



**planning consultants**

# **ATTACHMENT 6**

Your reference: Stockland, Vincentia - Bushfire [6376B]

Our reference: 10SGBBUS-0035/43



ABN 87 096 512 088

30 November 2010

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Dear David

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**Re: Bushfire Protection Assessment of Proposed Section 75W Application for  
Proposed Modification of Subdivision Layouts at Western and Central Precincts  
Stockland Vincentia**

This letter is a Bushfire Protection Assessment of the proposed Section 75W modification to the development consent for a residential subdivision by Stockland at Vincentia.

The approved subdivision within the Western Precinct did not occupy the entire potential residential development footprint reflected in the zoning. In particular, there is a strip of land adjacent to Naval College Road in the Western Precinct that has been zoned for R2 – Residential. The land was always proposed to be rezoned, but Stockland's subdivision layout did not extend the strip of land along Naval College Road. An amendment is now proposed to the approved subdivision layout to include 21 lots in the land adjacent to Naval College Road (see Figure 1 in Appendix 1).

Furthermore, an area within the north-eastern corner of the Central Precinct is proposed to be redesigned to include some larger allotments as shown in Figure 2. As a consequence of this redesign and to avoid many of these allotments having two street frontages, the perimeter road surrounding Lots 326-334 is proposed to be replaced with a sealed perimeter fire trail. These proposed changes to the Stockland Vincentia development consent require assessment under PBP.

The remaining PBP (2001) provisions for access and utilities have already been approved for this development and are not impacted by the proposed s.75W modifications, aside from a future dwelling within the south-eastern most allotment in the proposed Central Precinct being slightly further than 70 m from the nearest hydrant.

Therefore, this letter addresses Asset Protection Zones (APZs) and bushfire construction levels as per AS 3959-1999 and AS 3959-2009 'Construction of buildings in bushfire-prone areas' only in the vicinity of these additional/amended lots, under the current PBP (2006). It also addresses the issue of a future dwelling on the most south-eastern allotment within the amended area of the Central Precinct being located greater than 70 m from the nearest hydrant and the proposed replacement of the perimeter road with a sealed perimeter fire trail.

#### **Location of subject land and bushfire hazard**

The subject site is located on the northern corner of the intersection of Naval College (Jervis Bay) Road and The Wool Road, Vincentia within the Shoalhaven Local Government Area.

The site comprises Lots 801 and 802 in DP 1022286, Lots 72 – 75 in DP 874040 and Lots 321 – 334 within the Central Precinct and all public roads within these lots.

The site is bounded to the:

- south-east by The Wool Road;
- south-west by Naval College (Jervis Bay) Road and existing rural residential development;
- north-west by Jervis Bay National Park, and
- north-east by Jervis Bay National Park and the existing Council-operated Bay and Basin Leisure Centre.

The topography of the site is dominated by two north-east ridgelines dissected by three ephemeral watercourses flowing north to north-east to adjacent wetlands within Jervis Bay National Park. The terrain is flat to gently undulating with slopes being less than 5 degrees. Vegetation varieties which currently cover the site include sedgeland, heathland, woodland and open forest.

The subject land has been identified in the Jervis Bay Settlement Strategy (DIPNR 2003) as an area for urban expansion and a district level shopping centre.

#### **Asset Protection Zones (APZs)/construction standards**

The proposed Section 75W amendments to the original development consent are summarised on page one of this letter and the new proposed additional and amended lots are shown in Figures 1 and 2 respectively. These proposed changes have been assessed in accord with PBP with the vegetation and effective slopes having been determined within 140 m of the proposed development. APZs and Bushfire Attack Levels (BALs) have been determined using PBP and AS 3959-2009 for the Western Precinct using the vegetation and slope data shown in Table 1.

APZs and Bushfire Attack Levels (BALs) have been determined for the Central Precinct using the 'Bush Fire Attack Assessor V1.4' (BFAA) or 'View Factor Model' as it is also known based on the vegetation and slope data shown in Table 1. The BFAA reports for the Central Precinct are contained in Appendix 2.

