



Bushfire hazard and BAL assessment

Capricorn Coastal Node

Prepared for
Acumen Development Solutions
by Strategen

August 2015



STRATEGEN
environmental consultants

Bushfire hazard and BAL assessment

Capricorn Coastal Node

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August 2015

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Client: Acumen Development Solutions

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1. Introduction

1.1 Background

Capricorn Village Joint Venture (CVJV) is proposing to develop the Capricorn Coastal Node (CCN), located in Yancheep, Western Australia (Figure 1).

A subdivision application is currently being prepared for a portion of the CCN displayed in Figure 2 for submission to the City of Wanneroo (CoW) and the Department of Planning (DoP). As the subdivision application area is located adjacent to coastal vegetation which will pose an inherent bushfire risk to proposed life and property assets of the subdivision, the application will require a Bushfire Hazard Assessment (BHA) as a supporting document to identify the level of risk associated with vegetation in and around the subject land.

CVJV has commissioned Strategen to undertake a BHA of the subdivision application area and surrounding vegetation to confirm the location and level of existing bushfire hazards. CVJV has also requested that Strategen complete a Bushfire Attack Level (BAL) assessment of the subdivision application area to provide guidance for the future Fire Management Plan or any additional fire mitigation works to address current bushfire issues at the site.

CVJV has also requested Strategen provide bushfire management advice for the proposed neighbourhood centre directly abutting the eastern boundary of the proposed subdivision area. This has been included as Appendix 4.

1.2 Purpose of this report

The purpose of this report is to:

- document the findings of a bushfire hazard assessment and BAL assessment
- provide guidance on bushfire management considerations for the subdivision application area
- provide bushfire fuel hazard assessment for the future Fire Management Plan or any additional fire mitigation works to address current bushfire issues at the site
- document measures to achieve an acceptable and compliant fire management outcome for the site.

The need for a Fire Management Plan, or otherwise, will be based on the level of compliance of the proposed development with performance criteria outlined in *Planning for Bush Fire Protection Guidelines (Edition 2)* (PFBFP Guidelines; WAPC et al. 2010), Draft State Planning Policy 3.7 Planning for Bushfire Risk Management (DoP & WAPC 2014a) and accompanying Draft Planning for Bushfire Risk Management Guidelines (DoP & WAPC 2014b). Of particular importance will be the application of suitable building protection and hazard separation zones (defendable space) around the proposed development and specified level of construction standard in accordance with *AS 3959-2009 Construction of Buildings in Bushfire Prone Areas* (SA 2009).

1.3 Key objectives

Key objectives of the project include:

1. Undertake a detailed bushfire hazard assessment of the proposed subdivision application area and surrounds.
2. Undertake a BAL assessment of the proposed subdivision application area in accordance with AS 3959–2009.
3. Document key findings of the bushfire hazard and BAL assessments, including mapping of bushfire hazard areas and hazard levels in accordance with methodology outlined in the Guidelines.
4. Verify compliance of the proposed development with Guideline performance criteria in light of the assessed bushfire hazard levels and BAL.
5. Provide bushfire fuel hazard assessment for the future Fire Management Plan or any additional fire mitigation works to address current bushfire issues at the site.

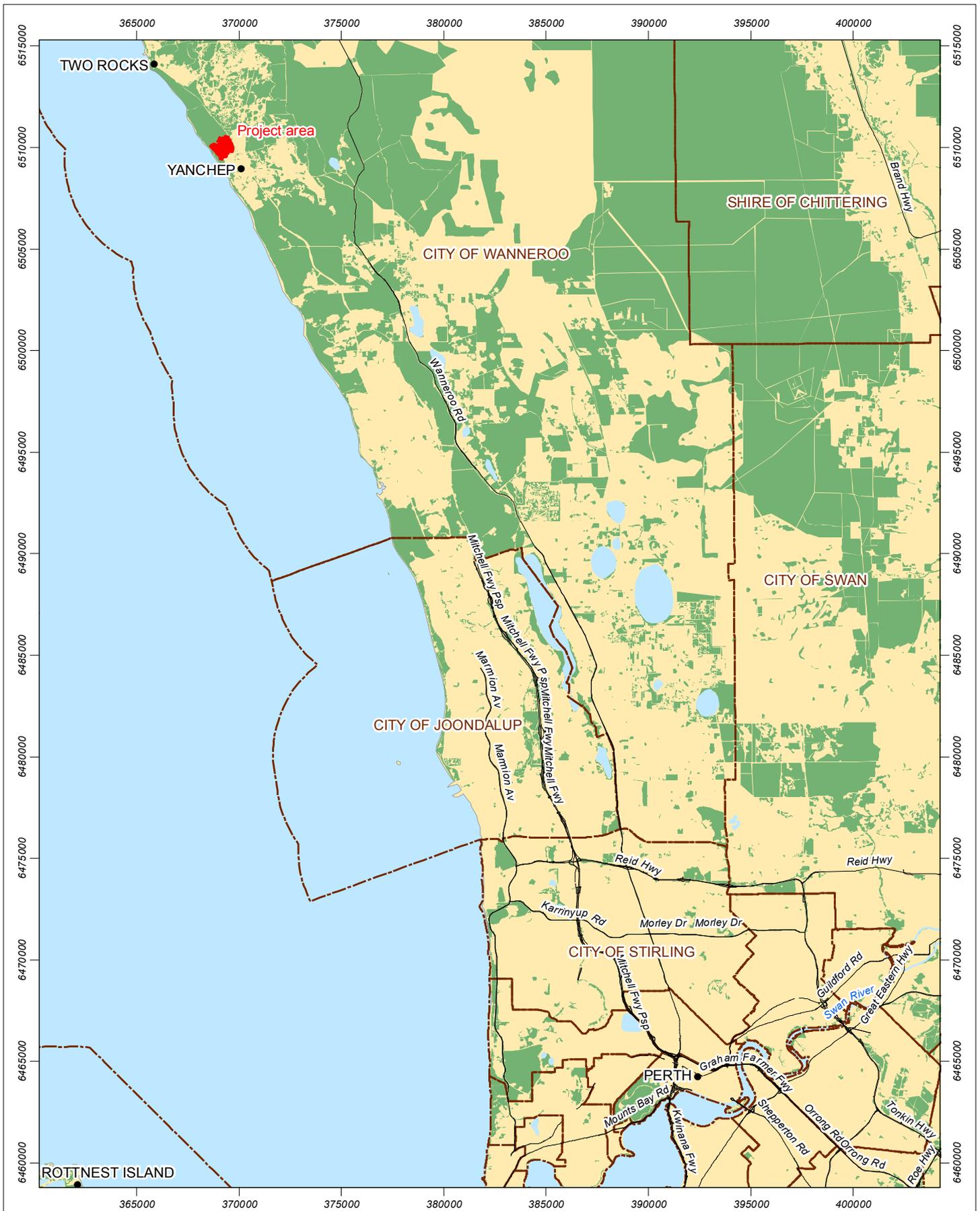
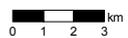


Figure 1 Regional Location

Scale 1:250,000 at A4



Coordinate System: GDA 1994 MGA Zone 50
 Note that positional errors may occur in some areas
 Date: 8/06/2015
 Author: JCrute
 Source: Topography: Geoscience Australia 2011.



Legend

- Town
- Major road
- Major river
- Lakes
- Native vegetation
- Local government boundary
- Project area





Figure 2: Concept Plan

Scale 1:3,500 at A4



Coordinate System: GDA 1994 MGA Zone 50
 Note that positional errors may occur in some areas
 Date: 8/06/2015
 Author: JCrute
 Source: Aerial image: Landgate, flown 09/2014. Concept Plan & contours: Client 2015.

Legend

- Carriageways
- Roads
- Project area boundary
- Subdivision lots
- POS



2. Bushfire hazard assessment

2.1 Site overview

2.1.1 Location

The proposed subdivision application area within the Capricorn Coastal Node development (the project area) is located in the Yanchep locality, approximately 51 km northwest of the Perth Central Business District (Figure 1). The project area is within the City of Wanneroo (CoW) adjacent to the existing Club Capricorn Resort.

2.1.2 Site topography

The majority of the project area is dominated by undulating topography formed by dunes systems which vary in height from 6 meters Australian Height Datum (mAHD) to 36 mAHD (Figure 3).

Modifications to the topography adjacent to the project area have occurred as a result of construction of the existing Club Capricorn Resort and associated infrastructure.

