



Bushfire Assessment

Residential subdivision

**23 Boomerang Drive,
Blueys Beach**

Addenbrooke Pty Ltd

24 August 2022

(Ref: 21140)

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BPAD LEVEL 3 ACCREDITED PRACTITIONER

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1 Introduction

Street or property name:	23 Boomerang Drive	
Suburb, town or locality:	Blueys Beach	Postcode: 2428
Lot/DP no:	Lot 23 DP 537919	
Local Government Area:	Mid-Coast Council	
Type of development:	Subdivision creating low density residential lots	

1.1 Background

Addenbrooke Pty Ltd commissioned Peterson Bushfire to prepare a Bushfire Assessment Report for a proposed residential subdivision located on bushfire prone land at Blueys Beach, NSW. This report presents the assessment and recommendations to ensure compliance with the relevant bushfire protection legislation and policy.

This bushfire assessment has been prepared by a consultant accredited by the Fire Protection Association of Australia's BPAD scheme (Accreditation No. BPD-L3-18882).

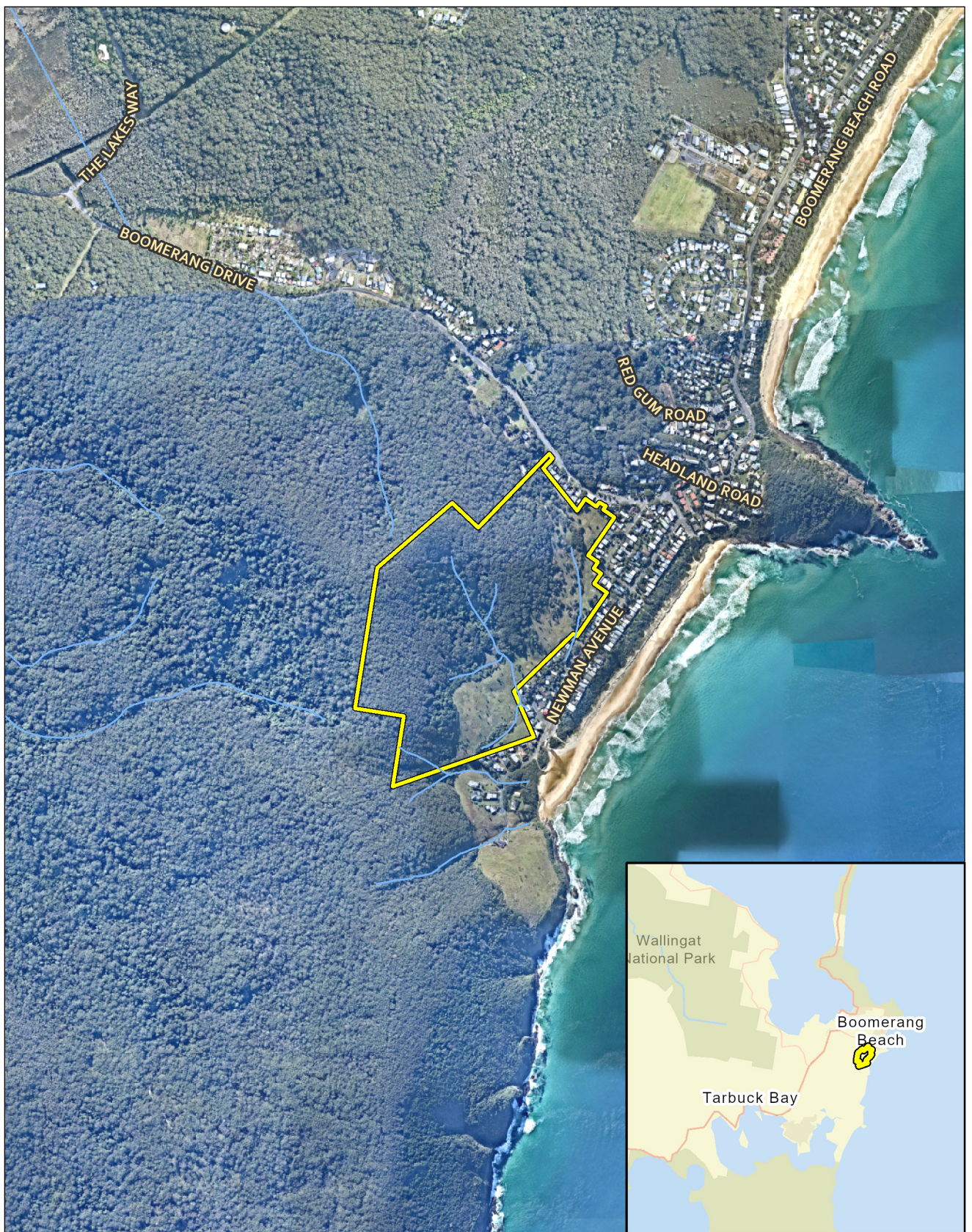
1.2 Location and description of the subject land

