



Bushfire Protection Assessment

Proposed Subdivision: Jordan Springs – Village Centre 2

Prepared for
CID Group

11 March 2014



DOCUMENT TRACKING

ITEM	DETAIL
Project Name	Bushfire Protection Assessment, Proposed Subdivision, Jordan Springs – Village Centre 2
Project Number	13GOSBUS-0138
Prepared by	Josh Calandra
Approved by	David Peterson
Status	FINAL
Version Number	5
Last saved on	11 March 2014

ACKNOWLEDGEMENTS

This document has been prepared by Eco Logical Australia Pty Ltd.

Disclaimer

This document may only be used for the purpose for which it was commissioned and in accordance with the contract between Eco Logical Australia Pty Ltd and CID Group. The scope of services was defined in consultation with CID Group, by time and budgetary constraints imposed by the client, and the availability of reports and other data on the subject area. Changes to available information, legislation and schedules are made on an ongoing basis and readers should obtain up to date information.

Eco Logical Australia Pty Ltd accepts no liability or responsibility whatsoever for or in respect of any use of or reliance upon this report and its supporting material by any third party. Information provided is not intended to be a substitute for site specific assessment or legal advice in relation to any matter. Unauthorised use of this report in any form is prohibited.

Contents

1	Property and proposal.....	1
1.1	Introduction	1
1.2	Location and description of subject land.....	1
1.3	Description of proposal	1
2	Bushfire threat assessment	6
2.1	Assessment requirements	6
2.2	Vegetation types and slopes.....	6
3	Bushfire protection measures	7
4	APZ maintenance plan.....	8
5	Construction standard.....	8
6	Water supply	9
7	Gas and electrical supplies.....	9
8	Access and egress.....	9
9	Fire trails	11
10	Assessment of environmental issues	11
11	Bushfire maintenance plans and fire emergency procedures	12
12	Recommendations and conclusion	12
12.1	Recommendations	12
12.2	Conclusion	13
	References	14

List of Figures

Figure 1: Location Plan for Jordan Springs – VC2	2
Figure 2: Bushfire Hazard Assessment for VC2	3
Figure 3: APZs for VC2	4
Figure 4: BALs for VC2	5

List of Tables

Table 1: Threat assessment, APZ and category of bushfire attack	7
Table 2: Performance criteria for proposed public roads* ¹	10

1 Property and proposal

Name:	CID Group		
Street or property Name:	Jordan Springs – Village Centre 2		
Suburb, town or locality:	Jordan Springs	Postcode:	2747
Lot/DP no:	Lot 11 DP 1176163		
Local Government Area:	Penrith City Council		
Type of development:	Subdivision		

1.1 Introduction

CID Group commissioned Eco Logical Australia Pty Ltd (ELA) to prepare a bushfire protection assessment (BPA) for the proposed subdivision of Village Centre 2 (VC2) for residential development in the form of 69 townhouses, Blocks A-D, and an alfresco dining piazza within Lot 11 DP 1176163 of Jordan Springs (hereafter referred to as the subject land).

This assessment has been prepared by the ELA Bushfire Consultant Josh Calandra (FPAA BPAD-D Certified Practitioner No. BPD-PD-23276). Josh is recognised by the NSW Rural Fire Service as a suitably qualified consultant in bushfire risk assessment.

The bushfire protection requirements for residential subdivision throughout Jordan Springs (formerly known as the Western Precinct) have been previously determined and approved at the Precinct Plan stage as described within the report *'Bushfire Protection Assessment – St Marys Western and Central Precincts'* prepared by BES (2009). This assessment follows and builds upon the findings of the initial bushfire report.

1.2 Location and description of subject land

The subject land is located approximately 3.4 kilometres east of the Nepean River and 2.9 kilometres north east of the Penrith CBD. The site is bounded to the north and east by land that is in varying stages of development for the Jordan Springs residential community. It is bounded in all other directions by Wianamatta Regional Park frontages. The subject land is located in the Local Government Area of Penrith City Council and has a Fire Danger Index (FDI) of 100.

The location is shown in **Figure 1**.

1.3 Description of proposal

The proposal is to establish 69 townhouses in the western portion of VC2 with the eastern portion proposed to be developed as 5 storey apartment blocks A-D with large open areas between designed to be an alfresco dining piazza.

