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Bushfire Risk Assessment

Planning Proposal – South Arm Road, Urunga

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1. INTRODUCTION

Barnson Pty Ltd (Barson) have been engaged by Toothaches Pty Ltd and Robert Riddel (proponents) to prepare a Bushfire Risk Assessment to support a Planning Proposal which seeks to amend the land zoning and reduce the minimum allotment size within the *Bellingen Local Environmental Plan 2010 (BELP 2010)*. The properties that are subject to Planning Proposal are:

- Lot 200 in Deposited Plan 1232259.
- Lot 2 in Deposited Plan 1232259; and
- Lot 124 in DP755557

The properties are referred to as the "site" throughout the report and are outlined in **Figure 1** below. It is noted that only a portion of those properties are subject to be altered under the proposed amendments sought under the Planning Proposal. The area subject to modification has been illustrated as the "Planning Proposal Area" (in blue) below and represents the existing land mapped to have an underlying land zoning RU4 – Primary Production Small Lot under the *Bellingen Local Environmental Plan 2010*.







The site has been identified to be within a "designated bushfire area" under Section 10.3 of the *Environmental Planning and Assessment Act 1979*. Therefore, in accordance with S.9.1(2) of the *Environmental Planning and Assessment Act 1979* and Direction 4.4 *Planning for Bushfire Protection 2019* applies to the Planning Proposal. Under the direction, the Planning Proposal should follow the direction of:

- 1. To protect life, property, and the environment from bushfire, by discouraging the establishment of incompatible land uses in bushfire area; and
- 2. To encourage sound management of bush fire prone area.

Under Direction 4.4 of the *Planning for Bushfire Protection 2019*, the relevant authority must consult with the commissioner of the NSW RFS during the preparation of the Planning Proposal and take into account any comments. From the discussions had with NSW RFS and in accordance with S9.1(2), a bushfire assessment is required to be submitted. Therefore, this Bushfire Risk Assessment has been prepared to accompany the Planning Proposal and has undertaken an assessment and the Rural Fire Act 1997 and *Planning for Bushfire Protection 2019* policy.

1.1 Purpose of a Bushfire Risk Assessment

The purpose of this report is to address bushfire protection and management issues that apply to the potential subdivision and development of the site that would be permitted if the Planning Proposal is adopted. Issues requiring consideration are detailed in *"Planning for Bushfire Protection 2019"* (PfBP 2019) which legislatively came into force on 1 March 2020 and is the legislation relevant to the proposal

PfBP 2019 has been introduced to provide effective planning guidelines to Councils, town planners, NSW fire authorities, developers, planning and bushfire consultants, surveyors and building practitioners. It provides the necessary planning considerations when development sites are near areas likely to be affected by bushfire events.

1.2 Identification of Bushfire Prone Land

Council's Bushfire Prone Land mapping identifies the subject land as being subject to bushfire risk as shown in **Figure 2** below. Most notably the map indicates vegetation to the north-west, north and south-west of the site as Category 1 Bushfire Risk. Therefore, the application of Planning for Bushfire Protection – 2019 (PBP) must apply in this instance.





Figure 2: Bushfire Prone Land- the sites identified as blue. Source: Bellingen Shire Council (Accessed 13/07/2021)

Category 1 vegetation is associated with the rural and environmental zoned land that is located around the periphery of the subject site. Utilizing Bellingen Shire Councils interactive mapping system, the adjacent lands comprise of a mix of remnant native vegetation and managed pastures. A site visit was undertaken on the 29th of June 2021 and confirmed the remnant native vegetation to be of a mostly "forest" characteristic.

It is noted that several portions of the site accommodate wetlands and as a result modified landscapes and vegetation strains are within the site area. This is further explored and discussed within the later sections of this report.



1.3 Site Details

Table 1 Subject Land Details Summary					
Legal Description and Property Address					
Street Address:	201 South Arm Road				
Suburb:	Urunga				
Subject Land Property Description:	Lot 2 in DP 1232259 and Lot 200 in DP1242996				
Land Zoning:	Lot 2 Land Zoning: W2: Recreational Waterways RU1: Primary Production RU4: Primary Production Small Lots C2: Environmental Conservation Lot 200 Land Zoning E3: Environmental Management C2 – Environmental Conservation W2: Recreational Waterways RU2: Rural Landscape RU4: Primary Production Small Lots R5: Large Lot Residential				
Name of Land Owner:	Robert Bruce Riddel and Toothaches Pty Ltd				
Local Government Area:	Bellingen Local Government Area.				

