

Bushfire Protection Assessment Planning Proposal for Town Centre The Gables, Box Hill North

August 2018



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1 Property and proposal

Table 1: Subject site summary

Street address or property name:	10 and 12 Red Gables Road		
Suburb, town or locality:	Box Hill	Postcode:	2765
Lot/DP no:	Lots 25 and 26 DP 255616		
Local Government Area:	The Hills Shire Council		
Zoning:	B2 – Local Centre		
Type of development:	Mixed use business and residen	itial (multistore	y dwellings)

1.1 Description of proposal

The project relates to the planning proposal for the Town Centre Development within The Gables Land Release Area (See **Figure 1**). The site falls within the Box Hill North Growth Centres Precinct.

1.2 Assessment process

The proposal was assessed in accord with Section 100B of the *Rural Fires Act 1997*, Section 4.14 (formerly 79BA) of the *Environmental Planning and Assessment Act* and 'Planning for Bush Fire Protection 2006' (RFS 2006), herein referred to as PBP (See **Appendix A** for a summary of the assessment process).

The requirements for proposed increased density on bushfire prone land as documented in the RFS Fast Fact 4/12 (NSW RFS 2012) was also considered. The key point of the Fast Fact in relation to the proposal is that an Asset Protection Zone (APZ) to be provided that achieves the 29 kW/m² approval threshold.

Assessment included a review of background documentation, design team consultation and GIS analysis.

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	Ø		3.1
Construction standard	V		3.3
Access	Ø	Further assessment required at detailed design stage.	3.4
Water supply	V		3.5
Gas and electrical supplies	Ø		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 Hills Shire Council bush fire prone land (BFPL) map¹.

¹ <u>https://www.planningportal.nsw.gov.au/find-a-property</u>



Figure 1: Layout

BARANCE STORE

2 Bushfire threat assessment

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

The effective slope has been determined from 2 m contour data, site inspections and the construction plans detailing the works within the riparian corridors. The land across the subdivision and within the riparian corridor is largely devoid of any undulations and falls within the PBP slope class '>0-5 degrees downslope'.

The vegetation that in future will be considered the bushfire hazard is the revegetation within the riparian corridor to the east as seen in **Figure 2**. The riparian corridor is currently cleared and subject to Bulk Earthworks. The riparian corridor is to be reconstructed and revegetated to a width of 25m in accordance with the approved Vegetation Management Plan (VMP) for Precinct E as shown in **Figure 2** (ref. Box Hill North – The Gables, Vegetation Management Plan – Precinct E January 2017 Final. Source: Cumberland Ecology).

The riparian corridor to the east of the lot will be 25 m wide, with a 2 m rock lined bed meandering through the centre. For the purposes of this assessment the future riparian corridor area has been assessed as a "Low Hazard" due to the width, with a potential fire run directly towards buildings not exceeding 50 m. Low hazard vegetation uses 'rainforest' setbacks and construction levels as a surrogate for the reduced fire behaviour expected from small and/or narrow areas of vegetation.

The restoration and revegetation which will occur along the corridors will contain flora species from the Cumberland Plain Woodland (CPW) and Alluvial Woodland (AW) community assemblages. The targeted planting density will only aim to restore the original canopy density of surrounding AW as mapped for this region. Further information is provided in **Appendix B**.

In all other directions, there are managed lands in the form of land cleared for future residential development, landscaped recreation areas and cycle ways associated with the subdivision construction.

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



Figure 2: Precinct E VMP Management Zones (Figure 3.1 from VMP dated Jan 2017)



Figure 3: Bushfire Hazard Assessment

³ Bushfire protection measures

3.1 Asset Protection Zones (APZ)

Table 3 shows the dimensions of the required APZ; and where relevant, information on how the APZ is to be provided is included. The footprint of the APZ is also shown in **Figure 3**.

As noted in **Section 2**, the riparian corridor in this location will not exceed 50 m in width. This assessment therefore utilises "rainforest" vegetation classification in accordance with PBP.

3.2 APZ maintenance plan

The following fuel management specifications are to be considered for any landscaping and ongoing management adjacent to the subject land:

- 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

Lot # OR direction from development boundary	Transect #	Slope	Vegetation	PBP required APZ (PBP 2006)	BAL-29 required APZ (AS 3959-2009)	Available APZ	Comments
East	1	>0-5° Downslope	Low Hazard (Rainforest)	10 m	14 m	≥14 m	APZ can be provided by the landscaped recreation zones and building setbacks. The nearest building line to the eastern boundary of the future riparian corridor is 40m. Refer to Figure 3 for the extent of BAL-29 relative to the building lines.

3.3 Construction standard

The Bushfire Attack Level (BAL) for future dwellings within the proposed subdivision 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 AS 3959-2009 fuel loads.

