



Attachment 3 to Item 2.1.1.

Bushfire Hazard Assessment Report

Date of meeting: 21 November 2024
Location: Audio-visual link
Time: 10am

Building Construction in Bush Fire Prone Areas

Bushfire Hazard Assessment Report

Ref No. 22.05.185

Address Lot 31 DP 7565
457 Bells Line of Road
Kurmond NSW 2757

For Attard, Dawson and Ross Family

The site was inspected on 13th June 2022

Report Preparation

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Grad Dip Design for Bushfire Prone Areas
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1.0 Introduction

We have been engaged by McKinlay Morgan & Associates on behalf of Attard, Dawson and Ross Family being the owners of the subject land to prepare a bush fire hazard assessment report to be a supplement for inclusion in a development application to the Hawkesbury City Council for the proposed development being the subdivision of the subject allotment.

The site has been identified as being bushfire prone land and therefore the legislative requirements for the proposed development are applicable.

This assessment concludes that the proposal will fully comply with the requirements of *Planning for Bush Fire Protection 2019*.

1.1 Purpose of Report

- To determine the vegetation type, the expected fire behaviour and the threat to the proposal
- To assess the proposal with reference to *Planning for Bush Fire Protection 2019* and *AS 3959-2018 Construction of buildings in bushfire prone areas*
- To identify any other such measures as to improve the chances of building and occupant survival during a bushfire event
- To provide information with respect to bushfire related matters for the development that will assist the Commissioner of the NSW Rural Fire Service for the issuance of a Bushfire Safety Authority
- To assist the consent authority Hawkesbury City Council in the determination of the development application subject to this proposal.

1.2 Scope of Report

The scope of this report is limited to the Bushfire Hazard Assessment for the proposed development and only contains comments for the subject property. Where reference is made to adjacent or adjoining lands, this report does not purport to assess those lands; rather it may discuss bushfire progression on and through those lands with the possible bushfire impact to the subject property and the proposed development.

1.3 Methodology

A site inspection for the purpose of assessing bushfire related matters affecting this site was conducted on the 13th June 2022 and a review of the proposed development plans as supplied and prepared by McKinlay Morgan & Associates has taken place.

An assessment of slope was conducted out to a distance of 100 metres and assessment of vegetation to a distance of 140 metres from the proposed development.

The findings were related and assessed with reference to *Planning for Bush Fire Protection 2019*, Appendix 2 contained in that document, for the formulation of the Bushfire Hazard Assessment together with AS 3959-2018 *Construction of buildings in bushfire prone areas*.

This report has been prepared in accordance with the requirements of Clause 44 of the *Rural Fire Service Regulation 2008* for the purpose of satisfying the requirements of section 100b of the *Rural Fires Act 1997*.

1.4 The Proposal

The proposal as indicated by consultation with McKinlay Morgan & Associates and perusal of the plan supplied is for the subdivision of the subject land to create four (4) individual allotments being Lot 21, Lot 22, Lot 23 and Lot 24.

- Lot 21 will be 5497m² with a building envelop of 909m²;
- Lot 22 will be 5454m² with a building envelop of 994m²;
- Lot 23 will be 5670m² with a building envelop of 1406m²; and
- Lot 24 will be 7118m² with a building envelop of 1025m².

Each of the parcels has direct road frontage to Bells Lane.

