Bushfire Protection Assessment

Proposed Subdivision: Lot 30 George Evans and Jonsson Roads, Mundamia

Prepared for
Jemalong Mundamia Pty Ltd

22 May 2015

DOCUMENT TRACKING

Item	Detail
Project Name	Bushfire Protection Assessment, Proposed Subdivision - Lot 30 George Evans and Jonsson Roads, Mundamia
Project Number	14SGBBUS-0093
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Approved by	David Peterson / Rod Rose
Status	Final
Version Number	5
Last saved on	22 May 2015

This report should be cited as 'Eco Logical Australia May 2015. *Bushfire Protection Assessment, Proposed subdivision - Lot 30 George Evans and Jonsson Roads, Mundamia*. Prepared for Jemalong Mundamia Pty Ltd.'

ACKNOWLEDGEMENTS

This document has been prepared by Eco Logical Australia Pty Ltd with support from Allen Price & Associates.

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1 Property and proposal

Name:	Jemalong Mundamia Pty Ltd		
Postal address:	C/- Allen Price & Associates		
Street or property Name:	Cnr George Evans and Jonsson Roads		
Suburb, town or locality:	Mundamia	**Postcode:**	2540
Lot/DP no:	Lot 30 DP 1198692		
Local Government Area:	Shoalhaven City Council		
Type of area:	Rural		
Type of development:	Subdivision: no. of proposed lots - 320 no. of existing lots - 1.		

1.1 Description of proposal

Jemalong Mundamia Pty Ltd commissioned Eco Logical Australia Pty Ltd (ELA) to prepare a bushfire protection assessment (BPA) for a proposed 319 lot subdivision at Lot 30 DP 1198692 George Evans and Jonsson Roads, Mundamia (hereafter referred to as the subject land).

The proposal consists of staged development creating a total of 319 residential lots, 1 commercial lot and 4 public reserves.

This assessment has been prepared by the ELA Senior Bushfire Consultant, Julie Holden (FPAA BPAD-A Certified Practitioner No. BPAD-L3-23572) with quality assurance review by David Peterson (FPAA BPAD-A Certified Practitioner No. BPAD-L3-18882). Both Julie Holden and David Peterson are recognised by the NSW Rural Fire Service as qualified bushfire consultants in bushfire risk assessment.

The performance solution for the south-eastern APZs has been prepared by the ELA's Director of Bushfire, Rod Rose (FPAA BPAD-Level 3 Certified Practitioner No. BPAD-PA-1940).

1.2 Location and description of subject land

The subject land is located on the corner of George Evans and Jonsson Roads in the suburb of Mundamia, to the west of Nowra as shown in **Figure 1**. **Figure 2** shows the subject land and the location of the proposed subdivision in relation to the nearest bush fire prone vegetation. **Figure 3** contains a site plan of the proposed development.

