



Bushfire Protection Assessment - FINAL

Proposed Subdivision: Lot DP 568613 & Lot DP 755952 at Mundamia Growth Area

Prepared for
Twynam Property Group

25 May 2012



DOCUMENT TRACKING

ITEM	DETAIL
Project Name	Bushfire Protection Assessment, Proposed Subdivision, Lot 3 DP 568613 & Lot 384 DP 755952 at Mundamia Growth Area
Project Number	11SGBBUS-0118
File location	11SGBBUS-0118_FINAL_BPA_Mundamia_Subdivision.docx
Project Manager	Julie Holden 02 4443 5555 8/128 Island Point Rd, St Georges Basin, NSW, 2540
Prepared by	Julie Holden
Approved by	David Peterson
Status	FINAL
Version Number	2
Last saved on	25 May 2012

ACKNOWLEDGEMENTS

This document has been prepared by Eco Logical Australia Pty Ltd, with assistance from Allen Price and Associates.

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1 Property and proposal

Name:	Twynam Property Group		
Postal address:	C/- Allen Price & Associates PO Box 73, Nowra NSW 2541		
Street or property Name:	Jonsson Rd		
Suburb, town or locality:	Mundamia	Postcode:	2540
Lot/DP no:	Lot 3 DP 568613 and Lot 384 DP 755952		
Local Government Area:	Shoalhaven City Council		
Type of area:	Rural		
Type of development:	Subdivision. Number of lots proposed 312, existing lots 2		

1.1 INTRODUCTION

Twynam Property Group commissioned Eco Logical Australia Pty Ltd (ELA) to prepare a Bushfire Protection Assessment for the future residential development of Lot 3 DP 568613 and Lot 384 DP 755952 at Mundamia Growth Area (hereafter referred to as the subject land).

This assessment has been prepared by the ELA Bushfire Consultant, Julie Holden and reviewed by David Peterson (FPAA BPAD-A Certified Practitioner No. BPD-PA-1888). David is recognised by the NSW Rural Fire Service as a qualified bushfire consultant in bushfire risk assessment.

1.2 LOCATION AND DESCRIPTION OF SUBJECT LAND

The subject land is located on the eastern side of George Evans Rd in the Nowra area, as shown in Figure 1. A plan of the proposed development is shown in Figure 2.

1.3 DESCRIPTION OF PROPOSAL

The proposal consists of staged development with 12 stages creating a total of 312 lots with 344 possible dwellings. Stage 1 and 12 will also create public reserves. The 312 lots will be comprised of 284 residential lots, 21 medium density lots (45 dwellings), 7 dual occupancy lots (14 dwellings) and 1 rural lot (1 existing dwelling).