**Table 1 – Summary of APZ and construction levels based on slope/vegetation data**

Direction	Slope <sup>1</sup>	Vegetation <sup>2</sup>	Minimum APZ <sup>†</sup>	AS 3959-2009 Construction Levels required			
				BAL-40	BAL-29	BAL-19	BAL-12.5
<b>Western Precinct</b>							
West	3 degrees downslope	Forest	25m	25 m - <32 m	32 m - <43 m	43 m - <57 m	57 m – 100 m
South	Level	Forest	20m	20 m - <25 m	25 m - < 35 m	35 m - <48 m	48 m – 100 m
<b>Central Precinct</b>							
North and east	1 degree downslope	Forest	22m*	22 m - <27 m*	27 m - <37 m*	37 m - < 50 m*	50 m - 100 m*
South	1 degree upslope	Tall heath (scrub)	13m*	13 m*	13 m - <19 m*	19 m - <27 m*	27 m – 100 m*

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

<sup>2</sup> 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" (AS 3959-2009 vegetation classification).

<sup>†</sup> Assessed using PBP.

\* Assessed using the 'Bush Fire Attack Assessor V1.4' (reports attached in Appendix 2)

The minimum APZs for the Western Precinct range from 20 m – 25 m while the minimum APZs for the Central Precinct range from 13 m – 22 m. Bushfire construction levels required for future dwellings within the proposed allotments as per AS 3959-2009 'Construction of buildings in bushfire-prone areas' will vary from BAL-40 down to BAL-12.5 as outlined in Table 1 and Figures 1 and 2.

Comment 9 from the NSW Department of Planning (DoP) in regards to Vincentia Coastal Village Modification 10 on 27 September 2010 and Point 2 of the NSW Rural Fire Service's correspondence of 11 October 2011 requested additional information on BALs/radiant heat levels impacting on a future dwelling within proposed Lot 1011.

Proposed Lot 1011 is the western-most allotment proposed on the southern side of the Western Precinct. As can be seen in Figure 3 in Appendix 1, this allotment will accommodate a small portion of the required APZ from the vegetation to the west and no building will be permitted within this APZ. The portion of the APZ within Lot 1011 will be ensured with an easement to be established by a Section 88B instrument.

Consequently, a future dwelling within Lot 1011 will require a combination of BAL-40 and BAL-29 construction as per AS3959-2009. The specific construction standard for each elevation of a future dwelling on Lot 1011 will be determined at the Development Application (79BA) stage.

Furthermore, as part of the proposed development, a radiant heat barrier in the form of a Colorbond fence a minimum of 1.8 m high will be erected to the west and south of Lot 1011 which will reduce the amount of radiant heat impacting on a future dwelling within this allotment.

Comment 10 from the DoP relates to the implication for future dwellings of allotments in the Central Precinct being impacted by a number of different Bushfire Attack Levels (BALs). The BAL implications for future dwellings within these allotments cannot be determined precisely until the Development Application stage as the precise location, orientation and design of a dwelling is required to determine exact BALs. However, future dwellings are likely to be a combination of at least 2-3 elevations being at the highest BAL that is intersected and 1-2 elevations at the next BAL down.

The RFS also requested additional information at Point 1 in their October 2010 correspondence as to who will be responsible for ensuring the maintenance of Asset Protection Zones in perpetuity. In the case of both the Western and Central Precincts (with the exception of Lot 1011 where a small amount of APZ is located in the north-western corner of the allotment as shown in Figure 3), the APZs are located within land that is to be transferred to Shoalhaven City Council as per the approved Statement of Commitments 8(a) and 8(b). Consequently, aside from a small amount of APZ within Lot 1011, the APZs will be maintained in perpetuity by Shoalhaven City Council.

#### **Water Supply for Central Precinct**

The proposed Central Precinct subdivision will be serviced by reticulated water. A future dwelling within the south-eastern most proposed allotment within the Central Precinct will be located such that it will be greater than 70 m from the nearest hydrant as required by the previous subdivision approval.

However, the previous approval was based on a bushfire assessment under Planning for Bushfire Protection 2001 and PBP 2006 is now the current document guiding development in bush fire prone areas. Under PBP 2006, the RFS will now accept a dwelling being located within 90 m of the nearest hydrant provided that a fire appliance may be parked in line between the hydrant and the dwelling. This will be the case with the south-eastern allotment in the Central Precinct and the current proposed subdivision will comply with the PBP 2006 requirements for reticulated water supply.

