Guidelines (WAPC 2021 v1.4)</i> and apply the interpretation guidance established by the <i>Position Statement: Planning in bushfire prone areas – Demonstrating Element 1: Location and Element 2: Siting and design (WAPC Nov 2019)</i>.</p>	
<p>Acceptable Solution: A1.1: Development Location</p>	
<p>ASSESSMENT AGAINST THE REQUIREMENTS ESTABLISHED BY THE GUIDELINES</p>	
<p>The proposed subdivision will provide an area of land within each lot that can be considered suitable for development as BAL-40 or BAL-FZ construction standards will not be required to be applied. This meets the requirements established by Acceptable Solution A1.1 and its associated explanatory note.</p> <p>Indicative BAL ratings for lots within the subdivision range between BAL-LOW and BAL-29. The exception is Lot 20 which, if the proposed road adjoining the southern boundary of the development is not built prior to the construction of the proposed subdivision, will have a small portion of the lot assessed as BAL-40.</p> <p>Where the proposed road, adjoining the southern boundary of the subject lot, is not built prior to the construction of the proposed subdivision, then building will be restricted on proposed Lot 20 by the application of a restrictive covenant (129BA Transfer of Land Act 189) as per the WAPC Model Subdivision Conditions Schedule (April 2020) Code F3. Figure 3.3 BAL Contour Map depicts the worst case scenario where the proposed southern road is not constructed.</p>	
<p>ASSESSMENT AGAINST THE REQUIREMENTS ESTABLISHED BY THE POSITION STATEMENT</p>	
<p>The position statement establishes that:</p> <ul style="list-style-type: none"> • The source of risk (the hazard) to be considered in Element 1 is the “level of bushfire exposure” from the type and extent of bushfire prone vegetation and the topography of the land on which it exists; and • “Consideration should be given to the site context” which includes the land both “within and adjoining the subject site”. The “hazards remaining within the site should not be considered in isolation of the hazards adjoining the site, as the potential impact of a bushfire will be dependent on the wider risk context.” <p>The position statement also recognises:</p> <ul style="list-style-type: none"> • That the proposed development site and its surrounding land may be part of an area “identified for development or intensification of land use prior to the release of SPP 3.7”; consequently • Consideration by decision-makers “should also be given to improving bushfire management of the site and surrounding area, thereby reducing the vulnerability of people property and infrastructure to bushfire”; and • The application of mitigation measures to lessen the risk to the broader area would include improvements to the local road network (including emergency access ways), improvements/additions to firefighting water supply and increasing separation distance from the hazard. 	

Element 1: Location

The Hazard Within the Subject Site

The whole of the proposed subdivision will be cleared and managed to a low bushfire threat state in perpetuity. There will be no bushfire prone vegetation remaining on the subject site.

The Hazard Adjoining the Subject Site

Built up residential areas currently abut the northern and western boundaries of the subject site. A residential subdivision is currently under construction adjoining the eastern boundary of the subject site.

Areas of woodland and forest exist to the south of the subject site. This will be the main area of effect on the proposed subdivision.

The impact of the slope under the vegetation will be dependent on a bushfire's direction of travel, but slopes in the range of zero to five degrees downslope from the proposed lots do exist. Bushfire travelling upslope will have increased intensity and rate of spread. However, the adjoining land cannot be considered as rugged (which would present the potential for more extreme and variable fire behaviour).

The potential bushfire impact on persons and property within the proposed lots will be radiant heat level and to increase the level of ember attack.

This radiant heat and ember threat will be mitigated by the application of appropriate building design and bushfire construction standards. The ongoing maintenance of the BAL APZs will ensure the buildings will not be impacted by consequential fire within combustible materials used, stored or accumulated within the APZ.

Element 2: Siting and Design of Development

Intent: To ensure that the siting and design of development (note: not building/construction design) minimises the level of bushfire impact.

Compliance: How the proposed development achieves the intent of Element 2:	By fully meeting all applicable acceptable solutions established by the bushfire protection criteria (Guidelines v1.4 WAPC 2021)
---	--

ASSESSMENT (COMPLIANCE) STATEMENTS

For each applicable acceptable solution, the following statements present the results of the assessment of the proposed development/use against the requirements established by the *Guidelines (WAPC 2021 v1.4)* and apply the interpretation guidance established by the *Position Statement: Planning in bushfire prone areas – Demonstrating Element 1: Location and Element 2: Siting and design (WAPC Nov 2019)*.

Acceptable Solution: A2.1: Asset Protection Zone

THE APZ - DEVELOPMENT SITING AND DESIGN PLANNING REQUIREMENTS

The necessary outcome of bushfire planning for development siting and design, is to ensure that a building can be located within the developable portion of any lot (i.e. outside those parts of the lot that form the required R-Code building setbacks, or any other excluded area), and be subject to potential radiant heat from a bushfire not exceeding 29 kW/m² (i.e. a maximum BAL of BAL-29).

This will be achieved when the size of the “low fuel area immediately surrounding a building”, the asset protection zone (APZ), is large enough. This requires a certain separation distance to exist between the building and areas of classified vegetation. These are the BAL-29 APZ dimensions and they will vary dependent on site specific parameters.

The APZ should be contained solely within the boundaries of each lot, except in instances where the neighbouring lot(s) or adjacent public land will be managed in a low-fuel state on an ongoing basis, in perpetuity.

Where possible, planning for siting and design should incorporate elements that include non-vegetated areas (e.g. roads/parking/drainage) and/or formally managed areas of vegetation (public open space/recreation areas/services installed in a common section of land), as either part of the required APZ dimensions or to additionally increase separation distances to provide greater protection. These elements create robust and easier managed asset protection zones.

THE ASSESSMENT

Future buildings on the lot(s) of the proposed subdivision can be surrounded by an APZ that will ensure the potential radiant heat impact of a bushfire does not exceed 29 kW/m² (BAL-29). The required APZ specifications of width, location and management can be achieved

APZ Width: The required APZ dimensions to ensure buildings are subject to a maximum BAL of BAL-29 (measured from any external wall or supporting post or column to the edge of the classified vegetation), has been determined in Section 3.2 of this BMP and are:

BAL-29 APZ Dimensions		
Applicable to Following Lot(s): All Lots	Building to Vegetation Area 1	Minimum 27 metres
	Building to Vegetation Area 2	Minimum 8 metres
	Building to Vegetation Area 3	Minimum 14 metres
	Building to Vegetation Area 4	Minimum 8 metres
	Building to Vegetation Area 8	Minimum 17 metres

Element 2: Siting and Design of Development

APZ Location: The BAL-29 APZ will exist both within and outside the proposed lots. The portions of the required size APZ that exist outside each proposed lot consist of:

- Adjacent residential lots.
- Road verges.