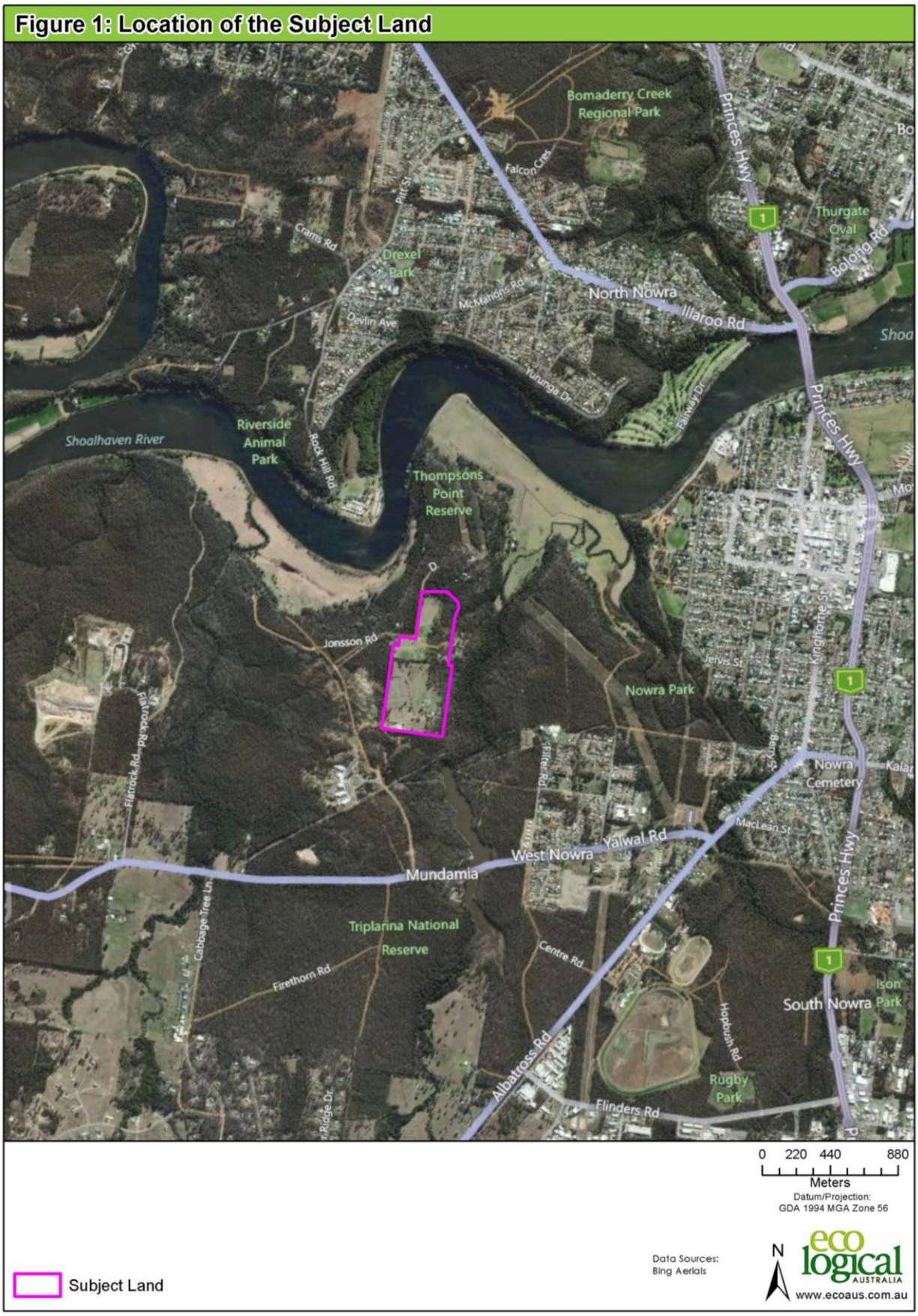

Figure 1: Location

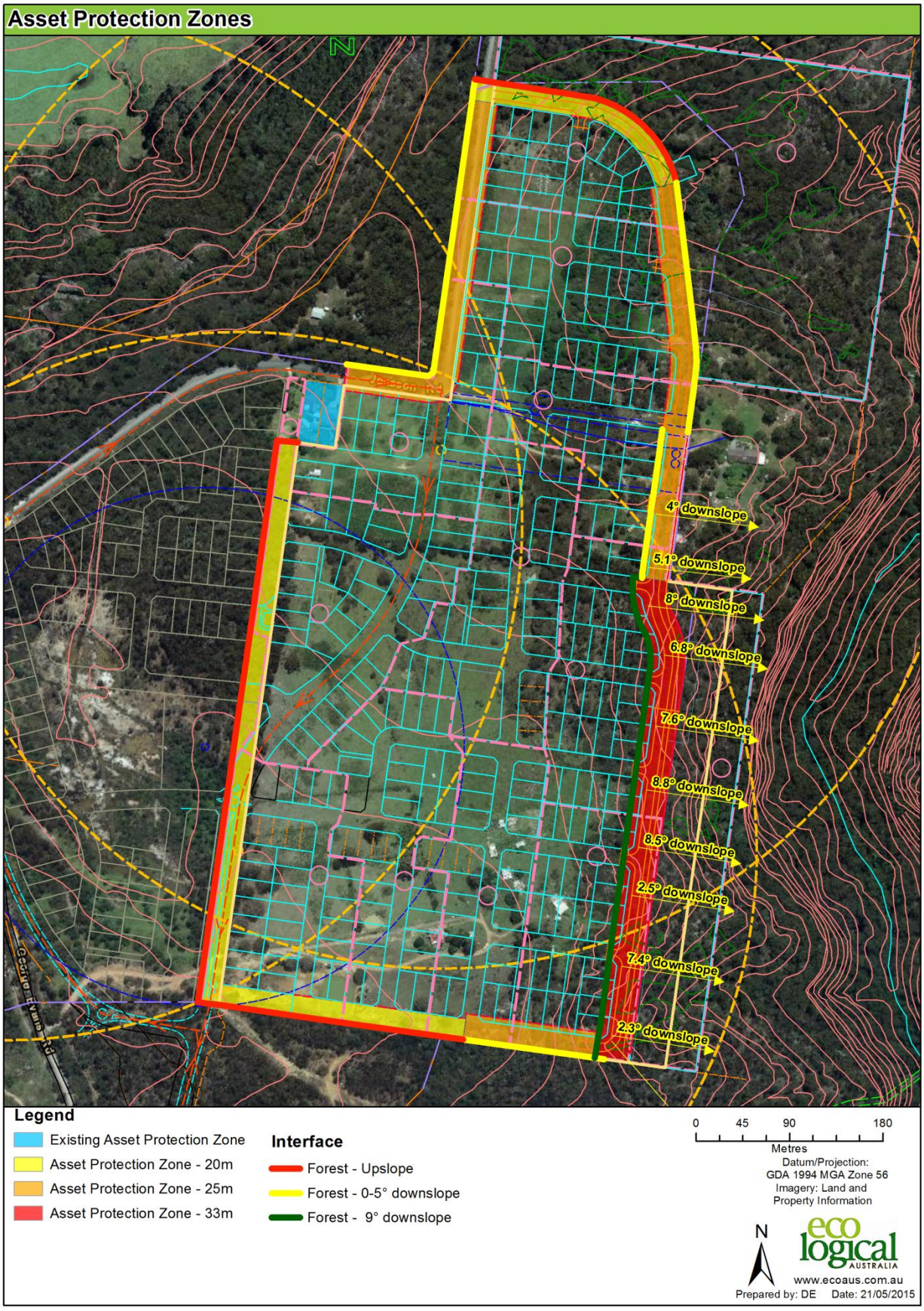

Figure 2: Bushfire hazard assessment and APZs

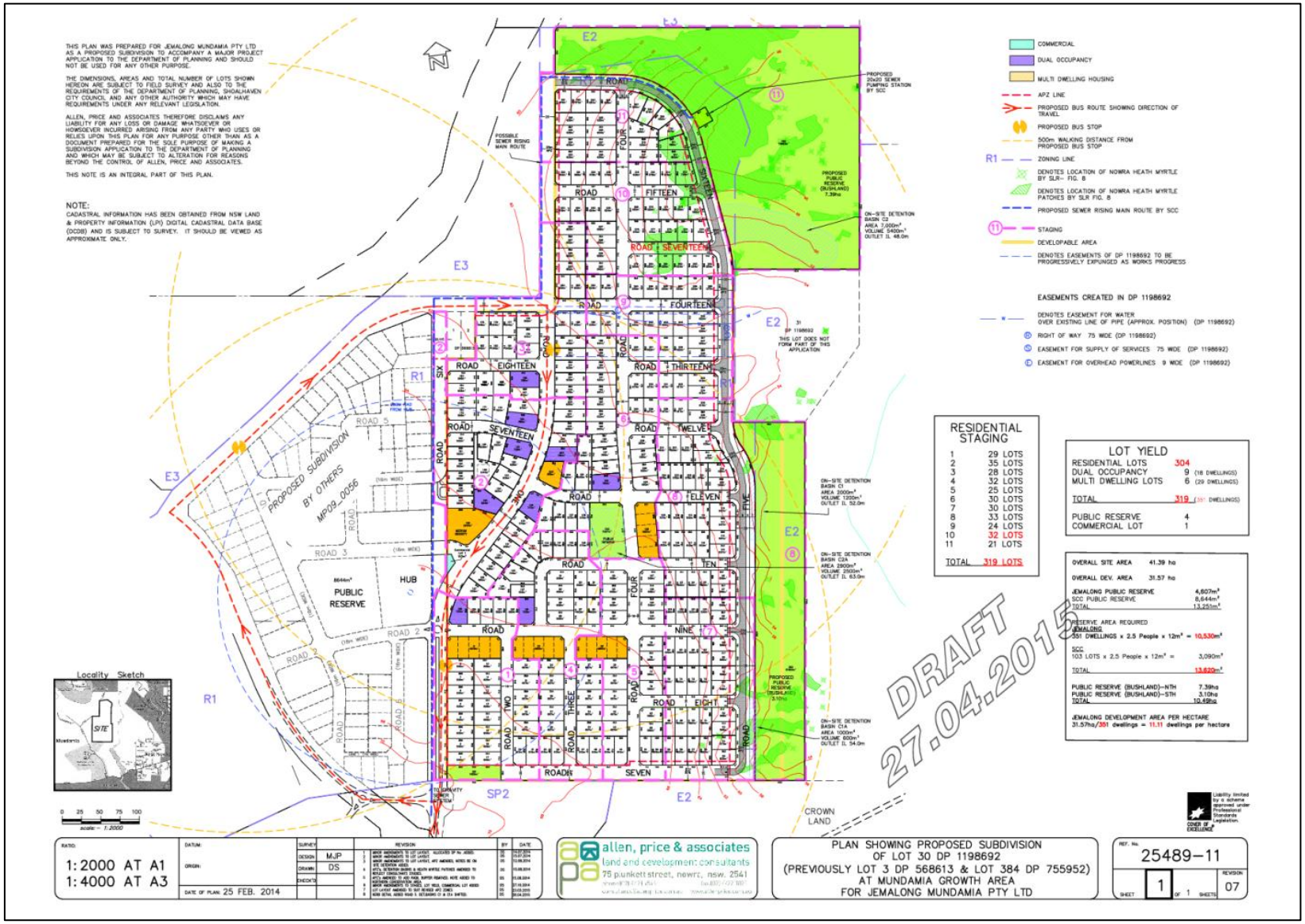

Figure 3: Development plan

2 Bushfire threat assessment

The subject land is identified as bush fire prone land by Shoalhaven City Council. The following assessment is prepared in accordance with Section 91 of the *Environmental Planning and Assessment Act 1979,* section 100B of the *Rural Fires Act 1997* and *Planning for Bush Fire Protection 2006* (RFS 2006), herein referred to as PBP.

2.1 Vegetation types and slope

The vegetation and slope have been assessed in all directions for each proposed allotment. In accord with PBP the predominant vegetation class has been calculated for a distance of at least 140 m out from each proposed allotment and where appropriate 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 m in all directions. The predominant vegetation and effective slope assessments are shown in **Figure 2**.

