BUSHFIRE ASSESSMENT REPORT

69 GORMAN ROAD, GOULBURN

Lot 11 DP 1044967

Bushfire strategic study for land rezoning

Prepared for Beth and James Hoskins

27.7.23

Final Issue

ember
bushfire consulting

EXECUTIVE SUMMARY

EMBER Bushfire Consulting has been engaged by Beth and James Hoskins to prepare a Bushfire Strategic Study (BFSS) in support of a planning proposal at 69 Gorman Road Goulburn (the Study Area) on the periphery of Goulburn. The planning proposal seeks the rezoning of developed land and a future development application for a concept two-lot rural residential subdivision at the subject Lot.

The proposed subdivision is located on bushfire prone land as declared by the Goulburn Mulwaree Council (GMC) and NSW RFS.

This assessment adopts a methodology provided under the requirements of Section 100B of the Rural Fires Act and the Rural Fire Regulations 2013 to assess the adequacy for bushfire protection of a concept subdivision under Planning for Bushfire Protection 2019 (PBP 2019).

The report establishes the level of bushfire threat to the Study Area and examines bushfire protection in accordance with the principles of Section 4 of PBP 2019 to ensure –

- the land is suitable for development in the context of bush fire risk;
- future development on BFPL can comply with PBP 2019;
- will minimise reliance on performance-based solutions;
- will provide adequate infrastructure associated with emergency evacuation and firefighting operations; and
- facilitate appropriate ongoing land management practices.

The recommendations contained in this report are designed to inform the planning proposal stage and, given the level of detail provided may also be used for DA purposes.

Given the predominate vegetation is Grassland with clear definition of areas of Forest on slightly undulating topography, the surrounding environment possesses a relatively moderate bushfire threat. This threat however can be further moderated with the adoption of the standard suite of protection measures offered by PBP 2019 and for which the proposed development can largely comply.

Given the open grassland setting it is envisaged that it will be easy to provide the necessary space for the establishment and ongoing maintenance of setbacks and APZs.

Access to the subject site is well provided for and will largely comply with the acceptable solutions set out in PBP 2019.

Specific Firefighting water supplies are recommended to meet the specific requirements of PBP 2019.

Based on the bushfire assessment and the recommendations contained in this report, the planning proposal is deemed capable of meeting the underlying principles of strategic planning and should be supported.

CERTIFICATION STATEMENT

Document Title:	Bushfire Assessment Report Bushfire Strategic Study - 69 Gorman Road, Goulburn
EMBER Reference:	JD.176.23
Lot & DP Number	Lot 11 DP 1044967
Street Address	69 Gorman Road, Goulburn
Local Government Area	Goulburn Mulwaree Council
Description of the development	Planning proposal
Type of assessment under Planning for Bushfire Protection (2019)	Section 4 – Bush Fire Strategic Study
Is referral of the proposal to the NSW RFS required?	Yes – Direction 4.4 of the EP&A Act (1979).
Has a pre-DA lodgment or bush fire design brief been provided to the NSW RFS?	NO
Highest radiant heat flux determined for the development.	<19 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 Study Area was carried out on 6th March 2023;
- 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;
- That I am a person recognised by NSW RFS as a qualified consultant in bush fire risk assessment; and
- That subject to the recommendations contained in this report, the concept development conforms to the relevant specifications and requirements of PBP.

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

27/7/2023

BPAD Bushfire Planning & Design Accredited Practitioner Level 3

Document Control

Information	Detail
Document Title:	Bushfire Assessment Report Bushfire Strategic Study - 69 Gorman Road, Goulburn
EMBER Reference:	JD.176.23
Other Reference:	215271-DA01-01_PPS1 (LandTeam Australia)
Version:	1.0
Version Control:	1.0 – First Issue – 12.5.23 2.0 – Second Issue – 5.6.23 incorporating adjustments to house location and APZ dimensions. 3.0 Final Issue – 30.6.23 Modification of report to an Bushfire Strategic Study of of a planning proposal. 4.0 Final Issue – 27.7.23 Minor amendments
Status:	Issued

KEY DETAILS OF DEVELOPMENT

Information	Detail
Zoning of subject land	C3 – Environmental Management RU6 - Transition
Zoning of adjoining lands	C3 – Environmental Management RU6 - Transition
Lot size	~10 ha
Staging issues	Nil
Development classification	Planning Proposal
Type of assessment	Bush Fire Strategic Study
Fire weather area	Southern Ranges
Fire Danger Index	100
Predominant vegetation	Grassland and Forest Vegetation
Slope	Ranging from upslope to 0°-5° downslope
Environmental constraints	Nil known
Cultural constraints	Nil known
Method of meeting performance requirements	Using both acceptable and performance-based design.

HOW TO READ THIS DOCUMENT

Section 1 Introduction – Introduction and overview of the Study Area and concept development.

Section 2 Assessing the bushfire threat - Identification of critical factors contributing to bushfire threat, planning considerations and assessment of the overall threat.

Section 3 Bushfire Protection Measures – Assessment and discussion of the recommended bushfire protection measures 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.

Section 5 Conclusion – Concluding statement.

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1 INTRODUCTION AND OVERVIEW

1.1 BACKGROUND

Beth and James Hoskins have engaged EMBER Bushfire Consulting to prepare a bushfire assessment report in support of a planning proposal for the rezoning of undeveloped land at 69 Gorman Road Goulburn (the Study Area), and a future development application for a concept two-lot rural residential subdivision at the subject Lot.

The planning proposal is located on land designated bushfire prone by NSW Rural Fire Service (NSW RFS) and Council and, as a result, requires the application of Section 9.1(2) of the Environmental Planning and Assessment Act (1979) (EP&A Act).

Under Direction 4.4 of the EP&A Act, Planning for Bush Fire Protection applies to planning proposals on designated Bush Fire Prone Land (BFPL).

Under Direction 4.4, planning proposals should adhere to the follow objectives:

- to protect life, property, and the environment from bushfire hazards by discouraging the establishment of incompatible land uses in bushfire prone areas; and
- to encourage sound management of bushfire prone areas.

The principles for assessment of the planning proposal are provided in Section 4 Strategic Planning, Planning for Bush Fire Protection (2019) (PBP 2019) and is therefore the key reference for this report.

The broad principles of Section 4 are to:

- ensure land is suitable for development in the context of bush fire risk;
- ensure new development on BFPL will comply with PBP;
- minimise reliance on performance-based solutions;
- provide adequate infrastructure associated with emergency evacuation and firefighting operations; and
- facilitate appropriate ongoing land management practices.

Should the planning proposal be successful future development of land will be required to satisfy the aims and objectives of PBP 2019 and therefore, is also addressed in this report.

This assessment was prepared through a desktop study of the Study Area and an in-person survey completed on 6.3.23 by Level 3 Accredited Bushfire Practitioner Jeff Dau from EMBER Bushfire Consulting.

1.2 AIM AND OBJECTIVES

The aim of this report is to:

- Evaluate the potential bushfire threat to the Study Area.
- Assess the capacity of the Study Area to support the subdivision of land and the erection of future dwellings while providing:
    - the minimum bushfire protection necessary to offer life safety to the occupants;
    - improve property protection and facilitate fire service intervention during a bushfire event; and
    - due regard to development potential, site characteristics and protection of the environment.
- Demonstrate the acceptability of the Planning Proposal from a strategic bushfire protection perspective, by assessing a concept 2-lot rural residential subdivision against the requirements of Section 5 of PBP 2019.

1.3 LIMITATIONS AND DISCLAIMER

This report is primarily concerned with assessing the capacity of the concept 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 concept 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
Beth & James Hoskins	Property Owner	Beth Hoskins	Not Given
PLANNED Town Planning Solutions	Town Planner	Elizabeth Slapp	0457 768 776
LandTeam	Surveyor	Not Given	4821 1033
Goulburn Mulwaree Council	Consent Authority	Not Given	4823 4444
NSWRFS	Consent Authority	Not Given	02 4475 1300

1.4 THE PLANNING PROPOSAL

The site is zoned C3 – Environmental Management and RU6 – Transition under the Goulburn Mulwaree Local Environmental Plan 2009. No Development Control Plan applies to the site; however, there is a minimum lot size across the site which prevents the further subdivision of land.