Figure 1: Location of the Subject Land

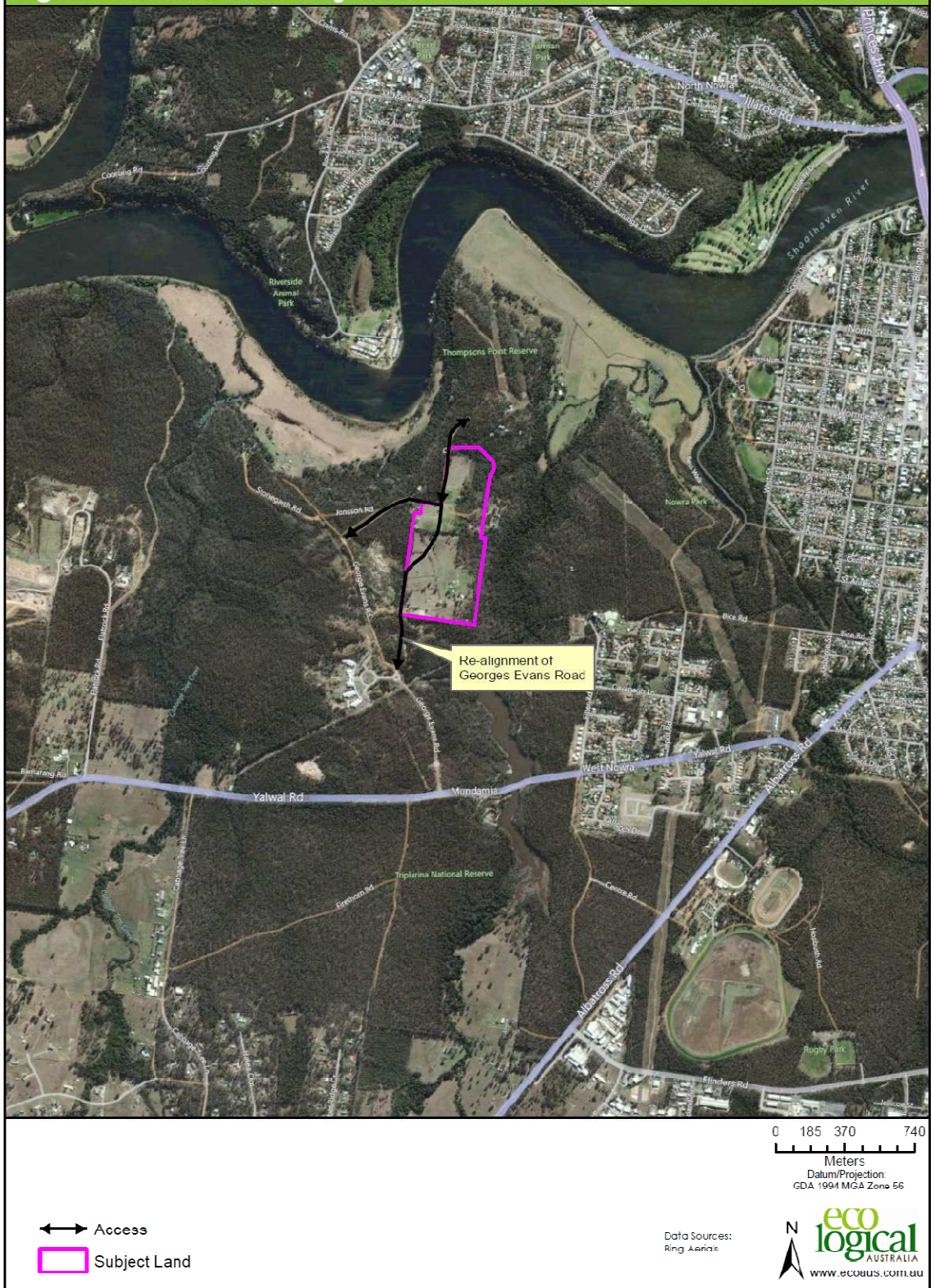


Figure 3: Vegetation, Slope and APZ's

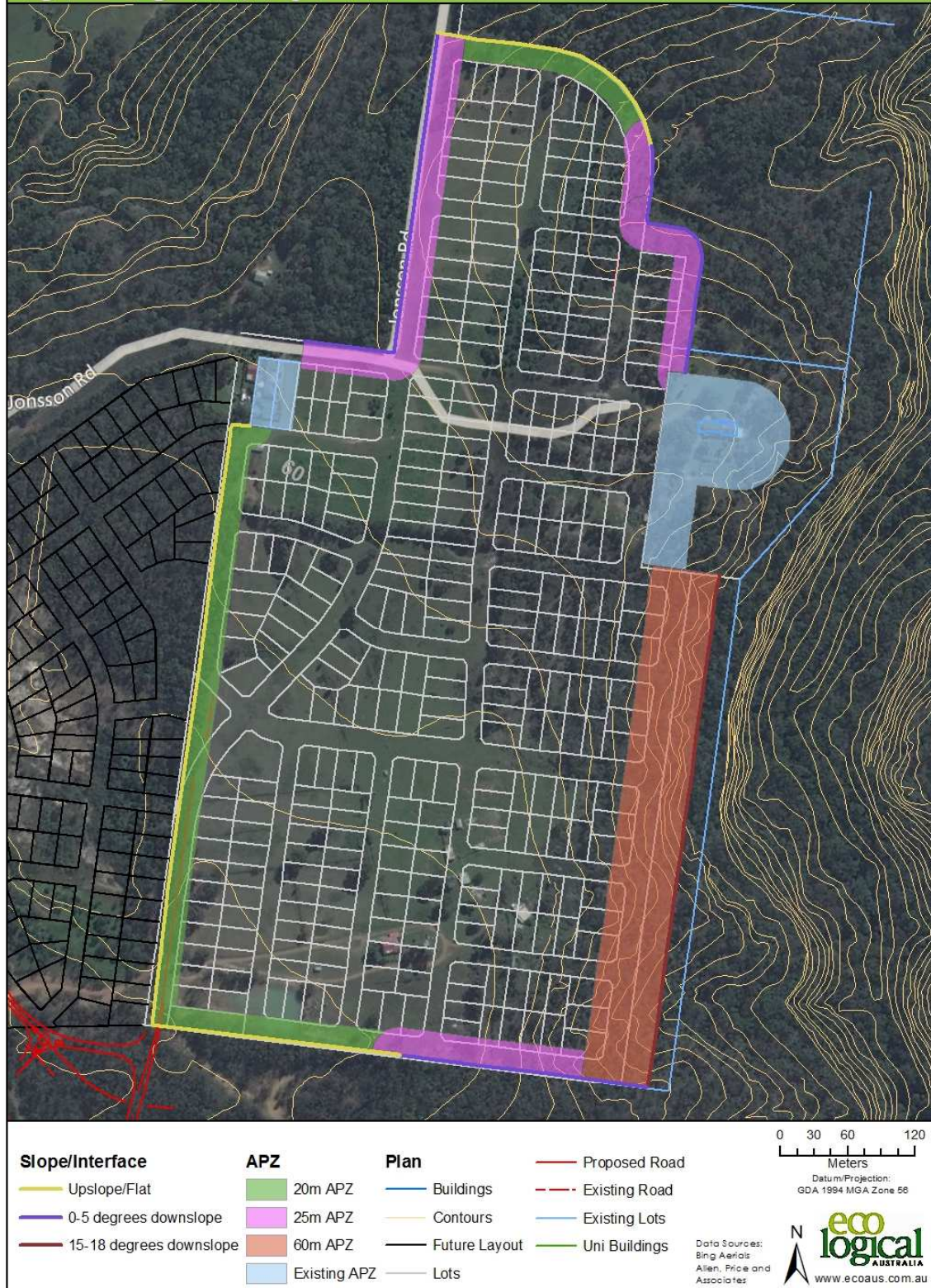


Figure 1: Vegetation, Slope and APZs

2 Bushfire threat assessment

2.1 ASSESSMENT REQUIREMENTS

The subject land is identified as Bush Fire Prone Land by Shoalhaven 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.

2.2 VEGETATION TYPES AND SLOPES

The vegetation and slope have been assessed in all directions for the proposed allotments adjoining a bushfire hazard and the existing residence on Lot 32. In accord with PBP, the predominant vegetation class has been calculated for a distance of at least 140 m out from these allotments 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]*" for a distance of at least 100 m. The predominant vegetation is forest in all instances.

The effective slope for the proposed development is shown in Figure 3. 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°'. The slopes out from the south-eastern corner of the proposed subdivision are steeper and fall within the PBP slope category of >15-18°.

In relation to the existing house on Lot 3, the surrounding vegetation is 'forest' and the land slopes down from the house at >0-5° to both the north and south, and downslope to the east at 5°-10°. The land slopes up from the house to the west, and this area is to be developed.

3 Asset Protection Zones (APZ)

PBP has 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 3. The proposed APZ are also shown in Figure 3.

All minimum APZs for the proposed development are 20 m wide where upslope from the development, and between 25 m and 60 m wide, where it is downslope of the development. The current APZ for the existing house on Lot 3 is 60 m to the east and greater than 100 m to the north, west and south. This APZ is considered appropriate.

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 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:
 - o are well spread out and do not form a continuous canopy;
 - o are not species that retain dead material or deposit excessive quantities of ground fuel in a short period or in a danger period; and
 - o 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); 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 bushfire construction standards or Bushfire Attack Levels (BALs) as per Australian Standard AS 3959-2009 'Construction of buildings in bushfire-prone areas' will be determined at the Development Application stage for future dwellings within the proposed subdivision (Standards Australia 2009). However, the BALs within the proposed subdivision are likely to range from BAL-29 down to BAL-12.5 and the internal areas greater than 100m from the bushfire hazard will not require any bushfire protection measures under AS3959.