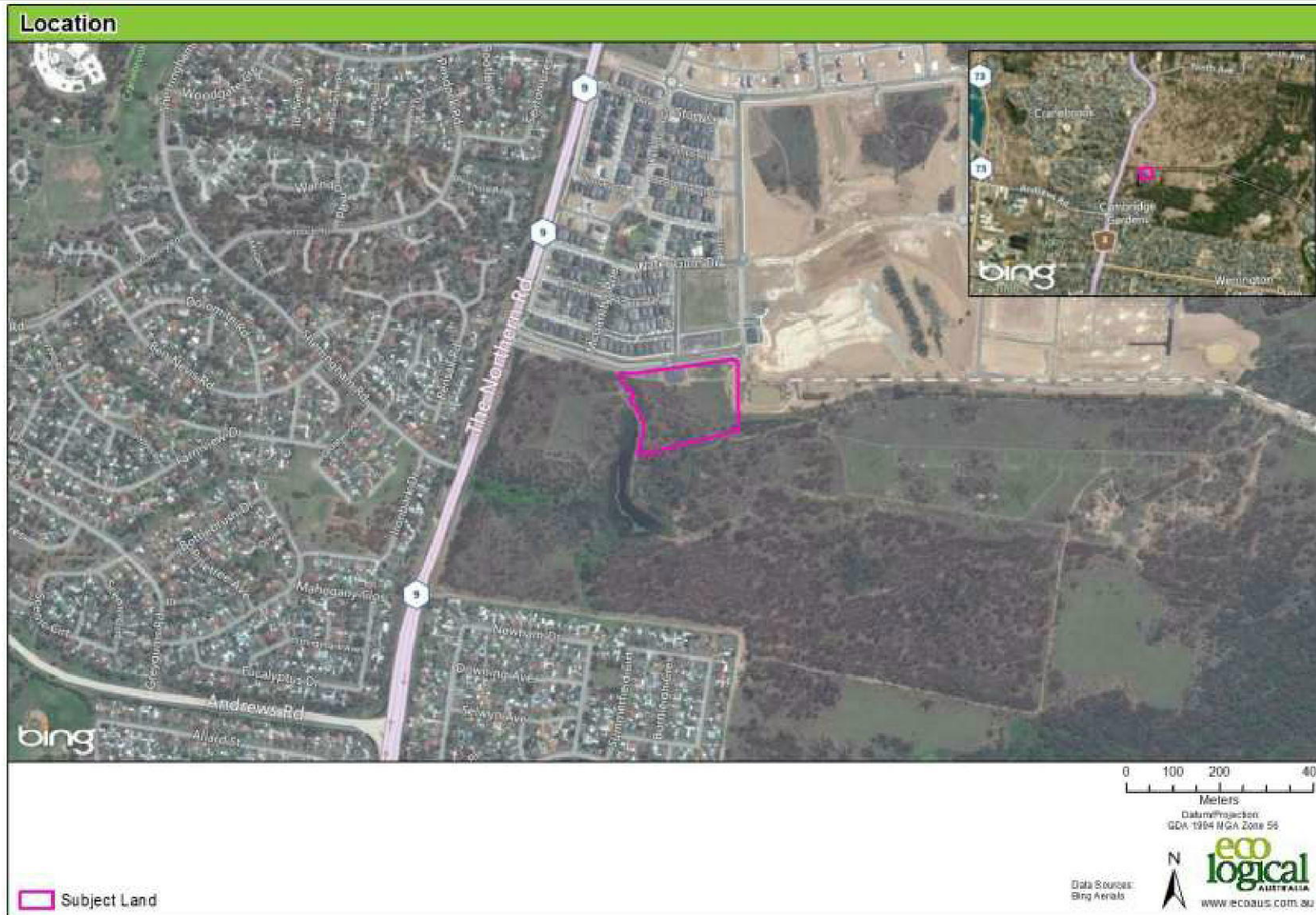


Figure 1: Location Plan for Jordan Springs – VC2

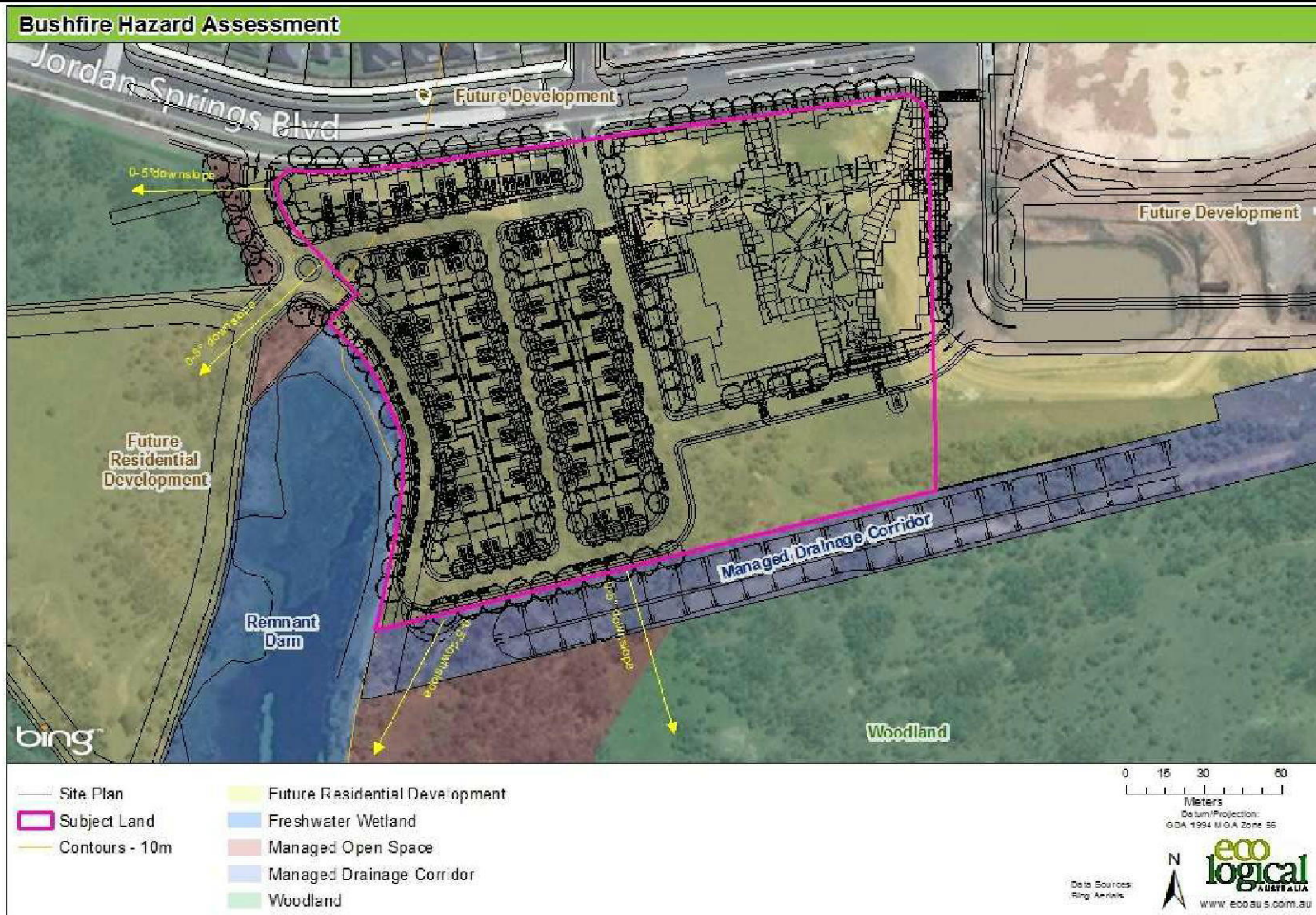


Figure 2: Bushfire Hazard Assessment for VC2



Figure 3: APZs for VC2

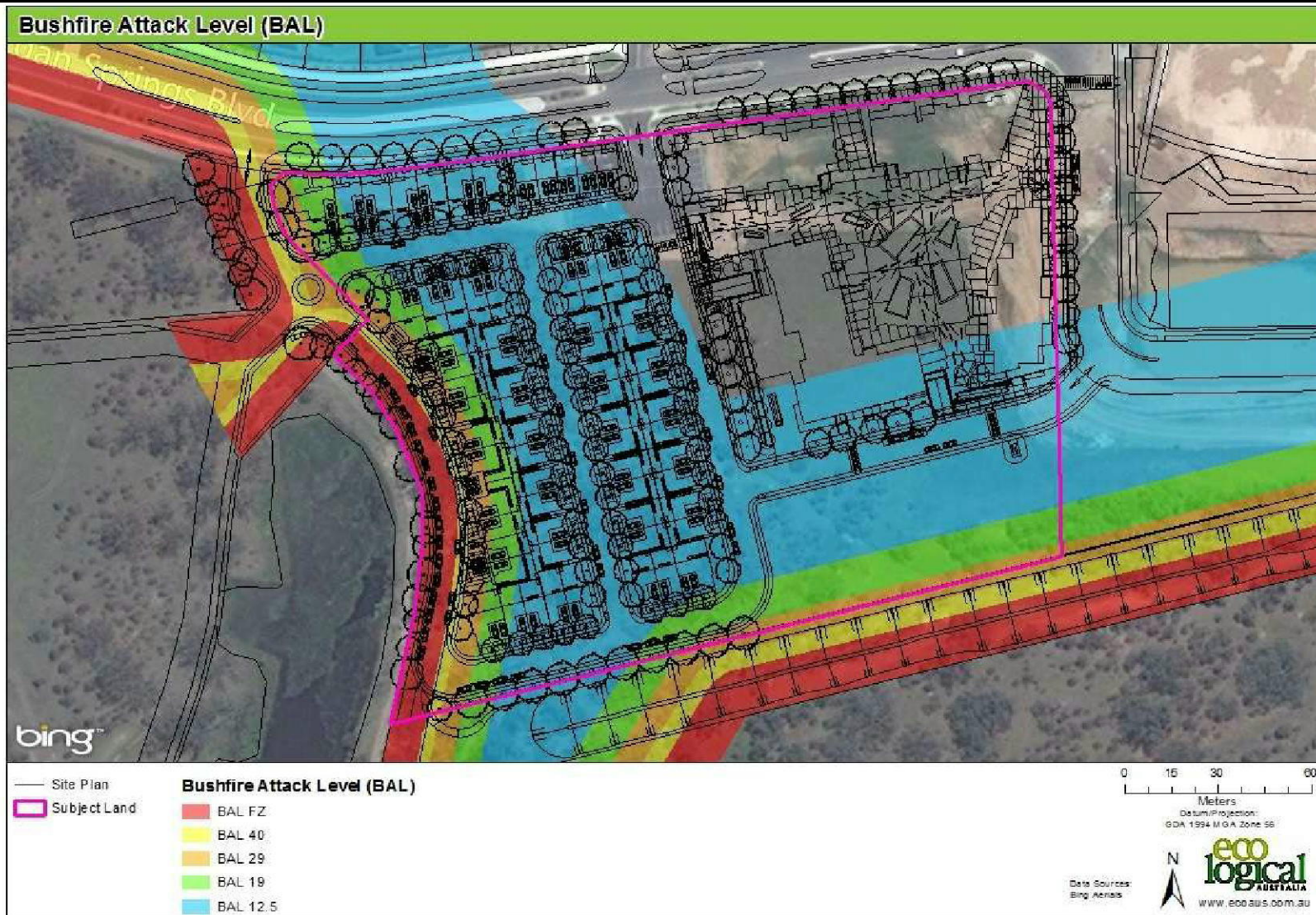


Figure 4: BALs for VC2

2 Bushfire threat assessment

2.1 Assessment requirements

The subject land is identified as Bush Fire Prone Land by Penrith City Council. The following assessment is prepared in accordance with Section 100B of the *Rural Fires Act 1997*, Clause 44 of the *Rural Fires Regulation 2008*, and 'Planning for Bush Fire Protection 2006' (RFS 2006) herein referred to as PBP.

The assessment also adopts the recommendations approved within the Precinct Plan relating to bushfire protection described within the report '*Bushfire Protection Assessment – St Marys Western and Central Precincts*' prepared by BES (2009). This assessment follows and builds upon the findings of the initial bushfire report.

2.2 Vegetation types and slopes

The vegetation and slope have been assessed in all directions for the proposed subdivision. In accord with PBP the predominant vegetation class has been calculated for a distance of at least 140 metres out from the boundary of the subject land and the slope class "most significantly affecting fire behaviour having regard for vegetation found [on it]" determined for a distance of at least 100 metres in all directions. The predominant vegetation and effective slope assessments are shown in **Table 1**.

The land to the north is managed as part of the existing Jordan Springs residential development. The land to the east has been cleared and is under construction for Village 4.

