Rezoning of 80 – 120 Pacific Highway, Doyalson (Doyalson Wyee RSL Club)

Bush Fire Strategic Study

Doyalson Wyee RSL

June 2019

DOCUMENT TRACKING

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Project Manager	Mick George
Prepared by	Letara Judd, Bruce Horkings, Mick George and Nial Roder
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Abbreviations

Abbreviation	Description
APZ	Asset Protection Zone
BAL	Bushfire Attack Level
BFRMP	Bushfire Risk Management Plan
BPM	Bushfire Protection Measures
ELA	Eco Logical Australia
EP&A Act	*Environmental Planning and Assessment Act 1979*
FDI	Fire Danger Index
NSW	New South Wales
PBP	Planning for Bushfire Protection
RFS	Rural Fire Service
RF Act	*Rural Fires Act 1997*
SFPP	Special Fire Protection Purpose
t/ha	Tonnes per hectare

Executive Summary

Eco Logical Australia Pty Ltd (ELA) was engaged by Doyalson RSL Pty Ltd to prepare a Bush Fire Strategic Study for a proposed residential and mixed business rezoning and development located on the Pacific Highway, Doyalson (the Development Site) in the Central Coast Local Government Area (LGA). The Development site is located at 80 – 120 Pacific Highway, within the following Lot/DPs:

- Lot 1 DP503655;
- Lot 11 DP240685;
- Lot 7 DP240685;
- Lot 49 DP707586; and
- Lot 62 DP755266.

This report has primarily been prepared to support a planning proposal for the rezoning of land to facilitate future development of the site. To accompany the planning proposal to rezone the study area, the proponent is required to provide a development layout. This report provides bushfire protection measures that meet the statutory and policy requirements for bushfire protection in NSW.

The proposal includes Special Fire Protection Purpose (SFPP) development of a Hotel, including main building and separate villas, seniors living, medical clinic, childcare centre as well as residential, commercial public facilities of RSL Club, health and wellness centre, recreational warehouse, and fast food outlets. The assessment assumes a worst likely bushfire attack scenario on a day of catastrophic bushfire danger (i.e. Fire Danger Rating of 100).

A number of strategies have been provided in the form of planning controls such that the risk from bushfire is reduced to an appropriate level and a level that meets or exceeds the deemed to satisfy bushfire protection requirements for NSW. The bushfire protection measures applied represent best practice bushfire risk reduction.

The strategies used to reduce the bushfire risk associated with the re-zoning, include:

- Setbacks from bushfire prone vegetation (APZs);
- Integration of non-combustible infrastructure within APZs such as roads, easements and parking areas;
- Access and egress from the site through a well-designed road system;
- Landscaping and garden design principles and guidance to minimise bushfire risk;
- Underground electricity and gas services;
- Compliant water supplies; and
- Emergency response planning.

More detailed bushfire assessment to accurately prescribe setbacks, roads and landscaping is required for development application, however the re-zoning application has provisions that allow this more detailed designed to occur smoothly and achieve the deemed to satisfy standards within NSW.

1 Introduction

1.1 Purpose of assessment

The report provides a bushfire risk assessment of the proposed re-zoning for the 80 – 120 Pacific Highway Doyalson (hereafter referred to as the subject land). It specifically addresses:

- Whether the statutory and policy requirements for bushfire protection NSW are met by the structure plan; and
- The extent to which best practice approaches to bushfire planning are achieved.

The Study provides an assessment of the landscape bushfire risk and the residual risk for development following the provision of bushfire protection measures. It is to include the strategic assessment considerations in Table 4.2.1 Planning for Bushfire Protection (PBP) (RFS 2018), as follows:

- ensuring land is suitable for development in the context of bush fire risk;
- ensuring new development on Bush Fire Prone Land will comply with PBP;
- minimising reliance on performance-based solutions;
- providing infrastructure associated with emergency evacuation and firefighting operations; and
- facilitating appropriate ongoing land management practices.

The Study Area includes analysis of risk data within 10 kms of the site of the development proposal.

1.2 Description of re-zoning proposal and process

This Planning Proposal has been prepared on behalf of Doyalson Wyee RSL Club (Club Ltd) to amend the Wyong Local Environmental Plan 2013 (WLEP 2013) for 80-120 Pacific Highway, Doyalson. This Planning Proposal is an Addendum to the Planning Proposal submitted for 100-120 Pacific Highway in December 2018. The Club Ltd is seeking to diversify its offer to meet the needs of a growing local community and to enhance its unique landscape setting to create a new leisure and experience – the Australian Resort.

Therefore, this Planning Proposal seeks to facilitate the future redevelopment of the site for an integrated retail, recreation, community and residential precinct, centred around Doyalson Wyee RSL Club.

The current zoning permits a limited range of land uses, including rural and recreational uses. The Planning Proposal seeks to deliver a broader range of retail, recreation, community and residential uses. The Planning Proposal seeks to change the zoning from RU6 Transition to RE2 Private Recreation with a additional permitted use schedule to include the following land uses contained in the concept plan.
.

An Indicative Concept Plan (Concept Plan) has been developed to support the Planning Proposal (**Figure 1**). The Concept Plan includes the following land uses:

- RSL Club;
- Wellness and fitness centre;
- Indoor and outdoor recreational facilities;
- Tourism and accommodation;
- Restaurants and cafes;
- Medical centre;

- Childcare centres;
- Seniors Living;
- Residential; and
- Landscaping, open space and lakefront accessibility.

Figure 1: Concept Masterplan

1.3 Existing site features

The Development Site comprises an area of approximately 44 hectares (ha) and is bounded by a hobby farms to the north, existing playing fields to the south, the Pacific Highway to the west and bushland to the east. The Development Site is currently privately owned and used for sporting fields, an adventure course, greenhouses and the Doyalson RSL Club. The Development Site has been subject to past native vegetation clearance and ongoing disturbance.

2 Bushfire Landscape Risk Assessment

The assessment of landscape bushfire risk includes an analysis in the subsequent sections of bushfire hazard, potential fire behaviour and bushfire history within at least a 10 kilometre radius of the Development site.

2.1 Bushfire Hazard

Bushfire hazard has been classified using vegetation, slope and weather data for the study area.

The Planning Proposal is within a wider landscape of bushfire prone land. The pattern of bushfire hazard is extensive enough and continuous enough to support larger sized bushfires.

