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'BUSHFIRE HAZARD ASSESSMENT'

For:

431 Greggs Road, KURRAJONG

CLIENT: Bull

REFERENCE: REF-144714-A

DATE: 11th August 2014

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	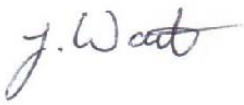
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TABLE OF CONTENTS

Appendices: APZ locations and distances from nearest vegetation and building envelope for all lots.

1. INTRODUCTION

1.1 Legislative Background

The *Environmental Planning and Assessment Act* (1979) and the *Rural Fires Act* (1997) was amended via the *Rural Fires and Environmental Assessment Legislation Amendment Act* (2002) to:

a) Require local government councils to record on maps, land identified by the Commissioner of the NSW Rural Fire Service as bushfire prone land;
b) Prevent development consent being granted for the carrying out of development for certain purposes on bushfire prone land unless the consent authority is satisfied that the development conforms to certain documented bushfire protection specifications and requirements ('Planning for Bushfire Protection' (2006) and AS 3959 – Construction of Buildings in Bushfire Prone Areas) or has consulted with the Commissioner.

Planning for Bushfire Protection (2006) defines bushfire prone areas as an area that can support a bushfire or is likely to be subject to bushfire attack. In general, a bushfire prone area is an area containing a high, medium or low bushfire hazard, or any area within 100 m of a high or medium bushfire hazard, or within 30 m of a low bushfire hazard.

1.2 Project Background

EnviroTech Pty. Ltd. has been engaged by Mr Bull ('the Principal'), to prepare a Bush Fire Hazard Assessment Report for 431 Greggs Road, KURRAJONG. This report is to accompany a planning proposal being submitted to Hawkesbury Council, subdivision for subject site (Appendix A). A locality plan is shown in **Figure 1** and **Figure 2**.

The Hawkesbury City Council Fire Prone Land Map indicates that the subject property is defined as containing *Category 1 vegetation.*

1.3 Objective

The purpose of this Bushfire Hazard Assessment Report is to provide the owners, the Rural Fire Service and the Hawkesbury City Council with an independent bushfire hazard determination. Within this report, necessary recommendations are given for construction and for bushfire mitigation measures, in accordance with the legislative requirements applicable to developing in 'bushfire prone' areas.

The recommendations contained within this report may assist in forming the basis of any specific construction conditions and/or bushfire mitigation measures that Council and/or the NSW Rural Fire Service may elect to place within any consent conditions issued for the subject Development Application.

1.4 Scope of Report

The scope of this report is limited to a Bush Fire Hazard Assessment on the site for the proposed development, containing recommendations 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 bush fire progression on and through those lands with the possible bush fire impact to the subject property. As required by legislation, the proposal must therefore be assessed in accordance with**:**

- *Planning for Bushfire Protection* (2006), (PBP) and,
- AS 3959 – *Construction of Buildings in Bushfire Prone Areas.*

Figure 1: Aerial layout of the site.

