REF: 6352BF

Date: 24/10/23

BUSHFIRE HAZARD EXISTING SFPP ASSESSMENT

PROPOSED ACCOMMODATION WING, SCOUT HALL, DUTY MANAGER ACCOMMODATION AND NEW ROAD

CAMP KURRAJONG, 790 OURA ROAD, EUNAOREENYA

LGA: Wagga Wagga

Lot 3 DP 751405, Lot 175 DP 751405, Lot 7004 DP 1069230

Applicant: Tim Lawler

HARRIS ENVIRONMENTAL CONSULTING

KATE@HEC.ECO

HARRIS ENVIRONMENTAL CONSULTING

Version Control

Date Created	4/10/2023			
Version Number	Name	Issue Detail	Date Modified	Status
1.0	SO	Report	24/10/23	Complete
1.1	KH	DA Report	24/10/23	Complete

Bushfire Hazard Assessment

Property Address:	Camp Kurrajong, 790 Oura Road, Eunaoreenya, Lot 3 DP 751405, Lot 175 DP 751405, Lot 7004 DP 1069230
Description of Proposal:	Proposed Accommodation Wing, Scout Hall, Duty Manager Accommodation and New Road
Plan Reference:	Masterplan: Project #: 3174; DWG #: DA110; Project: Scouts Camp Kurrajong; PMDL Architecture + Design; Date: July 23 Proposed Road: RoadKerb Design-Design Base-Layout1
Highest BAL Construction Standard	**BAL 19** because the construction standard is increased from BAL 12.5 due to lack of secondary access.
Performance-Based Solution	Yes - Due to the length of the access road and the lack of secondary access. The BAL is increased to BAL 19 in conjunction with SFPP APZ (10kW/m^2, 1200K).
Bushfire Assessment Reference:	6352BF
Report Date:	30/6/23
Accreditation Scheme/Certification No:	FPAA Australia Bushfire Planning & Design Scheme BPAD L3 26947

ASSESSOR & QUALIFICATIONS

Kate Harris

BPAD Bushfire Planning & Design Accredited Practitioner Level 3

BPAD L3 26947
MASTERS OF BUSHFIRE PROTECTION, UWS
GRAD DIP BUSH FIRE PROTECTION, UWS
GRAD DIP ENVIRO MANG HERTS, UK
GRAD DIP NAT RES UNE
BSC APP SC, AGRICULTURE HAC

ABN 541 287 40 549
Phone: (02) 42 360 954
Mobile: 0403 237 072
Email: kate@hec.eco

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.

TABLE OF CONTENTS

FIGURES

TABLES

APPENDIX

EXECUTIVE SUMMARY

This Bushfire Hazard Assessment is for the existing Scout Camp Kurrajong. The development proposed includes replacing some existing buildings with a new Scout Hall, new Accommodation Wing and Duty Managers Accommodation to be used for camps on Lot 3 DP 751405, Lot 175 DP 751405, Lot 7004 DP 1069230 on Camp Kurrajong, 790 Oura Road, Eunaoreenya. The Primitive Camping activity that currently exists will continue on both north and south sites. Sean Harris undertook the site inspection on 12 September 2023. This Development has been assessed in accordance with SFPP infill Section 6.4 PBP 2019. This section requires that in circumstances where new building projects are proposed within an existing SFPP, an appropriate combination of Bushfire Protection Measures (BPMs) are required.

The indicative concept plan will include a maximum of 200 people staying overnight and the proposed Scout Hall can provide a safe refuge building to accommodate all occupants. This building can meet 10kW/m^2 and will be constructed to BAL 19 due to the length of the access road over 200 m and lack of secondary access.

The Proposed Scout Hall (refuge building) can be constructed to **BAL 19** (Section 6 and Section 3) as specified by AS3959 - 2018 Construction for Buildings in Bushfire Prone Areas and/or *NASH Standard Steel Framed Construction in Bushfire Areas* (2014). New construction must also comply with the construction requirements in Section 7.5 of *Planning for Bush Fire Protection 2019.* The refuge will be required to provide SFPP 10 kW/m^2 APZs and under prescriptive requirements can be constructed to BAL 12.5. However, as access is greater than 200 m from a public through road and as a performance-based solution, the construction standard is increased from BAL 12.5 to BAL 19.

The refuge is provided within 100m walking distance of the proposed and existing accommodation buildings, specifically the Accommodation Wing, Duty Managers Accommodation and the Existing Merit Buildings. The accommodation buildings and existing campsites do not have any bushfire building construction or APZ requirements.

In accordance with Private Bushfire Shelters Performance Standard (ABCB, 2014) the refuge is required to be at least 150 m^2 and a floor area of 0.75 m^2 and volume 1.2 m^3 per person can shelter a maximum of 200 people. The proposed Scout Hall can provide a refuge area of approximately 800 m^2.

The bushfire prone land within 140 m of the proposed Scout Hall (refuge building) is:

Aspect	Vegetation Classification and slope	Distance from façade to hazard
North East	Flatland Woodland	42 m
East	Flatland Woodland	42 m
South East	Flatland Woodland	50 m
South West	Flatland Forested Wetland	34 m
West	Flatland Grassland	36 m

An SFPP APZ (10kW/m^2, 1200K) surrounding the Scout Hall (Refuge Building) is required to be established from the commencement of building works and maintained in perpetuity for the following distances:

- 42 m towards the northern, eastern and southeastern elevations
- 34 m towards the southwestern elevation
- 36 m towards the western elevation

The subject lot is located on Oura Road. This is a two-wheel drive, all-weather road. Road surfaces and bridges are sufficient to carry fully loaded firefighting vehicles.

The proposed access is required to comply with the PBP- Property Access Table 5.3b. This includes:

- A minimum carriageway width of four metres;
- provide enough turning room for a fire tanker that requires an inner minimum turning radius of 6 m and outer minimum radius of 12 m;
- Curves a minimum inner radius of six metres;
- The minimum distance between inner and outer curves is six metres;
- The cross fall is not more than 10 degrees;
- Maximum grades for sealed roads do not exceed 15 degrees (28 per cent) and not more than 10 degrees (18 percent) for unsealed roads;
- The internal road surfaces and bridges have a capacity to carry fully loaded firefighting vehicles (23 tonnes) and provide signage that clearly indicates the bridge capacity; 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.

The applicant should ensure there is at least 10,000 litre water supply available for firefighting purposes. Above ground tanks are required to be manufactured of concrete or metal and raised tanks have their stands protected. All above ground water pipes external to the building are required to be metal including and up to any taps. Pumps are to be shielded. Underground tanks should have an access hole of 200 mm and a hardened ground surface within 4 m of the access hole. A suitable connection for firefighting purposes is required such as a 65mm storz outlet and a gate or ball valve.

