

Bushfire Protection AssessmentProposed Fifteen Lot Subdivision48 Jervis Bay Road, Falls Creek

30 August 2019



### **DOCUMENT TRACKING**

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## 1 Property and proposal

Street address or property name:	48 Jervis Bay Road		
Suburb, town or locality:	Falls Creek   Postcode:   2540		
Lot/DP no:	Lot 3 DP 846470		
Local Government Area:	Shoalhaven City Council		
Zoning:	Majority R5 Large Lot Residential; small area in SW corner RU2 Rural Landscape		
Type of development:	Rural-residential subdivision		

Table 1: Subject site summary

### 1.1 Description of proposal

The proposal is for subdivision of 1 lots into 15 lots (See Figure 1).

The proposal seeks to subdivide the allotment into 14 rural residential allotments in accordance with Shoalhaven City Council provisions for this zoning, with a residual Community Property allotment.

### 1.2 Assessment process

The proposal was assessed in accord with Section 100B of the *Rural Fires Act 1997* and 'Planning for Bush Fire Protection 2006 (RFS 2006), herein referred to as PBP (See **Appendix A** for a summary of the assessment process).

Additionally, performance-based solutions were developed using the Pre-Release version of Planning for Bush Fire Protection 2018 (PBP 2018) to determine a number of bushfire protection measures.

Assessment included a review of background documentation, design team consultation, GIS analysis and a site inspection on 10 February 2016.

**Table 2** identifies the bushfire protection measures assessed and whether these involved acceptable or performance solutions.

Bushfire Protection Measure	Acceptable Solution	Performance Solution	Report Section
Asset Protection Zones			3.1
Construction standard		V	3.3
Access			3.4
Water supply			3.5
Gas and electrical supplies			3.5

### Table 2: Summary of bushfire protection measures assessed

### 1.3 Bush fire prone land status

The subdivision includes land classified as bush fire prone on the Shoalhaven City Council's Bush Fire Prone Land (BFPL) Map<sup>1</sup>.

<sup>&</sup>lt;sup>1</sup> <u>https://www.planningportal.nsw.gov.au/spatialviewer/#/find-a-property/address</u>

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### Figure 1: Subdivision layout

## 2 Bushfire threat assessment

**Figure 2** shows the effective slope and predominant vegetation on transect lines representing the highest bushfire threat potentially posed to the subdivision from various directions.

The effective slope has been determined from 10 m contour data and revised where required by site assessment.

The predominant vegetation has been determined by site assessment.

Figure 2 and Table 3 show the vegetation and slope information assessed. Where required additional information is provided within Table 3 on why and how the chosen slope and vegetation has been calculated.

The site is located within the Local Government Area (LGA) of Shoalhaven City Council and has a Fire Danger Index (FDI) of 100.



Figure 2: Bushfire hazard assessment and APZ/BAL

## 3 Bushfire protection measures

## 3.1 Asset Protection Zones (APZ)

**Table 3** shows the dimensions of the Asset Protection Zones (APZ) required in each of the transect line directions; and where relevant, information on how the APZ is to be provided is included. The footprint of the required APZ is also shown in **Figure 2**.

## 3.2 APZ maintenance plan

The majority of the APZ is already in place for the proposed subdivision with the remainder to be created by the construction of the infrastructure (roads and effluent disposal areas) required for the subdivision (see **Table 3**).

The APZ is to continue being managed to Inner Protection Area standards as follows:

- No tree or tree canopy is to occur within 2 m of the future building rooflines;
- The presence of a few shrubs or trees in the APZ is acceptable provided 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 the building so that they will not ignite future 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.

Further details on APZ implementation and management can be found on the NSW RFS website including:

https://www.rfs.nsw.gov.au/\_\_data/assets/pdf\_file/0010/13321/Standards-for-Asset-Protection-Zones.pdf.