The subject land is a large lot approximately 35 hectares in area and is located to the rear of the existing residential area on Blueys Beach. The location of the subject land is shown on Figure 1.



The western two-thirds of the subject land supports in-tact bushland in the form of forest and rainforest on the steep slopes that rise up and form the backdrop to Blueys Beach. The eastern third is regularly mown land and sits to the rear of existing residential properties along Newman Avenue and associated streets. The managed land is zoned C4 Environmental Living, R2 Low Density Residential and B1 Neighbourhood Centre.

1.3 Development proposal

The proposal consists of the subdivision of the land zoned R2 Low Density Residential and B1 Neighbourhood Centre to create lots, public roads and supporting uses such as open space and stormwater treatment assets. The proposal includes the maintenance of the C4 zone up to where it is currently maintained. This maintenance will provide the required APZ to the proposed lots. Figure 2 shows the proposed subdivision layout.



Legend

-  Watercourse
-  Subject Land



 **DKGIS**
Date: 12/08/2022

0 125 250 500
Metres

Figure 1: Location of the Subject Land

Coordinate System: GDA 1994 MGA Zone 56

Imagery: © Nearmap



Legend

- Subject Land
- Cadastre
- Development Area



Date: 12/08/2022

0 50 100 200
Metres

Figure 2: The Proposal

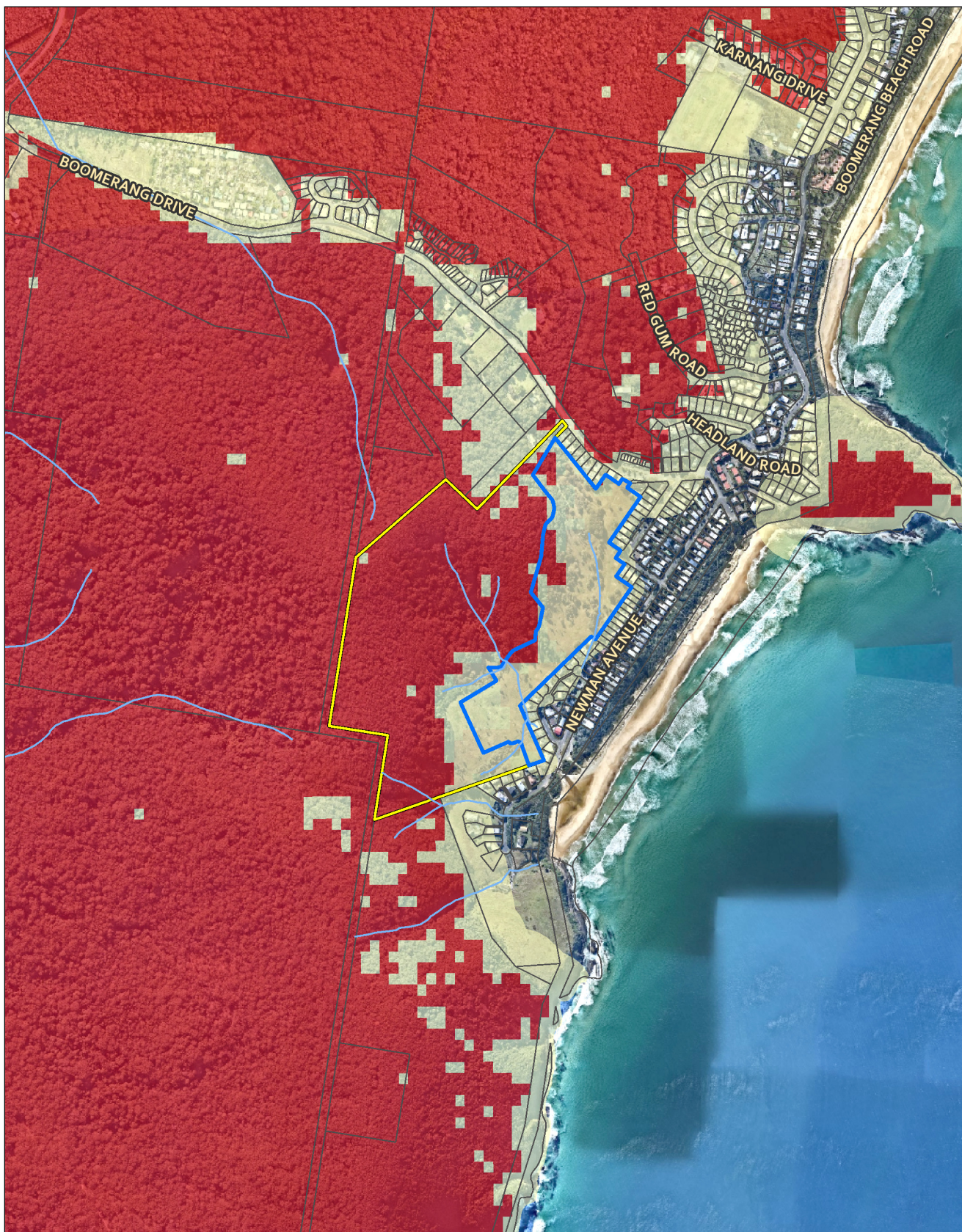
Coordinate System: GDA 1994 MGA Zone 56

Imagery: © Nearmap

1.4 Assessment requirements

The subject land is identified as 'bush fire prone land' as shown on Figure 3. Section 4.46 of the *Environmental Planning and Assessment Act 1979* requires a bushfire assessment of residential subdivision proposals on bush fire prone land following the process and methodology set out within Section 100B of the *Rural Fires Act 1997*, Clause 44 of the *Rural Fires Regulation 2013* and the NSW Rural Fire Service (RFS) document *Planning for Bush Fire Protection 2019* (referred to as 'PBP' throughout this report).

Chapter 5 of PBP outlines the planning requirements for residential development on bushfire prone land. The requirements are divided into a suite of bushfire protection measures such as Asset Protection Zones (APZ), Bushfire Attack Levels (BAL), access and road standards for emergency response and evacuation, water supply standards for fire-fighting, and vegetation management and landscaping standards.



