

Bushfire Hazard Assessment Report

79, 95 & 100 Bells Lane & 457 Bells Line
of Road, Kurmond NSW 2757



PREPARED FOR: Montgomery Planning Solutions Att: Robert Montgomery

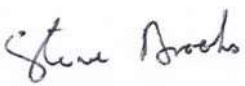
OUR REFERENCE: 19-8233

ISSUE DATE: 12/08/2019

CONTROLLED DOCUMENT
DISTRIBUTION AND REVISION REGISTER

<u>DISTRIBUTION LIST</u>		
Copy No.	Custodian	Location
1 Original	Daniel Mathew	ENVIROTECH PTY. LTD (Filed)
2 Soft Copy (PDF, emailed)	Robert Montgomery	robert@montgomeryplanning.com.au

Note: This register identifies the current custodians of controlled copies of the subject document.

<u>DOCUMENT HISTORY</u>		
Document No.	Revision No.	Issue Date
19-8233	A	12/08/2019
<u>AUTHORS</u>		
Steve Brooks Grad. Dip Bushfire Planning and Design (UWS) Grad. Cert. Fire Investigation (CSU) BPAD # 40765		
		

COPYRIGHT © 2019 ENVIROTECH PTY. LTD.

The report is protected by copyright law and may only be reproduced, in electronic or hard copy format, with the prior written permission of EnviroTech Pty. Ltd.

Table of Contents

Executive Summary	Page 7
1. Introduction	Page 9
2. Purpose of the report	Page 11
3. Methodology	Page 11
4. Scope of the report	Page 12
5. Legislative, policy and planning requirements	Page 12
5.1 Environmental Planning and Assessment Act 1979	Page 12
5.2 Building Code of Australia	Page 12
5.3 Planning for Bushfire Protection	Page 12
5.4 Australian Standard 3959-2009	Page 12
6. 79 Bells Lane, Kurmond	Page 13
6.1 Site Description	Page 13
6.2 Bushfire Prone Land	Page 16
6.3 Existing Vegetation Description and Slope	Page 17
6.4 Hazard Assessment for BAL-29	Page 20
6.5 Roads and access	Page 24
6.6 Water supply, services and utilities	Page 24
6.7 Environmental Impact	Page 24
7. Site Constraints	Page 25
8. Compliance with Planning for Bushfire Protection 2006	Page 26
9. Conclusion	Page 28
10. 95 Bells Lane, Kurmond	Page 29
10.1 Site Description	Page 29
10.2 Bushfire Prone Land	Page 32
10.3 Existing Vegetation Description and Slope	Page 33
10.4 Hazard Assessment for BAL-29	Page 35
10.5 Roads and access	Page 39
10.6 Water supply, services and utilities	Page 39

10.7	Environmental Impact	Page 39
11	Site Constraints	Page 40
12	Compliance with Planning for Bushfire Protection 2006	Page 41
13	Conclusion	Page 43
14	100 Bells Lane, Kurmond	Page 44
14.1	Site Description	Page 44
14.2	Bushfire Prone Land	Page 46
14.3	Existing Vegetation Description and Slope	Page 47
14.4	Hazard Assessment for BAL-29	Page 50
14.5	Roads and access	Page 54
14.6	Water supply, services and utilities	Page 55
14.7	Environmental Impact	Page 55
15	Site Constraints	Page 55
16	Compliance with Planning for Bushfire Protection 2006	Page 56
17	Conclusion	Page 58
18	457 Bells Line of Road, Kurmond	Page 59
18.1	Site Description	Page 59
18.2	Bushfire Prone Land	Page 61
18.3	Existing Vegetation Description and Slope	Page 62
18.4	Hazard Assessment for BAL-29	Page 65
18.5	Roads and access	Page 69
18.6	Water supply, services and utilities	Page 69
18.7	Environmental Impact	Page 70
19	Site Constraints	Page 70
20	Compliance with Planning for Bushfire Protection 2006	Page 71
21	Conclusion	Page 73
	References	Page 74