APZ Management: All vegetation that will require modification/removal and future management is onsite and therefore under the control of the landowner.

Retained vegetation will be managed in accordance with the technical requirements established by the Schedule 1: 'Standards for Asset Protection Zones (Guidelines)'. The APZ specifications are also detailed in Appendix 1 and the City of Wanneroo may have additional requirements established by their Fire Mitigation Notice.

THE APZ – REQUIRED DIMENSIONS TO SATISFY FUTURE BUILDING (AND ONGOING MANAGEMENT)

It is important for the landowner to be aware that the APZ dimensions that will be required to be physically established and maintained on each lot surrounding relevant future buildings, may be different to those stated above for the BAL-29 APZ - which is the minimum dimension a planning proposal needs to show can be established to comply with SPP 3.7.

The actual APZ dimensions to be physically established and maintained, will be based on which of the following establishes the larger APZ dimension:

- The dimensions corresponding to the determined BAL of a building (refer to Section 3.2 for explanation of the 'planning' versus 'building' requirements and 'indicative' versus 'determined' BAL); or
- The APZ dimensions established by the local government's Firebreak Notice.

If the dimensions of the APZ that are to be established are known at this time, they will be stated below.

For this proposed subdivision the Asset Protection Zones extend to the boundaries of each lot and includes road verges.

Element 3: Vehicular Access

Intent: To ensure that the vehicular access serving a subdivision/development is available and safe during a bushfire event.

Compliance: How the proposed development achieves the intent of Element 3:	By fully meeting all applicable acceptable solutions established by the bushfire protection criteria (Guidelines v1.4 WAPC 2021)
---	--

ASSESSMENT (COMPLIANCE) STATEMENTS

For each applicable acceptable solution, the following statements present the results of the assessment of the proposed development/use against the requirements established by the *Guidelines (WAPC 2021 v1.4)*.

Acceptable Solution: A3.1: Public Roads

All existing and proposed roads abutting or within the proposed subdivision will comply with the construction requirements of the IPWEA Subdivision Guidelines.

Acceptable Solution: A3.2a: Multiple Access Routes

It is expected by the proponent that the proposed road abutting the southern boundary of the subject subdivision will be constructed prior to the construction of this development. This road will provide access for proposed lots 15 to 19 and allow multiple access/egress routes for all lots within the subdivision (See Figure 5.1).

If the road adjoining the southern extents of the subdivision is not constructed before the proposed subdivision of Lot 9001 is under construction:

1. Proposed Lots 15 to 19 will remain as a balance lot for the subdivision until such time as compliant road access is made available to those lots.
2. Floresta Street will remain as a cul-de-sac.
3. The no through road portion of Floresta Street will be approximately 150 metres in length which is compliant with the requirements of this acceptable solution.

Acceptable Solution: A3.2b: Emergency Access Ways

N/A

Acceptable Solution: A3.3: Through Roads

All proposed roads will be compliant with this acceptable solution for through roads.

If the southern portion of Floresta Street remains as a cul-de-sac, a temporary turnaround area will be installed until such time as this section of road becomes a through road (see Appendix 2 for specifications).

Acceptable Solution: A3.4a: Perimeter Roads

The proposed subdivision is compliant with the requirements for perimeter roads.

If the proposed road by others to the south of the subject site is not constructed prior to construction of the subdivision, compliance may still be achieved as the adjoining classified vegetation to this portion of the subject lot is Class G Grassland.

Acceptable Solution: A3.4b: Fire Service Access Routes

N/A

Acceptable Solution: A3.5: Battle-axe Legs

N/A

Acceptable Solution: A3.6: Private Driveways

N/A

Figure 5.1

Proposed Subdivision Road Layout Map

Lot 9001 on Plan 65974
 Pt Lot 9500 on Plan 49784
 30 Capri Leone Way
 SINAGRA
 CITY OF WANNEROO

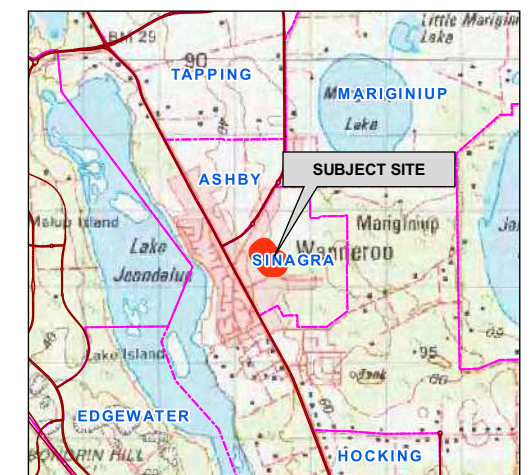
----- LEGEND -----

- Subdivision - Proposed
- Subdivision - Under Construction
- Subject Site
- Cadastral
- Roads - Proposed
- Roads - Under Construction
- Roads - By Others



Metres

----- LOCALITY -----



AERIAL IMAGERY: Landgate/SLIP



Coordinate System: GDA 1994 MGA Zone 50
 Projection: Universal Transverse Mercator Units: Metre
 Map by: 13-04-2022
 SCALE (A3): 1 : 1200



Disclaimer and Limitation: This map has been prepared for bushfire management planning purposes only. All depicted areas, contours and any dimensions shown are subject to survey. Bushfire Prone Planning does not guarantee that this map is without flaw of any kind and disclaims all liability for any errors, loss or other consequence which may arise from relying on any information depicted.

Element 4: Water

Intent: To ensure water is available to the subdivision, development or land use to enable people, property and infrastructure to be defended from bushfire.

Compliance: How the proposed development achieves the intent of Element 4:

By fully meeting all applicable acceptable solutions established by the bushfire protection criteria (Guidelines v1.4 WAPC 2021)

ASSESSMENT (COMPLIANCE) STATEMENTS

For each applicable acceptable solution, the following statements present the results of the assessment of the proposed development/use against the requirements established by the *Guidelines (WAPC 2021 v1.4)*.