Legend

-  Watercourse
-  Development Area
-  Subject Land
-  Cadastre

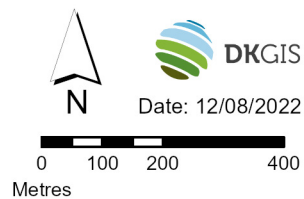


Figure 3: Bushfire Prone Land

Coordinate System: GDA 1994 MGA Zone 56

Imagery: © Nearmap

2 Bushfire hazard

An assessment of the bushfire hazard is necessary to determine the application of bushfire protection measures such as Asset Protection Zone (APZ) location and dimension. The following sub-sections provide a detailed account of the vegetation communities (bushfire fuels) and the topography (effective slope) that combine to create the bushfire hazard that may affect bushfire behaviour at the site.

2.1 Predominant vegetation

The 'predominant vegetation' influencing fire behaviour approaching the site has been assessed in accordance with the methodology specified within PBP. The bushfire hazards are described below and mapped on Figure 4.

There are two vegetation communities that adjoin the subdivision as mapped on Figure 4. The hazard at the northern end of the subject land is Northern Hinterland Wet Sclerophyll Forest and the hazard at the southern end is Littoral Rainforest. These communities are classified as 'forest' and 'rainforest' respectively for the determination of APZ.

2.2 Effective slope

The 'effective slope' influencing fire behaviour has been assessed in accordance with the methodology specified within PBP. This is conducted by measuring the slope that would most influence fire behaviour where the vegetation occurs over a 100 metre transect measured outwards from the proposed lots. The slope was determined using 2 m contours (refer to Figure 4). The slopes are indicated on Figure 4 and are listed in Table 2.

The effective slope for the northern end of the subdivision is in the PBP slope class of 'upslope/flat' and is characterised by the steep upslopes leading westwards. The slope class changes near the ridgeline within the central portion of the hazard interface where exposure to steep downslopes occur in the slope class of 'downslope 10-15 degrees'. Steep slopes are also present within the narrow rainforest corridor at the southern end of the subject land.