List of Abbreviations

ABCB	Australian Building Codes Board
APZ	Asset Protection Zone
AS1596	Australian Standard 1596
AS3959	Australian Standard 3959-2009
BAL	Bushfire Attack Level
BCA	Building Code of Australia
DCP	Development Control Plan
EP&A Act	Environmental Planning and Assessment Act 1979
FDI	Fire Danger Index
FRNSW	Fire and Rescue NSW
GDA	Geocentric datum of Australia
Ha	Hectare
IPA	Inner Protection Area
L	Litre
LEP	Local Environmental Plan
LGA	Local Government Area
m	Metre
MGA	Map Grid of Australia
mm	Millimetre
OPA	Outer Protection Area
PBP	Planning for Bushfire Protection – 2006
RF Act	Rural Fires Act – 1997
RFS	NSW Rural Fire Service

SEPP	State Environmental Planning Policy
SFPP	Special Fire Protection Purpose
SWS	Static Water Supply

Executive Summary

Envirotech Pty Ltd has been engaged, by Robert Montgomery of Montgomery Planning Solutions, to amend the Bushfire Hazard Assessment Report (RFI-LEP002/15 - Envirotech Ref. REP-672018, dated the 4th December 2018) for the proposed 5 Lot subdivision at 79 Bells Lane, Kurmond NSW 2757, the proposed 4 Lot subdivision at 95 Bells Lane Kurmond NSW 2757, the proposed 3 Lot subdivision at 100 Bells Lane Kurmond NSW 2757 & 4 Lot subdivision at 457 Bells Line of Road Kurmond NSW 2757.

Upon completion of the site inspection, of the subject Lots, I identified that the vegetation classification provided in the initial report was not entirely correct. The Forest Classified Vegetation along the creek lines on both No.79 & 100 Bells Lane is to be classified as a Riparian Corridor (as per Appendix 2 of *Planning for Bushfire Protection* 2006) as it is equal to or less than 20m in width. *Planning for Bushfire Protection* 2006 states “*Riparian areas are those areas of vegetation which are no greater than 20 metres in width and are found on either bank of a river, creek or stream identified on a Bushfire Prone Land map and are treated the same as Rainforests*”.

The vegetation that was classified as Forest in the neighbouring property to the West of No.79 Bells Lane and No.95 Bells Lane to the East, is to be changed to Woodland Classified Vegetation as it resembles more of a Woodland and not Forest.

The proposed Asset Protection Zones will be located only on the subject Lots and not in neighbouring properties.

The proposal is non-complying development and has been identified as being Bush Fire Prone Land and is to be considered under Section 4.47 of the Environmental Planning and Assessment Act 1979 (EP&A Act), Section 100B of the Rural Fires Act 1997 and Planning for Bushfire Protection (NSW RFS 2006). The subject Lot is located within Hawkesbury City Council LGA.

The proposal is found to be in the BAL – 29 range as per Table 2.4.2 of AS3959-2009 although. It will also need to meet the requirements of Planning for Bush Fire Protection (NSW RFS 2006).

This report makes recommendations to approve the proposal as I believe this development proposal can comply with the requirements of AS 3959-2009 Construction of Buildings in Bushfire Prone Areas, the Building Code of Australia and Planning for Bushfire Protection 2006.

The table below provides a summary of the recommendations written within this report and the and the method of assessment.

Measure	Recommendation	Assessment Method
Construction Standards	AS3959 2009/BCA	Deemed to satisfy
APZ	Comply with PBP 2006	Deemed to satisfy
Access	Comply with PBP 2006	Deemed to satisfy
Water Supply	Comply with AS2419	Deemed to satisfy
Electricity	Comply with PBP 2006	Deemed to satisfy
Gas Supply	Comply with PBP 2006	Deemed to satisfy
Landscaping	Comply with PBP 2006	Deemed to satisfy

Table 1 – Summary of recommendations and method of assessment

1 Introduction

Envirotech Pty Ltd has been engaged, by Robert Montgomery of Montgomery Planning Solutions, to amend the Bushfire Hazard Assessment Report (RFI-LEP002/15 Envirotech Ref. # REP-672018 dated the 4th December 2018) for the proposed 5 Lot subdivision at 79 Bells Lane, Kurmond NSW 2757, the 4 Lot subdivision at 95 Bells Lane, the proposed 3 Lot subdivision at 100 Bells Lane, Kurmond NSW 2757 and the proposed 4 Lot subdivision at 457 Bells Line of Road, Kurmond NSW 2757.