2.1.3 Vegetation

The project area is located in the South Western Botanical Province of Western Australia, in the Darling Botanical District and the Swan Coastal Plain subregion of the Drummond Botanical District (Beard 1990). Vegetation types of the project area are dominated by the Quindalup vegetation complex (Hedde *et al.* 1980) as illustrated in Figure 4. This complex can be described as:

- a coastal dune complex consisting mainly of two alliances - the strand and fore dune alliance and the mobile and stable dune alliance. Local variations include low closed forest of *Melaleuca lanceolata* - *Callitris preissii* and closed scrub of *Acacia rostellifera*.

The project area is bound to the north and west by coastal heath vegetation consistent with the above description (Figure 4).

2.1.4 Proposed site assets

Development of the project area will intensify life and property assets within the area due to construction of additional residences, recreational facilities, infrastructure and attraction of visitors.



Figure 3: Topography of the project area

Scale 1:4,000 at A4



Coordinate System: GDA 1994 MGA Zone 50
 Note that positional errors may occur in some areas
 Date: 8/06/2015
 Author: JCrute
 Source: Aerial image: Landgate, flown 09/2014. Concept Plan & contours: Client 2015.

Legend

- Roads
- Surface elevation (mAHD)
- Carriageways
- Project area boundary
- 100m wide assessment area
- Subdivision lots
- POS



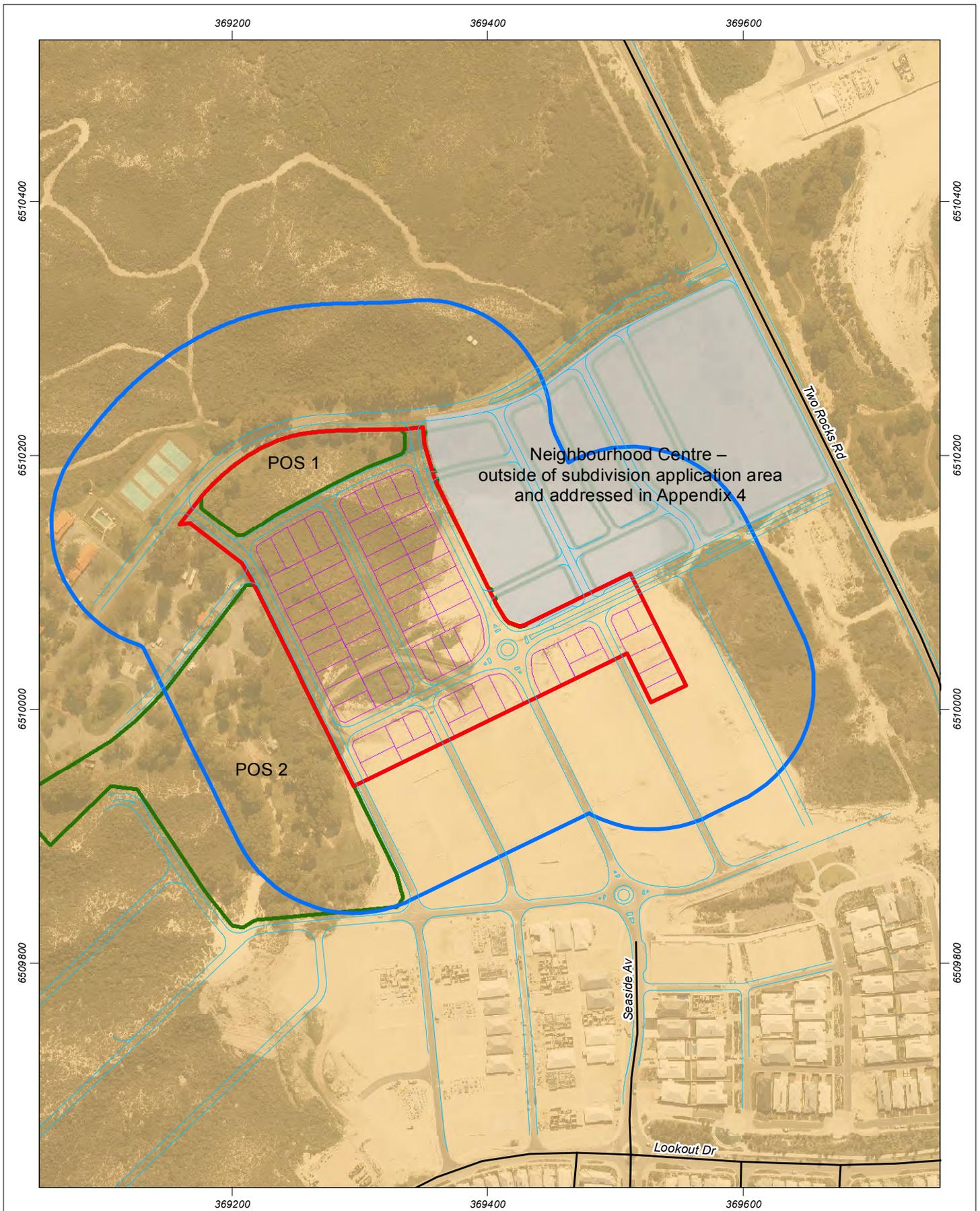
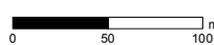


Figure 4: Vegetation complexes of the project area

Scale 1:4,000 at A4



Coordinate System: GDA 1994 MGA Zone 50
 Note that positional errors may occur in some areas
 Date: 8/06/2015
 Author: JCrute

Source: Aerial image: Landgate, flown 09/2014. Concept Plan: Client 2015. Vegetation: System 6, DEC 2012.

Legend

- | | | |
|----------------------|---------------------------|-----------------------------|
| Carriageways | Project area boundary | POS |
| Roads | 100m wide assessment area | Vegetation complexes |
| Neighbourhood centre | Subdivision lots | Quindalup complex |



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2.2 Fuel hazard assessment

Strategen staff undertook a fuel hazard assessment of the project area and surrounding vegetation on 19 January 2015. The assessment, undertaken in accordance with the *Swan Coastal Plain Visual Fuel Load Guide* (FESA 2012) included on-site verification of vegetation types and an assessment of the available fuel loads contained within on-site and surrounding vegetation on the basis of a visual inspection of:

- vegetation type and structure
- vegetation condition and density
- fuel age (years since last burn)
- scrub extent
- surface litter, trash and bark accumulation.

2.2.1 Predominant fuel type and available fuel loads

Vegetation adjacent to and within the project area represents a typical coastal heath structure (Plate 1, Plate 2). Strategen identified one predominant fuel type that could potentially pose a fire threat to existing and potential assets within the proposed subdivision area. The fuel type is a dense, closed heath occurring in association with sand dunes and dominated by the following species:

- *Lepidosperma gladiatum*
- *Olearia axillaris*
- *Threlkeldia diffusa*
- *Scaevola crassifolia*.

Total available fuel loads within this vegetation type were assessed as between 10-12 t/ha (tonnes per hectare).

Occasional Tuart trees occur in association with this heath vegetation type as displayed in Plate 2. These trees however, have been planted or retained in road verges and are not a common occurrence within the heath vegetation. Consequently, the trees have not been included within the fuel type classification outlined above.

Vegetation within the project area will be cleared/modified for subdivision purposes and thus has not been included within the classified vegetation type summary presented in Table 1. Additionally, vegetation within POS areas will be cleared or modified as part of the development and will continue to have available fuel loads managed to within 2 t/ha. An indicative concept of POS 2 located west of proposed lots is included in Appendix 3.

Similarly, vegetation within the neighbourhood centre to the east of proposed lots will be also cleared for development and available fuel loads will not exceed 2 t/ha. Vegetation within this area has historically been modified from its natural state and thus is unlikely to pose a bushfire hazard in the interim (Plate 3, Plate 4).

Vegetation to the southeast of proposed lots will also be cleared prior to buildings being constructed within the project area.



Plate 1: Coastal heath vegetation



Plate 2: Coastal heath vegetation



Plate 3: Neighbourhood centre vegetation

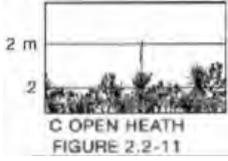


Plate 4: Neighbourhood centre vegetation – roadside strip in foreground

2.3 Classified vegetation types

An assessment of vegetation class and type within and adjacent to the project area was undertaken in accordance with procedures outlined in the PFBFP Guidelines (Table 1). The classified vegetation type aligns with the predominant fuel type identified in Section 2.2.1.