Legend

- Contour - 10m
- Watercourse
- Subject Land
- Cadastre

Ecological Constraints

- 2506 Rhodamnia
- EXCLUSION ZONE 2506 Rhodamnia
- PCT 1525

Vegetation Formation

- Forest
- Rainforest



Date: 23/08/2022

0 25 50 100
Metres

Figure 4: Bushfire Hazard Analysis

Coordinate System: GDA 1994 MGA Zone 56

Imagery: © Nearmap

3 Bushfire protection measures

PBP requires the assessment of a suite of bushfire protection measures that in total provide an adequate level of protection for residential development. The measures required to be assessed are listed in Table 1 below and are discussed in detail in the remainder of this section.

Table 1: PBP bushfire protection measures

Measures	Considerations
Asset Protection Zones (APZ)	Location and dimension of APZ building setbacks from vegetation including prescriptions of vegetation management within the APZ.
Access	Assessment to include access and egress, perimeter access and design standards of public roads.
Water supply and other utilities	List requirements for reticulated water supply and hydrant provisions, and any static water supplies for fire-fighting.

3.1 Asset Protection Zones (APZ)

Using the vegetation and slope information presented in Section 2, Asset Protection Zones (APZ) suitable for residential development have been calculated in accordance with PBP Table A1.12.3. The APZ determination is listed in Table 2 below and the resulting APZs are mapped on Figure 5.

The APZs listed are the minimum requirement where the hazard comes within close proximity of the proposed lots. A portion of the C4 zoned land south of Interface C will continue to be managed by slashing to provide the benefit of a wider APZ that will greatly exceed the minimum dimensions.

In total, the overall APZ will consist of the proposed perimeter roads, affected lots at Interface A and D, a portion of the C4 zone, stormwater treatment assets and pocket park.

Table 2: APZ determination

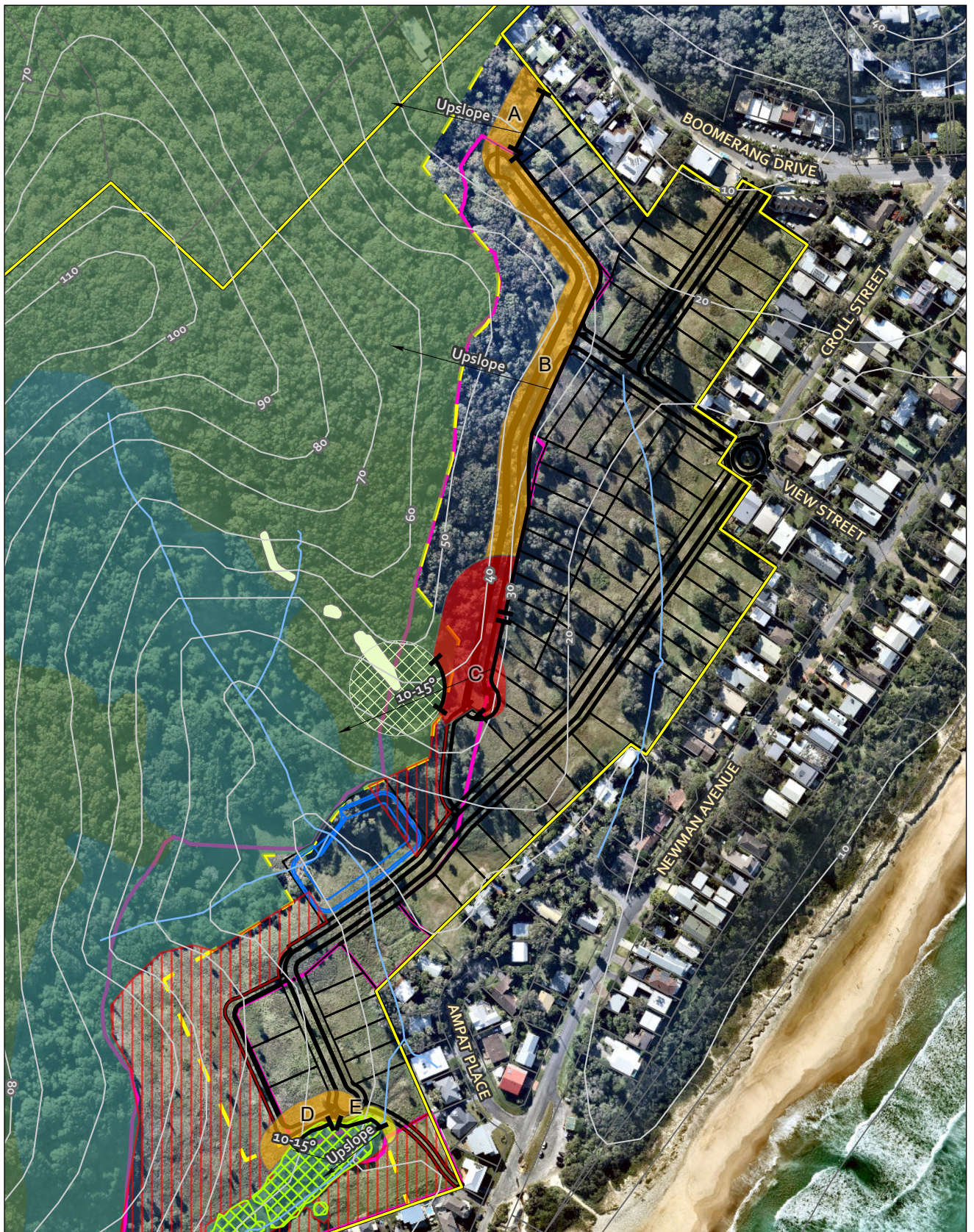
Interface ¹	Vegetation ²	Slope ³	APZ ⁴	Comment
A	Forest	Upslope/Flat	20 m	Forest in C2 zone
B	Forest	Upslope/Flat	20 m	Forest in C4 zone
C	Forest	Downslope 10-15°	31 m	Forest in C4 zone
D	Rainforest	Downslope 10-15°	20 m	Rainforest on steep slopes
E	Rainforest	Upslope/Flat	9 m	Rainforest

