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Appendix O – Bushfire Assessment Report



Bushfire Assessment Report

39 Razorback Road, Running Stream

Prepared for
Pine Plantations Australia

Final V2 / June 2022

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This report has been prepared in accordance with Appendix 2 of Planning for Bushfire Protection 2019 and certifies the development conforms to the specifications and requirements of S4.14 of the Environmental Planning and Assessment Act 1979.

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Finally, the implementation of the measures and recommendations forwarded within this report would contribute to the amelioration of the potential impact of any bushfire upon the development site, but they do not and cannot guarantee that the area will not be affected by bushfire at some time.

EXECUTIVE SUMMARY

MJD Environmental has been engaged by Pine Plantations Australia Pty Ltd to prepare a Bushfire Assessment Report to accompany a Development Application to be submitted to Mid-Western Regional Council for the proposed construction of a sand and gravel quarry at 39 Razorback Road, Running Stream, NSW.

The assessment considered and assessed the bushfire hazard and associated potential threats relevant to the proposal and outlined the minimum mitigative measures which would be required in accordance with *Planning for Bush Fire Protection 2019* (PBP), as adopted through the *Environmental Planning & Assessment Amendment* (Planning for Bush Fire Protection) *Regulation 2020*.

This assessment adhered to the methodology and procedures outlined in PBP (2019) via assessment of acceptable solutions as outlined in Chapter 8 of PBP (2019).

This assessment is based on the bushfire hazards in and around the Site at the time of site inspection and report production.

This BAR addresses the aims and objectives of PBP 2019, being:

- Afford buildings and their occupants protection from exposure to a bushfire;
- Provide for a defensible space to be located around buildings;
- Provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent the likely fire spread to buildings;
- Ensure that appropriate operational access and egress for emergency service personnel and occupants is available;
- Provide for ongoing management and maintenance of bushfire protection measures; and
- Ensure that utility services are adequate to meet the needs of firefighters.

Chapter 8.3.1 and 8.3.10 of PBP 2019 – *Buildings of Class 5 to 8 under the NCC* specifies the objectives to be applied in relation to access, water supply and services, and emergency and evacuation planning for developments of this type. The objectives are:

- to provide safe access to/from the public road system for firefighters providing property protection during a bush fire and for occupant egress for evacuation.
- to provide suitable emergency and evacuation (and relocation) arrangements for occupants of the development;
- to provide adequate services of water for the protection of buildings during and after the passage of bush fire, and to locate gas and electricity so as not to contribute to the risk of fire to a building; and
- provide for the storage of hazardous materials away from the hazard wherever possible.

The proposed development can meet the performance criteria for acceptable solutions for commercial development, giving due regard to the requirements of Chapter 8 of PBP 2019, specifically section 8.3.1. A suitable package of BPMS has been developed that is commensurate with the assessed level of risk to the development.

The built form of the proposed structures is a factor in the risk profile of the proposal, where all buildings are to be built to the NCC / NASH and have regard to AS3959. Typically, the buildings will be constructed of non-combustible wall materials and non-combustible roof structures (including metal frame super structure, metal cladding and roofing, or similar) which is highly resistant to radiant heat and are non-combustible materials. A copy of the plan has been provided as **Appendix A**.

Section 3.1 and 3.2 provides an acceptable solutions for APZ and BAL as it relates to residential developments. Importantly this is provided for context, and it is acknowledged the development can comply with the residential APZ setbacks as per PBP 2019 Section 8.3.1. In addition, a package of measures provided by the development includes:

- Provision of defendable space between the hazard and development;
- High resilience building typology on elevations facing the hazard; and
- Access and circulation suitable for a fully loaded fire appliance.

A managed fuel zone (slashed paddock) of 50m will be established around the site facilities (crib room, weighbridge etc). The area is to be managed to IPA standards at a minimum with due regard to Appendix 4 PBP (2019).

The assessment found that hazard vegetation types occur within 140m of the Site. The primary risk is from the pine plantation 'forest' class vegetation located on the Site. These hazards have been assessed as having the greatest effect on bushfire behaviour. The slope under the hazard vegetation has been assessed as varying from upslope to 0-5° Downslope.

In summary, the following key recommendations have been generated to enable the proposal to comply with PBP (2019).

- A managed fuel zone (slashed paddock) of 50m will be established around the site facilities (crib room, weighbridge etc). The area is to be managed to IPA standards as a minimum with due regard to Appendix 4 PBP (2019);
- Access will have due regard to the requirements of Table 5.3b, Chapter 8.3.1 and Appendix 3 of PBP (2019) and the discussion set out in section 3.2 of this report;
- Services are to be provided and connected to the site in accordance with PBP (2019) as summarised and assessed in Chapter 3, Section 3.3 of this report; and
- Careful consideration of future site landscaping and ongoing fuel management must occur to minimise the potential impact of bushfire on the site in accordance with PBP (2019) as summarised and assessed in Chapter 3, Section 3.4 of this report.

CONTENTS

1	Introduction	1
1.1	Aims & Objectives	1
1.2	Site Particulars.....	1
1.3	Description of Proposal	2
2	Bushfire Hazard Analysis	6
2.1	Vegetation Assessment.....	6
2.2	Slope Assessment.....	7
3	Bushfire Protection Measures	9
3.1	Asset Protection Zones	9
3.1.1	Determining APZs.....	10
3.1.2	Determining BAL.....	11
3.2	Access	11
3.3	Services – Water, Electricity, Gas	16
3.4	Landscaping & Fuel Management.....	17
3.5	Emergency Management	17
3.6	Appraisal against 8.3.1 objectives.....	18
4	Conclusion & Recommendations	19
5	Bibliography.....	21

LIST OF FIGURES

Figure 1	Site Location.....	4
Figure 2	Bushfire Prone Land Map	5
Figure 3	Vegetation Classification and Slope.....	8
Figure 4	APZ map (Acceptable Solutions Residential Developments PBP 2019).....	14
Figure 5	BAL map (Acceptable Solutions Residential Developments PBP 2019).....	15

LIST OF TABLES

Table 1 Vegetation Classification	6
Table 2 Slope Class	7
Table 3 APZ (Residential Developments PBP 2019).....	10
Table 4 BAL (Residential Developments PBP 2019)	11
Table 5 Acceptable solutions for access (PBP 2019)	11
Table 6 Acceptable solutions for services (PBP 2019)	16
Table 7 Appraisal against 8.3.1 Objectives	18

APPENDICES

Appendix A	Plan of Proposal
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GLOSSARY OF TERMS AND ABBREVIATIONS

Term/ Abbreviation	Meaning
APZ	Asset Protection Zone
AS2419-2005	Australian Standard – Fire Hydrant Installations
AS3959-2018	Australian Standard – Construction of Buildings in Bush Fire Prone Areas
BAR	Bushfire Assessment Report
BCA	Building Code of Australia
BC Act	Biodiversity Conservation Act 2016
BMP	Bush Fire Management Plan
BPA	Bush Fire Prone Area (Also Bushfire Prone Land)
BPL	Bush Fire Prone Land
BPLM	Bush Fire Prone Land Map
BPM	Bush Fire Protection Measures
DoE	Commonwealth Department of the Environment
DPI Water	NSW Department of Primary Industries – Water
EPA Act	NSW Environmental Planning and Assessment Act 1979
EPBC Act	Commonwealth Environment Protection and Biodiversity Conservation Act 1999
FDI	Fire Danger Index
FMP	Fuel Management Plan
ha	hectare
IPA	Inner Protection Area
LGA	Local Government Area
LLS Act	Local Land Services Act 2013
OPA	Outer Protection Area
OEH	NSW Office of Environment and Heritage
PBP or PBP (2019)	Planning for Bushfire Protection 2019
RF Act	Rural Fires Act 1997
RF Regulation	Rural Fires Regulation
RFS	NSW Rural Fire Service
TSC Act	NSW Threatened Species Conservation Act 1995 (as repealed)

1 Introduction

MJD Environmental has been engaged by Pine Plantations Australia Pty Ltd (PPA) to prepare a Bushfire Assessment Report to accompany a Development Application to be submitted to Mid-Western Regional Council for the proposed construction of a sand and gravel quarry at 39 Razorback Road, Running Stream, NSW. Hereafter referred to as the Site. Refer to **Figure 1**.

