

**Bushfire Assessment Report (BAR)
One (1) Lot into Three (3) Lot Subdivision**

(Part 5 PBP 2019- Residential and Rural-Residential
Subdivision's)
(Lot 6 DP95868) 68 Memorial Avenue, Stroud NSW
2425.

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Table 1 – Document Version and Disclaimer

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No:	Reference:	Author:	Reviewer:
Version 1	26_01_2024 68 Memorial Ave Stroud	Lezette Garry	
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Table 2 – Council and RFS Summary

Question:	Response:
What is the recommended level of compliance with AS3959-2018?	The recommended level of compliance with AS5989:2018 is maximum BAL29kW/m ² . (Sections 3 & 6). It is recommended that the existing dwelling on the site is upgraded to improve ember protection.
Can the proposed development comply with AS3959-2018 and RFS, 2019, Planning for Bushfire Protection?	Yes- the subdivision will have APZs where $\leq 29\text{kW/m}^2$ radiant heat at its boundaries. Refer to Table 7.1 of this report for the calculated APZs.
Does the proposed development comply with the aims and objectives of the RFS, 2019, Planning for Bushfire Protection?	Yes – A table that demonstrates that the proposal is consistent with the aims and objectives of the RFS, 2019, Planning for Bushfire Protection is provided in Section 8 of this report.
Is referral to the NSW Rural Fire Service required?	Yes – The development is defined as rural residential subdivision and Special Fire Protection Purpose (SFPP) under the Rural Fire Act 1997 (100B) and therefore requires a Bush Fire Safety Authority (BFSA).

TERMS & ABBREVIATIONS

APZ	Asset Protection Zone
AS3959	Australian Standard 3959
BAL	Bushfire Attack Level
BAR	Bushfire Assessment Report
BFSA	Bush Fire Safety Authority
BPAD	Bushfire Planning and Design
BPL	Bushfire Prone Land
BPM	Bushfire Protection Measures
DA	Development Application
DBYD	Dial Before You Dig
DP	Deposited Plan
DSF	Dry Sclerophyll Forest
EP&A Act	Environmental Planning and Assessment Act 1979
FDI	Fire Danger Index
FPAA	Fire Protection Association of Australia
IPA	Inner Protection Area
LEP	Local Environmental Plan
LGA	Local Government Area
NCC	National Construction Code
OPA	Outer Protection Area
PBP	Planning for Bushfire Protection
RFS	NSW Rural Fire Service
RoW	Right of Way
SEED	Sharing and Enabling Environmental Data
SFPP	Special Fire Protection Purpose
URA	Urban Release Area

EXECUTIVE SUMMARY

This Bushfire Assessment Report (BAR) has been prepared by Hunter Valley Bushfire Consulting Services to assess compliance with the document, Planning for Bushfire Protection (PBP 2019) for a proposed one (1) lot into three (3) lot subdivision of (Lot 6 DP95868), 68 Memorial Avenue, Stroud NSW 2425. Lot 61 contains an existing dwelling and outbuildings whilst proposed lots 62 and 63 are vacant. Lot 61 is a part of an existing unregistered subdivision of six (6) lots.

This report is to form part of the supporting documentation for Development Application (DA/2021/2064) lodged with Mid Coast Council (MCC). The proposed development is classified as Integrated Development under the provisions of Planning for Bushfire Protection (PBP) (NSW Rural Fire Service (RFS), 2019), and is therefore required under the legislation to be referred to the commissioner of the RFS, for the issue of a Bushfire Safety Authority under 100B of the Rural Fires Act 1997.

This assessment aims to consider and assess the bushfire hazard and associated potential threats relevant to the proposal. It also aims to provide a better bushfire outcome than what was existing on the site. Recommendations are provided regarding fuel management, access, provision of emergency services, building protection and construction standards, to facilitate an acceptable level of bushfire protection.

In summary, the following is recommended to enable the proposal to meet the relevant legislative requirements:

1. The APZs listed below are to be implemented around the boundaries of the subdivision, in accordance with Table 6-1 in the above report.

Asset Protection Zones (APZ) – The APZ provides space and reduced fuel loads to ensure radiant heat levels at the buildings are below critical limits and to prevent direct flame contact.

The APZ is the distance from the external wall of the habitable building (dwelling) to the unmanaged vegetation line to the north, east, south, and west. The shortest distance from the building to the unmanaged vegetation line has been identified to be:

- 11m to the north.
- 10m to the east.
- 11m to the west.
- 10m to the south.

The management and maintenance of the APZs are to be subject to an 88B Instrument.

2. The APZs listed below are to be implemented around the existing dwelling (located on Lot 61), as discussed in Section 9 in this report.

Asset Protection Zones (APZ) – The APZ provides space and reduced fuel loads to ensure radiant heat levels at the buildings are below critical limits and to prevent direct flame contact.

The APZ is the distance from the external wall of the existing dwelling to the unmanaged vegetation line to the north, east, south, and west. The shortest distance from the building to the unmanaged vegetation line has been identified to be:

- 5m (20m OPA) to the north.
- 30m (20m OPA) to the east.
- 5m (20m OPA) to the west.
- 50m (20m OPA) to the south.

The management and maintenance of the APZs are to be subject to an 88B Instrument.

3. The existing dwelling shall also be upgraded to improve **ember protection**. This ember protection shall 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, weepholes, and eaves. External doors are to be fitted with draft excluders.