Table 2 Subject Land Details Summary		
Legal Description and Property Address		
Street Address:	261 South Arm Road	
Suburb:	Urunga	
Subject Land Property Description:	124 DP755557	
Land Zoning:	RU4: Primary Production Small Lots RU1 – Primary Production C2 – Environmental Conservation	
Name of Land Owner:	Robert Bruce Riddel	
Local Government Area:	Bellingen Local Government Area.	

1.4 Proposed Planning Proposal

The Planning Proposal is seeking to:

- 1. Amend the Bellingen Local Environmental Plan
- 2. Alter the proposed land zoning from RU4 Primary Production to R5 Large Lot Residential or C2 – Environmental Conservation
- 3. Reduce the Proposed R5 Large Lot Residential Lane Zone to have a Minimum Allotment Size to 1 ha. Increase the Proposed C2 Environmental Conservation Land Zone to have a Minimum Allotment Size of 200ha.



Image 1: Existing Land Zoning

DP 847318

All land within the Planning Proposal Area is currently zoned RU4 – Primary Production



Image 2: Proposed Land Zoning The Planning Proposal seeks to make amendments to the

current Land Zoning by altering the existing Land Zoning to either R5 or C2.





1.5 Potential Subdivision of Land

As part of the preparation of the Planning Proposal, Barnson have also prepared hypothetical Plan of Subdivision that may be pursued if the proposed amendments to the Bellingen Local Environmental Plan is adopted.

The hypothetical subdivision would see to the properties be developed in accordance with the adopted land zoning and minimum allotment size. As a result, the proposal may yield approximately seventeen R5 – Large Lot Residential lots/split zone lots. A breakdown of the allotments has been included below:



Table 3: Potential Subdivision Details		
Proposed allotment	Size	
Proposed Lot 1	lha	
Proposed Lot 2	lha	
Proposed Lot 3	lha	
Proposed Lot 4	1.8ha	
Proposed Lot 5	lha	
Proposed Lot 6	lha	
Proposed Lot 7	lha	
Proposed Lot 8	lha	
Proposed Lot 9	lha	
Proposed Lot 10	lha	
Proposed Lot 11	lha	
Proposed Lot 12	lha	
Proposed Lot 13	lha	
Proposed Lot 14	lha	
Proposed Lot 15	lha	
Proposed Lot 16	1.1ha	
Proposed Lot 17	lha	
Proposed Lot 18	1.7ha	

A copy of the hypothetical Plan of Subdivision has been included at **Figure 3** of this report and attached at **Appendix A – Drawing 20078-DA004-08**. The plan of subdivision has been prepared to accompany the Planning Proposal and to assist with by Council and NSW RFS consideration of the application.







1.6 Bushfire Assessment Requirements

This report has been prepared having regard to the *Rural Fires Act 1997*, the *Rural Fires Regulation 2013* and *Planning for Bushfire Protection 2019*.

This report provides an assessment of the bushfire risk associated with the proposed activity having considered the provisions of the abovementioned documents. Barnson have made a site inspection of the subject property and the surrounding area.



2. CLAUSE 44 MATTER

The following matters address the issues requiring consideration under Clause 44 of the Rural Fires Regulation 2013. More specifically, the matters addressed below correspond to those described under sub-clause 1(a) - 1(f).

2.1 Site Topography

The effective slope is considered to be the slope under the classified vegetation that will most significantly influence bushfire behaviour towards the development site. The slope assessment is derived from the available contour information for the site and surrounding areas. with respect to this report, the slope that would have the most significant influence on the fire behaviour was determined by using the LiDR Date through their publicly available interactive mapping site. A site walkover was undertaken in late 2021 to confirm the contours and the influential slope on the site.

The subject site is surrounded by existing rural and rural residential properties which contain a mix of forest, grasslands and coastal wetlands. In general, the effective slopes under the bushfire hazards are downslope from the site.