To the south there is a proposed managed drainage corridor and beyond this within Lot 3993 is an area of Open Space (managed lands) that has been designated for community use. These areas are suitable for use as Asset Protection Zones (APZs) to provide separation from the adjoining hazard areas. The drainage corridor has been designed to comply with an APZ through the mass planting of native grasses and sparse tree planting. The future plan of management for the riparian corridor will stipulate the management regime to keep the grasses consistent with acceptable APZ fuel loads.

To the southeast beyond the managed drainage corridor and to the northwest is vegetation classified under PBP as 'Woodland' occurring within the Wianamatta Regional Park and is a significant bushfire hazard. The quality of the vegetation is variable, ranging from areas of Grassland through more mature and established Woodland Community structures.

To the west is a remnant dam which is currently either not vegetated or has highly disturbed vegetation that is classified under PBP as 'Freshwater Wetland' which is considered to have the same fuel loads as 'Scrub' for BAL assessment purposes.

The vegetation classifications provided above are consistent with the bushfire assessment (BES 2009) approved as part of the Precinct Plan.

The hazards to the southeast, southwest, west and northwest (refer to **Figure 2**) fall within the PBP slope classification of 'Downslope of 0-5 degrees'.

3 Bushfire protection measures

Table A2.4 of PBP has been used to determine the width of Asset Protection Zones (APZ) for the proposed development. **Table 1** below shows the APZ calculation and the location of APZs are shown in **Figure 3**.

Table 1: Threat assessment, APZ and category of bushfire attack

Direction	Slope ¹	Vegetation ²	PBP APZ ³	Proposed APZ	Comment
Southeast	Downslope >0-5°	Woodland	15 m	> 25 m	A minimum 25 metre drainage corridor and 3.6 metre wide maintenance track provide an adequate APZ
Southwest	Downslope >0-5°	Woodland	15 m	> 40 m	A minimum 10 metre of road reserve, 3.6 metre wide maintenance track and a proposed 30 metre drainage corridor provide an adequate APZ
West	Downslope >0-5°	Freshwater Wetland	15 m	> 15 m	The road reserve provides an adequate APZ
Northwest	Downslope >0-5°	Woodland	15 m	> 15 m	The landscaping of VC10 entry and road reserve provides an adequate APZ

All other directions are existing or proposed infrastructure and residential developments

¹ Slope most significantly influencing the fire behaviour of the site having regard to vegetation found. Slope classes are according to PBP.

² Predominant vegetation is identified, according to PBP and “Where a mix of vegetation types exist the type providing the greater hazard is said to be predominate”.

³ Assessment according to PBP.

4 APZ maintenance plan

The proposed APZ area is to be managed as follows:

- No tree or tree canopy is to occur within 2 metres of future dwelling rooflines;
- The presence of a few shrubs or trees in the APZ is acceptable provided that they:
 - are well spread out and do not form a continuous canopy;
 - are not species that retain dead material or deposit excessive quantities of ground fuel in a short period or in a danger period; and
 - are located far enough away from future buildings so that they will not ignite the buildings by direct flame contact or radiant heat emission.
- Any landscaping or plantings should preferably be local endemic mesic species or other low flammability species;
- A minimal ground fuel is to be maintained to include less than 4 tonnes per hectare of fine fuel (*fine fuel* means ANY dead or living vegetation of <6 mm in diameter e.g. twigs less than a pencil in thickness. 4 t/ha is equivalent to a 1 cm thick layer of leaf litter); and
- Any structures storing combustible materials such as firewood (e.g. sheds) must be sealed to prevent entry of burning debris.

5 Construction standard

The building construction standard is based on the determination of the Bushfire Attack Level (BAL) in accordance with Method 1 of AS 3959-2009 'Construction of Buildings in Bushfire Prone Areas'. The BAL is based on known vegetation type, effective slope and managed separation distance between the development and the bushfire hazard.

The BALs that are relevant to this development are shown in **Figure 4** with the townhouses to the west being exposed to BAL-29 to BAL-12.5 construction requirements and the apartment buildings to the east exposed to BAL-12.5 to BAL-LOW construction requirements.

6 Water supply

The subject land is to be serviced by reticulated water. The furthest point from any future dwellings to a hydrant is to be less than 90 metres. The reticulated water supply is to comply with the following acceptable solutions within Section 4.1.3 of PBP:

- Reticulated water supply to urban subdivisions uses a ring main system for areas with perimeter roads;
- Fire hydrant spacing, sizing and pressures comply with AS 2419.1 – 2005. Where this cannot be met, the RFS will require a test report of the water pressures anticipated by the relevant water supply authority. In such cases, the location, number and sizing of hydrants shall be determined using fire engineering principles;
- Hydrants are not located within any road carriageway;
- All above ground water and gas service pipes external to the building are metal, including and up to any taps; and
- The [PBP] provisions of parking on public roads are met.