Any bottled gas will be installed and maintained under 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 under specifications issued by Energy Australia.

1 PROPOSAL

The owners of Camp Kurrajong, 790 Oura Road, Eunaoreenya, on Lot 3 DP 751405, Lot 175 DP 751405, Lot 7004 DP 1069230 propose to construct an Accommodation Wing, Scout Hall, Duty Managers Accommodation, 2 Amenities buildings and a new road. The Scout Hall is proposed to be used as a safe refuge building in the event of a bushfire emergency. This assessment confirms the subject lot is mapped as bushfire prone.

Sean Harris undertook the site inspection on 12 September 2023.

Harris Environmental Consulting was commissioned to provide this bushfire hazard assessment.

Figure 1 shows the subject lot location.

Figure 2 provides a broad scale aerial view of the subject site.

Figure 3 shows a close up of the subject lot.

Figure 4 shows the proposed plan.

Figure 1 Site location

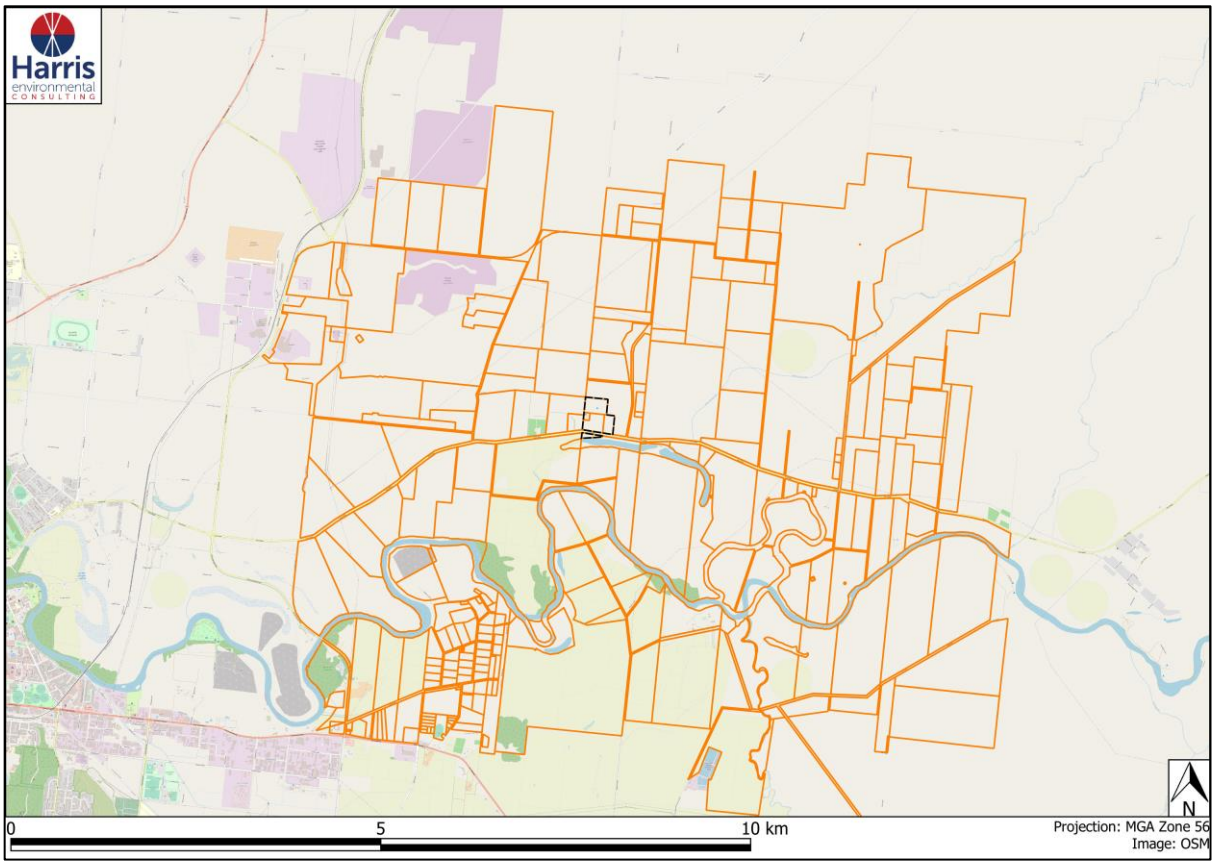
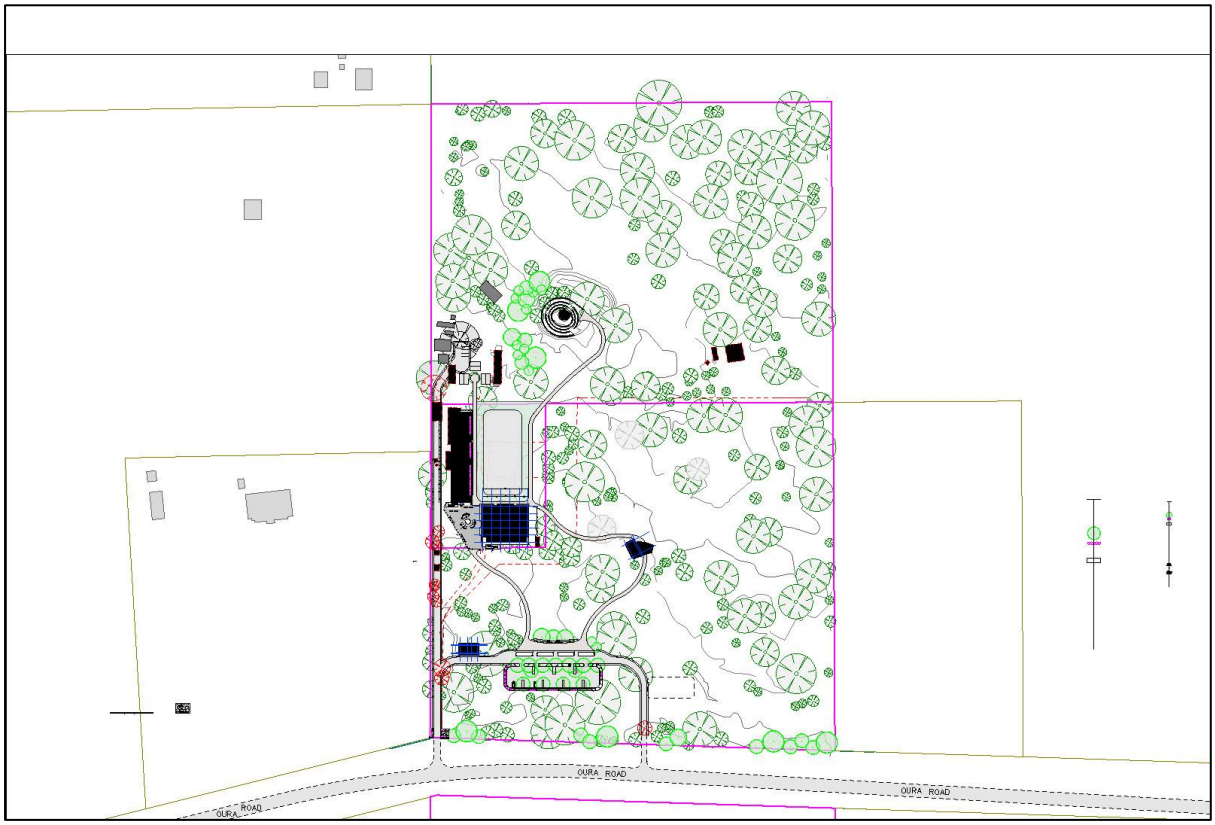