The assessment aims to consider and assess the bushfire hazard and associated potential threats relevant to the proposal, and to outline the minimum mitigative measures which would be required in accordance with *Planning for Bush Fire Protection 2019* (PBP), as adopted through the *Environmental Planning & Assessment Amendment* (Planning for Bush Fire Protection) *Regulation 2020*.

This assessment adhered to the methodology and procedures outlined in PBP (2019) via assessment of acceptable solutions as outlined in Chapter 8 of PBP (2019).

This assessment is based on the bushfire hazards in and around the Site at the time of site inspection and report production (July 2021).

1.1 Aims & Objectives

This BAR addresses the aims and objectives of PBP 2019, being:

- Afford buildings and their occupants protection from exposure to a bushfire;
- Provide for a defensible space to be located around buildings;
- Provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent the likely fire spread to buildings;
- Ensure that appropriate operational access and egress for emergency service personnel and occupants is available;
- Provide for ongoing management and maintenance of bushfire protection measures; and
- Ensure that utility services are adequate to meet the needs of firefighters.

Chapter 8.3.1 and 8.3.10 of PBP 2019 – *Buildings of Class 5 to 8 under the NCC* specifies the following objectives to be applied in relation to access, water supply and services, and emergency and evacuation planning for developments of this type, applicable to the proposal:

- to provide safe access to/ from the public road system for firefighters providing property protection during a bush fire and for occupant egress for evacuation;
- to provide suitable emergency and evacuation (and relocation) arrangements for occupants of the development;
- to provide adequate services of water for the protection of buildings during and after the passage of bush fire, and to locate gas and electricity so as not to contribute to the risk of fire to a building; and
- provide for the storage of hazardous materials away from the hazard wherever possible.

1.2 Site Particulars

Locality	The Site is situated at 39 Razorback Road, Running Stream, NSW.
Land Title	Lot 2 DP 569979
LGA	Mid-Western Regional Council
Area	Study Area – 151.27 ha Subject Site – 24.27 ha

Zoning	RU1 (Primary Production)
Boundaries	The subject site is situated to the south of Razorback Road, Running Stream. Large rural properties exist to the west and an existing Pine plantation to the immediate east.
Current Land Use	The subject site comprises of highly disturbed grassland due to the mass plantings of Pine trees (<i>Pinus spp.</i>). No native tree species were seen to be regenerating within the area. The Study Area contains native vegetation within the southern gully as well as on the adjacent foothills, however, this area is not to be impacted upon under this proposal.
Topography	The subject site lies predominantly on the ridge of a relatively flat undulating hill at an elevation 1050 metres. There are two natural drainage lines within the subject site that flow to the north.
Climate / Fire History	The Site lies within a geographical area with a Forest Fire Danger Index (FDI) rating of 80. The site is classified as being affected by Category 1, Category 2 and Category 3 Vegetation on the Bushfire Prone Land Map (DPE 2022). Refer to Figure 2.
Environment & Cultural Significance	A cultural heritage assessment and biodiversity assessment has been prepared to inform the proposal.

1.3 Description of Proposal

PPA propose to develop and operate a sand and gravel quarry on the 'Turonfels' property at 39 Razorback Road, Running Stream, approximately 8km south of Ilford within the Mid-Western Regional Council Local Government Area (LGA). The site is located approximately 1km west of the Castlereagh Highway. The quarry will extract up to 200,000 tonnes per annum (tpa) over a period of up to 30 years and will include access roads, a site office, workshop and weighbridge. The quarry will be progressively rehabilitated to pasture and pine plantation with potential future use of the facilities area for forestry related activities.

Site infrastructure and utilities are summarised as follows:

- A demountable building will be installed for use as the office and crib room for operators.
- A 20 m x 30 m steel framed and colourbond clad shed will be installed for storage and maintenance purposes.
- Toilet facilities will be via an on site septic system installed consistent with Section 68 of the Local Government Act 1993.
- Lighting plants will be used on occasion when loading trucks, however the majority of activities will be scheduled for daylight hours only.
- 10,000 L self-bunded diesel storage tank.
- 20,000 L water tank for potable supplies.
- Two out of pit dams, in conjunction with in-pit sumps will provide water management capably.
- 20,000 L dedicated tank for emergency bushfire supply; and
- Outgoing trucks will be weighed via a site weighbridge.

The following utilities will be used on site:

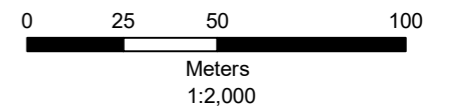
- Communications will be via mobile phone and UHF radio.
- Power will be supplied as needed using on site generators.
- Potable water will be imported to site from the nearest reticulated supply in Kandos, and/or sourced from rainwater collection or the excising onsite water bore; and
- No water will be used for processing.
- Water for dust suppression will be extracted from water management dams. If possible, subject to licencing, an existing on site bore on the property, will supplement quarry water supplies.

Refer to **Appendix A** for plans of the proposal.

39 RAZORBACK ROAD,
RUNNING STREAM
FIGURE 1: SITE LOCATION

Legend

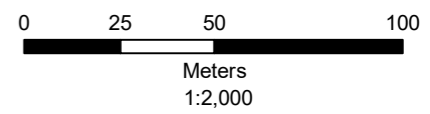
-  Emergency Access Trail
-  Site
-  Study Area
-  Cadastral Boundaries
-  Hardstand and Parking (Gravel)
-  Haul Road
-  Infrastructure Area
-  New Dam
-  Office, Crib Room and Toilets
-  Workshop Shed (20m x 12m)



39 RAZORBACK ROAD,
 RUNNING STREAM
**FIGURE 2: BUSHFIRE PRONE
 LAND**

Legend

-  Emergency Access Trail
-  Site
-  Study Area
-  Cadastral Boundaries
-  Hardstand and Parking (Gravel)
-  Haul Road
-  Infrastructure Area
-  New Dam
-  Office, Crib Room and Toilets
-  Workshop Shed (20m x 12m)
- Bush Fire Prone Vegetation**
-  Category 2
-  BFPV Buffer



Aerial: © Department of Customer Service 2020 | Data: MJD
 Environmental, Borgs, Spatial Services (2021) |
 Datum/Projection: GDA 2020 MGA Zone 56 | Date: 20/06/2022 |
 Version 1 | Z:\21068 - 39 Razorback Road, Running Stream |
 This plan should not be relied upon for critical design
 dimensions.