The Planning Proposal seeks for rezoning of the Study Area to enable a decrease in minimum lot size to support a future two-lot rural residential subdivision on the subject Lot.

A concept plan of a future 2-lot rural-residential subdivision is provided in Figure 1.

To demonstrate the acceptability of Planning Proposal from a strategic bushfire protection perspective, an assessment of the concept 2-lot rural residential subdivision is made against Section 5 of PBP 2019.

Upon successful rezoing, the concept development will be to divide the existing ~10 ha rural lifestyle property into two (2) separate title lots comprising Lot 1 – 2 ha and Lot 2 – 8.116 ha (Figure 1).

The concept lots will have the following provisions:

- Lot 2.
    - Greenfield site for rural residential use with boundary setbacks and an indicative building envelope.
    - An APZ that is proportionate to accommodate a dwelling with radiant heat levels not exceeding 19 kW/m^2, off grid electricity supply and a minimum of 40,000 L of water supplies for firefighting purposes.
    - Indicative property access road that is ~200 m long with a high-quality gravel all-weather, two-wheel-drive road surface with a minimum road width of 4m from the property boundary access point to the concept building envelope.
- Lot 1.
    - It is an existing rural residential lot.
    - Has one (1) existing residences (Class 1a building) and one (1) garage (Class 10a building).
    - It also has a water tank and fences, gates, and existing tracks-in-use throughout.
    - The existing residence has a well-established, expansive, and well-maintained APZs to the dimensions that will yield a max radiant heat flux of no greater than 29kW/m^2.

The concept development proposal will be limited to the formal subdivision of the lots, the preparation of building envelopes and property access.

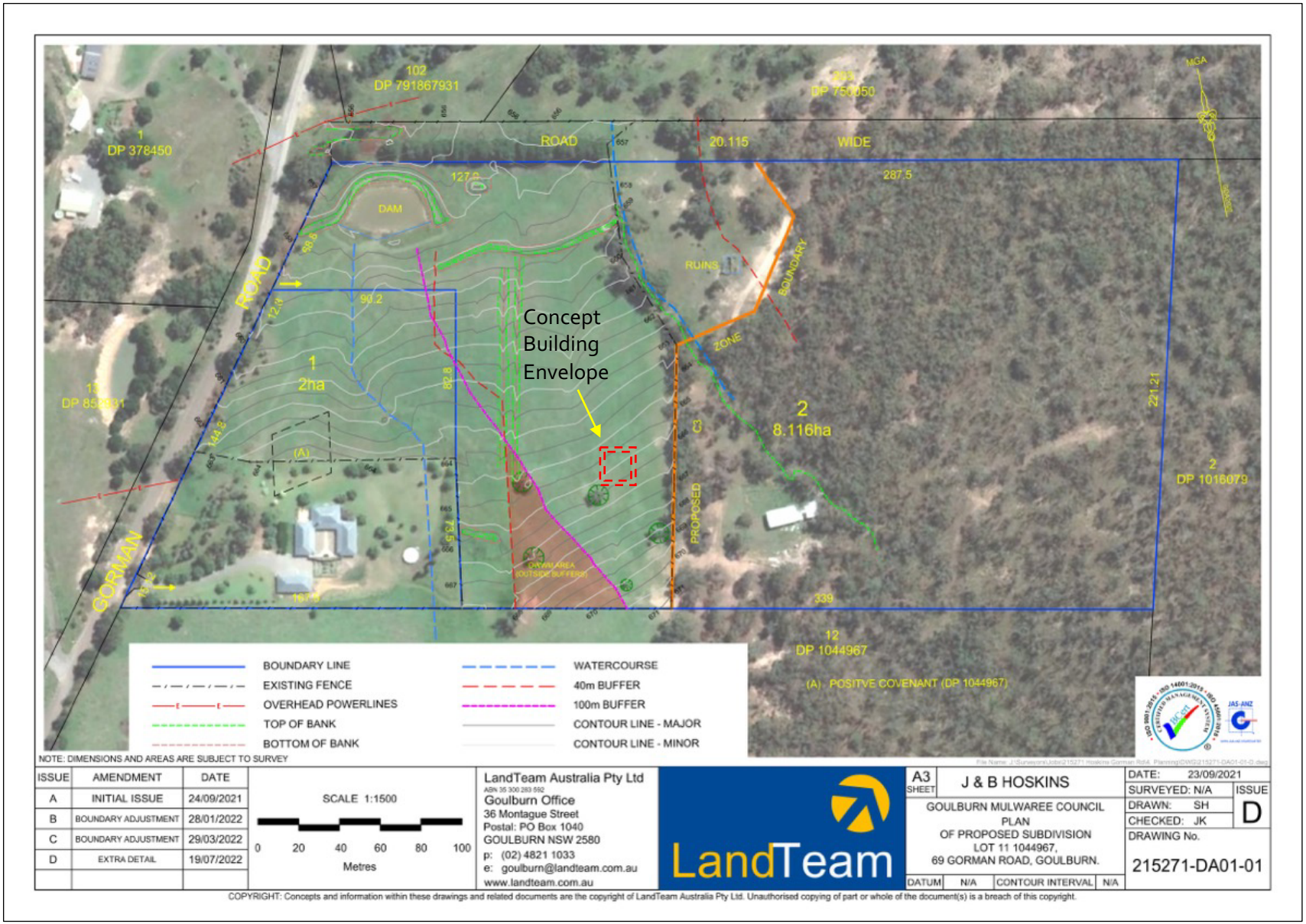


Figure 1 - Concept Subdivision (LandTeam, 2022)

1.5 STUDY AREA LOCATION

Figure 2 - Study Area regional context (GAIA GPS, 2023)

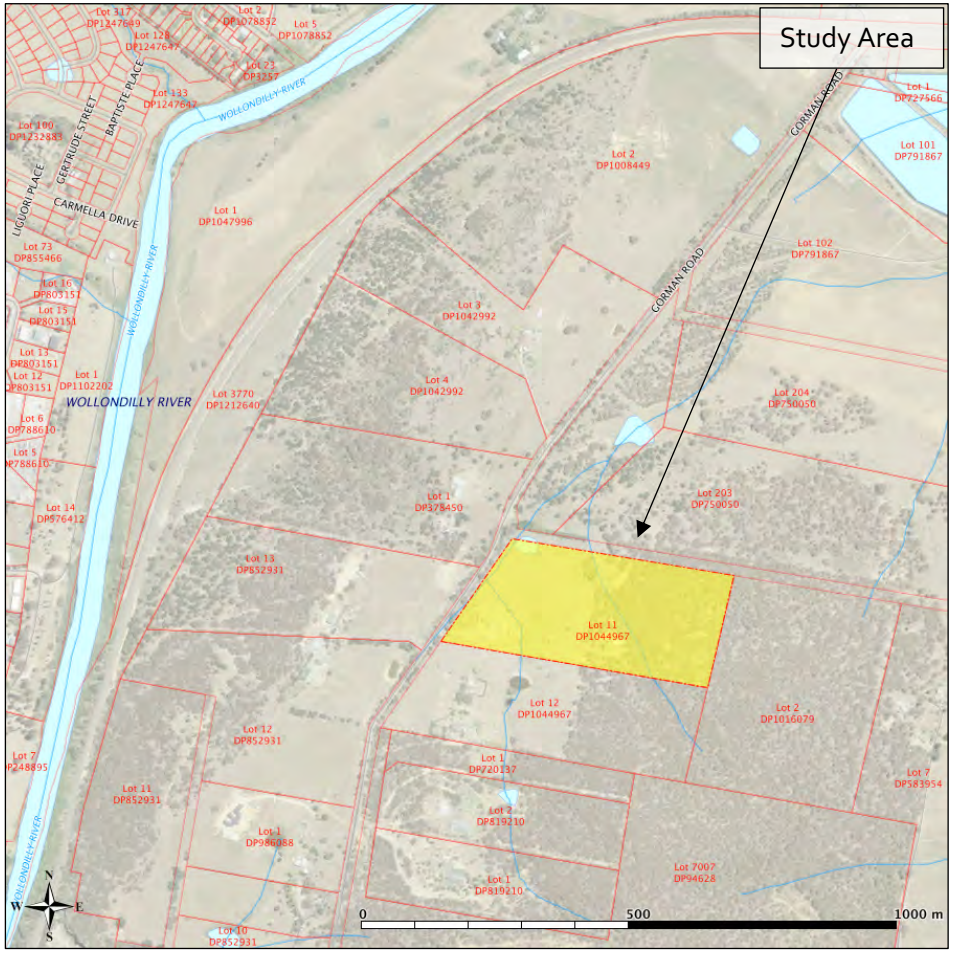


Figure 3 - Study Area local context (FPAA FireMaps, 2022)

1.6 STUDY AREA DESCRIPTION

Location:

The Study Area is located on the rural fringes, east of Goulburn, in the Southern Tablelands region of NSW, approximately 4.5 kilometres northwest of Goulburn city centre (Figure 2 & 3).