## Table 3: Bushfire hazard assessment and APZ requirements

Direction from development boundary	Transect #	Slope	Vegetation	PBP 2018 required APZ	Proposed APZ	Comments
North	1	Downslope >0 to 5 degrees	Forest	29 m	≥29 m	First 20 m of APZ to be provided within perimeter road reserve; remaining 9 m to be located within boundary of Lots 10-12
East (northern end)	2	Downslope >0 to 5 degrees	Forest	29 m	≥50 m	APZ to be located within a combination of the subdivision perimeter road and Jervis Bay Road
East (southern end)	3	Downslope >0 to 5 degrees	Forest	29 m	≥32 m	APZ provided by adjoining Jervis Bay Road
South	4	Downslope >0 to 5 degrees	Forest	29 m	≥32 m	APZ is to be located within the community property/access easement along the southern boundary (10 m), the emergency access fire trail (10 m) and the remaining 9 m is to be located within Lots 2-4
South-west	5	All upslopes and flat land	Forest	24 m	≥24 m	First 20 m of APZ to be provided within perimeter road reserve; remaining 4 m to be located within boundary of adjoining Lots 4-6
West and north-west	6 and 7	Downslope >0 to 5 degrees	Forest	29 m	≥29 m	First 20 m of APZ to be provided within perimeter road reserve; remaining 9 m to be located within boundary of adjoining Lots 7-10

## 3.3 Construction standard

The Bushfire Attack Level (BAL) for future dwellings within the proposed subdivision as per Australian Standard (AS) 3959-2009 'Construction of buildings in bushfire-prone areas' (Standards Australia 2009) will be determined at the individual dwelling Complying Development Certificate (CDC) or Development Application (DA) stage.

However, a maximum of BAL-29 is provided by the subdivision design using PBP 2018 (Table A1.12.5).

## 3.4 Access

Primary public road access to the subdivision will be via a perimeter road from Jervis Bay Road to the east as shown in **Figure 1**. **Figure 1** shows the following types of access:

- Perimeter public road; and
- A small section of perimeter fire trail.

The primary perimeter access road to the development exits onto Jervis Bay Road which is a 100 kph road. The location of the intersection of the subdivision access road and Jervis Bay Road has been carefully selected to provide maximum sight lines for drivers exiting the subdivision.

In order to provide secondary access to the proposed subdivision, alternate access/egress to/from the proposed subdivision will be provided to a secondary point on Jervis Bay Road by a PBP compliant emergency access fire trail in the south-eastern corner of the subdivision as shown in **Figure 1**.

While this is not compliant with the usual standards for perimeter roads, fire trail will be constructed to meet or exceed Category 1 Fire Trail standard as outlined in Table 1 of the NSW Rural Fire Service 'Fire Trail Guide Version 1.1' (RFS 2016) and will be managed as part of the Community Property Lot 1. The fire trail will be gated and locked with keys provided to all residents and local fire brigades.

At 10 m wide, the southern perimeter fire trail will in fact be larger than the minimum required for Category 1 Fire Trails (4 m) and that required for perimeter roads (8 m).

Consequently, the primary perimeter access road to the proposed subdivision complies with the Acceptable Solutions of PBP 2018 aside from along the southern side where the proposed fire trail complies with the Acceptable Solutions of PBP 2018 for fire trails. The southern fire trail component of the perimeter access to the proposed subdivision satisfies the relevant performance criterion for perimeter roads:

perimeter roads are designed to allow safe access and egress for medium rigid firefighting vehicles while residents are evacuating as well as providing a safe operational environment for emergency service personnel during firefighting and emergency management on the interface.

The performance criteria and acceptable solutions for each of these access types are shown in **Appendix B**, along with comment on the subdivision design compliance.

## 3.5 Services – Water, electricity and gas

## 3.5.1 Water

The proposal will be serviced by a non-reticulated water supply. **Table 4** identifies the acceptable solution requirements of Section 5.3 of PBP 2018 with which the proposal can comply subject to the specifications noted in **Table 4**.

Table 4: Performance criteria	for non-reticulated water	supplies (PBP 2018 Table 5.3c)
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Performance Criteria	Acceptable Solutions	Complies
The intent may be achieved where:		
a water supply is provided for firefighting purposes	a static water supply is provided (10,000 L per allotment)	Can comply
the integrity of the water supply is maintained	<ul> <li>all above ground water pipes external to the building are metal including and up to any taps</li> </ul>	Can comply

## 3.5.2 Electricity services

Electricity supply to the subject land is located above ground. **Table 7** (below) identifies the acceptable solution requirements of Section 5.3 of PBP 2018 with which the proposal can comply subject to the specifications noted in **Table 5**.

