DRAFT BUSHFIRE PROTECTION ASSESSMENT

Proposed Mixed-use Subdivision

Culburra Road, West Culburra

Prepared for
Realty Realizations

20 March 2013

DOCUMENT TRACKING

ITEM	DETAIL
Project Name	Bushfire Protection Assessment, Proposed Mixed-use Subdivision: West Culburra
Project Number	12SGBBUS-0059
Prepared by	Rod Rose
Reviewed by	Julie Holden
Approved by	David Peterson
Status	FINAL
Version Number	3
Last saved on	20 March 2013

ACKNOWLEDGEMENTS

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

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1 Property and proposal

Name:	Realty Realizations c/- Allen Price & Associates		
Postal address:	PO Box 73 Nowra NSW 2541		
Street or property Name:	Culburra Road		
Suburb, town or locality:	West Culburra	**Postcode:**	2540
Lot/DP no:	Part of DP 1065111 & Portions 61, 81 & 90 DP 755971		
Local Government Area:	Shoalhaven City Council		
Type of area:	Rural		
Type of development:	Mixed use subdivision		

1.1 DESCRIPTION OF PROPOSAL

Realty Realizations commissioned Eco Logical Australia Pty Ltd (ELA) to prepare a bushfire protection assessment (BPA) for a proposed mixed-use subdivision of Part of DP 1065111 & Portions 61, 81 & 90 DP 755971, off Culburra Road, West Culburra in the Shoalhaven region of NSW (hereafter referred to as the subject land).

The following mixed-uses will be enabled by the subdivision (**Figure 2** shows the location of these uses):

- Urban residential lots
- Medium density residential lots
- Industrial lots
- Tourism purpose lots, and
- Commercial use lots

1.2 LOCATION AND DESCRIPTION OF SUBJECT LAND

The subject land adjoins the Shoalhaven River and is located on the northern side of Culburra Road on the western side of the existing Culburra Beach village on the south coast of NSW (see **Figure 1**. The subject land is classified as bushfire prone land by Shoalhaven City Council.

Figure 1: Location

Subject Land

0 250 500 1,000

Meters

Datum/Projection:
GDA 1994 MGA Zone 56

N

Data Sources:
Bing Aerials

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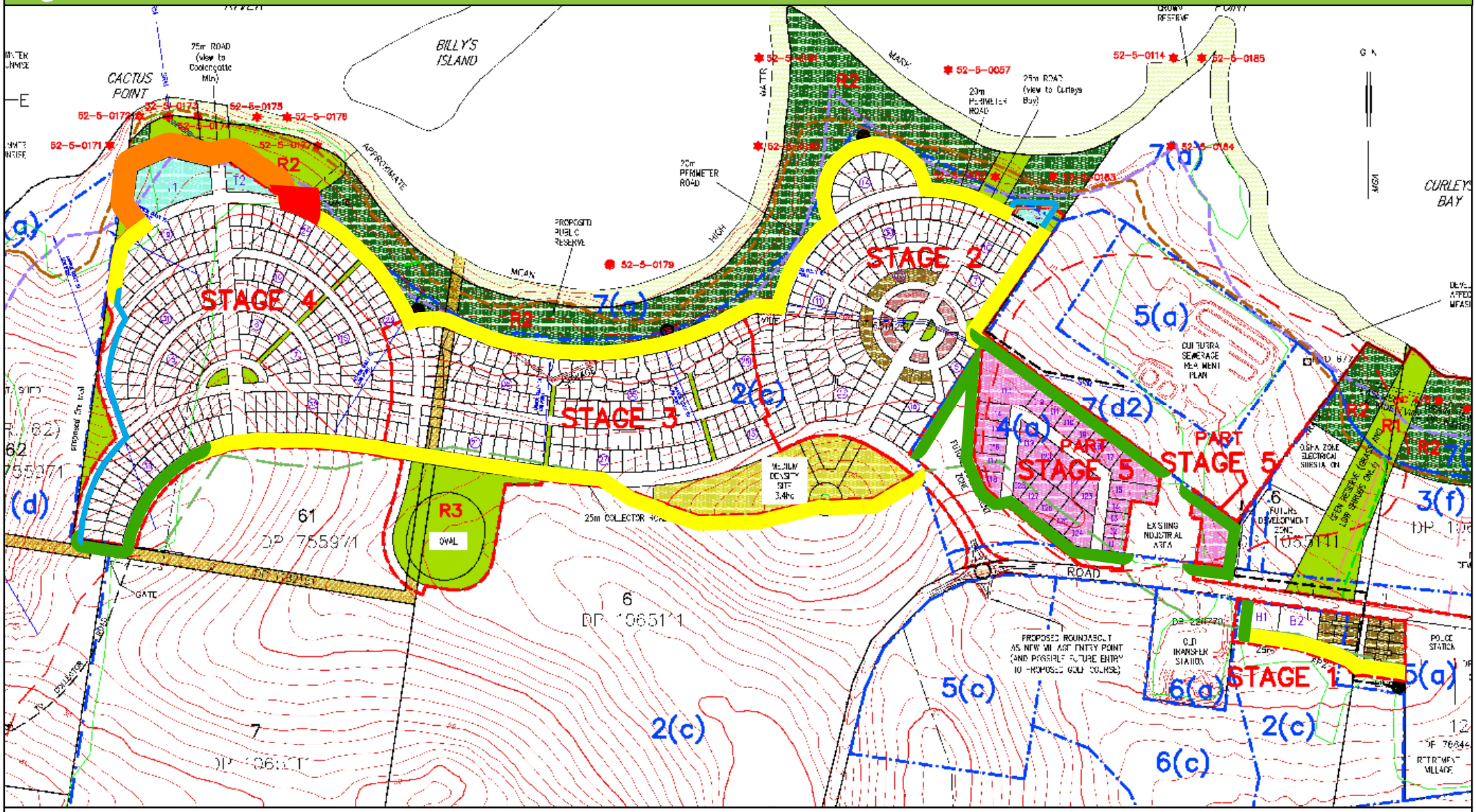
www.ecoaus.com.au