Acceptable Solution: A4.1: Identification of Future Water Supply

N/A

Acceptable Solution: A4.2: Provision of Water for Firefighting Purposes

A reticulated water supply is available to the proposed subdivision. The closest existing fire hydrant is located on Floresta Street at the front of proposed Lot 7. Further hydrants will be installed as required by the relevant authorities.

Staged Development and Management of Potential Bushfire Hazard Issues

Where the proposed development is staged each stage must comply with the requirements of the Guidelines for Planning in Bushfire Prone Areas and this Bushfire Management Plan. This may require the creation of roads, temporary emergency access ways, management of land or installation of water supply lines outside that particular stage to achieve compliance.

Vegetation on balance lot(s) may adversely affect the indicative BAL ratings of lots being developed. This should be assessed prior to the sale of the lots and the required vegetation on the balance lot managed and maintained until developed, or the indicative BAL ratings for the affected lots amended.

5.4 Recommended Additional Bushfire Protection Measures

The following bushfire protection measures are recommended to be implemented and maintained. They are additional to those established by the relevant acceptable solutions applied to the proposed subdivision, development or use.

The relevant acceptable solutions are those against which this planning proposal has been assessed in Section 5.3 of this Bushfire Management Plan.

5.4.1 Recommended Additional Measures to Improve Bushfire Performance

Some future buildings on lots within the proposed subdivision will be subject to a BAL rating of BAL-LOW, and these buildings will not be required to be constructed to bushfire standards. However, as these buildings may still be subject to ember attack during a bushfire event, Bushfire Prone Planning recommends that some form protection be considered such as construction to BAL-12.5 standards (i.e. ember protection).

SUMMARY OF RECOMMENDED ADDITIONAL BUSHFIRE PROTECTION MEASURES (TREATMENTS) TO BE APPLIED		
Treatment Category	Brief Description	The Relevant Element and its Intent the Treatment Has Been Developed to Help Achieve
Siting and Design	Recommended minimum bushfire construction standard for buildings within the proposed subdivision to be BAL-12.5.	Element 2

6 RESPONSIBILITIES FOR IMPLEMENTATION AND MANAGEMENT OF THE BUSHFIRE PROTECTION MEASURES

Table 6.1: BMP Implementation responsibilities prior to the issue of titles.

Developer (Landowner) - Prior to Issue of Titles		
No.	Implementation Actions	Subdivision Clearance
<p>Note: Planning approval may be conditioned with the requirements:</p> <ol style="list-style-type: none"> To place certain notifications on the certificates of title and the deposited plan, regarding the existence of this bushfire management plan and the obligations it creates; and To provide certification of the implementation of certain bushfire protection measures established by this bushfire management plan. 		
1	<p>A notification, pursuant to Section 165 of the <i>Planning and Development Act 2005</i>, is to be placed on the certificate(s) of title of the proposed lot(s) advising that the land is bushfire prone and subject to a Bushfire Management Plan.</p> <p>Notice of this notification is to be included on the diagram or plan of survey (deposited plan). See Code F2 of the Model Subdivision Schedule, WAPC June 2021.</p>	<input type="checkbox"/>
2	<p>A restrictive covenant may be required for proposed Lot 20 where the proposed road adjoining the southern extent of the subject lot is not constructed.</p> <p>Condition (as per Code F3 of Model Subdivision Schedule, WAPC April 2020):</p> <p>A plan is to be provided to identify areas of the proposed lot(s) that have been assessed as BAL-40 or BAL-FZ.</p> <p>A restrictive covenant to the benefit of the local government pursuant to section 129BA of the <i>Transfer of Land Act 1893</i>, is to be placed on the certificate(s) of title of the proposed lot(s) advising of the existence of a restriction on the use of land within areas that have been assessed as BAL-40 or BAL-FZ.</p> <p>Notice of this restriction is to be included on the diagram or plan of survey (deposited plan). The restrictive covenant is to state as follows:</p> <p>"No habitable buildings are to be built within areas identified as BAL-40 or BAL-FZ". (Local Government).</p>	<input type="checkbox"/>
3	Construct the public roads and cul-de-sacs to the standards stated in the BMP.	<input type="checkbox"/>
4	Install the reticulated water supply (hydrants) to the standards stated in the BMP.	<input type="checkbox"/>

Table 6.2: BMP Implementation responsibilities prior to lot sale, occupancy or building.

Landowner (Developer) - Prior to Sale of Lot(s), Occupancy or Building	
No.	Implementation Actions
1	Prior to sale and post planning approval, the entity responsible for having the BMP prepared should ensure that anyone listed as having responsibility under the Plan has endorsed it and is provided with a copy for their information and informed that it contains their responsibilities. This includes the landowners/proponents (including future landowners where the Plan was prepared as part of a subdivision approval), local government and any other authorities or referral agencies ('Guidelines' s4.6.3).
2	<p>Prior to sale of the subject lots, each individual lot is to be compliant with the City of Wanneroo Fire Mitigation Notice issued under s33 of the Bushfires Act 1954.</p> <p>This may include specifications for asset protection zones that differ from the Guideline's APZ Standards, with the intent to better satisfy local conditions. When these are more stringent than those created by the Guidelines, or less stringent and endorsed by the WAPC and DFES, they must be complied with. Refer to Appendix 1.</p>
3	Prior to building, the lot is to be managed to the Asset Protection Zone requirements stated in this Bushfire Management Plan. That is, the whole of the lot is to be managed to a low bushfire threat state.
4	<p>Prior to any building work, inform the builder of the existence of this Bushfire Management Plan and the responsibilities it contains, regarding the required construction standards. This will be:</p> <ul style="list-style-type: none"> • The standard corresponding to the determined BAL, as per the bushfire provisions of the Building Code of Australia (BCA); and/or • A higher standard because the BMP establishes that the construction standard is to correspond to a higher BAL as an additional bushfire protection measure.
5	To consider implementing the recommended additional bushfire protection measure contained in Section 5.4 of this Bushfire Management Plan, in addition to the measures that are established by the acceptable solutions.

Table 6.3: Ongoing management responsibilities for the Landowner/Occupier.