Table 1: Predominant vegetation class and type

Predominant fuel type and available fuel load	Vegetation class	Vegetation type	Figure (taken from the Guidelines)	Description
Open <i>Olearia-Lepidosperma</i> coastal heath (10-12 t/ha)	(C) Shrubland	Open heath		Found in wet areas but which are affected by poor soil fertility or shallow soils. Shrubs 1-2 metres high often comprising <i>Banksia</i> , <i>Acacia</i> , <i>Hakea</i> and <i>Grevillea</i> . Wet heaths occur in sands adjoining dunes of the littoral (shore) zone. Montane heaths occur on shallow or water-logged soils.

2.4 Location and levels of bushfire hazards

The location and levels of existing bushfire hazard areas both within and adjacent to the project area are outlined in the vegetation class and bushfire hazard assessment map (Figure 5). This map has been created using the abovementioned vegetation class and type description and assessed available fuel loads.

Bushfire hazard levels within the project area will be low during and after development. Bushfire hazard levels adjacent to the project area range from low to moderate. Classifying the bushfire hazard by assessing the predominant vegetation is a key to the initial determination of site suitability for development. This also leads to determination of the potential level of construction standard by the application of AS 3959–2009 for any proposed development.

2.5 Bushfire Attack Level assessment

This procedure, as outlined in the PFBFP Guidelines and AS 3959–2009, specifies the Bushfire Attack Level (BAL) by using a combination of the relevant fire danger index (FDI), vegetation class, slope and the distance maintained between the proposed development area and predominant vegetation. Based on the specified BAL, construction requirements for proposed buildings can then be assigned.

2.5.1 Fire danger index

A blanket FDI rating of 80 is adopted for Western Australian environments, as outlined in AS 3959–2009 and provided by Australasian Fire and Emergency Service Authorities Council (AFAC).

2.5.2 Vegetation class

One predominant vegetation classification (open heath) was identified as occurring in proximity to the project area.

2.5.3 Distance from classified vegetation

The project area is currently located within 100 m of classified vegetation. Some of this vegetation will be cleared for development, however vegetation north of the project area (across the current resort access road) will be retained during development. This will result in a 12 lots being located within 56-100 m of classified shrubland vegetation.

2.5.4 Effective slope under classified vegetation

Heath vegetation (classified as shrubland as per PFBFP Guidelines) occurs up-slope from the proposed development due in association with coastal dune systems. Therefore, no proposed buildings will be located upslope from classified vegetation.

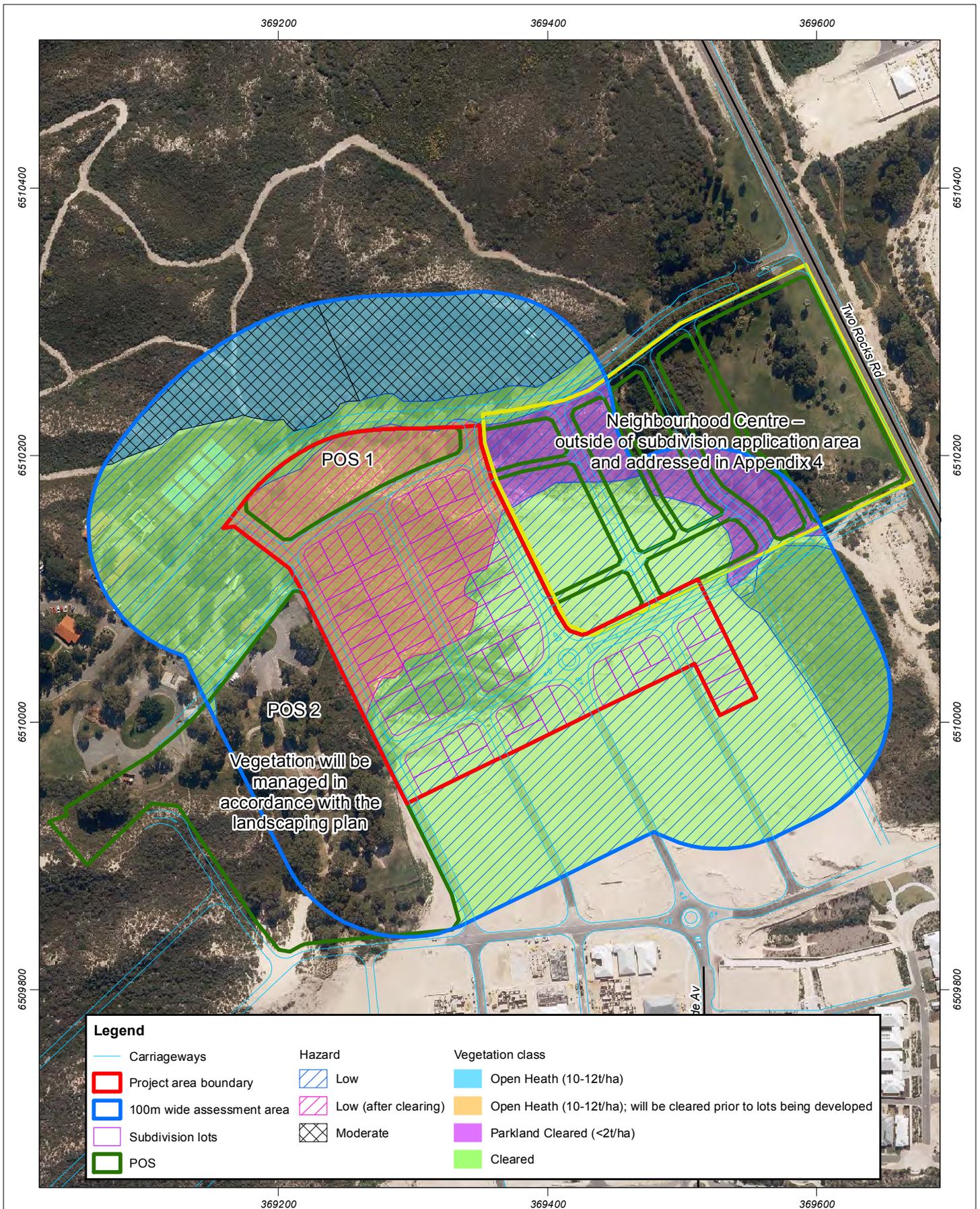


Figure 5: Vegetation class and bushfire hazard assessment map

Scale 1:3,800 at A4



Coordinate System: GDA 1994 MGA Zone 50

Note that positional errors may occur in some areas

Date: 28/08/2015

Author: JCrute

Source: Aerial image: Landgate, flown 09/2014. Concept Plan: Client 2015.



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2.5.5 Determination of Bushfire Attack Level

Based on the above parameters, the specified BAL for the proposed subdivision ranges from BAL 12.5 to BAL - Low, as indicated in Table 2 (i.e. 12 lots located between 56-100 m from classified vegetation and all other buildings located >100 m from classified vegetation). Separation distances from classified vegetation will create a suitable low fuel buffer and defensible space between vegetation and proposed buildings. The separation distance will be achieved by a combination of the following:

- roads
- firebreaks
- footpaths
- carparking areas
- low fuel areas
- building setbacks.

Table 2: Determination of Bushfire Attack Level

Vegetation class	Bushfire attack level (BAL)				
	BAL FZ	BAL 40	BAL 29	BAL 19	BAL 12.5
	Distance (m) of the site from the predominant vegetation class				
	Vegetation is upslope and flat land (0 degrees)				
(C) Shrubland	<7	7–<9	9–<13	13–<19	19–<100

Source: WAPC et al. 2010

A brief description of the various BALs and associated heat flux exposure threshold, bushfire attack and level of exposure, and relevant section of AS 3959–2009 is provided in Table 3.