The existing house on Lot 3, whilst of a reasonable standard with regard to bushfire protection, may not comply with AS3959. It is therefore recommended that the existing house be upgraded with the following if they are not already in place:

- aluminium fly-screen mesh to all openable windows; and
- wire screening other openings such as weepholes and vents.

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 m. 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;
- Fire 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

The electrical transmission line on the subject land will be underground and will also eventually replace the current overhead power supply line to the existing dwelling on Lot 32.

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

8 Access and egress

8.1 PUBLIC ROADS

Egress/ingress routes for the proposed subdivision are available from the south-west corner (via the re-aligned George Evans Road), western side (Jonsson Road) and north-western corner (Jonsson Road) and are shown in Figure 1.

Note that the re-alignment of George Evans Road to provide direct access to the proposed subdivision in the south-west corner has been approved (in DA09/1519) and has commenced. This will be completed prior to the commencement of the first stage of the proposed subdivision. The proposed public roads within the subdivision can comply with all of the PBP design requirements as outlined in Figure 1.

Access to the existing dwelling on Lot 32 will be via the nearest road within the proposed subdivision as shown in Figure 2. Consequently, the furthest point of the existing dwelling from the nearest public access road will be less than 70 m as a result of the proposed subdivision.

In accord with acceptable solutions within PBP no construction standard is required for property access roads or driveways as *“all property access roads are within an urban area where a 70 metres unobstructed path exists between the most distant external part of any proposed dwelling and the nearest part of the public access road (where the road speed limit is not greater than 70kph) that supports the operational use of emergency firefighting vehicles (i.e. a hydrant or water supply)”*.

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	Yes
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)	Yes
	the perimeter road is linked to the internal road system at an interval of no greater than 500 metres in urban areas	Yes
	traffic management devices are constructed to facilitate access by emergency services vehicles	Yes
	public roads have a cross fall not exceeding 3 degrees	Yes
	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	Yes
	curves of roads (other than perimeter roads) are a minimum inner radius of six metres	Yes
	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	Yes
	there is a minimum vertical clearance to a height of four metres above the road at all times	Yes
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	Yes
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	Yes
	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
there is clear access to reticulated water supply	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	Not applicable
	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
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	Yes
	public roads directly interfacing the bush fire hazard vegetation provide roll top kerbing to the hazard side of the road	Yes

*¹ PBP page 21

8.2 PROPERTY 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.

8.3 FIRE TRAILS

The only fire trails proposed as part of the subdivision will be located within the APZ to the east of the six eastern most allotments in Stage 12 and a 70m section on the southern boundary of Stage 1. These fire trails will comply with the design standards required by PBP shown in Table 2.

Table 2: Performance criteria for fire trails*¹

Performance Criteria	Acceptable Solutions	Complies
The intent may be achieved where:		
the width and design of the fire trails enables safe and ready access for firefighting vehicles	- a minimum carriageway width of four metres with an additional one metre wide strip on each side of the trail (clear of bushes and long grass is provided) - the trail is a maximum grade of 15 degrees if sealed and not more than 10 degrees if unsealed - a minimum vertical clearance of four metres to any overhanging obstructions, including tree branches is provided - the crossfall of the trail is not more than 10 degrees - the trail has the capacity for passing by: - reversing bays using the access to properties to reverse fire tankers, which are six metres wide and eight metres deep to any gates, with an inner minimum turning radius of six metres and outer minimum radius of 12 metres; and / or - a passing bay every 200 metres, 20 metres long by three metres wide, making a minimum trafficable width of seven metres at the passing bay <i>Note: Some short construction in the access may be accepted where they are not less than the minimum (3.5m) and extend for no more than 30m and where obstruction cannot be reasonably avoided or removed</i>	Yes Yes Yes Yes Yes Yes
fire trails are trafficable under all weather conditions. Where the fire trail joins a public road, access shall be controlled to prevent use by non authorised persons	- the fire service is accessible to firefighters and maintained in a serviceable condition by the owner of the land - appropriate drainage and erosion controls are provided - the fire trail system is connected to the property access road and / or to the through road system at frequent intervals of 200 metres or less - fire trails do not traverse a wetlands or other land potentially subject to periodic inundation (other than a flood or storm surge) - gates for fire trails are provided and locked with a key / lock system authorized by the local RFS	Yes Yes Yes Yes Yes
fire trails designed to prevent ween infestation, soil erosion and other land degradation	- fire trail does not adversely impact on natural hydrological flows - fire trail design acts as an effective barrier to the spread of weeds and nutrients - fire trail construction does not expose acid-sulphate soils	Yes Yes Yes