Upon completion of the site inspection of the subject Lots, I identified that the vegetation classification provided in the initial report was not entirely correct for 79 Bells Lane and 100 Bells Lane. The Forest Classified Vegetation along the creek line is to be classified as a Riparian Corridor (as per Appendix 2 of Planning for Bushfire Protection 2006) as it is equal to or less than 20m in width. Planning for Bushfire Protection 2006 states *“Riparian areas are those areas of vegetation which are no greater than 20 metres in width and are found on either bank of a river, creek or stream identified on a Bushfire Prone Land map and are treated the same as Rainforests”*.

The vegetation that was classified as Forest in the neighbouring property to the West of No.79 Bells Lane is to be changed to Woodland Classified Vegetation as it resembles more of a Woodland and not Forest.

The proposal is non-complying development and has been identified as being Bush Fire Prone Land and is to be considered under Section 4.47 of the Environmental Planning and Assessment Act 1979 (EP&A Act), Section 100B of the Rural Fires Act 1997 and Planning for Bushfire Protection (NSW RFS 2006).

The subject Lots are located within Hawkesbury City Council LGA.



Image 1 – Subject Lots, No.79, 95 & 100 Bells Lane and 457 Bells Line of Road Kurmond NSW 2757 where the subdivisions are proposed (NSW Government 2019)

2 Purpose of the report

The purpose of this report is to amend the Bushfire Hazard Assessment Report (RFI-LEP002/15 Envirotech Ref. # REP-672018 dated the 4th December 2018) in relation to :Show the Asset Protection Zones are clear of the Riparian areas and : Identify Inner and Outer Protection Zones in the Asset Protection Zones.

3 Methodology

This report has been prepared to in accordance with the Site Assessment Methodology in Appendix 3 of PBP 2006 and the aims and objectives of *Planning for Bush Fire Protection* 2006. The report addresses the following:

The report addresses the detailed information required in a Bush Fire Assessment Report for submission to the RFS under Clause 46 of the Rural Fires Regulation 2013:

- a description of the property
 - provide Lot No., DP of subject land
 - street address with locality map
 - zoning of subject land and any adjoining lands
- the classification of vegetation out to 140 metres from the development
- an assessment of the effective slope to 100 metres under the hazard
- identification of any significant environmental features
- details of threatened species, populations, endangered ecological communities and critical habitat known to the applicant
- details of Aboriginal heritage known to the applicant
- a bushfire assessment that addresses –
 - asset protection zones
 - siting and adequacy of water supplies
 - capacity of public roads
 - adequacy of access and egress
 - adequacy of landscaping plans
 - construction standards to be used
- how the development complies with the acceptable solutions, performance requirements and relevant specific objectives within Chapter 4 of PBP.

4 Scope of the report

This Bushfire Hazard Assessment Report and recommendations are limited to the subject lot and the proposed development only and not neighbouring properties or lands. This report considers the current bushfire legislation, planning controls and standards for building in bushfire prone land areas.

This report is based on revised concept plans, Flora and Fauna Assessment Report, site plans, a site visit and relevant information from the local council and government agencies.

5 Legislative, policy and planning requirements

5.1 Environmental Planning and Assessment Act 1979

The *Environmental Planning and Assessment Act* 1979 Section 4.14 requires that development on bushfire prone land comply with *Planning for bushfire protection* (NSW RFS 2006).

5.2 Building Code of Australia

The Building Code of Australia (2016) determines performance requirements and deemed-to-satisfy provisions for the construction of buildings in bush fire prone areas. Buildings primarily used as a residence are identified by the Building Code of Australia (2016) as Class 1 buildings.

5.3 Planning for Bushfire Protection

Development applications on bushfire prone land in NSW are to satisfy the aims and objectives of *Planning for Bushfire Protection* (NSW RFS 2006). The proposed development is consistent with “Integrated Development”. Bushfire protection measures incorporated into the proposed development meet the specific objectives and performance criteria of PBP.

5.4 Australian Standard 3959-2009

Deemed-to-satisfy construction standards for Class 1 buildings in a designated bushfire area are provided in *Australian Standard 3959-2009 Construction of Buildings in Bush-fire Prone Areas* and are to be applied in accordance with Appendix 3 of *Planning for Bushfire Protection* (NSW RFS 2006).

