REF: 5401BF

Date: 20/12/23

Valid to: 20/12/24

BUSHFIRE HAZARD ASSESSMENT

PROPOSED SUBDIVISION STAGE 5

LOT 350 TAIT STREET, CROOKWELL NSW

LGA: Upper Lachlan Shire

Lot 350 DP 1301003

Applicant: Darjeeling Pastoral

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BUSHFIRE HAZARD ASSESSMENT

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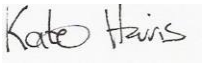

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VERSION CONTROL

Title	Bushfire Hazard Assessment			
Site address	Lot 350 Tait Street, Crookwell NSW			
Prepared By	Letara Judd BPAD L2 46804			
Approved by:	Katherine Harris BPAD L3 26947			
Date Created	15/12/2023			
Version Number	**Modified By**	**Modifications Made**	**Date Modified**	**Status**
[1.0]	LJ	Issue for client review	1/07/2022	Complete
[1.1]	LJ & MJ	Amendments to subdivision plan	15/12/2023	Complete
[1.2]	LJ & KH	Updates	20/12/2023	Complete

DISCLAIMER

The recommendations provided in the summary of this report are a result of the analysis of the proposal in relation to the requirements of Planning for Bushfire Protection 2019. Utmost care has been taken in the preparation of this report however there is no guarantee of human error. The intention of this report is to address the submission requirements for Development Applications on bushfire prone land. There is no implied assurance or guarantee the summary conditions will be accepted in the final consent and there is no way Harris Environmental Consulting is liable for any financial losses incurred should the recommendations in this report not be accepted in the final conditions of consent. This bushfire assessment provides a risk assessment of the bushfire hazard as outlined in the PBP 2019 and AS3959 2018. It does not provide protection against any damages or losses resulting from a bushfire event.

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EXECUTIVE SUMMARY

This report provides a Bushfire Hazard Assessment for the proposed Stage 5 subdivision at Lot 350 Tait Street, Crookwell NSW. The proposed Stage 5 subdivision is for 52 lots, 51 residential lots and a drainage reserve. The assessment confirms the subject lot is in land identified as bushfire prone with significant revegetation proposed at part of the subdivision development.

This assessment identifies the bushfire prone vegetation within 140m of the proposed subdivision as:

- Downslope 0-5 degree Grassland located on the south and east;
- Downslope 0-5 degree Woodland located on the south;
- Upslope Remnant located on the west; and
- Upslope Grassland located on the north and west.

The proposed Stage 5 subdivision can achieve **BAL 29** or less, with the Asset Protection Zone setback in accordance with <29 kW/m².

A 10 m Asset Protection Zone setback in accordance with <29 kW/m² will be required to be established from the commencement of building works and maintained for perpetuity on the western boundary of Stage 5. The APZ is to be maintained as an 88B Easement on the use of the land.

All land within each entire lot within Stage 5 will be required to be maintained to an APZ standard in perpetuity. This is to be managed to the standard of an IPA.

The proposed Stage 5 subdivision includes a non-perimeter road of 300 m in length that is accessed from McDonald Street on the south and Tait Street on the east. The proposed road is required to comply with Table 5.3c PBP 2019.

Proposed water supply to the subdivision to comply with:

- 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;
- reticulated water supply to urban subdivisions uses a ring main system for areas with perimeter roads.
- fire hydrant flows and pressures comply with the relevant clauses of AS 2419.1:2005
- 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.

Any bottled gas will be installed and maintained in accordance with AS1596 and the requirements of the relevant authority. If gas cylinders need to be kept close to the buildings, the release valves must be directed away from the building and away from any combustible material. Polymer sheathed flexible gas supply lines to gas meters adjacent to buildings are not to be used.

Electrical transmission lines, if above ground, will be managed in accordance with specifications issued by Energy Australia.

1. PROPOSAL

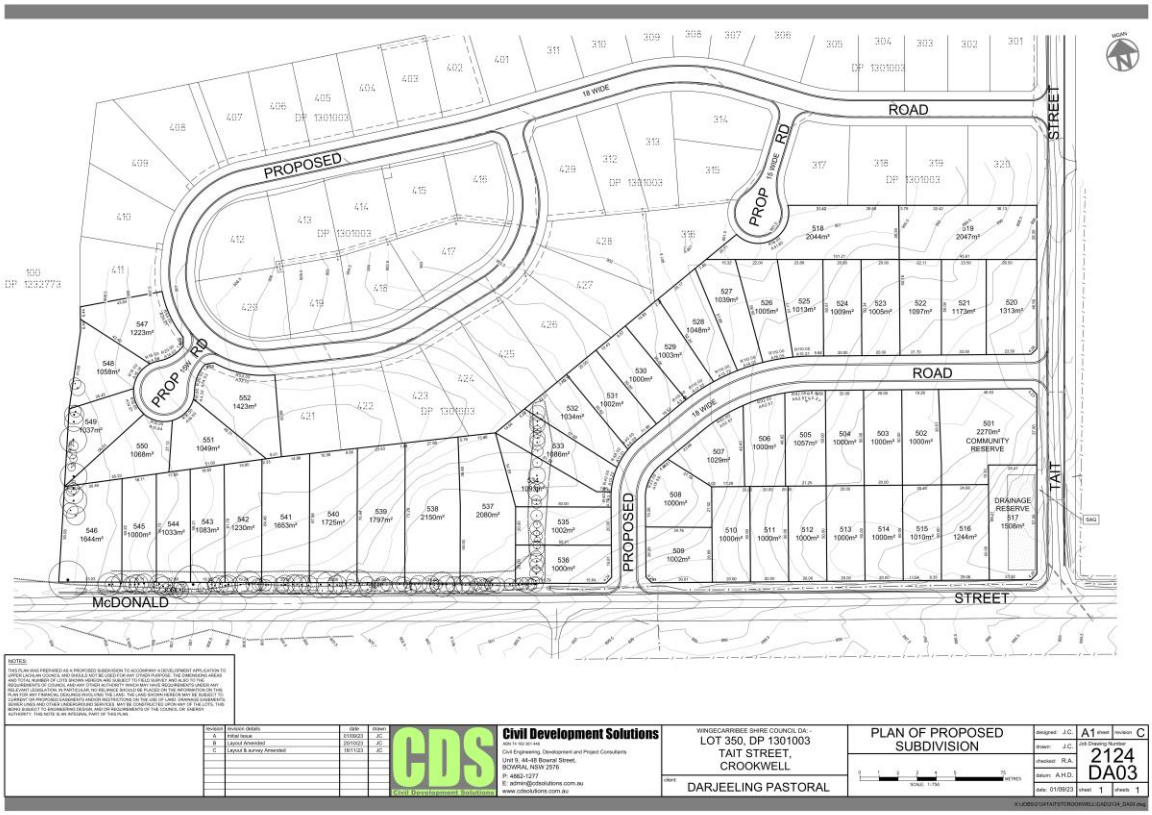
Beveridge Williams has commissioned Harris Environmental Consulting to provide a Bushfire Hazard Assessment at Lot 350 Tait Street, Crookwell NSW, for the proposal to subdivide the subject land into Stage 5 on Lot 350 DP 1301003.