#### **Perimeter Access for Stage 3 of the Central Precinct**

The proposed Central Precinct subdivision was originally approved with a perimeter road separating proposed allotments from the forest to the north and west and the tall heath vegetation to the south. However, this was based on small lot sizes and a larger number of lots which necessitated public roads down either side of the area covered by Lots 326-334 inclusive to provide street frontage for each of the original smaller allotments.

The new proposed layout for this area contains larger allotments and a perimeter fire trail is now proposed in place of the perimeter road. The perimeter fire trail will be located within the APZ within the Water Sensitive Urban Design (WSUD) reserves and these reserves and the fire trail will be maintained by Shoalhaven City Council. However, Statement of Commitment No. 8(a) requires that Stockland will remain responsible for the maintenance of the WSUD and APZs where they occupy the same area for a period of 3 years. This commitment will apply to the proposed perimeter fire trail.

The perimeter fire trail proposed complies with all PBP requirements as outlined in Appendix 3 and shown in Figure 3. The trail will consist of a 4 m wide sealed trafficable surface and will be locked to exclude public access with keys to be provided to the NSW Rural Fire Service, Shoalhaven District, to facilitate access for hazard reduction and emergency response only. The perimeter fire trail will be 285 m long and will be located on the non-hazard side of the 23 m APZ that is located within a future Council reserve. The perimeter fire trail links back to the internal road system at intervals of no greater than 200 m via an easement 6m wide (with 4m wide pavement) between Lot 331 and Lots 332-334 inclusive. The easement forms part of Lots 333 and 334 only.

The perimeter fire trail will be located within the APZ surrounding the proposed allotments in land that is to be maintained in perpetuity by Shoalhaven City Council (after the initial 3 year period) as per the approved Statement of Commitments. The proposed perimeter fire trail will be fully sealed with PBP compliant passing bays every 200 m and the perimeter fire trail will not be accessible to the public meaning that the trail will require less maintenance than would a perimeter road as it will be exposed to significantly less traffic.

Shoalhaven City Council (SCC) has raised an issue with the proposed perimeter fire trail surrounding the amended section of the Central Precinct citing the fact that the trail does not comply with the 'acceptable solution' examples within DCP 100 'Subdivision Code'. However, SCC's DCP 100 was adopted by Council on 18 December 2001 and effective from 16 February 2002 when a previous and now superseded version of PBP 2001 was in force.

Consequently, the suggested acceptable solutions within DCP 100 for perimeter fire trails are largely based on the requirements of PBP 2001, not the current version of PBP which is PBP 2006.

Given that PBP 2006 provides the current 'Acceptable Solutions' for bushfire access, the proposed access relating to the Central Precinct needs to comply with PBP 2006, not DCP 100.

The proposed fire trail will be provided in accord with the design requirements of PBP. Evacuation of the proposed Central Precinct subdivision will not take place along this proposed perimeter fire trail – egress will be via Moona Creek Road and other roads to the west and south of the subdivision which will take evacuees away from the bush fire prone vegetation located to the north and east of the site.

**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 Bushfire Protection' (RFS 2006) and appropriate for the issue of a Bush Fire Safety Authority.