Landowner/Occupier - Ongoing	
No.	Ongoing Management Actions
1	<p>Maintain the Asset Protection Zone (APZ) on the lot to the requirements of this Bushfire Management Plan. That is, the whole of the lot is to be maintained to a low bushfire threat state.</p> <p>Maintain the APZ to the standards established by the Guidelines (refer to Appendix 1) or as varied by the local government through their Firebreak Notice. This is the responsibility of the occupier.</p>
2	<p>Comply with the City of Wanneroo Fire Mitigation Notice issued under s33 of the Bush Fires Act 1954.</p> <p>This may include specifications for asset protection zones that differ from the Guideline's APZ Standards, with the intent to better satisfy local conditions. When these are more stringent than those created by the Guidelines, or less stringent and endorsed by the WAPC and DFES, they must be complied with. Refer to Appendix 1.</p>
3	<p>Ensure that any builders (of future structures on the lot) are aware of the existence of this Bushfire Management Plan and the responsibilities it contains regarding the application of construction standards corresponding to a determined BAL.</p>
4	<p>Ensure all future buildings the landowner has responsibility for, are designed and constructed in full compliance with:</p> <ol style="list-style-type: none"> 1. the requirements of the WA Building Act 2011 and the bushfire provisions of the Building Code of Australia (BCA); and 2. with any identified additional requirements established by this BMP or the local government.

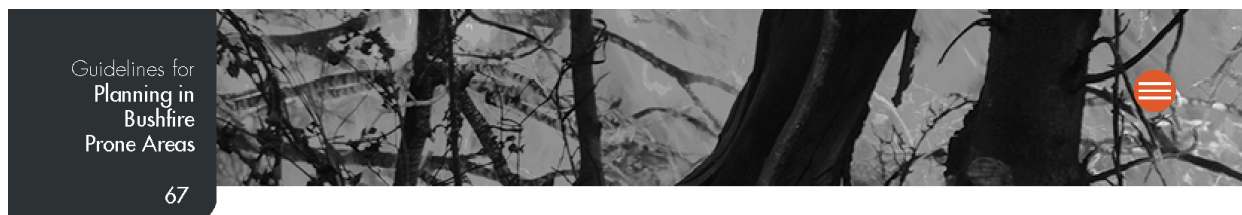
Table 6.4: Ongoing management responsibilities for the Local Government.

Local Government - Ongoing	
No.	Ongoing Management Actions
1	<p>Monitor landowner compliance with the Bushfire Management Plan and the annual Fire Mitigation Notice.</p>
2	<p>Where control of an area of vegetated land is vested in the control of the local government and that area of land has influenced the assessed BAL(s) of the subject site(s), there is an obligation to consider the impact of any changes to future vegetation management and/or revegetation plans with respect to that area.</p>

APPENDIX 1: TECHNICAL REQUIREMENTS FOR ONSITE VEGETATION MANAGEMENT

A1.1 Requirements Established by the Guidelines – Standards for Asset Protection Zones

(Source: *Guidelines for Planning in Bushfire Prone Areas - WAPC 2021 v1.4 Appendix 4, Element 2, Schedule 1 and Explanatory Note E2.1*)



ELEMENT 2: SITING AND DESIGN OF DEVELOPMENT

EXPLANATORY NOTES

E2 Managing an Asset Protection Zone (APZ) to a low threat state

An APZ is a low fuel area maintained around a habitable building to increase the likelihood that it will survive a bushfire, by providing a defensible space and reducing the potential for direct flame contact, radiant heat exposure and ember attack.

Vegetation management within an APZ should provide defensible space and be maintained to a low threat state, in perpetuity, in accordance with the requirements outlined in Schedule 1.

The width of an APZ varies with slope and vegetation type, however it should only be as wide as needed to ensure the potential radiant heat impact of a bushfire does not exceed $29\text{kW}/\text{m}^2$ (BAL-29), or $10\text{kW}/\text{m}^2$ where a building is identified for use as an on-site shelter. An APZ is generally not required where a building or development site achieves $29\text{kW}/\text{m}^2$ (BAL-29) or lower in its pre-development state (prior to any vegetation clearing or modification).

An APZ should include an area of defensible space immediately adjoining a building, that is kept free from combustible items and obstructions, within which firefighting operations can be undertaken to defend the structure. Where a lot contains a building envelope, it may not be necessary for the entire building envelope to achieve $29\text{kW}/\text{m}^2$ (BAL-29) as this may result in significant unnecessary clearing. It is recommended that the BMP identifies that a sufficient APZ can be accommodated within the building envelope, with the development site and associated APZ to be determined at the development approval stage.

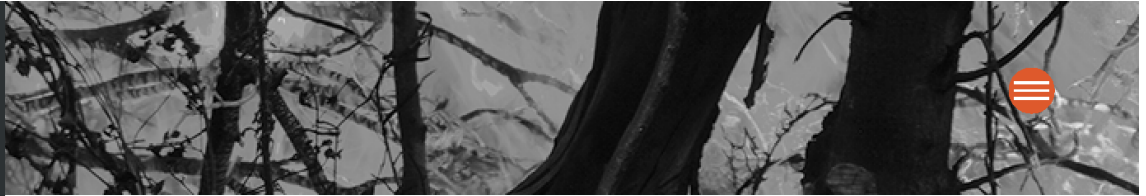
An APZ should be contained within the boundaries of the lot on which the building is situated, except in instances where it is demonstrated that the vegetation on the adjoining land is managed in a low threat state, as per cl. 2.2.3.2 of AS 3959, such as a road, managed park, rocky outcrop or a water body.

The siting of a habitable building and associated APZ should aim to minimise the clearing of vegetation. The BMP should demonstrate that the proposed APZ has minimised the unnecessary loss of vegetation or potential for conflict with landscape or environmental objectives; and complies with environmental approvals/exemptions (where necessary). A re-design or reduction in lot yield may be necessary to minimise the removal and modification of remnant vegetation.

It is recommended that development be located on flat areas or slopes less than 20 degrees (especially where classified vegetation is located downslope to a building) and away from ridge tops, crests or narrow gullies, as bushfire can spread rapidly in these areas. Circumstances where these locations may be suitable for development to occur include where the land is already cleared, and $29\text{kW}/\text{m}^2$ (BAL-29) or lower can be achieved for the whole development site without the use of an APZ. To ensure soil stability within an APZ, vegetation removal on slopes exceeding 18 degrees is discouraged.