Harris Environmental Consulting was commissioned to provide this bushfire assessment.

This proposal considers the subdivision of land and must ensure an APZ based on a radiant heat threshold of 29kW/m^2 can be achieved, along with suitable construction, access, water, and landscaping.

Figure 1 shows the subdivision plan.

FIGURE 1 SUBDIVISION PLAN



2. ASSESSMENT REQUIREMENTS

2.1 Regulation

As this proposal involves a subdivision it requires Integrated DA approval. This involves obtaining a Bushfire Safety Authority (BFSA) from the NSW Rural Fire Services (RFS).

Integrated development applications under section 100B of the *Rural Fires Act* (RF Act) and section 4.46 of the *EP&A Act* require the following detailed information:

- Description of property;
- Classification of vegetation out to 140 m from the development;
- An assessment of the effective slope to a distance of 100 m;
- Identification of any significant environmental features;
- Details of threatened species, populations, endangered communities and critical habitat known to the applicant;
- Details of Aboriginal heritage known to the applicant; and
- A bushfire assessment that complies with the relevant requirements of the PBP (2019) and AS 3959:2018.

These relevant specific objectives for subdivision in Chapter 5 of the PBP (2019) include:

- Minimise perimeters of the subdivision exposed to the bush fire hazard;
- Minimise bushland corridors that permit the passage of bush fire;
- Provide for the siting of future dwellings away from ridge tops and steep slopes;
- Ensure that separation distances (APZ) between a bush fire hazard and future dwellings enable conformity with deemed to satisfy requirements of the BCA;
- Ensure the ongoing maintenance of asset protection zones;
- Provide clear and ready access from all properties to the public road for residents and emergency services; and
- Ensure the provision of adequate supply of water and other services to facilitate effective firefighting.

2.2 Emergency Management

In the event of emergency, the residents are advised to become familiar with the RFS Bush Fire Alert Levels and develop a Bush Fire Survival Plan to ensure they know what to do in the event of a bush fire.

2.3 Landscape and Vegetation Management

To incorporate bushfire protection measures into future development, the owner is advised to consider the following:

- Maintain a clear area of low cut lawn or pavement adjacent to the house;
- Ensure any pastures within APZ are regularly slashed;
- Avoid planting trees species with rough fibrous bark, or which retain/shed bark in long strips or retain dead material in their canopy;
- Avoid planting deciduous species that may increase fuel at surface/ground level by the fall of leaves;
- Avoid climbing species to walls and pergolas;
- Locate combustible materials such as woodchips/mulch, flammable fuel stores (LPG gas bottles) away from the building;
- Locate combustible structures such as garden sheds, pergolas and materials such as timber furniture away from the building;
- Ensure any vegetation planted around the house is a suitable distance away so these plants do not come into physical contact with the house as they mature; and
- Incorporate suitable impervious area surrounding the house, including courtyards, paths and driveways.

2.4 Construction Standards

The Australian Standard AS3959; 2018 is the enabling standard that addresses the performance requirements of both parts 2.3.4 and Part GF5.1 of the Building Code of Australia for the construction of the Class 1, 2 and Class 3 buildings within a designated Bushfire Prone Area.

The following was determined for this site:

Relevant fire danger index……FDI 100
Flame temperature ……1090 K

The Building Code of Australia (BCA) is a performance based code which contains performance requirements and deemed to satisfy provisions relating to the construction of buildings in bushfire prone areas. These provisions include Class 1, 2, 3 & 4 buildings that are proposed for construction in designated bushfire prone areas. All class 10b (e.g. sheds) should be located >10 metres away from the dwelling, or be constructed to the relevant BAL.

3. SITE LOCATION

The following Figure 2 shows the subject lot location. Figure 3 provides a broad scale aerial view of the subject site. Figure 4 shows a close-up view of the subject lot.