Figure 4: Land Contours Source: CHCC (LIDAR 2018)





2.2 Existing Site and Dwellings

The site is found to comprise largely of managed pastures with remnant forest vegetation on some of the peripheral boundaries of the site. Historically, the site has been used for a mixture of agricultural purposes, including the cultivation of crops and breeding of livestock. As a result of these practices, the vegetation within the site has been highly modified from its natural state to represent predominantly as managed pastures.

The existing dwelling on the subject site has a significant cleared area around the property and benefits from several tanks that are to be used by NSW RFS at the time of a bushfire event. Any future development of the land that the Planning Proposal make allow the existing dwelling (if retained) will need to be thoroughly assessed against the provisions of the *Planning for bushfire protection 2019*.

2.3 Existing Access

The site sits adjacent to the existing public road known as South Arm Road, which runs from the north through the south, dissecting both property and providing public road access – shown in below.

The "new" Pacific highway was part of the Nambucca Heads to Urunga &780 million project that provided a 22-kilometre dual carriageway from Nambucca Heads interchange to Raleigh interchange and opened to traffic in July 2016 (illustrated in red in **Figure 5** below).



Figure 5: Site and Existing Road Network Source Barnson Pty Ltd





Image 5: Looking north along South Arm Road.



Image 6: Looking south along South Arm Road



2.4 Threatened Species

Due to the highly modified condition of the site and the intention not to remove any existing native vegetation, it is expected that the development will not have any significant negative impact upon any threatened species.

It is noted that the Planning Proposal has identified all native vegetation within the Planning Proposal Area. This High Environment Value area makes up 19.98ha of the Planning Proposal area. Of this, 15.27ha, or 75% of the site area is proposed to be protected and retained within the proposed Conservation Zone land.

The patches of native vegetation within the land proposed to be zoned R5 – Large Lot Residential are of low quality and are spares. Therefore, as part of the future development of the site, this vegetation is not required to be removed or modified to meet bushfire requirements.

A copy of the of the Ecolgical Assessment prepared by Eco-Logical Australia has been attached at **Appendix B** of this report.

2.5 Heritage (including Aboriginal)

As part of the preparation of the Planning Proposal ERM Pty Ltd. were engaged to prepare an Aboriginal Cultural Heritage Due-Diligence Assessment Report (Appendix C) where the local Coffs Harbour Local Aboriginal Land Council were engage throughout the preparation of the Planning Proposal. This has been discussed in Section 2.5 of the Planning Proposal.

It is noted that further assessments and engage of the LALC will be undertaken as part of a future Development Application.



3. BUSHFIRE RISK ASSESSMENT

The following matters address the issues requiring consideration under Clause 44 of the *Rural Fires Regulation 2013.* More specifically, the matters addressed below correspond to items described under sub-clause (g).

3.1 Asset Protection Zone

The building construction classification system is based on five (5) bushfire attack levels (BALs). These are

- BAL Flame Zone,
- BAL 40,
- BAL 29,
- BAL 19, and
- BAL 12.5 (AS3959 Construction of buildings in bushfire-prone areas).

The lowest level, BAL 12.5, has the greatest APZ distance while BAL – FZ has the least APZ distance. These allow for varying levels of building design and the use of appropriate materials. To determine the APZ associated with the hypothetical subdivision Table A1.12.3 was used from the PfBP2019 to deter the Minimum Asset Protection Distance need at each area within the proposed subdivision.

Table A1.12.3

Minimum distances for APZs - residential development, FFDI 80 areas (≤29kW/m², 1090K)

	EFFECTIVE SLOPE				
KEITH VEGETATION FORMATION	Up slopes and flat	>0°-5°	>5°-10°	>10°-15°	>15°-20°
	Distance	(m) from the ass	et to the predomi	nant vegetation f	ormation
Rainforest	9	12	15	20	25
Forest (wet and dry sclerophyll) including Coastal Swamp Forest, Pine Plantations and Sub-Alpine Woodland	20	25	31	39	48
Grassy and Semi-Arid Woodland (including Mallee)	11	13	17	21	27
Forested Wetland (excluding Coastal Swamp Forest)	8	10	13	17	22
Tall Heath	16	18	20	22	25
Short Heath	9	10	12	13	15
Arid-Shrublands (acacia and chenopod)	6	7	8	9	10
Freshwater Wetlands	5	6	6	7	8
Grassland	10	11	12	14	16

As an assessment has been prepared below and details each transect grade, vegetation community and required APZ distance. The location of each of the transects has been illustrated on Drawing 20078-DA004-07 (within Appendix A). The assessment has assumed that there is no Asset Protection Zone Management over the proposed C2 Environmental Conservation zone land.