2 Bushfire Hazard Analysis

2.1 Vegetation Assessment

Methodology

The vegetation in and around the Site, to a distance of 140m, has been assessed in accordance with PBP 2019. This assessment has been made via a combination of:

- aerial photo interpretation;
- on-site vegetation classification; and
- reference to regional community vegetation mapping.

These vegetation communities have been classified for bushfire purposes into structure and formation using the system adopted by Keith (2004) and using Figure A1.2 of PBP (2019) with due regard to Appendix 1 of PBP (2019).

Refer to typical site photo of pine plantation observed in and around the site during site inspection.

Vegetation Classification

Vegetation classification has been presented in **Table 1** below and **Figure 3**.

Table 1 Vegetation Classification

Direction	Description	Vegetation Classification
North	▪ Pine Plantation	Forest
East	▪ Pine Plantation	Forest
South	<ul style="list-style-type: none"> ▪ Pine Plantation ▪ PCT 1191 - Snow Gum - Candle Bark woodland on broad valley flats of the tablelands and slopes, South Eastern Highlands Bioregion 	Forest / Woodland
West	<ul style="list-style-type: none"> ▪ Pine Plantation ▪ Site access 	Forest
North-west	▪ Pine Plantation	Forest

Site Photo



Photo 1 – Typical view of Pine Plantation on site.

2.2 Slope Assessment

Methodology

In accordance with PBP (2019), an assessment of the slope was conducted throughout the Site (where a hazard is present) and for a distance of 100m around the Site in the hazard direction. Both the average slope and maximum slopes were considered to determine the level of gradient which will most significantly influence fire behaviour on the Site. The slope transect was categorised within the slope classification under PBP Appendix A1.4.

Slope assessment was assisted by:

- Preparation of a digital elevation model based on LiDAR;
- Preparation of slope assessment based on 1m contours derived from the DEM;

Effective Slope

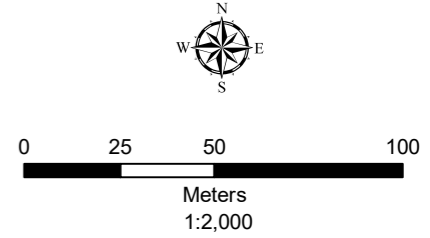
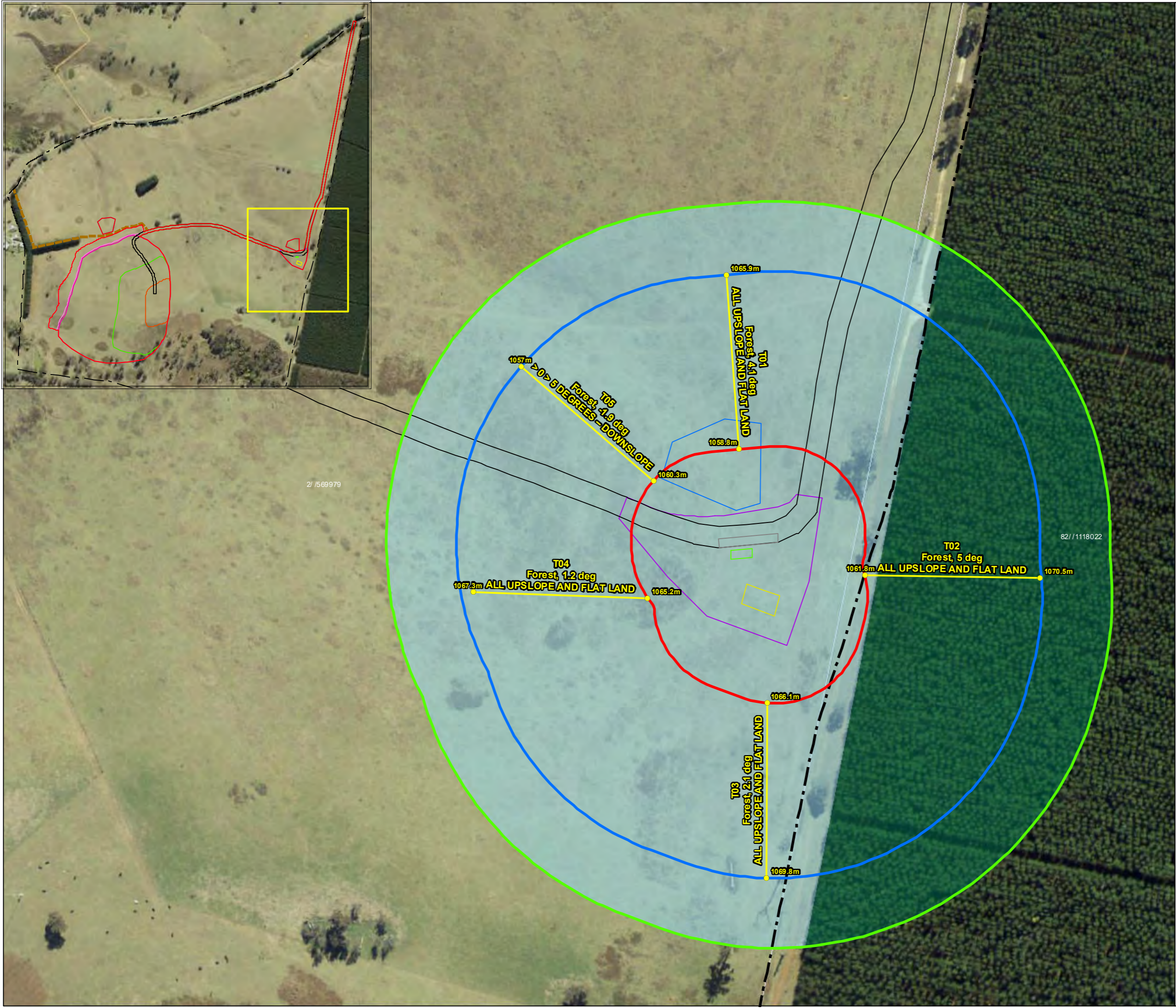
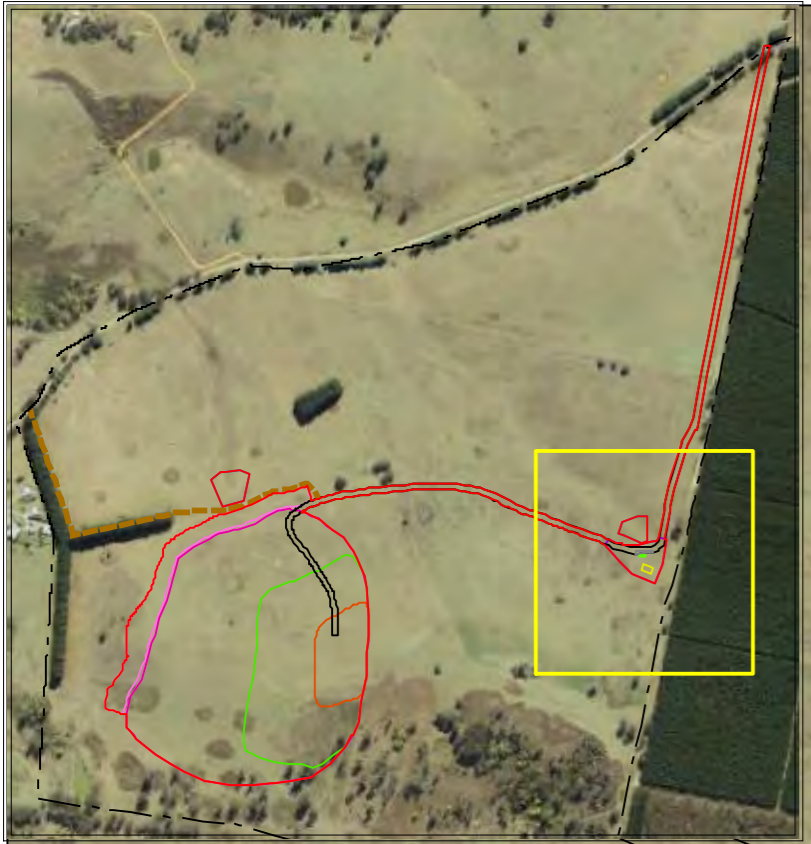
The slope class under the bushfire hazard within 100m is presented in **Table 2** below and **Figure 3**.