Figure 2 Broad scale aerial view of the subject site

Figure 3 Close up view of Subject Lot

Figure 4 Proposed Plan



1.1 Bushfire Hazard Assessment requirements for development of existing SFPP facilities

This development is considered to be Special Fire Protection Purpose (SFPP) development under Section 6 PBP (2019) and a BFSA is required under the RF Act. 100B.

Where new developments are located within existing SFPP sites, an appropriate combination of Bushfire Protection Measures are required. The intention is to achieve a better bushfire outcome than if the development were not to proceed.

Existing SFPP facilities constructed prior to the current bushfire requirements need to accommodate all occupants. This is to be provided through a safe refuge building that can provide a radiant heat threshold of no greater than 10kW/m^2 and a minimum BAL-12.5 construction.

In accordance with Section 6.4, the objectives of existing SFPP developments are as follows:

Section 6.4 BPM Objectives	Compliance
Provide an appropriate defendable space	Complies – a SFPP (10kW/m^2) APZ is proposed around the Scout Hall (proposed safe refuge)
Site the building in a location which ensures appropriate separation from the hazard to minimise potential for material ignition	Complies
Provide a better bushfire protection outcome for existing buildings	The existing building accommodation buildings are within 100 m of the proposed safe refuge building and are required to be upgraded for ember protection.
New buildings should be located as far from the hazard as possible and should not be extended towards or situated closer to the hazard than the existing building (unless they can comply with section 6.8)	The proposed accommodation buildings are not located closer to the hazard.
Ensure there is no increase in bushfire management and maintenance responsibility on adjoining landowners without their written confirmation	N/A
Ensure building design and construction enhances the chances of occupancy and building survival	The buildings will be ember protected.
Provide for safe emergency evacuation procedures including capacity of existing infrastructure (such as roads).	A new road is proposed in this development.

2 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 Category 3".
LEP Zone Map	6	The subject lot is zoned as "RE1 – Public Recreation" and "RU1 – Primary Production".
Vegetation Mapping – Validated by Lodge Environmental 2023.	7	The vegetation surrounding the development area has been mapped as "Floodplain Transition Woodlands", "Inland Riverine Forests" and "Western Slopes Grassy Woodlands" (DPIE, 2022).
Biodiversity Values Map	8	There is land identified on 11/10/2023 as having high biodiversity value under the Biodiversity Offsets Scheme under the *Biodiversity Conservation Act 2016.* This land does NOT include the existing or indicative proposed APZ.