2.1.1 Vegetation

As shown in **Figure 2**, the subject land is located within an urban area, separated by highly vegetated areas and a network of public roads. The areas of vegetation are relatively well connected. The predominate vegetation type in accordance with PBP to the north, south and east is classified as 'Forest' and to the west a mix of vegetation classified as 'Woodland' to the north of Wyee Road and 'Forest' to the south. Throughout the areas of 'Forest' are pockets of vegetation classified by PBP as 'Forested Wetland' located on the coastal inlets.

To the west the vegetation is more continuous, moving from an urban to more rural lots with less managed area. The fire run toward the subject land to the west is separated by public roads, however to the east the vegetation connected to the subject land is connected for an approximate length of 2 kms. Further to the south east the vegetation is more sparse do to the built up urban areas.

Unmanaged vegetation bounding the site gives rise to resultant radiant heat and fire behaviour characteristics. Forest on the north east and south west is Forest which provides the greatest hazard for the site.

Although the riparian area on the north varies significantly in structure and composition, these areas have been generally assessed as being bush fire hazards. The riparian area is the area of vegetation which is no greater than 20 metres in width and found on either bank of a creek and are treated the same as rainforests.

The development will include APZs that are predominately located on the boundaries of the site, with the staging of the development over approximately 20 years allowing for the consideration of temporary APZs to accommodate each stage. The re-zoning proposal can provide a compliant APZ at its final extent.

The vegetation within the site is to be managed as managed gardens, a vegetated easement and open space.

The primary bushfire hazard primarily consists of vegetation in the north, east and west of the site. The vegetation to the west consists of 'Forested Wetland' to the north west. This vegetation is separated from the site by the Pacific Highway.

The vegetation on the adjoining large lot on the northern and eastern boundaries and is classified 'Forest' by PBP. The vegetation on the east is classified as 'Forested Wetland' by PBP. APZs are

located on the western and eastern boundaries. No APZ have been identified for internal green areas as they will be APZ compliant as playing fields, gardens and managed landscapes etc.

2.1.2 Slope

Figure 3 shows the slope on the subject land using the slope classes of PBP. The slope surrounding the subject land is located on gentle slope falling into the slope category 'downslope >0-5 degrees' due to the coastal lowlands areas.

The site is located on a gentle crest. The slopes surrounding the site and along the riparian corridor on the north are typically gentle. Downslopes will contribute to the development of bushfire intensity, particularly with fire approaching from the east. The proposed APZ and the management of the river corridor will mitigate this risk.

The subject land is located on a gentle crest that falls to the north, east and west and falls into the PBP slope category '>0-5 degrees downslope'. The slope categories for each transect are displayed in **Table 1.**

2.1.3 Bushfire Weather

The subject land is located within 10 km of the coast with a cool temperate climate and summer rainfall. Within this coastal zone, this area can experience predominately coastal winds, with more humid, cooler and wetter weather patterns than more inland areas. The bushfire season runs from October to March. During this season, high daily temperatures, low relative humid, north westerly winds and dry lighting strikes can be expected (NSW BFRMC, 2011).

2.1.4 Bushfire History

The existing Doyalson – Wyee RSL club is situated directly to the south of the development site. It is identified in the Wyong Bush Fire Risk Management Plan (BFRMP) as being of low risk (Likelihood = unlikely; Consequence = moderate), with no treatments identified as a result.

The fire history within 10 km of the site, as shown in **Figure 6,** includes mostly smaller areas burnt by wildfire. The closest of which was a fire of the 1990's located 1 km to the east of the site which burnt approximately 35 ha. To the north east, the largest fire to impact close to the site was a fire occurring between 2013-2018 came within less than 2 km if the subject land.

The subject land falls within the Wyong Bush Fire Risk Management Plan (NSW BFRMC, 2011). This area has an expected 110 fires per year, 5 of which are expected to be major fires.