Administration:

The ~10 Ha rural lifestyle lot falls under the administration of the Goulburn Mulwaree Council.

Land use:

The dominant land use of the area is rural lifestyle properties and large sections of high conservation value reserve associated with the Governors Hill and Mount Grey area (Figure 6). Accordingly, the Study Area is zoned RU6 – Transition and C3 – Environmental Management, with the surrounding lot also RU6 and C3.

Topography:

The Study Area is situated on a topography that is slightly undulating.

The land surrounding the concept building envelope on Lot 2 slopes generally downwards to the north and west at consistent slight gradients towards water courses in that direction. To the east and south, the land tends to slope upwards towards higher relief associated with the neighbouring Governors Hill. To the west the land tends to be flatter towards Gorman Road before rising towards a minor ridge line.

Vegetation:

The Study Area presents large, distinct sections of cleared land (grassland hazard), surrounded by broad areas of woody vegetation, including a mix of Grassy Woodland (woodland hazard) and Dry Sclerophyll Forest (forest hazard) of varying density.

Access:

The access/egress route and road length from the Study Area to the public road network is:

- The property access road to Lot 1 current residence is existing with no improvements or changes concept.
- The concept property access road to Lot 2 building envelope (~200 m in length) will be a new 4 m wide road constructed with an all-weather gravel surface.
- Gorman Road (8 m wide, ~1.7 km in length), Council maintained high quality sealed public no through road.
- Sydney Road, sealed, dual carriageway, major regional public through road.

2 ASSESSING THE BUSHFIRE THREAT

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 GENERAL BUSHFIRE ENVIRONMENT

The following environmental factors are adopted across the site to determine the potential bushfire threat posed to the Study Area.

Table 3 - Bushfire behaviour factors

Factor	Value
Fire Weather Area	Southern Ranges
FDI	100
Predominant Vegetation Classification	Grassland and Forest
Slope	Ranging from Upslope to 5° downslope.

Note: A detailed bushfire hazard analysis is detailed below.

- *Vegetation formations within 140 m of the Study Area 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 STUDY AREA BUSHFIRE PRONE MAPPING

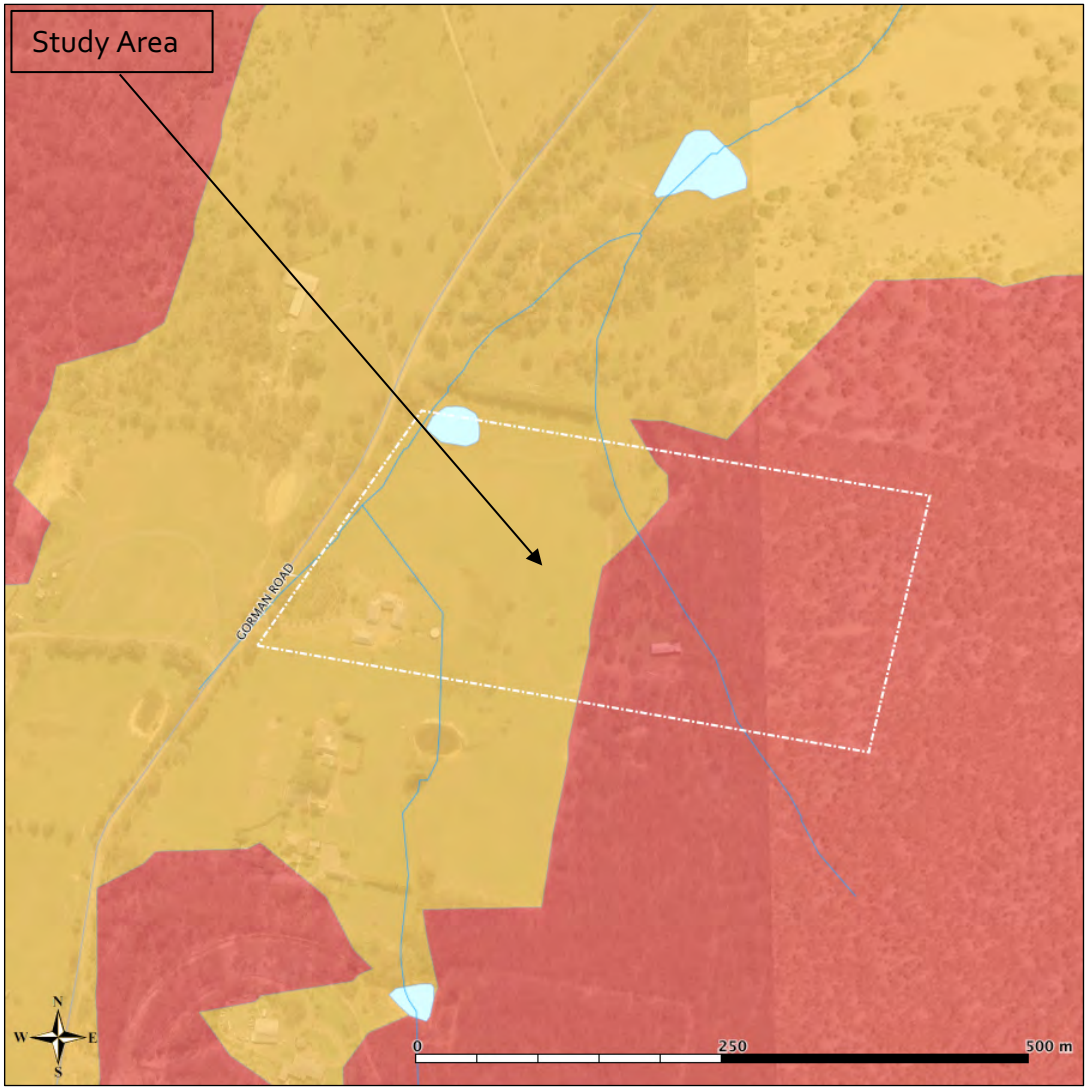
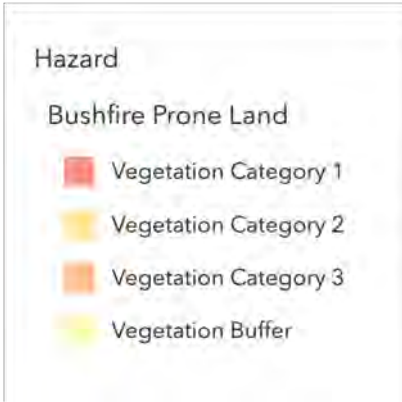


Figure 4 – Study Area Bushfire Prone Land Map. (FPAA FireMaps, 2023)

Bushfire prone mapping relative to the Study Area (Figure 4) showing adjacent land and the Study Area containing areas of Category 1 and Category 3 Vegetation identified as bush fire prone land by Council and NSW RFS.

During the site survey conducted on 6th July, these vegetation categories were verified, and the bushfire prone map found to be and accurate representation of the identified hazard.