Figure 5 Bushfire Prone Map

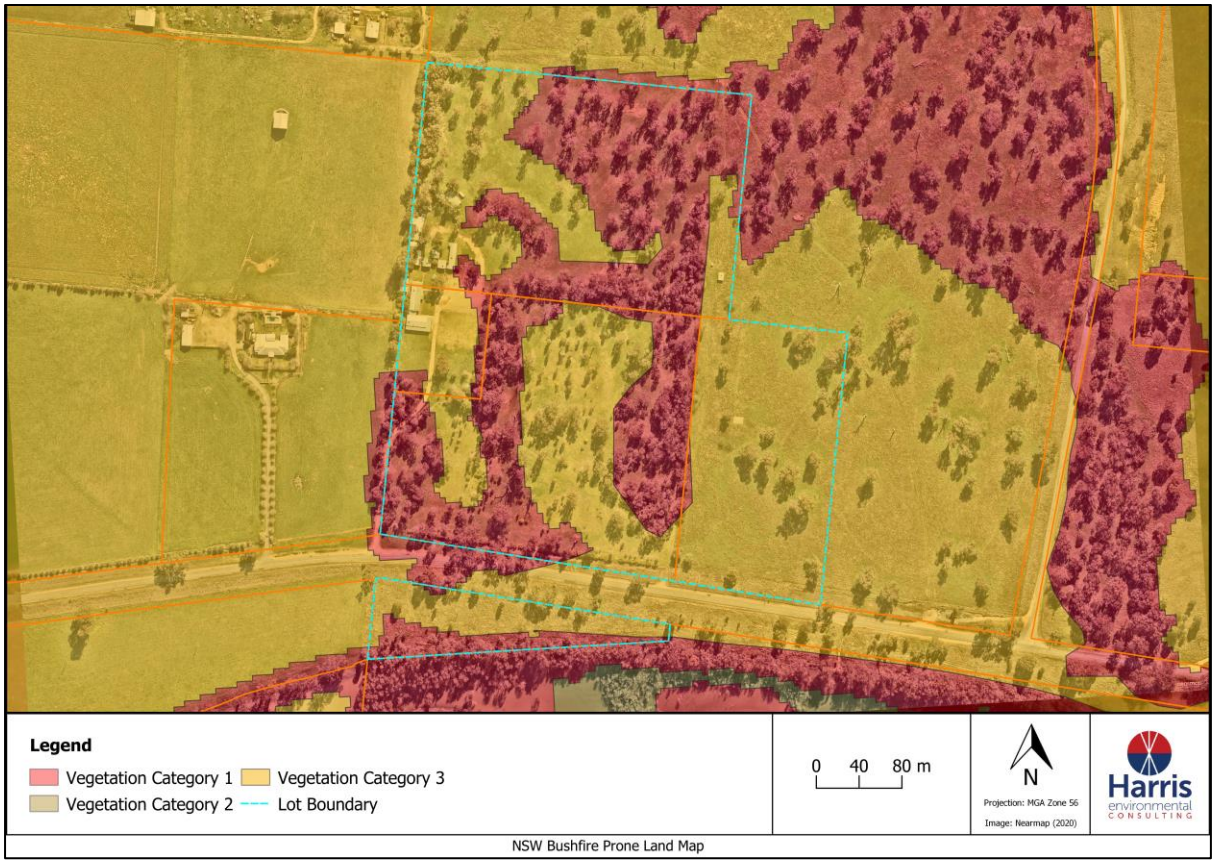


Figure 6 LEP Zone Map

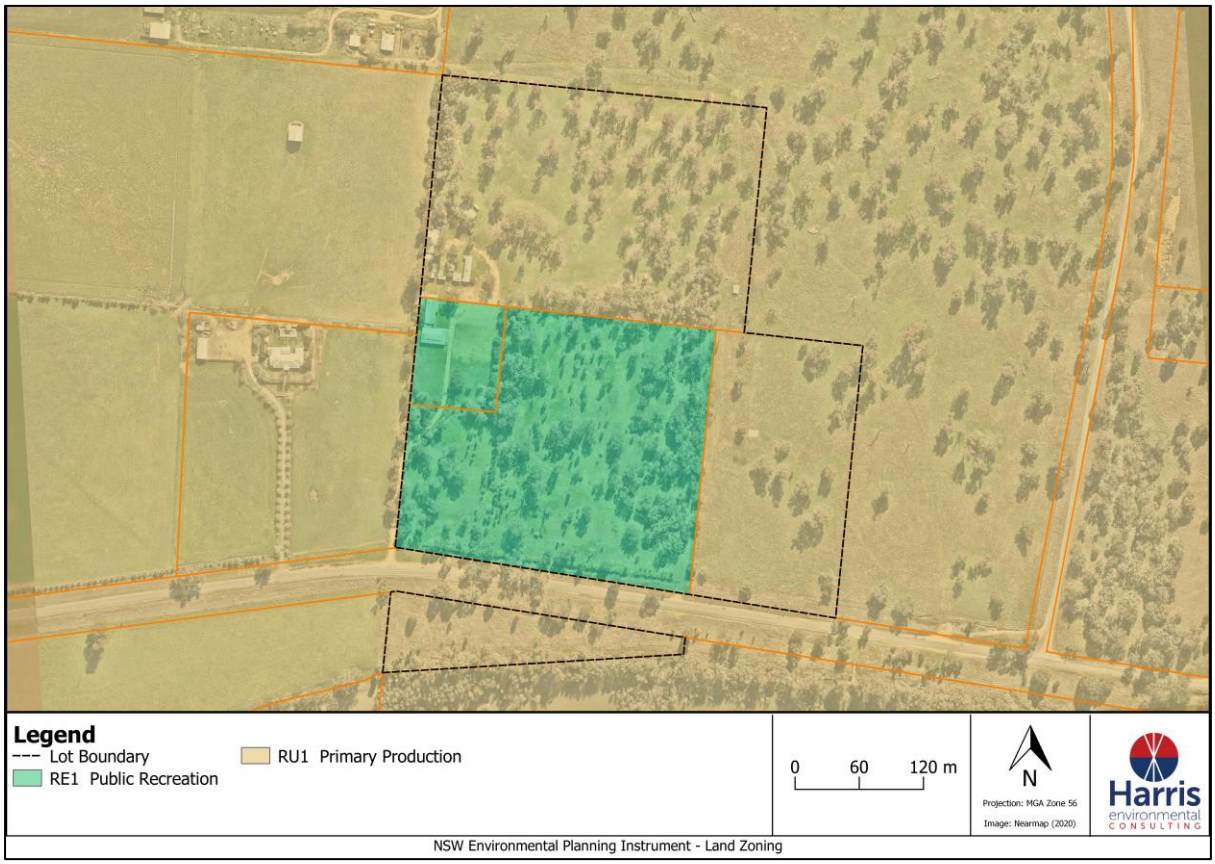


Figure 7 Vegetation Mapping

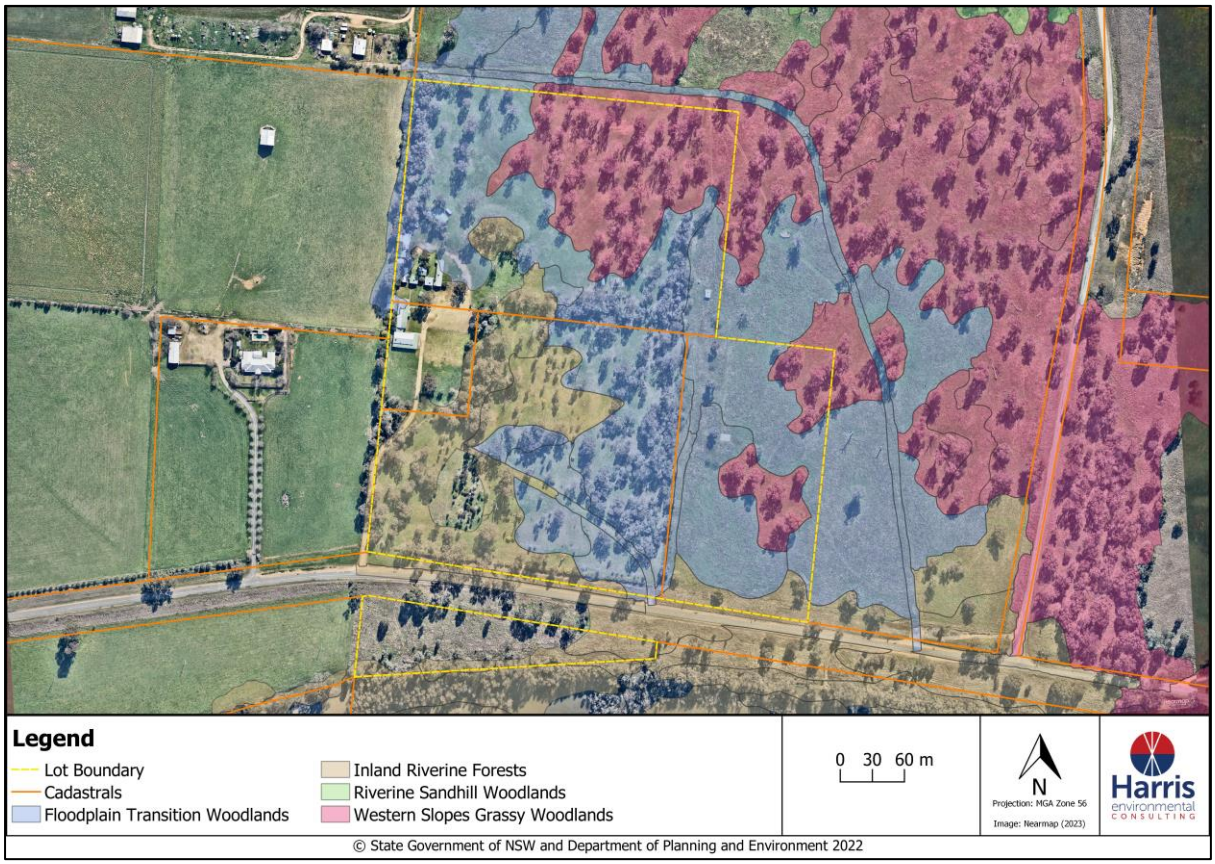


Figure 8 Biodiversity Values Map

3 SITE DESCRIPTION

3.1 Slope and Aspect of the Site within 100m

The slope that would most significantly influence fire behaviour was determined over a distance of 100 m out from the proposed residence. This assessment used 2 m contour intervals from ELVIS.

