



Bushfire Opportunities and Constraints Assessment
Proposed Subdivision
65 Hope St, Warialda

Daniel and Yvette Shepherd

DOCUMENT TRACKING

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Template 2.8.1

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1. Property and Proposal

Table 1 (below) identifies the subject property and outlines the type of development proposed.

Table 1: Subject site and development proposal summary

Street address or property name:	65 Hope Street		
Suburb, town or locality:	Warialda	Postcode:	2402
Lot/DP no:	Lots 1-3 DP 759052, Lot 233 DP 751137		
Local Government Area:	Gwydir Shire Council (GSC)		
Fire Danger Index (FDI):	80		
Current land zoning:	RU5 – Village		
Type of development proposed:	Residential subdivision		

1.1 Description of proposal

This report was commissioned by Daniel and Yvette Shepherd to investigate the bushfire protection requirements associated with the potential development of 65 Hope St, Warialda hereafter known as the ‘subject land’ and shown in Figure 1.

This report presents a due diligence assessment of a preliminary proposal to develop the subject land for a residential subdivision development.

Further assessment maybe required if there are significant changes to the development concept, proposed uses and/or in response to NSW Rural Fire Service (RFS) feedback.

NB: This Bushfire Opportunities and Constraints Assessment is valid as of the date of issue and is suitable for the purpose for which it was commissioned and is not a bushfire assessment report suitable for submission with a Development Application (DA).

Once the final development plans have been determined and any other necessary reports have been commissioned/completed, a Bushfire Protection Assessment of the development will be required for DA submission in accordance with the *Environmental Planning and Assessment Act 1979*, Section 100B of the *Rural Fires Act 1997* and ‘Planning for Bush Fire Protection 2019’ (RFS 2019), herein referred to as ‘PBP’. A Bush Fire Safety Authority issued by the NSW Rural Fire Service (RFS) will be required for any subdivision of the subject land.

1.2 Subject Land

The subject land currently consists of 4 lots which total 2.4 ha of predominantly cleared land. It is connected to the public road system in the north to Hope Street and the eastern boundary adjoins the southern unformed portion of East Street while the property is bounded to the south and south-west by Warialda Creek.

It is proposed the 4 lots be consolidated then subdivided into 7 lots as shown in Figure 2 ELA understands that the proposal does not seek to rezone the land.

The site is located on land classified as bush fire prone on the Gwydir Shire Council (GSC) Bush Fire Prone Land (BFPL) Map¹.