Figure 2: Asset Protection Zones



10m APZ
20m APZ
25m APZ
40m APZ
70m APZ

0 87.5 175 350
Meters

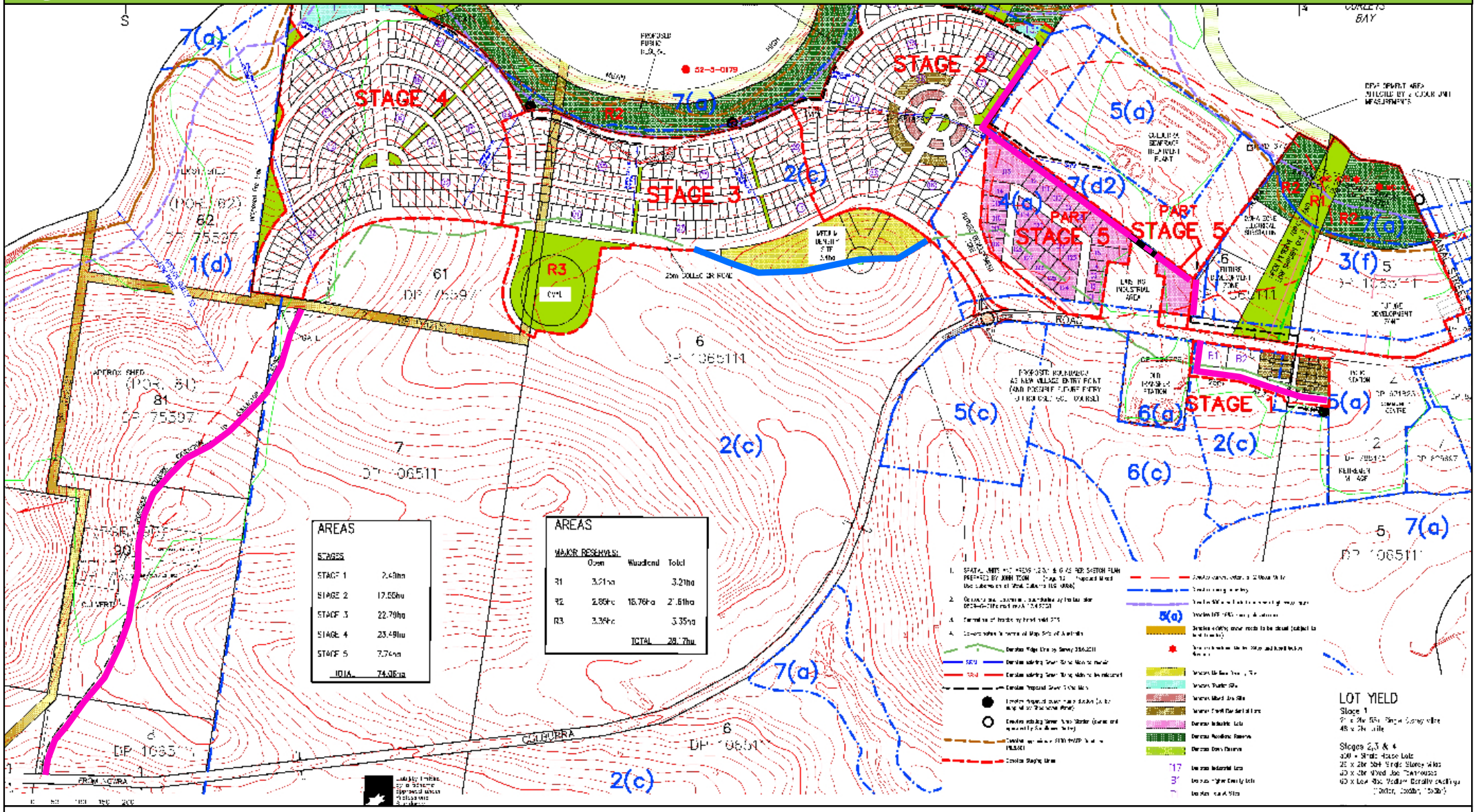
Datum/Projection:
GDA 1994 MGA Zone 56

Data Sources:
Bing Aerials

N

eco logical AUSTRALIA
www.ecoaus.com.au

Figure 3: Perimeter Roads and Fire Trails



2 Bushfire threat assessment

The Director Generals Requirements (DGR's) for the part 3A application require the following "Bushfire 6.4 Address the requirements of Planning for Bush Fire Protection 2006 (RFS). This assessment satisfies this requirement.

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.

The assessment required under Planning for Bush Fire Protection 2006 involves different approaches for the various subdivision uses; including Special Fire Protection Purpose (for tourist lots), and other specific approaches under Section 100B for the residential, industrial and commercial use portions of the subdivision.

2.1 VEGETATION TYPES AND SLOPES

The vegetation and slope have been assessed in all directions from the perimeter of all parts of the subdivision adjoining bushfire prone land. The adjoining vegetation is typically forest, although in places the forest has been cleared to the extent that it has a bushfire attack potential of remnant forest (i.e. <50 m fire run toward an allotment) or is cleared and managed as grassland or proposed subdivision landscaping. Extensive areas of mangrove occur to the north of the subdivision.

The slopes are gentle over the entire site with none exceeding a grade of 5 degrees. The predominant vegetation and effective slope for each perimeter portion of the subdivision is shown in **Table 1**. These data were used to prepare the APZ map (Figure 2).

3 Asset Protection Zones (APZ)

PBP has been used to determine the width of Asset Protection Zones (APZ) for each portion of subdivision adjoining bushfire prone land. The required APZ for each type of development and portion of the subdivision perimeter is shown in **Table 1** and in **Figure 2**.