Figure 17: Topography considerations for building locations





ELEMENT 2: SITING AND DESIGN OF DEVELOPMENT

EXPLANATORY NOTES

Fine fuel load should be maintained to less than two tonnes per hectare, however this is often a subjective assessment. Reducing fuel load levels does not necessarily require the removal of existing vegetation. A combination of methods can be utilised to reduce fuel load such as raking, weed removal, pruning, mulching and/or the removal of plant material.

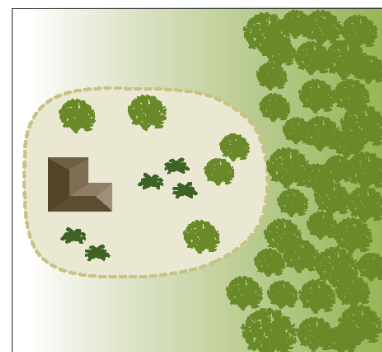
A simple method to estimate fuel load is to roughly equate one tonne of fuel load per hectare as 100 grams per square metre. For example, two tonnes per hectare of leaf litter is roughly 200 grams of leaf litter per square metre and eight tonnes per hectare is roughly 800 grams. Eucalyptus leaf litter is approximately 100 grams per handful, so two handfuls of litter per square metre will roughly equate to two tonnes per hectare. Different types of fine fuel, like mulch or pine needles may be more or less than a handful, however the 100 grams per square metre rule of thumb can still be used.

The landowner or proponent is responsible for maintaining an APZ in accordance with Schedule 1 - Standards for Asset Protection Zones. Ongoing maintenance of an APZ is usually enforced through the local government firebreak notice issued under section 33 of the *Bushfires Act 1954*, and/or through a condition of a development approval, which requires the implementation of measures identified within a BMP.

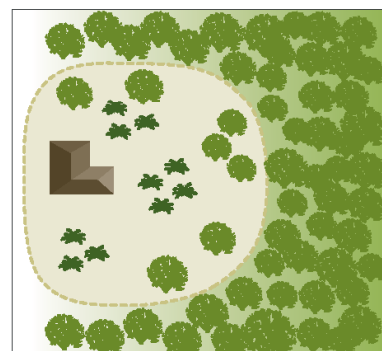
A copy of the firebreak notice and Schedule 1 should be included in a BMP specifically as a how-to guide for the landowner, and to demonstrate to decision-makers that the measures outlined in the BMP to achieve the appropriate BAL rating through provision and ongoing management of an APZ, can be implemented.

Regardless of whether an Asset Protection Zone exists in accordance with the acceptable solutions and is appropriately maintained, it should be noted that fire fighters are not obliged to protect an asset if they think the separation distance between the dwelling and vegetation is unsafe.

Hazard on one side



Hazard on three sides



Legend

- APZ
- trees
- shrubs

Figure 18: Design of Asset Protection Zone

Refer to Schedule 1: Standards for Asset Protection Zones

ELEMENT 2: SITING AND DESIGN OF DEVELOPMENT

EXPLANATORY NOTES

E2 Landscaping and design of an asset protection zone

Landscaping, design, and maintenance of an APZ in a bushfire prone area can significantly improve the bushfire resilience of a building. An APZ should not be seen as an area entirely cleared of vegetation, but as a strategically designed space that gives holistic consideration to how existing or proposed vegetation or non-combustible features interact with, or affect the building's bushfire resilience.

A well designed APZ provides a greater level of vegetation management within the first few metres of a building with, for example, less vegetation or inclusion of non-combustible materials. The vegetation within the remainder of an APZ can increase further away from the building with carefully considered plant selection and landscaping techniques.

Strategic landscaping measures can be applied, such as replacing weeds with low flammability vegetation (refer to E2 Plant Flammability) to create horizontal and vertical separations between the retained vegetation. The accumulation of fine fuel load from different plants is an important consideration for ongoing maintenance in accordance with Schedule 1. For example, when planting ground covers under deciduous trees within an APZ, the total fine fuel load prescribed in Schedule 1 will include any dead plant material from ground covers and leaf litter from the trees.

Plant density and final structure and form of mature vegetation should be considered in the initial landscaping stages. For example, clumps of sapling shrubs planted at a density without consideration of future growth, may increase the bushfire risk as a clump will quickly grow to exceed 5m². It should be noted that in some cases, a single shrub in a mature state may be so dense as to fill a 5m² clump alone.

The location of plants within an APZ is a key design technique. Separation of garden beds with areas of low fuel or non-combustible material, will break up fuel continuity and reduce the likelihood of a bushfire running through an APZ and subjecting a dwelling to radiant heat or direct flame contact. It is important to note, where mature trees are separated from a building by six metres, but the canopy has grown to extend or overhang a building, maintenance and pruning to remove the overhanging branches should be undertaken without the entirety of the tree being removed.

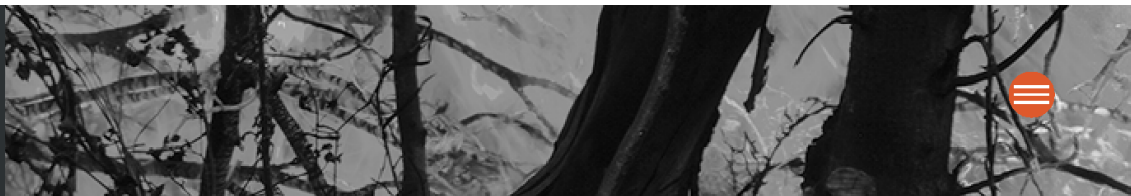
Mulches used within the APZ should be non-combustible. The use of stone, gravel, rock and crushed mineral earth is encouraged. Wood mulch >6mm in thickness may be used, however it is recommended that it is used in garden beds or areas where the moisture level is higher by regular irrigation. These materials could be sourced from non-toxic construction and demolition waste giving the added benefit of reducing the environmental impact of any 'hard landscaping' actions.

Combustible objects, plants, garden supplies such as mulches, fences made from combustible material, should be avoided within 10 metres of a building. Vines or climbing plants on pergolas, posts or beams, should be located away from vulnerable parts of the building, such as windows and doors. Non-flammable features can be used to provide hazard separation from classified vegetation, such as tennis courts, pools, lawns and driveways or paths that use inorganic mulches (gravel or crushed rock). Consider locating firewood stacks away from trees and habitable buildings.