Table 3: Construction standards

Bush fire attack level (BAL)	Classified vegetation within 100m of the site and heat flux exposure thresholds	Description of predicted bush fire attack and levels of exposure	Construction Section as per AS 3959
BAL – Low	-	There is insufficient risk to warrant specific construction requirements. Despite this, FESA strongly recommends that ember protection features be incorporated in design where practicable.	4
BAL – 12.5	$\leq 12.5 \text{ kW/m}^2$	Ember attack	3 and 5
BAL – 19	$> 12.5 \text{ kW/m}^2$ $\leq 19 \text{ kW/m}^2$	Increasing levels of ember attack and burning debris ignited by windborne embers together with increasing heat flux.	3 and 6
BAL – 29	$> 19 \text{ kW/m}^2$ $\leq 29 \text{ kW/m}^2$	Increasing levels of ember attack and burning debris ignited by windborne embers together with increasing heat flux.	3 and 7
BAL – 40 (not approved in WA)	$> 29 \text{ kW/m}^2$ $\leq 40 \text{ kW/m}^2$	Increasing levels of ember attack and burning debris ignited by windborne embers together with increasing heat flux with the increased likelihood of exposure to flames.	3 and 8
BAL – FZ (not approved in WA)	$> 40 \text{ kW/m}^2$	Direct exposure to flames from fire front in addition to heat flux and ember attack.	3 and 9

Source: SA 2009

3. Bushfire mitigation and compliance

3.1 Bushfire hazard performance criteria

The PFBFP Guidelines document a suite of bushfire hazard performance criteria and acceptable solutions to guide proposed developments in achieving suitable and effective bushfire mitigation and protection of life and property. The relationship between the various bushfire hazard levels and development performance criteria is set out in Table 4.

The surrounds of the proposed subdivision have a low to moderate bushfire hazard rating. However, as all proposed lots will be located greater than 100 m from classified vegetation, **no additional bushfire mitigation or management measures are required under the PFBFP Guidelines.**

Table 4: Bushfire hazard levels and performance criteria

Bushfire hazard level	Bushfire protection performance criteria required
Low hazard	Development does not require special bushfire planning controls. Despite this, DFES strongly recommends that ember protection features be incorporated in design where practicable.
Moderate hazard	Performance criteria for: <ul style="list-style-type: none"> • location (Element 1) • vehicular access (Element 2) • water (Element 3) • siting of development (Element 4) • design of development (Element 5).
Extreme hazard	Development is to be avoided in areas with these hazard levels.

Source: WAPC et al. 2010

Section 3.2 provides a discussion surrounding the compliance of the proposed subdivision with the above the PFBFP Guidelines. The completed fire management compliance checklist is provided in Appendix 1.

3.2 Bushfire mitigation

3.2.1 Development location

Strategic location, layout and management of future development at the planning stage can reduce future fire threat and risk to critical life and property assets. The current situation is that twelve lots are located between 56-100 m from classified vegetation. This will require building construction standards in accordance with AS 3959-2009 (i.e. BAL 12.5) to be applied to the affected lots.

As no lots are situated on land that is subject to an extreme bushfire hazard land classification or requires construction standards to BAL 40 or BAL FZ, compliance with Element 1 of the PFBFP Guidelines has been met.

3.2.2 Vehicular access

The proposed vehicular access network will provide a minimum of two links to the surrounding public road network (Figure 2). The proposed vehicular access network will also provide buffers and access for emergency service vehicles between proposed buildings and the surrounding bushland extent.

All public roads and private driveways will be constructed to specifications in accordance with Main Roads WA and DFES requirements and the proposed subdivision does not contain any cul-de-sacs or battle axes. The proposed road network will also serve as a fire service access route for emergency services. No additional emergency access routes, gates, firebreaks or signs are required under the PFBFP Guidelines.

These characteristics of the proposed development will ensure compliance with Element 2 of the PFBFP Guidelines.

3.2.3 Water supply

Potable water supply will be provided from the Water Corporation reticulated water supply scheme. Bores are already established within the surrounding area (Plate 3), and no issues are envisaged with extending water supply to the project area.

This is compliant with Element 3 of the PFBFP Guidelines.

3.2.4 Siting of development

There are 12 lots situated within 100 m of classified shrubland vegetation. This will require building construction standards in accordance with AS 3959-2009 (i.e. BAL 12.5) to be applied to the affected lots. Application of AS3959-2009 will ensure the development meets compliance with Element 4 of the PFBFP Guidelines.

3.2.5 Design of development

There are 12 lots situated within 100 m of classified shrubland vegetation. This will require building construction standards in accordance with AS 3959-2009 (i.e. BAL 12.5) to be applied to the affected lots. Application of AS3959-2009 will ensure the development meets compliance with Element 4 of the PFBFP Guidelines.

3.2.6 Additional bushfire mitigation strategies

The following bushfire mitigation strategies should be considered in addition to the strategies listed previously, including:

1. Emergency suppression response: in the event that wildfire occurs within or adjacent to the development area, a fast emergency suppression response time (within 30 minutes) can be achieved from local volunteer and career bushfire brigades.
2. Detailed evacuation plan and designation of safe fire refuge: on construction of the proposed development, Strategen recommends that the responsible authority have in place a detailed evacuation plan, including location and signage of designated safe fire refuge area/s. Access to and from the site is likely to be compromised in the event of a fire occurring in the area; therefore, the creation of a safe and humane refuge is an important component of any future Fire Management Plan.
3. Compliance with City of Wanneroo Fire Management Requirements: the responsible authority will be required to maintain compliance with the current City of Wanneroo Fire Management Requirements (Appendix 2).
4. Ensure Muster Points are provided: Muster points should be clearly demarcated on evacuation plans and using on-site signage. Patrons should also be made aware of their location.

These additional bushfire mitigation measures should be described in a detailed Fire Management Plan.

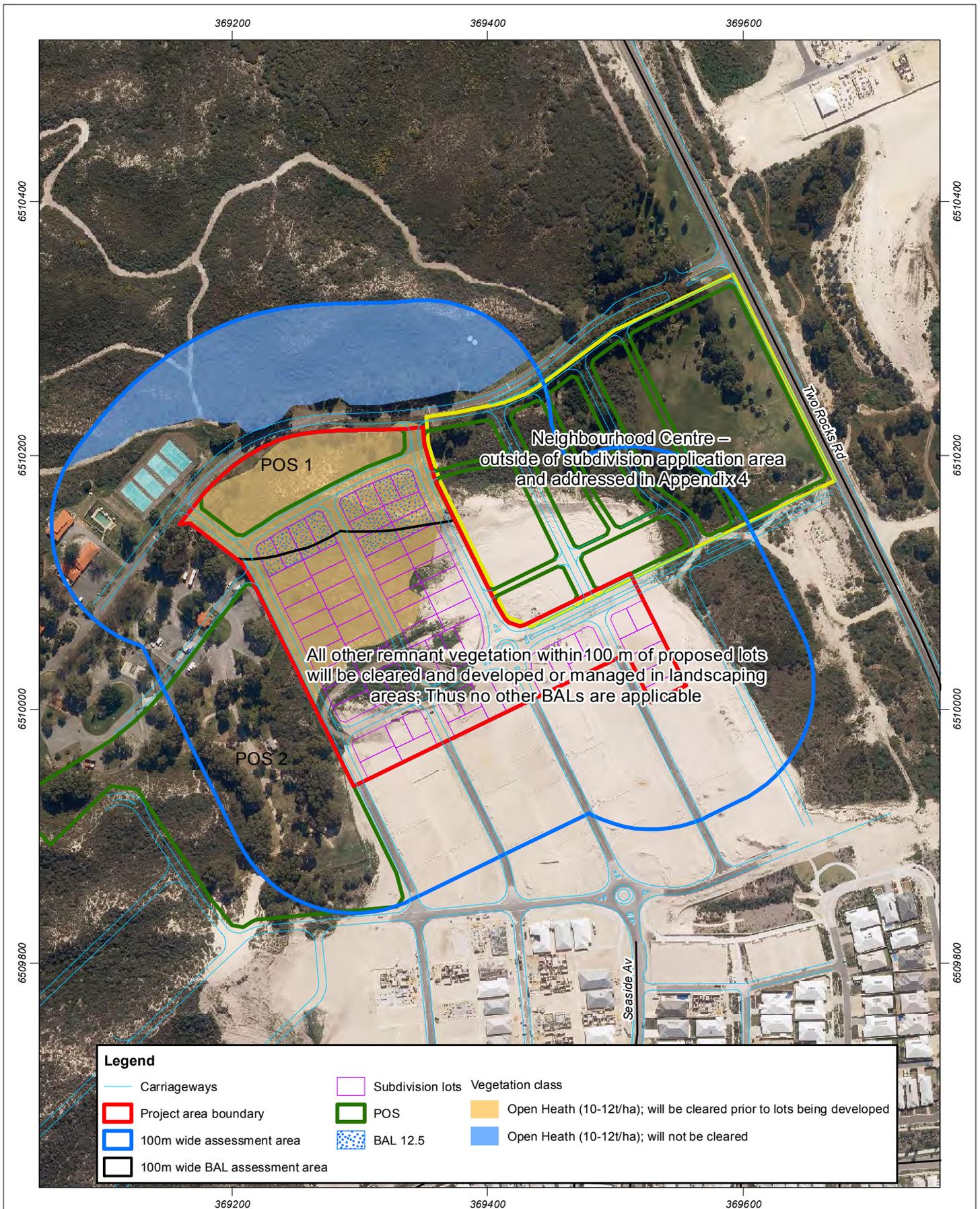
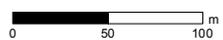


Figure 6: Indicative Building Protection Zones and BALs

Scale 1:4,000 at A4



Coordinate System: GDA 1994 MGA Zone 50
 Note that positional errors may occur in some areas
 Date: 28/08/2015
 Author: JCrute

Source: Aerial image: Landgate, flown 09/2014. Concept Plan: Client 2015.