4. **Landscaping** - Landscaping is to be consistent with the requirements of NSW RFS, 2019, 'Planning for Bushfire Protection' (Appendix 4 – Asset Protection Zone Requirements).

5. **Vehicular Access** – Access standards provide for emergency evacuation and firefighting operations.

An assessment of the existing access has identified the following requirements:

- two-wheel drive, all weather access,
- Minimum of 4m carriageway width,
- Minimum vertical clearance of 4m to any overhanging obstructions, such as tree branches,
- Suitable turning head, being a loop close to the dwelling,
- Minimum distance between inner and outer curves is 6m,

6. **Water Supplies** – A reticulated water supply is available to serve the proposed for firefighting purposes.

- This reticulated water supply is to be extended along the proposed shared driveway to service proposed Lots 62 & 63.
- Unobstructed access must always be provided to the fire hydrants.
- In lieu of a fire hydrant, proposed Lots 62 & 63 are to both have a 20,000L static water supply dedicated to firefighting. This water supply must: -

- a. a 20,000L static water supply tank must be provided on site.
- b. a connection for firefighting purposes is located within the IPA or non-hazard side and away from the structure.
- c. 65mm Storz outlet with a ball valve is fitted to the outlet.
- d. ball valve and pipes are adequate for water flow and are metal.
- e. supply pipes from tank to ball valve have the same bore size to ensure flow volume.
- f. a hardened ground surface for truck access is supplied within 4m.
- g. above-ground tanks are manufactured from concrete or metal.
- h. raised tanks have their stands constructed from non-combustible material or bush fire resisting timber (see Appendix F of AS 3959)
- i. unobstructed access can be provided at all times.
- j. tanks on the hazard side of a building are provided with adequate shielding for the protection of firefighters.
- k. all exposed water pipes external to the building are metal, including any fittings.
- l. where pumps are provided, they are a minimum 5hp or 3kW petrol or diesel- powered pump and are shielded against bush fire attack; any hose and reel for firefighting connected to the pump shall be 19mm internal diameter.
- m. fire hose reels are constructed in accordance with AS/NZS 1221:1997 and installed in accordance with the relevant clauses of AS 2441:2005; and
- n. the gate or ball valve, pipes and tank penetrations are to be designed to allow for a full 50mm inner diameter water flow through the Storz fitting and must be of a metal construction.

7. Electricity Services – The installation of new electricity seeks to limit the possibility of igniting the surrounding bushland. Transmission lines are to be placed underground. If placing them underground is not practical, then overhead transmission lines are to:

- Be 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.

8. Gas Services – The location and design of any gas services will not lead to the ignition of surrounding buildings or the fabric of buildings. The provision of gas requires that:

- Reticulated or bottled gas is installed and maintained in accordance with AS/NZS 1596:2014 and the requirements of relevant authorities,
- Metal piping is used,
- All fixed gas cylinders are kept clear of all flammable materials to 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-gas service pipes are metal including and up to any outlets.

9. Emergency Evacuation – A Bushfire Survival plan is to be prepared by the owners of the existing dwelling on the site. Information to assist with the preparation of the plan can be found at www.nswrfs.gov.au.

LOT INFORMATION

Address:	68 Memorial Ave, Stroud NSW 2425 (the site)
Legal Description:	Lot 6, DP95868
Total Area:	3.64h
Local Government Area:	MidCoast
Fire Danger Index (FDI):	80 – North Coast
Zoning:	Land zoned RU5 – Village
Is a Bushfire Safety Authority (BFS)	Yes – The proposal is for Rural residential subdivision, SFPP.
Current Land Use:	Existing Dwelling
Significant Features:	Stroud is characterised by light industry, rural and residential development. The site has direct access via Memorial Ave (sealed) and a proposed concrete shared driveway. The site is also bounded by Unformed roads – Gamack and John Sts.
Environmental Features:	The site is <u>not</u> mapped as containing Biodiversity Values under the Biodiversity Conservation Act 2016 (map checked 26/1/2024).
Significant Environmental Features:	No.
Threatened Species:	There is nothing mapped for the site on the SEED Portal.
Archaeological Features:	A basic search of the AHIMS database identified zero sites and/or places – refer to AHIMS map (dated 26 January 2024) in the Appendix of this report.
Climate/Fire History:	The Mid Coast Bush Fire Management Committee, 2018, "Bushfire Risk Management Plan (the Plan) states that: <i>'Prevailing weather conditions associated with the bush fire season in the Mid Coast BFMC area is north-east to easterly</i>

winds accompanied by high day-time temperatures and low relative humidity. There are also many dry lightning storms that occur during the bush fire season' (p.10).

There is no Fire History Map identified near the site.

Fire Trails:

The Plan does not identify any fire trails that exist on the property that are on the Rural Fire Act (s.620 - Register of Certified Fire Trails).

Bushfire Prone Land Map:

The site is identified as BPL, being Vegetation Category 3 (**FIGURE 4**).

Previous Approvals:

The existing development approvals listed table have been sourced from the MidCoast Council Application Tracking website on 26 January 2024.