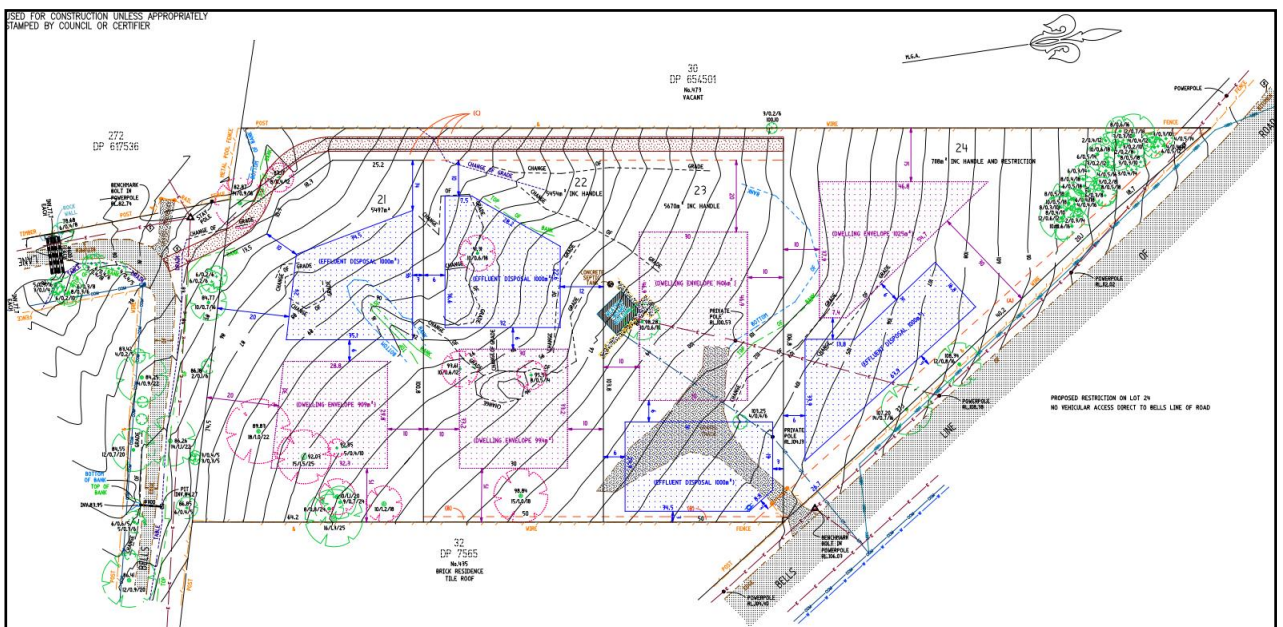


Figure 1; Extract of proposed development plans ex McKinlay Morgan & Associates

1.5 Regulatory Controls

The preparation of the bushfire hazard assessment report has given consideration to the various legislative and regulatory requirements including the *Environmental Planning and Assessment Act 1979*, the *Rural Fires Act 1997*, the Building Code of Australia, *Planning for Bush Fire Protection 2019*, AS 3959-2018 *Construction of buildings in bushfire prone areas*.

The proposal being an integrated development will require the issuance of a Bushfire Safety Authority by the Commissioner of the NSW Rural Fire Service under the provisions of *section 100b Rural Fire Act 1997*.

Development applications on bushfire prone land must be accompanied by a Bushfire Hazard Assessment within the Statement of Environmental Effects demonstrating compliance with the aims and objectives of *Planning for Bush Fire Protection 2019* and the specific objectives and performance criteria for the land use proposed.

The terrain of the site is the moderate slopes across the majority of the subject land with a south westerly aspect.

The infrastructure of electrical supply is available from existing overhead cabling within the carriageway of Bells Line of Road and Bells Lane but will be brought into the site by underground cabling. The development site is also serviced by mains reticulated water supply although Static Water Supplies will be required at the time of future residential construction.

The site is shown upon the Hawkesbury LGA Bushfire Prone Land Map to be wholly within an area of category 3 vegetation (shown dark orange) although it may be considered that the area of category 3 vegetation is actually overstated as the site inspection noted that the development site would be more accurately described as being within a combination of category 3 vegetation buffer zone and mostly not bushfire prone.



Figure 3; Section Hawkesbury LGA Bushfire Prone Land Map

2.2 Description of Adjoining Lands

To the north of the subject allotment is the carriageway of Bells Line of Road and beyond this is existing rural residential development with no areas of bushfire hazardous vegetation.