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



Figure 1: Location of subject land

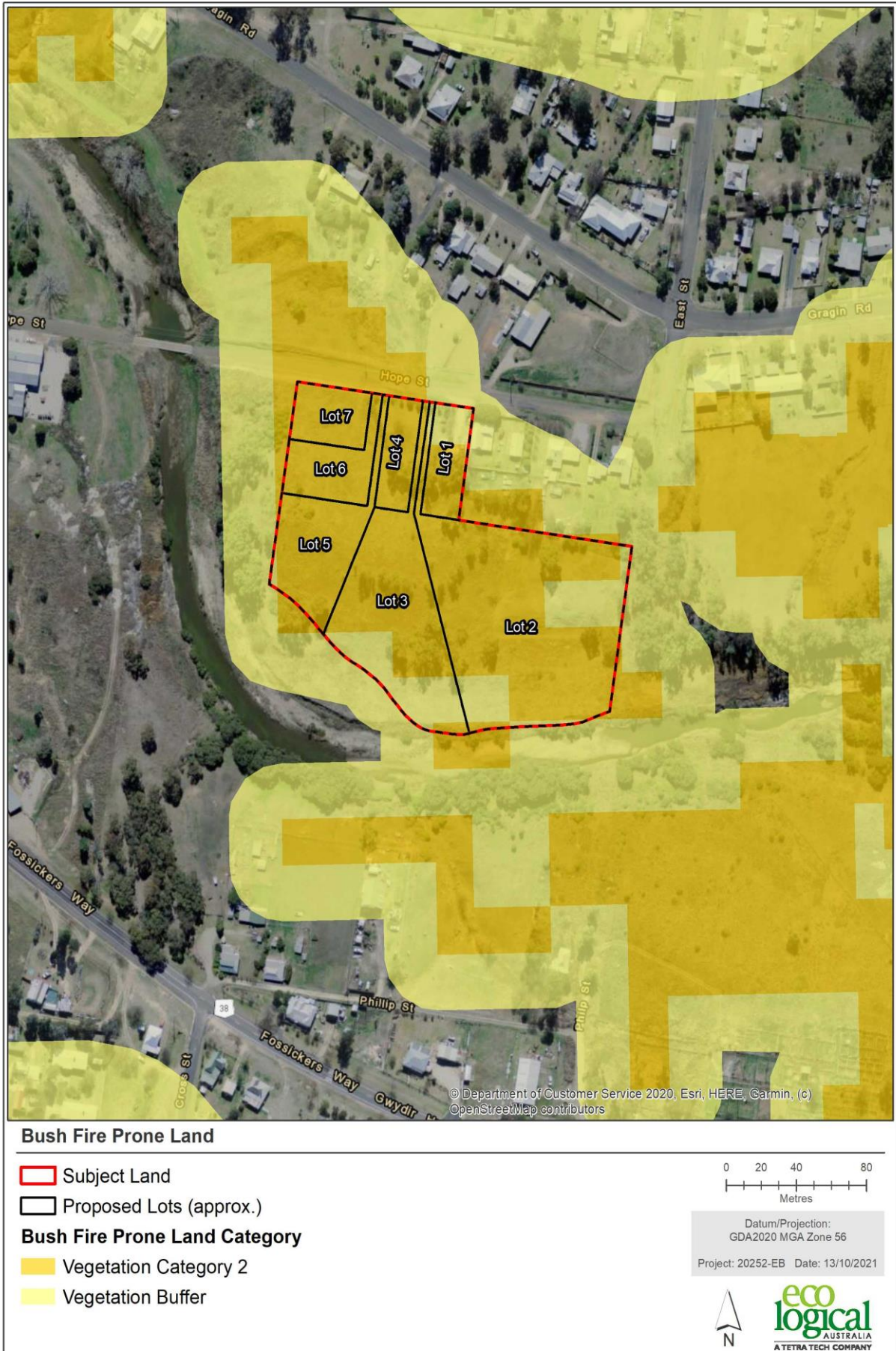


Figure 2: Excerpt of GSC Bush Fire Prone Land Map showing proposed subdivision layout

1.3 Methodology

The advice provided herein is based on the following research and knowledge:

- An analysis of the vegetation and topography within and surrounding the subject land;
- Provision of photographic evidence from clients dated 15 October 2021; and
- Online data from SIX Maps, Google Earth, Nearmap and the NSW Planning Portal.

This assessment identifies the minimum and recommended bushfire requirements for residential subdivision development to achieve compliance with PBP.

2. Bushfire hazard assessment

An assessment of the bushfire hazard has been undertaken in accord with the methodology in PBP as detailed below.

2.1 Vegetation

The predominant vegetation has been determined in accordance with the methodology within PBP and bushfire hazards have been identified within 140 m of the subject land.

Online vegetation mapping (DPIE 2016) identifies the surrounding vegetation as 'Black Tea-tree - River Oak - Wilga riparian low forest/shrubland wetland of rich soil depressions in the Brigalow Belt South Bioregion', and 'River Red Gum riparian tall woodland/open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion', both of which are classified as 'Forested Wetland' by PBP.

Provision of photos from client from within the subject land and aerial imagery shows that the subject land is predominantly mown grass with some scattered trees. While tree canopy cover is currently relatively sparse along the creek to the west and south (as shown within the photos provided by the client and aerial photography), the future vegetation management within Warialda Creek is not yet known and accordingly this report adopts a conservative approach in assigning the PBP classification 'Forested Wetland'.

The vegetation to the north and east of the proposed development is predominantly unmanaged grass and shrubs with scattered trees as shown in Figure 1, however with current or future management of this vegetation unknown a conservative approach has been adopted and this vegetation has also been assigned the PBP classification of 'Forested Wetland'

2.2 Slopes influencing bushfire

The slope classes 'most significantly affecting fire behaviour' have been considered for a distance of at least 100 m out from each proposed development element in accordance with the methodology within PBP.

Figure 3 and Table 3 show the classification and location of the vegetation and slope assessed, with explanatory comments provided where required.