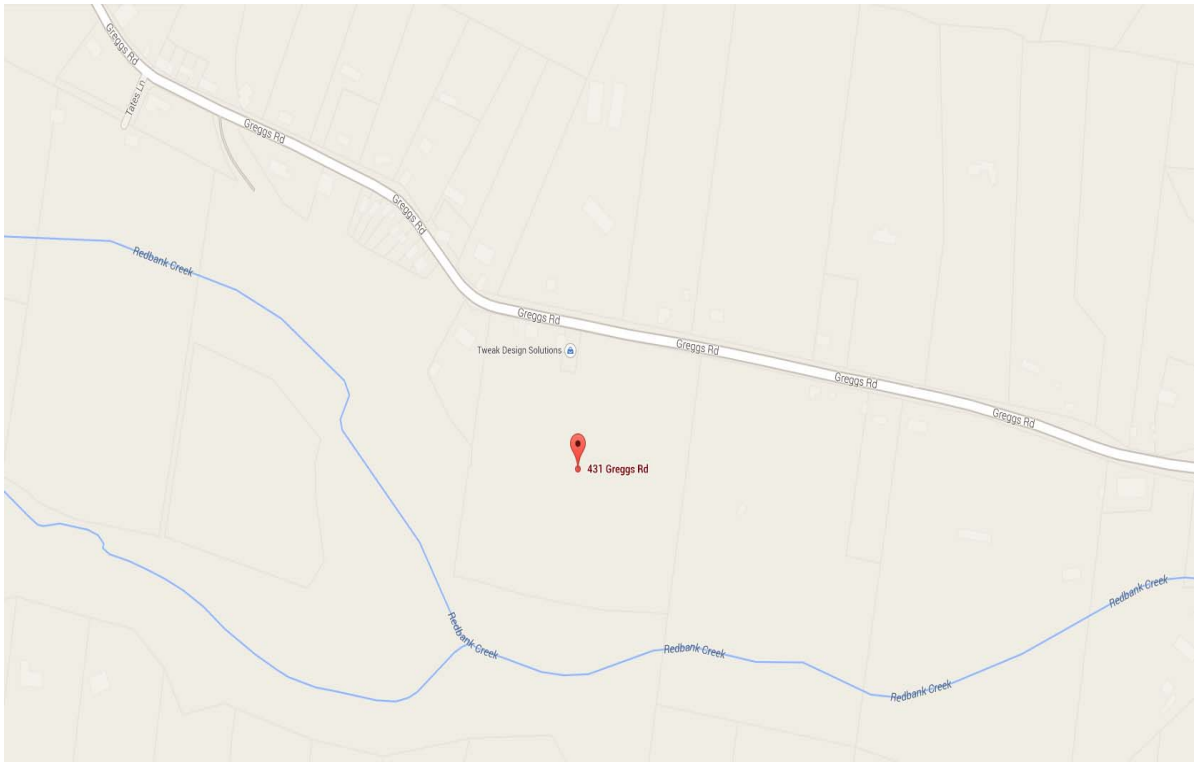

Figure 2: Layout of the site, showing access via Greggs Road.

2. BUSHFIRE HAZARD ASSESSMENT

A site inspection was conducted on the 21st of July 2014, for the purpose of assessing the intended development's bush fire risk and related matters.

Direct access to the site is currently via Greggs Road, to the North of the site. Sealed driveways will be provided for secondary use by fire trucks if ever needed

The site itself includes undulating hills and is extensively cleared. The subject site is surrounded by rural allotments with bushland to the west, south and east.

2.1 Slope and Topography

The slope that would most significantly affect fire behaviour must be assessed for at least 100 metres from the building footprint. The slope within the bushfire hazard that would most significantly influence bushfire impact was determined to be:

- Downslope 5-10 degrees.
- Upslope/Flat

In accordance with PBP, the predominant vegetation class has been determined for a distance of at least 140m out from the proposed development.

The predominant vegetation within the bushfire hazard area was found to be Forest (Figure 1).

2.2 Asset Protection Zones (APZ)

The primary purpose of an APZ is to ensure that a progressive reduction of bushfire fuels occurs between the bushfire hazard and any habitable structures.

In accordance with *Planning for Bushfire Protection* (2006), Forest Vegetation, which is Downslope 5-10 degrees, requires a minimum protection zone of 35 metres.

In accordance with *Planning for Bushfire Protection* (2006), Forest Vegetation, which is Upslope/Flat, requires a minimum protection zone of 20 metres.

The following addresses the requirements for an Asset Protection Zone (APZ) to be established for the proposed 9 lot subdivision. The APZs are to be established from the building footprint.

Forest Vegetation

Bal 12.5.	Downslope 5-10 degrees	> 69m
	Upslope/Flat	> 48m
Bal 19	Downslope 5-10 degrees	> 53m
	Upslope/Flat	> 35m
Bal 29	Downslope 5-10 degrees	> 39m
	Upslope/Flat	> 25m

Only 2 or 3 trees are required to be removed to achieve these APZs, given that the site is already vastly cleared. These trees inhabit lot 39.

2.3 Fire Fighting

2.3.1 Property Access/Egress, and evacuation

Property access roads from Greggs Road to the building, is to be based on the Performance criteria for 'Acceptable Solutions' (NSW RFS, 2006; Pgs. 35). This criteria enables safe access for emergency services, and allows fire crew to work with vehicle equipment without impediments. Specifically:

- The access road to the development should be a two-wheel drive, sealed, all-weather road;
- A vertical clearance of four metres is to be established and maintained for all access roads;
- The access roads should not traverse a wetland or other land potentially subject to periodic inundation;
- The cross fall of the access road should not exceed 10 degrees.

To address this criteria, it is recommended that the access from Greggs Road is maintained to the requirements suggested. This will accommodate for firefighting trucks facilitating evacuation and controlling the spread of fire. So long as fire trucks are able to defend all aspects of the building through the incorporation of the APZ, a satisfactory level of property access/egress shall be provided.

2.3.2 Electricity Supply

Electricity supply is to be provided underground where possible.

2.3.3 Gas

Reticulated or bottled gas shall be installed and maintained in accordance with AS/NZS 1596-2002: *Storage and Handling of LP Gas* and the requirements of the relevant authorities. If gas cylinders are to be kept close to buildings, the release valve must be directed away from the building and away from any hazardous materials such as firewood, so that it does not act as a catalyst to combustion.

2.3.4 Water Supply

Lot 36 has a dam available at present but the client has advised this may be filled. The below is applicable for all lots.

Being a rural-residential lot, the subject development is to incorporate a minimum un-reticulated water supply, according to PBP Guidelines, of 10,000L. Development Control Services (NSW Rural Fire Service), no longer require this water supply to be solely 'dedicated' for firefighting purposes, only that the supply be 'provided' when requested.

2.4 Level of Construction

Australian Standard 3959 (2009) *Construction of buildings in bushfire-prone* specifies construction standards for buildings within various Bushfire Attack Levels (BAL), as determined by the *Planning for Bushfire Protection* (2006) document.