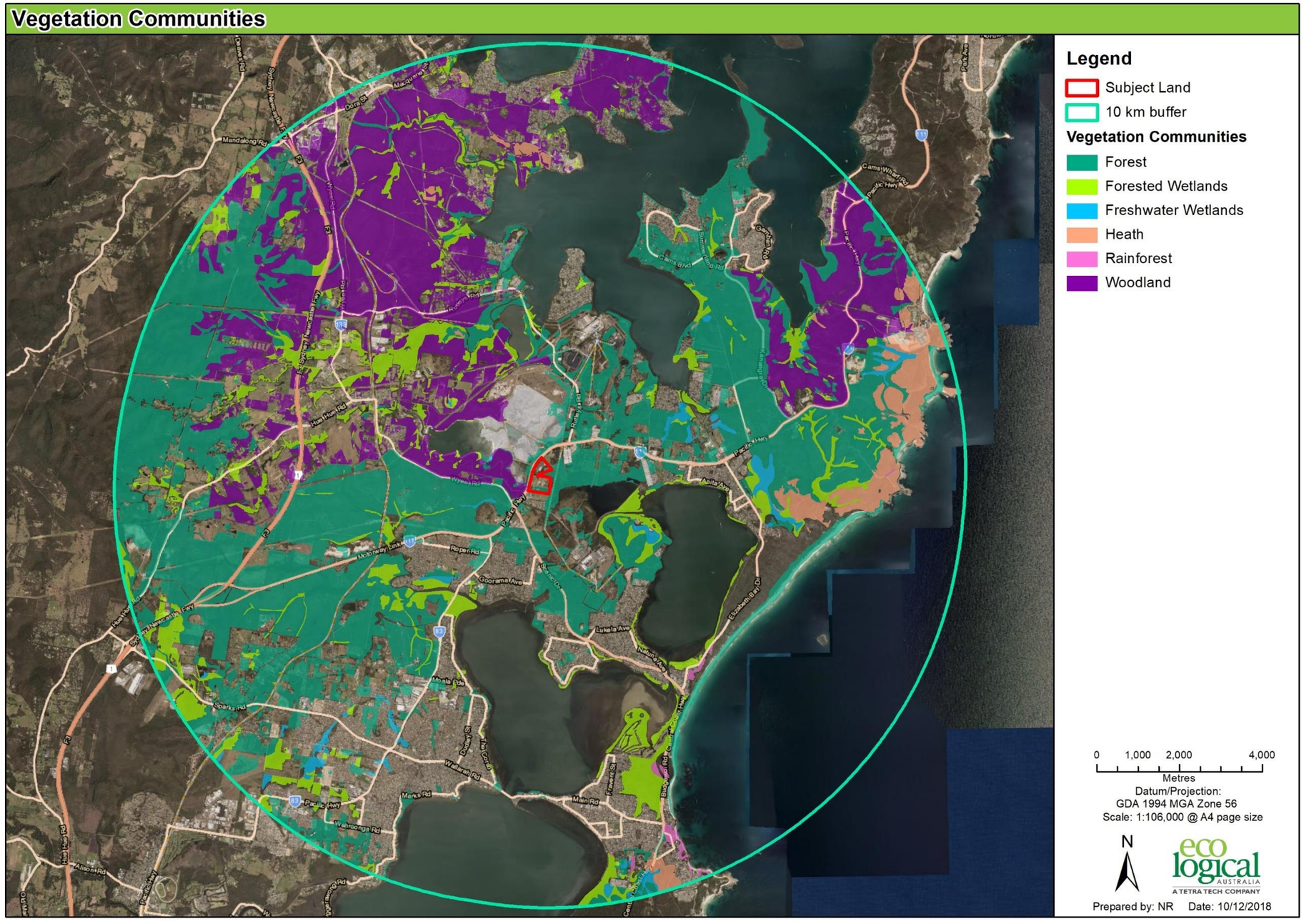

Figure 2: Vegetation Assessment

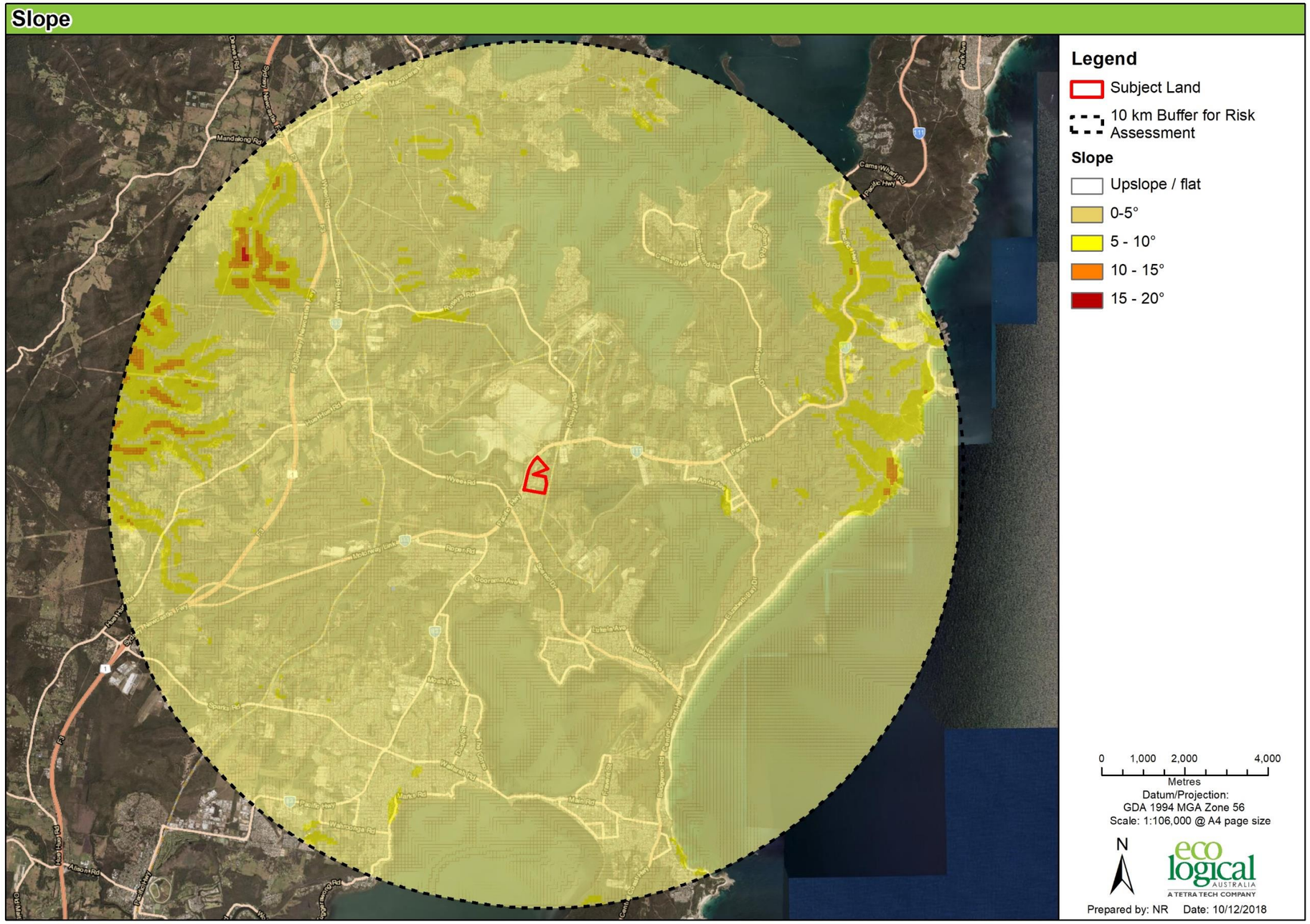

Figure 3: Slope assessment

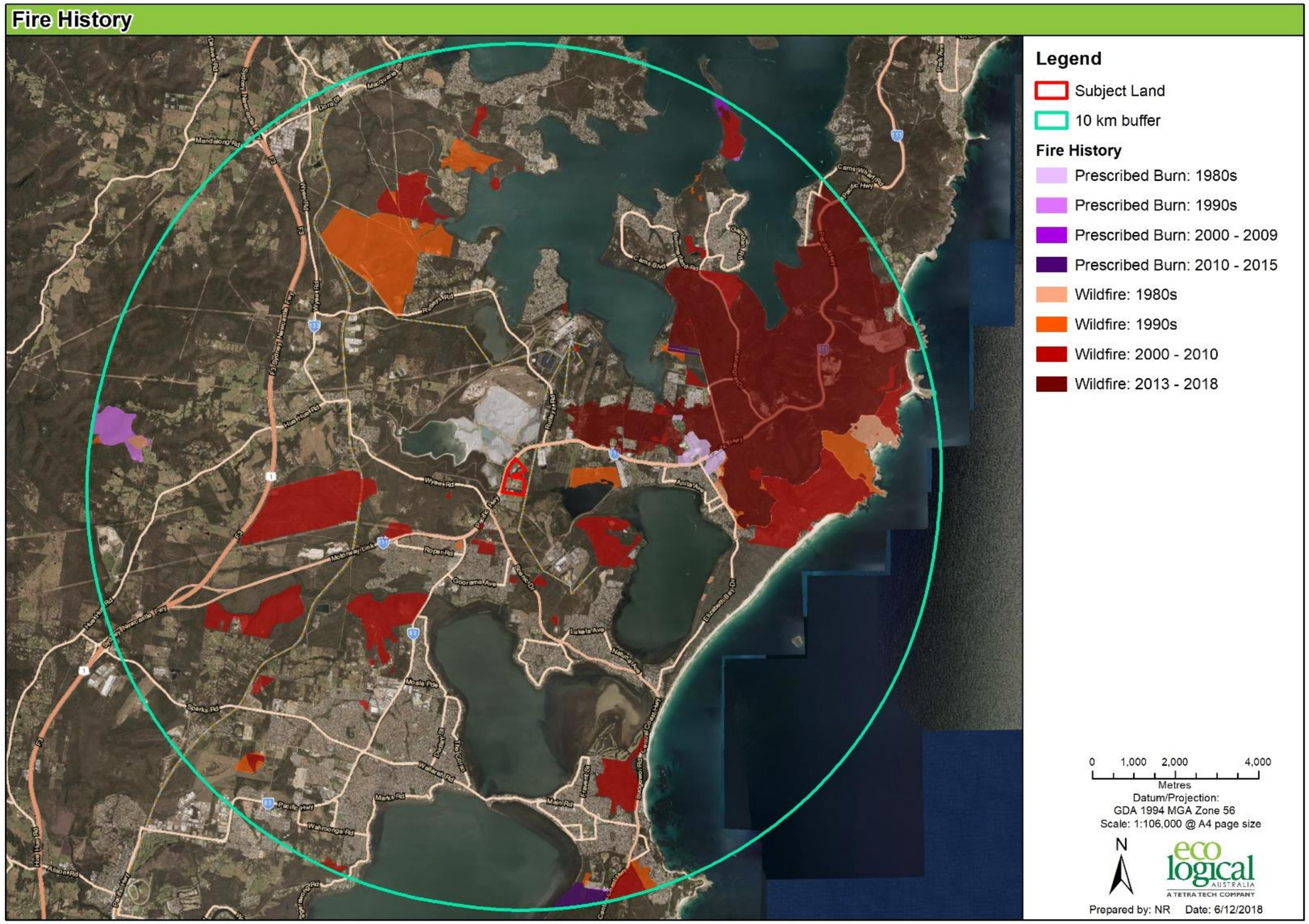

Figure 4: Fire History within 10 km

2.2 Summary of landscape bushfire risk assessment

The landscape hazard analysis indicates that the potential for attack by larger bushfires exist in most years, if not all, due to weather conditions and fuel continuity. It is also feasible that Bushfire Attack Level (BAL) of the magnitude required to be assessed under AS3959 and PBP 2018 could occur.

However, the likelihood of these fires impacting the proposed development will be determined by:

- the likelihood and location of ignitions within the landscape coinciding with adverse fire weather conditions that move a fire toward the proposed development; and
- factors related to wildfire mitigation and suppression such as reduced fuel areas, timing of fire runs compared to suppression deployment and capability, and the coincidence of these with landscape fire advantages such as coastal inlets.

Although the probability of a landscape wide fire or major fire attack is low, it is feasible. There is no evidence to suggest the development proposal is in an inappropriate bushfire landscape and total elimination of bushfire risk is not necessary or feasible. The landscape risk analysis indicates a risk level where it is feasible to design and build resilience into the community that matches or exceeds the risk in this landscape.

3 Landuse assessment

The *Environmental Planning and Assessment Act 1979* (EP&A Act) and the *Rural Fires Act 1997* (RF Act) are the primary legislative instruments relevant to bushfire planning for the site. Planning for Bushfire Protection (PBP) is called up by these legislation as the site is mapped as bushfire prone land, and it is a critical guide in assessing the bushfire risk suitability of the proposal.

PBP (RFS 2018) outlines broad principles and assessment considerations for strategic planning. It also specifies that bushfire protection measures need to be considered at the strategic planning stage to ensure that the future development can comply with PBP (as specified in Chapters 5-8 of PBP 2018).

The aim and objectives of PBP (RFS 2018) below provide additional guidance for land use assessment within a Strategic Bushfire Study:

> *The aim of PBP is to provide for the protection of human life and minimise impacts on property from the threat of bush fire, while having due regard to development potential, site characteristics and protection of the environment.*
>
> *The objectives are to:*
>
> *i. afford buildings and their occupants protection from exposure to a bush fire*
>
> *ii. provide for a defendable space to be located around buildings*
>
> *iii. provide appropriate separation between a hazard and buildings which, in combination with other measures, minimises material ignition*
>
> *iv. ensure that appropriate operational access and egress for emergency service personnel and residents is available*

v. provide for ongoing management and maintenance of bush fire protection measures

vi. ensure that utility services are adequate to meet the needs of firefighters.

3.1 Strategic assessment of resilience to bushfire attack

The feasibility of the proposal to comply with the bushfire protection measures within PBP (RFS 2018) is fundamental to the Study. Whilst Bushfire Protection Measures and their performance requirements are a benchmark for approval of a development, a strategic level study needs also to evaluate these measures within the landscape risk context. This Study has therefore considered the:

- Footprint within the bushfire landscape and the need for adjustment of the protection measures given the landscape risks;
- Pattern and potential bushfire resilience of the development bushland interface;
- Potential cumulative risk associated with the protection measures; and
- Potential for application of innovative or emerging bushfire protection measures.

The following landuse bushfire risk has been identified in the Study:

- The perimeter to area ratio of the development is low compared to most development proposed on bushfire prone land in NSW. A low perimeter to area ratio improves bushfire risk and community resilience;
- Over 50% of the development perimeter has a negligible to low bushfire risk; and
- No adverse cumulative risks have been identified, however, complimentary and consistent risk management through landscape and building design, and community programs will increase bushfire resilience.

3.2 Risk response - Bush Fire Protection Measures

The following BPMs are proposed by the development in response to the strategic level risks identified in Section 2. BPMs are required to improve the community resilience to bush fire attack and improve property protection.

