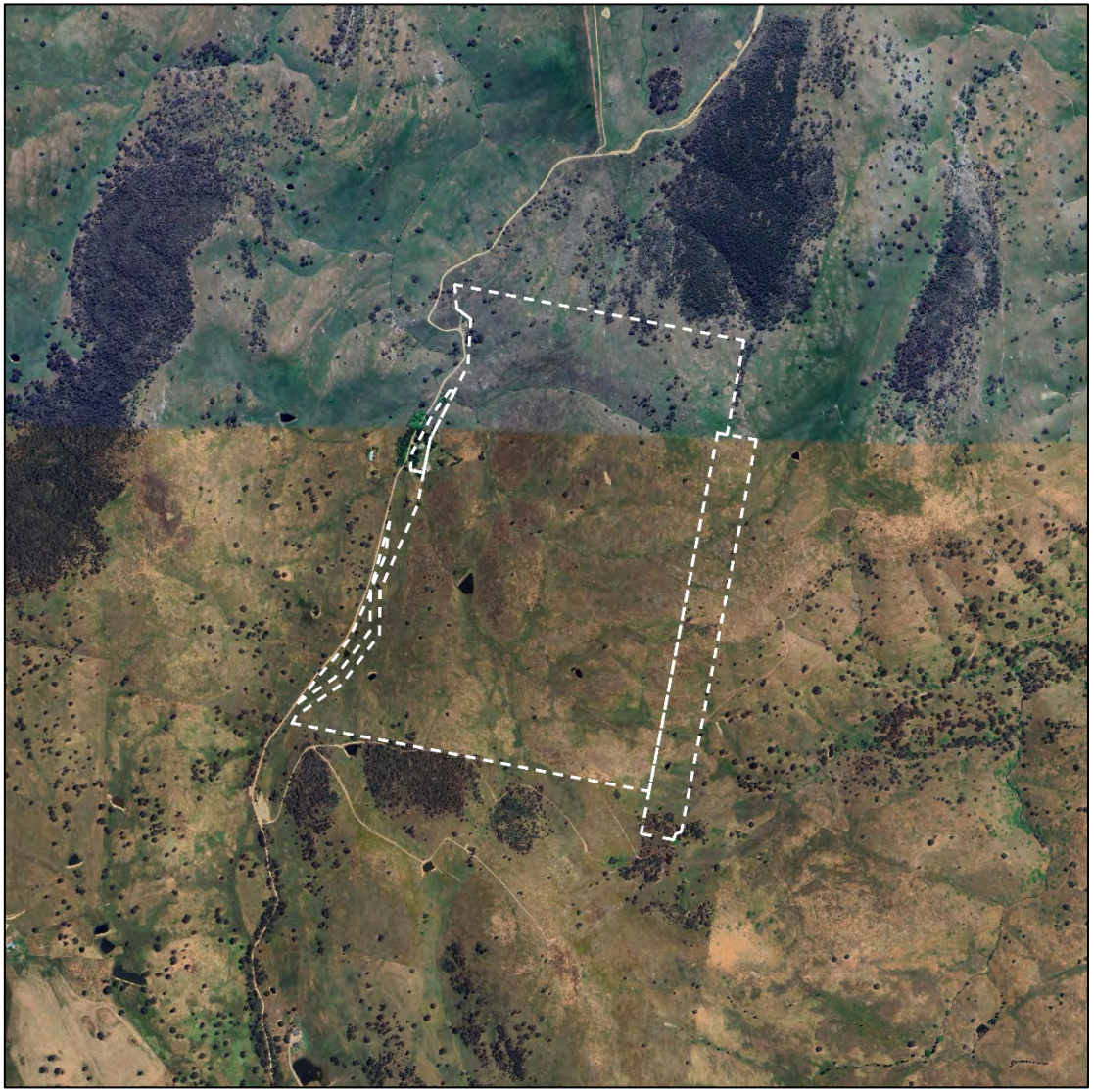


BUSHFIRE ASSESSMENT REPORT

336 GLENROCK ROAD, CAVAN

Lot 1 DP 113231, Lot 1 DP 1281518 &

Lot 107 DP 751807

Proposed Rural Residential Subdivision

Prepared for Peter Sekuless C/- Council

Approval Group

19.8.25

ember
bushfire consulting

EXECUTIVE SUMMARY

Council Approval Group has engaged EMBER Bushfire Consulting to prepare a bushfire assessment report for a proposed three (3) lot rural residential subdivision at Lot 1 DP 113231, Lot 1 DP 1281518 & Lot 107 DP 751807 - 336 Glenrock Road, Cavan.

The proposed subdivision is located on bushfire prone land as designated by Yass Valley Council.

This assessment adopts a methodology provided under the NSW RFS document Planning for Bushfire Protection 2019 (PBP 2019) to assess the adequacy of bushfire protection of the subdivision as planned.

The development proposal divides ~155 Ha primary production land over three (3) lots into three (3) new separate title rural lots (Lot A, Lot B and Lot C), including allocated or indicative building envelopes, Asset Protection Zone's (APZs), electricity supply and property access roads. There is an existing dwelling on Lot 1 DP 113231.

This report establishes the level of bushfire threat to the proposed subdivision. It examines bushfire protection for the existing residence on Lot A, and for ability to provide future residences on Lot B and Lot C, for measures such as Asset Protection Zones (APZs), access and water, gas and electricity services and construction standards.

Access to Lots B and C of the proposed subdivision can be well provided for and will essentially comply with the acceptable solutions set out in PBP (2019). Where the acceptable solutions cannot be met, a performance-based assessment of the proposal is undertaken, which considers the compliant APZ dimensions, higher levels of construction and increased water supplies, all of which improve the level of safety, resilience and defendability of the future structures while placing less reliance on access as a safety measure.

As part of the Performance-Based Design to address extended egress, any future dwelling on Lot C is required to be constructed to BAL-19.5 per the relevant sections of Australian Standard 3959-2018 Construction of buildings in bushfire-prone areas.

Electricity, water and gas supplies will be provided during future development and must comply with the general specifications provided here.

Electricity, water and gas supplies will be provided during future development and must comply with the general specifications provided here.

Based on the bushfire assessment and the recommendations contained in this report, the proposed development is deemed to comply with the specific and broad objectives of PBP (2019), the requirements of the Rural Fire regulations (2022) and, therefore, suitable for submission to the NSWRFS for the issuing of a bush fire safety authority.

CERTIFICATION STATEMENT

Document Title:	Bushfire Assessment Report 336 Glenrock Road, Cavan
EMBER Reference:	MA.191.25
Lot & DP Number	Lot 1 DP 113231, Lot 1 DP 1281518 & Lot 107 DP 751807
Street Address	336 Glenrock Road, Cavan
Local Government Area	Yass Valley Council
Description of the development	Rural Residential Subdivision
Type of assessment under Planning for Bushfire Protection (2019)	Section 5 – Rural Residential Subdivision
Is referral of the proposal to the NSW RFS required?	YES - Per Section 100B – Bush fire safety authorities. A subdivision of bush fire prone land that could lawfully be used for residential or rural residential purposes.
Has a pre-DA lodgment or bush fire design brief been provided to the NSW RFS?	NO
The highest radiant heat flux determined for the development.	<29 kW/m^2
Highest level of construction applicable:	Bushfire Attack Level (BAL) -29
Accreditation Scheme / Level of accreditation	Bushfire Planning and Design (BPAD) Accreditation Scheme administered by the Fire Protection Association Australia (FPAA)
Prepared by:	Jeff Dau – BPAD 33128 - Level 3
Verified by:	Rob McGregor – BPAD 33130 – Level 2

The author (Jeffrey Dau) hereby certifies that:

- A thorough, in person, survey of the Subject Site was carried out on 26 April 2025;
- A subsequent bushfire threat assessment was undertaken of the site and the proposal per the relevant sections of the NSW Rural Fire Service (NSW RFS) document Planning for Bushfire Protection 2019 (PBP 2019);
- A detailed bush fire assessment report is attached per the submission requirements of Appendix 2 of PBP, together with recommendations needed to satisfy the specifications and requirements of PBP;
- I am a person recognised by NSW RFS as a qualified consultant in bush fire risk assessment and
- Subject to the recommendations in this report, the proposed development conforms to PBP's relevant specifications and requirements.

Furthermore, I am aware that this report will be submitted to support a development application for this site and will be relied upon by the Council to ensure that the bushfire risk management aspects of the proposal have been addressed per PBP 2019.

19/8/2025

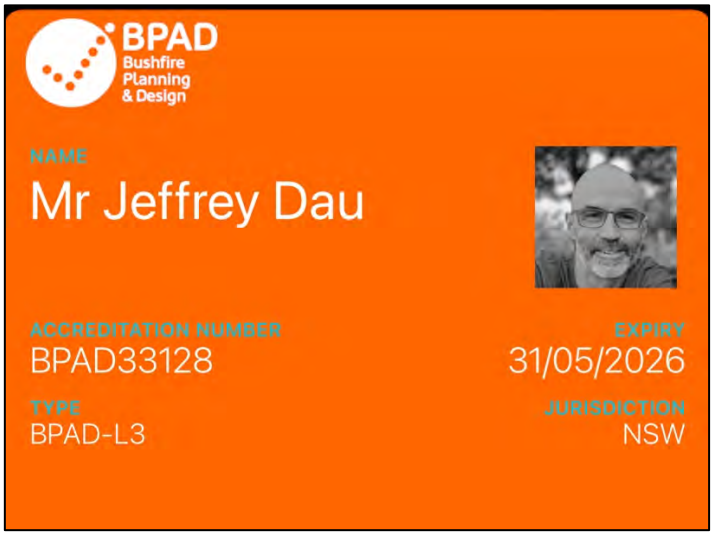
BPAD Bushfire Planning & Design Accredited Practitioner Level 3

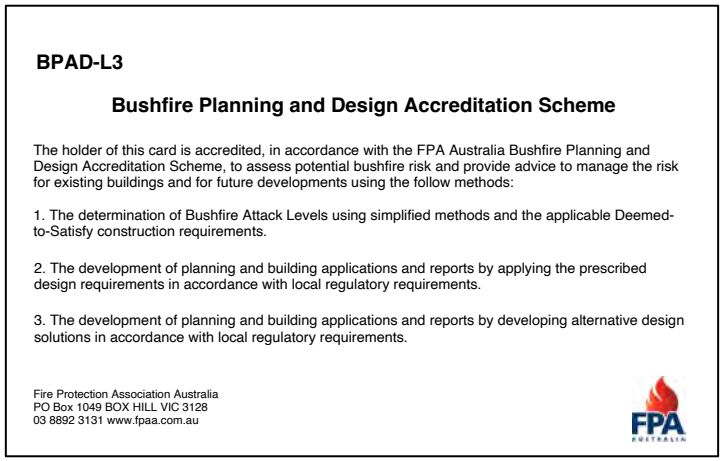
Document Control

Information	Detail
Document Title:	Bushfire Assessment Report 336 Glenrock Road, Cavan
EMBER Reference:	MA.191.25
Other Reference:	
Version:	1.0
Version Control:	1.0 – First Issue – 15.5.25 2.0 – Second Issue 19.8.25 Changes to Lot B building envelope
Status:	Issued

Key details of development

Information	Detail
Zoning of subject land	Ru1 – Primary Production
Zoning of adjoining lands	Ru1 – Primary Production
Lot size	~155 ha
Staging issues	Nil
Development classification	Rural Residential Subdivision
Type of assessment	Rural Residential Subdivision
Fire weather area	Southern Ranges
Fire Danger Index	100
Predominant vegetation	Grassland and Remnant Vegetation
Slope	Ranging from upslope to 10° downslope
Environmental constraints	Typical Biodiversity Offset Scheme (BOS)
Cultural constraints	Nil known
Method of meeting performance requirements	Using acceptable solutions.





HOW TO READ THIS DOCUMENT -

Section 1 Introduction – Introduction and overview of the subject site and proposed development.

Section 2 Bushfire Hazard Analysis - Assessment of the critical factors contributing to the potential bushfire attack of the proposed development, planning considerations and assessment of the overall bushfire hazard.

Section 3 Bushfire Protection Measures – Assessment and discussion of the recommended bushfire protection measures in response to the Bushfire Attack Assessment, necessary for life safety and compliance purposes.

Section 4 Bushfire Management Plan – A concise list of recommendations for the development proposal to be considered compliant with PBP.

Section 5 Conclusion – Concluding statement.

DEFINITIONS -

Asset Protection Zone (APZ) - A fuel-reduced area surrounding a built asset or structure that provides a buffer zone between a bushfire hazard and an asset. The APZ includes a defendable space within which firefighting operations can be carried out. The size of the required APZ varies with slope, vegetation and FFDI.

Bushfire attack - Attack of a built asset or structure by burning embers, radiant heat or flame generated by a bush fire.

Bushfire hazard - Any vegetation that can potentially burn and threaten lives, property or the environment.

Bushfire prone land (BFPL) - An area of land that can support a bushfire or is likely to be subject to bushfire attack, as designated on a bushfire-prone land map.

Bush fire protection measures (BPMs) - A range of measures used to minimise the risk from a bush fire that needs to be complied with. BPMs include APZs, construction provisions, suitable access, water and utility services, emergency management and landscaping.

Bushfire risk - is the likelihood and consequence of a bushfire igniting, spreading and causing life loss or damage to buildings of value to the community. Note: This assessment does not intend to determine the likelihood of bushfire impacting the subject site. Instead, it focuses on assessing the degree of bushfire attack, its expected consequences and the BPMs needed to moderate this attack.

Managed land - Land with vegetation removed or maintained to a level that limits the spread and impact of bush fire. This may include developed land, roads, golf course fairways, playgrounds, sports fields, vineyards, orchards, cultivated ornamental gardens and commercial nurseries. The most common will be gardens and lawns within the curtilage of buildings. These areas are managed to meet the requirements of an APZ.

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1 INTRODUCTION AND OVERVIEW

1.1 BACKGROUND

Peter Sekuless C/- Council Approval Group has engaged EMBER Bushfire Consulting to prepare a bushfire assessment report for a proposed three (3) lot rural residential subdivision at Lot 1 DP 113231, Lot 1 DP 1281518 & Lot 107 DP 751807 - 336 Glenrock Road, Cavan (the subject site).

The development proposal is located on land designated bushfire prone by Council and, and as a result, is subject to Division 4.8 of the Environmental Planning and Assessment Act (1979) (EP&A Act) and Section 100B of the Rural Fires Act (1997).

Under the Rural Fires Act (1997), the development proposal must be shown to conform with the broad aim and objectives of the NSW Rural Fire Service (NSW RFS) document Planning for Bushfire Protection (2019) (PBP 2019) and, therefore, is the key reference document for this assessment.

This assessment was prepared through a desktop study of the subject site and an in-person survey by Bushfire Consultant Michael Achurch on behalf of EMBER Bushfire Consulting on 26.4.25.