6. 79 Bells Lane, Kurmond

6.1 Site Description

The site is identified as 79 Bells Lane, Kurmond. NSW 2757 (Lot 38 of DP 7565). The site currently consists of an attached dual occupancy house situated in the Southern portion of the site adjacent to Bells Lane. Three (3) sheds are also located with close proximity to the houses. The site is approximately 2.7 Ha in size.

On site topography slopes down to the North-East of the current dwellings sloping down towards a seasonal watercourse lined with mature trees, a thin portion of vegetation (approx. 15-20m) associated with the embankment of the seasonal watercourse occurs down slope of the proposed subdivision. A patch of Woodland Classified Vegetation occurs to the West and East of the site. Much of the site is cleared and is currently managed/maintained.

A creek line/watercourse runs adjacent to the Northern boundary of the site. Rural residential properties are located North of the property and consist mostly of grazing lands. Surrounding properties in all directions consist of rural residential blocks with predominantly cleared pastures.

The neighbouring property to the East (95 Bells Line of Rd) consists of a cleared block with a dwelling and a shed. A creek line continues along the Northern boundary.

The block to the South (74 Bells Lane) of the site is a rural property sloping down in relation to the proposed development however no significant vegetation has been identified on the block within 140 m.

The land is identified as Bushfire Prone Land, containing predominantly Bushfire Prone Land – Category 1 & Category 3 Bushfire Hazard Vegetation over the entire site.



Image 2 – Site aerial (NSW Government 2019)

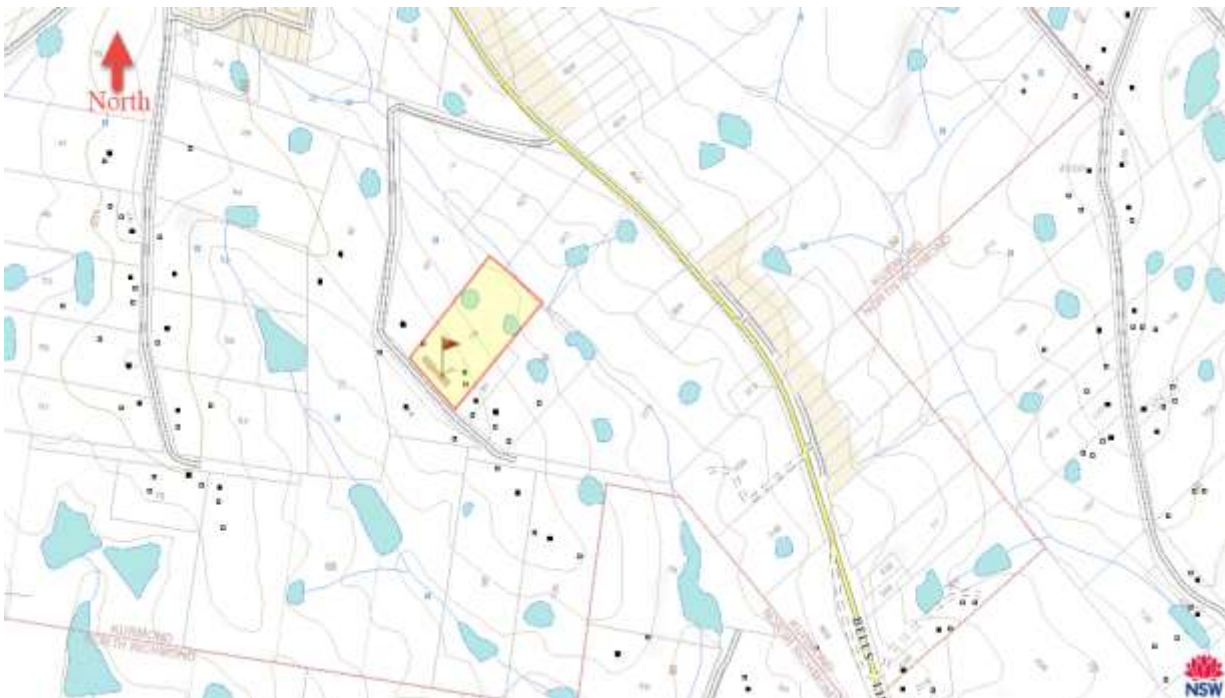


Figure 1 - Street Location of Property (NSW Government 2019)



Image 3 – Indicates the proposed subdivision layout (Montgomery Planning Solutions 2019)

6.2 Bushfire Prone Land

The land has been identified on the Hawkesbury City Council LGA Bush Fire Prone Land Map which covers the entire site.