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4. Conclusion and compliance with PFBFP Guidelines

Strategen has undertaken a bushfire hazard assessment and BAL assessment of the proposed subdivision application area within the Capricorn Coastal Node (CCN) development and surrounding vegetation. Findings of the assessments have revealed that 12 lots within the proposed development are situated within 100 m of classified vegetation. These 12 lots will require heightened construction standards in accordance with AS3959-2009 (i.e. BAL 12.5) for all buildings contained within. All other lots are situated greater than 100 m from classified vegetation.

The location of all lots within the proposed subdivision area and management measures outlined in section 3.2 will ensure that the current development design, location and layout will achieve full compliance with PFBFP Guideline requirements for planning in bushfire prone areas.

5. References

Department of Planning and Western Australian Planning Commission (DoP & WAPC) 2014a, *Draft State Planning Policy 3.7 Planning for Bushfire Risk Management*, Western Australian Planning Commission, Perth.

Department of Planning and Western Australian Planning Commission (DoP & WAPC) 2014b, *Draft Planning for Bushfire Risk Management Guidelines*, Western Australian Planning Commission, Perth.

Fire and Emergency Services Authority (FESA) 2012, *Visual Fuel Load Guide for the scrub vegetation of the Swan Coastal Plain and Darling Scarp including Geraldton Sandplains & Leeuwin Ridge Regions of Western Australia*, Bush Fire and Environmental Protection Branch, Fire and Emergency Services Authority, Perth.

Hedde EM, Loneragan OW & Havel JJ 1980, *Darling System, Vegetation Complexes*, Forest Department, Perth.

Standards Australia (SA) 2009, *Australian Standard AS 3959–2009 Construction of Buildings in Bushfire-Prone Areas*, Standards Australia, Sydney, New South Wales.

Western Australian Planning Commission, Department of Planning and Fire and Emergency Services Authority (WAPC et al.) 2010, *Planning for Bush Fire Protection Guidelines (Edition 2)*, Western Australian Planning Commission and Fire and Emergency Services Authority, Western Australia.

Appendix 1
Compliance checklist

Compliance checklist for performance criteria and acceptable solutions

Element	Acceptable solution	Compliance	Yes/No	Explanation (if no)
1. Location	A1.1 Development location	Does the proposal comply with performance criteria P1 by applying acceptable solution A1.1?	Yes	
2. Vehicular access	A2.1 Two access routes	Does the proposal comply with performance criteria P2 by applying acceptable solution A2.1?	Yes	
	A2.2 Public roads	Does the proposal comply with performance criteria P2 by applying acceptable solution A2.2?	Yes	
	A2.3 Cul-de-sacs	Does the proposal comply with performance criteria P2 by applying acceptable solution A2.3?	N/A	No cul-de-sacs proposed
	A2.4 Battle axes	Does the proposal comply with performance criteria P2 by applying acceptable solution A2.4?	N/A	No battle axes proposed
	A2.5 Private driveways	Does the proposal comply with performance criteria P2 by applying acceptable solution A2.5?	Yes	
	A2.6 Emergency access ways	Does the proposal comply with performance criteria P2 by applying acceptable solution A2.6?	N/A	No emergency access ways needed
	A2.7 Fire service access routes	Does the proposal comply with performance criteria P2 by applying acceptable solution A2.7?	Yes	
	A2.8 Gates	Does the proposal comply with performance criteria P2 by applying acceptable solution A2.8?	N/A	No gates needed
	A2.9 Firebreak widths	Does the proposal comply with performance criteria P2 by applying acceptable solution A2.9?	N/A	If needed, firebreaks will comply with A2.9
	A2.10 Signs	Does the proposal comply with performance criteria P2 by applying acceptable solution A2.10?	N/A	No signs needed
3. Water	A3.1 Reticulated areas	Does the proposal comply with performance criteria P3 by applying acceptable solution A3.1?	Yes	
	A3.2 Non-reticulated areas (a)	Does the proposal comply with performance criteria P3 by applying acceptable solution A3.2?	N/A	
	A3.3 Non-reticulated areas (b)	Does the proposal comply with performance criteria P3 by applying acceptable solution A3.3?	N/A	
4. Siting of development	A4.1 Hazard separation – moderate to extreme bush fire hazard level	Does the proposal comply with performance criteria P4 by applying acceptable solution A4.1?	Yes	
	A4.2 Hazard separation – low bush fire hazard level	Does the proposal comply with performance criteria P4 by applying acceptable solution A4.2?	Yes	
	A4.3 Building protection zone	Does the proposal comply with performance criteria P4 by applying acceptable solution A4.3?	Yes	
	A4.4 Hazard separation zone	Does the proposal comply with performance criteria P4 by applying acceptable solution A4.4?	Yes	

Element	Acceptable solution	Compliance	Yes/No	Explanation (if no)
	A4.5 Reduction in bush fire attack level due to shielding	Does the proposal comply with performance criteria P4 by applying acceptable solution A4.5?	N/A	All buildings located greater than 100 m from classified vegetation
5. Design of development	A5.1 Compliant development	Does the proposal comply with performance criteria P5 by applying acceptable solution A5.1?	Yes	
	A5.2 Non-compliant development	Does the proposal comply with performance criteria P5 by applying acceptable solution A5.2?	N/A	

Note: Performance criteria and acceptable solutions are in accordance with *Planning for Bush Fire Protection Guidelines (Edition 2)* (WAPC et al. 2010).

Applicant Declaration

I declare that the information provided is true and correct to the best of my knowledge.

Full name: Roger Banks

Applicant signature: 

Date: 29/01/2015

Appendix 2
City of Wanneroo firebreak order 2014

Protect your home and property from bushfires

NOTICE TO ALL OWNERS OR OCCUPIERS OF LAND IN THE DISTRICT OF THE CITY OF WANNEROO REGARDING FIREBREAKS.

The City of Wanneroo hereby gives notice pursuant to Section 33 of the **Bush Fires Act 1954** to all owners or occupiers of land in its district that they are required on or before 15 November, or within 14 days of becoming the owner or occupier of the land if that occurs after the 15 November, to annually plough, cultivate, scarify, or otherwise clear firebreaks as specified in this Notice and thereafter up to, and including the 30 April, annually, to maintain the firebreaks clear of flammable matter.

1. Land having an area of 2000m² or more

A firebreak not less than 3 metres wide and 3 metres high immediately inside and around all external boundaries of the land must be cleared.

2. Land having an area of less than 2000m²

A firebreak not less than 2 metres wide and 2 metres high immediately inside and around all external boundaries of the land must be cleared.

3. Buildings

A firebreak not less than 3 metres wide immediately around all external walls of every building must be cleared. Whenever a firebreak is cleared by burning the provisions of the Act and Regulations made thereunder must be observed. If pursuant to Item (2) of this Notice, mowing or slashing is carried out the height of vegetation thereafter must not exceed, as far as is reasonably practicable, 20mm over the entire area of the firebreak. The use of chemicals is subject to all restrictions imposed by the Department of Agriculture. Attention is drawn to the Flammable Liquids Regulations made under the Explosives and Dangerous Goods Act 1961, which requires a site on which flammable liquid is stored to be totally cleared of all flammable material for a minimum distance of 5 metres surrounding the site.

If it is considered to be impracticable for any reason to comply with the provisions of this Notice, application may be made not later than the 1st day of November annually to the Council or its authorised officer for permission to provide alternative fire protection measures. If permission is not granted the requirements of this Notice must be complied with.

Penalty

An owner or occupier of land who fails or neglects in any respect to comply with the requirements of this Notice is liable to a maximum fine of \$5,000.