¹ Hazard interface as labelled on Figure 5.

² Predominant vegetation classification over 140 m from proposed lots.

³ Effective slope assessed over 100 m from proposed lots where the bushfire hazard occurs.

⁴ APZ required by Table A1.12.3 of Planning for Bush Fire Protection 2019.



Legend

- Contour - 10m
- Watercourse
- Development Area
- Subject Land
- Cadastral
- C2 / C4 Zone Boundary

Vegetation Formation

- Forest
- Rainforest

Asset Protection Zone (APZ)

- Asset Protection Zone - 9m
- Asset Protection Zone - 20m

- Asset Protection Zone - 39m
- C4 APZ

Ecological Constraints

- 2506 Rhodamnia
- EXCLUSION ZONE 2506 Rhodamnia
- PCT 1525



Date: 23/08/2022

0 25 50 100
Metres

Figure 5: Asset Protection Zone (APZ)

Coordinate System: GDA 1994 MGA Zone 56

Imagery: © Nearmap

3.2 Vegetation and landscaping management

The APZs as mapped on Figure 5, as well as proposed lots, roads, parks, and stormwater treatment assets are to be managed to an Inner Protection Area (IPA) standard as described by Section A4.1.1. of PBP as repeated below:

- Trees
 - Tree canopy cover should be less than 15% at maturity
 - Trees at maturity should not touch or overhang the building
 - Lower limbs should be removed up to a height of 2 m above the ground
 - Tree canopies should be separated by 2 to 5 m
 - Preference should be given to smooth barked and evergreen trees.
- Shrubs
 - Create large discontinuities or gaps in the vegetation to slow down or break the progress of fire towards buildings should be provided
 - Shrubs should not be located under trees
 - Shrubs should not form more than 10% ground cover
 - Clumps of shrubs should be separated from exposed windows and doors by a distance of at least twice the height of the vegetation
- Grass
 - Grass should be kept mown (as a guide grass should be kept no more than 100 mm in height)
 - Leaves and vegetation debris should be removed.

3.4 Access

3.4.1 Alternate access and egress for evacuation

PBP requires an access design that enables safe evacuation whilst facilitating adequate emergency and operational response. All bushfire prone areas should have an alternate access or egress option depending on the bushfire risk, the density of the development, and the chances of the road being cut by fire for a prolonged period.

The subdivision has a logical public road layout that will provide three access/egress points to the existing adjoining road network. These are proposed Road 02 to Boomerang Drive and proposed Roads 03 and 04 to Croll Street and View Street.