Application of the BPMs described in PBP minimise the risks from bushfire and ensure that the aims and objectives of PBP are met. This PBP approach has been applied for the subject site.

The following key bushfire protection measures are addressed in this assessment:

- Asset Protection Zones (APZs);
- Water supplies;
- Infrastructure (including access road provisions and other services);
- Evacuation and emergency management (including emergency access/egress arrangements); and
- Landscape management and garden design principles.

3.3 Asset Protection Zones (APZs)

Table 1 provides the APZ dimensions for residential and SFPP developments for PBP 2018. APZ are typically refined during subdivision stages with the Structure Plan at re-zoning stage ensuring the APZ dimensions required at subdivision stage can be achieved. The APZ dimensions cited in this assessment will be refined for future subdivision as a more detailed assessment of slope, vegetation and bushfire

attack is required for each individual allotment, and the revised requirements of PBP 2018 will be applied. APZs are areas located between bushfire hazards and development to provide a defendable space in which to undertake emergency operations and to provide a buffer from direct flame contact, and the impacts of radiant heat, smoke and embers. APZs should be wholly contained within the proposed lot or subject land for which they are benefitting or protecting. However, in some circumstances APZs may consist of managed areas outside an allotment e.g. managed open space, managed service easements and roads. Perimeter roads form part of the APZ's throughout the site

The width of APZs is based on a combination of:

- Predominant vegetation (using structural classification);
- Effective slope (i.e. slope most affecting fire behaviour adjacent to the interface); and
- Fire Danger Index (FDI) of 100 (a catastrophic fire weather day).

Figure 6 shows the proposed APZ for the subject land, determined in size by vegetation and slope. **Table 1** identifies the slope and vegetation type used to determine the APZ.

3.3.1.1 APZs for Special Fire Protection Purpose Development

APZs for SFPP development are larger than those for residential development due to the increased vulnerability of the occupants and the increased emergency management needs. APZs for SFPP development are presented in **Table 1**. The concept plan can accommodate the required APZ for SFPP wholly within the subject land as indicated on **Figure 5**.

Performance based modelling using Method 2 of *AS 3959-2009 Construction of buildings in bushfire prone areas* was used to determine the require APZ to achieve the approval threshold of 10 kW/m^2 radiant heat exposure for SFPP development in the north-east of the site (Transects 3 and 4 in **Figure** 5). This modelling indicates a separation of 71 m is required to meet the 10 kW/m^2 threshold.

The following development is identified as SFPP in s100(b)(6) of the Rural Fires Act:

> *(a) a school,*
>
> *(b) a child care centre,*
>
> *(c) a hospital (including a hospital for the mentally ill or mentally disordered),*
>
> *(d) a hotel, motel or other tourist accommodation,*
>
> *(e) a building wholly or principally used as a home or other establishment for mentally incapacitated persons,*
>
> *(f) seniors housing within the meaning of State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004,*
>
> *(g) a group home within the meaning of State Environmental Planning Policy No 9—Group Homes,*
>
> *(h) a retirement village,*
>
> *(i) any other purpose prescribed by the regulations.*

In relation to point (i) above, the Rural Fires Regulations define the following as prescribed purposes:

*For the purposes of paragraph (i) of the definition of **special fire protection purpose** in section 100B (6) of the Act, the following purposes are prescribed:*

(a) a manufactured home estate (within the meaning of State Environmental Planning Policy No 36—Manufactured Home Estates), comprising two or more caravans or manufactured homes, used for the purpose of casual or permanent accommodation (but not tourist accommodation),

(b) a sheltered workshop, or other workplace, established solely for the purpose of employing persons with disabilities,

(c) a respite care centre, or similar centre, that accommodates persons with a physical or mental disability or provides respite for carers of such persons,

(d) student or staff accommodation associated with a school, university or other educational establishment,

(e) a community bush fire refuge approved by the Commissioner.

3.3.1.2 APZs for Non-Residential Development Types

It is recommended that development associated with employment lands, such as commercial and industrial development, be treated as residential development for the purpose of strategic planning. Non-habitable development of this kind has the opportunity to have an APZ less than that required for residential subdivision however this flexibility relies on the known use of the building, its design and construction standard, and can only be determined at the development application stage. Therefore, it is considered appropriate to assess residential sized APZs for such development at this stage in the planning process.

APZ for the areas of non-residential development as indicated on the Concept Plan (**Figure 1**) are all able to be achieved on the subject land as indicated on **Figure 5.**

3.4 Landscaping

PBP (Table 5.3a RFS 2018) specifies the following in relation to landscaping:

Landscaping is managed to minimise flame contact, reduce radiant heat levels, minimise embers and reduce the effect of smoke on residents and firefighters.

The 'acceptable solution' for landscaping is according to Appendix 4 of PBP (RFS 2018) which prescribes the standards for APZs.

This matter is not relevant at the strategic planning phase of land use planning however will need to be considered during future development application stages.

3.5 Construction Standards and Design

The BAL for future developments within the Development will need to be determined at the Development Application (DA) stage. A maximum BAL-29 will need to be provided by the development design for residential development and a maximum of BAL-12.5 for SFPP development. Development Applications will need to demonstrate a construction standard and building design appropriate to the BAL and in compliance with PBP (RFS 2018) and AS 3959-2009 (SA 2009). The large size of the development footprint enables the required BALs for residential and SFPP developments to be achieved.

Table 1: Threat assessment and APZ for PBP 2018

Transect #	Slope[1]	Vegetation[2]	PBP required APZ (residential)[3]	PBP required APZ (SFPP)[4]	Preliminary modelled APZ (SFPP)[5]	Comments
1	Downslope >0 to 5 degrees	Forested Wetland	12 m	42 m	-	The APZ is wholly provided by the road and roadside reserve of the Pacific Highway.
2	Downslope >0 to 5 degrees	Forested Wetland	12 m	42 m	-	The APZ provided within the subject lot is proposed to be access paths, managed gardens and should be managed to the standard of an Inner Protection Area.
3	Downslope >0 to 5 degrees	Forest	29 m	79 m	71 m	The APZ provided within the subject lot is proposed to be a lake, fire trails, access paths, managed gardens and should be managed to the standard of an Inner Protection Area. Preliminary modelling using the NBC Bush Fire model.
4	Downslope >0 to 5 degrees	Forest	29 m	79 m	71m	The APZ provided within the subject lot is proposed to be fire trails, managed gardens and should be managed to the standard of an Inner Protection Area.
5	Downslope >0 to 5 degrees	Forest	29 m	79 m	-	As above.
6	Downslope >0 to 5 degrees	Forested Wetland	12 m	42 m	-	The APZ provided within the subject lot is proposed to be perimeter roads, managed gardens and should be managed to the standard of an Inner Protection Area. Residential development also occurs between the hazard and the proposed Seniors Living.
7	Downslope >0 to 5 degrees	Forested Wetland	12 m	42 m	-	As above.