To the east of the subject allotment is a rural lifestyle allotment that entirely managed as an asset protection zone.

To the south of the subject allotment is the carriageway of Bells Lane and beyond this is a combination of managed lands associated with rural lifestyle allotments apart from a small area of remnant woodland.

To the west of the subject allotment is a large area of open grasslands which form the primary area of bushfire hazardous vegetation effective upon the proposed development.

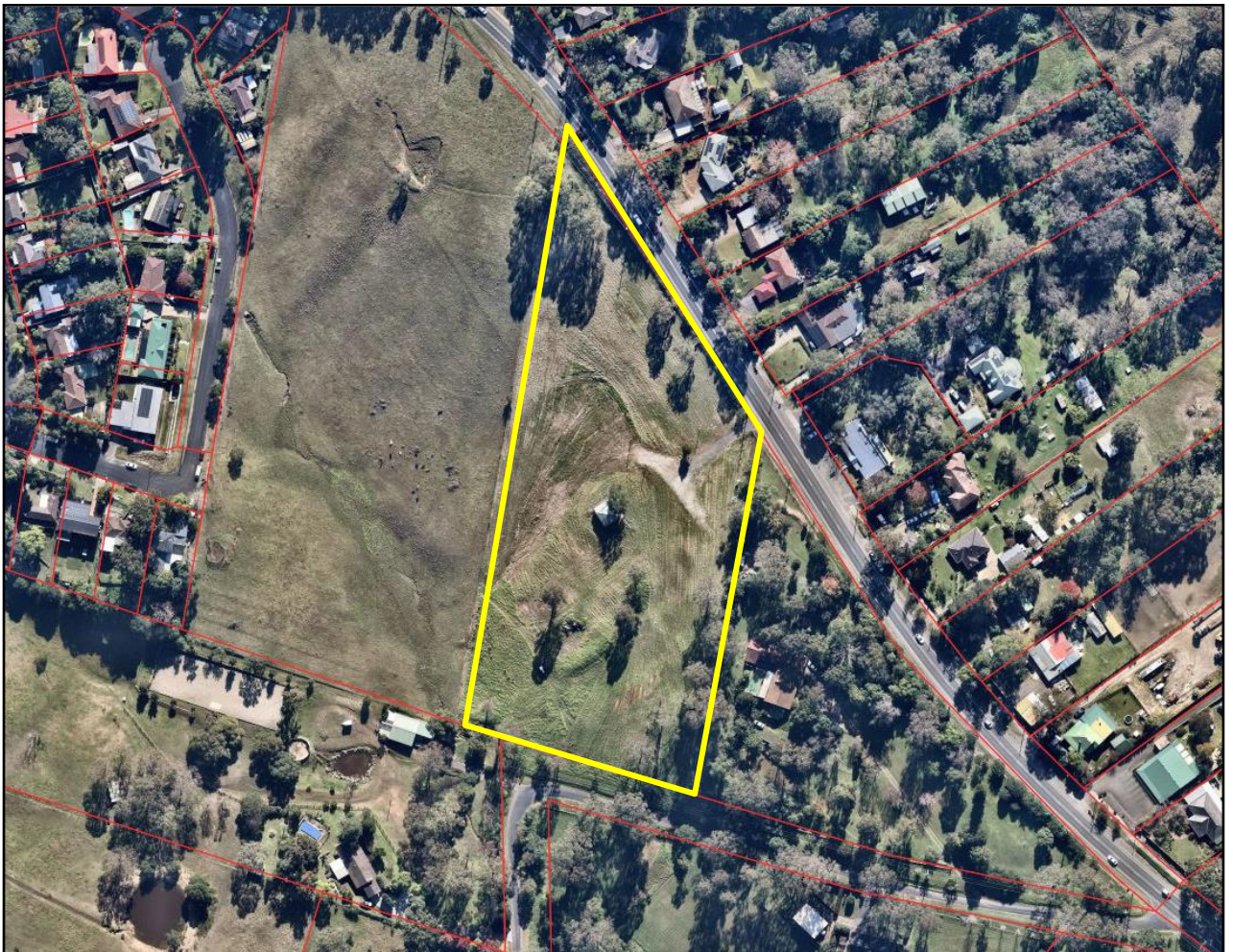


Figure 4; Development site and adjoining lands ex Nearmap

2.3 Classification of Vegetation and Separation Distances

The bushfire hazard assessment was conducted for the proposed development, using the procedures as outlined in *Planning for Bush Fire Protection 2019* to determine the bushfire attack level (BAL) likely upon the development.

The assessment was conducted on the assumption of the building footprint being positioned as described in section 1.4 The Proposal of this report and the site plan.



Figure 6; Vegetation study area ex Nearmap - - - - - Vegetation Hazard

To the west of the development site (Area A) is a large and expansive section of Grassland vegetation with a much smaller area of Remnant Woodland (Area B) to the south.

2.4 Slope Assessment

The slope was assessed for a distance of 100 meters within the bushfire hazardous vegetation and reference to slope classifications has been undertaken considering the procedure specified within *Planning for Bush Fire Protection 2019*.



Figure 7; Slope/contour image ex Geoscience Australia

The effective slope of the land (that is, the slope of the land most likely to influence bushfire behaviour for the purposes of calculating Asset Protection Zones, out to a distance of 100 metres from the proposed development that will have potential residential development.