Table 4 – Development Application History

Application	Date Lodged	Description
CC/2022/0974	28/12/2022	Subdivision 6 lots
DA/2023/0779	28/9/2023	Subdivision 3 lots

Figure 2: Location Map (Source: SEED NSW PORTAL 26/1/2024)

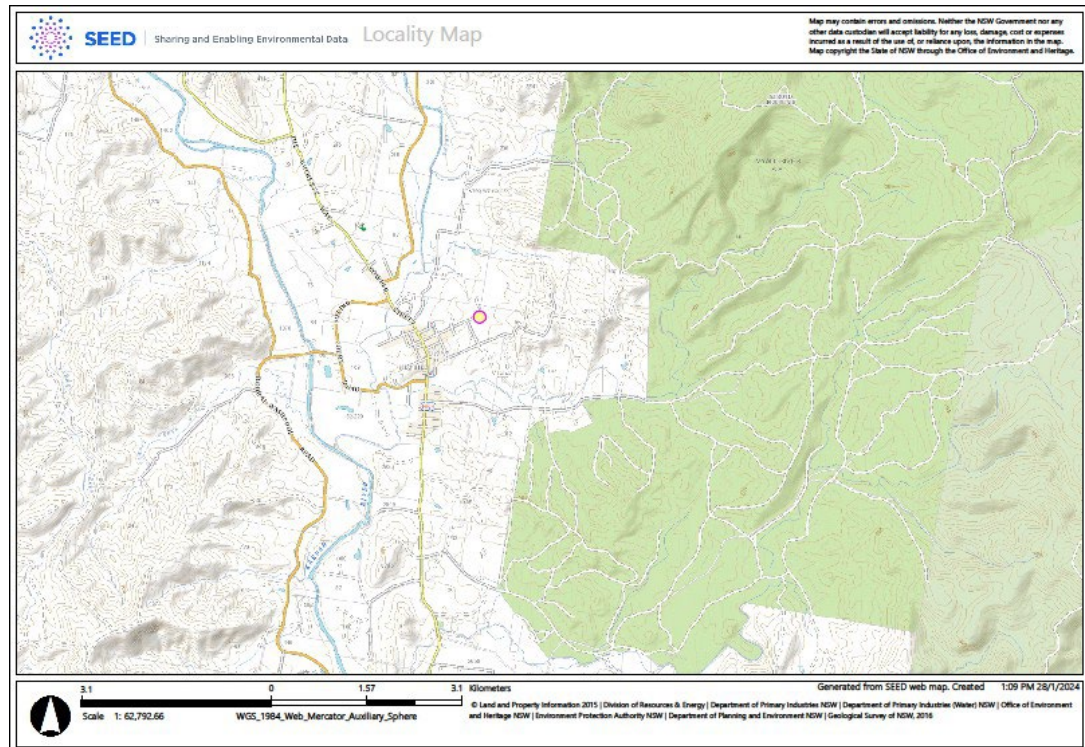


Figure 3: Site Map (Source: SEED NSW PORTAL 26/1/2024)

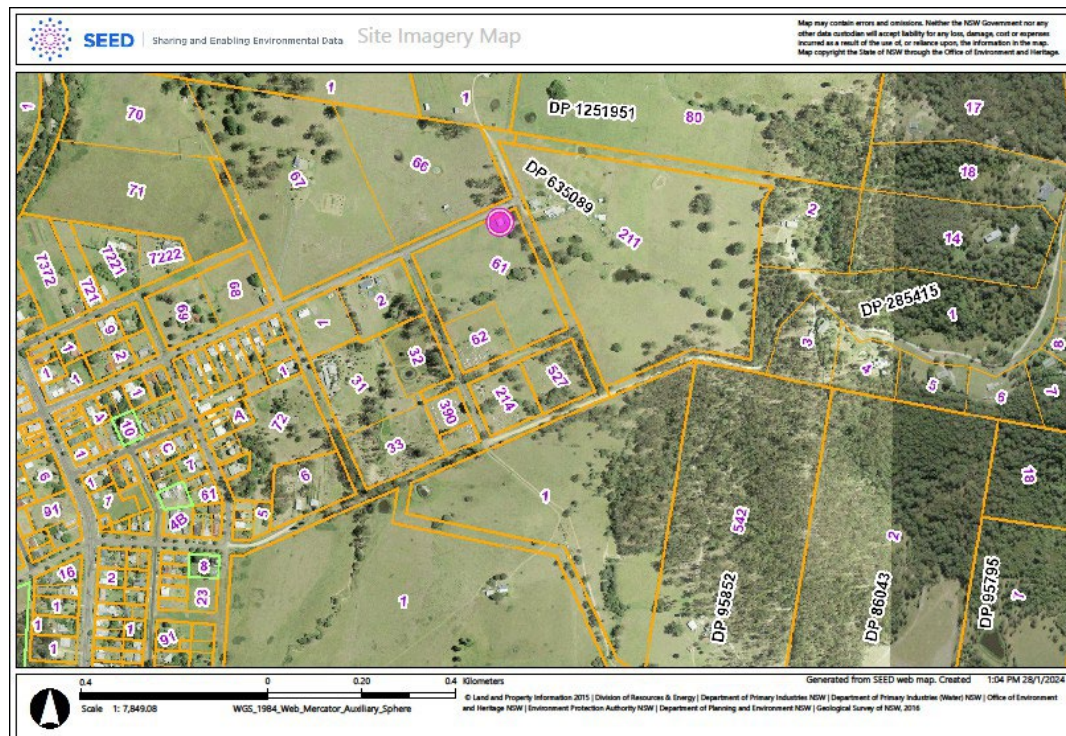
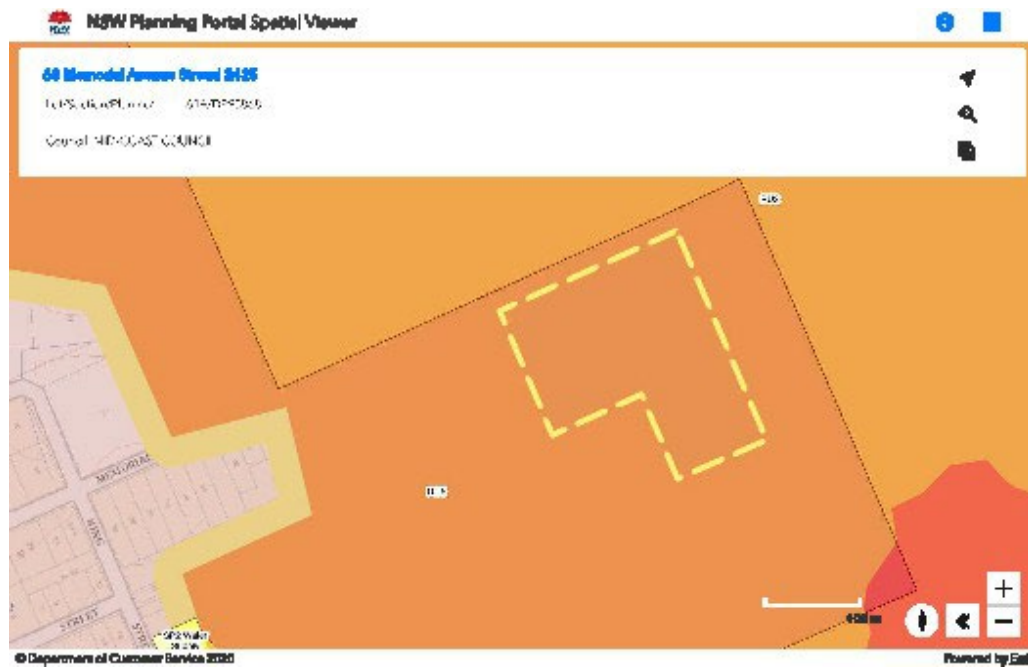