[1] Slope most significantly influencing the fire behaviour of the site having regard to vegetation found as per PBP.

[2] Predominant vegetation is identified, according to PBP.

[3] Assessment according to Table A1.12.2 of Draft PBP 2018.

[4] Assessment according to Table A1.12.1 of Draft PBP 2018.

[5] Assessment according to Method 2 of AS3559-2009.

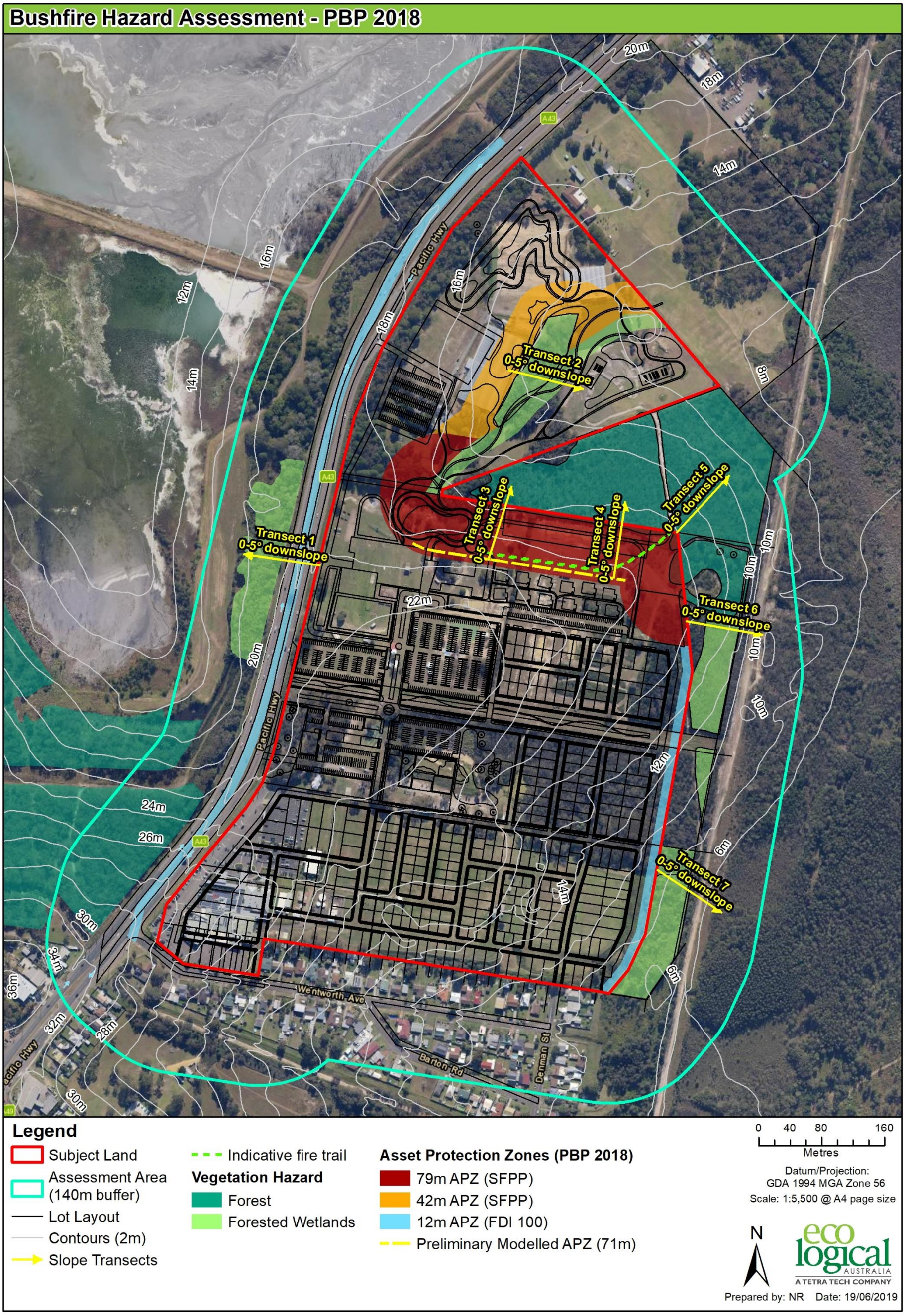

Figure 5: Asset Protection Zone (APZ)