The subject land is largely on a plateau with steep slopes to Flat Rock Creek to the east. The predominant slope on the western and northern boundary of the proposed subdivision falls into the PBP slope category of 'upslope/flat' and 'downslope >0-5^{o}'.

Detailed GIS slope analysis using 2 m contours was undertaken along the south-eastern boundary. 11 transects of 100 m each were used to determine the effective slope, with the slope ranging from 1.1^{o} to 8.8^{o} downslope. The steepest slope of 8.8^{o} (rounded up to 9^{o}) was used to model the width of the required APZ.

Public reserves proposed within the internal boundary of the subdivision shall be maintained with fuel loads which do not exceed those of an APZ.

3 Asset protection zones (APZ)

Both PBP and the NBC Bushfire Attack Assessor have been used to determine the width of Asset Protection Zones (APZ) for each proposed allotment adjoining a hazard using the vegetation and slope data identified in **Figure 2**. The proposed APZs are also shown in **Figure 2**.

All minimum APZs for the proposed development are 20 m wide where the hazard is upslope from the development, and either 25 m or 33 m wide, where it is downslope of the development.

The APZ for the south-eastern boundary was determined using the NBC Bushfire Attack Assessor, and the approach was discussed with Amanda Moylan of the RFS. The steepest slope of 8.8 degrees (rounded up to 9 degrees) was used to model the width of APZ at 32 m and subsequently rounded up to 33 m. A 33 m APZ was then applied to the full length of the south-eastern bushland interface.

This achieves the PBP Asset Protection Zone performance criteria of '*Radiant heat levels at any point on a proposed building will not exceed 29 kW/m2*'.

The only encroachment of the APZ onto residential lots is to the extent of the building setback line of 8 m, as is standard practice in subdivision design. The intent of the APZ is met by the requirement of the building setback and no additional provisions are required for formalise the APZ (i.e. no easement required, although it may be included as a restriction on the title if preferred).

All APZs are located within the development footprint and will consist of roadways and associated verges and residential lots (to the building setback line).