Figure 4: Bushfire Prone Land Map (Source: NSW Planning Portal 26/1/2024)



1. SCOPE

The scope of this BAR is to identify the bush fire hazard and provide measures to assist Council and the RFS that the identified fire hazard would be reduced to a level that is considered necessary to provide adequate protection to life and property.

This BAR provides the required information to assist Council and the RFS in determining compliance in accordance with the RFS, 2019, 'Planning for Bush Fire Protection' (PBP) and AS 3959-2018. Council is the final consent authority, and the future works must comply with the conditions listed in the Notice of Determination issued by Council.

2. PROPOSAL

The proposal is for a three lot Torrens title subdivision with an existing dwelling house and outbuildings (**Figure 1**) at 68 Memorial Ave (Lot 6 DP95868) Stroud NSW 2425 (the site).

3. ASSUMPTIONS OF THIS REPORT

The following assumptions have been made in the development of this report:

- A subdivision plan has been provided (**Figure 1**).
- Access to private properties, other than the site was not provided, so photos taken during the site inspection are from public areas, such as the road reserve.
- The BAR will be assessed by NSW RFS and Council who will develop conditions of consent. Any construction must comply with the conditions issued by Council, not this BAR.

4. SPECIFIC OBJECTIVES

4.1 Compliance with the Specific Objectives in Clause 5.2 of the PBP 2019.

Specific Objective	Compliance	Comments
Minimise perimeters of the subdivision exposed to the bushfire hazard (hourglass shapes which maximise perimeters and create bottlenecks should be avoided).	Able to comply	Subdivision plan in Figure 1 shows compliance with this objective.

Minimise vegetated corridors that permit the passage of bushfire towards buildings.	Able to comply	There are no vegetative corridors near this subject site.
Ensure the ongoing maintenance of APZ's.	Able to comply	An 88B instrument is to be provided. Refer to recommendations below.
Provide access to hazard vegetation to facilitate bushfire mitigation works and fire suppression	Able to comply	Internal access to and within the individual lots will be provided. Refer to Figure 1.
Provide adequate access from all properties to the wider road network for residents and emergency services	Able to comply	Access will be provided to proposed lots 62 & 63 by a shared driveway. Access to lot 61 already exists off Memorial Ave. Refer to Figure 1 .
Ensure the provision of an adequate supply of water and other services to facilitate effective firefighting.	Able to comply	a reticulated water supply is available and is located in Memorial Ave footpath as per Figure 1 . The proposed shared driveway will provide the extension of the reticulated water supply.

5. METHODOLOGY

The methodology for determining the required APZs is discussed below.