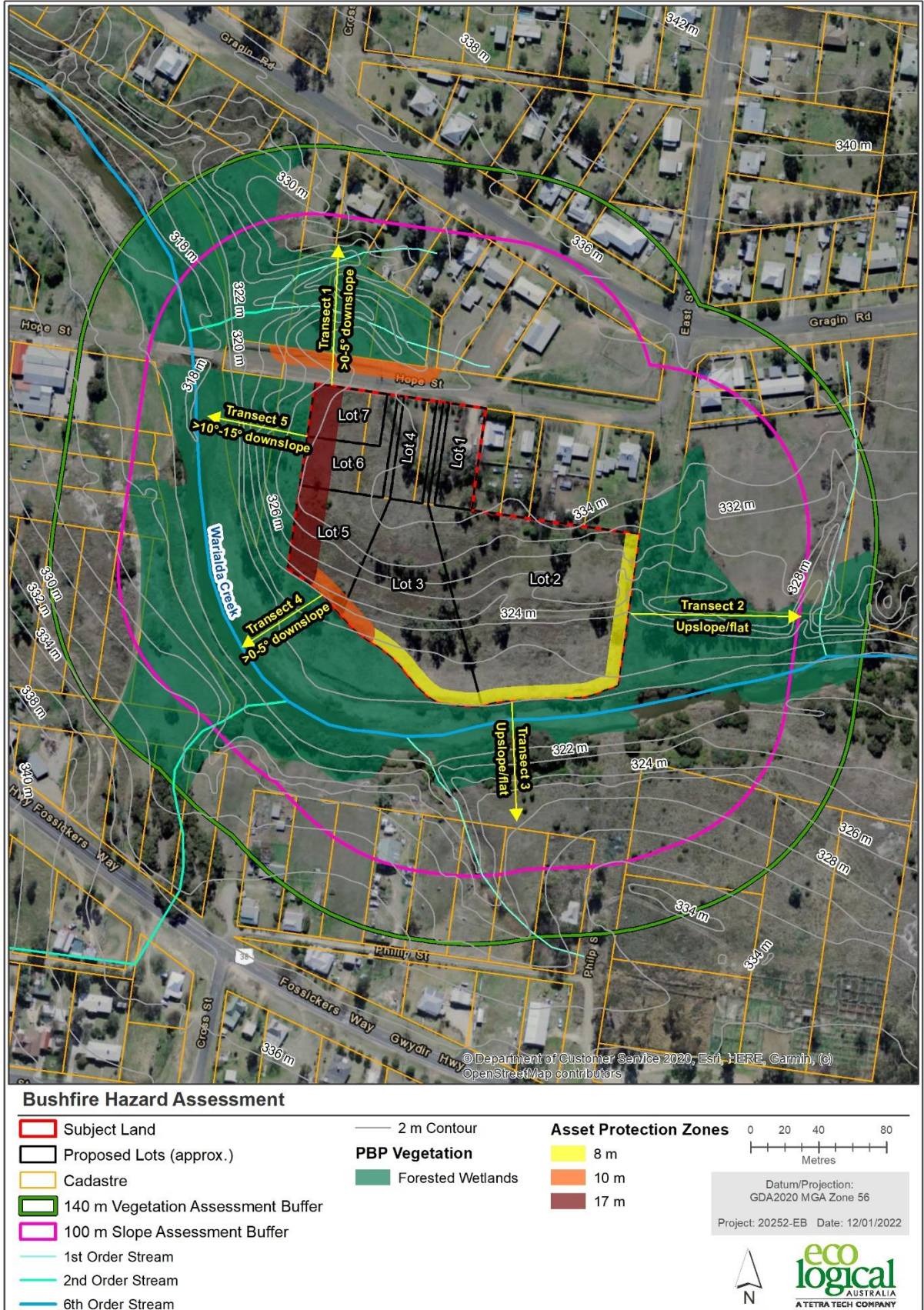


Figure 3: Bushfire hazard assessment and Asset Protection Zones (APZ)

3. Bushfire protection measures

PBP requires the assessment of the bushfire protection measures associated with a residential subdivision development listed in Table 2. These are discussed further in the remainder of this Section.

Table 2: PBP bushfire protection measures

Bushfire protection measures	Considerations
APZ	Location and dimension of APZ setbacks from vegetation including prescriptions of vegetation management within the APZ.
Access	Assessment to include access and egress in and out of a developable area such as alternate access, operational response and evacuation options. APZ perimeter access to be considered as is design standards of public roads and any fire trails.
Water supply and other utilities	List requirements for reticulated water supply and hydrant provisions, and any static water supplies for firefighting.
Building construction standards	Provide a guide on the application of construction standards for future buildings.
Landscaping	Principle aim to prevent flame impingement on buildings, provide defensible space for property protection, reduce fire spread, filter embers and reduce wind speed
Environmental issues	RFS requires sufficient information to ascertain whether environmental values are a constraint to development. The RFS is not providing an approval in relation to the loss or removal of these environmental assets, that is the role of the relevant consent authority.