Hazard classification key:



2.4 VEGETATION FORMATIONS INFLUENCING THE SUBJECT

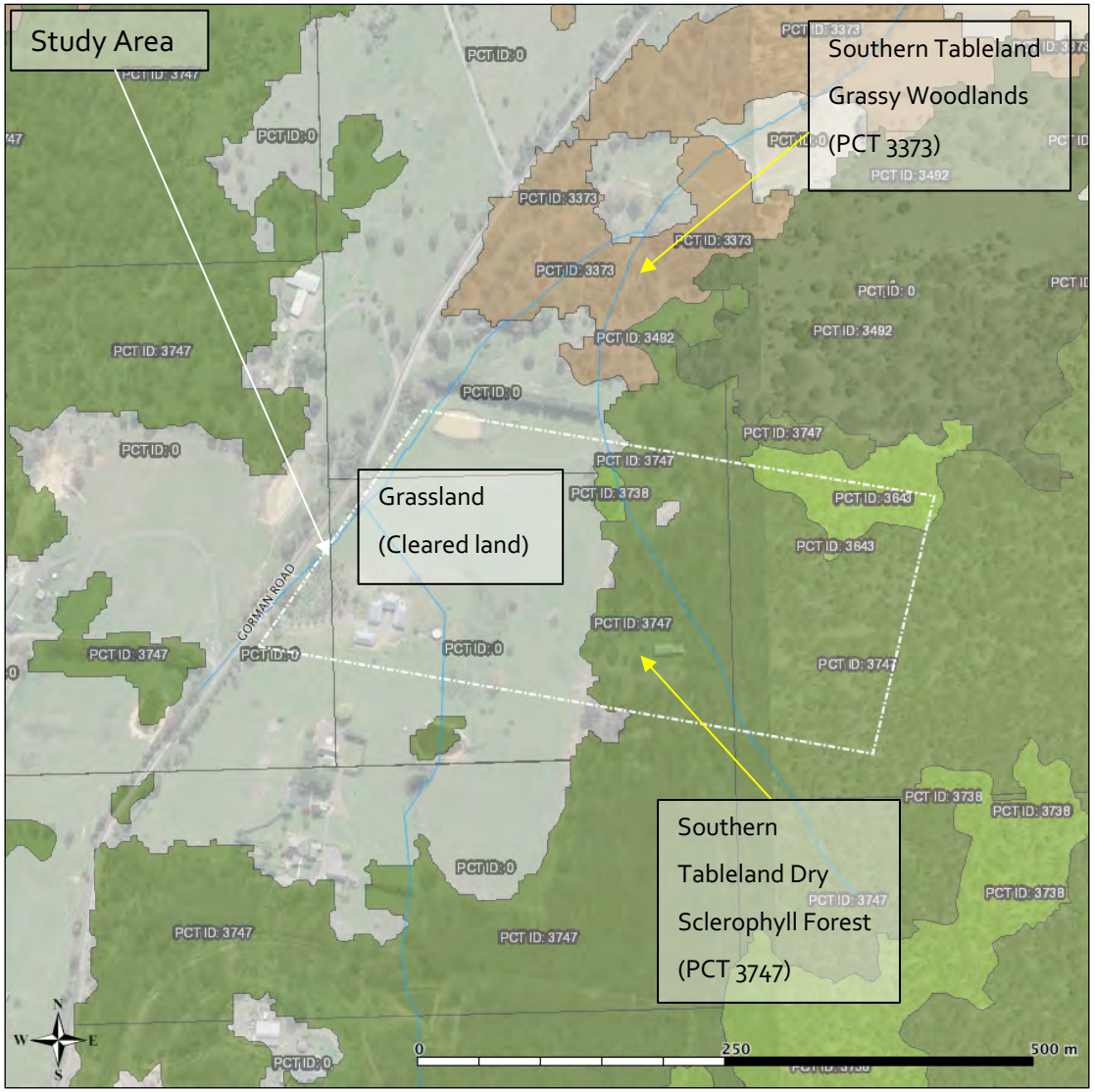


Figure 5 – Study Area Vegetation Formation Map. (SEED, 2023)

State based vegetation classification

Study Area vegetation formations (Figure 5) as defined by SEED (NSW Government, 2022) NSW State Vegetation Type Map.

Vegetation mapping indicates that the Study Area is dominantly influenced by –

- Cleared Land (low level threat)
- Woodland (medium level threat)
- Forest (high level threat)

2.5 STUDY AREA LAND USE AND ZONING

Figure 6 – Showing zoning of the Study Area and adjoining lots. (NSW Planning Portal, 2023)

Study Area zoning as defined by (NSW Government, 2023) 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 Study Area.

The land zoning map indicates that the Study Area is zoned as RU 6 – Transition and C3 – Environmental Management as are the surrounding lots.

While the concept development is within land zoned C3 and RU6, the change to the minimum lot size will only affect land zoned RU6. Furthermore, any future rural residential development will also be contained to the area zoned RU6.

From a bushfire protection perspective, given the RU6 zoning, land use practices and strategic landscape management will allow for the establishment and maintenance of the required APZ's.

2.6 BIODIVERSITY VALUES MAP

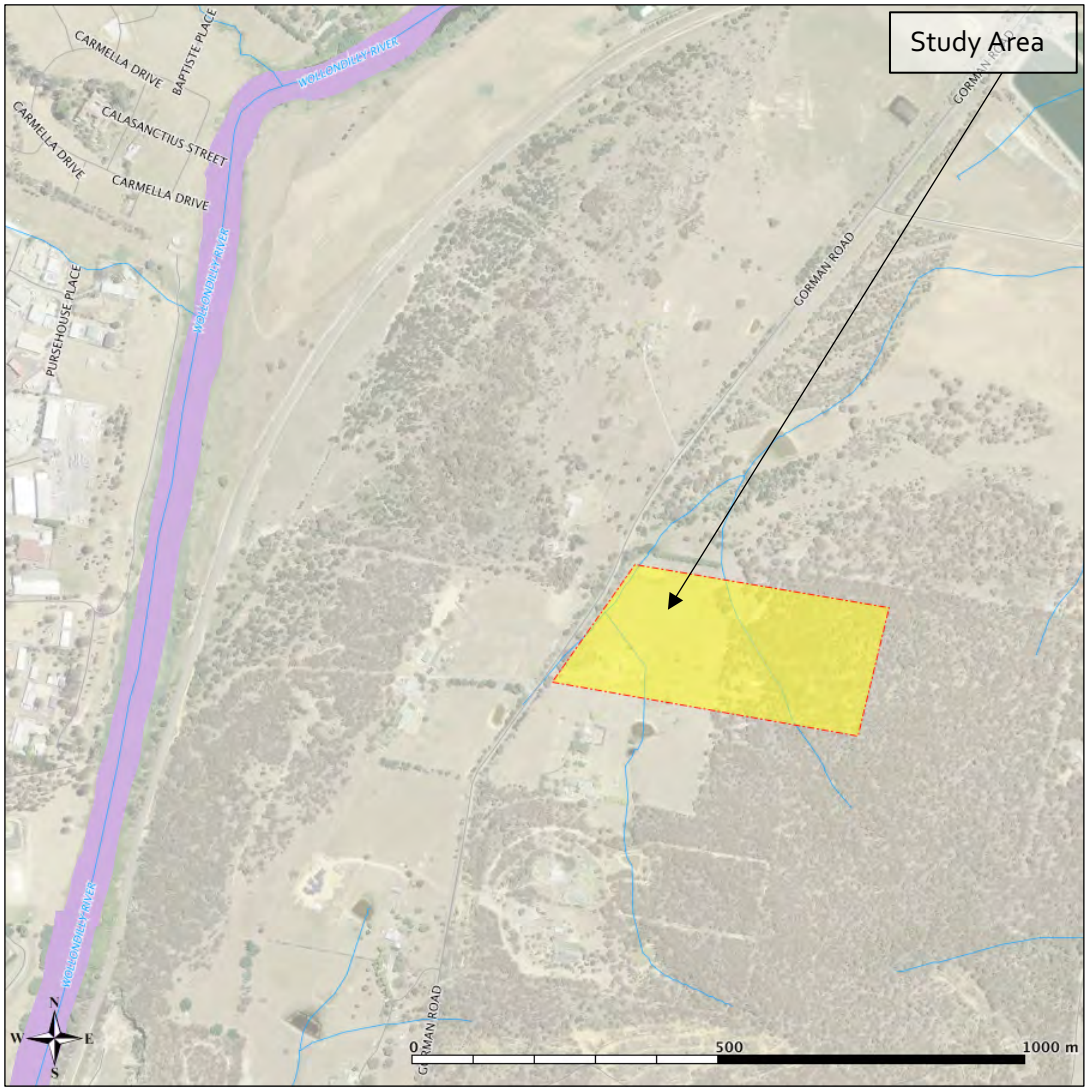


Figure 7 – Showing Biodiversity value vegetation influencing the Study Area. (FPAA FireMaps, 2023)

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 concept 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.