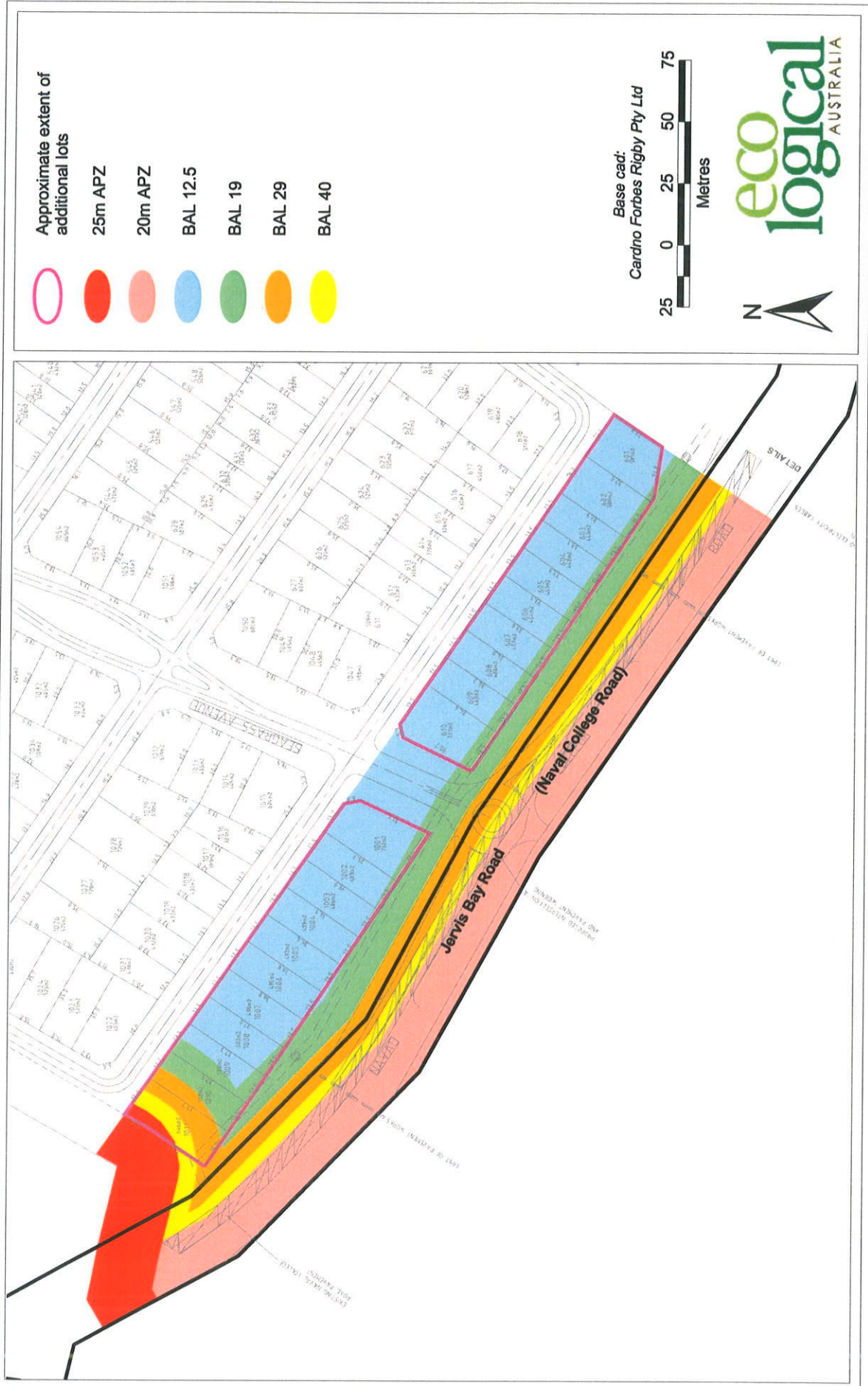


Susan Courtney  
**Senior Bushfire Planner**

## Appendix 1 – Figures



**Figure 1: Asset protection zones and building construction standards**



**Figure 2: Asset protection zones and building construction standards**

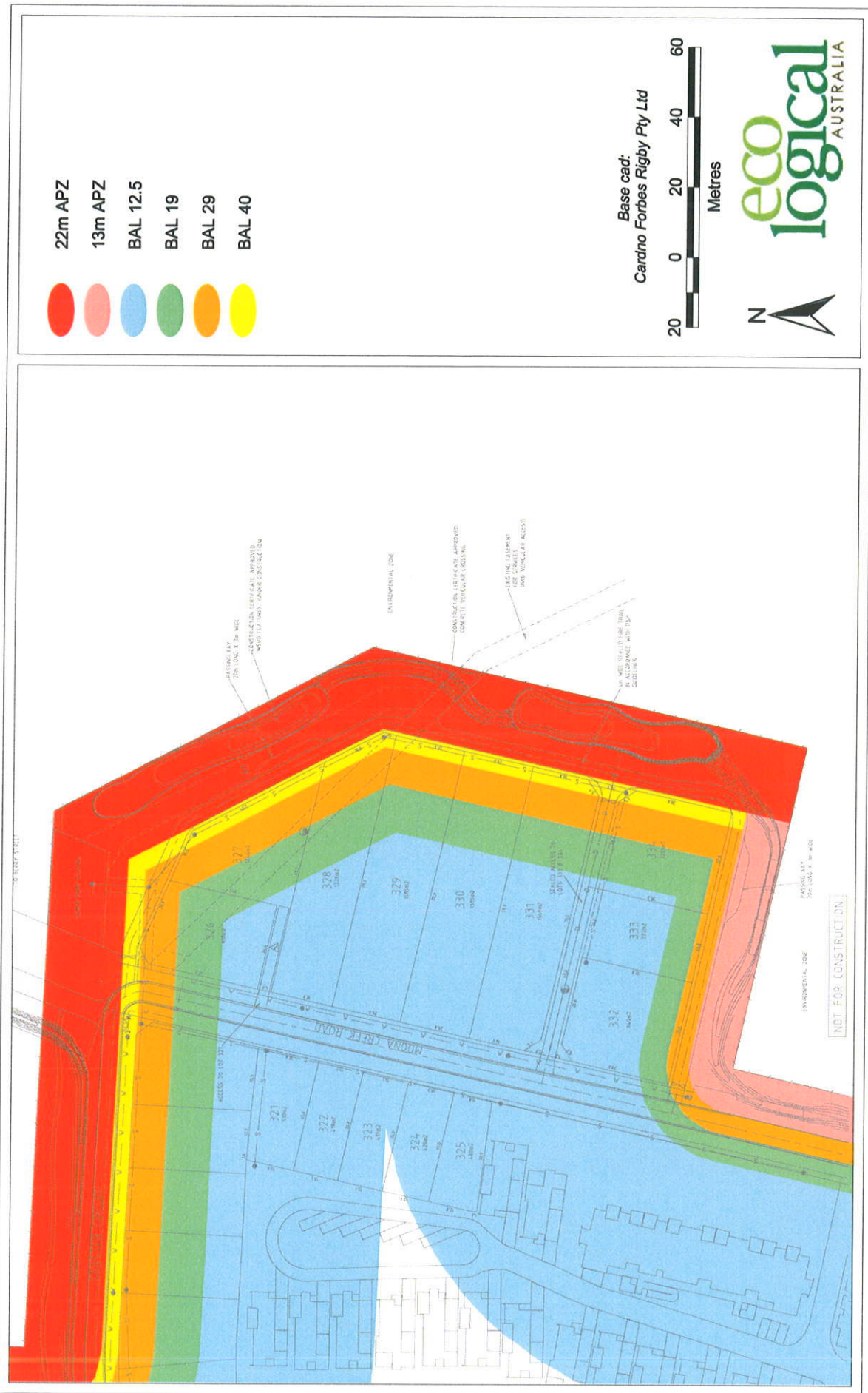


Figure 3: Enlarged view of Lot 1011 showing APZ easement and BALs



## **Appendix 2 – Bush Fire Attack Assessor V1.4 Reports Central Precinct**

## Bushfire Attack Assessment Report

AS3959 (2009) Version  
1.4.2

Print Date: 25/08/2010

Assessment

25/08/2010

**Site Street Address:** Central & Western Precinct, Vincentia  
**Assessor:** David Peterson; Bushfire+Environmental Services  
**Fire Danger Index:** 100 (Fire Weather Area: Illawarra / Shoalhaven)  
**Local Government** Shoalhaven **Alpine Area:** No

### Equations Used

Transmissivity: Fuss and Hammins, 2002  
 Flame Length: RFS PBP, 2001  
 Rate of Fire Spread: Noble et al., 1980  
 Radiant Heat: Drysdale, 1985; Sullivan et al., 2003; Tan et al., 2005  
 Peak Elevation of Receiver: Tan et al., 2005  
 Peak Flame Angle: Tan et al., 2005

**Run Description:** Central Precinct - N & E APZ

### Vegetation Information

<b>Vegetation Type:</b>	Forest	<b>Vegetation Group:</b>	Forest and Woodland
<b>Vegetation Slope:</b>	1 Degrees	<b>Vegetation Slope</b>	Downslope
<b>Surface Fuel</b>	20	<b>Overall Fuel</b>	25

### Site Information

<b>Site</b>	1 Degrees	<b>Site Slope Type:</b>	Downslope
<b>Elevation of</b>	Default	<b>APZ/Separation(m):</b>	22

### Fire Inputs

<b>Veg./Flame Width(m):</b>	100	<b>Flame Temp(K)</b>	1090
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### Calculation Parameters