4 APZ maintenance plan

The required APZ will largely be within the perimeter roads to be created as a part of the development. Vegetation clearance and tree removal are required to support the proposed development. Fuel management within the APZ is to be as follows:

- No tree or tree canopy is to occur within 2 m of the dwelling roofline
- 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
    - Are located far enough away from the building so that they will not ignite the building 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)
- Any structures storing combustible materials such as firewood (e.g. sheds) must be sealed to prevent entry of burning debris.

5 Construction standard

This application does not seek to apply the *Environmental Planning and Assessment Amendment (Bushfire Prone Land) Regulation 2014* reforms, which amend the *Rural Fires Regulation 2013.*

Section 44 (2) of the *Rural Fires Regulation 2013* specifies additional 'prescribed information' (as defined) may be required to accompany the application for a bush fire safety authority if:

> (a) the proposed development is subdivision for the purposes of dwelling houses, dual occupancies or secondary dwellings on property that is in an urban release area, and
>
> (b) the application specifies that the applicant wishes the Commissioner, when determining the application, to consider whether it would be appropriate for the future erection of the dwelling houses, dual occupancies or secondary dwellings concerned to be excluded from the application of section 79BA of the Environmental Planning and Assessment Act 1979 .

As this application does not seek exemption from 79BA of the Environmental Planning and Assessment Act 1979 (as per (b) above) and no further information is required for this submission.

The bushfire construction standards or Bushfire Attack Levels (BALs) as per *Australian Standard AS 3959-2009 'Construction of buildings in bushfire-prone areas'* (Standards Australia 2009) will be determined at the development application stage for future dwellings within the proposed subdivision.

Interim staging APZs will be implemented to allow construction standards for dwellings in early stages to be those which would apply at the end stage of development (i.e. large staging APZ's of 100m or to the study area perimeter will prevent unnecessary construction standards applying to early stages).

6 Water supply

The subject land will be serviced by reticulated water. The furthest point from any future dwellings to a hydrant will be less than 70 m. The reticulated water supply will 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 Australian Standard AS 2419.1 'Fire hydrant installations – System design installation and commissioning' (Standards Australia 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
- No part of a tree should be closer to a powerline than the distance specified in the 'ISSC 3 Guideline for Managing Vegetation Near Power Lines' (Industry Safety Steering Committee 2005).

Any gas services are to be installed and maintained in accordance with Australian Standard AS/NZS 1596 'The storage and handling of LP Gas' (Standards Australia 2008).

8 Access

8.1 Public roads

Egress/ingress routes for the proposed subdivision are available from the south-west corner (via the realigned George Evans Road) and western side (via existing Jonsson Road) and north-western corner (Jonsson Road). A separate subdivision is proposed to the west, and road design within each of the two subdivisions has adopted a configuration compatible with each other (i.e. roads within each individual subdivision align). This is a note only; access for the proposed subdivision on the subject land does not rely on any access provisions within the neighbouring proposal.

The proposed public roads within the subdivision can comply with all of the PBP design requirements as outlined **Table 1**.

8.2 Access and egress

Future dwellings within the proposed subdivision will be accessed via standard residential driveways. As outlined in **Table 1**, these residential driveways do not need to comply with any specific bushfire access design requirements because the following applies to the proposed subdivision:

(i) The proposed subdivision will be serviced by reticulated water

(ii) The furthest point of any future dwellings within the proposed subdivision from the nearest hydrant will be no greater than 70 m; and

(iii) The speed limit within the proposed subdivision will be less than 70 kph.

Table 1: Performance criteria for proposed public roads[1]

Performance Criteria	Acceptable Solutions	Complies
The intent may be achieved where:		
• firefighters are provided with safe all weather access to structures (thus allowing more efficient use of firefighting resources)	• public roads are two-wheel drive, all weather roads	Complies (note that arrows indicating traffic travel direction on Figure 3 indicate bus travel direction only, not all traffic)
• public road widths and design that allows safe access for firefighters while residents are evacuating an area	• 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)	Complies
	• the perimeter road is linked to the internal road system at an interval of no greater than 500 metres in urban areas	Complies