2.7 LOT 2 THREAT ANALYSIS AND SUPPORTING INFORMATION

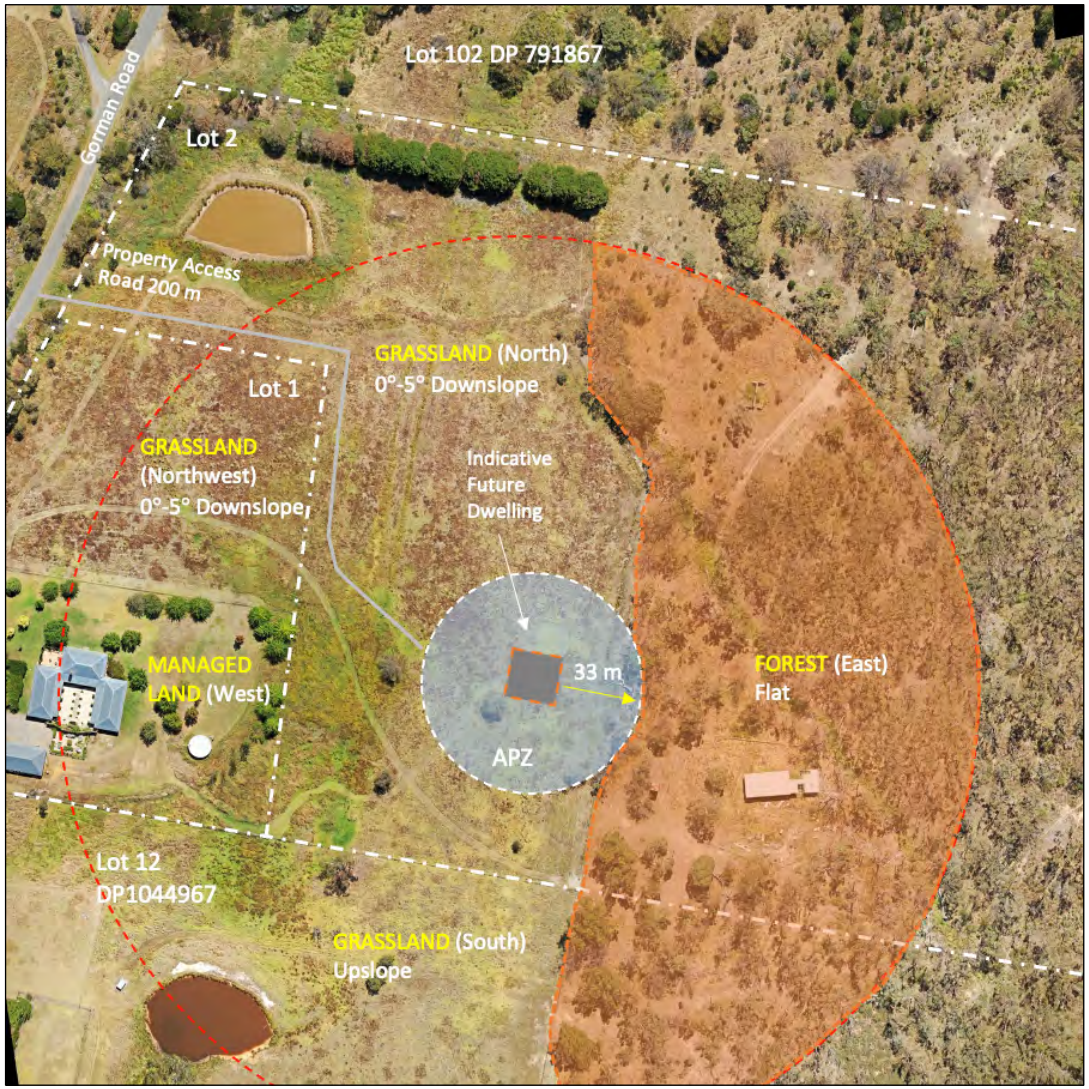


Figure 8 – Showing concept APZ and setback distances, vegetation classification, slope and property access for Lot 2. Indicative only. Not to scale. (Dau, 2023)

HAZARD and APZ ASSESSMENT:

Vegetation Classification

Forest (East)

Grassland (North, South, West)

Setbacks required for creation of APZ

The distances below are the minimum setbacks required measured from an indicative future dwelling (assumed 15m x 15m) to surrounding unmanaged vegetation and/or property boundary to ensure a maximum radiant heat flux of no greater than 19 kW/m^2.

The setbacks below define the minimum APZ dimensions required for any future dwelling.

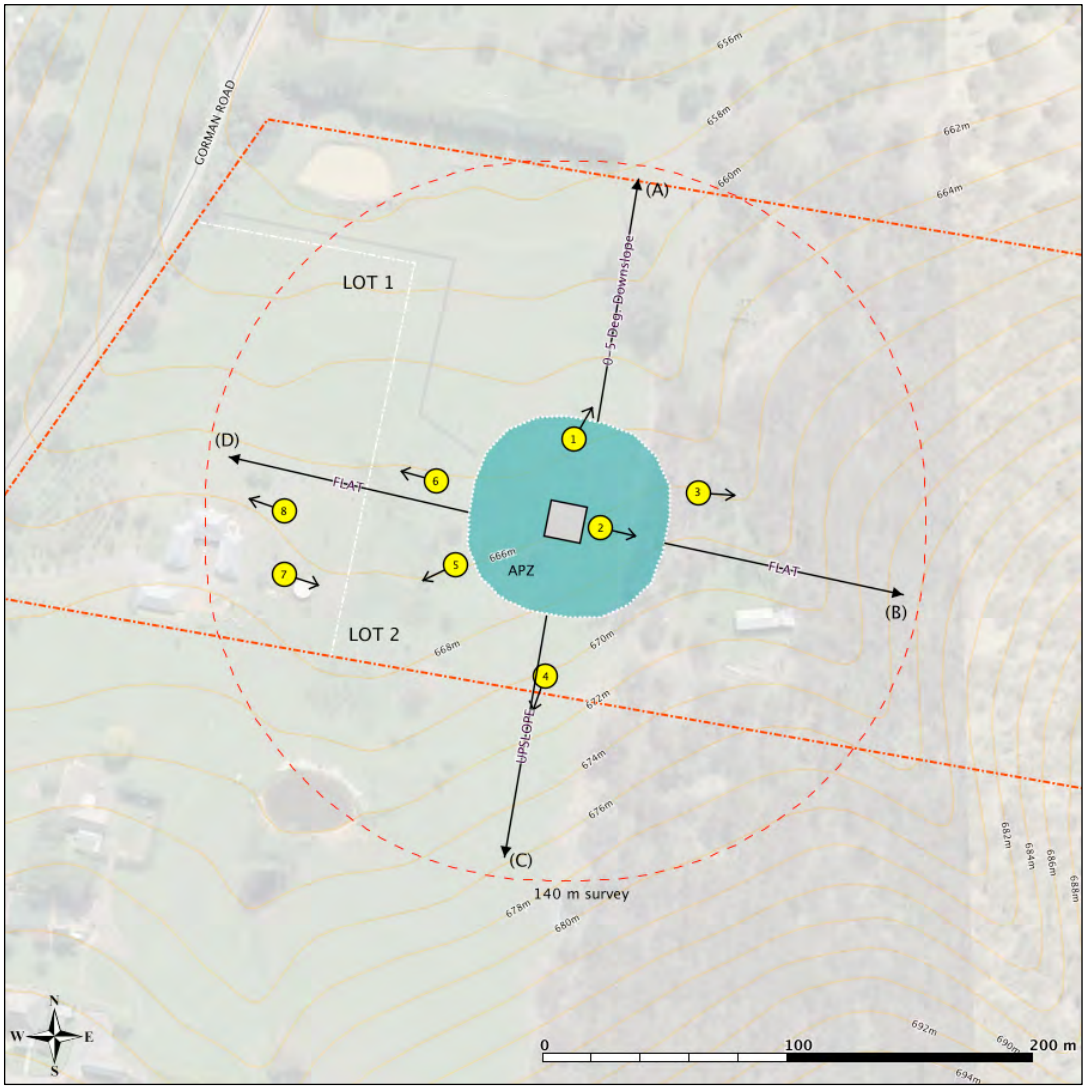
North – 25 m

East – 33 m

South – 25 m

West – 25 m

2.7.1 *LOT 2 SLOPE ANALYSIS AND PHOTO POINTS*



TRANSECT | DIRECTION | SLOPE READING

(A) | North | >0° - 5° Downslope

(B) | East | Flat

(C) | South | Upslope

(D) | West | Flat

Figure 9 – Slope analysis of Lot 2 indicative future dwelling site and associated photo points. (Dau, 2023)