7 Gas and electrical supplies

In accordance with PBP, electricity should be underground wherever practicable. Where overhead electrical transmission lines are installed:

- Lines are to be installed with short pole spacing, unless crossing gullies, and
- No part of a tree should be closer to a powerline than the distance specified in “Vegetation Safety Clearances” issued by Ausgrid (NS179, December 2010).

Any gas services are to be installed and maintained in accordance with AS/NZS 1596:2008 (Standards Australia 2008).

8 Access and egress

The subdivision is accessed via Jordan Springs Boulevard to the north and Lakeside Drive to the east. The proposed public road layout within the subdivision and its linkages to existing and future surrounding roads complies with PBP as listed within **Table 2** on the following page with the exception of roll top kerbs being provided next to a bushfire interface.

While a 200 mm high kerbs are not compliant with the acceptable solutions for public roads it satisfies the performance criteria. It has become accepted practice (by RFS and local councils) not to supply roll top kerbs at interfaces where the desire is to prevent other vehicles from accessing open space for parking or anti-social behaviour. This approach has been adopted at Jordan Springs Villages 2 and 4.

So while not complying with the acceptable solution, the 200 mm kerbs meet the performance requirement by not impeding the ability of emergency services vehicles to respond to an incident where this has been implemented.

Table 2: Performance criteria for proposed public roads*¹

Performance Criteria	Acceptable Solutions
<p>The intent may be achieved where:</p> <ul style="list-style-type: none"> firefighters are provided with safe all weather access to structures (thus allowing more efficient use of firefighting resources) 	<ul style="list-style-type: none"> public roads are two-wheel drive, all weather roads
<ul style="list-style-type: none"> public road widths and design that allows safe access for firefighters while residents are evacuating an area 	<ul style="list-style-type: none"> urban perimeter roads are two-way, that is, at least two traffic lane widths (carriageway 8 metres minimum kerb to kerb), allowing traffic to pass in opposite directions. Non perimeter roads comply with Table 4.1 – Road widths for Category 1 Tanker (Medium Rigid Vehicle) the perimeter road is linked to the internal road system at an interval of no greater than 500 metres in urban areas traffic management devices are constructed to facilitate access by emergency services vehicles public roads have a cross fall not exceeding 3 degrees public roads are through roads. Dead end roads are not recommended, but if unavoidable, dead ends are not more than 200 metres in length, incorporate a minimum 12 metres outer radius turning circle, and are clearly sign posted as a dead end and direct traffic away from the hazard curves of roads (other than perimeter roads) are a minimum inner radius of six metres maximum grades for sealed roads do not exceed 15 degrees and an average grade of not more than 10 degrees or other gradient specified by road design standards, whichever is the lesser gradient there is a minimum vertical clearance to a height of four metres above the road at all times
<ul style="list-style-type: none"> the capacity of road surfaces and bridges is sufficient to carry fully loaded firefighting vehicles 	<ul style="list-style-type: none"> the capacity of road surfaces and bridges is sufficient to carry fully loaded firefighting vehicles (approximately 15 tonnes for areas with reticulated water, 28 tonnes or 9 tonnes per axle for all other areas). Bridges clearly indicated load rating
<ul style="list-style-type: none"> roads that are clearly sign posted (with easy distinguishable names) and buildings / properties that are clearly numbered 	<ul style="list-style-type: none"> public roads greater than 6.5 metres wide to locate hydrants outside of parking reserves to ensure accessibility to reticulated water for fire suppression public roads between 6.5 metres and 8 metres wide are No Parking on one side with the services (hydrants) located on this side to ensure accessibility to reticulated water for fire suppression
<ul style="list-style-type: none"> there is clear access to reticulated water supply 	<ul style="list-style-type: none"> public roads up to 6.5 metres wide provide parking within parking bays and located services outside of the parking bays to ensure accessibility to reticulated water for fire suppression one way only public access roads are no less than 3.5 metres wide and provide parking within parking bays and located services outside of the parking bays to ensure accessibility to reticulated water for fire suppression
<ul style="list-style-type: none"> parking does not obstruct the minimum paved width 	<ul style="list-style-type: none"> parking bays are a minimum of 2.6 metres wide from kerb to kerb edge to road pavement. No services or hydrants are located within the parking bays public roads directly interfacing the bush fire hazard vegetation provide roll top kerbing to the hazard side of the road

*¹ PBP page 21

9 Fire trails

There are no fire trails proposed to support this development. There is a proposed maintenance trail between the drainage corridor and the southern boundary of the development. While the width and lack of passing bays do not comply with the PBP deemed-to-satisfy approach for fire trails it does provide some form of access in an emergency.