DATES TO REMEMBER

- Firebreaks must be cleared by **15 November (AND KEPT CLEAR UNTIL APRIL 30)**
- Burning permits required all year round
- Burning prohibited between **1 December to 31 March**

When and how to obtain a fire permit

Permits are available from the City of Wanneroo at the following locations:

WANNEROO ANIMAL CARE CENTRE

Located at the rear of the Ashby Operations Centre, 1204 Wanneroo Road, Ashby
The City's Rangers / Fire Control Officers are available to issue permits 7 days a week* from 4pm - 6pm
*Except Good Friday

CITY OF WANNEROO CIVIC CENTRE

23 Dundobar Road, Wanneroo
The City's Fire Control Officers / Permit Issuing Officers are available to issue permits Monday to Friday 9am - 4pm

TWO ROCKS VOLUNTEER FIRE BRIGADE

Captain / Fire Control Officer
Seatrees Estate, Two Rocks
Please phone 0427 026 000 before attending

NEED ADVICE?

Further advice about how to protect your home, constructing firebreaks, and when and how to burn off, is available from the City of Wanneroo during office hours on 9405 5000.



City of
Wanneroo

23 Dundobar Road, Wanneroo, WA 6065

Locked Bag 1, Wanneroo, WA 6946

T : (08) 9405 5000 F : (08) 9405 5499

After Hours : 1300 13 83 93

E : enquiries@wanneroo.wa.gov.au

wanneroo.wa.gov.au  

PROTECT YOUR HOME
AND PROPERTY FROM
BUSHFIRES



City of
Wanneroo

Keeping your home safe from fire

There are a number of ways you can help keep your home safe from fire:

- Install smoke detectors in your home
- Clear vegetation away from the walls of your home
- Clear all rubbish and flammable material from around your home to create a 20 metre circle of safety
- Store firewood, timber, petrol, and kerosene well away from your home
- Prior to summer, clean all leaves and debris from your gutters
- Don't have flammable trees such as conifers near buildings
- Have branches trimmed that overhang the house or powerlines
- Fit wire insect screens or shutters to windows and glass doors

If a firebreak is impractical along your boundary for environmental or other reasons notify the City of Wanneroo by 1 October to obtain permission to install firebreaks in alternative positions, or of a different nature.

ALTERNATIVE METHODS OF REDUCING FIRE HAZARDS ON VACANT LAND

- For urban land less than 2000m², if mowing or slashing is carried out, the height of the vegetation must not exceed, as far as is reasonably practical, 20mm over the entire area of the firebreak
- The use of chemicals is subject to all restrictions imposed by the Department of Agriculture
- Mulching • Disposal at an authorised rubbish tip site

When and how to burn

NO BURNING FROM 1 DECEMBER - 31 MARCH

Burning off - that is, bush/running fire including grass, on any land is totally prohibited between 1 December and 31 March. Fire permits for burning material other than garden rubbish are required all year round.

A person in control of the fire must stay with the fire until it is completely extinguished.

GARDEN RUBBISH AND REFUSE

The burning of garden refuse is permitted between the hours of 6pm and 11pm, provided the fire danger rating is not VERY HIGH, SEVERE, EXTREME or CATASTROPHIC or a TOTAL FIRE BAN has been declared.

Fire danger rating signs are located at the following locations:

- Corner of Joondalup Drive and Wanneroo Road
- Wanneroo Road, south of the Yancheop Beach Road turn off
- Wanneroo Road, Carabooda • Marmion Avenue, Jindalee
- Neaves Road, Mariginiup • Old Yancheop Road, Pinjar
- Gngangara Road, Landsdale • Country Side Drive, Two Rocks

Other points to remember when burning garden refuse and rubbish are:

- All bush and flammable material must be thoroughly cleared within two metres of all points of the site of the fire
- The material must be on the ground, and be no more than one metre wide and one metre high

Only one heap may be burnt at any one time
Incinerators may be used providing:

- The incinerator is properly constructed and designed to prevent the escape of sparks of burning material
- The incinerator is situated not less than two metres away from a building or fence
- An area of two metres surrounding the incinerator is clear of all flammable material

BARBECUES

Only gas or electric barbecues may be lit during VERY HIGH, SEVERE, EXTREME or CATASTROPHIC fire danger rating or declared TOTAL FIRE BAN. The lighting of solid fuel barbecues is not permitted on these days.

SMOKE NUISANCES

City of Wanneroo residents are advised to be mindful of smoke issues associated with any burning that they conduct. Steps should be taken to avoid undue smoke impact to neighbours and adjacent roads. Smoke across roadways can severely impact motorists' visibility and therefore road safety. Issues of smoke nuisance are regulated by the Waste Avoidance and Resource Recovery Act 2007.

CAMPFIRES

Campfires must not be lit on VERY HIGH, SEVERE, EXTREME or CATASTROPHIC fire danger days or declared TOTAL FIRE BAN. A person must remain in attendance at the site during the whole time the fire is burning. The user must extinguish the fire using water or earth before leaving the area.

Hints for safer burning

- Don't light a fire on a hot or windy day
- Don't burn more than you can control
- Let your neighbours know you'll be burning material
- Make sure smoke and sparks will not affect your neighbour's washing or enter open windows
- Cut or rake long grass around trees, building and fences before burning
- Burn against the wind
- On a sloping block, burn from the top down
- Keep a hose or spray pack at hand to dampen down fierce fires
- If in doubt, don't burn material yourself - call the Volunteer Fire Brigade
- Stay with the fire until it is completely extinguished
- Where possible, don't burn any closer than 20 metres from your home or other buildings

Penalties

Under the Bush Fires Act 1954, failing to comply with regulations can result in a fine ranging from \$250 to \$250,000 or imprisonment.

Failure to maintain 2/3 metre firebreak as per firebreak order \$250

Offence relating to lighting fire in the open air \$250
Setting fire to bush during prohibited burning times \$250

Failure of occupier to extinguish bush fire \$250

Major offences result in Court action with fines ranging from \$250 to \$250,000 or imprisonment for 14 years.

THE BIGGEST PENALTY OF ALL

The biggest penalty of all would be losing your loved ones or home to fire. Please ensure you, your family and your home are kept safe by taking the necessary precautions.

Special rural and residential land

Owners and occupiers of special rural and special residential land should be aware of their responsibilities to take bush fire prevention measures, while ensuring they do not contravene Town Planning Scheme provisions which control the removal of vegetation in Special Residential and Special Rural Zones.

These special rural zones were created in areas of natural flora, and the Scheme recognises the importance of preserving the natural environment in these areas. Anyone found cutting down, lopping or damaging trees in these areas without City approval may be guilty of an offence.

However, bush fire prevention, including the installation of firebreaks, is essential regardless of the zoning of the land.

Below are some guidelines for installing firebreaks in special rural zones to prevent bush fires, while minimising damage to the natural environment.

- A 3 metre wide and 3 metre high firebreak should be cleared around the perimeter of special rural or special residential lots
- These firebreaks need not be strictly around the perimeter, but may deviate according to the flora
- The firebreak does not have to be ploughed but can instead be created by clearing and removing all flammable material
- Care should be taken to avoid damaging or removing significant trees and shrubs
- Avoid the build up of undergrowth and leaf litter

Appendix 3
Concept plan for POS 2



Concrete footpath to rear of residential lots for easy access.

1 in 3 slope with planted native coastal vegetation.

Large family shade shelter with picnic table and seating.

Bicycle trail for teenagers with ramps & jumps

Sloped turf area with seating beneath the trees

Ramp access to park.

Retained coastal dune vegetation, with perimeter post and wire fence. Vegetation rehabilitated where affected by civil works.

20 metre Flying Fox play equipment.

Retained coastal dune vegetation, with perimeter post and wire fence. Vegetation rehabilitated where affected by civil works.

Toddler play area on white washed sand. Limestone seatwall to perimeter for good surveillance

Native planting to stabilise slope.

Climbing nets with seating pods on sloped softfall.

Step access with compacted limestone and wooden edges.

Slides on sloped embankment. Native planting to stabilise slope.

Lookout area with extensive views.

1 in 14 raised modwood ramp access to the top of the slope.

Feature grove of trees

Possible location of signage with park name.

Feature sculpture to the end of the landscape visual link with artwall.

Existing trees to be retained wherever possible.

Retained coastal dune vegetation, with perimeter post and wire fence.

Variety of exercise equipment on softfall.

BBQ amenity.

Existing grassed areas to be retained wherever possible for picnic and activity amenity.