Table 2 Slope Class

Direction	Vegetation Classification	Slope Class
North	Forest	Upslope
East	Forest	Upslope
South	Forest / Woodland	Upslope
		Upslope
West	Forest	Upslope
North-west	Forest	0-5° Downslope

39 RAZORBACK ROAD,
 RUNNING STREAM
**FIGURE 3: VEGETATION
 CLASSIFICATION AND SLOPE**

- Legend**
- Elevation
 - Transect
 - Emergency Access Trail
 - Site
 - Slope Classification Buffer (100m)
 - Vegetation Classification Buffer (140m)
 - Study Area
 - Cadastral Boundaries
 - Hardstand and Parking (Gravel)
 - Haul Road
 - Infrastructure Area
 - New Dam
 - Office, Crib Room and Toilets
 - Workshop Shed (20m x 12m)
- Vegetation**
- Forest (Established Pine)
 - Forest (Juvenile Pine)



3 Bushfire Protection Measures

PBP sets out a suite of BPMs and criteria that require consideration and assessment for applicable proposals on bushfire prone land in order to provide an adequate level of protection to new developments.

The measures required to be assessed are listed below and discussed throughout this chapter:

- Asset Protection Zones (APZs)
- Bushfire Attack Level (BAL)
- Access
- Services – Water supply, Gas and Electricity
- Landscaping and Fuel Management
- Emergency Management
- Asset Protection Zone Appraisal against 8.3.1 objectives for Commercial Developments

This development proposal entails industrial development thereby being of a building type that does not strictly trigger the criteria outlined with PBP (2019) for residential and/or Special Fire Protection Purpose (SFPP).

Whilst bush fire is not captured in the NCC for Class 5-8 buildings, the following objectives will be applied in relation to access, water supply and services, and emergency and evacuation planning:

- to provide safe access to/from the public road system for firefighters providing property protection during a bush fire and for occupant egress for evacuation;
- to provide suitable emergency and evacuation (and relocation) arrangements for occupants of the development;
- to provide adequate services of water for the protection of buildings during and after the passage of bush fire, and to locate gas and electricity so as not to contribute to the risk of fire to a building; and
- provide for the storage of hazardous materials away from the hazard wherever possible.

The proposed development can meet the performance criteria for acceptable solutions for commercial development, giving due regard to the requirements of Chapter 8 of PBP 2019, specifically section 8.3.1. A suitable package of BPMs has been developed and documented in this report that is commensurate with the assessed level of risk to the development.

3.1 Asset Protection Zones

An APZ is a buffer zone between the hazard and buildings that is progressively managed to minimise bushfire hazard (fuel loads and reduce potential radiant heat levels, flame, ember and smoke attack) PBP (2019), in order to mitigate risk to life and assets. Where a forest or woodland vegetation classification has been determined, an APZ can consist of two areas:

- 1) Inner Protection Area (IPA) – The IPA extends from the edge of the development/ buildings to the OPA. The IPA aims to provide defensible space and reduce potential for direct or spontaneous ignition by providing a heavily reduced or fuel free zone.
- 1) Outer Protection Area (OPA) – The OPA is located adjacent to the hazard. Within the OPA any trees and shrubs should be maintained in a manner such that the vegetation is not continuous to reduce flame length and fire intensity. A properly managed OPA can aid in ember attack by filtering embers and slowing the fires rate of spread.

An APZ can include the following:

- Lawns;
- Discontinuous gardens;

- Swimming pools;
- Driveways;
- Detached garages;
- Open space / parkland;
- Car parking; and
- Cycleway and formed walkways.

The built form of the proposed structures is a factor in the risk profile of the development, where all buildings are to be built to the NCC / NASH and have regard to AS3959. Typically, the buildings are of a non-combustible wall materials and non-combustible roof structures (including metal frame super structure, metal cladding and roofing, or similar) which is highly resistant to radiant heat and are non-combustible materials. A copy of the plan has been provided as **Appendix A**.

Section 3.1 and 3.2 below depict acceptable solutions for APZ and BAL as it relates to residential developments. Importantly this is provided for context, and it is acknowledged the development can comply with the residential APZ setbacks per PBP 2019 Section 8.3.1. In addition, a package of measures provided by the development includes:

- Provision of defensible space between the hazard and development;
- High resilience building typology on elevations facing the hazard; and
- Access and circulation suitable for a fully loaded fire appliance.

A managed fuel zone (slashed paddock) of 50m will be established around the site facilities (crib room, weighbridge etc). The area is to be managed to IPA standards at a minimum with due regard to Appendix 4 PBP (2019).

3.1.1 Determining APZs

The subject site lies within the Mid-Western Council LGA and therefore is assessed under an FDI (Fire Danger Index) rating of 80. As per Table A1.12.3 within PBP (2019), the acceptable solution setbacks have been calculated based on the bushfire hazard analysis presented in Chapter 2 (which are conservative as these are for a residential context). Notably, as the proposal is for commercial development, performance criteria for PBP relates to a package of measures to satisfy the BPM's. Refer to **Table 3** detailing the acceptable solution residential development APZ setbacks. Acceptable solution APZ for residential development are detailed on **Figure 4**.

Table 3 APZ (Residential Developments PBP 2019)

Direction	Vegetation Classification	Slope Class	APZ
North	Forest	Upslope	20m
East	Forest	Upslope	20m
South	Forest / Woodland	Upslope	20m
		Upslope	20m
West	Forest	Upslope	20m
North-west	Forest	0-5° Downslope	25m

A managed fuel zone (slashed paddock) of 50m will be established around the site facilities (crib room, weighbridge etc). The area is to be managed to IPA standards at a minimum with due regard to Appendix 4 PBP (2019).

3.1.2 Determining BAL

By considering the bushfire hazard analysis outcomes presented above, Table A1.12.6 of PBP (2019) was applied to the vegetation classification and slope analysis to calculate BAL for development based on separation from the hazard for the site. Refer to **Table 4** and **Figure 5**. Notwithstanding, the development is not of a residential or SFPP development type, BAL has been addressed and determined to provide a conservative assessment for the proposal.

Table 4 BAL (Residential Developments PBP 2019)

Direction	Vegetation Classification	Slope Class	APZ	Separation Distance (m)	BAL
North	Forest	Upslope	20m	<15 15-<20 20-<29 29-<40 40-<100	BAL- FZ
East	Forest	Upslope	20m		BAL-40
South	Forest / Woodland	Upslope	20m		BAL-29
		Upslope	20m		BAL-19
West	Forest	Upslope	20m		BAL-12.5
North-west	Forest	0-5° Downslope	25m	<19 19-<25 25-<35 35-<47 47-<100	BAL- FZ BAL-40 BAL-29 BAL-19 BAL-12.5

3.2 Access

In the event of a serious bushfire threat to the proposed development, it will be essential to ensure that adequate ingress/ egress and the provision of defensible space are afforded in the commercial development design with due regard to the requirements of Table 5.3b, Chapter 8.3.1 and Appendix 3 of PBP (2019).