Table 4: Transect Assessment				
Transect	Grade	Vegetation Community	APZ Distance	
Transect 1	10 Degree	Forest	31m	
Transect 2	2.5 Degree	Forest	25m	
Transect 3	5 Degree	Forest	25m	
Transect 4	5 Degree	Forest	25m	
Transect 5	6.8 Degree	Forest	31m	
Transect 6	3.4 Degree	Forest	25m	
Transect 7	7 Degree	Forest	31m	
Transect 8	4.5 Degree	Forest	25m	
Transect 9	10 Degree	Forest	31m	
Transect 10	8 Degree	Forest	31m	
Transect 11	4 Degree	Forest	25m	
Transect 12	2 Degree	Forest	25m	
Transect 13	12 Degree	Forest	39m	
Transect 14	Flat	Forest	20m	
Transect 15	12 Degree	Forest	39m	
Transect 16	13.5 Degree	Rainforest	20m	
Transect 17	9.1 Degree	Rainforest	15m	
Transect 18	11.3 Degree	Rainforest	20m	
Transect 19	Flat Degree	Rainforest	9m	
Transect 20	14.6 Degree	Rainforest	20m	
Transect 21	17.7 Degree	Rainforest	25m	
Transect 22	15.6 Degree	Rainforest	25m	
Transect 23	11.3 Degree	Rainforest	20m	



3.2 Determine Vegetation Formation

As discussed in *Planning for Bushfire Protection 2019*, it is requirement that all the vegetation formations for each aspect of the development within 140m of the development site needs to be considered. Where mixes of vegetation formations are located together, the vegetation formation providing the greater hazard shall be used for the purpose of assessment.

Transect 1 to 12 Assessment.

Transect 1 to 12 is located within the western portion of the Planning Proposal Area. The Transects have considered:

- The effective slope of the Bushfire Hazard of a 140m projection.
- The vegetation classification of the vegetation community per Keith (2004) within the 140m projection.

Transect 1 to 12 has a vegetation classification of "Forest" and the Asset Protection Zones been calculated based on using Table A1.12.3 of the *Planning for Bushfire Protection 2019.*

Transect 13 – 15 Assessment.

Transect 13 – 15 is located within the eastern portion of the Planning Proposal. Similar to above, the Transect assessment has been based on the effective slope and Vegetation Classification, which in this case is "Forest". It is noted that the Asset Protection Zone calculated has been based on Table A1.12.3 of the Planning for Bushfire Protection 2019.

Nonetheless, considering that the "bushfire hazard" is a narrow vegetation corridor and may not support a fully developed bushfire, its recognized that the bushfire behavior in this area may differ. Therefore, at the time of a Development Application be prepared a further detailed assessment pursuant of Al.11 of the *Planning for Bushfire Protection 2019* should be considered. However, for the sake of the Planning Proposal a modified Asset Protection Zone has not been considered.

Transect 16 – 23 Assessment.

Transect 16-13 is located within the eastern portion of the Planning Proposal. The area differs from the other portions of the property in that the vegetation classification and landscape over a 140m projection differs as it includes:

- 1. Coastal Freshwater Wetland.
- 2. Acid Sulfate Soils and low-lying Land.
- 3. Flood Storage Area.
- 4. Extensive grasslands.
- 5. Modified vegetation community with a short/narrow fire run.



Each of these are discussed below and have been used to determine the most appropriate vegetation community when calculating the Asset Protection Zones for Transect 16-23.