1.2 AIM AND OBJECTIVES

The report aims to:

- Evaluate the potential bushfire threat to the subject site.
- Assess the capacity of the proposed subdivision to provide the minimum bushfire protection necessary to offer life safety to the occupants, improve property protection and facilitate fire service intervention during a bushfire event.
- Assess the capacity of the proposed subdivision to achieve the relevant performance criteria using the acceptable solutions provided in PBP 2019.

The specific objectives required for the proposed development are detailed in Chapter 5 – Residential and Rural Residential Subdivisions PBP 2019 and include:

- minimise perimeters of the subdivision exposed to the bush fire hazard;
- minimise vegetated corridors that permit the passage of bush fire towards buildings;
- provide for the siting of future dwellings away from ridge-tops and steep slopes, within saddles and narrow ridge crests;

- ensure that APZs between a bush fire hazard and future dwellings are effectively designed to address the relevant bush fire attack mechanisms;
- ensure the ongoing maintenance of APZs;
- provide adequate access from all properties to the wider road network for residents and emergency services;
- provide access to hazard vegetation to facilitate bush fire mitigation works and fire suppression; and
- ensure the provision of an adequate supply of water and other services to facilitate effective firefighting.

Accordingly, the following bushfire protection measures are to be assessed:

- Asset Protection Zones (APZs)
- Landscaping
- Access
- Water, Electricity and Gas Supplies (Services),
- Construction and other protection requirements, and
- Emergency Management.

1.3 LIMITATIONS AND DISCLAIMER

This report is primarily concerned with assessing the capacity of the proposed development to withstand the impacts of a bushfire, including ember attack, radiant heat and flame contact.

Where necessary, Ember will recommend protection measures to provide satisfactory protection to the occupants and the structures themselves.

The proponent should remember that the prescribed measures cannot guarantee that the proposed development will survive a bushfire event on every occasion. This is primarily due to the reliance on vegetation management, the unpredictable behaviour of fire, and extreme weather conditions.

EMBER Bushfire Consulting has prepared this report with all reasonable diligence. The information in this report has been gathered from field investigations of the site and plans provided by the developer.

Table 1 - Stakeholders

Stakeholder	Role	Contact	Detail
Peter Sekuless	Property Owner		
Jane Kerr	Senior Town Planner	Jane Kerr	1300 008 138
Yass Valley Council	Consent Authority	Not Given	6226 1477
NSWRFS	Consent Authority	Not Given	02 4475 1300

1.4 THE DEVELOPMENT PROPOSAL

The development proposal is to divide ~155 Ha of three (3) existing primary production lots into three (3) new separate title lots comprising Lot 1 DP 113231 – 0.9 Ha, Lot 1 DP 1281518 - ~137 Ha and Lot 107 – ~16 Ha (Figure 1 and Figure 2).

The proposed lots will have the following provisions:

- Lot A.
    - Will have an existing rural residential lot with one (1) existing but derelict residence (Class 1a building).
    - Has several sheds and outbuildings, water supplies (above ground poly tanks), fences, gates, and tracks throughout.
- Lot B.
    - Greenfield site for rural residential use.
    - An indicative building footprint.
    - An APZ that is proportionate to accommodate a dwelling with a rating of BAL-29, overhead powerline access to the main electricity grid and a minimum of 20,000 L of water supplies for firefighting purposes.
    - 1 large dam (~5 ML)
    - A proposed property access road that is ~130 m long, gravel all-weather, two-wheel-drive road surface with a minimum road width of 4m from the property boundary access point will meet requirements.
- Lot C.
    - Greenfield site for rural residential use.
    - An indicative building footprint.
    - An APZ that is proportionate to accommodate a dwelling with a rating of BAL-29, overhead powerline access to the main electricity grid and a minimum of 20,000 L of water supplies for firefighting purposes.
    - 4 small dams (~0.7 ML)
    - The proposed property access road is ~270m long, gravel all-weather, two-wheel-drive road surface with a minimum road width of 4m from the property boundary access point.

The development proposal is limited to the formal subdivision of the lots. The proposal does not intend to include any further subdivisions or the erection of any new structures or water tanks.

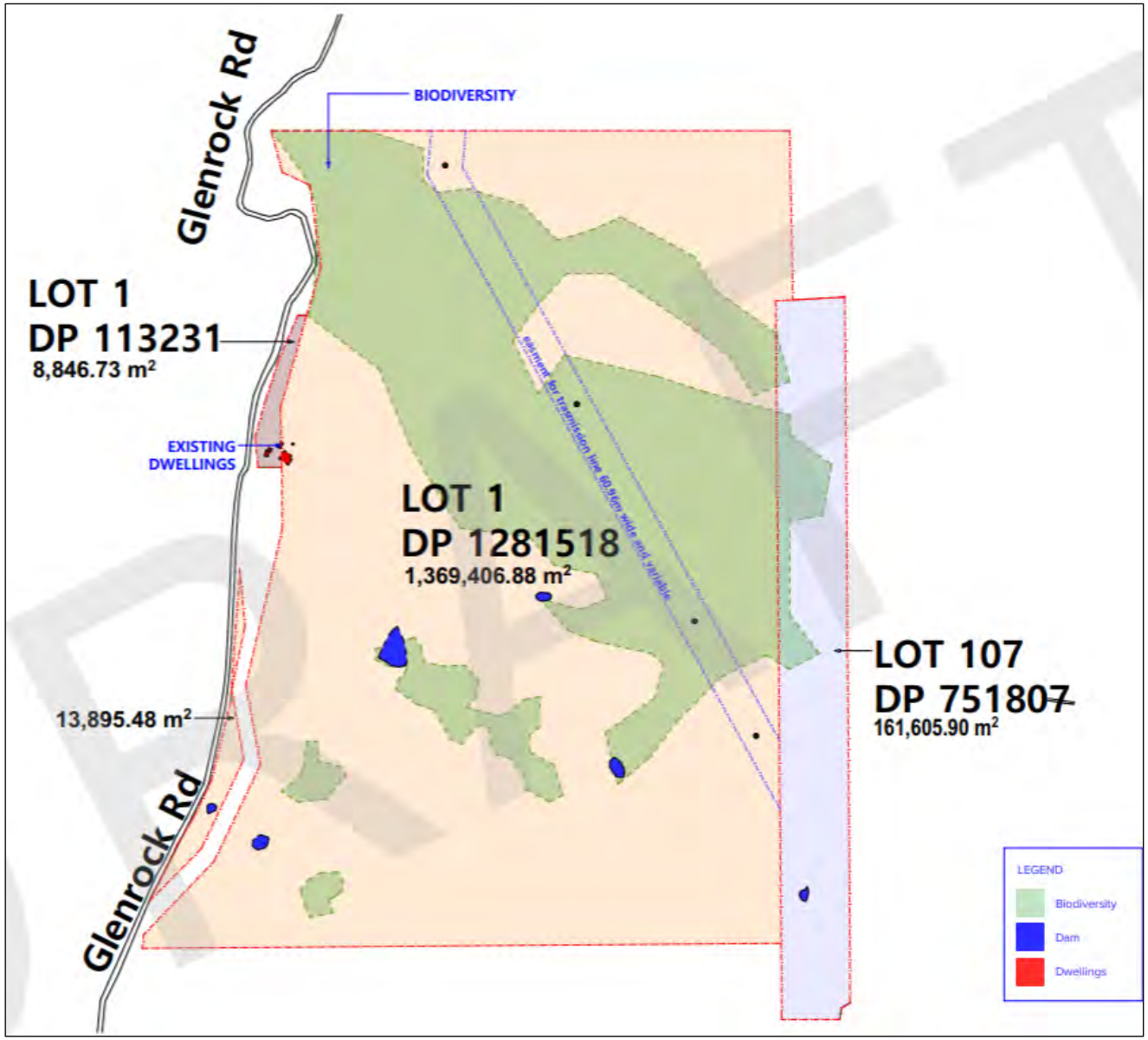

Figure 1 - Existing Subdivision (Council Approval Group, 2025)

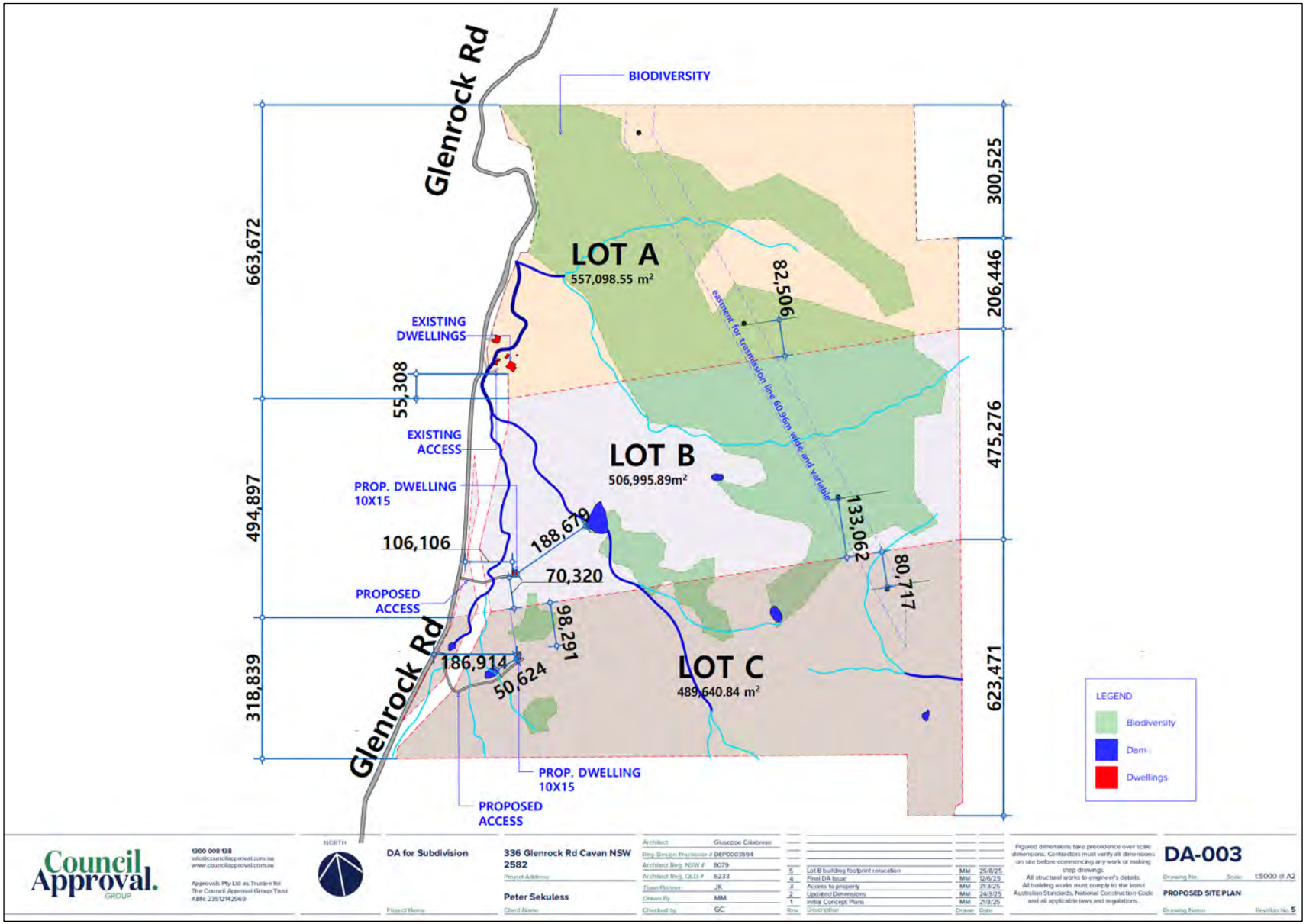

Figure 2 - Proposed Subdivision (Council Approval Group, 2025)

1.5 SUBJECT SITE LOCATION

Figure 3 - Subject site regional context (Achurch, 2025)

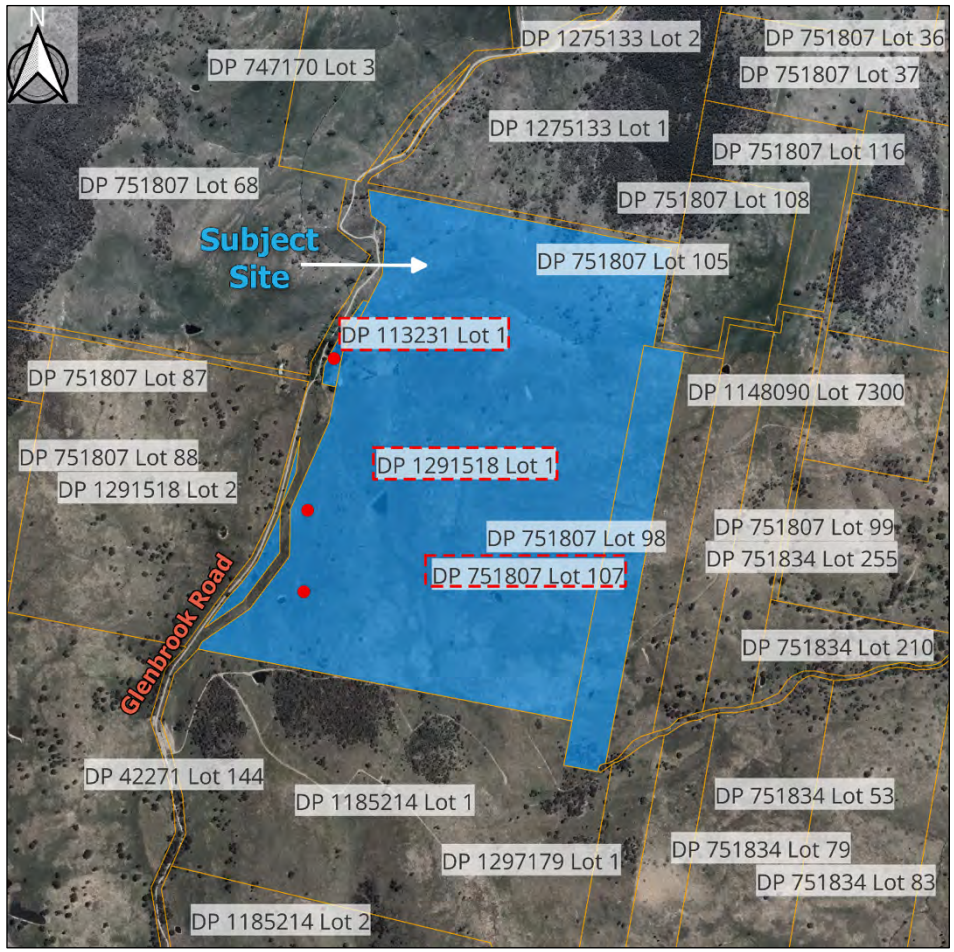

Figure 4 - Subject site local context (Achurch, 2025)

1.6 SUBJECT SITE DESCRIPTION

Location:

The subject site is located in the rural locality of Cavan, in the Southern Tablelands region of NSW, approximately 17 kilometres southwest of Murrumbateman, 26 kilometres south of Yass and 17 kilometres northwest of the border of Canberra (Figure 3).