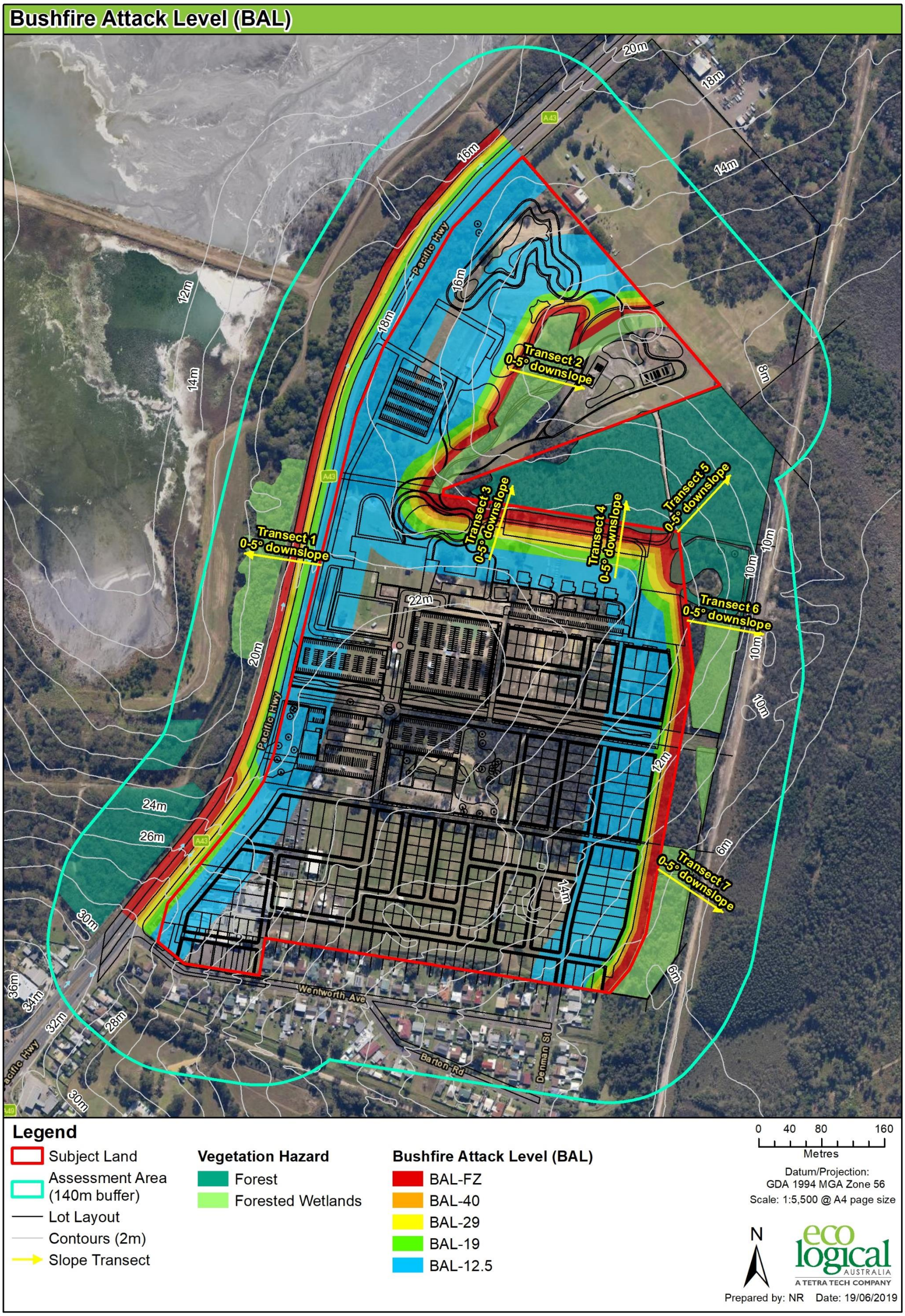

Figure 6: Bushfire Attack Levels (BALs)

3.6 Access

Safe access, egress and defendable spaces are required for emergency services. Emergency management arrangements are also required such as procedures and routines for evacuation and consideration of safer places.

Specific management and evacuation plans may be required at a later stage especially where the SFPP developments are proposed. The emergency management requirements and their capacity to meet response times and related safety measures is also critical.

Given the importance of rapid first attack on bushfires the travel times for the nearest NSW RFS brigade units are important. The Lake Munmorah and Mannering Park RFS are the nearest stations. These stations will provide good response times on completion of roads for the subject development.

A key to emergency access is a road network with frequent direct access to the internal road system for easy and rapid access/egress. Specifications for public roads and internal access roads are provided below. **Figure 1** shows the indicative roading as part of the masterplan with connections to the west and south of the site to existing roads.

A perimeter fire trail along the northern boundary behind the proposed villas would not be used for access/egress of residents and guests at the hotel but would be provided for firefighting purposes. The proposed fire trail would connect to the footpath/track network indicated on Figure 1 to provide a minimum carriageway of 4 m (with an additional one m strip either side of the trail clear of bushes/long grass) that could be used for firefighter access in the event of an emergency. This fire trail would additionally provide connection to the fire trail network running through the crown land adjoining the site. This would be a controlled access with gates (lock/key system authorised by the local RFS).

3.6.1 Public roads

Public roads include both the perimeter road and the internal road system. A safe operational access to structures and water supply for emergency services personnel, while occupants are seeking to evacuate from an area is required. Key requirements include road size (safe/efficient access/egress) and suitable location of water supply points (readily accessible during bushfire).

The proposed public roads within the development are to comply with all of the PBP design requirements as outlined in **Table 2.**

Table 2: Performance criteria for proposed public roads (PBP 2018 page 44)

Performance Criteria	Acceptable Solutions
The intent may be achieved where:	
• Firefighting vehicles are provided with safe, all-weather access to structures and hazard vegetation	• property access roads are two-wheel drive, all-weather roads; and • perimeter roads are provided for residential subdivisions of three or more allotments; and • subdivisions of three or more allotments have more than one access in and out of the development; and • traffic management devices are constructed to not prohibit access by emergency services vehicles; and • 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 • 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; and • where kerb and guttering is provided on perimeter roads, roll top kerbing should be used to the hazard side of the road; and • 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
• 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.
• there is appropriate access to water supply	• the hydrants are located outside of parking reserves and road carriageways to ensure accessibility to reticulated water for fire suppression; • hydrants are provided in accordance with AS 2419.1:2005 [2017]; there is suitable access for a Category 1 fire appliance to within 4m of the static water supply where no reticulated supply is available

Performance Criteria	Acceptable Solutions
• **Perimeter roads** • access 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	• perimeter roads are two-way sealed roads; and • 8m carriageway width kerb to kerb; and • parking is provided outside of the carriageway width; and • hydrants are located clear of parking areas; and • there are through roads, and these are linked to the internal road system at an interval of no greater than 500m; and • curves of roads have a minimum inner radius of 6m; and • the maximum grade road is 15° and average grade is 10°; and • the road crossfall does not exceed 3°; and • a minimum vertical clearance of 4m to any overhanging obstructions, including tree branches, is provided.
• **Non-perimeter roads** • access roads are designed to allow safe access and egress for medium rigid firefighting vehicles while residents are evacuating	• minimum 5.5m width kerb to kerb; and • parking is provided outside of the carriageway width; and • hydrants are located clear of parking areas; and • roads are through roads, and these are linked to the internal road system at an interval of no greater than 500m; and • curves of roads have a minimum inner radius of 6m; and • the road crossfall does not exceed 3°; and • a minimum vertical clearance of 4m to any overhanging obstructions, including tree branches, is provided

4 Infrastructure

4.1 Water

The proposal is serviced by a reticulated water supply. **Table 3** identifies the acceptable solution requirements of Section 5.3.4 of PBP for which the proposal is compliant with, subject to the following specifications:

Table 3: Performance criteria for reticulated water supplies (PBP 2018 page 48)

Performance Criteria	Acceptable Solutions	Complies
The intent may be achieved where:		
• Water supply is required for firefighting purposes	• Reticulated water us to be provided to the development where available; • A static water supply is provided where no reticulated water is available;	Complies Complies
• Water supplies are located at regular intervals; • The water supply is accessible and reliable for firefighting operations	• Fire hydrant spacing, design and sizing comply with the Australian Standard 2419.1 2005 • Hydrants are not located within any road carriageway • Reticulated water supply uses a ring main system for areas with perimeter roads	Complies Complies Complies
• Flows and pressure are appropriate	• Fire hydrant flows and pressure comply with Australian Standard 2419.1 2005	
• The integrity of the water supply is maintained	• All above-ground water service pipes are metal, including and up to any taps	

4.2 Electricity and gas

Electricity supply to the subject land is above ground.