There are no slopes within 100 m of lots with a grade of >5 degrees. Forest vegetation is the 'predominant vegetation' (as assessed under PBP) abutting the perimeter of all subdivided areas except for some of the western-most residential lots which adjoin grassland and the Tourist Lots T1 and T2 which adjoin remnant forest of < 50 m fire run (adjoining the Shoalhaven River), see **Figure 2**.

Table 1: APZ required for mixed-use subdivision (APZ shown in Figure 2)

Development type	Vegetation	Slope under hazard	APZ required	Comment
Residential Lots	Forest	Upslope and flat	20m	All lots in Figure 2 are residential unless specifically shown as industrial, tourist or commercial. High and medium density lots are proposed in some locations
		Downslope >0 to 5^0	25m	
	Grassland	Downslope >0 to 5^0	10 m	
		Downslope >5^0 to 10^0	10 m	
Industrial (Lots I1-I29)	Forest	Upslope and flat	20 m	BAL 40 construction to apply
		Downslope >0 to 5^0	20 m	BAL 40 construction to apply
Tourist (Lots T1 & T2)	Forest	Downslope >0 to 5^0	70 m	A small portion of to the east of T2 has forest of >50m
	Remnant Forest	Downslope >0 to 5^0	40 m	Some existing vegetation within 140 m of the Lots T1 and T2 are to be cleared so they are <50 m in width and eligible to be classified as remnant forest.
Commercial (Lot T3)	Forest	Downslope >0 to 5^0	10 m	Likely to be used for a café. Defendable space 'APZ' only.

4 APZ maintenance plan

The required APZ shown in Figure 2 will largely be within the perimeter roads of the subdivision; where it extends beyond this 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; and
    - 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 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 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 a building are to be metal, including and up to any taps; and

- The PBP provisions of parking on public roads are met.