Administration:

The ~155 Ha rural lot falls under the administration of the Yass Valley Council.

Land use:

The dominant land use of the area is primary production, including a small number of rural lifestyle properties (Figure 7). Accordingly, the subject site is zoned RU1 – Primary Production, as are the neighbouring lots.

Topography:

The subject site is in a valley surrounded by rolling hills. The natural watercourses across the property drain generally to the north, feeding a series of creeks before joining the Murrumbidgee River further north.

Vegetation:

The subject site is dominated by Grassland with pockets of Grassy Woodlands and Dry Sclerophyll. This formation has been cross-checked with the Bio-Net State Vegetation Type Map.

Access:

Proposed Lots A and B have direct access (<200 m) to Glenrock Road, which is a council maintained, public through road.

Proposed Lot C has direct access to Glenrock Road, however the property access road is 270 m).

Glenrock Road offers egress in 2 directions from both lots.

Heading north along Glenrock Road the road ends ~4.1 km at Cavan Road, providing access to Wallaroo to the South and Yass to the North.

Heading south along Glenrock Road the road ends ~3.1 km at Mountains Creek Road, offering access to Canberra to the South.

2 BUSHFIRE HAZARD ANALYSIS

2.1 METHODOLOGY

The methodology adopted to prepare this report is as follows:

Table 2 - Report Methodology

Method	Task	Considerations
Desktop analysis	Review available mapping resources, policy documents & development plans	Online Maps Development Control Plans Local Environmental Plan
Site inspection	Evaluate the site's context, determine bushfire threat, asset protection zones, access roads, and infrastructure options.	Ground truth online mapping data, validate vegetation class, obtain site measurements, assess existing structures and infrastructure.
Assessment of proposal against the NSWRFS Planning for Bushfire Protection (PBP 2019).	Assess the development proposal against the performance criteria of PBP 2019.	Does the proposal comply with the performance criteria provided under PBP 2019?
Report	Preparation and publication of bushfire assessment report	Demonstrate the proposal can meet the aims and objectives of PBP 2019.

2.2 DESIGN FIRE ATTRIBUTES

The following attributes are adopted to determine the potential bushfire hazard posed to the subject site (design fire).

Table 3 - Bushfire behaviour factors

Factor	Value
Fire Weather Area	Southern Ranges
FDI	100
Predominant Vegetation Classification	Grassland
Slope	Ranging from Upslope to 10° downslope.

Note: A detailed bushfire hazard analysis is detailed below.

- *Vegetation formations within 140 m of the subject site are classified following Section 1.2 of PBP 2019.*
- *Slopes out to 100 m from planned APZs and lot boundaries are assessed following A1.4 & A1.5 of PBP 2019.*
- *The fire danger index for the site has been determined per the NSW Rural Fire Service.*

2.3 SUBJECT SITE BUSHFIRE PRONE MAPPING AND VEGETATION FORMATIONS

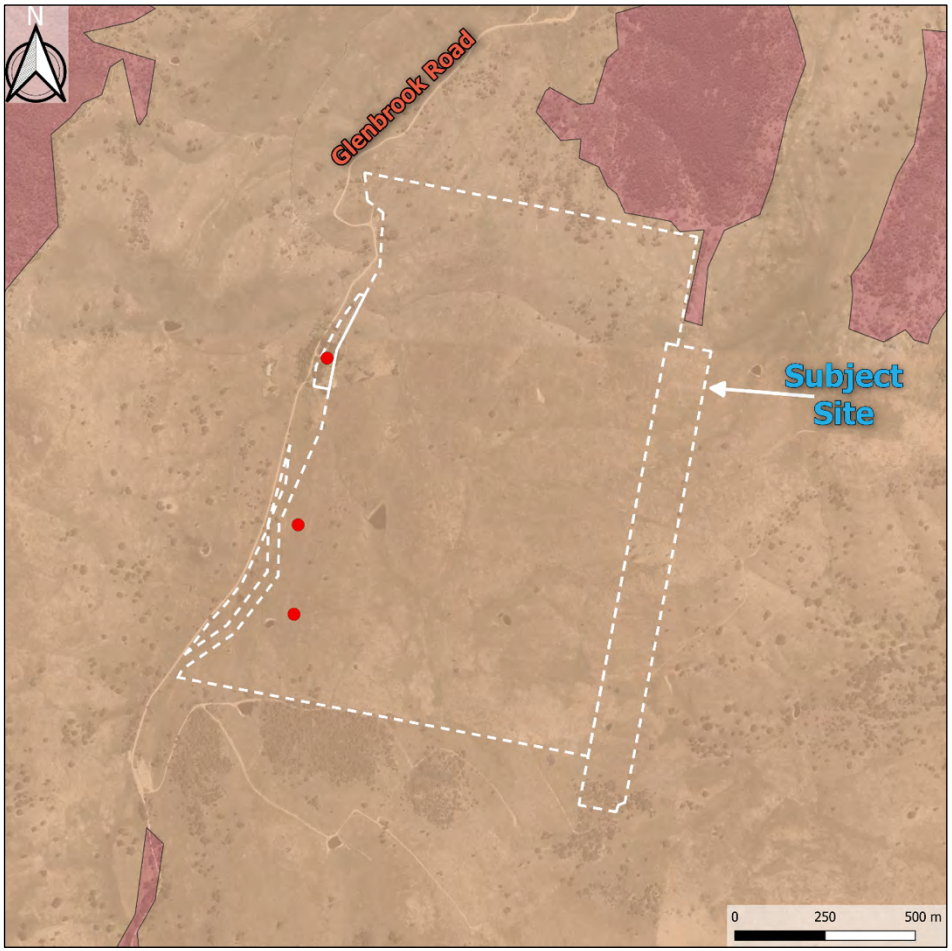

Figure 5 – Subject site Bushfire Prone Land Map. (Achurch, 2025)

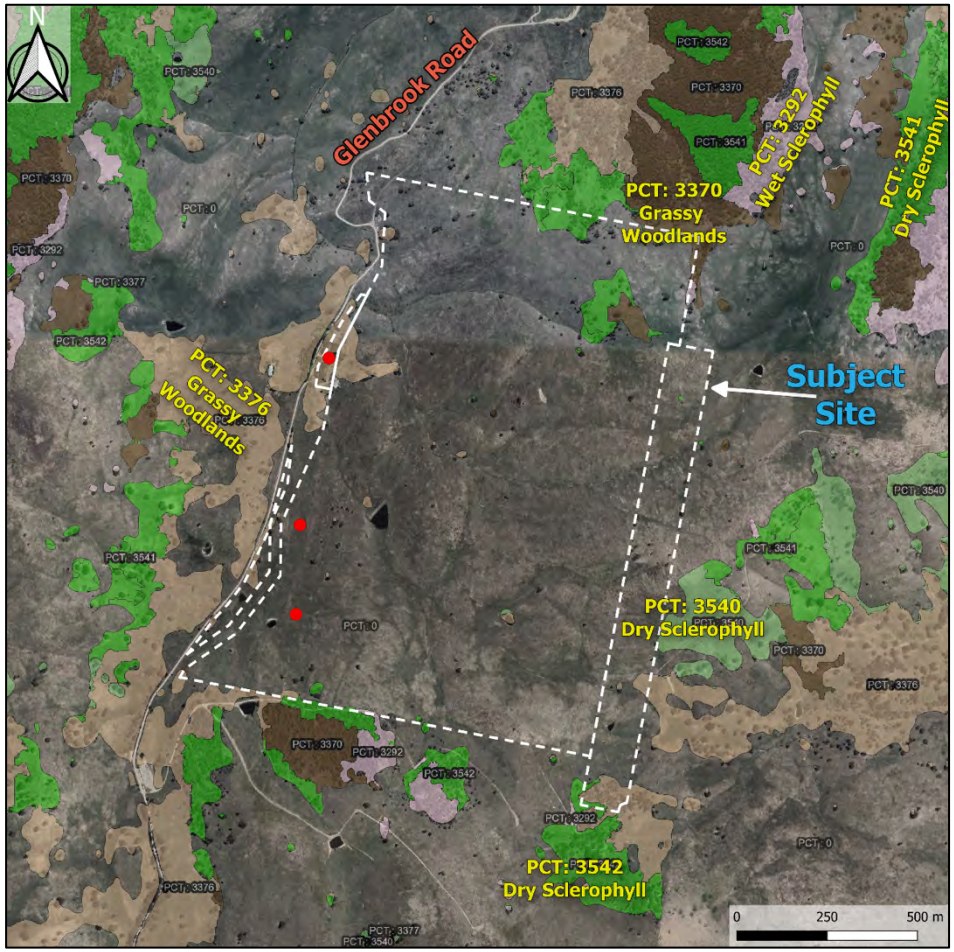

Figure 6 – Subject site Vegetation Formation Map. (Achurch, 2025)

2.4 SUBJECT SITE LAND USE AND BIODIVERSITY MAPPING

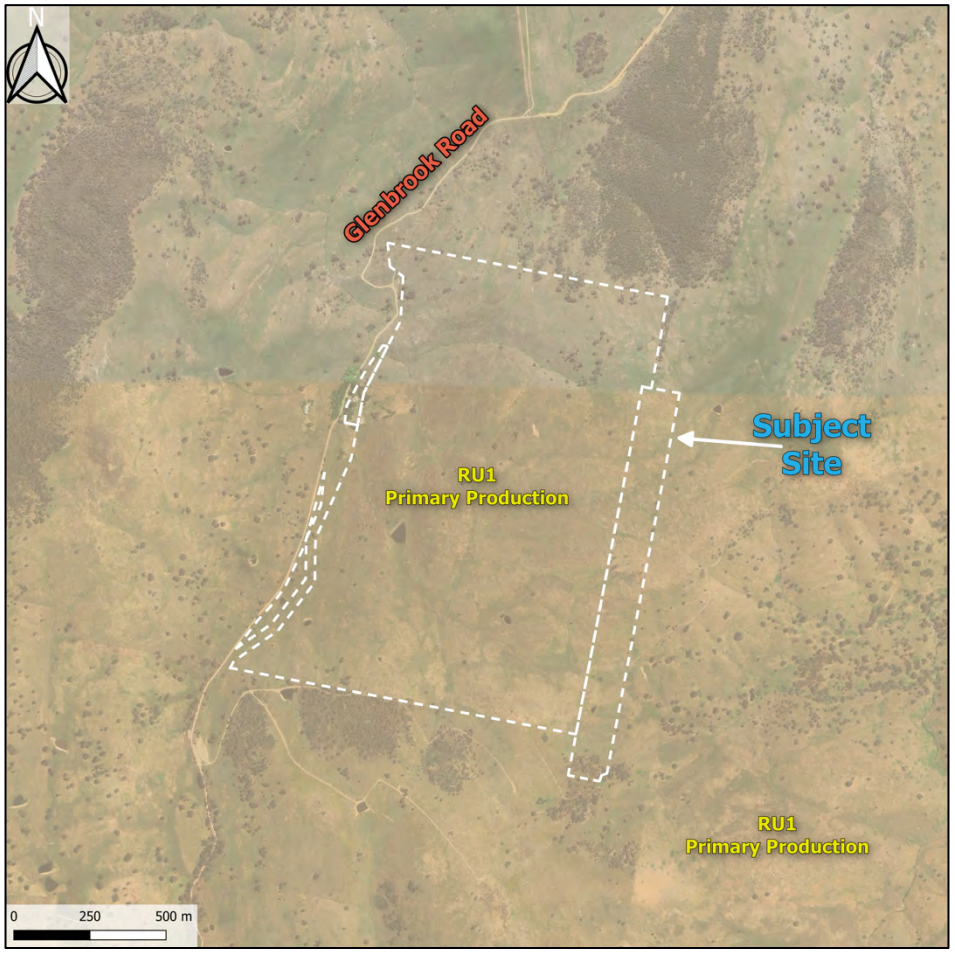

Figure 7 – Showing zoning of the subject site and adjoining lots. (Achurch, 2025)

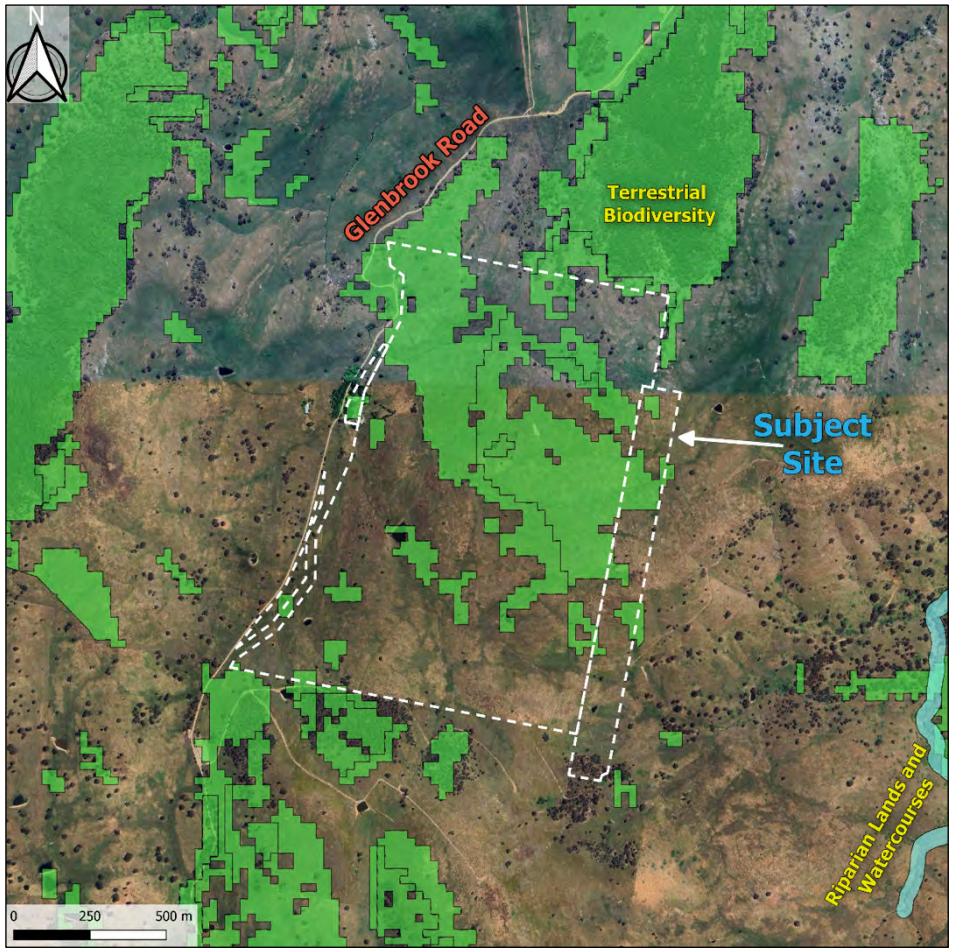

Figure 8 – Showing Biodiversity value vegetation influencing the subject site.