A fourth access point is an emergency accessway from the southern end of Road 04 to near the southern end of Newman Avenue. The accessway will be a 4 m wide sealed road and will

provide alternate access to the southern end of the subdivision via an existing access easement over No. 87 Newman Avenue. The accessway addresses the issue of providing a secondary access point for lots located beyond 200 m from the nearest intersection. The most southern lots at the end of Road 04 will be located 240 m from where Road 01 intersects with an emergency accessway.

Road 01 and 04 will be linked by a 4 m wide sealed emergency accessway located along the western edge of the proposed park. A formal road connection is not achievable within this location due to the steep gradients and the inability to satisfy Council's road requirements.

The proposed road design satisfies PBP access objectives in relation to access and egress.

3.4.2 Perimeter access

Roads 01 and 04 will provide the perimeter access for the majority of the lots adjoining the hazard interface. Three lots at the southern end of Road 04 will have a 4 m wide sealed emergency accessway to allow fire-fighters access to the rear of lots. The length of interface could also be reached by 70 m of hose from fire appliances standing on Road 04 at both ends of the row of lots.

The subdivision layout satisfies PBP access objectives in relation to perimeter access.

3.4.3 Design and construction standards

The proposed subdivision roads are to comply with the PBP Acceptable Solutions (Table 5.3b of PBP) for the design and construction of public roads in bushfire prone areas as listed below, except for Point 6 whereby emergency accessways are proposed to fulfill the 'through road' requirement.

Road 01 and the southern end of Road 04 (south of the proposed park) are classed as 'perimeter roads'. The remainder (Road 02, Road 03 and the northern end of Road 04) are classed as 'non-perimeter roads'.

1. *Property access roads are two-wheel drive, all weather roads.*
2. *Perimeter roads are provided for residential subdivisions of three or more allotments.*
3. *Subdivisions of three or more allotments have more than one access in an out of the development.*
4. *Traffic management devices are constructed to not prohibit access by emergency service vehicles.*
5. *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.*
6. *All 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.*

7. *Where kerb and guttering is provided on perimeter roads, roll top kerbing should be used to the hazard side of the road.*
8. *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.*
9. *One way only public access roads are no less than 3.5 metres wide and have designated parking bays with hydrants located outside of these areas to ensure accessibility to reticulated water for fire suppression.*
10. *The capacity of perimeter and non-perimeter road surfaces and any bridges and causeways is sufficient to carry fully loaded firefighting vehicles (up to 23 tonnes); Bridges/causeways are to clearly indicate load rating.*
11. *Hydrants are located outside of parking reserves and road carriageways to ensure accessibility to reticulated water for fire suppression.*
12. *Hydrants are provided in accordance with 'AS 2419.1:2005 – Fire hydrant installations: System design, installation and commissioning'*
13. *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.*
14. *Perimeter roads are:*
 - a. *two-way sealed roads;*
 - b. *minimum 8 m carriageway width kerb to kerb;*
 - c. *parking is provided outside of the carriageway width;*
 - d. *hydrants are located clear of parking areas;*
 - e. *there are through roads, and these are linked to the internal road system at an interval of no greater than 500 m;*
 - f. *curves of roads have a minimum inner radius of 6 m;*
 - g. *the maximum road grade is 15° and average grade of not more than 10°;*
 - h. *the road crossfall does not exceed 3°;*
 - i. *a minimum vertical clearance of 4 m to any overhanging obstruction, including tree branches, is provided.*
15. *Non-perimeter roads are:*
 - a. *minimum 5.5 m carriageway width kerb to kerb;*
 - b. *parking is provided outside of the carriageway width;*

- c. *hydrants are located clear of parking areas;*
- d. *there are through roads, and these are linked to the internal road system at an interval of no greater than 500 m;*
- e. *curves of roads have a minimum inner radius of 6 m;*
- f. *the road crossfall does not exceed 3°;*
- g. *a minimum vertical clearance of 4 m to any overhanging obstruction, including tree branches, is provided.*

The three emergency accessways are to be designed and constructed to comply with the relevant Acceptable Solutions for the standard of 'property access' (Table 5.3b of PBP). These requirements are listed below.