FIGURE 2 LOCATION OF SUBJECT LOT

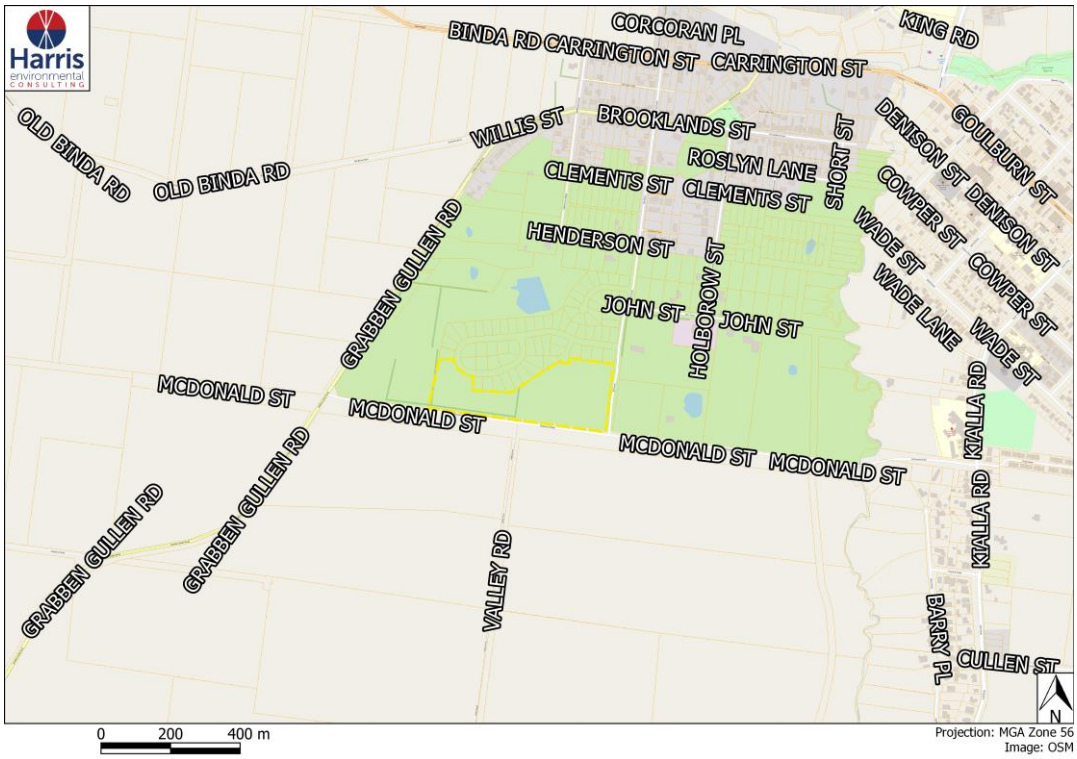
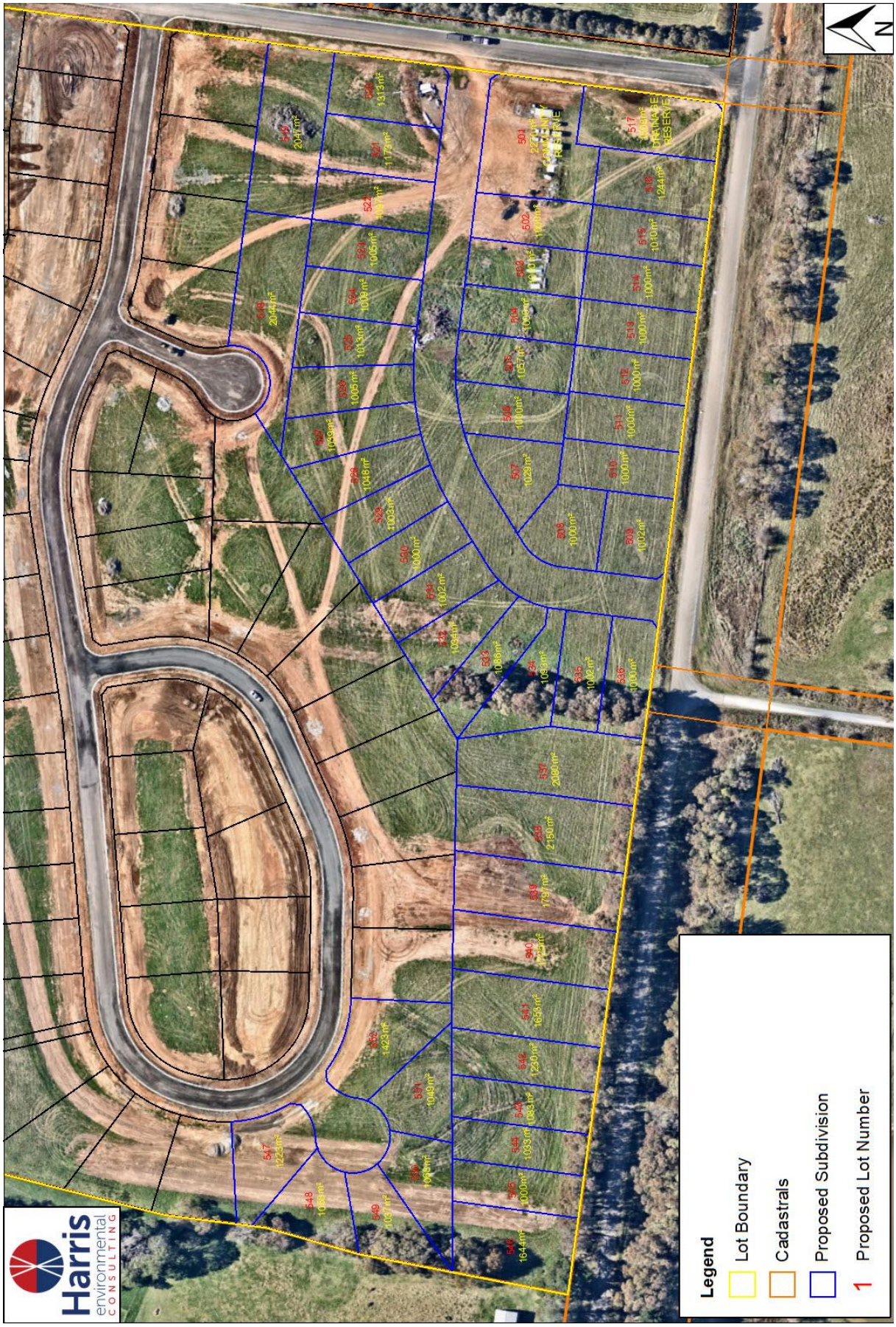