Direct access to the site will occur from Razorback Road in Running Stream. Razorback Road is an all-weather unsealed rural road connecting to Castlereagh Highway to the East. The site facilities and weighbridge will be accessed via an access road running down the western boundary. This access shall be compliant with the Property Access criteria set out in Table 5.3b of PBP (2019). A secondary emergency access is available on site travelling in a westerly direction beyond the quarry pit and connecting onto Razorback Road to the north.

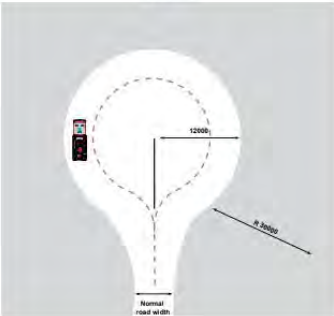
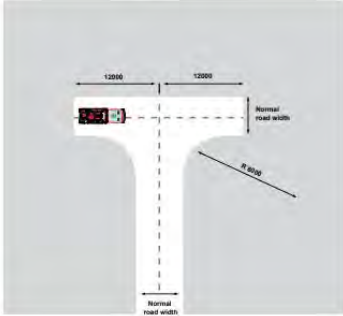
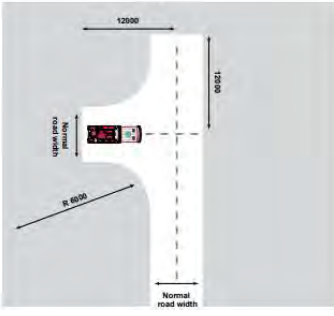
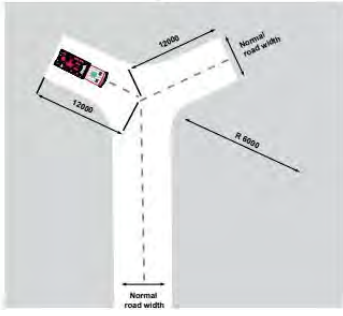
Refer to **Appendix A** for Site Plan showing access.

The following summarises the requirements of Table 5.3b, and Appendix 3 of PBP (2019) specifically general requirements and property access. Deviations from the below acceptable solutions for access may be considered (depending on the situation) through a performance-based assessment.

Table 5 Acceptable solutions for access (PBP 2019)












Performance Criteria	Acceptable Solutions
The intent may be achieved where:	
<p>General Requirements</p> <ul style="list-style-type: none"> Firefighting vehicles are provided with safe, all-weather access to structures. 	<ul style="list-style-type: none"> property access roads are two-wheel drive, all weather roads; perimeter roads are provided for residential subdivisions of three or more allotments; subdivisions of three or more allotments have more than one access in and out of the development; traffic management devices are constructed to not prohibit access by emergency services vehicles; maximum grades for sealed roads do not exceed 15 degrees and an average grade of not more than 10 degrees or other

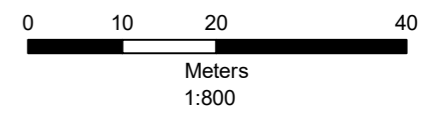
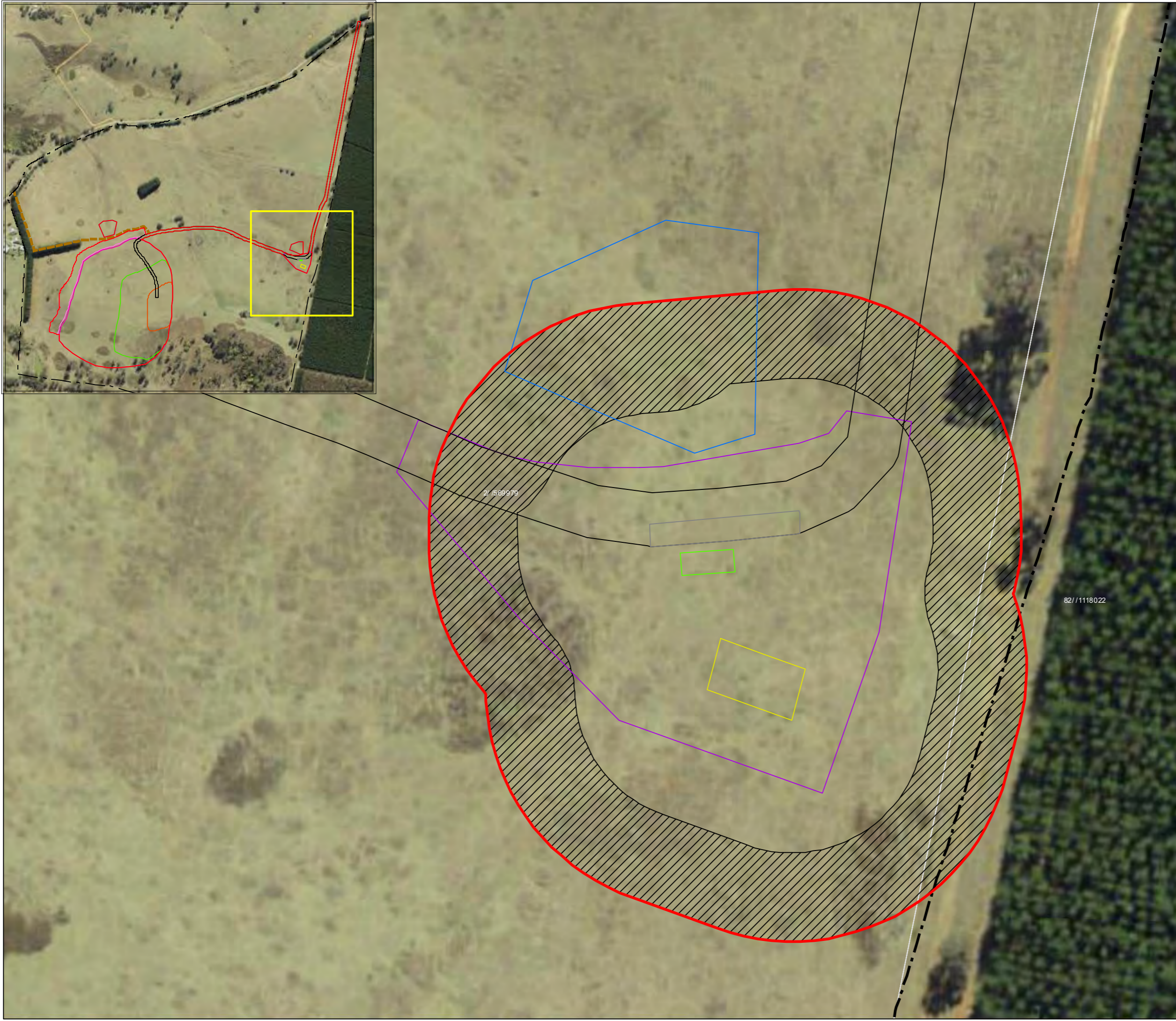
Performance Criteria	Acceptable Solutions										
	<p>gradient specified by road design standards, whichever is the lesser gradient;</p> <ul style="list-style-type: none"> ▪ all roads are through roads; ▪ dead end roads are not recommended, but if unavoidable, are not more than 200 metres in length, incorporate a minimum 12 metres outer radius turning circle, and are clearly sign posted as a dead end; ▪ where kerb and guttering is provided on perimeter roads, roll top kerbing should be used to the hazard side of the road; ▪ where access/egress can only be achieved through forest, woodland and heath vegetation, secondary access shall be provided to an alternate point on the existing public road system; 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"> ▪ the capacity of access roads is adequate for firefighting vehicles. 	<ul style="list-style-type: none"> ▪ 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. 										
<ul style="list-style-type: none"> ▪ there is appropriate access to water supply. 	<ul style="list-style-type: none"> ▪ 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 the relevant clauses of AS 2419.1:2005; and ▪ there is suitable access for a Category 1 fire appliances to within 4m of the static water supply where no reticulated supply is available. 										
<p>Property Access</p> <p>Firefighting vehicles can access the dwelling and exit the property safely.</p>	<ul style="list-style-type: none"> ▪ 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>In circumstances where this cannot occur, the following requirements apply:</p> <ul style="list-style-type: none"> ▪ minimum 4m carriageway width; ▪ in forest, woodland and heath situations, rural property access roads have passing bays every 200m that are 20m long by 2m wide, making a minimum trafficable width of 6m at the passing bay; ▪ a minimum vertical clearance of 4m to any overhanging obstructions, including tree branches; and ▪ provide a suitable turning area in accordance with Appendix 3. <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr style="background-color: #444; color: white;"> <th>Curve radius (inside edge in metres)</th> <th>Swept path (metres width)</th> </tr> </thead> <tbody> <tr style="background-color: #eee;"> <td>< 40</td> <td>4.0</td> </tr> <tr> <td>40 - 69</td> <td>3.0</td> </tr> <tr style="background-color: #eee;"> <td>70 - 100</td> <td>2.7</td> </tr> <tr> <td>> 100</td> <td>2.5</td> </tr> </tbody> </table>	Curve radius (inside edge in metres)	Swept path (metres width)	< 40	4.0	40 - 69	3.0	70 - 100	2.7	> 100	2.5
Curve radius (inside edge in metres)	Swept path (metres width)										
< 40	4.0										
40 - 69	3.0										
70 - 100	2.7										
> 100	2.5										