2.7.2 *LOT 2 AERIAL OVERVIEW*

Figure 10 – Aerial overview looking north showing indicative building footprint, access, and vegetation classification for Lot 2. Indicative only. Not to scale (Dau, 2023)

2.7.3 *ACCESS ARRANGEMENTS*

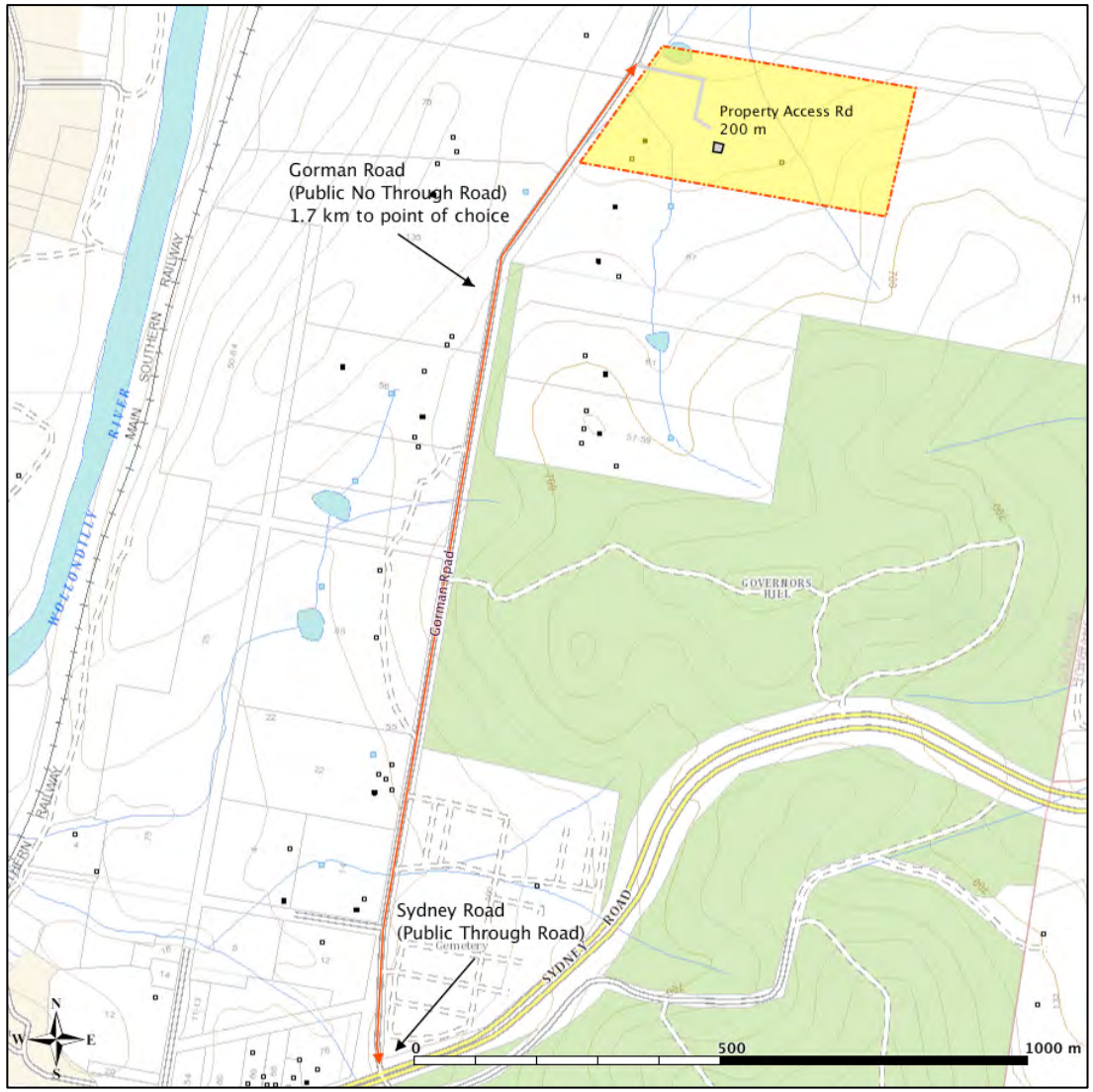


Figure 11 – Overview of access arrangements for the Study Area. (Dau, 2023)

ACCESS ARRANGEMENTS

- The property access road to Lot 1 current residence is existing with no improvements or changes proposed.
- The concept property access road to Lot 2 building envelope (~200 m in length) will be a new 4 m wide road constructed with an all-weather gravel surface.
- Gorman Road (8 m wide, ~1.7 km in length), Council maintained high quality sealed public no through road.
- Sydney Road, sealed, dual carriageway, major regional public through road.

2.7.4 LOT 2 PHOTOGRAPHIC OVERVIEW OF SITE

Figure 12. Photo point 1 Looking at grassland hazard north of the concept building envelope.

Figure 13. Photo point 2 Looking at grassland and forest hazard east of the concept building envelope.

Figure 14. Photo point 3 Looking at forest hazard east of the concept building envelope.

Figure 15. Photo point 4 Looking at grassland hazard vegetation south of the concept building envelope.

Figure 16. Photo point 5 Looking at grassland hazard vegetation west of the concept building envelope.

Figure 17. Photo point 6 Looking at grassland hazard vegetation west of the concept building envelope.