5.1 Vegetation Assessment

Vegetation surveys and vegetation mapping carried out on the site has been undertaken as follows:

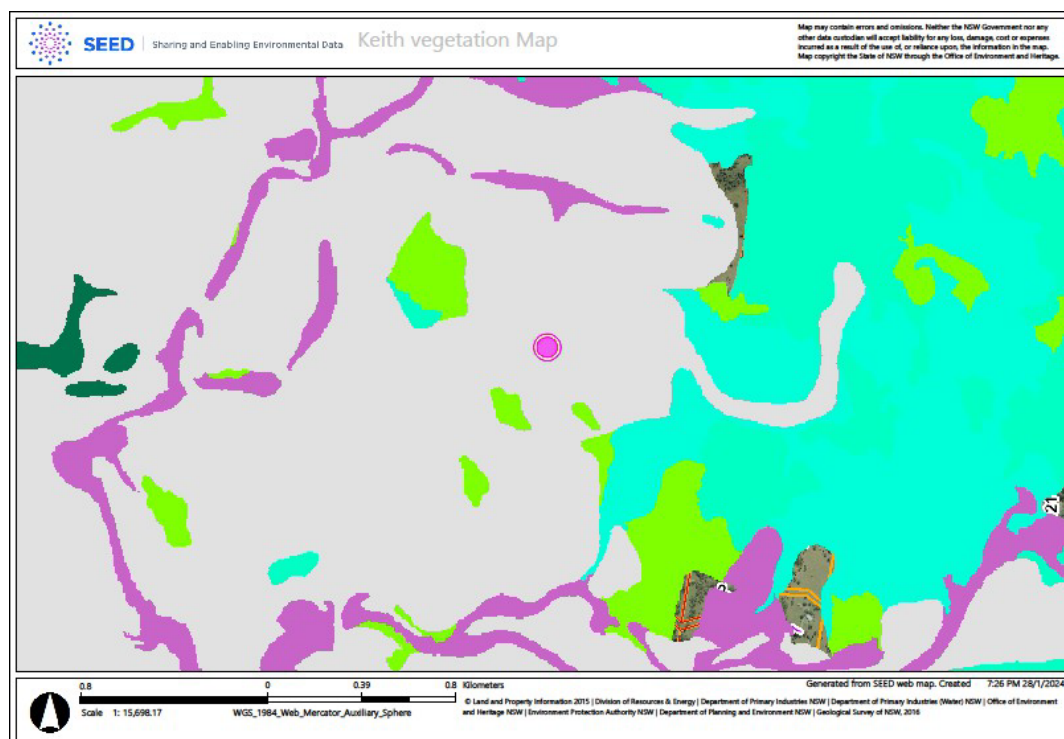
- Aerial Photograph Interpretation to map vegetation cover and extent.
- Confirmation of the vegetation present via a site inspection.

5.2 Slope Assessment

Slope assessment has been undertaken as follows:

- Aerial Photograph Interpretation in conjunction with analysis of electronic contour maps with a contour interval of 10m.
- Confirmation of the slope present via a site inspection.

Figure 5: Keith Vegetation Classes (source: SEED NSW Portal 26/1/2024)



6. DETERMINATION OF FIRE DANGER INDEX (FDI)

The FFDI was determined by referring to the RFS, 2020, 'Building in Bushfire Prone Areas Single Dwelling Application Kit' (p.9). The NSW Local Government Areas (LGA) Fire Danger Index (FDI) is repeated below for quick reference.

The LGA is Mid-Coast Council in accordance with the NSW Planning Portal, which was viewed on 26 January 2024 and therefore the FDI is North Coast (80) in accordance with the table below.

Table 6– NSW Local Government Areas (LGA) Fire Danger Index (FDI)

Far North Coast (80) Ballina Byron Clarence Valley Kyogle Lismore Richmond Valley Tweed	Illawarra/Shoalhaven (100) Kiama Shellharbour Shoalhaven Wingecarribee Wollondilly Wollongong	Northern Slopes (80) Gunnedah Gwydir Inverell Liverpool Plains Tamworth Regional	Eastern Riverina (80) Albury Coolamon Greater Hume Junee Lockhart Wagga Wagga
North Coast (80) Bellingen Coffs Harbour Mid-Coast Port Macquarie-Hastings Kempsey Nambucca	Far South Coast (100) Bega Valley Eurobodalla	North Western (80) Moree Plains Narrabri Walgett Warrumbungle	Southern Riverina (80) Berrigan Edward River Federation Murray River
Greater Hunter (100) Cessnock Dungog Lake Macquarie Maitland Muswellbrook Newcastle	Monaro Alpine (80) Snowy Monaro	Upper Centre West Plains (80) Bogan Coonamble Gilgandra Warren	Northern Riverina (80) Carrathool Griffith Hay Leeton Narrandera Murrumbidgee

Port Stephens Singleton Upper Hunter			
Greater Sydney Region (100) All Sydney Metropolitan Councils Plus, Blue Mountains, Hawkesbury, and Central Coast	Southern Ranges (100) Queanbeyan-Palerang Goulburn Mulwaree Upper Lachlan Yass Valley	Lower Central West Plains (80) Bland Dubbo Regional Forbes Lachlan Narromine Parkes Temora Weddin	South Western (80) Balranald Wentworth
	Central Ranges (100) Bathurst Blayney Cabonne Cowra Lithgow Mid-Western Regional Oberon Orange	Southern Slopes (80) Hilltops Cootamundra-Gundagai Snowy Valleys	Far Western (80) Bourke Brewarrina Broken Hill Central Darling Cobar Unincorporated NSW
	New England (80) Armidale Regional Glenn Innes Severn Tenterfield Uralla Walcha		

The above table was taken from the NSW RFS, 2020, 'Single Dwelling Application Ki

7. SITE ASSESSMENT

Table 7.1: Asset Protection Zone (APZ) Assessment of Table A1.12.3, PBP 2019 – residential subdivision. FFDI 80 (Mid-Coast LGA).