BBQ amenity.

Large family shade shelter with picnic tables.

On street parking bays.

Picnic tables located in shade.

Concrete footpaths meander throughout the park for good access to facilities.

Proposed trees to add to existing maturity.

Retained grassed area for active play.

Swing area on play mulch with seats.

Small shade shelter with BBQ.

Possible location for signage wall with park name.

Minor earthworks to ensure views into park



Appendix 4
Bushfire management advice –
Neighbourhood centre

Preston O'Keefe
Development Manager
Acumen Development Solutions
18 Lyall Street
SOUTH PERTH WA 6151

Our reference: ADS14159.02

Dear Preston

BUSHFIRE MANAGEMENT ADVICE – CAPRICORN NEIGHBOURHOOD CENTRE

This document provides a summary of a Bushfire Hazard Assessment (BHA) and Bushfire Attack Level (BAL) assessment of the Capricorn Neighbourhood Centre (CNC).

The CNC is located within the Capricorn Joint Venture development and is bound by Two Rocks Road and the current entry to the Capricorn Resort as displayed in Figure 1.

Strategen has undertaken a BHA and BAL assessment for a proposed subdivision area adjacent to the neighbourhood centre (Strategen 2015). As majority of the site characteristics within and surrounding both the subdivision area and neighbourhood centre are the same, these same factors have been used to determine the bushfire management requirements for both areas. A full description of factors influencing the vegetation classification assessment, BHA and BAL assessment can be found in Strategen (2015). A summary of these factors is included below in Table 1.

Table 1: Factors influencing the BHA and BAL assessment for the Capricorn Neighbourhood Centre

Factor	Characteristic
Classified vegetation within 100 m of the CNC	<ul style="list-style-type: none"> Open <i>Olearia-Lepidosperma</i> coastal heath. Total available fuel loads within 10-12 t/ha Open <i>Banksia</i> woodland. Total available fuel loads within 5-8 t/ha.
Bushfire Hazard Level within the CNC	Low – vegetation has been modified from its native extent and comprises trees over grass in a parkland cleared structure. Additionally, this vegetation will be cleared for development.
Bushfire Hazard Level adjacent to the CNC	<p>Moderate – However, vegetation to the south and west of the CNC will be cleared as part of the Local Structure Plan (LSP) over the entire area, thus reducing the bushfire hazard in these area to Low.</p> <p>Open woodland vegetation to the east and heath vegetation to the north is outside of the control of the developer and thus will remain as Moderate hazards.</p>
Distance from classified vegetation	The CNC is currently located within 100 m of classified vegetation in all directions. However, the developer will be clearing all vegetation within 100 m of proposed lots to the south and west in line with the LSP. Vegetation to the north and east of the CNC however, will not be cleared by the developer and is located at a minimum distance of 14 m from the CNC.

Factor	Characteristic
Effective slope under vegetation	Heath (classified as shrubland as per PFBFP Guidelines) and woodland vegetation occurs at equal elevation to, or up-slope from the proposed development due in association with coastal dune systems. Therefore, no proposed buildings will be located upslope from classified vegetation.

Based on the above parameters, the specified BALs for the CNC range from BAL – Low to BAL 29 as indicated in Table 2. This separation distance from classified vegetation will create a suitable low fuel buffer and defensible space between vegetation and proposed buildings. The separation distance will be achieved by a combination of the following:

- roads
- firebreaks
- footpaths
- carparking areas
- low fuel areas
- building setbacks.

Table 2: Determination of Bushfire Attack Level

Vegetation class	Bushfire attack level (BAL)				
	BAL FZ	BAL 40	BAL 29	BAL 19	BAL 12.5
	Distance (m) of the site from the predominant vegetation class				
	Vegetation is upslope and flat land (0 degrees)				
(B) Woodland	<10	10-<14	14-<20	20-<29	29-<100
(C) Shrubland	<7	7-<9	9-<13	13-<19	19-<100

Source: WAPC et al. 2010

A summary of the BHA and BAL assessments is displayed in Figure 2 and Figure 3.

The surrounds of the CNC have a low to moderate bushfire hazard rating. As future buildings may be located within 100 m of classified vegetation, **heightened construction standards and further bushfire mitigation/management measures may be required under the PFBFP Guidelines.**

Yours sincerely

Daniel Panickar
CONSULTANT
28 August 2015

Roger Banks
PRINCIPAL
28 August 2015

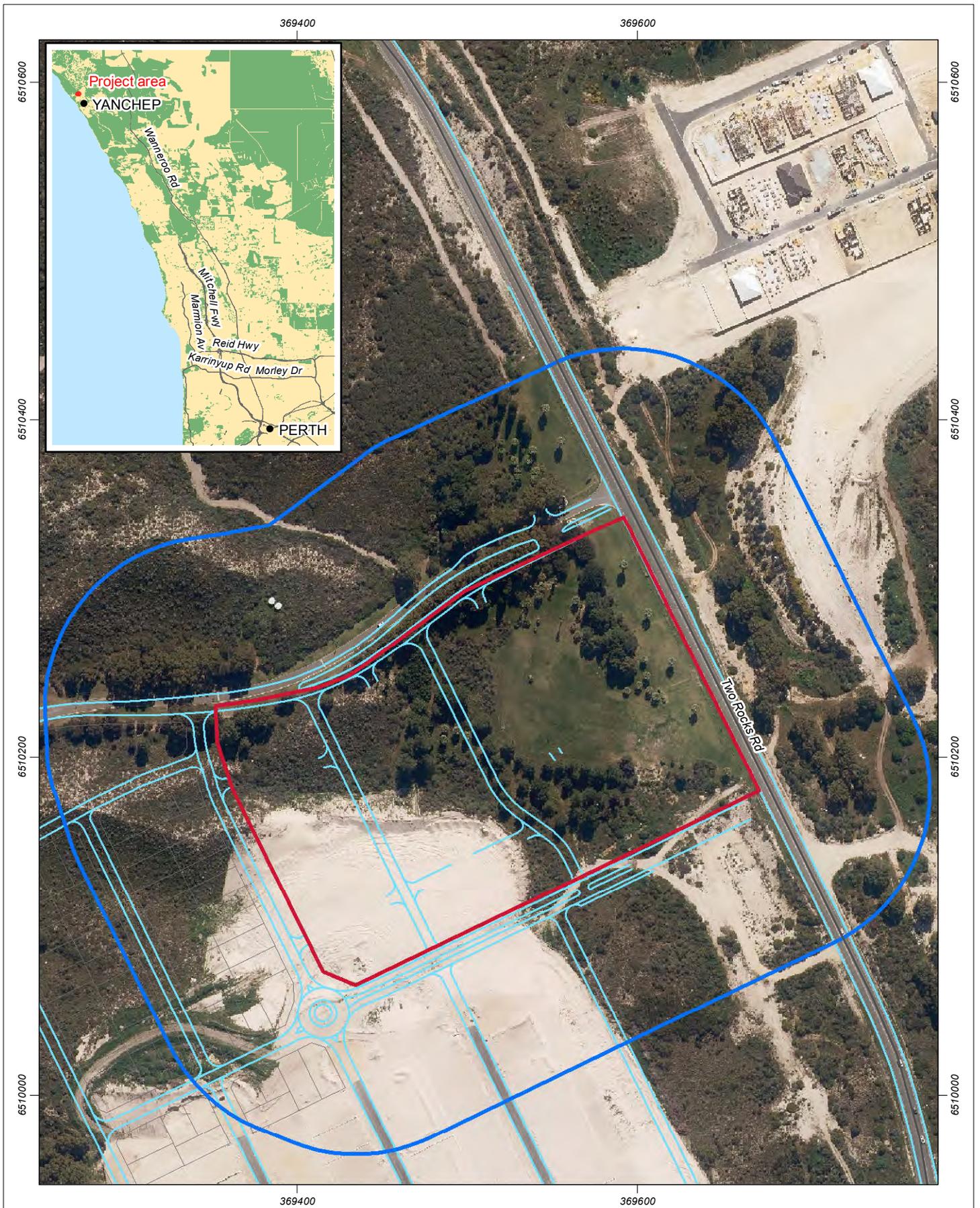


Figure 1: Location

Scale 1:3,000 at A4



Coordinate System: GDA 1994 MGA Zone 50
 Note that positional errors may occur in some areas
 Date: 2/02/2015
 Author: JCrute
 Source: Aerial image: Landgate, flown 09/2014. Concept Plans: Client 2015.