FIGURE 3 EXTENDED AERIAL VIEW OF THE SUBJECT LOT

FIGURE 4 CLOSE-UP AERIAL



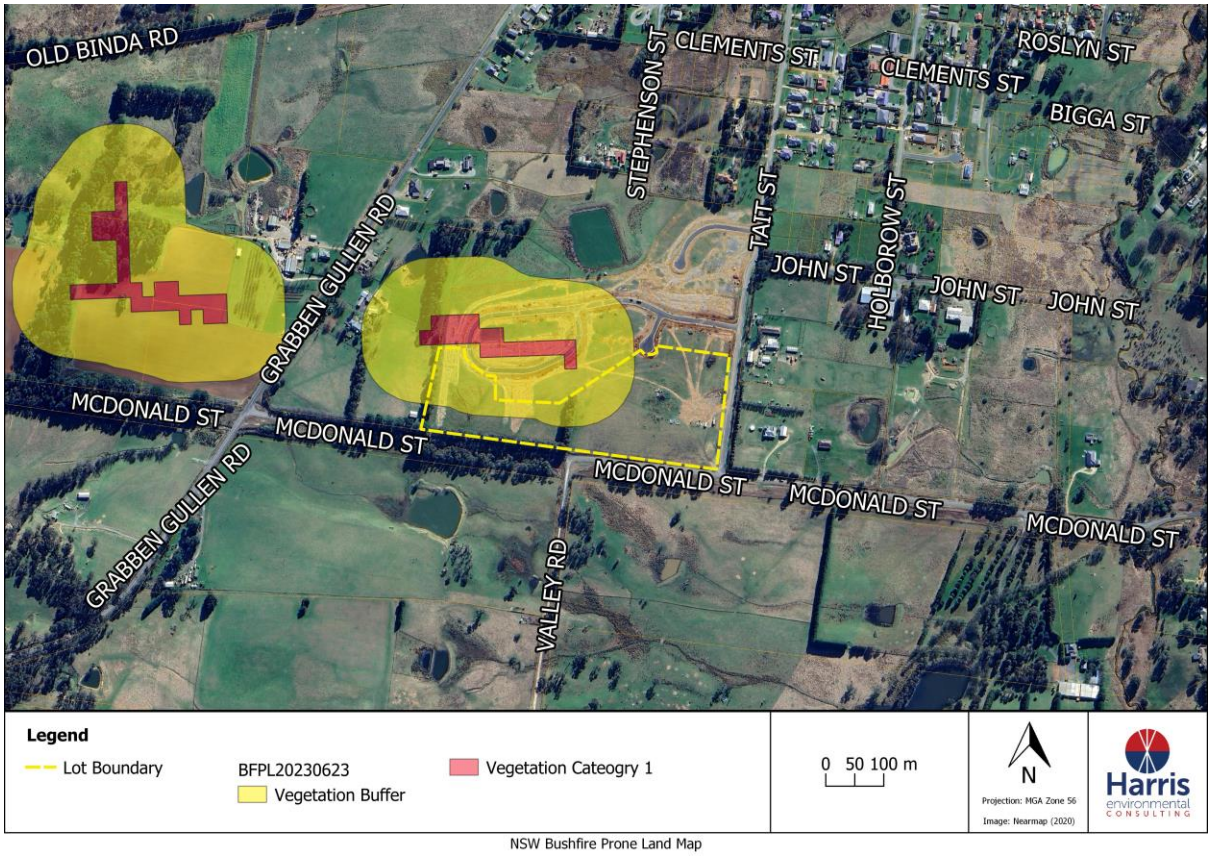
4. PLANNING LAYERS

The following planning layers are described in Table 1 and shown in the Figures below:

TABLE 1 PLANNING LAYERS

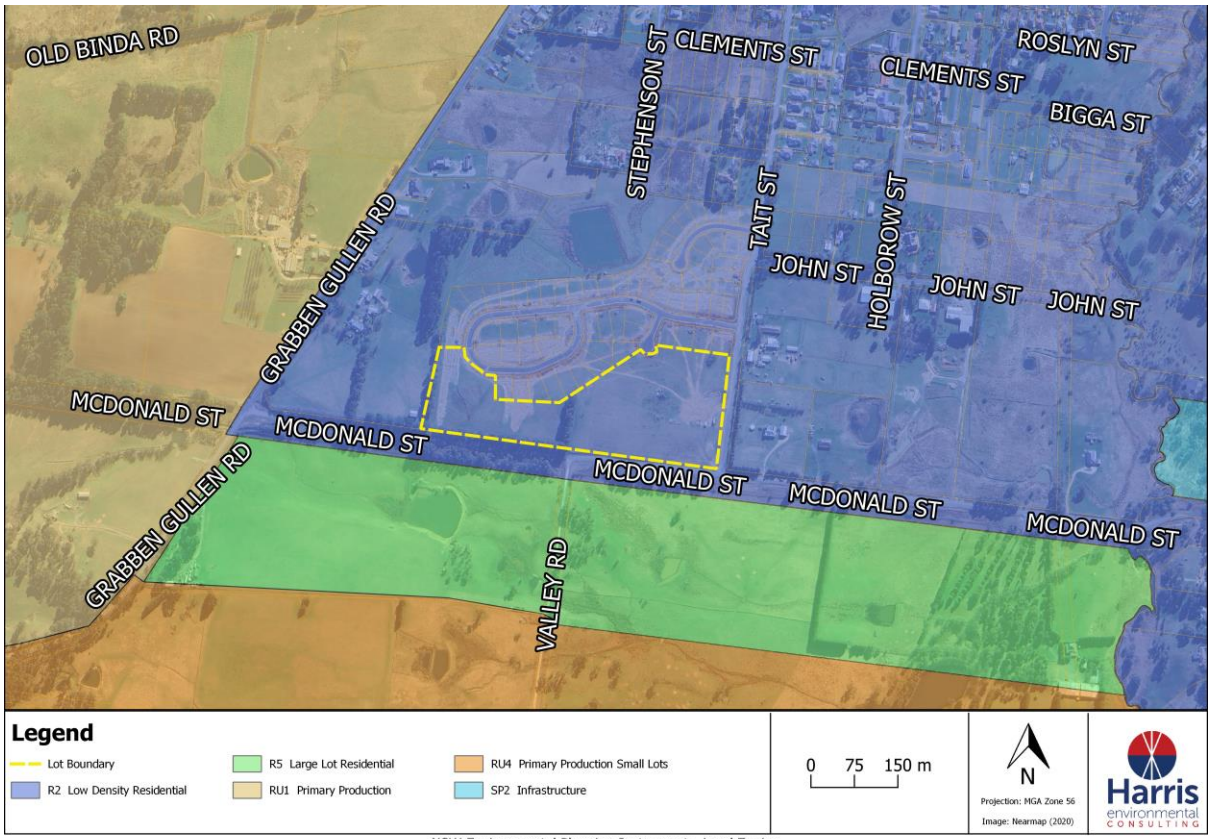
MAP	FIGURE	DESCRIPTION
Bushfire Prone Land Map	5	The subject lot is mapped "Vegetation Category 1" and "Vegetation Buffer" on the south east. The majority of the subject lot is not mapped bushfire prone.
LEP Zone Map	6	The subject lot is zoned as "R1 General Residential", "E4 Environmental Living" and "E2 Environmental Conservation".
Vegetation Mapping	7	The vegetation surrounding the subject lot has been mapped as "Southern Tableland Grassy Woodland' (DPIE, 2022).
Biodiversity Values Map	8	As of 1/7/22, there is land identified within the subject lot as having high biodiversity value under the Biodiversity Offsets Scheme under the Biodiversity Conservation Act 2016.