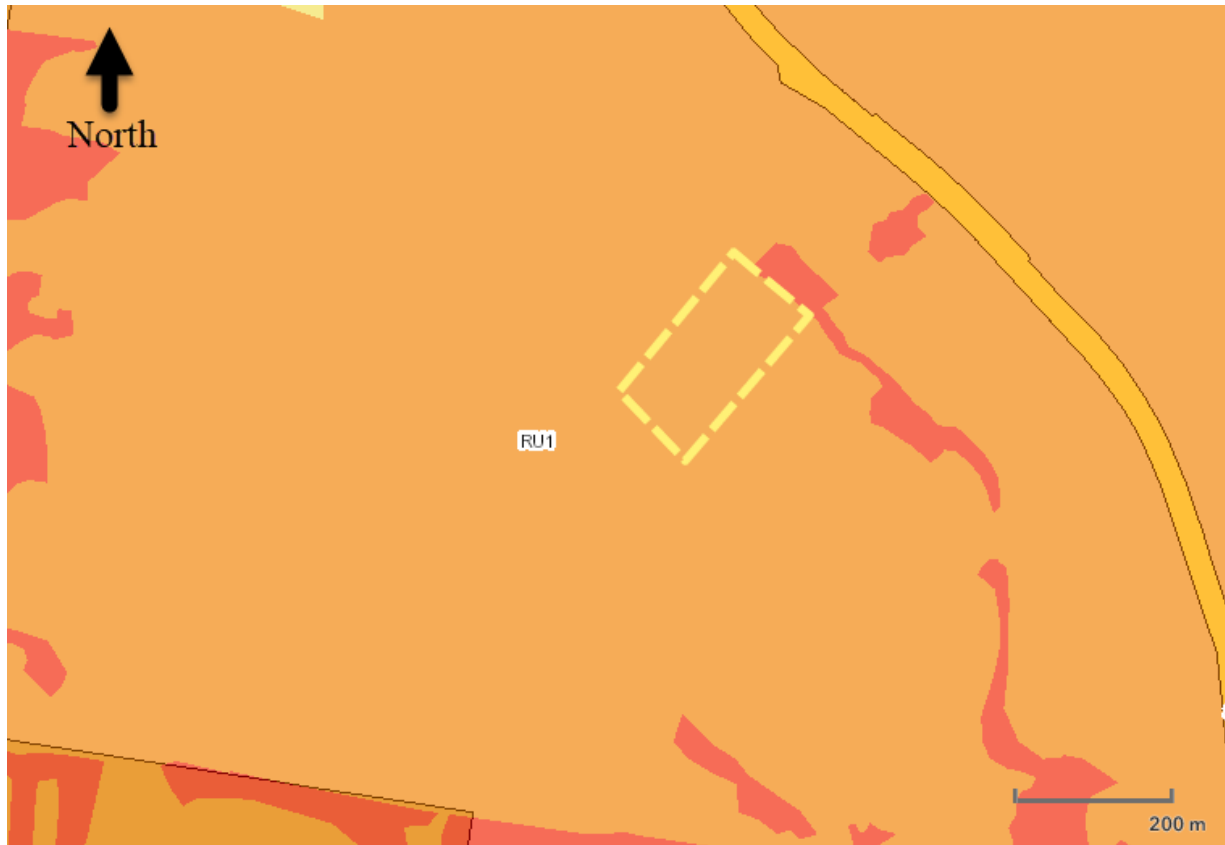


Figure 2 – Indicates that 79 Bells Lane, Kurmond is within a Category 3 Bushfire Hazard Vegetation Zone (NSW Government 2019)

Hazard

Bushfire Prone Land

- Vegetation Category 1
- Vegetation Category 2
- Vegetation Category 3
- Vegetation Buffer

6.3 Existing Vegetation Description and Slope

The patch of five (5) Eucalypt trees which are present in the northern end of the subject Lot can be incorporated within the Inner Protection Zone and will not need to be removed for the purpose of the development.

Vegetation adjacent the Northern boundary is considered Riparian Vegetation and **not** Forest Classified Vegetation as described in the previous Bushfire Hazard Assessment Report.