Direction from site	Vegetation type within 140m of development.	Effective slope under vegetation (degrees) up to 100m.	Minimum APZ $\leq 29\text{kW/m}^2, 1090\text{K}$
east	Grassland	upslope	10m
north	Grassland	0–5-degree downslope	11m
west	Grassland	0–5-degree downslope	11m
south	Grassland	upslope	10m

8. BUSHFIRE PROTECTION MEASURES

Table 8.1: APZ's and Compliance with Table 5.3a in Section 5 of the PBP 2019.

Performance Criteria	Acceptable Solutions	Compliance	Comments
Potential building footprints must not be exposed to radiant heat levels exceeding 29kW/m^2 on each proposed lot.	APZs are provided in accordance with Tables A1.12.2 and A1.12.3 based on the FFDI	Able to comply	The proposed subdivision can comply with the minimum APZs as listed in Table A1.12.3 PBP 2019. Refer to Table 7.1 above for the required APZs for this development. A minimum 10m APZ is to be applied to the eastern and southern boundary of the subdivision. A minimum 11m APZ is to be applied to the western and northern boundary.

			A recommendation is placed below.
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Table 8. 2: Landscaping and Compliance with Table 5.3a in Section 5 of the PBP 2019.

Performance Criteria	Acceptable Solutions	Compliance	Comments
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	Able to comply	Existing fencing is open wire. Existing landscaping is minimal. A recommendation is placed below regarding the compliance of future fencing and landscaping.

Table 8.3: Access and compliance with table 5.3b in Section 5 of the PBP 2019

Performance Criteria	Acceptable Solutions	Compliance	Comments
<u>General access requirements</u> - Fire Fighting Vehicles are provided with safe all-	property access roads are two-wheel drive, all-weather roads.	Able to comply	The subdivision plan in Figure 1 above shows that: - 1. Memorial Ave provides property access to the existing dwelling on proposed lot 61. Memorial Ave is a sealed road. 2. A shared concrete driveway (right of access-150m) to the west of

weather access to structures	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		proposed lot 61 will provide vehicular access to proposed lots 62 & 63. Gamack St to the east of proposed lots 61 & 62 is unformed. John St to the south of proposed lots 62 & 63 is partially unformed. Memorial Ave and the shared concrete driveway (right of access) are to be the required perimeter roads. Internal property access details for each lot are not known at this stage, however a recommendation is placed below. Internal property access will be assessed in separate DA when lodged for individual dwellings.
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	metres outer radius turning circle and are clearly sign posted as a dead end. where kerb and guttering are 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		
<u>General access requirements</u> - the capacity of	the capacity of perimeter and non-perimeter road surfaces and any	Able to comply	Memorial Ave and the proposed shared concrete driveway (right of access) are able to carry fully loaded firefighting vehicles. There are no

access roads is adequate for fire fighting vehicles	bridges/causeways is sufficient to carry fully loaded firefighting vehicles (up to 23 tonnes). bridges/causeways are to clearly indicate load rating.		bridges or causeways built as a part of this development. A culvert will be installed in the southern area of the proposed shared concrete driveway. This construction of this culvert is to match the culvert that exists in Nairn St to the west of the development.
<u>general access requirements</u> - 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. hydrants are provided in accordance with the relevant clauses of AS 2419.1:2021 - Fire hydrant installations System design, installation, and commissioning. there is suitable access for a Category 1 fire appliance to within 4m of the static water supply where no reticulated supply is available.	Able to comply	Figure 1 above shows existing water hydrants along the road reserve in Memorial Ave. In lieu of a water hydrant it is recommended that a 20,000L static water supply be installed to each lot 62 & 62 for a dedicated firefighting purpose. All lots have the turning circle capacity for emergency vehicles.

<u>Non-Perimeter</u> -Access roads are designed to allow safe access and egress for firefighting vehicles whilst 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.	Able to comply	Memorial Ave is 15m wide whilst the shared concrete driveway (right of access is 4.5m). In Figure 1, the shared concrete driveway shows a passing bay.
<u>Property access</u> – firefighting vehicles can access the dwelling and exit the property safely	There are no specific access requirements in an urban area where an unobstructed path (no greater than 70m) is provided between the most distant external part of the proposed dwelling and the nearest	Able to comply	The proposed development is in an urban area. The existing road system (Memorial Ave) is part of an existing subdivision. Again, the existing grades and crossfall of the public roads are assumed to meet the Council/State Road standards as a minimum. The vegetation threat is grassland, therefore there are no vehicles passing through forest or woodland.

	part of the public access road (where the road speed limit is not greater than 70kph) that supports the operational use of emergency firefighting vehicles. In circumstances where this cannot occur, the following requirements apply: minimum 4m carriageway width; in forest, woodland and heath situations, rural property access roads have passing bays every 200m that are 20m long by 2m wide, making a minimum trafficable width of 6m at the passing bay. a minimum vertical clearance of 4m to any overhanging obstructions, including tree branches. provide a suitable turning area in		
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	accordance with Appendix 3. curves have a minimum inner radius of 6m and are minimal in number to allow for rapid access and egress. the minimum distance between inner and outer curves is 6m. the crossfall is not more than 10 degrees. maximum grades for sealed roads do not exceed 15 degrees and not more than 10 degrees for unsealed roads; and a development comprising more than three dwellings has access by dedication of a road and not by right of way. Note: Some short constrictions in the access may be accepted where they are not less than 3.5m wide, extend for no more		
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	than 30m and where the obstruction cannot be reasonably avoided or removed. The gradients applicable to public roads also apply to community style development property access roads in addition to the above.		
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firefighting operations	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.		
Flows and pressure are appropriate	fire hydrant flows and pressures comply with the relevant clauses of AS 2419.1:2021	Able to comply	Noted – flows and pressures were not tested as a part of this report, but compliance will be able to be achieved. A recommendation is to be made below.
The integrity of the water supply is maintained.	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.	Able to comply	Noted – compliance will be able to be achieved. Recommendation is to be placed at the end of the report.