FIGURE 5 BUSHFIRE PRONE MAP



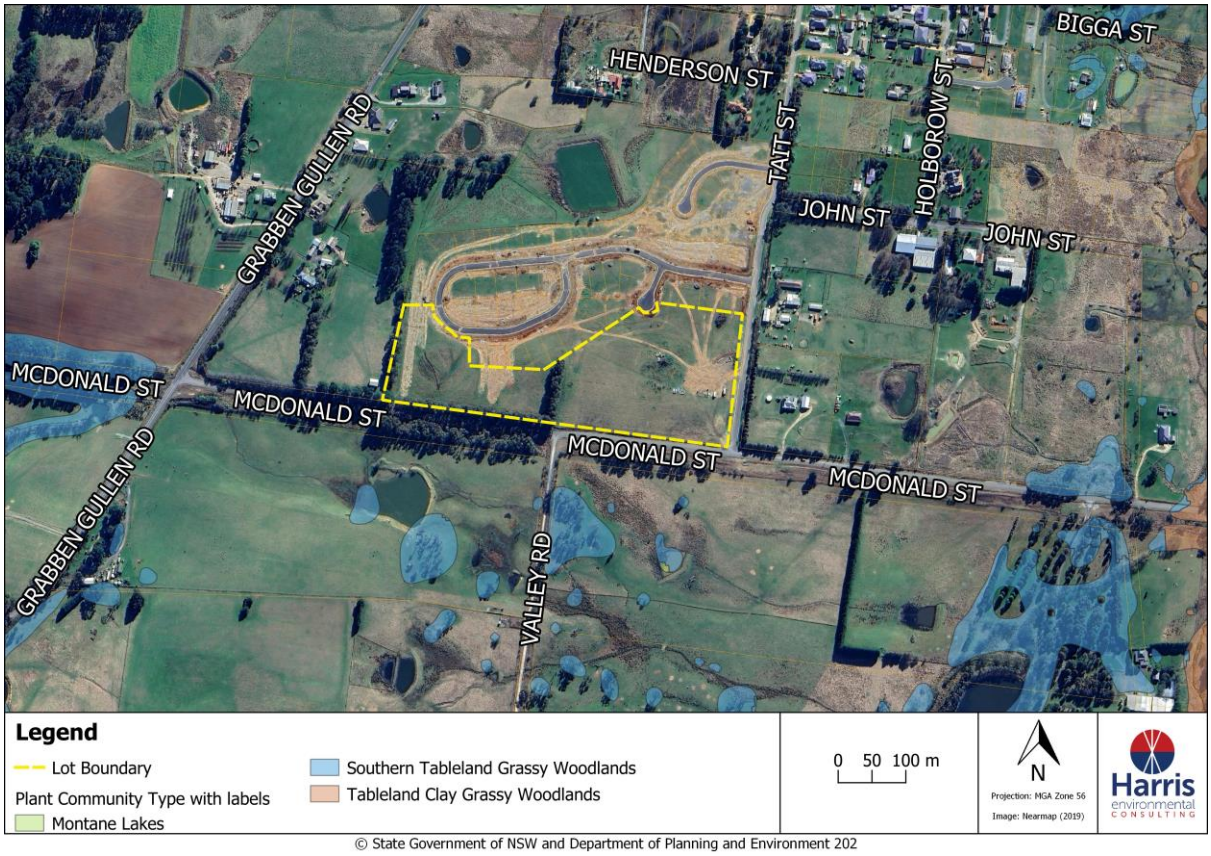
NSW Bushfire Prone Land Map

FIGURE 6 LEP ZONE MAP



NSW Environmental Planning Instrument - Land Zoning

FIGURE 7 VEGETATION MAPPING



5. SITE DESCRIPTION

5.1. Slope and aspect of the site within 100 m

The slope that would most significantly influence fire behaviour was determined over a distance of 100m out from the proposed residence. This assessment was made using 2 m contour intervals and field inspection, using a clinometer.

The Australian Standard AS3959:2018 identifies that the slope of the land under the classified vegetation is much more important than the slope between the site and the edge of the classified vegetation.

As can be seen in Figure 8 the subject site is located on topography that exhibits a gentle slope that falls to the east.

FIGURE 8 SLOPE

5.2. Identification of significant environmental features

The owner has not provided any studies of environmental significance.

5.3. Vegetation formation within 140 m of proposed development

Figure 9 shows the managed and unmanaged land within 140 m of the proposed subdivision.

The vegetation formations are described below and summarised in Table 2.

The predominate vegetation on all elevations is classified cleared and agricultural land classified as 'Grassland' in accordance with PBP 2019.

To the south, a small area of vegetation within the lot south of McDonald Street is classified 'Woodland' in accordance with PBP.

The vegetation on the north west of the subject lot, west of existing Stage 2, is classified 'Grassland' in accordance with PBP 2019.

To the west, vegetation within the western adjoining lot is less than 1 Ha and less than 50 m in width. This vegetation is classified 'Remnant' in accordance with PBP 2019.

TABLE 2 PREDOMINATE VEGETATION CLASSIFICATION

	Vegetation Formation	Effective Slope	Distance from façade to hazard
North	Grassland	Upslope	> 50 m
South	Grassland Remnant Woodland	Downslope 0-5˚	17 m 25 m 91 m
East	Grassland	Downslope 0-5˚	20 m
West	Grassland & Remnant	Upslope	10 m & 33 m

FIGURE 9 BUSHFIRE PRONE VEGETATION WITHIN 140 M OF PROPOSED SUBDIVISION

6. BUSHFIRE THREAT ASSESSMENT

6.1. Asset Protection Zones (APZ)

Table A1.12.2 *PBP 2019* has been used to determine the width of the required APZ for the proposed development using the vegetation and slope data identified.