Performance Criteria	Acceptable Solutions
	<div style="display: flex; flex-wrap: wrap; justify-content: space-around;"> <div style="text-align: center; margin: 5px;"> <p>Type A</p>  </div> <div style="text-align: center; margin: 5px;"> <p>Type B</p>  </div> <div style="text-align: center; margin: 5px;"> <p>Type C</p>  </div> <div style="text-align: center; margin: 5px;"> <p>Type D</p>  </div> </div> <ul style="list-style-type: none"> ▪ curves have a minimum inner radius of 6m and are minimal in number to allow for rapid access and egress; ▪ the minimum distance between inner and outer curves is 6m; ▪ 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; and ▪ a development comprising more than three dwellings has access by dedication of a road and not by right of way. <p><i>Note: Some short constrictions in the access may be accepted where they are not less than 3.5m wide, extend for no more than 30m 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.</i></p>

39 RAZORBACK ROAD,
RUNNING STREAM
FIGURE 4: APZ MAP












Legend

-  Emergency Access Trail
-  Site
-  Study Area
-  Cadastral Boundaries
-  Hardstand and Parking (Gravel)
-  Haul Road
-  Infrastructure Area
-  New Dam
-  Office, Crib Room and Toilets
-  Workshop Shed (20m x 12m)
-  Asset Protection Zone








39 RAZORBACK ROAD,
 RUNNING STREAM
FIGURE 5: BAL MAP

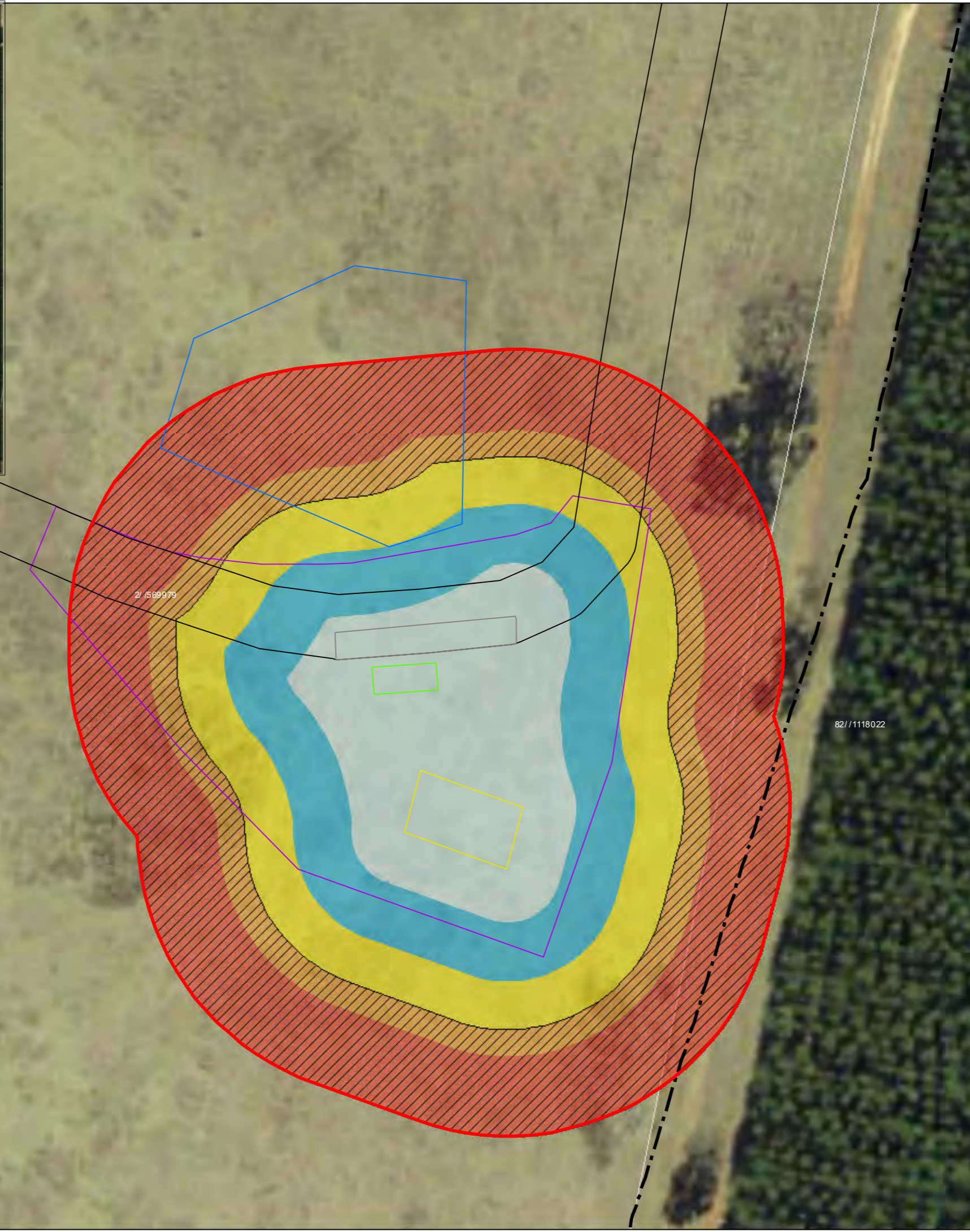
Legend

-  Emergency Access Trail
-  Site
-  Study Area
-  Cadastral Boundaries
-  Hardstand and Parking (Gravel)
-  Haul Road
-  Infrastructure Area
-  New Dam
-  Office, Crib Room and Toilets
-  Workshop Shed (20m x 12m)
-  Asset Protection Zone