Appendix 2 of PBP 2006 states “*Riparian areas are those areas of vegetation which are no greater than 20m in width and are found on either bank of a river, creek or stream identified on a bush fire prone land map and are treated the same as Rainforests*”.

The Riparian Vegetation to the North is along, what appears to be, a seasonal creek but was dry on the day of the site-inspection and has a potential fire-run of approx. 10m from the creek bed downslope of the proposal. On the Northern side of the creek bed there is a potential fire-run of approx. 10m upslope of the proposal. The depth of the vegetation is approx. 15-20m maximum and runs East to West, thus the rating as Remnant Forest Vegetation. The 10m downslope is within the 5°- 10° range.

The neighbouring property to the East, No. 95 Bells Lane, is proposed for a four (4) Lot subdivision and the vegetation currently located on the Lot, at 34m, is considered to be Woodland Classified Vegetation whilst further to the East is Forest Classified Vegetation >100m from the Eastern boundary No.79. The effective slope is within the 5°- 10° downslope range.

To the West, approx. 7m from the boundary fence, is Woodland Classified Vegetation. The understory is managed and the potential fire-run towards existing dwellings and proposed dwellings is <50m and the area is <1Ha. The effective slope is within the 5°- 10° downslope range.

To the South of the proposed subdivision is managed/maintained land.



Photo 1 – Indicates the “dry creek bed” to the North of the proposal looking West (Steve Brooks 2019). Note the lack of surface vegetation.



Photo 2 – Indicates the Riparian Corridor directly to the North of the proposed Lot 4 of the subdivision (Steve Brooks 2019).



Photo 3 – Indicates the understory and downslope of the Riparian Corridor to the North of proposed Lot 4 of the subdivision (Steve Brooks 2019)



Photo 4 – Indicates the Woodland Classified Vegetation to the West of proposed Lot 5 (Simon Doberer 2018)

6.4 Hazard Assessment for BAL-29

Aspect	North
Local Government Area	Hawkesbury City Council
Forest Fire Danger Index	100
Vegetation Classification	Riparian Corridor/Rainforest
Slope under the vegetation	5°- 10°downslope
Current Asset Protection Zone (APZ)	<1m
Asset Protection Zone required by Table Appendix 2.4 of PBP 2006	15m
Minimum APZ distance required by AS3959 for BAL-29 Construction	15m
BAL-Rating	BAL-29

Table 2 - BAL Assessment to the North

Aspect	South
Local Government Area	Hawkesbury City Council
Forest Fire Danger Index	100
Vegetation Classification	Managed/Maintained Land
Slope under the vegetation	N/A 100+m
Current Asset Protection Zone (APZ)	100+m
Asset Protection Zone required by Table Appendix 2.4 of PBP 2006	N/A
Minimum APZ distance required by AS3959 for BAL-29 Construction	N/A
BAL-Rating	BAL-LOW

Table 3 – BAL-Assessment to the South

Aspect	East
Local Government Area	Hawkesbury City Council
Forest Fire Danger Index	100
Vegetation Classification	Woodland
Slope under the vegetation	5°-10°downslope
Current Asset Protection Zone (APZ)	34m
Asset Protection Zone required by Table Appendix 2.4 of PBP 2006	20m
Minimum APZ distance required by AS3959 for BAL-29 Construction	22m
BAL-Rating	BAL-29

Table 4 – BAL Assessment to the East

Aspect	West
Local Government Area	Hawkesbury City Council
Forest Fire Danger Index	100
Vegetation Classification	Woodland
Slope under the vegetation	5°- 10°downslope
Current Asset Protection Zone (APZ)	7m
Asset Protection Zone required by Table Appendix 2.4 of PBP 2006	15m
Minimum APZ distance required by AS3959 for BAL-29 Construction	22m
BAL-Rating	BAL-29

Table 5 -BAL Assessment to the West

Asset Protection Zones in Forest and Woodland vegetation formations may be maintained as Outer and Inner protection areas. Outer protection areas may account for the outer 10m of the Asset Protection Zone.

Existing distances between the subject Lot and hazardous bushfire vegetation do not meet the Asset Protection Zone distances required by Table Appendix 2.4 of PBP 2006 for proposed Lots 4 & 5. The required APZs for Lots 4 & 5 are indicated in the Tables above for both PBP 2006 and AS3959-2009. All other proposed Lots exceed the requirements of Table Appendix 2.4 of PBP 2006.