An FDI of 100 was used for this location.

Table 3 below shows the APZ and BAL Determination for proposed building envelopes.

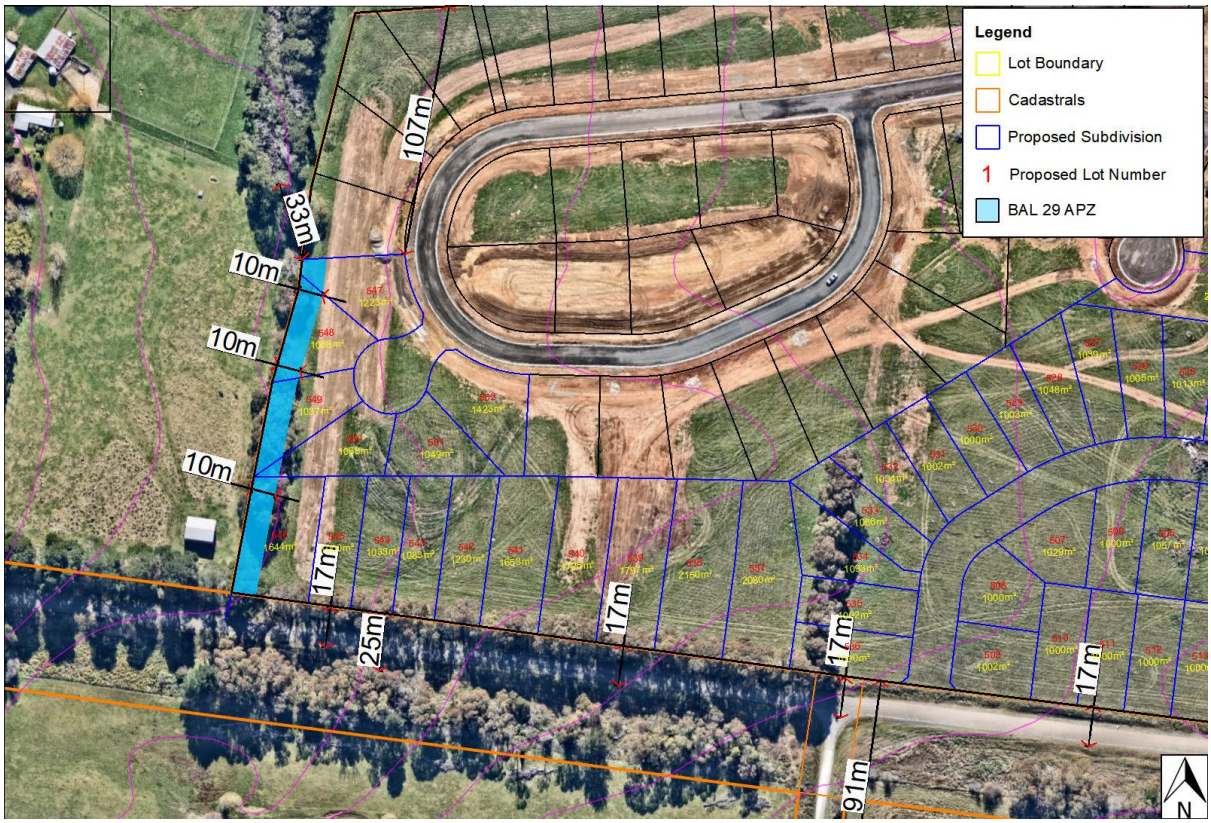
An 10 m Asset Protection Zone setback in accordance with <29 kW/m² will be required to be established from the commencement of building works and maintained for perpetuity on the western boundary of Stage 5. The APZ is to be maintained as an 88B Easement on the use of the land.

All land within each entire lot within Stage 5 will be required to be maintained to an APZ standard in perpetuity. This is to be managed to the standard of an IPA outlined in Section 7.

TABLE 3 APZ AND BAL DETERMINATION USING PBP 2019

	North	South	Remnant	South	East	West	West
Vegetation	Grassland	Woodland	Woodland	Grassland	Grassland	Grassland	Remnant
Gradient	Upslope	0-5° downslope	0-5° downslope	0-5° downslope	0-5° downslope	Upslope	Upslope
Distance between facade and vegetation	> 50 m	91 m	91 m	17 m	20 m	10 m	33 m
BAL 29 required APZ						**10-<22 m**	
BAL 19 required APZ				17-<25 m	17-<25 m	15-<22 m	
BAL 12.5 required APZ	22-<50 m	32-<100 m	32-<100 m	25-<50 m	25-<50 m	22-<50 m	23-<100 m

FIGURE 10 ASSET PROTECTION ZONES



6.2. Relevant Construction Standard

The Australian Standard AS3959:2018 is the enabling standard that addresses the performance requirements of both parts 2.3.4 and Part GF5.1 of the Building Code of Australia for the construction of the Class 1, 2 and Class 3 buildings within a designated Bushfire Prone Area.