Table 8.4: Water supply and compliance with Table 5.3c of PBP 2019

Performance Criteria	Acceptable Solutions	Compliance	Comments
Adequate water supplies are provided for firefighting purposes	reticulated water is to be provided to the development where available. a static water and hydrant supply is provided for non-reticulated developments or where reticulated water supply cannot be guaranteed; and static water supplies shall comply with Table 5.3d	Able to comply	Figure 1 above shows that the development will have a reticulated water supply available. In lieu of a water hydrant lots 62 & 63 are to have a dedicated 20,000L static water supply for firefighting purposes. A recommendation of the same is to be placed at the end of this report.
Water supplies are located at regular intervals; and The water supply is accessible and reliable for	fire hydrant, spacing, design and sizing complies with the relevant clauses of Australian Standard AS 2419.1:2021.	Able to comply	The proposal is within an urban area. Figure 1 above shows that water hydrants are provided along Memorial Ave.

firefighting operations	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.		
Flows and pressure are appropriate	fire hydrant flows and pressures comply with the relevant clauses of AS 2419.1:2021	Able to comply	Noted – flows and pressures were not tested as a part of this report, but compliance will be able to be achieved. A recommendation is to be made below.
The integrity of the water supply is maintained.	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.	Able to comply	Noted – compliance will be able to be achieved. Recommendation is to be placed at the end of the report.

Table 8.5: Electricity and Compliance with Table 5.3c of the PBP 2019

Performance Criteria	Acceptable solutions	compliance	comments
Location of electricity services limits the possibility of ignition of surrounding bushland or the fabric of the buildings	where practicable, electrical transmission lines are underground. where overhead, electrical transmission lines are proposed as follows: lines are installed with short pole spacing of 30m, unless crossing gullies, gorges, or	Able to comply	Noted – compliance will be able to be achieved. Figure 1 above shows underground power is installed along Memorial Ave. A recommendation is to be placed at end of report.

	riparian areas; and no part of a tree is closer to a power line than the distance set out in ISSC3 Guideline for Managing Vegetation Near Power Lines		
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Table 8.6: Gas and compliance with Table 5.3c of the PBP 2019

Performance criteria	Acceptable solutions	compliance	comments
Location and design of gas services will not lead to ignition of surrounding bushland or the fabric of the buildings	reticulated or bottled gas is installed and maintained in accordance with AS/NZS 1596:2014 - The storage and handling of LP Gas, the requirements of relevant authorities, and metal piping is used. all fixed gas cylinders are kept clear of all flammable materials to a distance of 10m and shielded on the hazard side. 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.	Able to comply	Should reticulated gas be used its installation will comply. A recommendation is to be placed at the end of this report.

9. ACHIEVING A BETTER BUSHFIRE OUTCOME FOR THE SITE.

Clause 5.1.3 of PBP 2019 provides for bushfire protection measures to be applied to existing dwellings in a proposed subdivision. Bushfire protection measures such as water supply and the upgrading of the buildings to provide ember protection. This site contains an existing dwelling. This BAR contains recommendations listed below, that address additional bushfire protection measures (APZ, water supply, ember protection and emergency management). These recommendations will ensure a better bushfire outcome for the site than what currently exists. The additional fire protection measures are discussed here.

There is no APZ around the existing dwelling (built prior to 2001) as required for new dwellings under Table A1.12.3 in PBP2019 (i.e., FFDI 80 Grassland – 10m flat/upslope and 11m-5 degrees downslope). The location of the existing dwelling to the front of the property provides for easy access and proximity to the existing fire hydrant system in Memorial Ave during a bushfire event. Applying an APZ around the building will provide access and some protection until fire fighting vehicles can get there. The recommended APZ for Lot 61 is 5m to the north, 5m to the west, 50m to the south and 30m to the east.

It is recommended that the existing dwelling be upgraded and provided with ember protection to be protected from an ember attack during a bushfire event. Combined with the above APZs the ember protection to the existing habitable buildings should provide a basic level of protection that currently doesn't exist.

There is a reticulated water supply located outside of the property along the front boundary in the road reserve in Memorial Ave. This reticulated water supply is also supported by a fire hydrant system. The nearest hydrant is on the corner of Memorial Ave and Gamack St to serve the existing dwelling. In order to serve proposed lots 62 & 63 of this development, it is recommended below that a dedicated 20,000L static water supply be provided to each Lot for firefighting purposes.

Any occupants of the existing (and proposed) dwellings will benefit from having a Bushfire Survival Plan prepared for each Lot on the site. This can be addressed with assessment of any proposed dwellings on Lots 62 & 63.

In summary, it is considered reasonable to apply several bushfire protection measures to the existing dwelling on Lot 61, to provide protection during an event. These bushfire protection measures are upgraded ember protection; an APZ around the existing dwelling and a bushfire survival plan be prepared for lot 61.

RECOMMENDATIONS.