6 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 2010)

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

7 Access

7.1 PUBLIC ROADS

The proposed public roads within the subdivision (see **Figure 3**) comply with all of the PBP design requirements as outlined in **Table 2**. Various connecting roads provide numerous alternate egress routes for most of the subdivision. A small length of the primary feeder road provides a single egress route (see location south-east of proposed industrial area); whilst this is unlikely to present a bushfire egress issue, an alternate egress fire trail connects the subdivision 'feeder road' with Culburra Road. This fire trail will ultimately become a public road when the locality is further developed.

7.2 FIRE TRAILS

Fire trails are proposed in the following locations (see Figure 3):

- On the northern side of the Industrial Estate adjoining the Culburra Sewerage Treatment Plant (note: neighbouring landowner agreement to future access provided as Appendix 1)
- On the eastern side of the residential development adjoining the Culburra Sewerage Treatment Plant and linking the residential area cul-de-sacs
- Providing links between various roads in the south-eastern most allotments
- Extending the 'feeder public road' to the southwest and onto Culburra Road

All of the requirements of PBP for fire trails (see **Table 3**) are met by the proposed fire trails. Approval is being obtained from the neighbouring land owner of the existing Industrial Area to allow the perimeter fire trail adjoining the sewerage treatment plant to extend over their land (see **Figure 3**).

Table 2: Performance criteria for proposed public roads*[1]

Performance Criteria	Acceptable Solutions
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
▪ 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) ▪ 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
▪ 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
▪ 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 ▪ 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
▪ 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 ▪ 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
▪ 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 ▪ public roads directly interfacing the bush fire hazard vegetation provide roll top kerbing to the hazard side of the road

*[1] PBP page 21

Table 3: Performance criteria for fire trails*[1]

Performance Criteria	Acceptable Solutions
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 *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*
▪ 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
▪ 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

*[1] PBP page 25

8 Assessment of environmental issues

The DGR's include specific requirements for assessment of environment issues. These are addressed in a separate report by SLR Consulting.

9 Staging

The mixed-use subdivision will be constructed in the following stages:

- Stage 1: small lot subdivision (southeast)
    - Perimeter roads and trails and APZ will be provided as shown in **Figure 2** and **Figure 3**
- Stage 2: main residential subdivision around the circus
    - Developed progressively westward
    - APZ are to be provided between progressing development perimeter and the bushfire hazard. These APZ are to be wide enough to ensure the adjoining allotments are able to be built upon to the standard anticipated under AS3959 when the total subdivision is complete. This may be up to 100 m wide in some instances.
    - Interim fire trails compliant with Table 3 are to be provided to separate all lots from the bushfire hazard where a road is not provided
    - The fire trail egress to the south-west is required to be constructed in this stage
- Timing of construction of tourist facilities and the industrial estate are not known but will require measures similar to that identified for Stage 2.

10 Summary of protection provisions and conformity with PBP

Table 4 summarises the bushfire protection proposed for the proposed mixed use subdivision and its conformity with PBP.

Table 4: Assessment of conformity with PBP

Bushfire protection provision	Proposal	Complies with PBP
Asset Protection Zones	Figure 2 identifies the size of proposed APZs and Table 1 identifies how these were determined.	Yes
Construction Standards	Not applicable at subdivision stage	n/a
Access	All access design standards are appropriate. Approval required from neighbour for fire trail over existing industrial land	Yes
Water supply	Reticulated water will be provided	Yes

10.1 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. This satisfies the requirement of Director Generals Requirements relating to bushfire.

Rod Rose
Director / Senior Bushfire Consultant

11 References

Ausgrid. 2010. *Network Standard NS 179 Vegetation Safety Clearances* (updated from Energy Australia. 2002. *Network Standard NS 179 (Vegetation Safety Clearances)).* Ausgrid, Sydney.

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.

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

Appendix 1

11 March 2013
APA ref: 25405 MJPmrf

Realty Realizations Pty Ltd
GPO Box 2678
SYDNEY NSW 2000

Attention: Mr John Creelman

Dear John

WEST CULBURRA GROWTH AREA – BUSHFIRE TRAIL THROUGH LOT

I am a Director of JackM Pty Limited, which is the owner of Lot 2 DP 836137 being 3 Strathstone Street, Culburra Beach.

I understand that as part of the West Culburra Expansion Area proposed by Realty Realizations Pty Limited, it is suggested that a fire trail be provided linking proposed industrial lots to the west of Lot 2 DP836137 through to Strathstone St.

I confirm that JackM Pty Limited is willing to negotiate a suitable easement through Lot 2 DP 836137 with Realty Realizations Pty Limited for this purpose.

If you wish to discuss this matter further, please do not hesitate to contact the writer.

Yours faithfully

John Norman
JackM Pty Limited

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