Table 5: Performance criteria for	electricity services	(PBP 2018 Table 5.3c)
		(

Performance Criteria	Acceptable Solutions	Complies
The intent may be achieved where:		
location of electricity services limits the possibility of ignition of surrounding bush land or the fabric of buildings	<ul> <li>where practicable, electrical transmission lines are underground;</li> <li>where overhead, electrical transmission lines are proposed as follows:         <ul> <li>lines with short pole spacing (30 metres) are required, unless crossing gullies, gorges or riparian areas; and</li> <li>no part of a tree is closer to a power line than the distance set out in accordance with the specifications in 'Guide for the Management of Vegetation in the Vicinity of Electricity Supply Infrastructure' issued by the Industry Safety Steering Committee 3 (ISSC3 2016).</li> </ul> </li> </ul>	Can comply

## 3.5.3 Gas services

Gas services (reticulated or bottle gas) are compliant with Section 5.3 of PBP 2018, as outlined in **Table 6** overleaf.

Performance Criteria	Acceptable Solutions	Complies
The intent may be achieved where:		
location of electricity services limits the possibility of ignition of surrounding bush land or the fabric of buildings	<ul> <li>reticulated or bottled gas is installed and maintained in accordance with Australian Standard AS/NZS 1596 'The storage and handling of LP Gas' (SA 2014), and metal piping is to be used;</li> <li>all fixed gas cylinders are kept clear of all flammable materials to a distance of 10 metres and shielded on the hazard side of the installation;</li> <li>connections to and from gas cylinders are metal;</li> <li>polymer-sheathed flexible gas supply lines to gas meters adjacent to buildings are not used; and</li> <li>above-ground gas service pipes are metal, including and up to any outlets.</li> </ul>	Can comply

#### Table 6: Performance criteria for gas services (PBP 2018 Table 5.3c)

## Assessment of environmental issues

A Flora and Fauna Assessment (FFA) has been prepared in support of the proposed development (Eco Logical Australia 2019) containing recommendations to mitigate potential impacts from the proposed development.

The FFA has determined that there are no significant environmental features, threatened species or Aboriginal relics identified under the *Biological Conservation Act 2016* or the *National Parks Act 1974* that will significantly affect or be affected by the bushfire protection proposals in this report.

Site impacts have been minimised by carefully selected bushfire protection measures and by siting the proposed development within already cleared portions of the subject land.

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

# 5 Conclusion

The proposed subdivision complies with the acceptable solutions and/or performance criteria within 'Planning for Bush Fire Protection 2006' as indicated in **Table 2**.

Bushfire Protection Measures	Complies	Requirements	Acceptable Solution	Performance Solution	Report Section
Asset Protection Zones	Ø	APZ dimensions are detailed in <b>Table 3</b> .		Ø	3.1
APZ Maintenance plan	Ø	Identified APZ to be maintained in perpetuity to the detailed specifications in <b>Section 3.2</b> .	Ø		3.2
Construction standard	Ø	BAL for dwellings to be determined at individual CDC/DA stage however, a maximum of BAL-29 is achievable using PBP 2018.		Ø	3.3
Access	M	Access to meet standards detailed in <b>Appendix B</b> .		V	3.4
Water supply	V	Non-reticulated water supply to meet PBP acceptable solutions specifications for a subdivision ( <b>Table 4</b> ).		Ŋ	3.5.1
Electricity services	Ø	Electricity supply to comply with the PBP specification ( <b>Table 5</b> ).		Ŋ	3.5.2
Gas services	V	Gas services are to be installed and maintained in accordance with AS/NZS 1596:2014 ( <b>Table 6</b> ).		D	3.5.3

Table 7: Summary	v of bushfire	protection	measures	assessed
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## 6 Recommendations

It is recommended that the subdivision be issued a Bush Fire Safety Authority.

Yours sincerely,

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BPAD Bushfire Planning & Design Accredited Practitioner Level 3

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## 7 References

Eco Logical Australia (ELA). 2019. Flora and Fauna Assessment, Proposed Fifteen Lot Subdivision, 48 Jervis Bay Road, Falls Creek. ELA, Huskisson.

Industry Safety Steering Committee 3 (ISSC3). 2016. *ISSC3 Guide for the Management of Vegetation in the Vicinity of Electricity Supply Infrastructure*. November 2016. NSW.

NSW Rural Fire Service. (RFS). 2006. *Planning for Bush Fire Protection: A Guide for Councils, Planners, Fire Authorities, Developers and Home Owners*. RFS, Sydney.

NSW Rural Fire Service (RFS). 2016. Fire Trail Standards Version 1.1. RFS, Sydney.