For the purpose of this assessment the entire APZ will be an Inner Protection Area within the boundaries of the proposed Lots. i.e. no Outer Protection Areas. Trees present in the Northern sector of proposed Lot 5 can be included as part of the Inner Protection Zone as the canopy is $\leq 15\%$.

Asset protection zones will be managed in accordance with the requirements of Standards for Asset Protection Zones (NSW RFS 2005).

The implementation and maintenance of Asset Protection Zones aims to prevent the spread of fire within and across property boundaries. Landscaping will be managed adjacent to all proposed dwellings and associated buildings to maintain a defensible space for property protection and to prevent flame contact with the dwelling.

The potential impacts on native vegetation of managing APZs is addressed in the Flora and Fauna Report.



Image 4 – Indicates the 22m APZ required for the Western boundary and 15m Northern boundary of Lot 5 and the Northern and Eastern boundary of Lot 4 for compliance with PBP 2006 and AS3959-2009 (note the APZs in this image is for BAL-29 Construction).

6.5 Roads and access

The proposed subdivision will have access to Bells Lane. The access to the subdivision is a two-wheel drive road and is designed to meet the requirements for emergency access for fire fighters, emergency service workers and residents. The access to proposed Lots 4 & 5 will have minimum carriageway width of 4m.

The dead end, outside proposed Lot 4, will incorporate a minimum 12m outer radius turning circle, and will be clearly sign posted as a dead end and direct traffic away from the hazard. The roads have a cross fall of the road not more than 10 degrees and the maximum gradient of the roads shall not exceed 15 degrees.

The capacity of the road surfaces will be sufficient to carry fully loaded firefighting vehicles.

6.6 Water supply, services and utilities

The proposed subdivision will be connected reticulated mains pressure water supply and the proposed fire hydrant spacing, sizing and pressures are to be compliant with AS 2419.1 – 2005. Any proposed hydrants are not to be located in any road carriage way. All above ground water pipes external to the building are metal, including and up to any taps.

Electricity transmission will be underground supply lines.

Reticulated or bottled gas is installed and maintained in accordance with AS 1596 and the requirements of relevant authorities. Metal piping is to be used. All fixed gas cylinders are kept clear of all flammable materials to 10m and shielded on the hazard side of the installation. If gas cylinders need to be kept close to the building, the release valves are directed away from the building and at least 2m away from any combustible material, so that they do not act as a catalyst to combustion. Connections to and from gas cylinders are metal.

6.7 Environmental Impact

The proposed subdivision is not expected to have a negative impact on the environment.

7 Site Constraints

Significant Environmental Features

A dam is present on site however it is proposed that the dam will be infilled. At the time of the inspection the Dam was dry. A watercourse runs along the northern boundary (partially within the subject land and partially within the adjoining land).

Threatened Species, Populations, Endangered Ecological Communities and Critical Habitat

A desktop review of the Vegetation community maps prepared by Tozer et al was undertaken and revealed the potential presence of shale/sandstone transition as Endangered Ecological Community (EEC). This has been considered in the concept design and as such minimal clearing is required, the nature, extent and validity of this mapping has not been undertaken for the purpose of this assessment. However, we have reviewed the flora and fauna report prepared by Envirotech on the 30/11/2018.

Aboriginal Heritage

A search of the NSW OEH database for Archaeological, Heritage and Aboriginal Significant sites was undertaken in relation to the site. No features were identified. The client is unaware of any Aboriginal items on the site.

8 Compliance with Planning for Bushfire Protection 2006

The proposed subdivision must also comply with the specification and requirements of Chapter 4 of Planning for Bush Fire Protection 2006. This assessment is provided below in detail.