10 Assessment of environmental issues

PBP requires that known significant environmental features, threatened species or Aboriginal relics identified under the *Threatened Species Conservation Act 1995* or the *National Parks Act 1974* that will affect or be affected by the development be addressed in this report.

A Species Impact Statement for the development prepared by Cumberland Ecology and dated 2013 has determined the following:

“The proposed development of the subject site will remove a total of 2.84 ha of Cumberland Plain Woodland (CPW) in the form of mature CPW (1.33 ha), regenerating CPW (0.63 ha) and low diversity Derived Native Grassland (0.88 ha). However, and with due consideration of the restricted distribution of this Critically Endangered Ecological Community (CEEC) in the region, the proposed development is not likely to have a significant impact on CPW such that the large and viable representatives in the Regional Park would be placed at risk of extinction.

The mature and regenerating CPW and to a lesser extent, the low diversity Derived Native Grassland, to be cleared for the proposed development provide an area of potential habitat for threatened plants and animals, primarily the Cumberland Plain Land Snail. However, when directly compared with the habitats of the Regional Park, this area of habitat is considered to be degraded and of a lesser importance due to the increased level of disturbance, sparse nature and its comparatively small size. Therefore, the loss of this habitat within the proposed development area is not considered to be significant.

The impact of the proposal will be more than balanced by the major conservation outcome resulting from of the creation of the 900ha Regional Park. The Regional Park comprises CPW of quality and scale in a consolidated land holding, to be transferred into public ownership and subject to a Plan of Management. When weighed against the conservation benefits, both direct and indirect, that will be derived from the 900ha Regional Park, together with the various mitigation measures afforded by the management strategies for weeds, feral and domestic animals and macrofauna, the relatively small areas of vegetation to be cleared as a result of the proposal are considered to be of minor consequence. The proposal is unlikely to result in any threatened species or ecological community becoming extinct.”

Penrith City Council is the determining authority for this infill development; they will assess more thoroughly any potential environmental and heritage issues.

11 Bushfire maintenance plans and fire emergency procedures

The areas determined to provide the required separation distances (APZ's) from the hazard are to be maintained in perpetuity for the life of the subdivision.

The future occupants of single dwellings on the proposed lots will be responsible for their emergency management strategies.

12 Recommendations and conclusion

12.1 Recommendations

The following recommendations have been made within this report to ensure the proposed development is compliant with Section 100B of the *Rural Fires Act 1997*, Clause 44 of the *Rural Fires Regulation 2008*, and '*Planning for Bush Fire Protection 2006*' (RFS 2006):

Recommendation 1- Asset protection zones are to be provided to the proposed development as listed in **Table 1** and shown in **Figure 3**;

Recommendation 2- Asset protection zone landscaping is to comply with the NSW Rural Fire Service document '*Planning for Bush Fire Protection 2006*' inner protection area requirements as listed in Appendix 2 Section A2.2 of PBP and guided by the fuel management principles listed in Section 4 of this report;

Recommendation 3- Landscaping across the subdivision is to comply with the principles listed in Appendix 5 of the NSW Rural Fire Service document '*Planning for Bush Fire Protection 2006*';

Recommendation 4- The BALs that are relevant to this development are shown in **Figure 4** with the townhouses to the west being exposed to BAL-29 to BAL-12.5 construction requirements and the apartment buildings to the east exposed to BAL-12.5 to BAL-LOW construction requirements.