- Transect A – Grassland - > 5 to 10 degrees downslope (assumed) (elevation 9.19 met / dist. 86.98 met = 6.03 degrees)

- Transect B – Grassland - > 5 to 10 degrees downslope (assumed) (elevation 8.11 met / dist. 68.97 met = 6.71 degrees)
- Transect C – Grassland - > 0 to 5 degrees downslope (assumed) (elevation 2.24 met / dist. 48.24 met = 2.66 degrees)
- Transect D – Grassland – Upslope degrees (assumed) (elevation 0.99 met / dist. 41.49 met = 1.37 degrees)
- Transect E – Remnant Woodland - > 5 to 10 degrees downslope (assumed) (elevation 8.01 met / dist. 48.2 met = 9.46 degrees)

2.5 BAL 29 Exposure Assessment



Figure 8; Bushfire Attack Level (BAL) 29 threshold

On the basis of the distance of separation and the effective slope the proposed development can clearly satisfy the provisions for compliant subdivision of *Planning for Bush Fire Protection 2019* for a maximum radiant heat exposure of Bushfire Attack Level (BAL) 29 of AS 3959-2018 *Construction of buildings in bushfire prone areas*.

Lot 21 – Building Envelop

Vegetation Hazard	Slope	Sep Distance (m)	Bushfire Attack Level (BAL) PBP 2018
Area B – Remnant Woodland to south	> 5 to 10 degrees downslope	41	BAL 12.5
Area A – Grassland to west	Upslope degrees	63.5	BAL Not applicable

Lot 22 – Building Envelop

Vegetation Hazard	Slope	Sep Distance (m)	Bushfire Attack Level (BAL) PBP 2018
Area A – Grassland to west	> 0 to 5 degrees downslope	60.5	BAL Not applicable

Lot 23 – Building Envelop

Vegetation Hazard	Slope	Sep Distance (m)	Bushfire Attack Level (BAL) PBP 2018
Area A – Grassland to west	> 5 to 10 degrees downslope	29	BAL 12.5

Lot 24 – Building Envelop

Vegetation Hazard	Slope	Sep Distance (m)	Bushfire Attack Level (BAL) PBP 2018
Area A – Grassland to west	> 5 to 10 degrees downslope	15	BAL 29

2.6 Environmental Considerations

Consultation with the project management team has indicated that there are no significant environmental features, threatened species or aboriginal sites known to exist on the subject site.