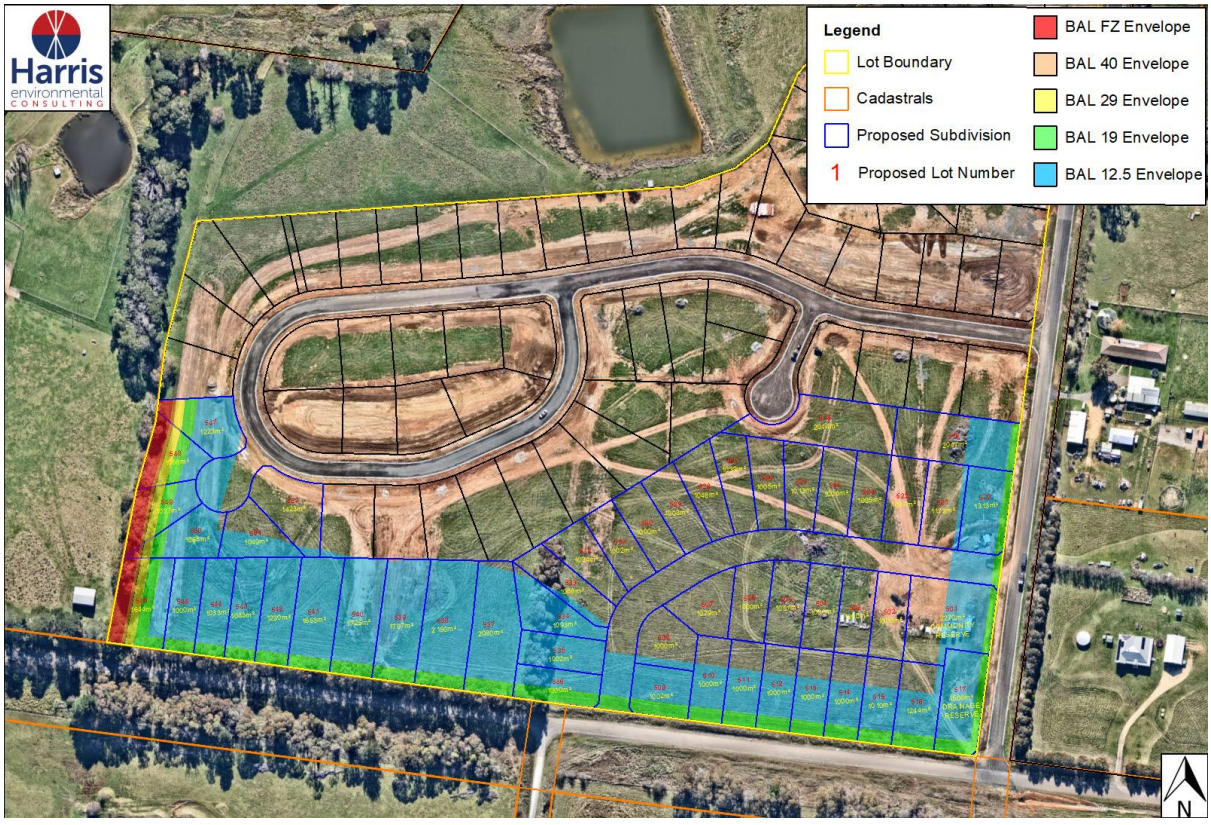
The following was determined for this site:

Relevant fire danger index……FDI 100
Flame temperature ……1090 K

The proposed subdivision can achieve **BAL 29** or less, with the Asset Protection Zone setback in accordance with <29 kW/m².

The location of BALs is shown in Figure 11.

FIGURE 11 BUSHFIRE ATTACK LEVELS (BALS)



6.3. Safe Operational Access

The PBP (2019) requires the provision of safe operational access to structures and water supply for emergency services, while residents are seeking to evacuate from an area.

The subject lot is located on Tait Street. This is a two-wheel drive, all weather road. The capacity of road surfaces and bridges is sufficient to carry fully loaded firefighting vehicles.

The proposed Stage 5 subdivision includes a non-perimeter road of 300 m in length that is accessed from McDonald Street on the south and Tait Street on the east. The proposed road is required to comply with Table 5.3c PBP 2019 including the below general and non-perimeter access road requirements.

General Requirements:

- 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.

Non-Perimeter Roads:

- 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.

6.4. Emergency Management

The owners are advised to obtain the *NSW Rural Fire Service – "Guidelines for the Preparation of Bush Fire Evacuation Plans"* & *'Bush Fire Survival Plan'* In the event of emergency, the owners should ensure they are familiar with the RFS Bush Fire Alert Levels and use their Bush Fire Survival Plan.

6.5. Adequate Water and Utility Services

Reticulated water is supplied to the subdivision.

Proposed water supply to the subdivision to comply with:

- 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;
- reticulated water supply to urban subdivisions uses a ring main system for areas with perimeter roads.
- fire hydrant flows and pressures comply with the relevant clauses of AS 2419.1:2005
- 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.

Any bottled gas will be installed and maintained in accordance with AS1596 and the requirements of the relevant authority. If gas cylinders need to be kept close to the buildings, the release valves must be directed away from the building and away from any combustible material. Polymer sheathed flexible gas supply lines to gas meters adjacent to buildings are not to be used.

Electrical transmission lines, if above ground, will be managed in accordance with specifications issued by Energy Australia.

7. LANDSCAPING

An APZ is required to be established and should be maintained for perpetuity.

When landscaping, vegetation should be located greater than 2 m from any part of the roofline of a dwelling or the shed. Garden beds of flammable shrubs are not to be located under trees and should be no closer than 10 m from an exposed window or door. Trees should have lower limbs removed up to a height of 2 m above the ground.

Appendix 4 (PBP 2019) provides guidelines for landscaping and Bushfire Provisions within the APZ. To incorporate bushfire protection measures into future development, the owner is advised to consider the following:

- Avoid planting trees species with rough fibrous bark, or which retain/shed bark in long strips or retain dead material in their canopy.
- Avoid planting deciduous species that may increase fuel at surface/ground level by the fall of leaves.
- Avoid climbing species to walls and pergolas.
- Locate combustible materials such as woodchips/mulch, flammable fuel stores (LPG gas bottles) away from the building.
- Locate combustible structures such as garden sheds, pergolas, and materials such as timber furniture away from the building.
- Ensure any vegetation planted around the house is a suitable distance away so these plants do not come into physical contact with the house as they mature.
- The property should be developed to incorporate suitable impervious area surrounding the house, including courtyards, paths, and driveways.

The APZ will be required to be maintained as an Inner Protection Area.

The IPA is the area closest to the building and creates a fuel-managed area which can minimise the impact of direct flame contact and radiant heat on the development and act as 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 building, consisting of a mown lawn and well maintained gardens.

When establishing and maintaining an IPA the following requirements apply:

Trees

- tree canopy cover should be less than 15% at maturity;
- trees at maturity should not touch or overhang the building;
- lower limbs should be removed up to a height of 2m above the ground;
- tree canopies should be separated by 2 to 5m; and
- 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 should be provided;
- shrubs should not be located under trees;
- shrubs should not form more than 10% ground cover; and
- clumps of shrubs should be separated from exposed windows and doors by a distance of at least twice the height of the vegetation.