2.8 LOT 1 THREAT ANALYSIS AND SUPPORTING INFORMATION

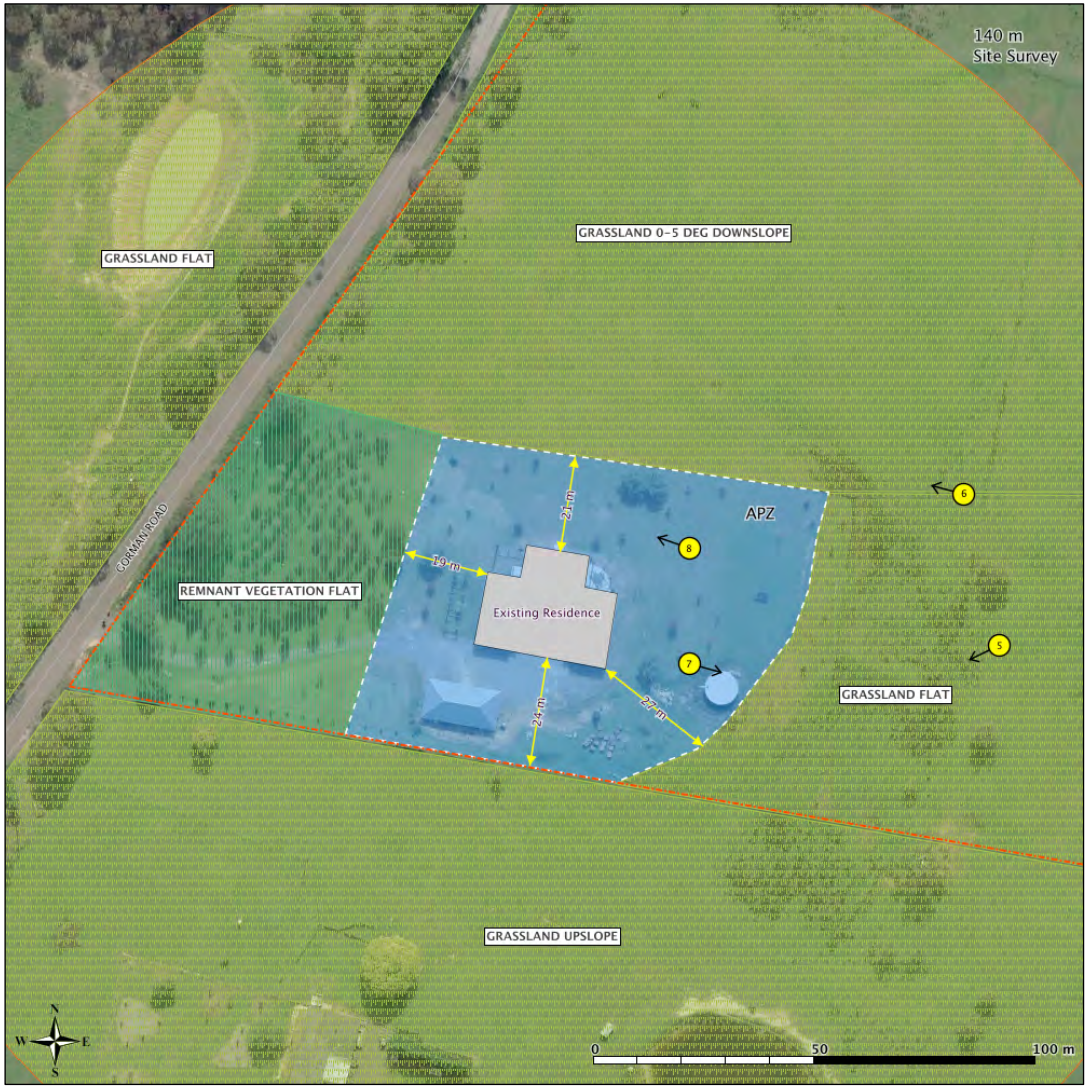


Figure 18 – Showing existing APZ setback distances, vegetation classification, slope and property access for Lot 1. (Dau, 2023)

HAZARD and APZ ASSESSMENT:

Vegetation Classification

Grassland -North, East and South

Remnant Vegetation – West

Assessment of current APZ/setbacks available.

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

Table 5 – Radiant heat flux determination of existing residence

Aspect	Vegetation Formation	Slope	APZ available	Max. Radiant Heat Flux (kW/m²)
N	Grassland	>0° – 5° Downslope	21 m	19
E	Grassland	Flat	27 m	12.5
S	Grassland	Upslope	24 m	12.5
W	Remnant Woodland	Flat	19 m	19

2.8.1 LOT 1 AERIAL OVERVIEW

Figure 19 – Aerial overview of existing residence, showing well managed condition of the existing APZ for Lot 1. (Dau, 2023)

2.8.2 *LOT 1 EXISTING RESIDENCE OVERVIEW*

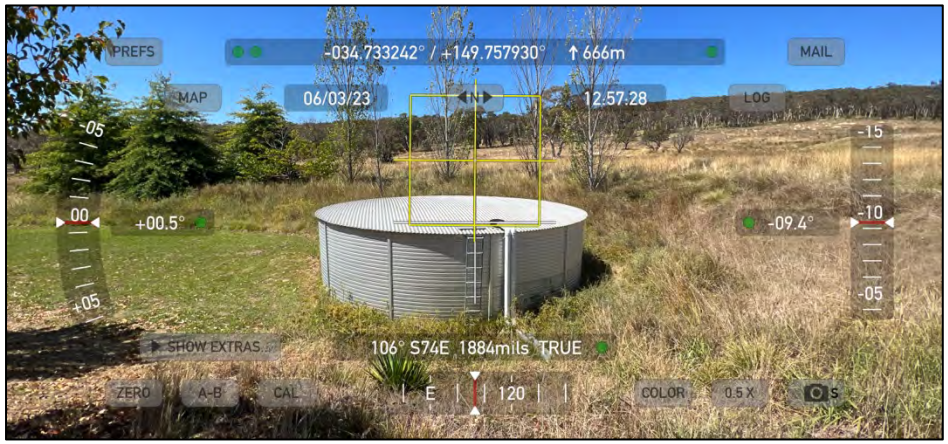


Figure 20 - Showing existing 110,000 L water supplies (Dau, 2023)

Figure 21 – Showing existing residence and adjoining landscape (Dau, 2023)

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 concept 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 1.

A statement of compliance of the concept 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 dimensions (including setbacks from lot boundaries) for any concept dwelling on Lot 2 in the building envelope specified and the existing Lot 1 residence, which will ensure that the future or existing dwellings are not exposed to radiant heat levels exceeding 29 kW/m^2.

The APZ dimensions proposed for Lot 1 meets the minimum requirements specified by Table A1.12.2 PBP 2019 and therefore satisfies the acceptable solutions for APZs.

The APZ dimensions (including setbacks from lot boundaries) for concept Lot 2 have been specified to ensure that future dwellings are not exposed to radiant heat levels exceeding 19 kW/m^2 and therefore surpasses the minimum requirements.

The radiant heat level of 19 kW/m^2 is less than the allowable 29 kW/m^2 and therefore this design feature provides a higher level of safety and resilience to the future building footprints for the Lot. This design feature forms part of a performance-based design to address extended access/egress discussed in Section 3.3.

Recommendations:

- Lot 2 APZ dimensions, including setbacks from lot boundaries, are to comply with the minimum dimensions provided in Table 6 below.
- Lot 2 APZ dimensions may not be reassessed and decreased at the time of future development to increase the radiant heat flux.
- Lot 1 APZ is established and in a well-maintained order. The current dimensions will ensure that the existing residence is not exposed to a radiant heat flux exceeding 29 kW/m^2 and therefore does not require expansion.
- APZs must be maintained to the minimum distances in perpetuity to provide a minimum level of protection.

Table 6- Lot 1 and 2 APZ requirements

Lot	Aspect	Vegetation Formation	Slope	Min. setback / APZ required	Max. Radiant heat (kW/m²)
1	N	Grassland	>0° – 5° Downslope	11 m	29
1	E	Grassland	Flat	10 m	29
1	S	Grassland	Upslope	10 m	29
1	W	Remnant Vegetation	Flat	10 m	29
2	N	Grassland	>0° – 5° Downslope	25 m	19
2	E	Grassland	Flat	25 m	19
2	E	Forest	Flat	33 m	19
2	S	Grassland	Upslope	25 m	19
2	W	Grassland	Flat	25 m	19

3.2 LANDSCAPING:

Recommendations:

- All landscape within the areas identified as APZ (Figures 8, 9 & 10) are managed in perpetuity and following the requirements of Asset Protection Zone Standards - Appendix 4 of PBP (2019) (Attachment A).

3.3 ACCESS:

Discussion – Performance Based Design:

The future residence on Lot 2 is accessed from Gorman Road (a public no through road) via a 200 m property access road. From the property entrance at Gorman Road it is 1.7 km to Sydney Road from where alternative egress options are available.

As a minimum, the property access roads to Lot 2 will be constructed to a high-quality gravel, all-weather, two-wheel-drive road surface with a minimum road width of 4m and an unobstructed clearance height of 4m.

Lot 1 property access is existing. No modifications or improvements are proposed.

The concept property access road arrangements for the subdivision will meet most of the acceptable solutions provided in PBP (2019), with the exception that the access to the site is a dead end greater than 200 m in length from a public through road being Sydney Road.

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

Performance criteria to be addressed (general access)-

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

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

Understanding the issue.

Firstly, it should be noted that property access is mainly compliant. Apart from access road length, 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. dead end road.

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.

The concept building envelope for Lot 2 is 200 m from Gorman Road, and therefore compliant with the 200 m single access rule. Therefore, the level of safety associated with the Property Access Road is comparable with a 200 m Property Access Road, which under any other circumstances would be deemed acceptable.

The perceived risk to safety to fire crews therefore lies with Gorman Road.

Gorman Road, despite being a no through road, has a trafficable width of 8 m, and is therefore unlikely to become blocked entrapping fire crews.