Table 4: Performance criteria for utilities (PBP 2018 page 48)

Performance Criteria	Acceptable Solutions	
The intent may be achieved where:		
• Location of electrical services limits the possibility of ignition of surrounding bush land or the fabric of building	• where practicable, electrical transmission lines are to be located underground; • where overhead, electrical transmission lines are proposed as follows: • lines are installed with short pole spacing (30m), unless crossing gullies, gorges or riparian areas • no part of a tree is closer to a power line than the distance set out in accordance with the specifications in ISSC3 Guideline for Managing Vegetation Near Power Lines	Complies Complies Complies Complies
• Location and design of gas services will not lead to ignition of surrounding bushland or the fabric of buildings;	• Reticulated or bottled gas is installed and maintained in accordance with AS/NZS 1596:2014 and the requirements of relevant authorities, and metal piping is used • All fixed gas cylinders are kept clear of all flammable materials to a distance of 10 m and shielded on the hazard side • Connections to and from gas cylinders are metal • Polymer-sheathed flexible gas supply lines are not used • Above-ground gas service pipes are metal, including and up to any outlets.	Complies Complies Complies Complies Complies

Electricity and gas supplies do not constrain the proposed development.

- 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.

5 Emergency management

The proximity of emergency services to the precinct are considered adequate, subject to the timing of completion of all access roads.

Consultation with the NSW RFS and Fire and Rescue services will ensure adequate emergency response during all phases of construction and occupation of development on the subject land.

The preparation of bushfire emergency procedures is the responsibility of the applicant. An Emergency and Evacuation Management Plan is to either be prepared prior to occupation of the proposed development. The plan will need to be consistent with the RFS Guidelines for the preparation of the Emergency / Evacuation Plan.

A template for an Emergency Management and Evacuation Plan is available on the NSW Rural Fire Service website http://www.rfs.nsw.gov.au/__data/assets/pdf_file/0003/29271/Bush-Fire-Emergency-Management-and-Evacuation-Plan.pdf

6 Adjoining land

Future development will not be reliant on any off-site bushfire mitigation measures. All buildings and use will be designed to be resilient to bushfire attack in circumstances where no additional fuel management occurs outside of APZs etc.

Local Bushfire Management Committees will be updated annually of the bushfire protection measures in-built and proposed for the development.

The proposed land uses should not have a significant deleterious impact on the ability for bushfire management activities to be undertaken on adjoining land. Given the adherence to PBP and other land use planning requirements, the proposed land uses should not increase bushfire management needs for retained and/or adjoining bushfire prone vegetation.

7 Conclusions

A number of strategies have been provided in the form of planning controls such that the risk from bushfire is reduced to an appropriate level and a level that meets the deemed to satisfy bushfire protection requirements in NSW.

The strategies used to reduce the bushfire risk associated with the re-zoning, include:

- Setbacks from bushfire prone vegetation (APZs);
- Integration of non-combustible infrastructure within APZs such as roads, easements and parking areas;
- Access and egress from the site through a well-designed road system with multiple connections to existing roads;
- Underground electricity and gas services;
- Compliant water supplies; and
- Emergency response planning.

More detailed bushfire assessment to accurately prescribe setbacks, roading and landscaping is required for each stage of development, however the re-zoning application has provisions that allow this more detailed designed to occur smoothly and achieve the deemed to satisfy standards within NSW. The concept plan for the subject land provides the bushfire protection measures, including the required APZ's, for the SFPP, residential and non-residential development proposed.

8 Recommendation

It is recommended that the re-zoning application be approved based upon the bushfire protection measures identified in this report.

References

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ISO 14001 Environmental Management

AS/NZS 4801:2001 Occupational Health and Safety Management

ISO 9001 Quality Management

HEAD OFFICE
Suite 2, Level 3
668-672 Old Princes Highway
Sutherland NSW 2232
T 02 8536 8600
F 02 9542 5622

CANBERRA
Level 2
11 London Circuit
Canberra ACT 2601
T 02 6103 0145
F 02 9542 5622

COFFS HARBOUR
35 Orlando Street
Coffs Harbour Jetty NSW 2450
T 02 6651 5484
F 02 6651 6890

PERTH
Suite 1 & 2
49 Ord Street
West Perth WA 6005
T 08 9227 1070
F 02 9542 5622

ADELAIDE
2, 70 Pirie Street
Adelaide SA 5000
T 08 8470 6650
F 02 9542 5622

SYDNEY
Level 3
101 Sussex Street
Sydney NSW 2000
T 02 8536 8650
F 02 9542 5622

NEWCASTLE
Suites 28 & 29, Level 7
19 Bolton Street
Newcastle NSW 2300
T 02 4910 0125
F 02 9542 5622

ARMIDALE
92 Taylor Street
Armidale NSW 2350
T 02 8081 2685
F 02 9542 5622

WOLLONGONG
Suite 204, Level 2
62 Moore Street
Austinmer NSW 2515
T 02 4201 2200
F 02 9542 5622

BRISBANE
Suite 1, Level 3
471 Adelaide Street
Brisbane QLD 4000
T 07 3503 7192
F 07 3854 0310

HUSKISSON
Unit 1, 51 Owen Street
Huskisson NSW 2540
T 02 4201 2264
F 02 9542 5622

NAROOMA
5/20 Canty Street
Narooma NSW 2546
T 02 4302 1266
F 02 9542 5622

MUDGEE
Unit 1, Level 1
79 Market Street
Mudgee NSW 2850
T 02 4302 1234
F 02 6372 9230