(Achurch, 2025)

Bushfire-Prone Land Mapping (Figure 5)

Bushfire prone mapping relative to the subject site showing adjacent land and the subject site containing broad areas of Category 3 Vegetation (Grassland) identified as bush fire prone land by Council and NSW RFS.

During the site survey conducted on 26th April, these vegetation categories were verified, and the bushfire prone map found to be an accurate representation of the identified hazard.

State based vegetation classification (Figure 6)

Subject site vegetation formations as defined by SEED (NSW Government, 2025) NSW State Vegetation Type Map.

Vegetation mapping indicates that the subject site is dominantly influenced by –

- Grassland (low level threat)

Land Use Mapping (Figure 7)

Subject site zoning as defined by (NSW Government, 2025) NSW Planning Portal – ePlanning Spatial Viewer.

An assessment of land use zoning aids in the evaluation of broadscale landscape practices and the ability to manage vegetation within and surrounding the subject site.

The land zoning map indicates that the subject site is zoned as RU1 – Primary Production as are the surrounding lots indicating that land use practices and strategic landscape management allows for the broad management of vegetation (fuels).

Biodiversity Mapping (Figure 8)

The Biodiversity Values Map identifies land with high biodiversity value that is particularly sensitive to impacts from development and clearing.

The map forms part of the Biodiversity Offsets Scheme threshold, which is one of the factors for determining whether the Biodiversity Offset Scheme applies to a clearing or development proposal.

The map is prepared by the Department of Planning and Environment under Part 7 of the Biodiversity Conservation Act 2016 (BC Act).

The proposed development sites are clear of areas identified with high biodiversity value and therefore the clearing or management of land for the purposes of APZs or property access may be achievable.

Note, this is for indicative purposes and not intended to be a replacement for a comprehensive ecological assessment.

2.5 LOT A BUSHFIRE HAZARD ANALYSIS

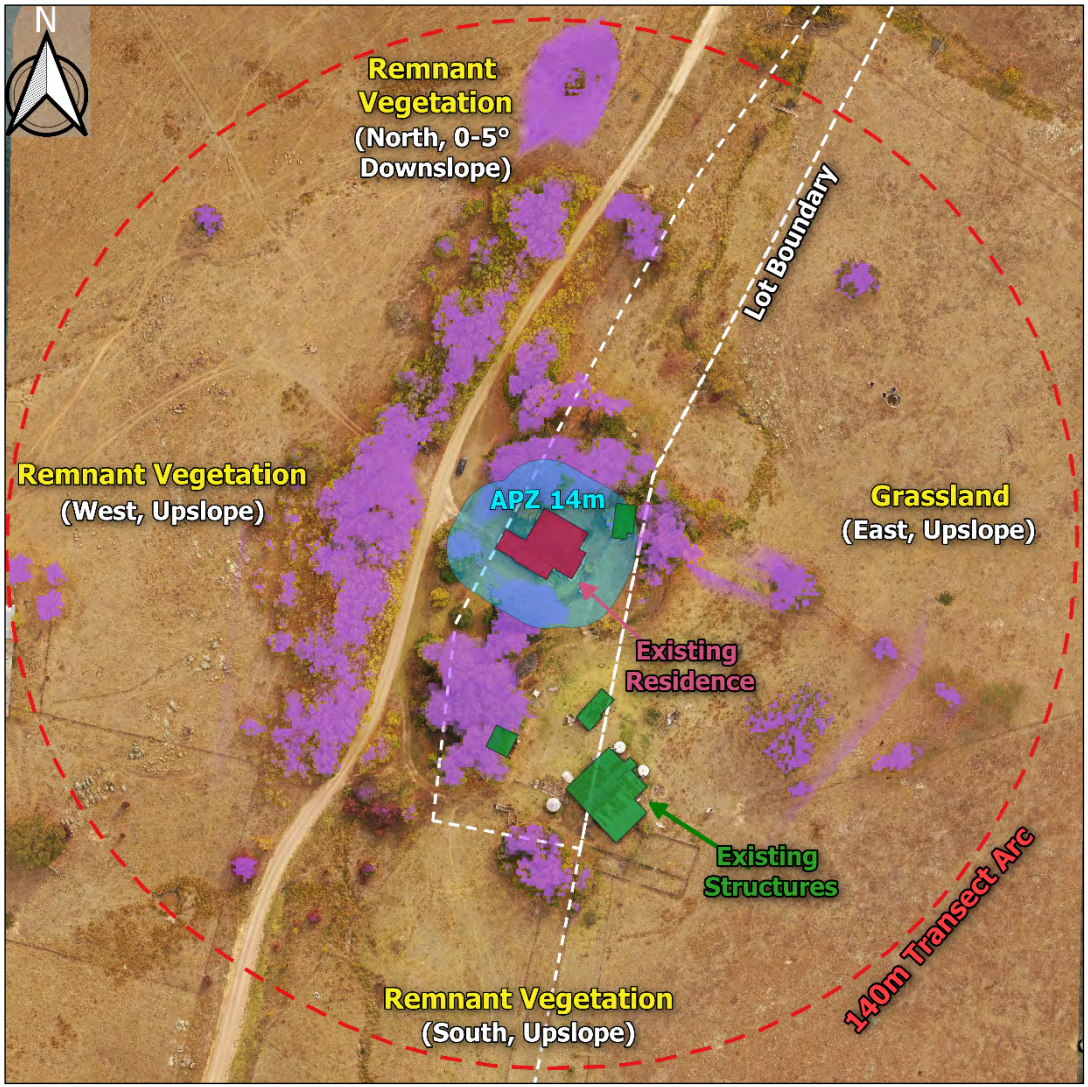

Figure 9 – Showing proposed 29 kW/m² APZ setback distances, vegetation classification and slope for Lot A. Indicative only. Not to scale. (Achurch, 2025)

HAZARD and APZ ASSESSMENT:

Vegetation Classification

Remnant Vegetation (North, South and West) and Grassland (East)

Assessment of current APZ/setbacks available.

The distances below are the current APZ setback dimensions available. These dimensions provide for a maximum radiant heat flux of no greater than 29 kW/m².

Table 4 – Radiant heat flux determination of in principle residence

Aspect	Vegetation Formation	Slope	APZ available	Max. Radiant Heat Flux (kW/m²)
N	Remnant Vegetation	0 – 5° Downslope	14 m	29
E	Grassland	Upslope	14 m	29
S	Remnant Vegetation	Upslope	14 m	29
W	Remnant Vegetation	Upslope	14 m	29

2.5.1 *LOT A SLOPE ANALYSIS AND PHOTO POINTS*

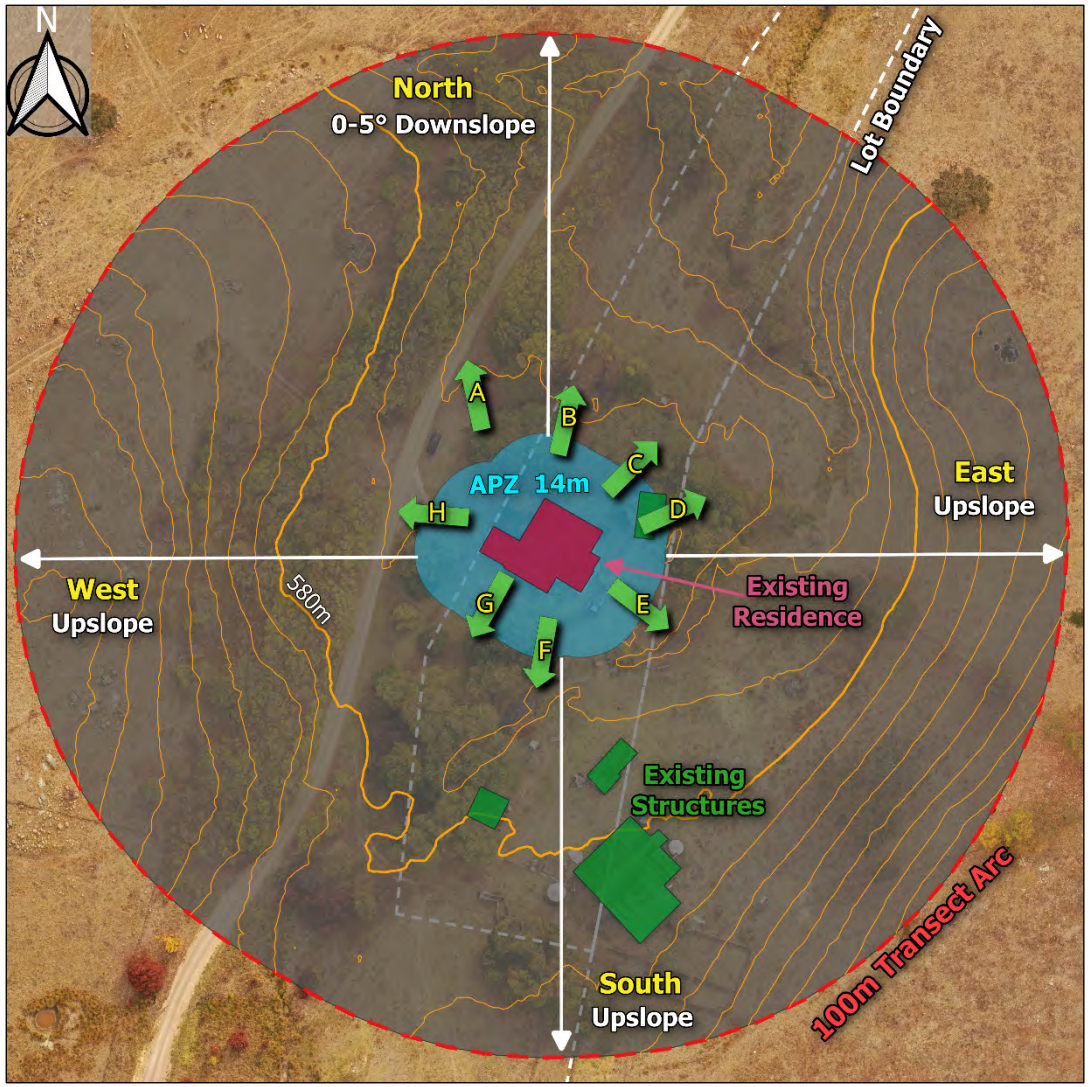

Figure 10 – Slope analysis of Lot A existing dwelling and associated photo points. (Achurch, 2025)

TRANSECT | DIRECTION | SLOPE READING

(A) | North | 0-5° Downslope

(B) | East | Upslope

(C) | South | Upslope

(D) | West | Upslope

2.5.2 *LOT A OVERVIEW OF SITE VEGETATION*

Photo point A Looking across Glenrock Road with remnant hazard vegetation northeast of the existing building.

Photo point C Looking at remnant hazard vegetation northeast of the existing building.

Photo point B showing remnant hazard vegetation north of the existing building.

Photo point D Showing remnant hazard vegetation east of the existing building.

LOT A OVERVIEW OF SITE VEGETATION

Photo point E Showing the existing power lines and shed in the grassland hazardous vegetation to southeast.

Photo point G Showing remnant hazardous vegetion south of the existing building.

Photo point F Looking south at existing structures and remnant hazard vegetation.

Photo point H Looking west across Glenrock Road.

2.5.3 *OVERVIEW OF EXISTING RESIDENCE ON LOT A*

Showing the carport attached to the existing residence.

Showing the southeast corner of the existing residence.

Looking at the southern side of the existing residence and indicative condition of building.

Looking at the east facing door with significant gaps for ember ingress on the existing building.

OVERVIEW OF EXISTING RESIDENCE ON LOT A

Looking at the northeast corner of the existing building

Looking at the north aspect of the existing building.

Showing gap above the window into the interior of the building

Showing the northeast corner of the existing building.

OVERVIEW OF EXISTING RESIDENCE ON LOT A

Looking at two ~110,000 L water tanks to the east of the existing building, outside of the proposed APZ.

Showing the proximity of vegetation to the southern aspect of the existing building

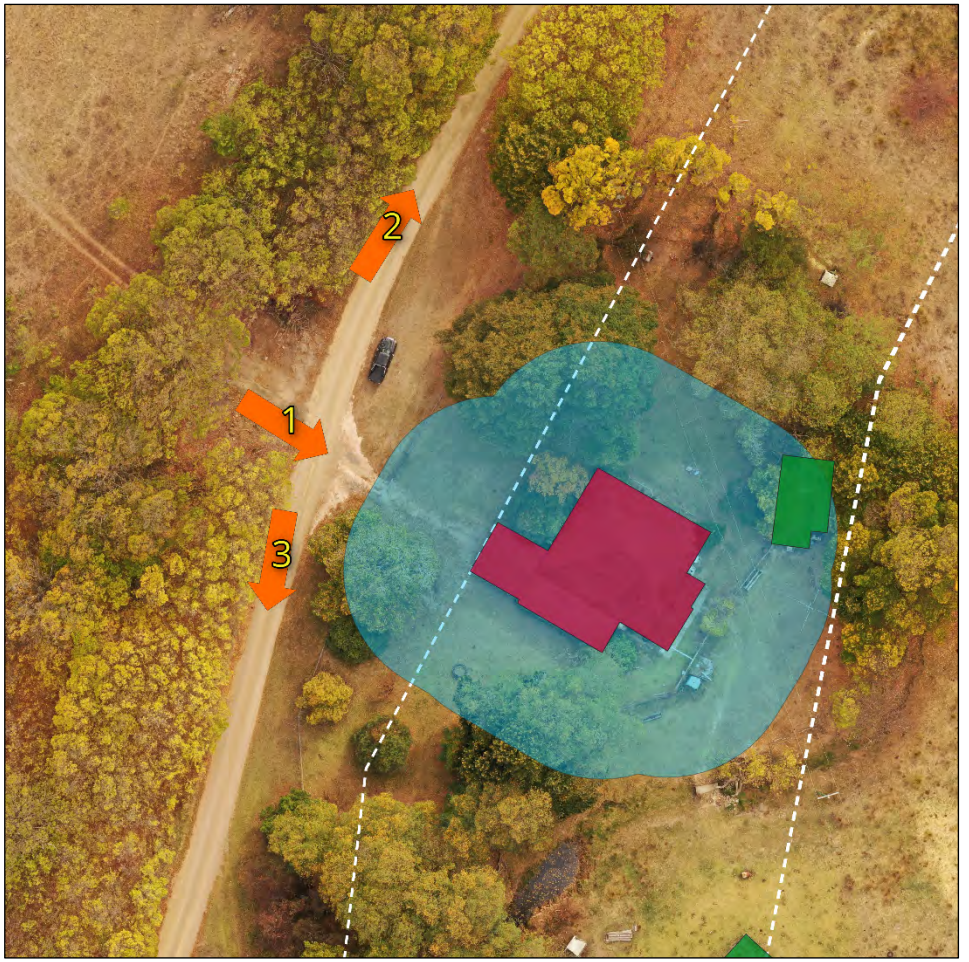

Figure 11 –Photo points showing existing access to Lot A existing building. (Achurch, 2025)

2.5.4 *SITE ACCESS TO EXISTING RESIDENCE ON LOT A*

Photo Point 1 Looking at the entrance gate and existing residence across Glenrock Road

Photo Point 3 Looking south along Glenrock Road.