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 Lot 2 dwelling are proposed:

- Enlarged APZs, reducing radiant heat levels (19 kW/m^2 down from 29 kW/m^2) and therefore making the property more defendable.
- Improved construction BAL-29, up from BAL19, making the future dwelling more resilient, and providing higher level of safety should fire crews need to seek shelter during active defense 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 a more extended period.

This performance-based design will enable future occupants and attending fire crews to conduct protect-in-place strategy more safely, if the need arises, 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 concept subdivision is deemed to satisfy the performance requirements for access as per PBP (2019).

Recommendations for Access: -

- Access within the concept Lot 2 per the requirements for Access – Table 5.3 b of PBP (2019)
- Lot 2 APZ dimensions, including setbacks from lot boundaries, are to comply with the minimum dimensions provided in Table 6, as part of the Performance Based Design to address extended egress.
- Adoption of a min. BAL-29 construction for the future residence on Lot 2, as part of the Performance Based Design to address extended egress.
- Inclusion of 40,000 L min. of static water supply within the APZ dedicated to firefighting purposes on Lot 2, as part of the Performance Based Design to address extended egress.

3.4 WATER SUPPLIES

Discussion:

The provision and siting of water supplies for Lot 2 will occur at the time of construction of a future residence.

Lot 1 has existing water supplies with a total capacity well in excess of 20,000 L and therefore complies with the requirements of Section 5.1.3 of PBP 2019.

Recommendations:

- Lot 2 future residence to be provided with a min. of 40,000 L of static water supplies at the time of future development.
- Water supplies for the concept subdivision are per the requirements for Water Supplies – Table 5.3 c of PBP (2019).
- All fittings and specifications per Table 7.4a PBP 2019.
- Lot 1 existing water supplies satisfy the requirements of PBP 2019, and therefore no modifications or improvements are proposed.

3.5 ELECTRICITY SERVICES

Discussion:

Future development of Lot 2 will be provided with electricity fed from an off-grid photovoltaic system.

Lot 1 electricity services are existing and are outside the scope of this assessment.

Recommendations:

- Electrical services for Lot 2 are to be provided per Table 7.4a PBP 2019.

3.6 GAS SERVICES

Discussion:

The provision of gas supplies may occur at the time of construction of any future residence on Lot 2.

Lot 1 gas services are existing and are outside the scope of this assessment.

Recommendations:

- If applicable, bottle gas supplies for Lot 2 future residence are to be provided per Table 7.4a PBP 2019.

3.7 CONSTRUCTION REQUIREMENTS

Discussion:

The APZ dimensions for Lot 2 are provided (Table 6) to ensure that any future dwelling is not subject to radiant heat levels exceeding 19 kW/m^2, therefore complying with Table A1.12.2 of PBP 2019.

The level of construction is fixed however at BAL-29 as part of a performance-based design to address extended property access/egress.

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 that provisions ember protection measures for the existing dwelling.

Recommendations:

- The future construction of residence on Lot 2 must comply with the Sections 3 and Section 7 (BAL-29) 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, and
- Section 7.5 of Planning for Bush Fire Protection 2019.
- To improve ember protection of the existing residences on Lot 1 (where currently not available), several enhancements are recommended 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.

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 Severe.

3.9 ENVIRONMENTAL CONSIDERATIONS

Information regarding the potential impact that the concept 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 Study Area.

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 2 APZ dimensions, including setbacks from lot boundaries, are to comply with the minimum dimensions provided in Table 6 below.
- Lot 2 APZ dimensions may not be reassessed and decreased at the time of future development to increase the radiant heat flux.
- Lot 1 APZ is established and in a well-maintained order. The current dimensions will ensure that the existing residence is not exposed to a radiant heat flux exceeding 29 kW/m^2 and therefore does not require expansion.
- APZs must be maintained to the minimum distances in perpetuity to provide a minimum level of protection.

Table 7- Lot 1 and 2 APZ requirements

Lot	Aspect	Min. setback / APZ required
1	N	11 m
1	E	10 m
1	S	10 m
1	W	10 m
2	N	25 m
2	E	25 m
2	E	33 m
2	S	25 m
2	W	25 m

4.2 LANDSCAPING

- All landscape within the areas identified as APZ for Lot 1 & Lot 2 (Figures 8,9 & 10) are managed in perpetuity and per the requirements of Asset Protection Zone Standards - Appendix 4 of PBP (2019) (Attachment A).

4.3 ACCESS

- Access within the concept subdivision is to be per the requirements for Access – Table 5.3 b of PBP (2019).
- Nil requirements for Lot 1

4.4 WATER SUPPLIES, ELECTRICITY AND GAS

- Lot 2 future residence to be provided with a min. of 40,000 L of static water supplies at the time of future development.
- Water supplies for the concept subdivision comply with the Water Supplies requirements – Table 5.3 c of PBP (2019).
- All fittings and specifications per Table 7.4a PBP 2019 for water supplies.
- Lot 1 water supplies satisfy the requirements of PBP 2019, and therefore no modifications or improvements are proposed.
- Electrical services for Lot 2 are to be provided per Table 7.4a PBP 2019.
- If applicable, bottle gas supplies for Lot 2 future residence are to be provided per Table 7.4a PBP 2019.

4.5 CONSTRUCTION

- The future construction of residence on Lot 2 must comply with the Sections 3 and Section 7 (BAL-29) 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, and
- Section 7.5 of Planning for Bush Fire Protection 2019.
- To improve ember protection of the existing residence on Lot 1, where currently not available, several enhancements are recommended 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.

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 Severe.

5 CONCLUSION

This report documents the findings from a Bush Fire Strategic Study conducted in support of a planning proposal for the rezoning of undeveloped land at 69 Gorman Road Goulburn, and a future development application for a concept two-lot rural residential subdivision at the subject Lot.

The report establishes the level of bushfire threat to the Study Area and examines a range of principles for the concept subdivision to be regarded as suitable for development and that any future development can satisfy the broad aims and objectives of PBP 2019.

The proposed concept subdivision and rezoning of the Study Area is seen as being consistent with the principles of Strategic Planning under PBP 2019.

Given the predominate vegetation is Grassland with clear definition of areas of Forest on slightly undulating topography, the surrounding environment possesses a relatively moderate bushfire threat. This threat however can be further moderated with the adoption of the standard suite of protection measures offered by PBP 2019 and for which the proposed development can largely comply.

Given the open grassland setting it is envisaged that it will be easy to provide the necessary space for the establishment and ongoing maintenance of setbacks and APZs.

Access to Lot 2 of the concept subdivision is 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 quality of Gorman Road, larger APZs, higher level of construction and increased water supplies all of which improve the level of safety, resilience and defendability of the future structure whilst allowing future occupants and attending fire crews safe unimpeded access to/from the future residence.

As part of the Performance-Based Design to address extended egress however, any future dwelling on Lot 2 is required to construct to BAL-29 as per the relevant sections of Australian Standard 3959-2018 Construction of buildings in bushfire-prone areas.

Water supplies and other utilities will be capable of satisfying the acceptable solutions detailed in PBP 2019.

Based on the BFSS and the recommendations contained in this report, the proposed concept multi-lot residential subdivision will be capable of:

- ensuring land is suitable for development in the context of bush fire risk;
- ensuring new development on BFPL will comply with PBP
- minimising reliance on performance-based solutions;

- providing adequate infrastructure associated with emergency evacuation and firefighting operations; and
- facilitating appropriate ongoing land management practices.

And therefore, the proposal is deemed capable of meeting the underlying principles of strategic planning and should be supported.

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

6 REFERENCE

- ePlanning Spatial Viewer, Department of Planning Industry and Environment, accessed 11 May 2023, https://www.planningportal.nsw.gov.au/spatialviewer/#/find-a-property/address
- FireMaps (FPA Australia, 2023), https://maps.fpaafiremaps.com.au, accessed 11 May 2023,
- 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 11 May 2023, 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 11 May 2023, https://maps.six.nsw.gov.au/#
- Standards Australia, (2018) "AS/NZS 3959-2018 Construction of buildings in bushfire-prone areas."

ATTACHMENT A – 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.