The Australian Standard AS3959 - 2018 and PBP 2019 identify 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 shown in Figure 9, the development area is located on very level land in all elevations. The land slopes downwards south of Oura Road.

Figure 9 Slope

3.2 Vegetation Formation Within 140m of Proposed Development

Figure 10 shows the managed and unmanaged land within 140 m of the proposed Scout Hall.

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

The vegetation towards the southern elevation has been mapped as “Inland Riverine Forests” (DPIE 2022). In accordance with *Planning for Bushfire Protection (PBP) 2019*, this vegetation has been classified as “Forested Wetlands”.

The vegetation towards the northern and eastern elevation has been mapped as “Floodplain Transition Woodlands” (DPIE 2022). In accordance with PBP 2019, this vegetation has been classified as “Grassy Woodland”.

The cleared paddock on the neighbouring property towards the western elevations has been classified as “Grassland” in accordance with PBP 2019 and upon site inspection.

The surrounding vegetation is shown in Photos 1 – 3.

Table 2 Predominate Vegetation Classification

	Vegetation Formation	Effective Slope	Distance from façade to hazard
North East	Woodland	Flatland	42 m
East	Woodland	Flatland	42 m
South East	Woodland	Flatland	50 m
South West	Forested Wetland	Flatland	34 m
West	Grassland	Flatland	36 m

Figure 10 Bushfire Prone Vegetation within 140 metres of the Scout Hall

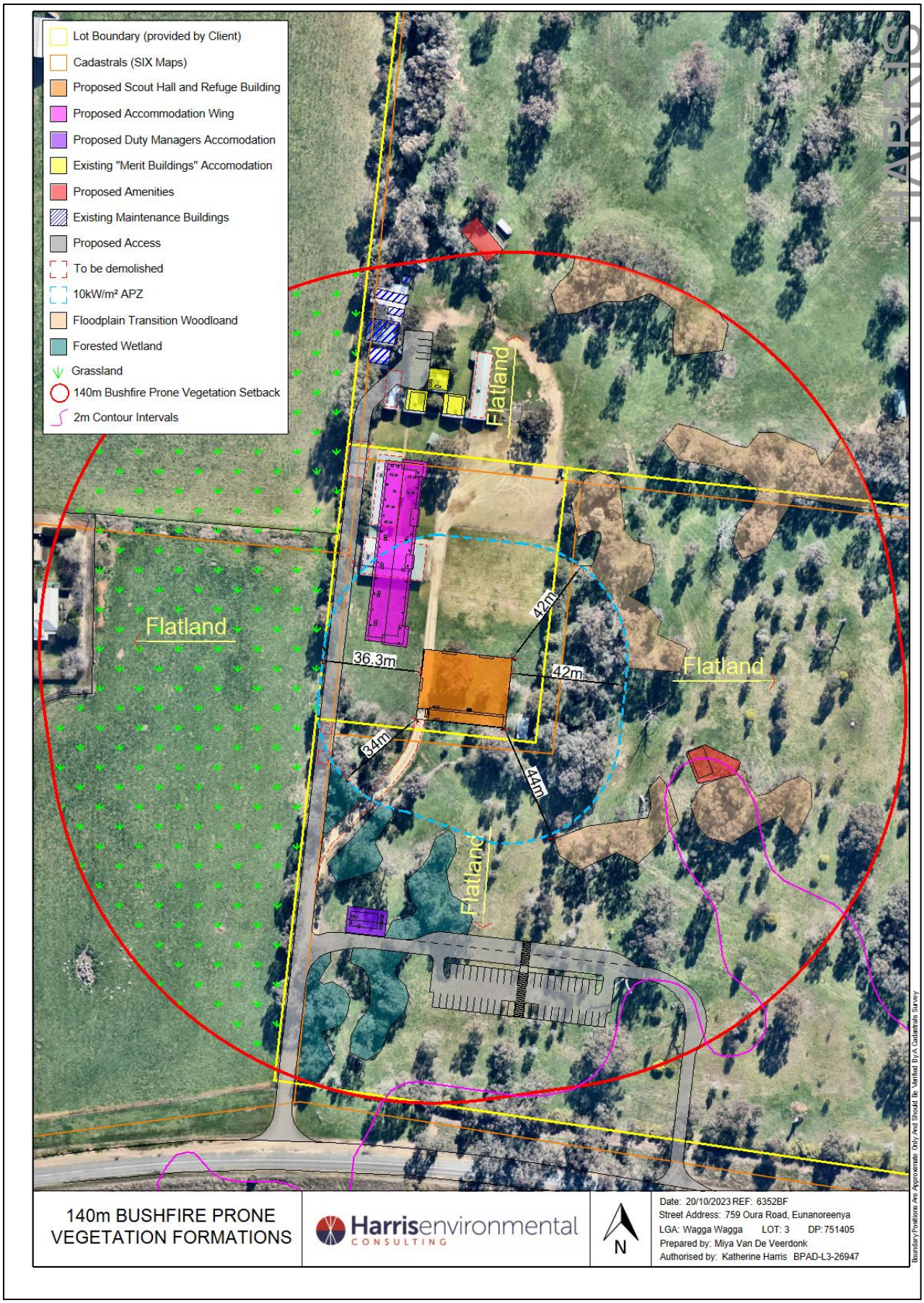


Photo 1 View of Level Grassland towards the western elevation.

Photo 2 View of Forested Wetland vegetation and towards the southern elevating, facing south east.

Photo 3 View of managed vegetation and woodland on the eastern elevation, facing south.

4 BUSHFIRE THREAT ASSESSMENT

4.1. Asset Protection Zones (APZ)

Table A1.12.1 *Planning for Bush Fire Protection 2019* has been used to determine the width of the required APZ for the proposed development using the vegetation and slope data identified.

Figure 11 and Table 3 below shows the APZ and BAL Determination for the subject site.