3.1 Asset Protection Zones (APZ)

Table A1.12.3 of PBP has been used to determine the width of APZ for the proposed development using the vegetation and slope data identified in Section 2. Table 3 identifies the results of this constraints assessment which are also shown in Figure 3.

APZs do not preclude the proposed development, however APZ requirements do impact on the area available for dwelling entitlements on Lots 6 and 7. There may be opportunities to refine the lot layout configuration to provide a larger area for future dwellings on these lots.

If vegetation management within the creek corridor included APZ managed in perpetuity under a Vegetation Management Plan, or Plan of Management, there may be an opportunity for APZ widths to be reduced within the southern boundaries of proposed Lots 2, 3 and 5.

It should be noted that if rehabilitation and/or management of the waterway is required to meet any requirements of the *Water Management Act 2000* the southern APZs may need to be reassessed.

Provision of a perimeter road, as detailed in Section 3.4 could also constitute a portion of the required APZ.

Table 3: Bushfire hazard assessment and APZ requirements

Transect	Slope	Vegetation	Required Residential Subdivision APZ	Comment
1 North	>0-5° downslope	Forested wetland	10 m	APZ located within managed public road.
2 East	All upslopes and flat land	Forested wetland	8 m	APZ to be contained within subject land
3 South	All upslopes and flat land	Forested wetland	8 m	APZ to be contained within subject land
4 South-west	>0-5° downslope	Forested wetland	10 m	APZ to be contained within subject land
5 West	>10°-15° downslope	Forested wetland	17 m	APZ to be contained within subject land
All other directions			Managed land	

3.2 APZ maintenance and landscaping

Landscaping within the APZ specified in Figure 3 must achieve the specifications as described in Appendix 4 of PBP. Any future landscaping within the development will need to consider bushfire implications to ensure it does not create bushfire hazards within future allotments.

3.3 Building construction standard (BAL)

Residential subdivisions are required to demonstrate all buildings can achieve a maximum Bushfire Attack Level of BAL-29. The APZ detailed in Section 3.1 and shown in Figure 3 demonstrates that Lots 6 and 7 are most impacted by the minimum APZ required to achieve BAL 29. Lots 6 and 7 each have a remaining area of ≥ 26 m x 30 m within which to locate a future dwelling and still achieve a BAL rating of no greater than BAL-29.

3.4 Access provisions

Access to the proposed development is from Hope St which is an existing public road. (Figure 3). No additional public roads are proposed in relation to the subdivision development. Residential subdivisions are required to comply with the PBP access requirements in Table 5, Table 6, Table 7 and Table 8 (Appendix B) which specifically relate to perimeter roads, internal access roads and access to water supplies, parking etc.

There are no specific requirements for property access under PBP for Lots 1, 4, 6 and 7 where an unobstructed path (no greater than 70m) is provided between the most distant external part of the proposed dwelling and the nearest part of the public access road (where the road speed limit is not greater than 70kph) that supports the operational use of emergency firefighting vehicles.

To comply with PBP acceptable solutions for road design the development is required to provide:

- A perimeter road to any lots directly adjoining a bushfire hazard in accord with Table 5.3b of PBP; and
- Property access in accord with Table 5.3b of PBP and suitable turning areas in accord with Appendix 3 of PBP for all lots where future dwellings which will not be within 70 m of the public access road.

The current concept shows no perimeter road along the identified hazard and the following options have been identified to potentially address this non-compliance:

- The concept plan is redesigned to provide a perimeter road between the proposed lots and adjoining hazard from East Street clockwise around Lots 2, 3, 5, 6 and 7 back to Hope Street to the north-west of the subdivision;
- If future dwellings on Lots 6 and 7 can be located entirely within 70 m of the nearest hydrant in Hope Street, a perimeter road could be provided from the battleaxe entrance into Lot 2 and clockwise around through Lot 3 and Lot 5 and then back out through the battleaxe entrance to Lot 5 back onto Hope Street. It may then be possible to argue that a perimeter road along Lots 6 and 7 is not necessary given that access to that portion of the creekline vegetation is provided by Hope Street to the north; or
- Concept plan remains unchanged and a performance solution to address the lack of perimeter road and alternate access is addressed at DA stage which may include:
 - justification of limited hazard exposure based on the type and extent of the vegetation that has been identified to the west, south and east of the proposed subdivision;
 - isolation of adjoining creekline vegetation and proposed subdivision from other more extensive areas of bushfire hazard vegetation; and
 - the presence of multiple access points to the creekline vegetation from existing roads in all directions that facilitate firefighting mitigation and suppression operations.
- It should be noted that all performance solutions are subject to RFS approval and ELA cannot guarantee RFS acceptance.