Incorporation of landscaping features, such as masonry feature walls can provide habitable buildings with barriers to wind, radiant heat and embers. These features can include noise walls or wind breaks. Use of Appendix F of AS 3959 for bushfire resistant timber selection within areas of 29kW/m² (BAL-29) or below, or the use of non-combustible fencing materials such as iron, brick, limestone, metal post and wire is encouraged.

In addition to regular maintenance of an APZ, further bushfire protection can be provided at any time by:

- ensuring gutters are free from vegetation;
- installing gutter guards or plugs;
- regular cleaning of underfloor spaces, or enclosing them to prevent gaps;
- trimming and removing dead plants or leaf litter;
- pruning climbing vegetation (such as vines) on a trellis, to ensure it does not connect to a building, particularly near windows and doors;
- removing vegetation in close proximity to a water tank to ensure it is not touching the sides of a tank; and/or
- following the requirements of the relevant local government section 33 fire break notice, which may include additional provisions such as locating wood piles more than 10 metres from a building.



ELEMENT 2: SITING AND DESIGN OF DEVELOPMENT

EXPLANATORY NOTES

Preparation of a property prior to the bushfire season and/or in anticipation of a bushfire is beneficial even if your plan is to evacuate. As embers can travel up to several kilometres from a bushfire and fall into small spaces and crevices or land against the external walls of a building, best practice recommends that objects within the APZ are moved away from the building prior to any bushfire event. Objects may include, but are not limited to:

- door mats;
- outdoor furniture;
- potted plants;
- shade sails or umbrellas;
- plastic garbage bins;
- firewood stacks;
- flammable sculptures; and/or
- playground equipment and children's toys.

E2 Plant flammability

There are certain plant characteristics that are known to influence flammability, such as moisture or oil content and the presence and type of bark. Plants with lower flammability properties may still burn during a bushfire event, but may be more resistant to burning and some may regenerate faster post-bushfire.

There are many terms for plant flammability that should not be confused, including:

- Fire resistant – plant species that survive being burnt and will regrow after a bushfire and therefore may be highly flammable and inappropriate for a garden in areas of high bushfire risk.
- Fire retardant – plants that may not burn readily or may slow the passage of a bushfire.
- Fire wise – plants that have been identified and selected based on their flammability properties and linked to maintenance advice and planting location within a garden.

Although not a requirement of these Guidelines, local governments may develop their own list of fire wise or fire-retardant plant species that suit the environmental characteristics of an area. When developing a recommended plant species list, local governments should consult with ecologists, land care officers or environmental authorities to ensure the plants do not present a risk to endangered ecological communities, threatened, or endangered species or their habitat.

When selecting plants, private landholders and developers should aim for plants within the APZ that have the following characteristics:

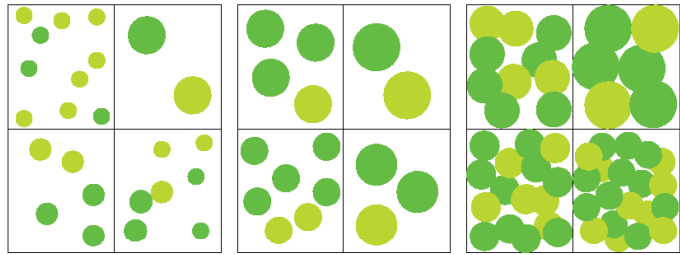
- grow in a predicted structure, shape and height;
- are open and loose branching with leaves that are thinly spread;
- have a coarse texture and low surface-area-to-volume ratio;
- will not drop large amounts of leaves or limbs, that require regular maintenance;
- have wide, flat, and thick or succulent leaves;
- trees that have bark attached tightly to their trunk or have smooth bark;
- have low amounts of oils, waxes, and resins (which will often have a strong scent when crushed);
- do not produce or hold large amounts of fine dead material in their crowns; and/or
- will not become a weed in the area.

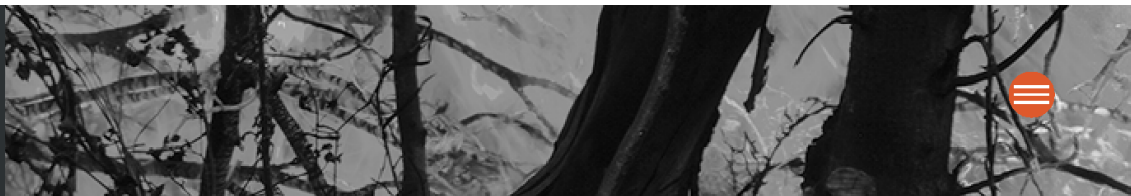
Refer to the WAPC Bushfire and Vegetation Fact Sheet for further information on clearing and vegetation management and APZ landscaping, design and plant selection reference material.



ELEMENT 2: SITING AND DESIGN OF DEVELOPMENT

SCHEDULE 1: STANDARDS FOR ASSET PROTECTION ZONES

OBJECT	REQUIREMENT
Fences within the APZ	<ul style="list-style-type: none"> Should be constructed from non-combustible materials (for example, iron, brick, limestone, metal post and wire, or bushfire-resisting timber referenced in Appendix F of AS 3959).
Fine fuel load (Combustible, dead vegetation matter <6 millimetres in thickness)	<ul style="list-style-type: none"> Should be managed and removed on a regular basis to maintain a low threat state. Should be maintained at <2 tonnes per hectare (on average). Mulches should be non-combustible such as stone, gravel or crushed mineral earth or wood mulch >6 millimetres in thickness.
Trees* (>6 metres in height)	<ul style="list-style-type: none"> Trunks at maturity should be a minimum distance of six metres from all elevations of the building. Branches at maturity should not touch or overhang a building or powerline. Lower branches and loose bark should be removed to a height of two metres above the ground and/or surface vegetation. Canopy cover within the APZ should be <15 per cent of the total APZ area. Tree canopies at maturity should be at least five metres apart to avoid forming a continuous canopy. Stands of existing mature trees with interlocking canopies may be treated as an individual canopy provided that the total canopy cover within the APZ will not exceed 15 per cent and are not connected to the tree canopy outside the APZ. <p data-bbox="572 1249 1118 1312">Figure 19: Tree canopy cover – ranging from 15 to 70 per cent at maturity</p> <div data-bbox="572 1339 1254 1626">  <p data-bbox="663 1603 703 1626">15%</p> <p data-bbox="895 1603 935 1626">30%</p> <p data-bbox="1126 1603 1166 1626">70%</p> </div>
Shrub* and scrub* (0.5 metres to six metres in height). Shrub and scrub >6 metres in height are to be treated as trees.	<ul style="list-style-type: none"> Should not be located under trees or within three metres of buildings. Should not be planted in clumps >5 square metres in area. Clumps should be separated from each other and any exposed window or door by at least 10 metres.
Ground covers* (<0.5 metres in height. Ground covers >0.5 metres in height are to be treated as shrubs)	<ul style="list-style-type: none"> Can be planted under trees but must be maintained to remove dead plant material, as prescribed in 'Fine fuel load' above. Can be located within two metres of a structure, but three metres from windows or doors if >100 millimetres in height.