It is important that the most recent and current version of AS 3959-2009 is consulted. Additionally, the ember proofing measures as outlined in PBP (within the 2010 Appendix 3 Addendum) are to be implemented as applicable to the proposed development.

3.4 Access

Public road access to the subdivision is via Red Gables Road and Fountain Drive.

Figure 1 shows the internal road network within the proposal. It shows the following types of access:

• Internal public road.

The layout within the site does not include a public perimeter road between the hazard and the future hazard to the east, therefore it does not comply to the acceptable solution criteria for access and will require further assessment at detailed design to demonstrate that a performance solution can be achieved. Review of the building layout, hardstand areas and footpath networks shows that there is sufficient trafficable area around the eastern edge of the site and that there is potential to design trafficable verges into the shared path network which will allow for access for fire fighting vehicles along the Riparian Corridor.

The performance criteria for fire trails has been included in Appendix C to guide future design of the perimeter access design.

The performance criteria and acceptable solutions for each of the access types are shown in Appendix C, along with comment on the subdivision design compliance or otherwise. All access within the subdivision can meet the acceptable solutions within PBP.

3.5 Services – Water, electricity and gas

3.5.1 Water

The subject site will be serviced by reticulated water. The furthest point from the proposed dwellings to a hydrant will be less than 70 m. No additional water supplies are required for this development.

3.5.2 Electricity services

Electricity supply to the subject land is located underground and therefore complies with Section 4.1.3 of PBP.

3.5.3 Gas services

Gas services (reticulated or bottle gas) are compliant with Section 4.1.3 of PBP, subject to the following specifications:

- Any gas services are to be installed and maintained in accordance with Australian Standard AS/NZS 1596 *The storage and handling of LP Gas* (SA 2014). Metal piping is to be used;
- 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;
- If gas cylinders need to be kept close to the building, the release valves are directed away from the building and at least 2 metres away from any combustible material, so that they do not act as a catalyst to combustion. Connections to and from gas cylinders are metal; and
- Polymer sheathed flexible gas supply lines to gas meters adjacent to buildings are not used.

Assessment of environmental issues

An assessment of significant environmental features, threatened species or Aboriginal relics identified under the *Biodiversity Conservation Act 2016* or the *National Parks Act 1974* that will affect or be affected by the bushfire protection proposals in this report has not been undertaken as it is covered by other parts of the DA process. However, the site is already cleared, and no environmental impacts are expected.

5 Conclusion

The Town Centre Planning Proposal complies with all relevant acceptable solutions within 'Planning for Bush Fire Protection 2006', (see **Table 2**).

Bushfire Protection Measures	Complies	Requirements	Acceptable Solution	Performance Solution	Report Section
Asset Protection Zones	Ø	APZ dimensions are detailed in Table 3 and Figure 2 .	Ø		3.1
APZ Maintenance plan	Ø	Recommend that any future landscaping meets the detailed specifications in Section 3.2.	Ø		3.2
Construction standard	V	BAL for dwellings to be determined at individual CDC/DA stage however, a maximum of BAL-29 (using AS 3959-2009 fuel loads) is achievable.	Ø		3.3
Access	V	Access to meet standards detailed in Appendix C. Further design of perimeter access at DA stage.	Ø	Ø	3.4
Water supply	Ø	Reticulated water supply meets PBP acceptable solution specifications for a subdivision.	V		3.5.1
Electricity service	Ø	Electricity supply located underground.	Ø		3.5.2
Gas service	Ø	Gas services are to be installed and maintained in accordance with AS/NZS 1596:2014.	Q		3.5.3

Table 4: Summary of bushfire protection measures assessed

6 Recommendations

It is recommended that the planning proposal be approved and this report demonstrates that BAL-29 in accordance with AS 3959-2009 can be achieved based on the current design.

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7 References

Cumberland Ecology. 2017. *Box Hill North – The Gables: Vegetation Management Plan – Precinct E.* For Celestino Developments Pty Limited.

Keith, D. 2004. *Ocean shores to desert dunes: the native vegetation of New South Wales and the ACT*. NSW Department of Environment and Conservation, Hurstville.

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.

NSW Rural Fire Service (RFS). 2012. Increased Density on a Single Parcel of Land Fast Fact 4/12

Standards Australia (SA). 2009. Construction of buildings in bushfire-prone areas (including Amendments 1 - 3), AS 3959-2009. 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 A2.4 (FDI 100) of PBP 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: Western Sydney Vegetation Communities - Pictorial Guide

Background

Alluvial Woodland falls within the Coastal Floodplain Wetlands class and the Forested Wetland formation whilst Cumberland Plain Woodland falls within the Coastal Valley Grassy Woodlands class and Grassy Woodland formation (Keith 2004). The Forested Wetland formation includes Coastal Swamp Forests, Coastal Floodplain Wetlands, Eastern Riverine Forests, and Inland Riverine Forests. Although these communities have the same formation, the fuel loads within each are significantly different; Coastal Swamp Forests have high fuel loads resulting from a prevalent understorey, bark fuels and canopy cover, whilst the fuel loads within a Coastal Floodplain Wetland are significantly less with an absence of understorey and bark fuels, and minimal surface fuels.