<b>Flame Emissivity:</b>	95	<b>Relative Humidity(%):</b>	25
<b>Heat of</b>	18600	<b>Ambient Temp(K):</b>	308
<b>Moisture Factor:</b>	5		

### Program Outputs

<b>Category of Attack:</b>	HIGH	<b>Peak Elevation of</b>	8.4
<b>Level of</b>	BAL 29	<b>Fire Intensity(kW/m):</b>	33215
<b>Radiant</b>	27.86	<b>Flame Angle (degrees):</b>	63
<b>Flame Length(m):</b>	19.71	<b>Maximum View Factor:</b>	0.437
<b>Rate Of Spread</b>	2.57	<b>Inner Protection Area(m):</b>	22
<b>Transmissivity:</b>	0.839	<b>Outer Protection Area(m):</b>	0

**Run Description:** Central Precinct - N & E BAL-40

**Vegetation Information**

<b>Vegetation Type:</b>	Forest	<b>Vegetation Group:</b>	Forest and Woodland
<b>Vegetation Slope:</b>	1 Degrees	<b>Vegetation Slope</b>	Downslope
<b>Surface Fuel</b>	25	<b>Overall Fuel</b>	35

**Site Information**

<b>Site</b>	1 Degrees	<b>Site Slope Type:</b>	Downslope
<b>Elevation of</b>	Default	<b>APZ/Separation(m):</b>	27

**Fire Inputs**

<b>Veg./Flame Width(m):</b>	100	<b>Flame Temp(K)</b>	1090
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**Calculation Parameters**

<b>Flame Emissivity:</b>	95	<b>Relative Humidity(%):</b>	25
<b>Heat of</b>	18600	<b>Ambient Temp(K):</b>	308
<b>Moisture Factor:</b>	5		

**Program Outputs**

<b>Category of Attack:</b>	HIGH	<b>Peak Elevation of</b>	10.5
<b>Level of</b>	BAL 29	<b>Fire Intensity(kW/m):</b>	58125
<b>Radiant</b>	28.21	<b>Flame Angle (degrees):</b>	61
<b>Flame Length(m):</b>	25.09	<b>Maximum View Factor:</b>	0.448
<b>Rate Of Spread</b>	3.21	<b>Inner Protection Area(m):</b>	18
<b>Transmissivity:</b>	0.828	<b>Outer Protection Area(m):</b>	9

**Run Description:** Central Precinct - N & E BAL-29

**Vegetation Information**

<b>Vegetation Type:</b>	Forest	<b>Vegetation Group:</b>	Forest and Woodland
<b>Vegetation Slope:</b>	1 Degrees	<b>Vegetation Slope</b>	Downslope
<b>Surface Fuel</b>	25	<b>Overall Fuel</b>	35

**Site Information**

<b>Site</b>	1 Degrees	<b>Site Slope Type:</b>	Downslope
<b>Elevation of</b>	Default	<b>APZ/Separation(m):</b>	37

**Fire Inputs**

<b>Veg./Flame Width(m):</b>	100	<b>Flame Temp(K)</b>	1090
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**Calculation Parameters**

<b>Flame Emissivity:</b>	95	<b>Relative Humidity(%):</b>	25
<b>Heat of</b>	18600	<b>Ambient Temp(K):</b>	308
<b>Moisture Factor:</b>	5		

**Program Outputs**

<b>Category of Attack:</b>	MODERATE	<b>Peak Elevation of</b>	10.9
<b>Level of</b>	BAL 19	<b>Fire Intensity(kW/m):</b>	58125
<b>Radiant</b>	18.88	<b>Flame Angle (degrees):</b>	67
<b>Flame Length(m):</b>	25.09	<b>Maximum View Factor:</b>	0.31
<b>Rate Of Spread</b>	3.21	<b>Inner Protection Area(m):</b>	25
<b>Transmissivity:</b>	0.8	<b>Outer Protection Area(m):</b>	12

Run Description: Central Precinct - N & E BAL-19

**Vegetation Information**

<b>Vegetation Type:</b>	Forest	<b>Vegetation Group:</b>	Forest and Woodland
<b>Vegetation Slope:</b>	1 Degrees	<b>Vegetation Slope</b>	Downslope
<b>Surface Fuel</b>	25	<b>Overall Fuel</b>	35