ELEMENT 2: SITING AND DESIGN OF DEVELOPMENT

SCHEDULE 1: STANDARDS FOR ASSET PROTECTION ZONES

OBJECT	REQUIREMENT
Grass	<ul style="list-style-type: none"> • Grass should be maintained at a height of 100 millimetres or less, at all times. • Wherever possible, perennial grasses should be used and well-hydrated with regular application of wetting agents and efficient irrigation.
Defendable space	<ul style="list-style-type: none"> • Within three metres of each wall or supporting post of a habitable building, the area is kept free from vegetation, but can include ground covers, grass and non-combustible mulches as prescribed above.
LP Gas Cylinders	<ul style="list-style-type: none"> • Should be located on the side of a building furthest from the likely direction of a bushfire or on the side of a building where surrounding classified vegetation is upslope, at least one metre from vulnerable parts of a building. • The pressure relief valve should point away from the house. • No flammable material within six metres from the front of the valve. • Must sit on a firm, level and non-combustible base and be secured to a solid structure.

* Plant flammability, landscaping design and maintenance should be considered – refer to explanatory notes

A1.2 Requirements Established by the Local Government – the Firebreak Notice

The local government's current Firebreak Notice is available on their website, at their offices and is distributed as ratepayer's information. It must be complied with.

These requirements are established by the local government's Firebreak Notice created under s33 of the Bushfires Act 1954 and issued annually (potentially with revisions). The Firebreak Notice may include additional components directed at managing fuel loads, accessibility and general property management with respect to limiting potential bushfire impact.

If Asset Protection Zone (APZ) specifications are defined in the Firebreak Notice, these may differ from the Standards established by the Guideline's, with the intent to better satisfy local conditions. When these are more stringent than those created by the Guidelines, or less stringent and endorsed by the WAPC and DFES, they must be complied with.

The APZ dimensions to be physically established and maintained, will be based on which of the following establishes the larger APZ dimension:

- The dimensions corresponding to the determined BAL of a building (refer to Section 3.2 explanation of the 'planning' versus 'building' requirements and 'indicative' versus 'determined' BAL(s)); or
- The APZ dimensions established by the local government's Firebreak Notice.

A1.3 Requirements Recommended by DFES – Property Protection Checklists

Further guidance regarding ongoing/lasting property protection (from potential bushfire impact) is presented in the publication 'DFES – Fire Chat – Your Bushfire Protection Toolkit'. It is available from the Department of Fire and Emergency Services (DFES) website.

A1.4 Requirements Established by AS 3959:2018 – 'Minimal Fuel Condition'

This information is provided for reference purposes. This knowledge will assist the landowner to comply with Management Requirement No. 3 set out in the Guidance Panel at the start of this Appendix. It identifies what is required for an area of land to be excluded from classification as a potential bushfire threat.

"Australian Standard - AS 3959:2018 Section 2.2.3.2: Exclusions - Low threat vegetation and non-vegetated areas:

The Bushfire Attack Level shall be classified BAL-LOW where the vegetation is one or a combination of the following:

- a) Vegetation of any type that is more than 100m from the site.*
- b) Single areas of vegetation less than 1ha in area and not within 100m of other areas of vegetation being classified vegetation.*
- c) Multiple area of vegetation less than 0.25ha in area and not within 20m of the site or each other or other areas of vegetation being classified vegetation.*
- d) Strips of vegetation less than 20m in width (measured perpendicular to the elevation exposed to the strip of vegetation) regardless of length and not within 20m of the site or each other, or other areas of vegetation being classified vegetation.*
- e) Non-vegetated areas, that is, areas permanently cleared of vegetation, including waterways, exposed beaches, roads, footpaths, buildings and rocky outcrops.*
- f) Vegetation regarded as low threat due to factors such as flammability, moisture content or fuel load. This includes grassland managed in a **minimal fuel condition**, (means insufficient fuel available to significantly increase the severity of a bushfire attack – for example, recognisable as short cropped grass to a nominal height of 100mm), mangroves and other saline wetlands, maintained lawns, golf courses (such as playing areas and fairways), maintained public reserves and parklands, sporting fields, vineyards, orchards, banana plantations, market gardens (and other non-curing crops), cultivated gardens, commercial nurseries, nature strips and windbreaks (single row of trees)."*