The current concept does not achieve a minimum carriageway width of 4 m for property access to comply with PBP acceptable solutions. There is an opportunity to address this by amending plans to incorporate the minimum required width. Alternatively, a performance solution could be addressed at DA stage.

3.5 Services – Water, electricity and gas

3.5.1 Water

The proposed development will be serviced by reticulated water.

Dwellings on lots 1, 4, 6 and 7 can achieve the requirements of an unobstructed path no greater than 70 m from hydrant installation.

Future dwellings that are further than 70 m from the nearest hydrant will be required to provide a static water and hydrant supply. This will be a consideration for the proposed lots 2, 3 and 5 who will each require a minimum 10,000L static water supply. Static water supplies shall comply with Table 5.3d of PBP. Suitable access for Category 1 tankers will be required to within 4 m of the static water supply and turning areas in accordance with Appendix 3 of PBP.

Water supply requirements constrain but do not preclude the proposed subdivision.

3.5.2 Electricity and gas

No constraints were identified with regard to meeting electricity and gas service requirements subject to the services being designed and installed in accordance with the relevant specifications in Table 5.3c of PBP including electricity services to each allotment being located underground.

3.6 Staging

Staged development of areas often exposes the edge of each stage to a temporary bushfire risk. Clear information on how these risks are managed will be required e.g. temporary APZ maintained beyond buildings to the extent that the longer-term BAL is achieved for the effected buildings. Similarly, temporary perimeter roads may be required to ensure no building is inadequately protected. Alternate egress routes are also essential for each stage of development. This will need to be considered in any staging plan.

4. Conclusion and recommendations

This report provides a Bushfire Opportunities and Constraints Assessment of the proposed development of the subject land for residential subdivision.

Current design constraints:

- Perimeter road access has not been provided;
- Property access roads do not meet all PBP acceptable solutions including the requirement for a 4 m wide carriageway for Lots 2, 3 and 5; and
- APZ requirements impact the size/location of building envelopes on Lots 6 and 7.

Opportunities

- Development layout can be refined to address PBP acceptable solutions for access including the provision of perimeter access and property access;
- Development layout can be refined to increase dwelling entitlements on identified lots impacted by APZ requirements; and
- Engagement with the RFS is undertaken to gauge their support for proposed performance solutions based on current development concept prior to final subdivision design.

From a bushfire perspective, the proposed development is not precluded by any current bushfire planning requirements however some subdivision plan redesign is required to address property access non-compliances and a performance solution may be required to address the lack of perimeter road access to surrounding bushfire hazards. Bushfire protection measures such as APZs, landscaping and utilities are capable of achieving the required bushfire protections measures under PBP.



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Appendix A – APZ Specifications

Table 4: APZ management specifications

Vegetation Strata	Inner Protection Area (IPA)	Outer Protection Area (OPA)
Trees	<ul style="list-style-type: none"> • 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 ground; • Canopies should be separated by 2 to 5 m; and • Preference should be given to smooth barked and evergreen trees. 	<ul style="list-style-type: none"> • Tree canopy cover should be less than 30%; and • Canopies should be separated by 2 to 5 m.
Shrubs	<ul style="list-style-type: none"> • 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; and • Clumps of shrubs should be separated from exposed windows and doors by a distance of at least twice the height of the vegetation. 	<ul style="list-style-type: none"> • Shrubs should not form a continuous canopy; and • Shrubs should form no more than 20% of ground cover.
Grass	<ul style="list-style-type: none"> • Should be kept mown (as a guide grass should be kept to no more than 100 mm in height); and • Leaves and vegetation debris should be removed. 	<ul style="list-style-type: none"> • Should be kept mown to a height less than 100 mm; and • Leaf and other debris should be removed.