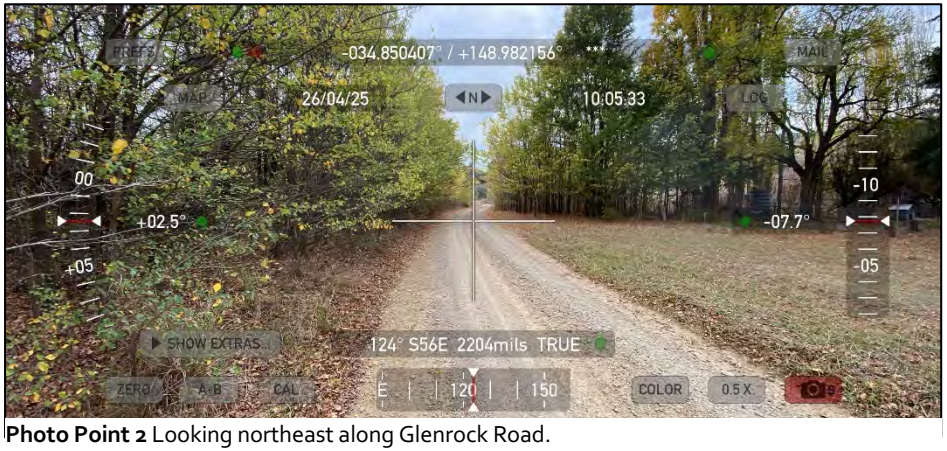

Photo Point 2 Looking northeast along Glenrock Road.

2.6 LOT B BUSHFIRE HAZARD ANALYSIS

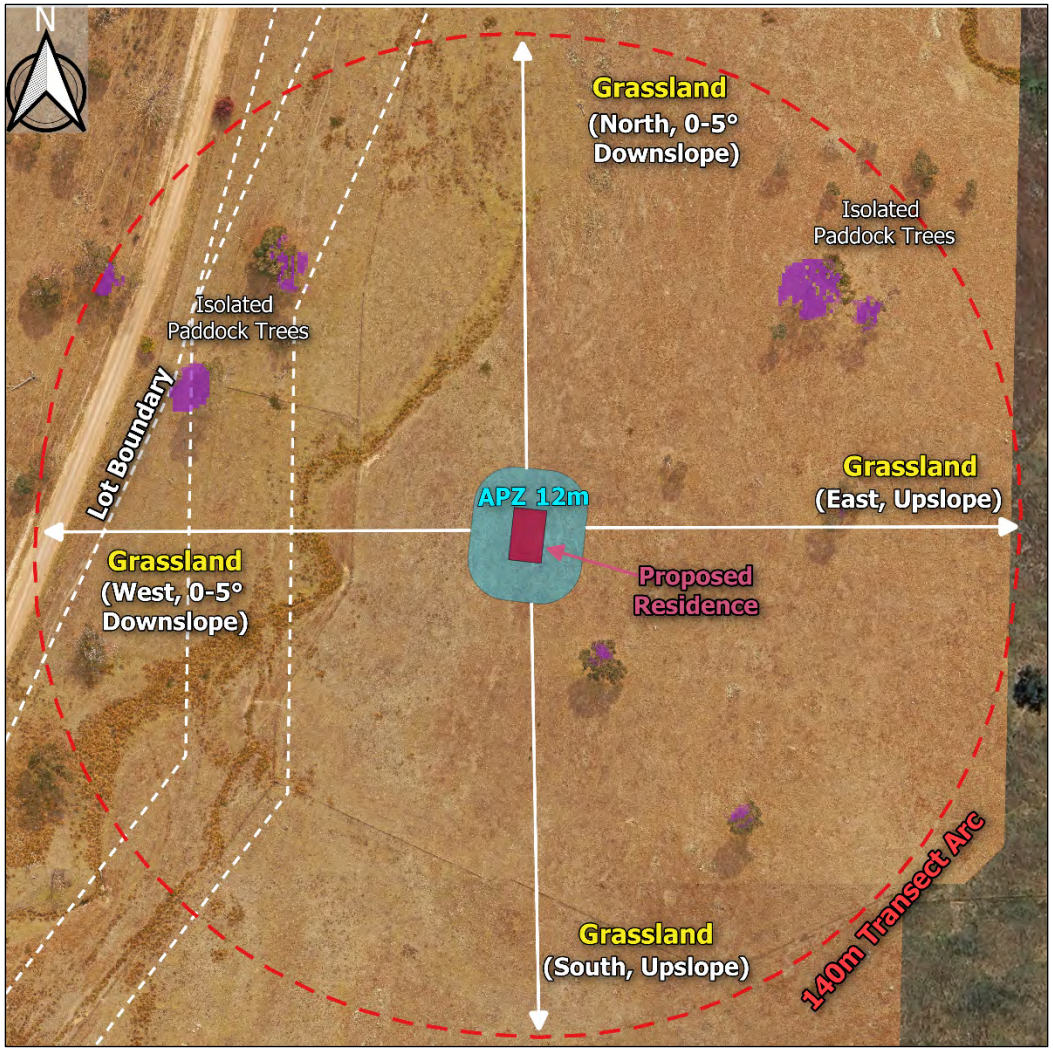

Figure 12 – Showing proposed 29 kW/m² APZ setback distances, vegetation classification and slope for Lot B. Indicative only. Not to scale. (Achurch, 2025)

HAZARD and APZ ASSESSMENT:

Vegetation Classification

Grassland (North, East, South, West)

Distances required for the creation of APZ setbacks.

The distances below are the minimum APZ setbacks required for a BAL-29 APZ, measured from the building footprint to surrounding unmanaged vegetation to ensure a maximum radiant heat flux of no greater than 29 kW/m².

APZ Dimension: 12m

2.6.1 *LOT B SLOPE ANALYSIS*

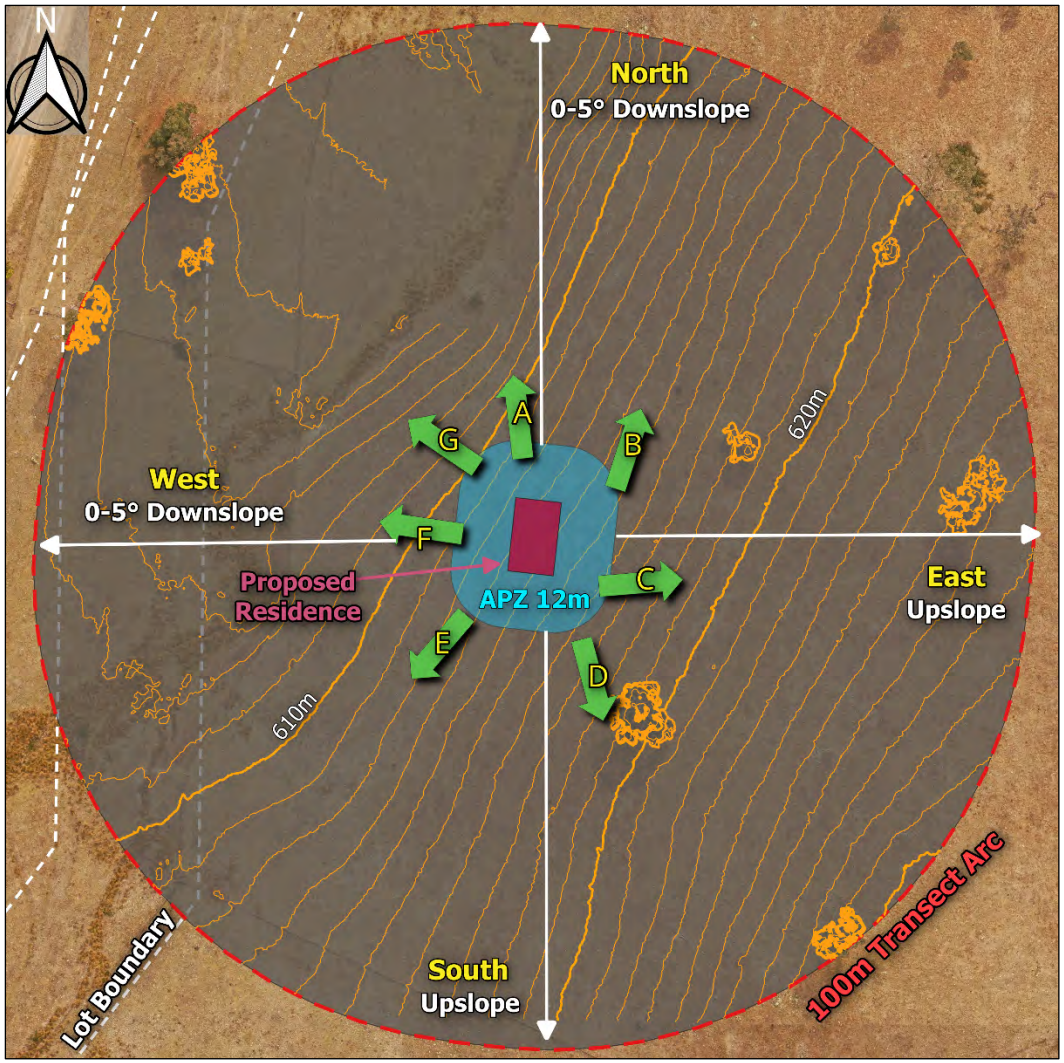

Figure 13 – Slope analysis of Lot B with indicative building footprint. (Achurch, 2025)

TRANSECT | DIRECTION | SLOPE READING

(A) | North | 0 – 5° Downslope

(B) | East | Upslope

(C) | South | Upslope

(D) | West | 0 – 5° Downslope

2.6.2 LOT B OVERVIEW OF EXISTING VEGETATION AND ACCESS

Photo Point A Looking north at the grassland hazardous vegetation

Photo Point C Looking east at the grassland hazardous vegetation

Photo Point B Looking north at the grassland hazardous vegetation

Photo Point D Looking south at the grassland hazardous vegetation

LOT B OVERVIEW OF EXISTING VEGETATION AND ACCESS

Photo Point E Looking southwest at the grassland hazardous vegetation

Photo Point G Looking northwest at the grassland hazardous vegetation

Photo Point F Looking west at the grassland hazardous vegetation

Photo point 1 (below) looking towards the proposed building footprint (Achurch, 2025).

LOT B OVERVIEW OF EXISTING VEGETATION AND ACCESS

Photo point 2 looking north along Glenrock Road (Achurch, 2025).

Photo point 3 looking south along Glenrock Road (Achurch, 2025).

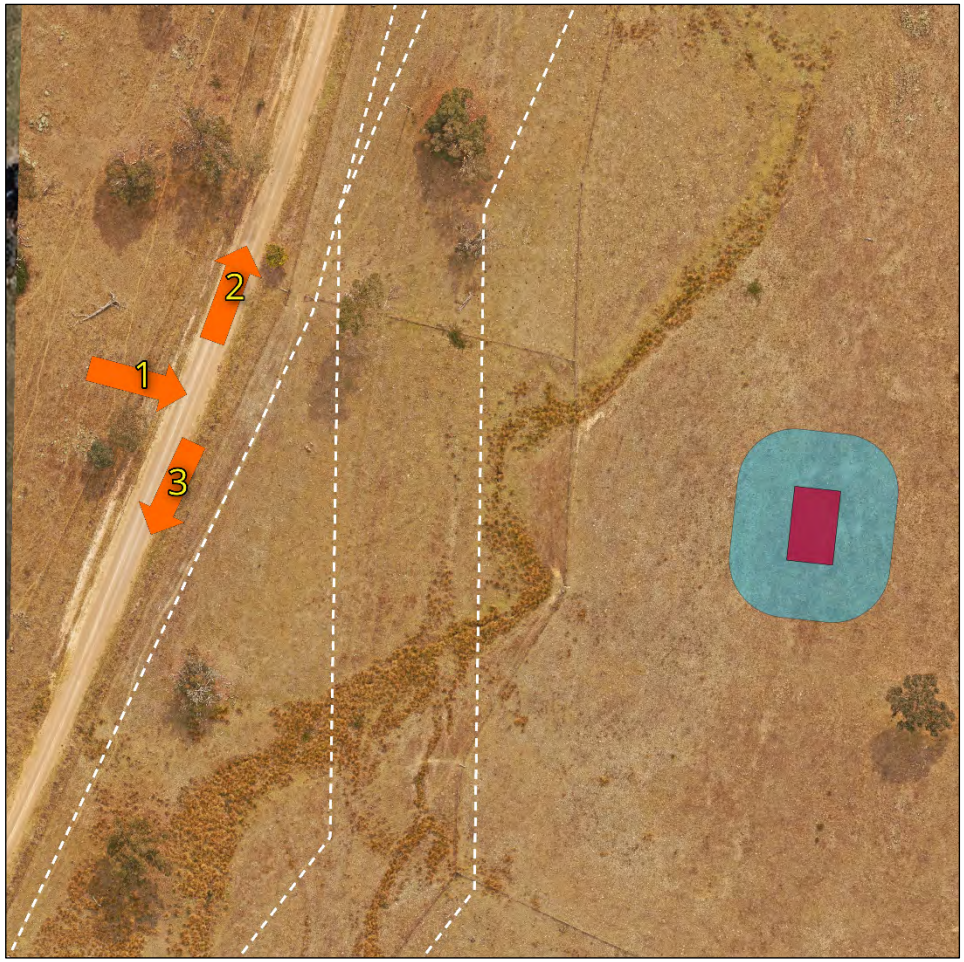

Figure 14 –Photo points showing potential access location to Lot B. (Achurch, 2025)