An SFPP APZ (10kW/m^2, 1200K) surrounding the Scout Hall (Safe Refuge Building) is required to be established from the commencement of building works and maintained in perpetuity for the following distances as shown in Figure 11:

- 42 m towards the northern, eastern and southeastern elevations
- 34 m towards the southwestern elevation
- 36 m towards the western elevation

Table 3 APZ and BAL Determination for Proposed

	NORTH	***EAST***	***SOUTH EAST***	***SOUTH WEST***	***WEST***
Vegetation	Woodland	Woodland	Woodland	Forested Wetland	Grassland
Gradient	Flatland	Flatland	Flatland	Flatland	Flatland
Distance between façade and hazard	42 m	42 m	50 m	34 m	36 m
Table A1.12.1 PBP 2019 required setback for SFPP APZ (<10kW/^{2}, 1200 K)	42 m	42 m	42 m	34 m	36 m
Proposed Construction BAL	**BAL 19**	**BAL 19**	**BAL 19**	**BAL 19**	**BAL 19**
Proposed APZ BAL	**SFPP APZ**	**SFPP APZ**	**SFPP APZ**	**SFPP APZ**	**SFPP APZ**

Figure 11 SFPP APZ from the Proposed Scout Hall (Refuge Building)

4.2. Relevant Construction Standard

The Australian Standard AS3959 – 2018 and/or *NASH Standard Steel Framed Construction in Bushfire Areas* (2014) are the enabling standards that address the performance requirements of both parts 2.3.4 and Part GF5.1 of the Building Code of Australia for the Construction of 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 80
Flame temperature ……1200 K

Due to the length of the access road and lack of secondary access, it is proposed that the BAL be raised by one level. This would result in the establishment of SFPP APZ on all elevations with BAL 19 construction for the proposed Scout Hall.

The Proposed Scout Hall (safe refuge building) can be constructed to **BAL 19** (Section 6 and Section 3) as specified by AS3959 - 2018 Construction for Buildings in Bushfire Prone Areas and/or *NASH Standard Steel Framed Construction in Bushfire Areas* (2014). New construction must also comply with the construction requirements in Section 7.5 of *Planning for Bush Fire Protection 2019.* The refuge will be required to provide SFPP 10 kW/m^2 APZs and under prescriptive requirements can be constructed to BAL 12.5. However, as access is greater than 200 m from a public through road and as a performance-based solution, the construction standard is increased from BAL 12.5 to BAL 19.

The refuge is provided within 100m walking distance of the proposed and existing accommodation buildings, specifically the Accommodation Wing, Duty Managers Accommodation and the Existing Merit Buildings. The accommodation buildings and existing camp sites do not have any bushfire building construction of APZ requirements.

In accordance with Private Bushfire Shelters Performance Standard (ABCB, 2014) the refuge is required to be at least 150 m^2 and with a floor area of 0.75 m^2 and volume 1.2 m^3 per person can shelter a maximum of 200 people. The proposed Scout Hall can provide a refuge area of approximately 800 m^2.

The existing accommodation (Merit Buildings) are required to be upgraded to improve ember protection, unless already constructed to a relevant standard. This is to be achieved by enclosing all openings (excluding roof tile spaces) or covering openings with a non-corrosive metal screen mesh with a maximum aperture of 2mm. Where applicable, this includes any sub floor areas, openable windows, vents, weep holes and eaves. External doors are to be fitted with draft excluders.

4.4. Emergency Management

The owners are required to prepare a Bushfire Emergency Management Plan that is consistent with the NSW RFS publication: *A Guide to developing a Bushfire Management and Evacuation Plan* and the Australian Standard AS3745:2010 *Planning for emergencies in facilities* for the existing facility. In the event of an emergency, the owners should ensure they are familiar with the RFS Bush Fire Alert Levels and use their Bush Fire Survival Plan.

4.5. Adequate Water and Utility Services

The applicant should ensure there is at least 10,000 litre water supply available for firefighting purposes. Above ground, tanks are required to be manufactured of concrete or metal, and raised tanks have their stands protected. All above-ground water pipes external to the building must be metal, including up to any taps. Pumps are to be shielded. Underground tanks should have an access hole of 200 mm and a hardened ground surface within 4 m of the access hole. A suitable connection for firefighting purposes is required, such as a 65mm Storz outlet and a gate or ball valve.

Any bottled gas will be installed and maintained under AS1596 and the relevant authority's requirements. If gas cylinders need to be kept close to the buildings, the release valves must be directed away from the building and 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 under specifications issued by Energy Australia.

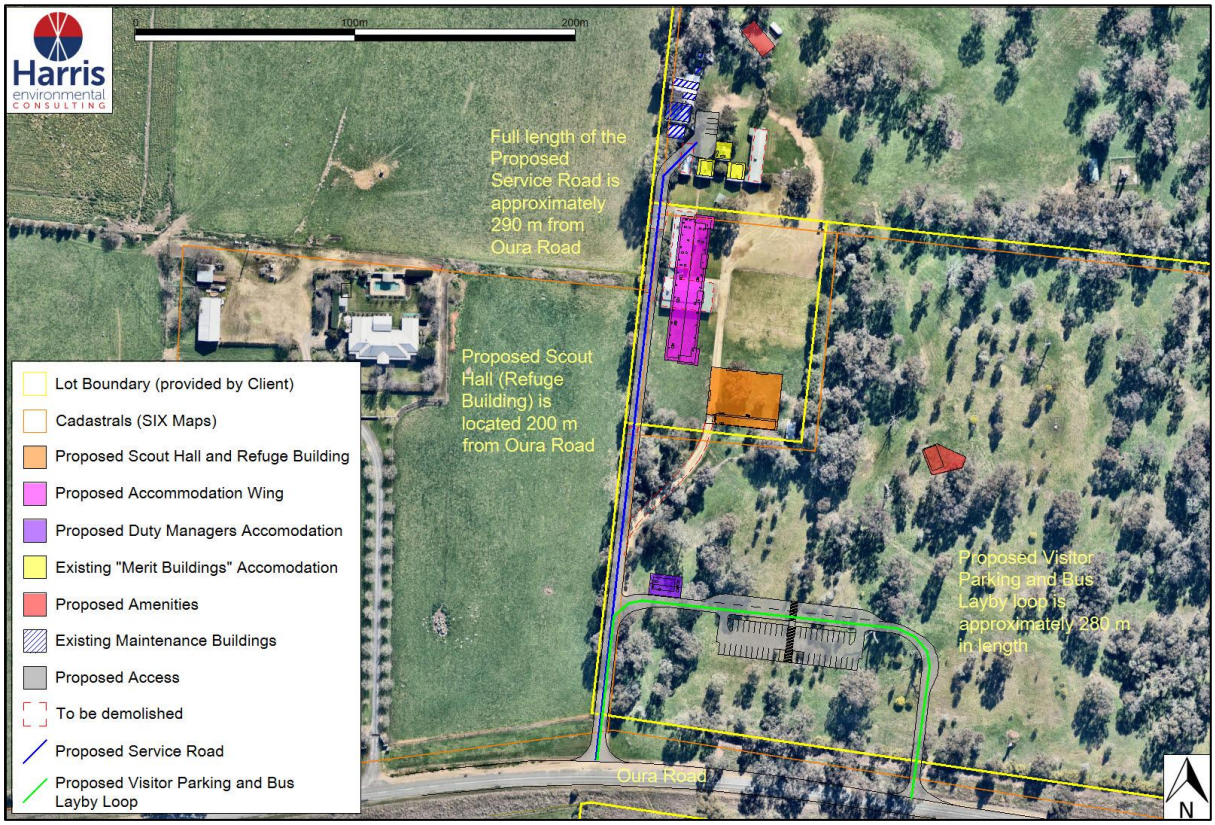
4.6. Safe Operational Access

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

The subject lot is located on Oura Road. This is a two-wheel drive, all weather road. Road surfaces and bridges are sufficient to carry fully loaded firefighting vehicles. The proposed Service Road approximately 290 m in length from Oura, and the Scout Hall (refuge building) is located 200 m from the public road. The internal access traverses grassland and forested wetland vegetation and the width of the road is proposed to be 6 m wide.