**Site Information**

<b>Site</b>	1 Degrees	<b>Site Slope Type:</b>	Downslope
<b>Elevation of</b>	Default	<b>APZ/Separation(m):</b>	50

**Fire Inputs**

<b>Veg./Flame Width(m):</b>	100	<b>Flame Temp(K)</b>	1090
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**Calculation Parameters**

<b>Flame Emissivity:</b>	95	<b>Relative Humidity(%):</b>	25
<b>Heat of</b>	18600	<b>Ambient Temp(K):</b>	308
<b>Moisture Factor:</b>	5		

**Program Outputs**

<b>Category of Attack:</b>	LOW	<b>Peak Elevation of</b>	10.99
<b>Level of</b>	BAL 12.5	<b>Fire Intensity(kW/m):</b>	58125
<b>Radiant</b>	12.32	<b>Flame Angle (degrees):</b>	71
<b>Flame Length(m):</b>	25.09	<b>Maximum View Factor:</b>	0.209
<b>Rate Of Spread</b>	3.21	<b>Inner Protection Area(m):</b>	35
<b>Transmissivity:</b>	0.774	<b>Outer Protection Area(m):</b>	15

**Run Description:** Central Precinct - South APZ

**Vegetation Information**

<b>Vegetation Type:</b>	Scrub/Tall Heath	<b>Vegetation Group:</b>	Shrub & Heath
<b>Vegetation Slope:</b>	1 Degrees	<b>Vegetation Slope</b>	Upslope
<b>Surface Fuel</b>	25	<b>Overall Fuel</b>	25

**Site Information**

<b>Site</b>	1 Degrees	<b>Site Slope Type:</b>	Upslope
<b>Elevation of</b>	Default	<b>APZ/Separation(m):</b>	13

**Fire Inputs**

<b>Veg./Flame Width(m):</b>	100	<b>Flame Temp(K)</b>	1090
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**Calculation Parameters**

<b>Flame Emissivity:</b>	95	<b>Relative Humidity(%):</b>	25
<b>Heat of</b>	18600	<b>Ambient Temp(K):</b>	308
<b>Moisture Factor:</b>	5		

**Program Outputs**

<b>Category of Attack:</b>	HIGH	<b>Peak Elevation of</b>	5.25
<b>Level of</b>	BAL 29	<b>Fire Intensity(kW/m):</b>	50228
<b>Radiant</b>	28.49	<b>Flame Angle (degrees):</b>	63
<b>Flame Length(m):</b>	11.27	<b>Maximum View Factor:</b>	0.435
<b>Rate Of Spread</b>	3.89	<b>Inner Protection Area(m):</b>	13
<b>Transmissivity:</b>	0.862	<b>Outer Protection Area(m):</b>	0

**Run Description:** Central Precinct - South BAL-40

**Vegetation Information**

<b>Vegetation Type:</b>	Scrub/Tall Heath	<b>Vegetation Group:</b>	Shrub & Heath
<b>Vegetation Slope:</b>	1 Degrees	<b>Vegetation Slope</b>	Upslope
<b>Surface Fuel</b>	25	<b>Overall Fuel</b>	25

**Site Information**

<b>Site</b>	1 Degrees	<b>Site Slope Type:</b>	Upslope
<b>Elevation of</b>	Default	<b>APZ/Separation(m):</b>	13

**Fire Inputs**

<b>Veg./Flame Width(m):</b>	100	<b>Flame Temp(K)</b>	1090
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**Calculation Parameters**

<b>Flame Emissivity:</b>	95	<b>Relative Humidity(%):</b>	25
<b>Heat of</b>	18600	<b>Ambient Temp(K):</b>	308
<b>Moisture Factor:</b>	5		

**Program Outputs**

<b>Category of Attack:</b>	HIGH	<b>Peak Elevation of</b>	5.25
<b>Level of</b>	BAL 29	<b>Fire Intensity(kW/m):</b>	50228
<b>Radiant</b>	28.49	<b>Flame Angle (degrees):</b>	63
<b>Flame Length(m):</b>	11.27	<b>Maximum View Factor:</b>	0.435
<b>Rate Of Spread</b>	3.89	<b>Inner Protection Area(m):</b>	13
<b>Transmissivity:</b>	0.862	<b>Outer Protection Area(m):</b>	0