The area identified and outlined below is the land that is part of Lot 2 in DP 1232259 and Lot 124 in DP755557 which is not proposed to be rezoned under this Planning Proposal. The area has a land zoning of C2 – Environmental Conservation (being associated with the mapped wetland) or RU1 – Primary Production (Figure 6 and 7). The area is currently used by the existing landowner as cattle/agri paddocks



Figure 6: Existing Conservation Land Zone Source: Nearmap– Edited by Barnson Pty Ltd





Figure 7: Access Network Source: Nearmap– Edited by Barnson Pty Ltd

The area is subject to inundation, being regularly subject to flooding and flood storage The area is also nominated in the *Bellingen Local Environmental Plan 2010* to be land identified as wetlands and to Class 2 and 3 Acid Sulfate Soil – See Figure X – X below



Figure 8: Wetland (identified in blue) Source: NSW Planning Portal (Edited by Barnson Pty Ltd)





Figure 9: ASS Mapping Source: NSW Planning Portal (Edited by Barnson Pty Ltd)

Image 7 – 8 below were taken in mid-late 2021 and illustrates the vegetation community and water inundation within this area of the site..



Image 7: Vegetation looking at the ASS Area and Coastal Wetland (Looking east)





Image 8: Vegetation looking at the bottom of the spur – across the wetland (Looking south east)

As a result, the majority of vegetation over a projection of 140m should be excluded (per A1.10 of the Planning for Bushfire Protection) from being a Bushfire Hazard due to

- the vegetation be regards as low threat due to the area being subject to flooding,
- being a coastal wetland,
- accomodated on ASS Soils,
- the absence vegetation community and structure and the areas inability to support a fully developmet vegetation community that would otherwise support a bushfire hazard.

The remaning vegetation that is not covered by this exclusion that sits on the upper slope of the spurs (being the vegetation being the 50m immediataly adjacent to proposed R5 – Large Lot Residential Land and potential lots is considered as a narrow vegetation corridorr due to the size and shape of the small amount of vegetation that should be considered as a bushfire hazard.

Therefore, it is believed that Asset Protection Zone calculation associated with Transect **16 – 23** should be calculated using a simplied approach (per Al.11.1 of the *Planning for Bushfire Protection 2019*) and therefore the assessment has adopted a "rainforest" vegetation classification subsequent Asset Protection Zone associated with this classifications within table Al.12.3 of the Planning for Bushfire Protection have been illustrated.



3.3 Water Supply

As the proposed development is for large lot residential i.e. rural residential, style development there will be no town water supply available to the site. it is proposed that the future dwellings on each lot will be required to meet the minimum water supply requirement for a Rural/Residential allotment as set out in Table 5.3d of the *Planning for Bushfire Protection 2019* as shown below.

DEVELOPMENT TYPE	WATER REQUIREMENTS
Residential lots (<1,000m²)	5,000L/lot
Rural-residential lots (1,000-10,000m ²)	10,000L/lot
Large rural/lifestyle lots (>10,000m²)	20,000L/lot
Multi-dwelling housing (including dual occupancies)	5,000L/dwelling

Source: Extract from Planning for Bushfire Protection 2019

3.4 Property Access

As discussed in the earlier sections of this report, both properties benefit from public road access. Therefore, a future subdivision will likely seek to benefit from this frontage and subdivide the land, so each lot has direct access. The proposed hypothetical subdivision does rely on new private driveways to be constructed to provide access to the lots that sit beyond the road. This specifically related to Lot 4, 16 and 17. These lots will rely on the construction of a private driveway in accordance with Appendix 3 of the *PfBP 2019*.

Therefore, those lots will have a minimum 4m carriageway – see Figure 10 below. If passing bays a required this would need to be incorporated into the design of the driveway. Additional, turning areas within the property would also need to be created to ensure that a NSW RFS Fire Truck is able to ingress and egress the site in a forward and safe manner.



A3.9.3 Property access

Property access roads are to be a minimum of 4m wide.

Figure A3.9c

Property access road widths.



Figure 10: Access Network

Source: Extract from Planning for Bushfire Protection 2019



4. BUSHFIRE HAZARD DETERMINATION

This section aims to address the requirements of Part 6, Clause 44(h) of *the Rural Fires Regulation 2013*. More specifically, it provides an assessment of the extent to which the proposed activity conforms with or deviates from the standards, specific objectives and performance criteria set out in Section 5 of *Planning for Bush Fire Protection 2019*.