At least one alternative property access road is required for developments that are located more than 200 metres from a public through road. The access is greater than 200 m in length with no alternate access. Due to the lack of secondary access it is proposed that the BAL be raised by one level. This would result in the establishment of SFPP APZ on all elevations with BAL 19 construction for the proposed Scout Hall (refuge building).

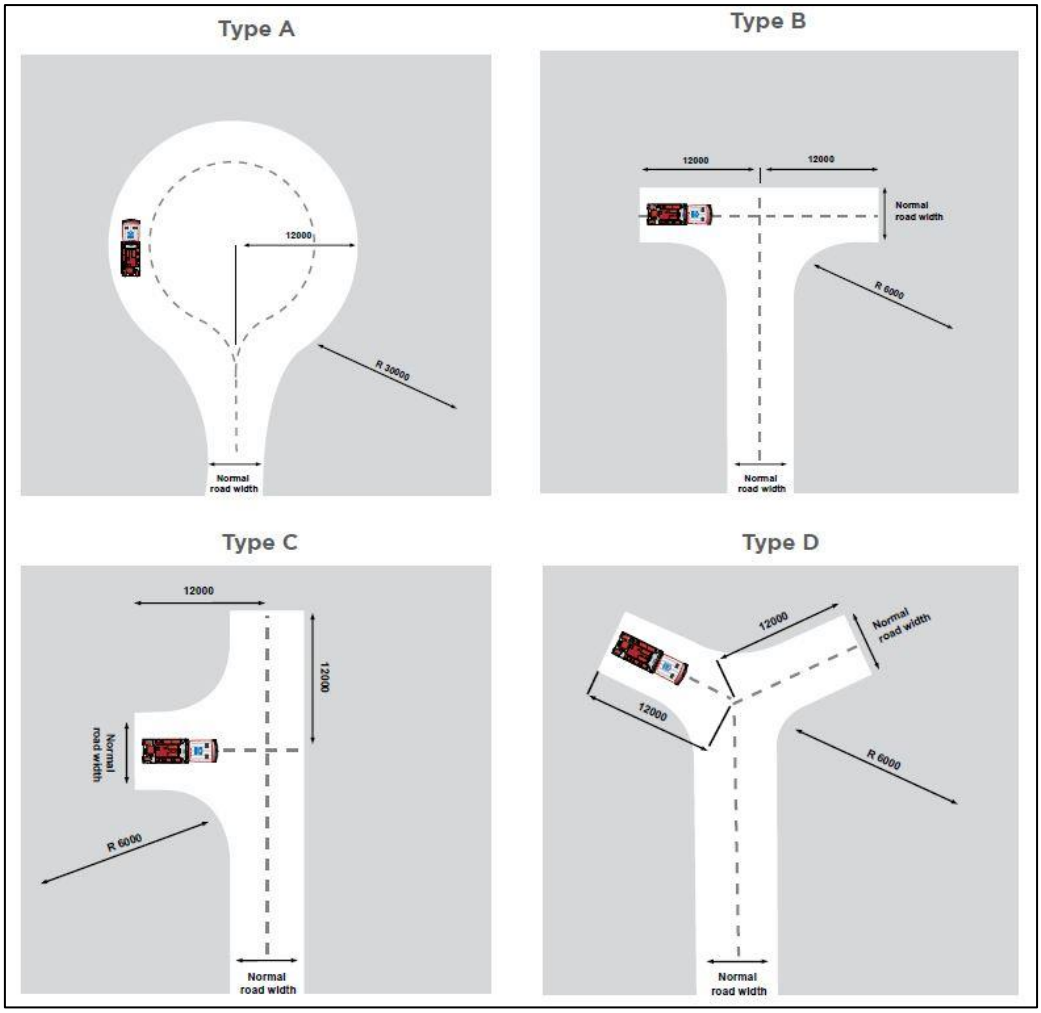
Figure 12 Access



The proposed access is required to comply with the PBP- Property Access Table 5.3b. This includes:

- A minimum carriageway width of four metres;
- provide enough turning room for a fire tanker that requires an inner minimum turning radius of 6 m and outer minimum radius of 12 m;
- Curves a minimum inner radius of six metres;
- The minimum distance between inner and outer curves is six metres;
- The cross fall is not more than 10 degrees;
- Maximum grades for sealed roads do not exceed 15 degrees (28 per cent) and not more than 10 degrees (18 percent) for unsealed roads;
- The internal road surfaces and bridges have a capacity to carry fully loaded firefighting vehicles (23 tonnes) and provide signage that clearly indicates the bridge capacity; 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.

Figure 13 Multipoint turning options



5 LANDSCAPING

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

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 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.

6 SUMMARY

- Due to the length of the access road and lack of secondary access, it is proposed that the BAL be raised by one level. This would result in the establishment of SFPP APZ on all elevations with BAL 19 construction for the proposed Scout Hall.

- The Proposed Scout Hall (safe refuge building) can be constructed to **BAL 19** (Section 6 and Section 3) as specified by AS3959 - 2018 Construction for Buildings in Bushfire Prone Areas and/or *NASH Standard Steel Framed Construction in Bushfire Areas* (2014). New construction must also comply with the construction requirements in Section 7.5 of *Planning for Bush Fire Protection 2019.* The refuge will be required to provide SFPP 10 kW/m^2 APZs and under prescriptive requirements can be constructed to BAL 12.5. However, as access is greater than 200 m from a public through road and as a performance-based solution, the construction standard is increased from BAL 12.5 to BAL 19.

- The refuge is provided within 100m walking distance of the proposed and existing accommodation buildings, specifically the Accommodation Wing, Duty Managers Accommodation and the Existing Merit Buildings. The accommodation buildings and existing camp sites do not have any bushfire building construction of APZ requirements.