NSW Rural Fire Service (RFS). 2018. *Planning for Bush Fire Protection: A Guide for Councils, Planners, Fire Authorities, Developers and Home Owners*. Pre-release version. RFS, Sydney.

NSW Soil Conservation Service. 2017. *Fire Trail Design, Construction and Maintenance Manual*. Developed by the Soil Conservation Service for the NSW Rural Fire Service, Sydney.

Standards Australia (SA). 2009. *The construction of buildings in bushfire-prone areas*, Amendment 3. SAI Global, Sydney.

Standards Australia (SA). 2014. *The storage and handling of LP Gas*, AS/NZS 1596:2014. SAI Global, Sydney.

# Appendix A – Assessment process

## Vegetation types

In accord with PBP the predominant vegetation class has been assessed for a distance of at least 140 m from the subject land in all directions.

### Effective slope

In accord with PBP, the slope that would most significantly influence fire behaviour was determined over a distance of 100 m from the boundary of the proposed development where the vegetation was found.

## **Asset Protection Zone determination**

Table A1.12.2 (FDI 100) of PBP 2018 has been used to determine the width of required Asset Protection Zone (APZ) for the proposed development using the vegetation and slope data identified in **Section 2**.

# Appendix B – Access specifications

### Table 8: Performance criteria for proposed public roads (PBP Table 5.3b)

Performance Criteria	Acceptable Solutions	Complies	
The intent may be achieved where:			
<ul> <li>achieved where:</li> <li>firefighting vehicles are provided with safe, all- weather access to structures and hazard vegetation</li> </ul>	<ul> <li>property access roads are two-wheel drive, all-weather roads; and</li> <li>perimeter roads are provided for residential subdivisions of three or more allotments; and</li> <li>subdivisions of three or more allotments have more than one access in and out of the development; and</li> <li>traffic management devices are constructed to not prohibit access by emergency services vehicles; and</li> <li>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; and</li> <li>all roads are through roads. Dead end roads are not more than 200 m in length, incorporate a minimum 12 metres outer radius turning circle, and are clearly sign posted as a dead end; and</li> <li>where kerb and guttering is provided on perimeter roads, roll top kerbing should be used to the hazard side of the road; and</li> <li>where access/egrees can only be achieved through forest</li> </ul>	<ul> <li>Can comply</li> <li>Complies</li> <li>Complies</li> <li>Can comply</li> <li>Complies</li> <li>Complies (loop road)</li> <li>Can comply</li> <li>Can comply</li> <li>Can comply</li> </ul>	
	<ul> <li>Where access/egress can only be achieved through forest, woodland or heath vegetation, secondary access shall be provided to an alternate point on the existing public road system.</li> </ul>		
the capacity of access roads is adequate for firefighting vehicles	• the capacity of perimeter and non-perimeter road surfaces and any bridges/causeways is sufficient to carry fully loaded firefighting vehicles (up to 23 tonnes); bridges/causeways are to clearly indicate load rating.	Can comply	
there is appropriate access to water supply	<ul> <li>there is suitable access for a Category 1 fire appliance to within 4 m of the static water supply where no reticulated supply is available</li> <li>curves have a minimum inner radius of six metres and are minimal in number to allow for rapid access and egress.</li> <li>the minimum distance between inner and outer curves is six metres.</li> <li>the crossfall is not more than 10 degrees.</li> </ul>	<ul> <li>Can comply</li> <li>Complies</li> <li>Complies</li> <li>Can comply</li> <li>Complies</li> </ul>	

Performance Criteria	Acceptable Solutions	Complies
	<ul> <li>maximum grades for sealed roads do not exceed 15 degrees and not more than 10 degrees for unsealed roads.</li> <li>access to a development comprising more than three dwellings have formalised access by dedication of a road and not by right of way.</li> </ul>	Complies
<ul> <li>perimeter roads are designed to allow safe access and egress for medium rigid firefighting vehicles while residents are evacuating as well as providing a safe operational environment for emergency service personnel during firefighting and emergency management on the interface</li> </ul>	<ul> <li>perimeter roads are two-way sealed roads; and</li> <li>8m carriageway width kerb to kerb; and</li> <li>parking is provided outside of the carriageway width; and</li> <li>hydrants are located clear of parking areas; and</li> <li>there are through roads, and these are linked to the internal road system at an interval of no greater than 500m; and</li> <li>curves of roads have a minimum inner radius of 6m; and</li> <li>the maximum grade road is 15° and average grade is 10°; and</li> <li>the road crossfall does not exceed 3°; and</li> <li>a minimum vertical clearance of 4m to any overhanging obstructions, including tree branches, is provided.</li> </ul>	<ul> <li>Perf. solution</li> <li>Can comply</li> <li>Can comply</li> <li>Can comply</li> <li>Can comply</li> <li>N/A - no internal roads</li> <li>Complies</li> <li>Complies</li> <li>Can comply</li> <li>Can comply</li> <li>Can comply</li> </ul>