2.7 LOT C BUSHFIRE HAZARD ANALYSIS

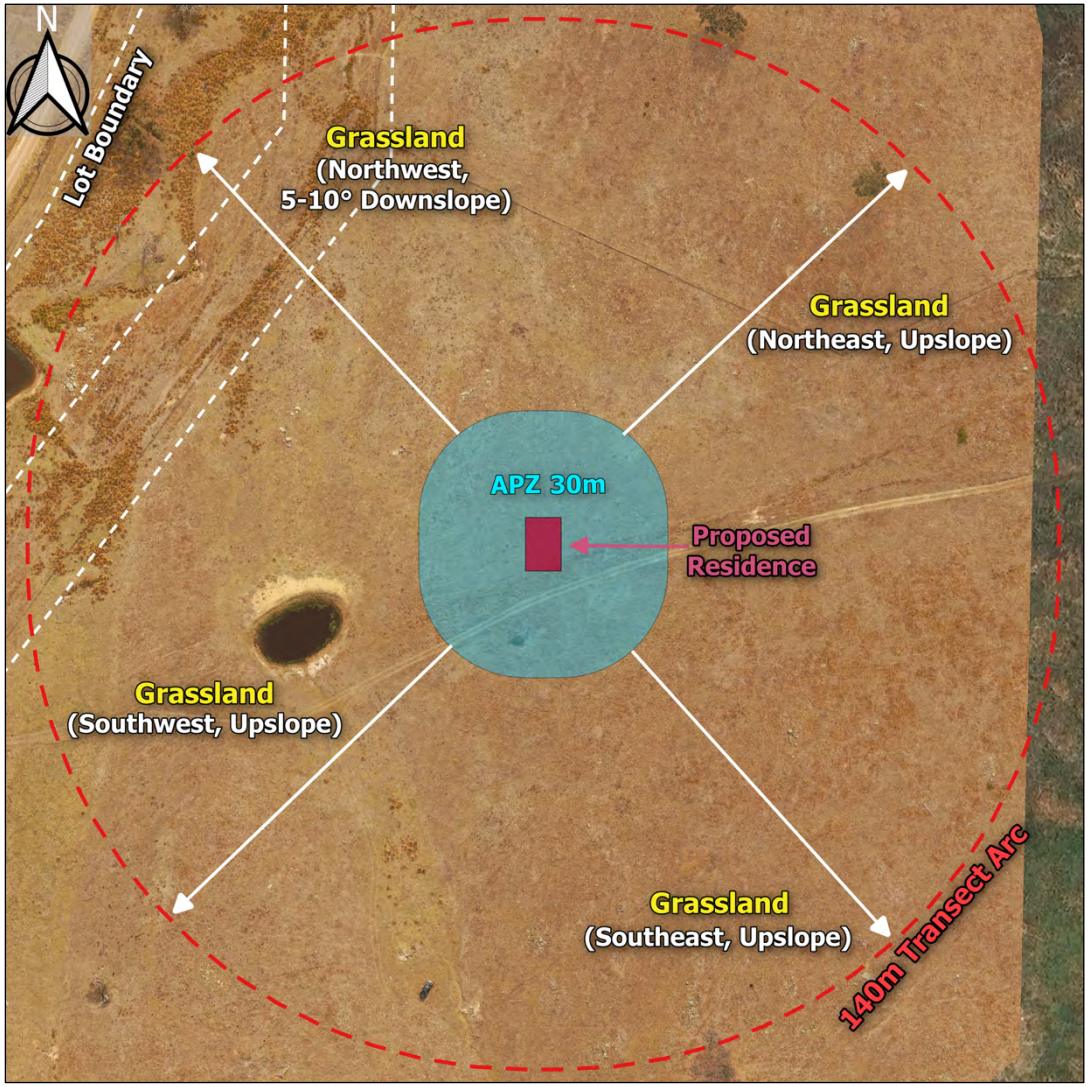

Figure 15 – Showing proposed 19 kW/m² APZ setback distances, vegetation classification and slope for Lot C. Indicative only. (Achurch, 2025)

HAZARD and APZ ASSESSMENT:

Vegetation Classification

Grassland Vegetation (Northeast, Southeast, Southwest and Northwest)

Distances required for the creation of APZ setbacks.

The distances below are the minimum APZ setbacks required for a BAL-12.5 APZ, measured from the building footprint to surrounding unmanaged vegetation to ensure a maximum radiant heat flux of no greater than 12.5 kW/m².

APZ Dimension: 30 m

2.7.1 *LOT C SLOPE ANALYSIS AND PHOTO POINTS*

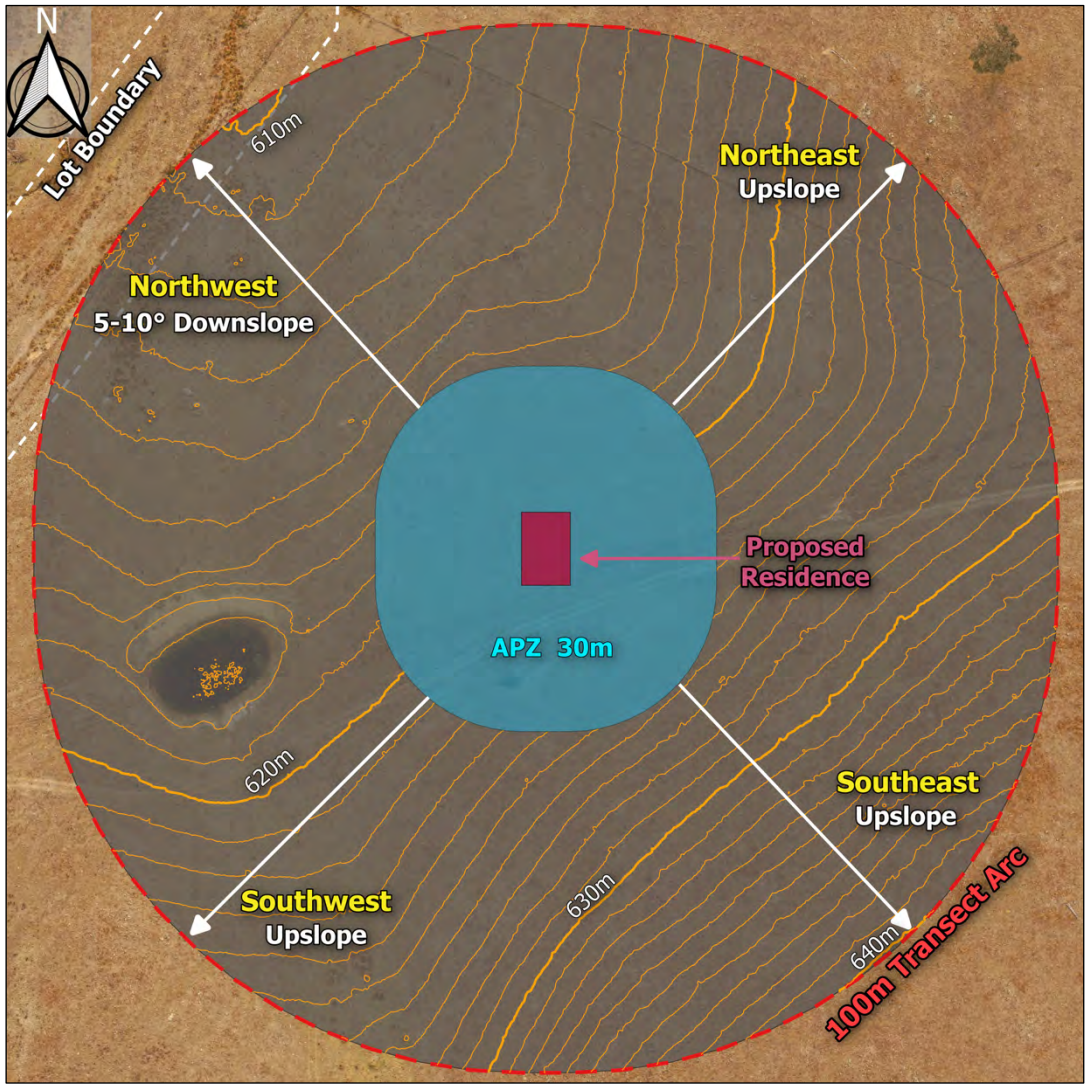

Figure 16 – Slope analysis of Lot C in principle dwelling and associated photo points. (Achurch, 2025)

TRANSECT | DIRECTION | SLOPE READING

(A) | Northeast | Upslope

(B) | Southeast | Upslope

(C) | Southwest | Upslope

(D) | Northwest | 5 – 10° Downslope

2.7.2 *LOT C OVERVIEW OF SITE VEGETATION AND ACCESS*

Photo point A Looking at the grassland hazardous vegetation north of the indicative building envelope.

Photo point C Looking at the grassland hazardous vegetation southeast of the indicative building envelope.

Photo point B Looking at the grassland hazardous vegetation northeast of the indicative building envelope.

Photo point D Looking at the grassland hazardous vegetation south of the indicative building envelope.

Photo point E Looking at the existing dam and grassland hazardous vegetation southwest of the indicative building envelope.

Photo point G Looking at the grassland hazardous vegetation northwest of the indicative building envelope.

Photo point F Looking at the existing dam and grassland hazardous vegetation west of the indicative building envelope.

LOT C OVERVIEW OF EXISTING VEGETATION AND ACCESS

Photo point 1 looking east to the existing gate and property access road across Glenrock Road (Achurch, 2025).

Photo point 2 looking southwest along Glenrock Road (Achurch, 2025).

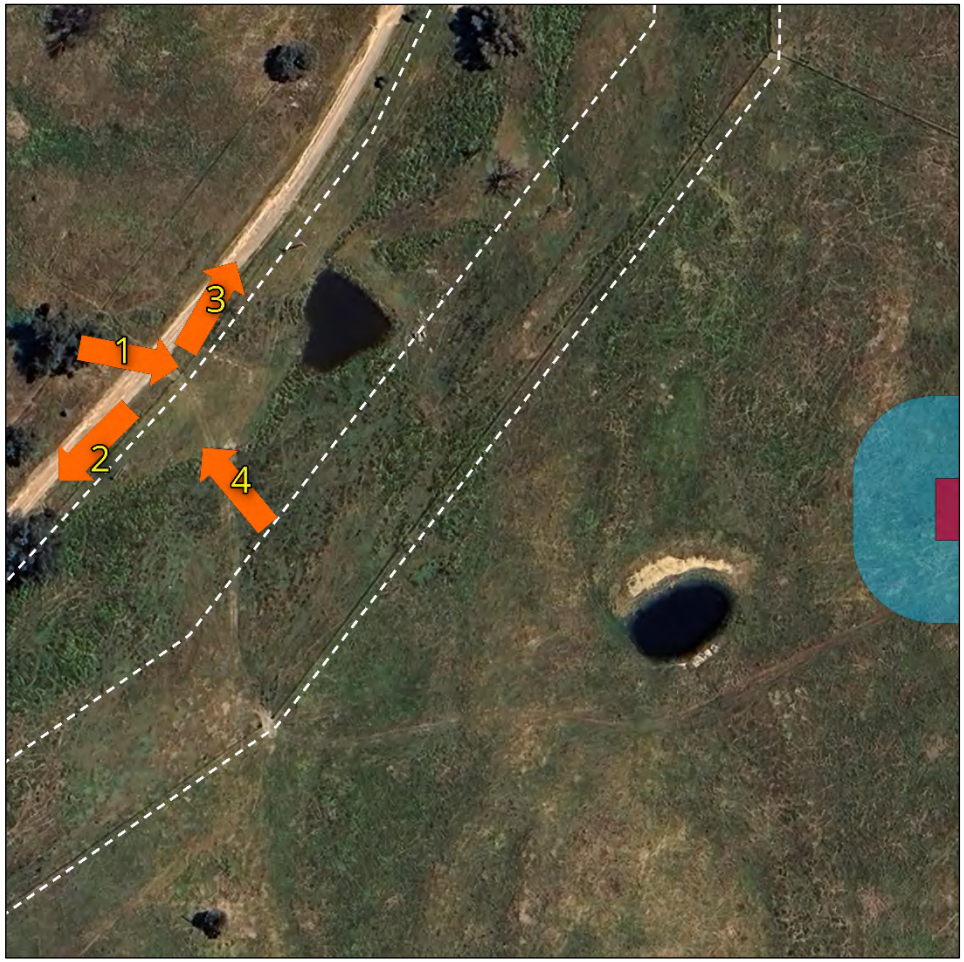

Figure 17 – Photo points showing existing access location to Lot C. (Achurch, 2025)

LOT C OVERVIEW OF EXISTING VEGETATION AND ACCESS

Photo point 3 looking northeast along Glenrock Road (Achurch, 2025).

Photo point 4 looking at a covered cattle grid in a dried out creek bed ~30m southeast of the access gate for Lot C (Achurch, 2025).

2.8 THREAT ANALYSIS CONCLUSIONS:

2.8.1 VEGETATION FORMATIONS

Vegetation formations within 140 m of the subject sites were identified and classified per Appendix A1.2 of PBP (2019).

Lot A	
Aspect	**Formation**
North	Remnant Vegetation
East	Grassland
South	Remnant Vegetation
West	Remnant Vegetation
Lot B	
Aspect	**Formation**
North	Grassland
East	Grassland
South	Grassland
West	Grassland
Lot C	
Aspect	**Formation**
Northeast	Grassland
Southeast	Grassland
Southwest	Grassland
Northwest	Grassland

2.8.2 RELEVANT FIRE DANGER INDEX

The fire danger index for the site has been determined per the NSW Rural Fire Service.

NSW Fire Area	**Fire Danger Index (FDI)**
Southern Ranges	100

2.8.3 SLOPE AND APZ SETBACK ASSESSMENT

Site slope and APZ setbacks (currently available and anticipated) were assessed per A1.4, A1.5 and Table A1.12.5 PBP 2019.

2.8.4 BUSHFIRE ATTACK LEVEL (BAL) ASSESSMENT

The resultant BAL ratings (Table 5) were determined per Table A1.12.5 of PBP (2019).

Table 5 – BAL Table

Lot	Aspect	Vegetation Formation	Slope	Min. Setback Required	Min. Setback Proposed	BAL
A	N	Remnant Vegetation	0-5° Downslope	14 m	14 m	29
A	E	Grassland	Upslope	11 m	14 m	29
A	S	Remnant Vegetation	Upslope	11 m	14 m	29
A	W	Remnant Vegetation	Upslope	11 m	14 m	29
B	N	Grassland	0-5° Downslope	12 m	12 m	29
B	E	Grassland	Upslope	10 m	12 m	29
B	S	Grassland	Upslope	10 m	12 m	29
B	W	Grassland	0-5° Downslope	12 m	12 m	29
C	NE	Grassland	Upslope	20 m	30 m	12.5
C	SE	Grassland	Upslope	10 m	30 m	12.5
C	SW	Grassland	Upslope	10 m	30 m	12.5
C	NW	Grassland	Upslope	10 m	30 m	12.5

2.8.5 GENERAL STATEMENT ON BUSHFIRE HAZARD

Given:

- the prominence of grassland vegetation surrounding the proposed building envelopes and existing dwelling providing relatively low fuel conditions,
- the slightly undulating topography moderating fire intensity and making fire behaviour comparatively less erratic and more predictable than steep topography,
- the extensive setbacks available for the creation and management of APZs,

The Subject Site broadly presents a low hazard bushfire environment. In response, the proposed development generally requires the standard suite of protection measures per PBP 2019 to address this hazard.

However, access to the allocated building envelope in Lot C is extended via no through roads, a departure from the acceptable solutions, resulting a performance-based design approach, as discussed in the next chapter.

3 BUSHFIRE PROTECTION MEASURES

DISCUSSION AND RECOMMENDATIONS:

In response to the bushfire threat analysis, a suite of Bushfire Protection Measures (BPMs) is to be adopted for the proposed subdivision per Section 5 Residential and Rural Residential Subdivisions.