Bushfire Attack Levels

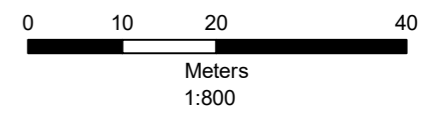
PBP 2019

-  BAL-FZ
-  BAL-40
-  BAL-29
-  BAL-19
-  BAL-12.5



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2/1569979



3.3 Services – Water, Electricity, Gas

The Site is to be developed in accordance with the PBP (2019) acceptable solutions for services listed in Table 6.

The proposal is able to satisfy these requirements given:

- The Site will provide a dedicated 20,000 L dedicated tank for emergency bushfire supply.
- The Site power supply will be provided as needed using on site generators.
- Any water storage tanks are to include connection points in accordance with PBP (2019) and be readily accessible and clearly marked. If pumps are to be made available, they must be regularly maintained and in good working order.
- Dams to be constructed on site will provide additional water supply for fire fighting.
- Gas supply if available shall be provided within the sites in accordance with the provisions of PBP 2019.

Table 6 Acceptable solutions for services (PBP 2019)

Performance Criteria	Acceptable Solutions										
The intent may be achieved where:											
<p>Water Supplies</p> <ul style="list-style-type: none"> ▪ a static water supply is provided for firefighting purposes in areas where reticulated water is not available. <table border="1" style="width: 100%; margin-top: 10px;"> <thead> <tr> <th style="width: 50%;">Development Type</th> <th style="width: 50%;">Water Requirements</th> </tr> </thead> <tbody> <tr> <td>Residential lots (<1000m²)</td> <td>5,000L/lot</td> </tr> <tr> <td>Rural-residential lots (1000-10,000m²)</td> <td>10,000L/lot</td> </tr> <tr> <td>Large rural/lifestyle lots (>10,000m²)</td> <td>20,000L/lot</td> </tr> <tr> <td>Multi-dwelling housing (including dual occupancies)</td> <td>5,000L/dwelling</td> </tr> </tbody> </table> <p>Table 5.3d PBP 2019</p>	Development Type	Water Requirements	Residential lots (<1000m ²)	5,000L/lot	Rural-residential lots (1000-10,000m ²)	10,000L/lot	Large rural/lifestyle lots (>10,000m ²)	20,000L/lot	Multi-dwelling housing (including dual occupancies)	5,000L/dwelling	<ul style="list-style-type: none"> ▪ where no reticulated water supply is available, water for firefighting purposes is provided in accordance with Table 5.3d; ▪ a connection for firefighting purposes is located within the IPA or non-hazard side and away from the structure; 65mm Storz outlet with a ball valve is fitted to the outlet; ▪ ball valve and pipes are adequate for water flow and are metal; ▪ supply pipes from tank to ball valve have the same bore size to ensure flow volume; ▪ underground tanks have an access hole of 200mm to allow tankers to refill direct from the tank; ▪ a hardened ground surface for truck access is supplied within 4m; ▪ above-ground tanks are manufactured from concrete or metal; ▪ raised tanks have their stands constructed from non-combustible material or bush fire-resisting timber (see Appendix F of AS 3959); ▪ unobstructed access can be provided at all times; ▪ underground tanks are clearly marked; ▪ tanks on the hazard side of a building are provided with adequate shielding for the protection of firefighters; ▪ all exposed water pipes external to the building are metal, including any fittings; ▪ where pumps are provided, they are a minimum 5hp or 3kW petrol or diesel-powered pump, and are shielded against bush fire attack; any hose and reel for firefighting connected to the pump shall be 19mm internal diameter; and
Development Type	Water Requirements										
Residential lots (<1000m ²)	5,000L/lot										
Rural-residential lots (1000-10,000m ²)	10,000L/lot										
Large rural/lifestyle lots (>10,000m ²)	20,000L/lot										
Multi-dwelling housing (including dual occupancies)	5,000L/dwelling										

Performance Criteria	Acceptable Solutions
	<ul style="list-style-type: none"> ▪ fire hose reels are constructed in accordance with AS/NZS 1221:1997 and installed in accordance with the relevant clauses of AS 2441:2005.
<p>Electricity Services</p> <ul style="list-style-type: none"> ▪ location of electricity services limits the possibility of ignition of surrounding bushland or the fabric of buildings 	<ul style="list-style-type: none"> ▪ where practicable, electrical transmission lines are underground. ▪ where overhead electrical transmission lines are proposed: <ul style="list-style-type: none"> ○ lines are installed with short pole spacing (30 metres), unless crossing gullies, gorges or riparian areas; and ○ no part of a tree is closer to a power line than the distance set out in accordance with the specifications in ISSC3 <i>Guideline for Managing Vegetation Near Power Lines</i>.
<p>Gas services</p> <ul style="list-style-type: none"> ▪ location of gas services will not lead to ignition of surrounding bushland or the fabric of buildings 	<ul style="list-style-type: none"> ▪ reticulated or bottled gas is installed and maintained in accordance with AS/NZ 1596:2014 – <i>The storage and handling of LP Gas</i>, and the requirements of relevant authorities. 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; ▪ Above-ground gas service pipes are metal, including and up to any outlets; ▪ Connections to and from gas cylinders are metal; and ▪ polymer sheathed flexible gas supply lines to gas meters adjacent to buildings are not used.

3.4 Landscaping & Fuel Management

All future landscaping on the Site should be designed and managed to minimise impact of bushfire based on the principles set out in PBP (2019) being:

- Prevent flame contact / direct ignition on the dwelling;
- Provide a defensible space for property protection;
- Reduce fire spread;
- Deflect and filter embers;
- Provide shelter from radiant heat; and
- Reduce wind speed.

In this manner, consideration should be given to species selection, planting location, flammability and size at maturity to ensure discontinuous canopy/ structure both vertically and horizontally to ensure the above principles are met.

Ongoing fuel management across the site as part of the maintenance regime should comply with the NSW RFS 'Asset protection zone standards' and Appendix 4 - Asset Protection Zone Requirements of PBP (2019) which provides guidance on maintenance activities to assist in achieving the landscape principles.

3.5 Emergency Management

Any fire within the Site would be attended in the first instance by Capertee & District Rural Fire Service, with support available from Fire and Rescue NSW Kandos Fire Station.

To assist emergency response from the NSW RFS and/or NSW Fire and Rescue, site access is to comply with the provisions set out in PBP (2019) and all tanks including connection points are to be readily accessible and clearly marked. If pumps are to be made available, they must be regularly maintained and in good working order.

3.6 Appraisal against 8.3.1 objectives

The broad objectives are listed with comment on how they are achieved in **Table 7** below.