PBP identifies fuel loads for Forested Wetland communities as 15/20 t/ha which are reflective of the Coastal Swamp Forest class, whereas fuel loads occurring within the Coastal Floodplain Wetland class are consistent with those of a Grassy Woodland (e.g. 10/15 t/ha). The reduced fuel loads for the Coastal Floodplain Wetland are reflective of those observed on the ground within the riparian corridor and which has been recommended within the VMP. Importantly these fuel loads are less than those occurring within a Coastal Valley Grassy Woodland and support a vegetation classification of 'woodland' in accordance with PBP. This approach has been supported for surrounding areas in the South West Priority Growth Area that have a similar mix of Alluvial Woodland and Cumberland Plain Woodland (e.g. Kolombo Creek at Oran Park and South Creek at Gregory Hills and Catherine Park). The pictorial guide below illustrates the vegetation structure and fuel loads expected through the VMP.

This approach was approved as part of the assessment of the original subdivision by NSW Rural Fire Service (RFS).

Pictorial guide

This pictorial guide has been prepared to provide a visual guide to the expected structure and fuel load of revegetation and restoration works, for riparian corridors within the Cumberland Plain, predominantly within the South Western Sydney area (Camden, Campbelltown, Liverpool, Blacktown and Penrith Local Government Areas). Note this may be adapted to other areas. It focuses on scenarios with Alluvial Woodland (River Flat Eucalypt Forest) and Cumberland Plain Woodland (CPW) communities.

Scenario 1: Alluvial Woodland

Revegetation and restoration to an Alluvial Woodland will reflect that shown in **Plate 1** and **Plate 2**. The resulting community will include Casuarina species with Eucalypt and Melaleuca species dispersed throughout and a prominent groundcover of soft-leaved forbs and grasses. It generally occupies habitats where flooding is periodic and will exhibit an absence of understorey and bark fuels.



Plate 1: Alluvial Woodland



Plate 2: Alluvial Woodland with Casuarina's dominating

Scenario 2: Cumberland Plain Woodland

Revegetation and restoration to a Cumberland Plain Woodland community will reflect that shown in **Plate 3** and **Plate 4**. The resulting community will comprise an open tree canopy, a near-continuous groundcover dominated by grasses and herbs, sometimes with layers of shrubs and/or small trees.



Plate 3: Cumberland Plain Woodland



Plate 4: Cumberland Plain Woodland in early stages or revegetation

Scenario 3: Alluvial Woodland and Cumberland Plain Woodland mix

Revegetation and restoration to an Alluvial Woodland, Cumberland Plain Woodland mix will reflect that shown in **Plate 5** and **Plate 6**. The resulting community will exhibit an absence of understorey and bark fuels in areas subject to inundation, transitioning to an open woodland with a grassy understorey.



Plate 5: Alluvial Woodland and Cumberland Plain Woodland mix



Plate 6: Alluvial Woodland and Cumberland Plain Woodland mix with no defined understorey

Appendix C – Access specifications

Table 5: Performance criteria for proposed public roads (PBP page 21)

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 	Y
 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) 	Can Comply. Perimeter Access to be further assessed at detailed design.
	 the perimeter road is linked to the internal road system at an interval of no greater than 500 metres in urban areas 	Can Comply. Perimeter Access to be further assessed at detailed design.
	 traffic management devices are constructed to facilitate access by emergency services vehicles 	Can comply
	public roads have a cross fall not exceeding 3 degrees	Y
	• 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	Can comply
	 curves of roads (other than perimeter roads) are a minimum inner radius of six metres 	Can comply
	 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 	Y
	• there is a minimum vertical clearance to a height of four metres above the road at all times	Υ

Performance Criteria	Acceptable Solutions	Complies
 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 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 	Can comply. Can comply
 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 	Can comply Can comply
 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 	Can comply Can comply

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.	
	• Note: Some short constrictions 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	• the fire trail is accessible to firefighters and maintained in a serviceable condition by the owner of the land.	
trail joins a public road, access shall be controlled	appropriate drainage and erosion controls are provided.	
to prevent use by non- authorised persons	• 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	
• Fire trails designed to prevent weed infestation,	 fire trail design does not adversely impact on natural hydrological flows. 	
soil erosion and other land degradation	• fire trail design acts as an effective barrier to the spread of weeds and nutrients.	
	• fire trail construction does not expose acid-sulphate soils.	

 Table 6: Performance criteria for proposed fire trail (PBP page 25) – for reference only.







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