*¹ PBP page 25

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.

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

10 Staging

Figure 2 shows the various development stages for the proposed subdivision. Each stage of the subdivision is to be provided with either a perimeter road or a perimeter fire trail to the standards described in Table 1 and Table 2 (respectively). An APZ is also required for all perimeter allotments as per Figure 3. For allotments that are inside the ultimate final perimeter of development, an APZ of 100 m is required unless this 100 m interim APZ extends beyond the final APZ as shown in Figure 3.

11 Recommendations and conclusion

11.1 RECOMMENDATIONS

The following recommendations have been made within this report to ensure the proposed subdivision 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 subdivision indicated 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: Future landscaping for individual lots across the subdivision is to comply with the principles listed in Appendix 5 of PBP.

Recommendation 4: A hydrant water supply should be installed in accordance with Australian Standard AS 2419.1.

Recommendation 5: Public roads are to comply with the NSW Rural Fire Service document 'Planning for Bush Fire Protection 2006' as listed in Section 8 of this report.

Recommendation 6: Electrical services should be underground.

Recommendation 7: Gas services are to be installed and maintained in accordance with AS/NZS 1596:2008 (Standards Australia 2008).

Recommendation 8: Each stage of the subdivision is to be provided with either a perimeter road or a perimeter fire trail to the standards described in Table 1 and Table 2 (respectively).

12 Summary of protection provisions and conformity with PBP

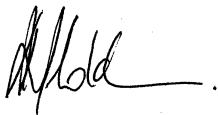
Table 3 summarises the bushfire protection proposed for the proposed subdivision and its conformity with PBP.

Table 3: Assessment of conformity with PBP

Bushfire protection provision	Proposal	Complies with PBP
Asset Protection Zones	Figure 3 identifies the size of proposed APZs.	Complies with PBP
Construction Standards	Existing house on Lot 3, requires some ember protection, see Section 5. Compliant construction standards under AS 3959 and PBP can be achieved on all new allotments.	Complies with PBP
Access	All access design standards are appropriate, see Section 8.	Complies with PBP
Water supply	Reticulated water, see section 6.	Complies with PBP
Electricity supply	Underground	Complies with PBP
Staging	Provides compliant APZ and perimeter road/trails	Complies with PBP

12.1 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 development, a standard that is consistent with 'Planning for Bush Fire Protection' (RFS 2006) and appropriate for the issue of a Bush Fire Safety Authority.



Julie Holden
Senior Bushfire Consultant

13 References

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Whelans Insites, 2009, *Environmental Flora & Fauna Assessment, Lot 3 in DP 568613 and Lot 384 in DP 755952, George Evans Road, Mundamia*, Proposed Residential Estate

**HEAD OFFICE**

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

CANBERRA

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

COFFS HARBOUR

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

PERTH

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

DARWIN

16/56 Marina Boulevard
Cullen Bay NT 0820
T 0488 050 916

SYDNEY

Level 6
299 Sussex Street
Sydney NSW 2000
T 02 9993 0566
F 02 9993 0573

NEWCASTLE

Suite 17, Level 4
19 Bolton Street
Newcastle NSW 2300
T 02 4910 0125
F 02 4910 0126

ARMIDALE

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

WOLLONGONG

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

BRISBANE

51 Amelia St
Fortitude Valley QLD 4006
T 07 3503 7192

ST GEORGES BASIN

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

NAROOMA

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

MUDGEES

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

GOSFORD

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