4.1 Consideration Under Section 5 of PfBP 2019

An assessment has been undertaken within Table 5 below against the provisions relating to asset protection zones, access and services detailed in Section 5 of the PBP 2019.

Table 5: Assessment against Table 5.3a of the PfBP 2019 2019					
Performance Criteria	Acceptable Solutions	Compliance	Comment		
Asset Protection Zone (APZ)	 potential building footprints must not be exposed to radiant heat levels exceeding 29 kW/m² on each proposed lot. 	Yes	 Can comply 		
	 APZs are managed and maintained to prevent the spread of a fire towards the building 	Yes	 Can Comply 		
	the APZs is provided in perpetuity	Yes	 Can Comply 		
	 APZ maintenance is practical, soil stability is not compromised and the potential for crown fires is minimised. 	Yes	 Can Comply 		
Landscaping	 landscaping is designed and managed to minimise flame contact and radiant heat to buildings, and the potential for wind-driven embers to cause ignitions 	Yes	Can Comply		

4.1.1 Asset Protection Zones (TABLE 5.3a of PfBP 2019 2019)



4.1.2 Access

Table 6: Access – Internal Roads					
Performance Criteria	Acceptable Solutions	Compliance	Comment		
Access (General)	 firefighting vehicles are provided with safe, all-weather access to structures. 	Yes	 Can Comply 		
	 the capacity of access roads is adequate for firefighting vehicles 	Yes	 Can Comply 		
	 there is appropriate access to water supply. 	Yes	 Can Comply 		
Perimeter Road	 access roads are designed to allow safe access and egress for 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. 	YCCas	Noted		
Non- perimeter Roads	 access roads are designed to allow safe access and egress for firefighting vehicles while residents are evacuating. 	Yes	 Can Comply 		
Property Access	 firefighting vehicles can access the dwelling and exit the property safely 	Yes	 Can Comply 		

4.1.3 Services – Water, gas and electricity

Table 7: Services – Water, gas and electricity					
Performance Criteria	Acceptable Solutions	Compliance	Comment		
Water Supplies	 adequate water supplies are provided for firefighting purposes. 	Yes	 Can Comply 		
	 The provisions of public roads in section 4.1.3 in relation to parking are met. 	Yes	 Ca Comply 		
	 flows and pressure are appropriate. 	Not applicable	 Not applicable. 		
	 the integrity of the water supply is maintained. 	Not applicable	 Not applicable 		



Electricity	 location of electricity services limits the possibility of ignition of surrounding bush land or the fabric of buildings. 	Yes	 Future electricity services for the development will be a combination of above and underground.
Gas	 location and design of gas services will not lead to ignition of surrounding bushland or the fabric of buildings. 	NA	Not applicable.



5. CONCLUSION

This Bushfire Risk Assessment has been prepared to accompany a Planning Proposal that seeks to amend the land zoning and reduce the minimum allotment size within the *Bellingen Local Environmental Plan 2010 (BELP 2010)*. This report has been prepared in accordance in accordance with S.9.1(2) of the *Environmental Planning and Assessment Act 1979* and Direction 4.4 *Planning for Bushfire Protection 2019*.

Given that the property is deemed bushfire prone land under Bellingen Shire Bushfire Mapping, any future development, including the subdivision of land, would need to meet the requirements of the *Planning for Bushfire Protection – 2019*. The determination of any bushfire hazard must be made on a site-specific basis that includes an assessment of the local bushland area and its possible impact on the subject property.

The Bushfire Risk Assessment has determined that if the proposed changes to the LEP will result in the:

- Protection of life, property, and the environment from bushfire, by discouraging the establishment of incompatible land uses in bushfire areas;
- encourages sound management of bush fire prone areas; and,
- Is able to support a subdivision that is strictly compliant with the bushfire policies pertaining to the site.

In consideration of the bushfire safety assessment detailed herein, it is our opinion that the Planning Proposal will be afforded a reasonable and satisfactory level of bushfire protection.

Should further clarification be required in relation to any aspect of this report, please do not hesitate to contact Barson Pty Ltd.



APPENDIX A - PLAN PACKAGE





APPENDIX B - Flora and Fauna Assessment



APPENDIX C - Aboriginal Cultural Heritage Due-Diligence