It is also my opinion that the bushfire protection measures as recommended within this report will have little or no adverse environmental effect.

3.0 Bushfire Assessment

3.1 The extent to which the development is to provide for setbacks, including Asset Protection Zones

The proposed development can fully provide suitable asset protection zones within the site boundaries and by consideration of clearly managed lands on adjoining allotments.

The site is located within the Hawkesbury local government area, in the Greater Sydney Fire Weather area, and is subject to an FDI rating of 100 according to Table A2.3 of *Planning for Bush Fire Protection 2006*.

Based upon the provisions of *Planning for Bush Fire Protection 2019* Table A1.12.2 the asset protection zone required to be provided between the closet and most effective vegetation hazard and the proposed building envelopes are compliant as demonstrated in section 2.5 of this report.

The objective of *Planning for Bush Fire Protection 2019* asset protection zones is to not have any potential building envelope exposed to greater than 29kW/m² of radiant heat and compliance is easily achieved.

This report will recommend that the entire area of the proposed development site should be maintained in accordance with the requirements of the NSW Rural Fire Service document entitled *Standards for Asset Protection Zones (2005)* for an inner protection area.

The following are the requirements for asset protection zone inner protection areas as described within the documents *Planning for Bush Fire Protection 2019* and NSW RFS *Standards for Asset Protection Zones*.

Inner Protection Area (IPA)

The IPA is the area closest to the building and creates a fuel management area which can minimise the impact of direct flame contact and radiant heat on the development and act as a defensible space. Vegetation within the IPA should be kept to a minimum level. Litter fuels within the IPA should be kept below 10cm 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 in IPA the following requirements apply;

Trees

- tree canopy cover should be listed 15% at maturity;
- trees at maturity should not touch or overhang the building;
- lower limbs should be removed to a height of two metres above the ground;
- preference should be given to smooth bark and Evergreen trees

Shrubs

- create large discontinuities or gaps in the vegetation to slow down or break the progress of fire towards the buildings;
- 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 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 vegetation debris should be removed

3.2 Fire Fighting Water Supply and other Services

3.2.1 Water

The development site is serviced by mains reticulated water supply although the distance from the closest hydrant to the proposed dwelling will not satisfy the requirements of *Planning for Bush Fire Protection 2019*.

Therefore, at the time of future residential construction each of the allotment will be required to provide a Static Water Supply (SWS) in compliance with the requirements of *Planning for Bush Fire Protection 2019*.

3.2.2 Electricity

The development site will be serviced by underground electrical supply, and this therefore satisfies the provisions of *Planning for Bush Fire Protection 2019*.

3.2.3 Gas

The objective of *Planning for Bush Fire Protection 2019* with regards to the supply of gas is to ensure that the infrastructure for this service does not contribute to the risk of fire to buildings.

However, in this instance no gas supply is intended to be connected to the development site.

3.3 Public Road Capacity to Handle Increased Traffic Volume

The objective of *Planning for Bush Fire Protection 2019* with regards the provision of public roads is to ensure safe operational access to structures and water supply for emergency services, while residents are seeking to evacuate from an area.

Perusal of the subdivision plans indicates that no construction of public roads is proposed. A study of the existing road system within the general area of the development indicates that compliance to the above noted criteria of *Planning for Bush Fire Protection 2019* is achieved.

3.4 Public Road Links to Fire Trail Network and Two Way Access

The objective of *Planning for Bush Fire Protection 2019* for provision of a dedicated fire trail system is to assist fire fighters in either offensive or defensive fire fighting. In addition, a fire trail may be incorporated into a development to define the asset protection zone and to provide access for maintenance.

In this instance there is no system of fire trails shown on the subdivision plans and none are required.

3.5 Adequacy of Access and Egress from the Development Site for Emergency Response

The proposed development is located approximately 3 kilometres to the east of the Kurrajong NSW Rural Fire Service Brigade Station.