Table 7 Appraisal against 8.3.1 Objectives

Objective (PBP 2019)	Comment
To provide safe access to/from the public road system for firefighters providing property protection during a bush fire and for occupant egress for evacuation;	<ul style="list-style-type: none"> ▪ Refer to Section 3.2. ▪ The proposal shall provide and maintain appropriate property access for ingress/ egress to site for emergency vehicle access. ▪ The site has direct public road frontage to Razorback Road. ▪ A secondary emergency access is available on site travelling in a westerly direction beyond the quarry pit and connecting onto Razorback Road to the north. <p style="text-align: center;">This objective is satisfied.</p>
To provide suitable emergency and evacuation (and relocation) arrangements for occupants of the development	<ul style="list-style-type: none"> ▪ Occupants have two egress points from the quarry operation ▪ A managed fuel zone (slashed paddock) of 50m will be established around the site facilities (crib room, weighbridge etc). <p style="text-align: center;">This objective is satisfied.</p>
To provide adequate services of water for the protection of buildings during and after the passage of bush fire, and to locate gas and electricity so as not to contribute to the risk of fire to a building; and	<p>Refer to Section 3.3. The proposal can satisfy this requirement given:</p> <ul style="list-style-type: none"> ▪ The Site will be provide a dedicated 20,000 L dedicated tank for emergency bushfire supply. ▪ The Site shall be connected to the existing power supply and Power will be supplied as needed using on site generators. ▪ Any water storage tanks shall are to include connection points in accordance with PBP (2019) and be readily accessible and clearly marked. If pumps are to be made available, they must be regularly maintained and in good working order. ▪ Dams to be constructed on site provide additional water supply for fire fighting. <p style="text-align: center;">This objective is satisfied.</p>
Provide for the storage of hazardous materials away from the hazard wherever possible.	<ul style="list-style-type: none"> ▪ The nature of this commercial development encompasses the establishment and operation of a quarry and associated plant, site shed, office, stand down areas and associated facilities. Combustible materials will be required to assist operations (e.g. fuel) however will be stored in a self-bunded containerised fuel tank. <p style="text-align: center;">This objective is satisfied.</p>

4 Conclusion & Recommendations

MJD Environmental has been engaged by Pine Plantations Australia Pty Ltd to prepare a Bushfire Assessment Report to accompany a Development Application to be submitted to Mid-Western Regional Council for the proposed construction of a sand and gravel quarry at 39 Razorback Road, Running Stream, NSW.

The assessment considered and assessed the bushfire hazard and associated potential threats relevant to the proposal and outlined the minimum mitigative measures which would be required in accordance with *Planning for Bush Fire Protection 2019* (PBP), as adopted through the *Environmental Planning & Assessment Amendment* (Planning for Bush Fire Protection) *Regulation 2020*.

This assessment adhered to the methodology and procedures outlined in PBP (2019) via assessment of acceptable solutions as outlined in Chapter 8 of PBP (2019).

This assessment is based on the bushfire hazards in and around the Site at the time of site inspection and report production.

This BAR addresses the aims and objectives of PBP 2019, being:

- Afford buildings and their occupants protection from exposure to a bushfire;
- Provide for a defensible space to be located around buildings;
- Provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent the likely fire spread to buildings;
- Ensure that appropriate operational access and egress for emergency service personnel and occupants is available;
- Provide for ongoing management and maintenance of bushfire protection measures; and
- Ensure that utility services are adequate to meet the needs of firefighters.

Chapter 8.3.1 and 8.3.10 of PBP 2019 – *Buildings of Class 5 to 8 under the NCC* specifies the objectives to be applied in relation to access, water supply and services, and emergency and evacuation planning for developments of this type. The objectives are:

- to provide safe access to/from the public road system for firefighters providing property protection during a bush fire and for occupant egress for evacuation.
- to provide suitable emergency and evacuation (and relocation) arrangements for occupants of the development;
- to provide adequate services of water for the protection of buildings during and after the passage of bush fire, and to locate gas and electricity so as not to contribute to the risk of fire to a building; and
- provide for the storage of hazardous materials away from the hazard wherever possible.

The proposed development can meet the performance criteria for acceptable solutions for commercial development, giving due regard to the requirements of Chapter 8 of PBP 2019, specifically section 8.3.1. A suitable package of BPMs has been developed that is commensurate with the assessed level of risk to the development.

The built form of the proposed structures is a factor in the risk profile of the proposal, where all buildings are to be built to the NCC / NASH and have regard to AS3959. Typically, the buildings will be constructed of non-combustible wall materials and non-combustible roof structures (including metal frame super structure, metal cladding and roofing, or similar) which is highly resistant to radiant heat and are non-combustible materials. A copy of the plan has been provided as **Appendix A**.

Section 3.1 and 3.2 provides an acceptable solutions for APZ and BAL as it relates to residential developments. Importantly this is provided for context, and it is acknowledged the development can comply with the residential APZ setbacks as per PBP 2019 Section 8.3.1. In addition, a package of measures provided by the development includes:

- Provision of defensible space between the hazard and development;
- High resilience building typology on elevations facing the hazard; and
- Access and circulation suitable for a fully loaded fire appliance.

A managed fuel zone (slashed paddock) of 50m will be established around the site facilities (crib room, weighbridge etc). The area is to be managed to IPA standards at a minimum with due regard to Appendix 4 PBP (2019).

The assessment found that hazard vegetation types occur within 140m of the Site. The primary risk is from the pine plantation 'forest' class vegetation located on the Site. These hazards have been assessed as having the greatest effect on bushfire behaviour. The slope under the hazard vegetation has been assessed as varying from upslope to 0-5° Downslope.

In summary, the following key recommendations have been generated to enable the proposal to comply with PBP (2019).

- A managed fuel zone (slashed paddock) of 50m will be established around the site facilities (crib room, weighbridge etc). The area is to be managed to IPA standards as a minimum with due regard to Appendix 4 PBP (2019);
- Access will have due regard to the requirements of Table 5.3b, Chapter 8.3.1 and Appendix 3 of PBP (2019) and the discussion set out in section 3.2 of this report;
- Services are to be provided and connected to the site in accordance with PBP (2019) as summarised and assessed in Chapter 3, Section 3.3 of this report; and
- Careful consideration of future site landscaping and ongoing fuel management must occur to minimise the potential impact of bushfire on the site in accordance with PBP (2019) as summarised and assessed in Chapter 3, Section 3.4 of this report.

5 Bibliography

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NSW Rural Fire Service (2019). *Planning for Bushfire Protection – A Guide for Councils, Planners, Fire Authorities, and Developers*.

NSW Rural Fire Service (2002). *Circular 16/2002: Amendments to the Rural Fires Act 1997 – hazard reduction and planning requirements*.

Standards Australia (2018). *AS 3959 – 2018: Construction of Buildings in Bushfire-prone Areas*.

Appendix A Plan of Proposal

The information included on this graphic representation has been compiled from a variety of sources and is subject to change without notice. Urban Space Pty Ltd makes no representations or warranties, expressed or implied, as to the accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a land survey product nor is it designed or intended as a construction design document. The use or misuse of the information contained on this graphic representation is at the sole risk of the part using or misusing the information.



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Figure:
1

Proposed Razorback Quarry - General Arrangement



Source: © Department of Customer Service 2020, VGT - 2020, Wedgetail Project Consulting - 2020, NSW DFSI - 2021

Pine Plantation Products Australia
39 Razorback Road, Running Stream NSW

User: deaneb Version 1
Date: 22/10/2021 2:53 PM

Scale: 1:10,000