- In accordance with Private Bushfire Shelters Performance Standard (ABCB, 2014) the refuge is required to be at least 150 m^2 and with a floor area of 0.75 m^2 and volume 1.2 m^3 per person can shelter a maximum of 200 people. The proposed Scout Hall can provide a refuge area of approximately 800 m^2.

- An SFPP APZ (10kW/m^2, 1200K) surrounding the Scout Hall (Refuge Building) is required to be established from the commencement of building works and maintained in perpetuity for the following distances:
  - 42 m towards the northern, eastern and southeastern elevations
  - 34 m towards the southwestern elevation
  - 36 m towards the western elevation

- The owners are required to prepare a Bushfire Emergency Management Plan that is consistent with the NSW RFS publication: *A Guide to developing a Bushfire Management and Evacuation Plan* and the Australian Standard AS3745:2010 *Planning for emergencies in facilities* for the existing facility.

- The subject lot is located on Oura Road. This is a two-wheel drive, all-weather road. Road surfaces and bridges are sufficient to carry fully loaded firefighting vehicles.

- The access is required to comply with the PBP- Property Access Table 5.3b. This includes:
  - A minimum carriageway width of four metres;
  - Curves a minimum inner radius of six metres;
  - The minimum distance between inner and outer curves is six metres;
  - The cross fall is not more than 10 degrees;
  - Maximum grades for sealed roads do not exceed 15 degrees (28 per cent) and not more than 10 degrees (18 percent) for unsealed roads;

  - The internal road surfaces and bridges have a capacity to carry fully loaded firefighting vehicles (23 tonnes) and provide signage that clearly indicates the bridge capacity; and
  - There is suitable access for a Category 1 fire appliance to within 4 m of the static water supply where no reticulated supply is available.

- The applicant should ensure at least a 10,000-litre water supply is available for firefighting purposes. Above ground, tanks are required to be manufactured of concrete or metal, and raised tanks have their stands protected. All above-ground water pipes external to the building must be metal, including up to any taps. Pumps are to be shielded. Underground tanks should have an access hole of 200 mm and a hardened ground surface within 4 m of the access hole. A suitable connection for firefighting purposes is required, such as a 65mm Storz outlet and a gate or ball valve.

- 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 REFERENCES

Australia, G. (2019). *ELVIS - Elevation - Foundation Spatial Data*. Elevation.fsdf.org.au. Available at: http://elevation.fsdf.org.au/

Keith, D. (2004). "*Ocean Shores to Desert Dunes*" Department of Environment and Conservation, Sydney

Lodge Environmental (2023) *42 The Outpost Road, Yaouk – Biodiversity Development Assessment Report (LE1559)*

National Association of Steel-Framed Housing (2014) *NASH Standard Steel Framed Construction in Bushfire Areas*

NSW Department of Environment, Climate Change and Water (2010) Southeast NSW Native Vegetation Classification and Mapping - SCIVI VIS_ID 2230 20030101. Bioregional Assessment Source Dataset. Viewed 18 June 2018, http://data.bioregionalassessments.gov.au/dataset/0f1aeb33-1b49-4839-88fa-8b635cf9d3ab.

NSW Department of Planning and Environment. Planning Portal. Accessed at: https://www.planningportal.nsw.gov.au/

NSW Office of Environment and Heritage (2020). Biodiversity Value Map. Accessed at: https://www.lmbc.nsw.gov.au/Maps/index.html?viewer=BVMap

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

Standards Australia (2018). *AS3959, Construction of buildings in bushfire-prone areas.*

Tozer MG, Turner K, Keith DA, Tindall D, Pennay C, Simpson C, MacKenzie B, Beukers P, Cox S (2010). *Native Vegetation of southeast NSW: a revised classification and map for the coast and eastern tablelands*. Cunninghania 11:359-406.

Appendix i Definition of Asset Protection Zones

Vegetation within the APZ should be managed in accordance with APZ specifications for the purposes of limiting the travel of a fire, reducing the likelihood of direct flame contact, and removing additional hazards or ignition sources. The following outlines some general vegetation management principles for APZs:

1) Discontinuous shrub layer (clumps or islands of shrubs not rows);

2) Vertical separation between vegetation stratums;

3) Tree canopies not overhanging structures;

4) Management and trimming of trees and other vegetation in the vicinity of power lines and tower lines in accordance with the specifications in "Vegetation Safety Clearances" issued by Energy Australia (NS179, April 2002);

5) Maintain low ground covers by mowing / whipper snipper / slashing; and

6) Noncombustible mulch e.g. stones and removing stores of combustible materials;

7) Vegetation to be planted should consist of fire retardant/ less flammable species strategically located to reduce attack from embers (i.e. as ember traps when in small clumps and short wind breaks).

Appendix ii Definition & Abbreviations

Asset Protection Zone- A fuel reduced area surrounding 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.

AS3959-2019: Australian Standard AS 3959:2018 Construction of buildings in bush fire-prone areas.

Bush fire prone area- an area of land that can support a bush fire or is likely to be subject to bushfire attack, as designated on a bush fir prone land map

Bush fire prone vegetation (BFPV) – A map prepared by Council in accordance with RFS guidelines and defining area of vegetation by BFPV categories

Bushfire prone land map (BFPL) A map prepared in accordance with RFS guidelines and certified by the Commissioner of the NSW RFS under section 146 (2) of the Environmental Planning and Assessment Act (1979)

BFSA: Bush fire safety authority.

Effective Slope: The land beneath the vegetation which most significantly effects fire behaviour, having regard to the vegetation present.

Fire Danger Index (FDI) The chance of a fire starting, its rate of spread, its intensity and the difficulty potential for its suppression, according to various combinations of air temperature, relative humidity, wind speed and both the long- and short term drought effects.

Fire hazard: the potential for land o carry a bush fire, utilizing materials or fuels that can be ignited

Grasslands- Grassed areas capable of sustaining a fire. Under Australia standard 3959 Construction of buildings in bushfire -prone areas, identified as low open shrubland, hummock grassland, closed tussock grassland, tussock grassland, open tussock, sparse open tussock, dense sown pasture, sown pasture, open herbfield and sparse open herb field. Grass, whether exotic or native, which is regularly maintained at or below 10 cm in height (includes maintained lawns, golf course, maintained public reserves, parklands, nature strips and commercial nurseries) are regarded as managed land

Inner Protection Area (IPA): the component of an APZ which closest to the asset (measured from unmanaged vegetation). It consists of an area maintained to minimal fuel loads so that a fire path is not created between the hazard and the building.

Managed land- Managed land is land that has vegetation removed or maintained to limit the spread and impact of bushfire. It may include existing developed land (i.e. residential, commercial or industrial) roads, golf course fairways, playgrounds or sports fields, vineyards, orchards, cultivated ornamental gardens, and commercial nurseries.

PBP 2019: Planning for Bushfire Protection 2019

SFPP: Special Fire Protection Purpose