Under Section 5.1.3 of PBP 2019, existing dwellings are not subject to development consent in creating a subdivision. On this basis, only certain conditions are applied to Lot A.

A statement of compliance of the proposed subdivision against PBP 2019 is provided in Appendix A of this report.

3.1 ASSET PROTECTION ZONES:

Discussion:

Table 6 (below) details the minimum APZ setback dimensions to ensure that a future dwelling on proposed Lot B, Lot C and the existing residence on Lot A are not exposed to radiant heat levels exceeding 29 kW/m^2.

The APZ setback dimensions proposed meet the minimum requirements specified by Table A1.12.2 PBP 2019 and, therefore, satisfies the acceptable solutions for APZs.

The APZ setback dimensions for proposed residence on Lot C have been specified to ensure that any future dwelling is not exposed to radiant heat levels exceeding 12.5 kW/m^2 and, therefore, exceeds the minimum requirements.

The radiant heat level of 12.5 kW/m^2 is less than the allowable 29 kW/m^2. This intended design feature will provide a higher level of safety and resilience to the future dwellings of Lots C. This design feature forms part of a performance-based design to address extended access/egress discussed in Section 3.3.

Recommendations:

- Lot A and Lot B APZ setback dimensions are to comply with the minimum dimensions provided in Table 6 below.
- Lot C APZ setback dimensions shall not be decreased during future development.
- Lot A & B APZ setback dimensions may be increased during future development to reduce the radiant heat exposure and therefore the corresponding BAL rating of any future works.

- At the commencement of building works and in perpetuity, all land within the area identified as APZ is to be managed as APZ Inner Protection Area in accordance with the requirements of Asset Protection Zone Standards - Appendix 4 of PBP (2019) (Attachment B).

Table 6- Lot A, Lot B and Lot C APZ setback requirements

Lot	Aspect	Vegetation Formation	Slope	Min. Setback Proposed	Max. Radiant heat (kW/m²)	BAL Rating
A	N	Grassland	0-5° Downslope	14 m	29	BAL-29
A	E	Forest	Upslope	14m	29	BAL-29
A	S	Grassland	Upslope	14m	29	BAL-29
A	W	Grassland	Upslope	14m	29	BAL-29
B	N	Grassland	0-5° Downslope	12 m	29	BAL-29
B	E	Grassland	Upslope	12 m	29	BAL-29
B	S	Grassland	Upslope	12 m	29	BAL-29
B	W	Grassland	0-5° Downslope	12 m	29	BAL-29
C	NE	Grassland	Upslope	30 m	12.5	BAL-12.5
C	SE	Grassland	Upslope	30 m	12.5	BAL-12.5
C	SW	Grassland	Upslope	30 m	12.5	BAL-12.5
C	NW	Grassland	5-10° Downslope	30 m	12.5	BAL-12.5

3.2 LANDSCAPING:

Recommendations:

- All landscape within the areas identified as APZ (Figures 9, 10, 12, 13, 15 & 16) are managed in perpetuity and following the requirements of Asset Protection Zone Standards - Appendix 4 of PBP (2019) provided here in Attachment B).

3.3 ACCESS:

Discussion:

The existing residence on Lot A has direct access to Glenrock Road via an existing well-maintained gravel property access road with a trafficable road width of 4m. No modifications or improvements are proposed.

Any future dwelling on Lot B will be accessed from Glenrock Road (a public through road) via a property access road that is a dead end but is less than 200 m and therefore complies with the acceptable solutions for access.

Discussion – Performance-Based Design - General Access:

Any future dwellings on Lot C will be accessed from Glenrock Road (a public through road) via a 270 m property access road that is a dead end.

At a minimum, the property access roads to Lot B and Lot C will be constructed of a gravel, all-weather, two-wheel-drive road surface with a minimum road width of 4m and an unobstructed clearance height of 4m.

The proposed property access road arrangements for the subdivision will meet most of the acceptable solutions provided in PBP (2019), except that the access to Lot C is a dead end that is greater than 200 m in length from a public through road being Glenrock Road.

The general access provisions for the Subject Site do not meet the following acceptable solutions under PBP 2019.

Performance criteria to be addressed (general access)-

- *Firefighting vehicles are provided with safe, all-weather access to structures.*

Instead of adopting the acceptable solutions offered in PBP 2019, a performance-based design is proposed to satisfy the performance criteria for general access for Lot C.

Understanding the issue.

Firstly, it should be noted that property access across the subdivision is mainly compliant. Apart from access road length to Lot C, all other acceptable solutions for access can be adopted.

Secondly, the intent of the 200 m limitation on access should be understood when assessing the performance of the development proposal. In the context of a bushfire event, 200 m is deemed the maximum allowable distance to the relative safety of a public road when through-road access cannot be provided, i.e., a dead-end road.

Property access to Lot C from a public through road is up to 270 m.

While traversing the 200 m distance in a typical bushfire-prone environment, there is the potential risk to evacuating residents or responding fire crews from radiant heat exposure, flame contact, reduced visibility and the prospect of a blocked road from falling trees or oncoming traffic, all of which could lead to entrapment. Simply put, the longer that one-way access is, the higher the risk and the less safe egress/access becomes.

Assessment and response to the issue.

If the radiant heat levels at the future dwellings can be reduced to below the minimum acceptable level, the future dwellings made more resilient through higher levels of construction and additional water supplies provided. The site becomes safer overall for attending fire crews and occupants and places less reliance on access as a safety measure.

In addition to the above, if the radiant heat levels at the building envelope can be reduced to below the minimum acceptable level, the future dwelling made more resilient through higher levels of construction, and additional water supplies provided, then the site becomes overall safer for both attending fire crews and occupants and placing less reliance on access as a safety measure.

To increase access safety, several improvements to the future dwelling on Lot C is proposed:

- Enlarged and fixed APZs, reducing radiant heat levels to 12.5 kW/m² down from 29 kW/m² making the property more defendable.
- Improved construction of BAL-19, up from BAL-12.5 making the future dwellings more resilient and providing a higher level of safety should fire crews seek shelter during the active defence of the dwelling.
- Min. of 40,000 L of static water supply (non-combustible tank/s) in place of a stand-alone 20,000 L, enabling fire crews and occupants to undertake active protection for extended periods.

This performance-based design will enable future occupants and attending fire crews to conduct a protect-in-place strategy more safely, if needed, during a bushfire event, given the enlarged APZ dimensions, improved construction rating, and increased water supplies, reducing the reliance on access for safety.

Access for the proposed subdivision is deemed to satisfy the performance requirements for access as per PBP (2019).

Recommendations for Access: -

- Access to the proposed Lot B and Lot C per the requirements for Access – Table 5.3 b of PBP (2019) provided here in (Attachment A) except that the property access road for Lot C can be greater than 200 m without an alternative access route.

3.4 WATER SUPPLIES

Discussion:

The existing residence has access to two existing 110 KL poly water tanks above ground and outside of the APZ. A minimum of 20,000 L must be dedicated to firefighting purposes. This will satisfy the minimum acceptable solutions for water supplies under PBP 2019 whilst providing additional supplies to strengthen onsite safety along with improving the resilience and defendability of the property.

Currently there is no Storz fitting to the tank and this will be required as part of the recommendations of this report.

Lot A has the following sources of existing water supplies:

- 2 x ~110,000 L poly water tanks above ground but outside of the APZ.

Lot A existing residence has sufficient water supplies exceeding 20,000 L, therefore complying with the requirements of Section 5.1.3 of PBP 2019.

The provision and siting of water supplies for Lots B and C will occur at the time of construction of a future dwelling.

Recommendations:

- Lot B future dwelling will be provided with a minimum of 20,000 L of static water supplies at the time of future development per the acceptable solutions of PBP 2019.
- Lot C future dwelling will be provided with a minimum of 40,000 L of static water supplies at the time of future development as part of the performance-based design.
- Water supplies provided for future dwellings on Lot B and Lot C are per the requirements for Water Supplies – Table 5.3 c of PBP (2019) provided herein (Attachment A).
- All fittings and specifications per Table 7.4a PBP 2019 for water supplies are detailed in Attachment A.

3.5 ELECTRICITY SERVICES

Discussion:

Future development of Lot B and Lot C will be provided with overhead electricity fed from the main electricity network.

Lot A electricity services are existing and are outside the scope of this assessment.

Recommendations:

- Electrical services for Lot B and Lot C are to be provided per Table 7.4a PBP 2019, detailed here in Attachment A.

3.6 GAS SERVICES

Discussion:

The provision of gas supplies may occur at the time of construction of any future residence on Lot B and Lot C.

Lot A gas services are existing and are outside the scope of this assessment.

Recommendations:

- If applicable, bottle gas supplies for Lot B and Lot C future residence are to be provided per Table 7.4a PBP 2019 detailed in Attachment A.

3.7 CONSTRUCTION REQUIREMENTS

Discussion:

The APZ setback dimensions for Lot A & B are provided (Table 6) to ensure that any future dwelling on Lot B and the existing residence on Lot A can achieve a radiant heat flux of less than 29 kW/m^2 therefore complying with Table A1.12.2 of PBP 2019.

The level of construction for a future dwelling on Lot C is fixed, however, at BAL-19 as part of the design to address the isolated nature of the subdivision.

While all new dwellings within a subdivision must comply with PBP 2019, existing homes can also benefit from Bushfire Protection Measures such as improved ember protection. Therefore, conditions may be applied to the subdivision consent.

Recommendations:

- The construction of a future dwelling on Lot C must comply with Sections 3 and Section 6 (BAL-19) of Australian Standard AS3959-2018 Amd 2 Construction of buildings in bushfire-prone areas as amended or NASH Standard (1.7.14 updated) National Standard Steel Framed Construction in Bushfire Areas – 2014 as appropriate,
- There is no specific BAL rating determined for a future dwelling on Lot B. The BAL rating for this future dwelling is to be determined at the time of future development, however it must comply with the appropriate specifications of Australian Standard AS3959-2018 Amd 2 Construction of buildings in bushfire-prone areas as amended,
- NASH Standard (1.7.14 updated) National Standard Steel Framed Construction in Bushfire Areas – 2014 as appropriate, and
- Section 7.5 of Planning for Bush Fire Protection 2019.
- A legally binding covenant (Section 88b instrument) stating that any future residence on Lot C must be constructed to no less than BAL-19 to ensure the level of future construction is complied with.

To improve ember protection of the existing residence on Lot A (where currently not available), several enhancements are recommended as per NSW RFS Upgrading of Existing Buildings, 2014, including:

  - Enclose all openings, including subfloor areas, openable windows, vents, weep holes and eaves.
  - Cover openings with a non-corrosive metal screen mesh with a maximum aperture of 2mm.
  - Fit external doors with draft excluders.
  - Install non-combustible gutter and valley leaf guard as required.

3.8 EMERGENCY MANAGEMENT PLANNING

Recommendation:

- Before occupying any new dwelling, residents should develop an *NSWRFS Bushfire Survival Plan.*
- EMBER Bushfire Consulting strongly recommends a "leave early" approach, specifically when fire conditions reach a Fire Danger Rating of Extreme.

3.9 Environmental Considerations

Information regarding the potential impact that the proposed development may have on the environmental and cultural values of the site is required as part of the issuing of the bush fire safety authority by the NSWRFS.

EMBER Bushfire Consulting understands from the proponent that any necessary environmental and cultural investigations are being taken as part of the development application process and will be submitted as part of the Statement of Environmental Effects.

Furthermore, if the recommended protection measures impact any environmental or culturally sensitive areas of the lot, a consultation will be made to provide alternative protection measures.

At the time of this bushfire assessment, no known environmental or cultural values or significant environmental features have been identified on the subject site.

3.10 Bushfire protection measures conclusion

The subdivision has been assessed and found capable of the following:

- APZs can provide sufficient space and reduced fuel loads to ensure radiant heat levels at the building will not exceed 29 kW/m^2.
- Landscaping can be managed to minimise flame contact, reduce radiant heat levels, minimise embers and reduce the effect of smoke on residents and firefighters.
- Safe operational access can be provided to structures and water supplies for emergency services while providing for evacuating residents, and suitable access is provided for fire management and APZ management purposes.
- Providing water for the protection of buildings during and after the passage of a bush fire, gas and electricity will be located so as not to contribute to the risk of fire to a building.

4 BUSHFIRE MANAGEMENT PLAN - SUMMARY OF RECOMMENDATIONS.

4.1 ASSET PROTECTION ZONES

- Lot A and Lot B APZ setback dimensions are to comply with the minimum dimensions provided in Table 6 below.
- Lot C APZ setback dimensions shall not be decreased during future development.
- Lot A & B APZ setback dimensions may be increased during future development to reduce the radiant heat exposure and therefore the corresponding BAL rating of any future works.
- At the commencement of building works and in perpetuity, all land within the area identified as APZ is to be managed as APZ Inner Protection Area in accordance with the requirements of Asset Protection Zone Standards - Appendix 4 of PBP (2019) (Attachment B).

Table 6- Lot A, Lot B and Lot C APZ setback requirements

Lot	Aspect	Vegetation Formation	Slope	Min. Setback Proposed	Max. Radiant heat (kW/m²)	BAL Rating
A	N	Grassland	0-5° Downslope	14 m	29	BAL-29
A	E	Forest	Upslope	14m	29	BAL-29
A	S	Grassland	Upslope	14m	29	BAL-29
A	W	Grassland	Upslope	14m	29	BAL-29
B	N	Grassland	0-5° Downslope	12 m	29	BAL-29
B	E	Grassland	Upslope	12 m	29	BAL-29
B	S	Grassland	Upslope	12 m	29	BAL-29
B	W	Grassland	0-5° Downslope	12 m	29	BAL-29
C	NE	Grassland	Upslope	30 m	12.5	BAL-12.5
C	SE	Grassland	Upslope	30 m	12.5	BAL-12.5
C	SW	Grassland	Upslope	30 m	12.5	BAL-12.5
C	NW	Grassland	5-10° Downslopes	30 m	12.5	BAL-12.5

4.2 LANDSCAPING

- All landscape within the areas identified as APZ (Figures 9, 10, 12, 13, 15 & 16) are managed in perpetuity and following the requirements of Asset Protection Zone Standards - Appendix 4 of PBP (2019) provided here in Attachment B).

4.3 ACCESS

- Access to the proposed Lots B and C per the requirements for Access – Table 5.3 b of PBP (2019) provided here in (Attachment A) except that the property access road for Lot C can be greater than 200 m without an alternative access route.

4.4 WATER SUPPLIES, ELECTRICITY AND GAS

- Lot B future dwelling will be provided with a minimum of 20,000 L of static water supplies at the time of future development per the acceptable solutions of PBP 2019.
- Lot C future dwelling will be provided with a minimum of 40,000 L of static water supplies at the time of future development as part of the performance-based design.
- Water supplies provided for future dwellings on Lot B and Lot C are per the requirements for Water Supplies – Table 5.3 c of PBP (2019) provided herein (Attachment A).
- All fittings and specifications per Table 7.4a PBP 2019 for water supplies are detailed in Attachment A.
- Electrical services for Lot B and Lot C are to be provided per Table 7.4a PBP 2019, detailed here in Attachment A.
- If applicable, bottle gas supplies for Lot B and Lot C future residences are to be provided per Table 7.4a PBP 2019 detailed in Attachment A.