Six (6) levels of building construction exist, these being:

- BAL - Low - BAL - 12.5 - BAL - 19
- BAL - 29 - BAL - 40 - BAL – FZ

On subject site there are 3 Bal levels which will be established

Based upon an APZ area of >69 metres with a downslope gradient of 5-10^{o,} and upslope/flat APZ area of >48 metres forest, the category of Bush Fire Attack Level (BAL) in this instance, is BAL – 12.5 for

Attack by burning debris is significant with radiant heat (not greater than 12.5 kW/m2). Radiant heat is unlikely to threaten building elements (eg unscreened glass). Specific construction requirements for ember protection and accumulation of debris are warranted.

Based upon an APZ area of >53 metres with a downslope gradient of 5-10^{o,} forest and upslope/flat APZ area of >35 metres, the category of Bush Fire Attack Level (BAL) in this instance, is BAL – 19**.**

Attack by burning debris is significant with radiant heat levels (not greater than 19 kW/m2) threatening some building elements (screened glass). Specific construction requirements for embers and radiant heat are warranted.

Based upon an APZ area of >39 metres with a downslope gradient of 5-10°, forest and upslope/flat APZ area of >25 metres, the category of Bush Fire Attack Level (BAL) in this instance, is BAL - 29.

Attack by burning debris is significant and radiant heat levels (not greater than 29 kW/m2) threaten building integrity. Specific construction requirements for ember and higher radiant heat are warranted. Some flame contact is possible.

2.5 Fire Service Response

The NSW Rural Fire Service is the combat agency for bushfires in the Kurrajong local area. The following is the closest station to the site.

Kurrajong Fire Service
Old Bells Line of Road, KURRAJONG NSW

3. CONCLUSION

The determination of any bushfire hazard must be made on a site-specific basis that includes an assessment of the local bushland area and its possible impact to the subject property.

It is intended for the subject site to become a rural residential development. The hazard was identified as forest vegetation from the east, west and south of subject site.

Based upon an APZ area of >69 metres with a downslope gradient of 5-10°, forest, the category of Bush Fire Attack Level (BAL) in this instance, is **BAL – 12.5.**

Based upon an APZ area of >55 metres with a downslope gradient of 5-10°, forest and upslope/flat APZ area of >35 metres, the category of Bush Fire Attack Level (BAL) in this instance, is **BAL – 19.**

Based upon an APZ area of >39 metres with a downslope gradient of 5-10°, forest and upslope/flat APZ area of >25 metres, the category of Bush Fire Attack Level (BAL) in this instance, is **BAL – 29.**

4. RECOMMENDATIONS

The following recommendations are provided as the minimum necessary for compliance with *Planning for Bushfire Protection* (2006) and AS3959. Additional recommendations are provided to supplement these minimum requirements where considered necessary.

4.1 Asset Protection Zones

- All APZs are maintained in accordance with Appendix 2 of *Planning for Bushfire Protection* (2006) and the RFS document *Standards for Asset Protection Zones*.

4.2 Fire Fighting

- Maintenance of landscaped vegetation is needed to ensure that access roads have a 4 metre trafficable width, and a 4 metre vertical clearance for the entire length;
- Any landscaped vegetation surrounding these roads are thinned and maintained to make the roads safe for use during evacuation; and
- It is recommended that all of the driveways to the individual proposed lot be an all-weather surface.

4.3 Construction Method

The highest Bushfire Attack Level to the proposed development was determined to be 'BAL-29. Construction provisions listed in Section 7 of Australian Standard 3959 (2009) are deemed adequate for asset protection and occupant safety on required allotments.

The middle Bushfire Attack Level to the proposed development was determined to be 'BAL-19. Construction provisions listed in Section 6 of Australian Standard 3959 (2009) are deemed adequate for asset protection and occupant safety on required allotments

The lowest Bushfire Attack Level to the proposed development was determined to be 'BAL-12.5. Construction provisions listed in Section 5 of Australian Standard 3959 (2009) are deemed adequate for asset protection and occupant safety on on required allotments

So long as the recommendations contained within this report are followed, a reasonable and satisfactory level of bushfire protection shall be provided

4.4 Landscaping

- Do not use plants with high volatile oil content such as eucalyptus;
- Avoid the use of plants which support large proportions of dead leaves, dead twigs, dead bark or produce copious quantities of litter in the local fire season (e.g. pines, melaleucas, xanthorrhoea sp.);
- Use plants with a high moisture content such as succulents and native Australian rainforest species. Fire retardant introduced species include lavender and camellias;

On the below diagram this is the key.

Bal 12.5 is the green line.

Bal 19 is the blue line.

Bal 29 is the orange line.

The red line is the minimum APZ line.

As the final location of building envelopes is still at the conceptual stage the below diagram shows the definitive APZ locations for once final building envelope locations are determined.


Lot 31
Lot 32
Lot 33
Lot 34
Lot 39
Lot 38
Lot 36
Dam
Lot 37