Legend

- Roads
- Carriageways
- 100m wide assessment area
- Neighbourhood centre



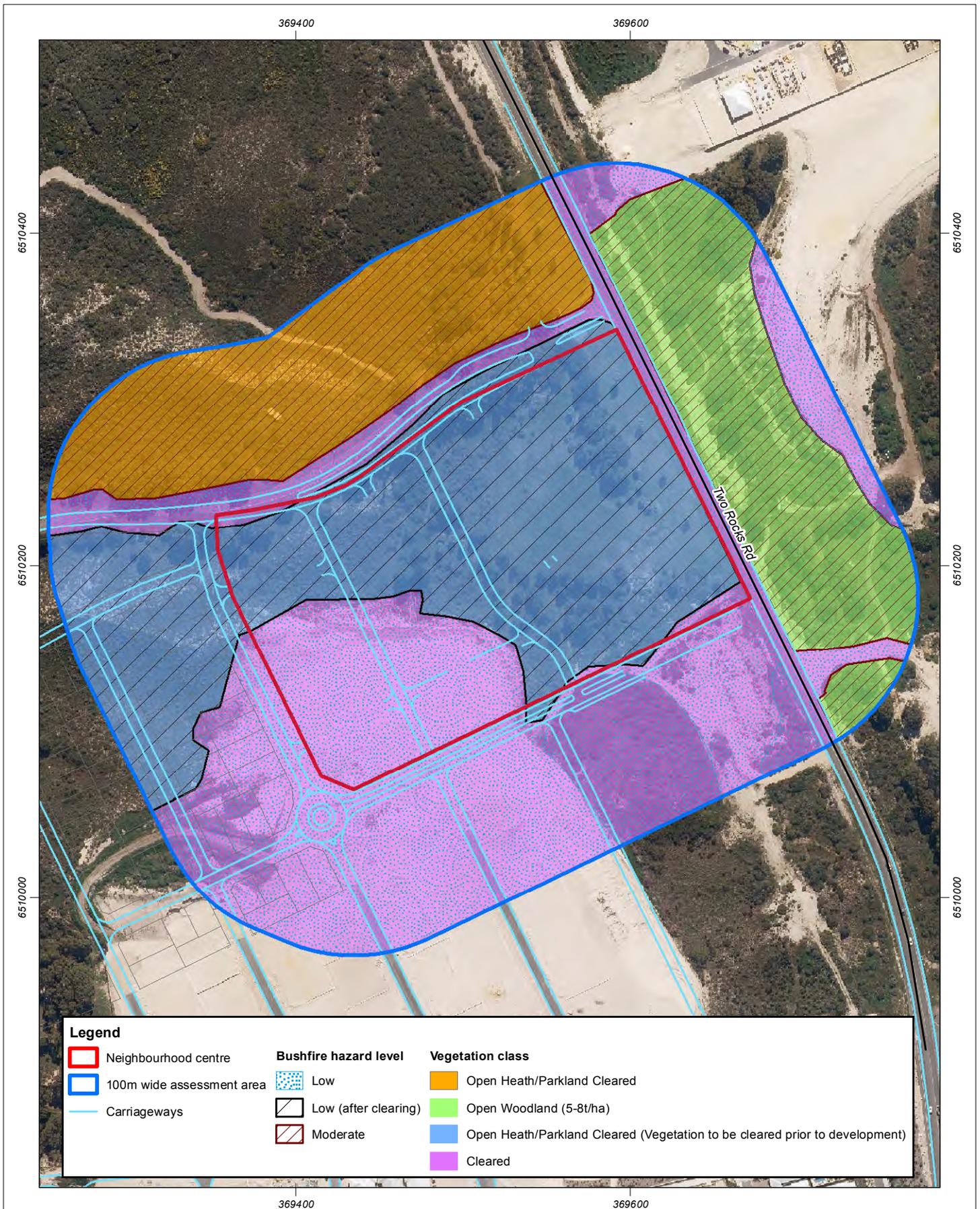


Figure 2: Vegetation class and bushfire hazard assessment map

Scale 1:3,059 at A4



Coordinate System: GDA 1994 MGA Zone 50
 Note that positional errors may occur in some areas

Date: 28/08/2015

Author: JCrute

Source: Aerial image: Landgate, flown 09/2014. Concept Plan: Client 2015.



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 www.strategen.com.au

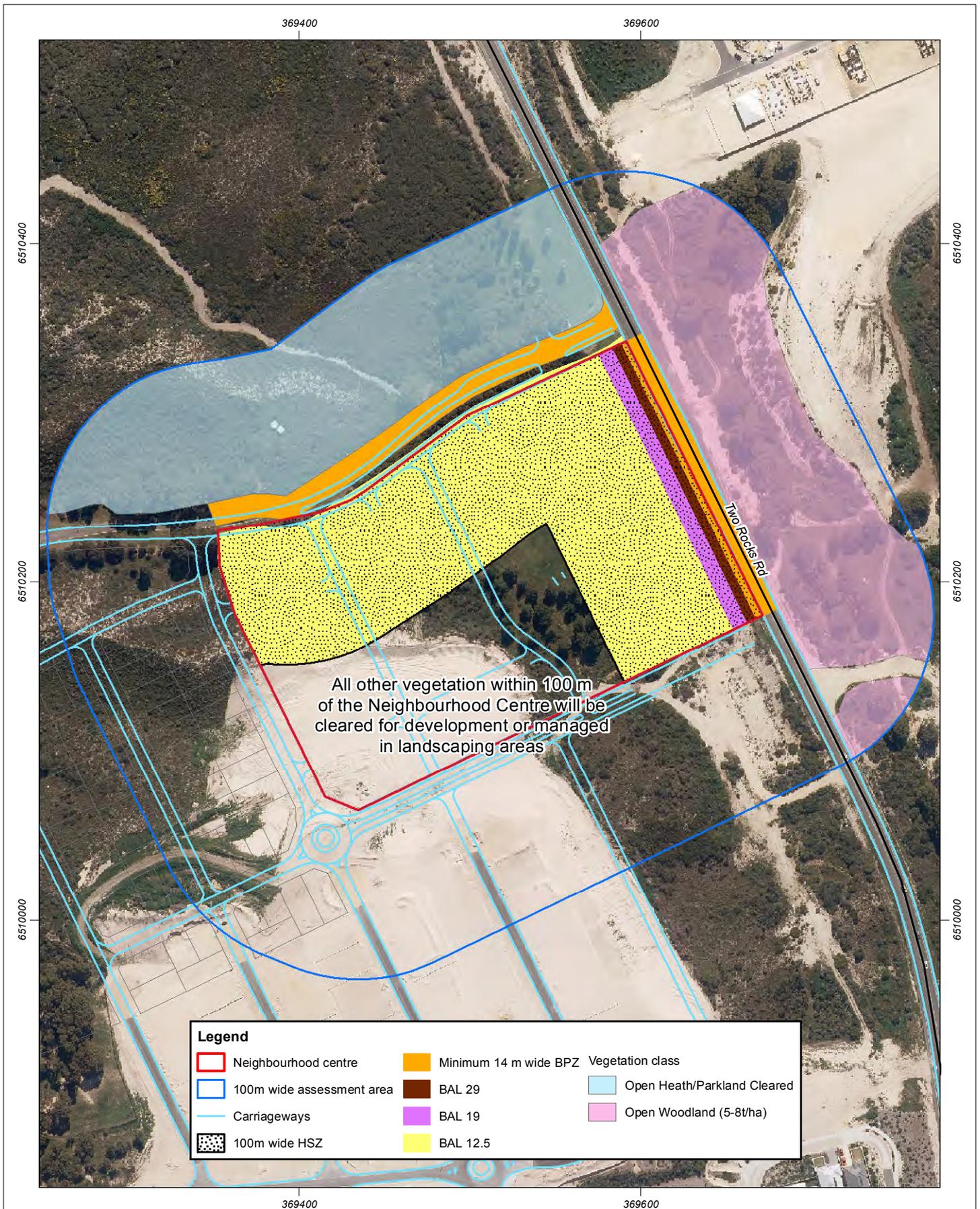


Figure 3: Indicative Building Protection Zones and BALs

Scale 1:3,000 at A4



Coordinate System: GDA 1994 MGA Zone 50
 Note that positional errors may occur in some areas
 Date: 28/08/2015
 Author: JCrute

Source: Aerial image: Landgate, flown 09/2014. Concept Plan: Client 2015.

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