4.5 CONSTRUCTION

- The construction of a future dwelling on Lot C must comply with Sections 3 and Section 6 (BAL-19) of Australian Standard AS3959-2018 Amd 2 Construction of buildings in bushfire-prone areas as amended or NASH Standard (1.7.14 updated) National Standard Steel Framed Construction in Bushfire Areas – 2014 as appropriate,
- There is no specific BAL rating determined for a future dwelling on Lot B. The BAL rating for this future dwelling is to be determined at the time of future development, however it must comply with the appropriate specifications of Australian Standard AS3959-2018 Amd 2 Construction of buildings in bushfire-prone areas as amended,
- NASH Standard (1.7.14 updated) National Standard Steel Framed Construction in Bushfire Areas – 2014 as appropriate, and
- Section 7.5 of Planning for Bush Fire Protection 2019.
- To improve ember protection of the existing residence on Lot A (where currently not available), several enhancements are recommended as per NSW RFS Upgrading of Existing Buildings, 2014, including:
    - Enclose all openings, including subfloor areas, openable windows, vents, weep holes and eaves.
    - Cover openings with a non-corrosive metal screen mesh with a maximum aperture of 2mm.

- Fit external doors with draft excluders.
- Install non-combustible gutter and valley leaf guard as required.

4.6 EMERGENCY MANAGEMENT PLANNING

Recommendation:

- Before occupying any new dwelling, residents should develop an *NSWRFS Bushfire Survival Plan.*
- EMBER Bushfire Consulting strongly recommends a "leave early" approach, specifically when fire conditions reach a Fire Danger Rating of Extreme.

5 CONCLUSION

This report documents the findings from a bush fire assessment conducted on a proposed subdivision at 336 Glenrock Road, Cavan.

APZ setback dimensions within the proposed Lots A, B and C will ensure that the existing and future dwellings are not exposed to radiant heat levels exceeding 29 kW/m^2 and will comply with Table A1.12.2 of PBP 2019.

Access to Lots B and C of the proposed subdivision can be well provided for and will essentially comply with the acceptable solutions set out in PBP (2019). Where the acceptable solutions cannot be met, a performance-based assessment of the proposal is undertaken, which considers the compliant APZ dimensions, higher levels of construction and increased water supplies, all of which improve the level of safety, resilience and defendability of the future structures while placing less reliance on access as a safety measure.

As part of the Performance-Based Design to address extended egress, any future dwelling on Lot C is required to be constructed to BAL-19 per the relevant sections of Australian Standard 3959-2018 Construction of buildings in bushfire-prone areas.

Electricity, water and gas supplies will be provided during future development and must comply with the general specifications provided here.

At the time of this report, the development is not known to have any significant environmental or cultural values within the subdivision areas requiring consideration as part of this assessment.

Based on the bushfire assessment and the recommendations contained in this report, the proposed development is deemed to comply with the specific and broad objectives of PBP (2019), the requirements of the Rural Fire regulations (2022) and, therefore, suitable for submission to the NSWRFS for the issuing of a bush fire safety authority.

Be advised that the NSWRFS may alter recommendations or impose additional conditions as it feels necessary to offer further protection to the structures, occupants and firefighters during a bushfire.

6 REFERENCE

- ePlanning Spatial Viewer, Department of Planning Industry and Environment, accessed 6th May 2025, https://www.planningportal.nsw.gov.au/spatialviewer/#/find-a-property/address
- FireMaps (FPA Australia, 2021), https://maps.fpaafiremaps.com.au, accessed 6th May 2025,
- Keith D. (2004) "Ocean Shores to Desert Dunes", Department of Environment and Conservation, Sydney.
- NSW Rural Fire Service. (2019) "Planning for Bushfire Protection". Sydney (PBP (2019)
- SEED (NSW Government, 2022) Vegetation Formations and Classes of NSW (Version 3.03 – 200m Raster) – David A. Keith and Christopher C. Simpson. VIS_ID 3848, accessed 6th May 2025, https://geo.seed.nsw.gov.au/Public_Viewer/index.html?viewer=Public_Viewer&locale=enAU&runWorkflow=AppendLayerCatalog&CatalogLayer=SEED_Catalog.85.Areas
- Six Maps, NSW Department of Finance and Services, accessed 6th May 2025, https://maps.six.nsw.gov.au/#
- Standards Australia, (2018) "AS/NZS 3959-2018 Construction of buildings in bushfire-prone areas."

ATTACHMENT A – PBP 2019 COMPLIANCE ASSESSMENT

The following compliance assessment tables show the performance criteria for each protection measure for the proposed development. The table also identifies which avenue is used to achieve compliance, details of the acceptable solution and specific information on how this is achieved for the proposed development. Where performance-based solutions are proposed, further details are provided in Section 3 – Bushfire Protection Measures.

Performance Criteria	Method of Compliance	Acceptable Solution	Comments / Details
ASSET PROTECTION ZONES			
• Potential building footprints must not be exposed to radiant heat levels exceeding 29 kW/m^2 on each proposed lot.	Will meet the acceptable solutions.	• APZs are provided per Tables A1.12.2 and A1.12.3 based on the FFDI.	Can Comply
• APZs are managed and maintained to prevent the spread of a fire towards the building.	Will meet the acceptable solutions.	• APZs are managed per the requirements of Appendix 4.	Can Comply
• The APZs is provided in perpetuity.	Will meet the acceptable solutions.	• APZs are wholly within the boundaries of the development site	Can Comply
• APZ maintenance is practical, soil stability is not compromised and the potential for crown fires is minimised.	Will meet the acceptable solutions.	• APZs are located on lands with a slope less than 18 degrees.	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.	Will meet the acceptable solutions.	• landscaping is per Appendix 4; and • fencing is constructed per section 7.6.	Can Comply

ACCESS (General Requirements)			
• firefighting vehicles are provided with safe, all-weather access to structures.	Will meet the acceptable solutions.	• 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 gradient specified by road design standards, whichever is the lesser gradient; • 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.	Performance based design per Section 3.3 of this report.
• the capacity of access roads is adequate for firefighting vehicles.	Will meet the acceptable solutions.	• 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.	Can Comply
• there is appropriate access to water supply.	Will meet the acceptable solutions.	• hydrants are located outside of parking reserves and road carriageways to ensure accessibility to reticulated water for fire suppression; • hydrants are provided per the relevant clauses of AS 2419.1:2005 - Fire hydrant installations System design, installation and commissioning; and • there is suitable access for a Category 1 fire appliance to within 4m of the static water supply where no reticulated supply is available.	Can Comply
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	Perimeter roads are not applicable.	• are two-way sealed roads; • minimum 8m carriageway width kerb to kerb; • parking is provided outside of the carriageway width; • hydrants are located clear of parking areas;	Perimeter roads are not applicable.

firefighting and emergency management on the interface.		• are through roads, and these are linked to the internal road system at an interval of no greater than 500m; • curves of roads have a minimum inner radius of 6m; the maximum grade road is 15 degrees and average grade of not more than 10 degrees; • the road crossfall does not exceed 3 degrees; and • a minimum vertical clearance of 4m to any overhanging obstructions, including tree branches, is provided.	
NON-PERIMETER ROADS			
• access roads are designed to allow safe access and egress for firefighting vehicles while residents are evacuating.	Non-Perimeter roads are not applicable.	• minimum 5.5m carriageway width kerb to kerb; • parking is provided outside of the carriageway width; • hydrants are located clear of parking areas; • roads are through roads, and these are linked to the internal road system at an interval of no greater than 500m; • curves of roads have a minimum inner radius of 6m; • the road crossfall does not exceed 3 degrees; and • a minimum vertical clearance of 4m to any overhanging obstructions, including tree branches, is provided.	Non-Perimeter roads are not applicable.

PROPERTY ACCESS			
• firefighting vehicles can access the dwelling and exit the property safely.	Will meet the acceptable solutions.	• 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. In circumstances where this cannot occur, the following requirements apply: ○ 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; ○ provide a suitable turning area per Appendix 3; ○ 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;	Can Comply

		○ 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. 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.	
WATER SUPPLIES			
• adequate water supplies is provided for firefighting purposes.	Will meet the acceptable solutions.	• reticulated water is to be provided to the development where available; • a static water and hydrant supply is provided for non-reticulated developments or where reticulated water supply cannot be guaranteed; and • static water supplies shall comply with Table 5.3d.	40,000 L static water supplies is proposed to Lot C residence as part of a performance based design to address extended egress.
• water supplies are located at regular intervals; and • the water supply is accessible and reliable for firefighting operations.	Fire hydrants are not applicable.	• fire hydrant, spacing, design and sizing complies with the relevant clauses of Australian Standard AS 2419.1:2005; • hydrants are not located within any road carriageway; and • reticulated water supply to urban subdivisions uses a ring main system for areas with perimeter roads.	Not applicable.
• flows and pressure are appropriate.	Fire hydrants are not applicable.	• fire hydrant flows and pressures comply with the relevant clauses of AS 2419.1:2005.	Not applicable.
• the integrity of the water supply is maintained.	Will meet the acceptable solutions.	• all above-ground water service pipes are metal, including and up to any taps; and • above-ground water storage tanks shall be of concrete or metal.	Can Comply
ELECTRICITY SERVICES			
• location of electricity services limits the possibility of ignition of surrounding bush land or the fabric of buildings.	Will meet the acceptable solutions.	• where practicable, electrical transmission lines are underground; • where overhead, electrical transmission lines are proposed as follows: ○ lines are installed with short pole spacing of 30m, 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 ISSC3 Guideline for Managing Vegetation Near Power Lines.	Can Comply
GAS SERVICES			
• location and design of gas services will not lead to ignition of surrounding bushland or the fabric of buildings.	Will meet the acceptable solutions.	• reticulated or bottled gas is installed and maintained per AS/NZS 1596:2014 - The storage and handling of LP Gas, the requirements of relevant authorities, and metal piping is used; • all fixed gas cylinders are kept clear of all flammable materials to a distance of 10m and shielded on the hazard side;	Can Comply

		• connections to and from gas cylinders are metal; • polymer-sheathed flexible gas supply lines are not used; and • above-ground gas service pipes are metal, including and up to any outlets.	

ATTACHMENT B – APZS, LANDSCAPING, FENCES AND GATES

In Australia, bush fires are a natural and essential aspect of the landscape as many plants and animals have adapted to fire as part of their life cycle. However, development adjacent to bush land areas has increased the risk of fire impacting on people and their assets. The impact on property and life can be reduced with responsible preparation and management of bush fire hazards.

In combination with other BPMs, a bush fire hazard can be reduced by implementing simple steps in reducing vegetation levels. This can be done by designing and managing landscaping to implement an APZ around the property.

This Appendix sets the standards which need to be met within an APZ.

A4.1 Asset protection zones

An APZ is a fuel-reduced area surrounding a built asset or structure.

For a complete guide to APZs and landscaping, download the NSW RFS document *Standards for Asset Protection Zones* at: www.rfs.nsw.gov.au/resources/publications.

An APZ provides:

- a buffer zone between a bush fire hazard and an asset
- an area of reduced bush fire fuel that allows suppression of fire
- an area from which backburning or hazard reduction can be conducted,
- an area which allows emergency services access and provides a relatively safe area for firefighters and home owners to defend their property.

Potential bush fire fuels should be minimised within an APZ. This is so that the vegetation within the planned zone does not provide a path for the transfer of fire to the asset either from the ground level or through the tree canopy.

An APZ, if designed correctly and maintained regularly, will reduce the risk of:

- direct flame contact on the asset
- damage to the built asset from intense radiant heat
- ember attack.

The APZ should be located between an asset and the bush fire hazard.

The methodology for calculating the required APZ distance is contained within Appendix 1. The width of the APZ required will depend upon the development type. APZs for new development are set out within Chapters 5, 6 and 7 of this document.

In forest vegetation, the APZ can be made up of an inner protection area (IPA) and an outer protection area (OPA).

Inner protection areas (IPAs)

The IPA is the area closest to the asset and creates a fuel-managed area which can minimise the impact of direct flame contact and radiant heat on the development and be a defendable space. Vegetation within the IPA should be kept to a minimum level. Litter fuels within the IPA should be kept below 1cm in height and be discontinuous.

In practical terms the IPA is typically the curtilage around the dwelling, consisting of a mown lawn and well maintained gardens.

When establishing and maintaining an IPA the following requirements apply:

Trees:

- 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 2m above ground
- canopies should be separated by 2 to 5m
- preference should be given to smooth barked and evergreen trees.

Shrubs:

- create large discontinuities or gaps in the vegetation to slow down or break the progress of fire towards buildings
- shrubs should not be located under trees
- shrubs should not form more than 10% ground cover
- clumps of shrubs should be separated from exposed windows and doors by a distance of at least twice the height of the vegetation.

Grass:

- should be kept mown (as a guide grass should be kept to no more than 100mm in height)
- leaves and vegetation debris should be removed.

Outer protection areas (OPAs)

An OPA is located between the IPA and the unmanaged vegetation. Vegetation within the OPA can be managed to a more moderate level. The reduction of fuel in this area substantially decreases the intensity of an approaching fire and restricts the pathways to crown fuels; reducing the level of direct flame, radiant heat and ember attack on the IPA.

Because of the nature of an OPA, they are only applicable in forest vegetation.

In practical terms the OPA is an area where there is maintenance of the understorey and some separation in the canopy.

When establishing and maintaining an OPA the following requirements apply:

Trees:

- tree canopy cover should be less than 30%
- trees should have canopy separation
- canopies should be separated by 2 to 5m

Shrubs:

- shrubs should not form a continuous canopy
- shrubs should form no more than 20% of ground cover

Grass:

- should be kept mown (as a guide grass should be kept to no more than 100mm in height)
- leaf and other debris should be mown, slashed or mulched.

An APZ should be maintained in perpetuity to ensure ongoing protection from the impact of bush fires. Maintenance of the IPA and OPA to the standards given above should be undertaken on an annual basis, in advance of the fire season, as a minimum.

FENCES & GATES (SECTION 7.6 PBP 2019)

Fences and gates in bush fire prone areas may play a significant role in the vulnerability of structures during bush fires. In this regard, all fences in bush fire prone areas should be made of either hardwood or non-combustible material.

However, in circumstances where the fence is within 6m of a building or in areas of BAL-29 or greater, they should be made of non-combustible material only.

ATTACHMENT C - ACCESS

A3.3 Vehicle turning head requirements

Dead ends that are longer then 200m must be provided with a turning head area that avoids multipoint turns. "No parking" signs are to be erected within the turning head.

The minimum turning radius shall be in accordance with Table A3.2. Where multipoint turning is proposed the NSW RFS will consider the following options:

Figure A3.3

Multipoint turning options.