Performance Criteria	Acceptable Solutions	Complies	
The intent may be achieved where:			
• The width of the trail provides for safe, reliable and unobstructed passage by a Category 1 firefighting vehicle within acceptable operation limits.	<ul> <li>The trafficable surface has a width of 4 metres except for short constrictions to 3.5 metres for no more than 30 metres in length where an obstruction cannot be reasonably avoided or removed.</li> <li>Curves have a minimum inner radius of 6 metres. The minimum distance between inner and outer curves is 6 metres.</li> </ul>	<ul> <li>Can comply (total width 10 m)</li> <li>Complies</li> </ul>	
• The construction and formation of the trail is trafficable under all weather conditions (other than due to flood, storm surge or snowfall) for a Category 1 firefighting vehicle.	<ul> <li>Trail surfaces and crossing structures are capable of carrying vehicles with a gross vehicle mass of 15 tonnes and an axle load of 9 tonnes.</li> </ul>	Can comply	
<ul> <li>The vertical profile of the trail provides for traction and safe working angle within the physical operational capability of a Category 1 firefighting vehicle. <i>Note: This includes</i> <i>design that does not</i> <i>impede the</i> <i>undercarriage of a</i> <i>vehicle.</i></li> </ul>	<ul> <li>The maximum grade of a trail is not more than 15 degrees.</li> <li>The crossfall of the trail surface is not more than 6 degrees.</li> <li>Drainage structures, feature crossings, or other significant changes in the grade of the trail shall be in accordance with the NSW RFS Fire Trail Design, Construction and Maintenance Manual [NSW Soil Conservation Service 2017</li> </ul>	<ul><li>Complies</li><li>Can comply</li><li>Can comply</li></ul>	
<ul> <li>A cleared corridor is provided around the trail which permits the unobstructed passage of a Category 1 firefighting vehicle and for a working corridor either side of the vehicle to enable firefighters to exit from, and access equipment in, the vehicle.</li> </ul>	A minimum vertical clearance of 4 metres is provided above the surface of the trafficable surface clear of obstructions.	Can comply	

## Table 9: Performance criteria for proposed fire trail (Category 1 Fire Trail requirements)

Performance Criteria	Acceptable Solutions	Complies
• The trail provides for two Category 1 firefighting vehicles to pass at appropriate intervals so as to avoid unacceptable delays in operations.	<ul> <li>Capacity for passing is provided every 250 metres comprising: <ul> <li>A widened trafficable surface of at least 6 metres for a length of at least 20 metres; or</li> <li>A 6 metre wide and 8 metre long area clear of the trafficable surface with a minimum inner curve radius of 6 metres and minimum outer radius of 12 metres; or</li> <li>A turnaround as provided for in this table.</li> </ul> </li> </ul>	<ul> <li>Complies</li> <li>N/A</li> <li>N/A</li> </ul>
• The trail provides for a turning manoeuvre for a Category 1 firefighting vehicle to return in the direction from which it came at appropriate intervals and at the termination of a trail.	<ul> <li>A turning area is provided at the termination of a trail and every 500 metres and is achieved by:</li> <li>An area clear of the trafficable surface 6 metres wide and 8 metres deep, with a minimum inner curve radius of 6 metres and outer minimum radius of 12 metres; or</li> <li>A turning circle of minimum 22 metre diameter.</li> <li>A T-junction with each terminating end of the junction being at least 10 metres in length from the intersection of the roads and the inner radius of that intersection being at least 6 metres</li> <li>A fire trail or road intersection.</li> </ul>	<ul> <li>N/A (trail doesn't terminate and is less than 500 m long)</li> </ul>
The fire trail is drained effectively to manage rainfall runoff to prevent damage to the trafficable surface.	<ul> <li>Drainage of the trail is designed and constructed in accordance with the NSW RFS Fire Trail Design, Construction and Maintenance Manual.</li> </ul>	Can comply









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