Recommendation 5- A hydrant water supply should be installed in accordance with Australian Standard AS 2419.1 where it can be within 90 metres of the entire building envelope;

Recommendation 6- Public roads are to comply with the NSW Rural Fire Service document '*Planning for Bush Fire Protection 2006*' as listed in **Table 2** of this report;

Recommendation 7- 200 mm high kerbs are proposed in lieu of roll top kerbs adjacent to the bushfire interface;

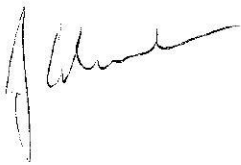
Recommendation 8- Electrical services should be underground and if overhead lines are used, overhanging branches should be trimmed according to "Vegetation Safety Clearances" issued by Ausgrid (NS179, December 2010);

Recommendation 9 Gas services are to be installed and maintained in accordance with AS/NZS 1596:2008 (Standards Australia 2008); and

Recommendation 10- The future occupants of single dwellings on the proposed lots will be responsible for their emergency management strategies.

12.2 Conclusion

In the author's professional opinion the bushfire protection requirements listed in this assessment provide an adequate standard of bushfire protection for the proposed development. The proposal is consistent with the intent of '*Planning for Bush Fire Protection*' (RFS 2006) and appropriate for the issue of a Bush Fire Safety Authority.



Josh Calandra
Bushfire Consultant
Eco Logical Australia Pty Ltd
FPAA BPAD Certified Practitioner No. BPD-PD-23276



References

- Ausgrid. 2010. *Network Standard NS 179 Vegetation Safety Clearances* (updated from Energy Australia. 2002. *Network Standard NS 179 (Vegetation Safety Clearances)*, Sydney.)
- BES. 2009. *Bushfire Protection Assessment – St Marys Western and Central Precincts*. Lendlease
- Cumberland Ecology. 2013. *Townhouse Development within Stage VC2 and VC3 of Jordan Springs in the Western Precinct, St Mary's Property – Species Impact Statement* CID Group
- NSW Rural Fire Service (RFS). 2006. *Planning for Bush Fire Protection: A Guide for Councils, Planners, Fire Authorities, Developers and Home Owners*. Australian Government Publishing Service, Canberra.
- NSW Rural Fire Service (RFS). 2006. *Building in Bush Fire Prone Areas: Guidelines for Subdivision Applications*. Australian Government Publishing Service, Canberra.
- Standards Australia. 2005. *Fire hydrant installations - System design, installation and commissioning*, AS2419.1, Fourth edition 2005, Standards Australia International Ltd, Sydney.
- Standards Australia. 2008. *The storage and handling of LP Gas*, AS/NZS 1596:2008, Fourth edition 2005, Standards Australia International Ltd, Sydney
- Standards Australia. 2009 (Amendment 3). *Construction of buildings in bushfire-prone areas*, AS 3959-2009, Standards Australia International Ltd, Sydney

eco
logical
AUSTRALIA



HEAD OFFICE

Suite 4, Level 1
2-4 Merton Street
Sutherland NSW 2232
T 02 8536 8600
F 02 9542 5622

SYDNEY

Level 6
299 Sussex Street
Sydney NSW 2000
T 02 8536 8650
F 02 9264 0717

ST GEORGES BASIN

8/128 Island Point Road
St Georges Basin NSW 2540
T 02 4443 5555
F 02 4443 6655

CANBERRA

Level 2
11 London Circuit
Canberra ACT 2601
T 02 6103 0145
F 02 6103 0148

NEWCASTLE

Suites 28 & 29, Level 7
19 Bolton Street
Newcastle NSW 2300
T 02 4910 0125
F 02 4910 0126

NAROOMA

5/20 Cauty Street
Narooma NSW 2546
T 02 4476 1151
F 02 4476 1161

COFFS HARBOUR

35 Orlando Street
Coffs Harbour Jetty NSW 2450
T 02 6651 5484
F 02 6651 6890

ARMIDALE

92 Taylor Street
Armidale NSW 2350
T 02 8081 2681
F 02 6772 1279

MUDGEE

Unit 1, Level 1
79 Market Street
Mudgee NSW 2850
T 02 4302 1230
F 02 6372 9230

PERTH

Suite 1 & 2
49 Ord Street
West Perth WA 6005
T 08 9227 1070
F 08 9322 1358

WOLLONGONG

Suite 204, Level 2
62 Moore Street
Austinmer NSW 2515
T 02 4201 2200
F 02 4268 4361

GOSFORD

Suite 5, Baker One
1-5 Baker Street
Gosford NSW 2250
T 02 4302 1220
F 02 4322 2897

DARWIN

16/56 Marina Boulevard
Cullen Bay NT 0820
T 08 8989 5601

BRISBANE

PO Box 1422
Fortitude Valley QLD 4006
T 07 3503 7193

1300 646 131
www.ecoaus.com.au