Performance Criteria	Acceptable Solutions	Complies
	• traffic management devices are constructed to facilitate access by emergency services vehicles	Can comply
	• public roads have a cross fall not exceeding 3 degrees	Complies
	• 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	Complies (no dead end roads)
	• curves of roads (other than perimeter roads) are a minimum inner radius of six metres	Complies
	• the minimum distance between inner and outer curves is six metres.	Complies
	• 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	Complies
	• there is a minimum vertical clearance to a height of four metres above the road at all times	Can comply
• the capacity of road surfaces and bridges is sufficient to carry fully loaded firefighting vehicles	• 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	Can comply
• roads that are clearly sign posted (with easy distinguishable names) and buildings / properties that are clearly numbered	• public roads greater than 6.5 metres wide to locate hydrants outside of parking reserves to ensure accessibility to reticulated water for fire suppression	Can comply
	• 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	Not applicable, all roads greater than 6.5m wide
• there is clear access to reticulated water supply	• public roads up to 6.5 metres wide provide parking within parking bays and locate services outside of the parking bays to ensure accessibility to reticulated water for fire suppression	Not applicable, all roads greater than 6.5m wide

Performance Criteria	Acceptable Solutions	Complies
	• 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	Not applicable, all roads greater than 6.5m wide
• parking does not obstruct the minimum paved width	• 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	Can comply
	• public roads directly interfacing the bush fire hazard vegetation provide roll top kerbing to the hazard side of the road	Can comply

[1] PBP page 21

9 Assessment of environmental issues

An assessment of previous subdivision plans for the same lots was undertaken by Whelans Insites in 2009. This assessment addressed all known significant environmental features and threatened species identified under the Threatened Species Conservation Act 1995. Aboriginal relics or the National Parks Act 1974 that will affect or be affected by the bushfire protection proposals in this report have not been assessed.

NSW Department of Planning is the determining authority for this subdivision; they will assess more thoroughly any potential environmental and heritage issues.

10 Staging

Previous subdivision plans for the same lots were submitted in May 2013 and in response to this previous application RFS submitted a further information request (S08/0042 DA13050887368LC) which included questions about management of staging.

The current proposal includes 11 stages with an average of 29 lots per stage. Each stage of the subdivision is to be provided with primary and alternate access routes, perimeter access and APZs. Access roads or a perimeter fire trails are to comply with the standards described in **Table 1**.

APZ's will be either:

- For all perimeter allotments: as per **Figure 2**.
- For allotments that are inside the ultimate final perimeter of development, a temporary APZ of 100 m or to the final development perimeter is required.

Both staging access and APZ's must be formalised in a s88B instrument under the *Conveyancing Act 1919.*

11 Recommendations and conclusion

The proposal consists of a 319 lot subdivision which will be able to satisfy the aim and objectives of PBP for subdivision.

The following recommendations have been made within this report:

1. APZs are provided in accordance with **Figure 2** of this report;
2. All public reserves within the internal boundary of the subdivision shall be maintained with fuel loads which do not exceed that of an APZ;
3. Reticulated water is provided in accordance with **Section 7** of this report;
4. Access compliant with PBP is provided, as detailed in **Section 9** of this report;
5. A 0.5 m clearance is to be maintained between any above ground power line conductors and tree branches (**Section 8**);
6. Any gas services are to be installed and maintained in accordance with AS/NZS 1596:2008 (**Section 8**); and
7. Staging is to include provisions for perimeter access and temporary APZs as detailed in **Section 11** of this report.

11.1 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 subdivision, a standard that is consistent with 'Planning for Bush Fire Protection 2006' and appropriate for the issue of a Bush Fire Safety Authority.

Rod Rose
Director - Senior Bushfire Planner
FPAA BPAD-A Certified Practitioner No. BPAD-L3-1940

12 References

Industry Safety Steering Committee. 2005 *ISSC 3 Guideline for Managing Vegetation Near Power Lines*. (updated from Energy Australia. 2002. *Network Standard NS 179 (Vegetation Safety Clearances)).*

NSW Rural Fire Service (RFS). 2006. *Planning for Bush Fire Protection: A Guide for Councils, Planners, Fire Authorities, Developers and Home Owners* including the 2010 Appendix 3 Addendum. Australian Government Publishing Service, Canberra.

Standards Australia. 2005. *Fire hydrant installations - System design, installation and commissioning*, AS2419.1, Fourth edition 2005, SAI Global, Sydney.

Standards Australia. 2008. *The storage and handling of LP Gas*, AS/NZS 1596:2008, Fourth edition 2005, SAI Global, Sydney.

Standards Australia. 2009. *Construction of buildings in bushfire-prone areas, AS 3959-2009*. SAI Global, Sydney

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