Appendix B- Access specifications

Table 5: General access requirements (PBP)

Performance Criteria	Acceptable Solutions	Comments
Access (General Requirements)		
firefighting vehicles are provided with safe, all-weather access to structures	<ul style="list-style-type: none"> Access roads are two-wheel drive, all-weather roads; access is provided to all structures; traffic management devices are constructed to not prohibit access by emergency services vehicles; dead end roads are not recommended, but if unavoidable, are not more than 200 m in length, incorporate a minimum 12 metre outer radius turning circle, and are clearly sign posted as a dead end; where kerb and guttering is provided on perimeter roads roll top kerbing should be used to the hazard side of the road; and 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. 	<ul style="list-style-type: none"> Can comply Can comply Not applicable Not applicable Not applicable Not applicable
the capacity of access roads is adequate for firefighting vehicles	the capacity of road surfaces and any bridges/ causeways is sufficient to carry fully loaded firefighting vehicles (up to 23 tonnes); bridges and causeways are to clearly indicate load rating	<ul style="list-style-type: none"> Not applicable
there is appropriate access to water supply	hydrants are located outside of parking reserves and road carriageways to ensure accessibility to reticulated water for fire suppression, and	<ul style="list-style-type: none"> Can comply
	hydrants are provided in accordance with the relevant clauses of AS 2419.1:2005	<ul style="list-style-type: none"> Can comply

Table 6: Perimeter road requirements (PBP)

Performance Criteria	Acceptable Solutions	Comments
Perimeter Roads		
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	<ul style="list-style-type: none"> there are two-way sealed roads, 8 m carriageway width kerb to kerb; parking is provided outside of the carriageway width; hydrants are to be located clear of parking areas; there are through roads, and these are linked to the internal road system at an interval of no greater than 500 m; curves of roads have a minimum inner radius of 6 m; the maximum grade road is 15° and average grade of not more than 10°; the road crossfall does not exceed 3°; and a minimum vertical clearance of 4m to any overhanging obstructions, including tree branches, is provided. 	<ul style="list-style-type: none"> Not applicable. No new public roads are proposed.

Table 7: Non-perimeter road requirements (PBP)

Performance Criteria	Acceptable Solutions	Comments
Non-Perimeter Roads		
access roads are designed to allow safe access and egress for firefighting vehicles while residents are evacuating	<ul style="list-style-type: none"> • minimum 5.5 m width kerb to kerb; • parking is provided outside of the carriageway width; • hydrants are located clear of parking areas; • there are through roads, and these are linked to the internal road system at an interval of no greater than 500 m; • curves of roads have a minimum inner radius of 6 m; • the road crossfall does not exceed 3°; and • a minimum vertical clearance of 4m to any overhanging obstructions, including tree branches, is provided. 	<ul style="list-style-type: none"> • Not applicable. • No new public access roads are proposed.

Table 8: Property access requirements (PBP)

Performance Criteria	Acceptable Solutions	Comments
Property access		
Firefighting vehicles can access the dwelling and exit the property safely	<p>There are no specific access requirements in an urban area where an unobstructed path (no greater than 70m) is provided between the most distant external part of the proposed dwelling and the nearest part of the public access road (where the road speed limit is not greater than 70kph) that supports the operational use of emergency firefighting vehicles.</p> <p>In circumstances where this cannot occur, the following requirements apply:</p> <ul style="list-style-type: none"> • Minimum 4 m carriageway width; • In forest, woodland and heath situations, rural property access roads have passing bays every 200 m that are 20 m long by 2 m wide, making a minimum trafficable width of 6 m at the passing bay; • A minimum vertical clearance of 4 m to any overhanging obstructions, including tree branches; • Provide a suitable turning area in accordance with Appendix 3; • Curves have a minimum inner radius of 6 m and are minimal in number to allow for rapid access and egress; • The minimum distance between inner and outer curves is 6 m; • The crossfall is not more than 10 degrees; • Maximum grades for sealed roads do not exceed 15 degrees and not more than 10 degrees for unsealed roads; • A development comprising more than three dwellings has access by dedication of a road and not by right of way. <p>Note: Some short constrictions in the access may be accepted where they are not less than the minimum (3.5 m), extend for no more than 30 m and where the obstruction cannot be reasonably avoided or removed. the gradients applicable to public roads also apply to community style development property access roads in addition to the above.</p>	<ul style="list-style-type: none"> • Applies to Lots 1, 4, 6 and 7. • To comply • Not applicable • To comply • To comply • To comply • To comply • To comply • To comply • Not applicable