The system of public roads to the site should be adequate under most conditions to allow for access and egress for the site for emergency service vehicles.

The proposed Lot 22, Lot 23 and Lot 24 will have access by construction of a driveway adjacent to the western boundary of the development site.

For the purposes of subdivision to comply with the requirements of *Planning for Bush Fire Protection 2019* the driveway surface must be an all-weather surface capable of carrying a fully laden fire tanker (23 tonnes).

The driveway must have trafficable width of not less 4.0 metres and have a minimum of 4.0 metres vertical clearance. The inner radius of any curve must be greater than 6.0 metres. The minimum distance between inner and outer curves is 6.0 metres.

At the time of future residential construction each allotment must provide an area of hard surfaced driveway to negotiate the turning around of a bushfire tanker that is constructed in accordance with Appendix 3 of *Planning for Bush Fire Protection 2019*.

It must also be noted that emergency access to the development site would be available from the Bells Line of Road.

3.6 Adequacy of Bushfire Maintenance Plans and Fire Emergency Procedures for the Development Site

No detail of any bushfire maintenance plan or fire emergency procedures has been provided by the proponents with respect of these matters.

3.7 Construction Standards for Building Elements in the Development

No construction of any structures is included within this proposal.

3.8 Adequacy of Sprinkler Systems and other Fire Protection Measures to be Incorporated

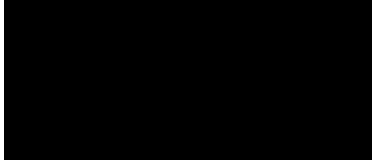
No additional bushfire protection measures or external bushfire sprinkler systems are recommended for this development apart from those previously nominated in this report and listed within the recommendations section of this report.

4.0 Recommendations

1. That the entire area of the proposed development site shall have the vegetation reduced where or if necessary to satisfy the requirements of *Planning for Bush Fire Protection 2019* and the NSW Rural Fire Service document “Standards for Asset Protection Zones” for an inner protection area of an asset protection zone and this area shall be maintained at this vegetation level for the lifetime of the development.
2. That no future landscaping features, planting of shrubs, trees or other vegetation shall occur in such a manner as to compromise the integrity of the asset protection zone.
3. That the access driveway adjacent to the western boundary of the development site must have a trafficable width of not less than 4 metres and have a minimum 4 metres vertical clearance. Inner radius of any curve must be greater than six metres the minimum distance between inner and outer curves in six metres.

5.0 Conclusion

Based upon the bushfire hazard assessment for the proposed development of the subject allotment, this report concludes that scope of works as described by the development plans prepared by McKinlay Morgan & Associates, this development can comply to the requirements of *Planning for Bush Fire Protection 2019* as required under section 100b of the *Rural Fires Act 1997* with the inclusion of the 3 recommendations contained within this report.



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Caveat

Quote from *Planning for Bushfire Protection 2001*, *'notwithstanding the precautions adopted, it should always be remembered that bushfire burn under a wide range of conditions and an element of risk, no matter how small always remains.'*

Quote from Standards Australia, *'Although the standard is designed to improve the performance of such buildings, there can be no guarantee, because of the variable nature of bushfires, that any one building will withstand bushfire attack on every occasion.'*

References

Planning for Bushfire Protection 2019 Planning NSW in conjunction with NSW Rural Fire Service

Building Code of Australia Volume 2 2005 Australian Building Codes Board

AS 3959 – 2018 Construction of buildings in bushfire prone areas Standards Australia & Australian Building Codes Board

Landscape and building Design for Bushfire Areas Ramsay C. & Rudolph L. CSIRO 2003

Quantifying bushfire penetration into urban areas in Australia Keping Chan & McAneny J. Geophysical Research Letters, Volume 31, L12212, doi:10.1029/2004GL020244,2004

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Appendix 1- Proposed Development Plan ex McKinlay Morgan & Associates