1. Property access roads are two-wheel drive, all-weather roads
2. Minimum 4 m carriageway. Some short constrictions in the access may be accepted where they are not less than 3.5 m wide, extend for no more than 30m and where the obstruction cannot be reasonably avoided or removed
3. A minimum vertical clearance of 4m to any overhanging obstructions
4. Curves have a minimum inner radius of 6m and are minimal in number to allow for rapid access and egress
5. The minimum distance between inner and outer curves is 6m
6. The crossfall is not more than 10°
7. Maximum grades for sealed roads do not exceed 15° and not more than 10° for unsealed roads

3.5 Water supply and utilities

3.5.1 Water supply

The subdivision roads will require fire hydrants to be installed to comply with *AS 2419.1 – 2005 Fire Hydrant Installations - System Design, Installation and Commissioning* (AS 2419) so that all building envelopes are within 70 m of a hydrant by lay of the hose (or 90 m with a tanker parked in-line maximum 20 m from the hydrant).

3.5.2 Electrical supply

Electricity will be provided underground and therefore complies with PBP.

3.5.3 Gas supply

Any gas services are to be installed and maintained in accordance with *AS/NZS 1596-2014 The storage and handling of LP gas*.

4 Conclusion and recommendations

4.1 Summary

The proposal consists of a residential subdivision of land identified as bushfire prone located within Blueys Beach, NSW. The bushfire hazard consists of forest and rainforest situated primarily on upslopes west of the proposed lots.

Planning for Bush Fire Protection 2019 requires APZs ranging from 9 m to 39 m between the identified bushfire hazards and building envelopes within proposed lots. The proposed subdivision layout will provide the required APZs through perimeter roads and management of the adjoining C4 zoned land.

4.2 Conclusion

This report presents an assessment of residential subdivision at 23 Boomerang Drive, Blueys Beach. The assessment demonstrates that the proposal, together with the recommendations (see below), complies with s100B *Rural Fires Act 1997*, Clause 44 of the *Rural Fires Regulation 2013* and *Planning for Bush Fire Protection 2019* (refer to Section 3 – Bushfire Protection Measures).

4.3 Recommendations

The recommendations made within this assessment are repeated below:

1. APZs labelled A, B, C, D and E are to be provided to the subdivision as identified on Figure 5 and listed within Table 2.
2. The additional APZ within the portion of land zoned C4 Environmental Living as mapped on Figure 5 is to be maintained as an Asset Protection Zone (APZ).
3. All APZs within C4 zoned land that fall outside of public infrastructure (such as road reserves, parks and stormwater treatment assets) are to be placed within a section 88b easement to ensure maintenance.
4. All identified APZs, proposed lots, roads, accessways, parks, and stormwater treatment assets are to be maintained to the standard of an Inner Protection Area as listed within Section A4.1.1 of *Planning for Bush Fire Protection 2019*.
5. The design and construction of subdivision roads is to comply with the Acceptable Solutions as listed within Table 5.3b of *Planning for Bush Fire Protection 2019* as repeated at Section 3.4.3 of this report. An exception is the proposed emergency accessways fulfill the 'through road' requirement of Point 6 of the Acceptable Solutions. Road 01 and the southern end of Road 04 (south of the proposed park) are classed as 'perimeter roads'. The remainder (Road 02, Road 03 and the northern end of Road 04) are classed as 'non-perimeter roads'.

6. The design and construction of the three emergency accessways are to comply with the relevant Acceptable Solutions for the standard of 'property access' as listed within Table 5.3b of *Planning for Bush Fire Protection 2019* as repeated at Section 3.4.3 of this report.
7. The subdivision roads will require fire hydrants to be installed to comply with AS 2419.1 – *2005 Fire Hydrant Installations - System Design, Installation and Commissioning* (AS 2419).
8. Any gas services are to be installed and maintained in accordance with AS/NZS 1596-2014 *The storage and handling of LP gas*.



David Peterson



References

NSW Rural Fire Service (RFS). 2019. *Planning for Bush Fire Protection: A Guide for Councils, Planners, Fire Authorities and Developers*. State of New South Wales through the NSW Rural Fire Service.

Standards Australia. 2005. *Fire hydrant installations - System design, installation and commissioning*, AS2419.1, Fourth edition 2005, Standards Australia International Ltd, Sydney.

Standards Australia. 2014. *The storage and handling of LP Gas*, AS/NZS 1596-2014, Standards Australia International Ltd, Sydney.