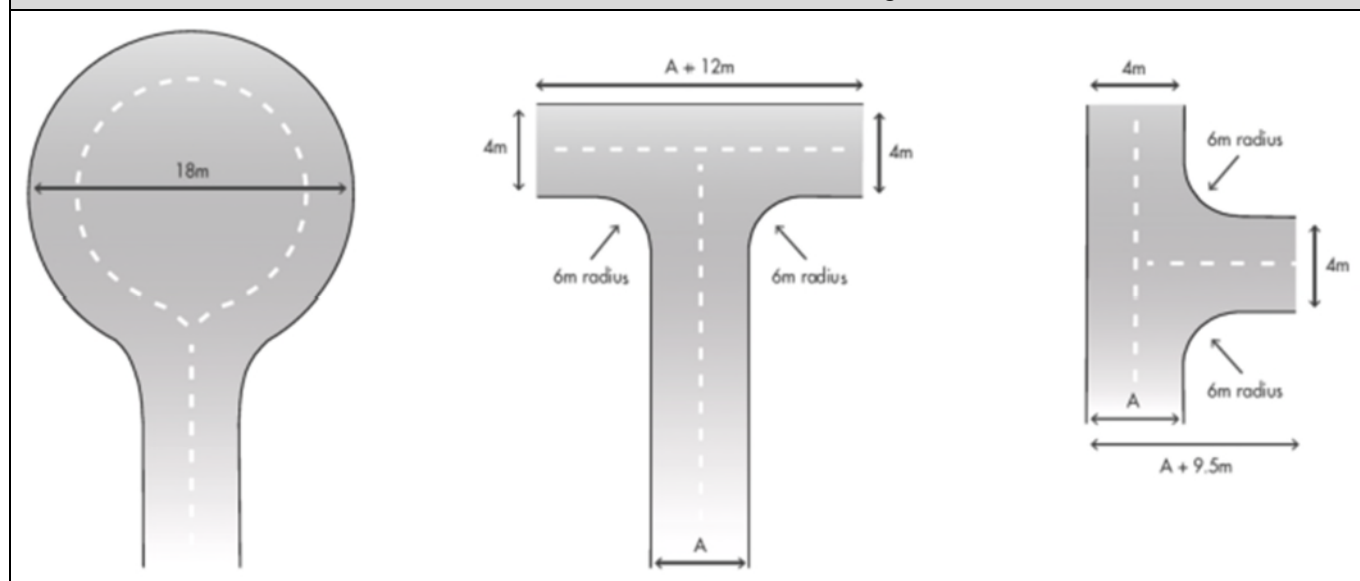
APPENDIX 2: TECHNICAL REQUIREMENTS FOR VEHICULAR ACCESS

The design/layout requirements for access are established by the acceptable solutions of the Guidelines (DPLH, 2021 v1.4) Element 3 and vary dependent on the access component, the land use and the presence of 'vulnerable' persons. Consequently, the best reference source are the Guidelines. The technical requirements that are fixed for all components and uses are presented in this appendix.

GUIDELINES TABLE 6, EXPLANATORY NOTES E3.3 & E3.6 AND RELEVANT ACCEPTABLE SOLUTIONS

Technical Component	Vehicular Access Types / Components			
	Public Roads	Emergency Access Way ¹	Fire Service Access Route ¹	Battle-axe and Private Driveways ²
Minimum trafficable surface (m)	In accordance with A3.1	6	6	4
Minimum Horizontal clearance (m)	N/A	6	6	6
Minimum Vertical clearance (m)	4.5			
Minimum weight capacity (t)	15			
Maximum Grade Unsealed Road ³	As outlined in the IPWEA Subdivision Guidelines	1:10 (10%)		
Maximum Grade Sealed Road ³		1:7 (14.3%)		
Maximum Average Grade Sealed Road		1:10 (10%)		
Minimum Inner Radius of Road Curves (m)		8.5		

Turnaround Area Dimensions for No-through road



APPENDIX 3: TECHNICAL REQUIREMENTS FOR FIREFIGHTING WATER

Reticulated Areas

[Source: Guidelines for Planning in Bushfire Prone Areas WAPC 2021 v1.4, Appendix 4, Element 4]

The Water Corporation's 'No 63 Water Reticulation Standard' is deemed to be the baseline criteria for developments and should be applied unless local water supply authority's conditions apply.

The requirement is to supply a reticulated water supply and fire hydrants, in accordance with the technical requirements of the relevant water supply authority and DFES.

Key specifications in the most recent version/revision of the design standard include:

- **Residential Standard** – hydrants are to be located so that the maximum distance between the hydrants shall be no more than 200 metres.
- **Commercial Standard** – hydrants are to be located with a maximum of 100 metre spacing in Industrial and Commercial areas.
- **Rural Residential Standard** – where minimum site areas per dwelling is 10,000 m² (1ha), hydrants are to be located with a maximum 400m spacing. If the area is further subdivided to land parcels less than 1ha, then the residential standard (200m) is to be applied.

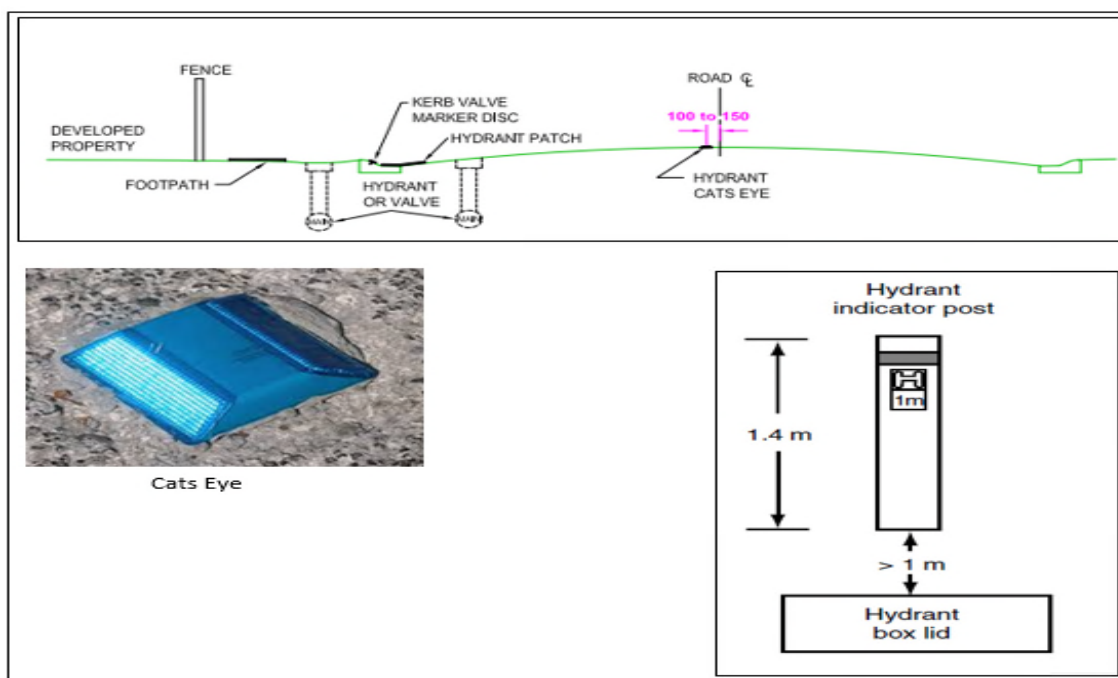


Figure A4.1: Hydrant Location and Identification Specifications