The proposed three (3) lot Torrens Title subdivision can comply with the provisions of Section 5 – Residential and Rural Residential Subdivisions, of the document, Planning for Bushfire Protection (RFS,2019). Subject to the APZ distances (listed in Table 7.1 above) being implemented around the existing dwelling (on Lot 61) and the subdivision boundaries, any habitable buildings shall not be exposed to radiant heat levels exceeding 29kW/m². All existing habitable buildings are also to be provided with ember protection. It is therefore recommended that: -

1. The APZs listed below are to be implemented around the boundaries of the subdivision, in accordance with Table 6-1 in the above report.

Asset Protection Zones (APZ) – The APZ provides space and reduced fuel loads to ensure radiant heat levels at the buildings are below critical limits and to prevent direct flame contact.

The APZ is the distance from the external wall of the habitable building (dwelling) to the unmanaged vegetation line to the north, east, south, and west. The shortest distance from the building to the unmanaged vegetation line has been identified to be:

- 11m to the north.
- 10m to the east.
- 11m to the west.
- 10m to the south.

The management and maintenance of the APZs are to be subject to an 88B Instrument.

2. The APZs listed below are to be implemented around the existing dwelling (located on Lot 61), as discussed in Section 9 in this report.

Asset Protection Zones (APZ) – The APZ provides space and reduced fuel loads to ensure radiant heat levels at the buildings are below critical limits and to prevent direct flame contact.

The APZ is the distance from the external wall of the existing dwelling to the unmanaged vegetation line to the north, east, south, and west. The shortest distance from the building to the unmanaged vegetation line has been identified to be:

- 5m (20m OPA) to the north.
- 30m (20m OPA) to the east.
- 5m (20m OPA) to the west.
- 50m (20m OPA) to the south.

The management and maintenance of the APZ are to be subject to an 88B Instrument.

3. The existing dwelling shall also be upgraded to improve **ember protection**. This ember protection shall 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, weepholes, and eaves. External doors are to be fitted with draft excluders.
4. **Landscaping** - Landscaping is to be consistent with the requirements of NSW RFS, 2019, 'Planning for Bushfire Protection' (Appendix 4 – Asset Protection Zone Requirements).
5. **Vehicular Access** – Access standards provide for emergency evacuation and firefighting operations.
An assessment of the existing access has identified the following requirements:
 - two-wheel drive, all weather access,
 - Minimum of 4m carriageway width,
 - Minimum vertical clearance of 4m to any overhanging obstructions, such as tree branches,
 - Suitable turning head, being a loop close to the dwelling,
 - Minimum distance between inner and outer curves is 6m,
6. **Water Supplies** – A reticulated water supply is available to serve the proposed for firefighting purposes.
 - This reticulated water supply is to be extended along the proposed shared concrete driveway to service proposed Lots 62 & 63.
 - Unobstructed access must always be provided to the fire hydrants.
 - All exposed water pipes external to any building are to be metal, including any fittings,
 - In lieu of a fire hydrant, proposed Lots 62 & 63 are to both have a 20,000L static water supply dedicated to firefighting. This water supply must: -
 - a. a 20,000L static water supply tank (non-combustible) must be provided on site.
 - b. a connection for firefighting purposes is located within the IPA or non-hazard side and away from the structure.
 - c. 65mm Storz outlet with a ball valve is fitted to the outlet.
 - d. ball valve and pipes are adequate for water flow and are metal.

- e. supply pipes from tank to ball valve have the same bore size to ensure flow volume.
- f. a hardened ground surface for truck access is supplied within 4m.
- g. above-ground tanks are manufactured from concrete or metal.
- h. raised tanks have their stands constructed from non-combustible material or bush fire resisting timber (see Appendix F of AS 3959)
- i. unobstructed access can be provided at all times.
- j. tanks on the hazard side of a building are provided with adequate shielding for the protection of firefighters.
- k. all exposed water pipes external to the building are metal, including any fittings.
- l. where pumps are provided, they are a minimum 5hp or 3kW petrol or diesel-powered pump and are shielded against bush fire attack; any hose and reel for firefighting connected to the pump shall be 19mm internal diameter.
- m. fire hose reels are constructed in accordance with AS/NZS 1221:1997 and installed in accordance with the relevant clauses of AS 2441:2005; and
- n. the gate or ball valve, pipes and tank penetrations are to be designed to allow for a full 50mm inner diameter water flow through the Storz fitting and must be of a metal construction.

7. Electricity Services – The installation of new electricity seeks to limit the possibility of igniting the surrounding bushland. Transmission lines are to be placed underground. If placing them underground is not practical, then overhead transmission lines are to:

- Be 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.

8. Gas Services – The location and design of any gas services will not lead to the ignition of surrounding buildings or the fabric of buildings. The provision of gas requires that:

- Reticulated or bottled gas is installed and maintained in accordance with AS/NZS 1596:2014 and the requirements of relevant authorities,
- Metal piping is used,
- All fixed gas cylinders are kept clear of all flammable materials to 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-gas service pipes are metal including and up to any outlets.

9. Emergency Evacuation – A Bushfire Survival plan is to be prepared by the owners of the existing dwelling on the site. Information to assist with the preparation of the plan can be found at www.nswrfs.gov.au.

CONCLUSION

This BAR discusses how the proposed one into three-lot subdivision complies with the acceptable solutions as listed in Table 5.3 of Section 5, PBP 2019. A dwelling exists on the site and were constructed prior to the introduction of the PBP 2001. Bushfire protection measures have been applied to these existing habitable buildings. The recommendations listed above are made in order to achieve a better bushfire outcome for the site.

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