Grass

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

7. HOW THIS PROPOSAL MEETS DEEMED TO SATISFY

The following tables show how the proposal meets the Performance Based Controls of the PBP (2019) Chapter 5.

TABLE 4 DEMONSTRATION OF PBP 2019 TABLE 5.3A COMPLIANCE

	Performance Criteria	Acceptable Solution	Demonstration of Compliance
ASSET PROTECTION ZONES	Potential building footprints must not be exposed to radiant heat levels exceeding 29 kW/m² on each proposed lot.	APZs are provided in accordance with Tables A1.12.2 and A1.12.3 based on the FFDI.	A 10 m Asset Protection Zone setback in accordance with <29 kW/m² will be required to be established from the commencement of building works and maintained for perpetuity on the western boundary of Stage 5.
	APZs are managed and maintained to prevent the spread of a fire to the building.	APZs are managed in accordance with the requirements of Appendix 4 of PBP.	The APZ can be managed.
	The APZ is provided in perpetuity.	APZs are wholly within the boundaries of the development site.	The APZ is located within the proposed subject lots.
	APZ maintenance is practical, soil stability is not compromised and the potential for crown fires is minimised.	APZ are located on lands with a slope less than 18 degrees.	The land is less than 18 degrees downslope.
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.	Landscaping is in accordance with Appendix 4; and Fencing is constructed in accordance with section 7.6.	Will be required to comply.

TABLE 5 DEMONSTRATION OF PBP 2019 TABLE 5.3B COMPLIANCE

	Performance Criteria	Acceptable Solution	Demonstration of Compliance
ACCESS (GENERAL REQUIREMENTS)	Firefighting vehicles are provided with safe, all-weather access to structures.	Property access roads are two-wheel drive, all-weather roads.	Is required to comply.
		Perimeter roads are provided for residential subdivisions of three or more allotments.	Not proposed as part of Stage 5.
		Subdivisions of three or more allotments have more than one access in and out of the development.	Access to lots is from the proposed non-perimeter road, McDonald Street and Tait Street.
		Traffic management devices are constructed to not prohibit access by emergency services vehicles.	Is required to comply.
		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.	Is required to comply.
		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.	Complies Not applicable as part of Stage 5.
		Where kerb and guttering are provided on perimeter roads, roll top kerbing should be used to the hazard side of the road.	Is required to comply.
		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;	Is required to comply.
	The capacity of access roads is adequate for firefighting vehicles	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.	Is required to comply.
	There is appropriate access to water supply	Hydrants are located outside of parking reserves and road carriageways to ensure accessibility to reticulated water for fire suppression.	Is required to comply.
		Hydrants are provided in accordance with the relevant clauses of AS 2419.1:2005 - Fire hydrant installations System design, installation and commissioning; and	Is required to comply.
		There is suitable access for a Category 1 fire appliance to within 4m of the static water supply where no reticulated supply is available.	Is required to 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 firefighting and emergency management on the interface.	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. 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.	Not proposed as part of Stage 5.
NON-PERIMETER ROADS	Access roads are designed to allow safe access and egress for firefighting vehicles while residents are evacuating.	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.	Is required to comply.

TABLE 6 DEMONSTRATION OF PBP 2019 TABLE 5.3C COMPLIANCE

	Performance Criteria	Acceptable Solution	Demonstration of Compliance
WATER SUPPLIES	An adequate water supply is provided for firefighting purposes.	Reticulated water is to be provided to the development, where available; and Or a 20,000 L minimum static water supply is provided where no reticulated water is available.	Is required to comply.
	Water supplies are located at regular intervals; and The water supply is accessible and reliable for firefighting operations.	Fire hydrant spacing, design and sizing comply with the relevant clauses of 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.	Is required to comply.
	Flows and pressure are appropriate.	Fire hydrant flows and pressures comply with the relevant clauses of AS 2419.1:2005.	Is required to comply.
	The integrity of the water supply is maintained.	All above-ground water service pipes external to the building are metal, including and up to any taps.	Is required to comply.
ELECTRICITY SEVICES	Location of electricity services limits the possibility of ignition of surrounding bush land or the fabric of buildings.	Where practicable, electrical transmission lines are underground; and Where overhead, electrical transmission lines are proposed as follows: • lines are installed with short pole spacing (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 accordance with the specifications in ISSC3 *Guideline for Managing Vegetation Near Power Lines.*	Is required to comply.

GAS SERVICES	Location and design of gas services will not lead to ignition of surrounding bushland or the fabric of buildings.	Reticulated or bottled gas is installed and maintained in accordance with AS/NZS 1596:2014 and 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. 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.	Is required to comply.

8. SUMMARY

The proposed Stage 5 subdivision can achieve **BAL 29** or less, with the Asset Protection Zone setback in accordance with <29 kW/m².

A 10 m Asset Protection Zone setback in accordance with <29 kW/m² will be required to be established from the commencement of building works and maintained for perpetuity on the western boundary of Stage 5. The APZ is to be maintained as an 88B Easement on the use of the land.

All land within each entire lot within Stage 5 will be required to be maintained to an APZ standard in perpetuity. This is to be managed to the standard of an IPA.

The proposed Stage 5 subdivision includes a non-perimeter road of 300 m in length that is accessed from McDonald Street on the south and Tait Street on the east. The proposed road is required to comply with Table 5.3c PBP 2019.

Proposed water supply to the subdivision to comply with:

- 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;
- reticulated water supply to urban subdivisions uses a ring main system for areas with perimeter roads.
- fire hydrant flows and pressures comply with the relevant clauses of AS 2419.1:2005
- 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.

Any bottled gas will be installed and maintained in accordance with AS1596 and the requirements of the relevant authority. If gas cylinders need to be kept close to the buildings, the release valves must be directed away from the building and away from any combustible material. Polymer sheathed flexible gas supply lines to gas meters adjacent to buildings are not to be used.

Electrical transmission lines, if above ground, will be managed in accordance with specifications issued by Energy Australia.

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9. REFERENCES

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