Performance requirement chapter 4 PBP	Acceptable Solution	Compliance
<p>in relation to Asset Protection Zones:</p> <ul style="list-style-type: none"> • A defensible space is provided onsite. • An asset protection zone is provided and maintained for the life of the development. 	<p>APZ determined in accordance with Appendix 2 and section 3.3</p> <p>Exceptional Circumstances for APZs.</p>	<p>Complies</p> <p>The proposed APZs meets the requirements of section 3.3</p> <p>Exceptional Circumstances for APZs and Appendix 2. Lots 4 & 5 can achieve a BAL Rating of 29 on the subject Lots for a proposed building footprint.</p>
<p>in relation to siting and design:</p> <ul style="list-style-type: none"> • The existing building are sited and designed to minimise the risk of bush fire attack. 	<p>Buildings are designed and sited in accordance with the siting and design principles of section 4.3.5.</p>	<p>Complies</p> <p>Yes – future structures will be in a cleared area allowing for firefighting on all sides and evacuation</p>
<p>in relation to construction standards:</p> <ul style="list-style-type: none"> • It is demonstrated that the proposed building can withstand bush fire attack in the form of wind, smoke, embers, radiant heat and flame contact. 	<p>Construction determined in accordance with Appendix 3.</p>	<p>Complies</p> <p>Future dwellings will be constructed in accordance with Appendix 3.</p>
<p>in relation to access requirements:</p> <ul style="list-style-type: none"> • safe, operational access is provided (and maintained) for emergency services personnel in suppressing a bush fire while residents are seeking to relocate, in advance of a bush fire. 	<p>Compliance with section 4.1.3 for property access roads.</p> <p>Compliance with section 4.2.7 for access standards for internal roads.</p>	<p>Complies</p> <p>Access to the proposed Lots is via Bells Lane and an access road for proposed Lots 4 & 5. A minimum carriageway width of 4m.</p>

Performance requirement chapter 4 PBP	Acceptable Solution	Compliance
		<p>A minimum vertical clearance of 4m is achieved from any overhanging obstructions, including tree branches.</p> <p>Road curves have a minimum inner radius of 6m and are minimal in number to allow for rapid access and egress.</p> <p>The minimum distance between inner and outer curves is 6m.</p> <p>The crossfall of the road is not more than 10 degrees.</p> <p>The maximum grades for sealed roads do not exceed 15 degrees and not more than 10 degrees for unsealed roads.</p>
<p>in relation to water and utility services:</p> <ul style="list-style-type: none"> • adequate water and electricity services are provided for fire- fighting operations • gas and electricity services are located so as not to contribute to the risk of fire to a building. 	Compliance with section 4.1.3 for services - water, electricity and gas.	<p>Complies</p> <p>Reticulated water supplies are easily accessible. Electrical transmission lines are underground.</p> <p>Gas services will be installed and maintained in accordance with the requirements of AS 1596.</p>
<p>in relation to landscaping:</p> <ul style="list-style-type: none"> • it is designed and managed to minimise flame contact and radiant heat to buildings, and the potential for wind driven embers to cause ignitions. 	Compliance with Appendix 5.	<p>Complies</p> <p>No significant planting under windows or other exposed elements of house.</p>

9 Conclusion

The proposed subdivision for 79 Bells Lane, Kurmond NSW 2757 can meet the planning requirements of Planning for Bush Fire Protection (NSW RFS 2006). The proposed Asset Protection Zones determined from Table 2.4 of PBP 2006 will meet the intent of Section 3.3 of PBP 2006.

In accordance with the bushfire measures contained with this report and the site-specific assessment as per PBP and AS3959, it is our opinion that combined will provide a satisfactory level of bushfire safety to the property and satisfies the requirements of the RFS and Councils obligations for this area.

It is the opinion of Envirotech Pty Ltd that the proposed development, with recommendations from this Report will provide a satisfactory level of bushfire safety to the property and satisfies the requirements of the NSW Rural Fire Service and Hawkesbury City Council's obligations for this area.

The potential impacts on native vegetation of managing APZs is addressed in the Flora and Fauna Report.

Envirotech Pty Ltd considers that Hawkesbury City Council can determine the matter as complying with the specifications and requirements of *Planning for Bushfire Protection* (NSW RFS 2006) and Section 4.14 of the *Environmental Planning and Assessment Act* 1979; and that the NSW Rural Fire Service may approve the proposed subdivision to 79 Bells Lane, Kurmond NSW 2757 in respect to bushfire requirements.

10. 95 Bells Lane Kurmond NSW 2757

10.1 Existing site description

The site is identified as 95 Bells Lane, Kurmond NSW 2757 (Lot 38 DP 7588). The site currently consists of a residential house and associated garage on the Southern boundary of the site, as well as a large shed in the South-West corner. The site is approximately 2.4 hectares in size.

On site topography slopes down to the North-East of the current dwellings sloping down towards a watercourse lined with mature trees and a dam in the North-Eastern corner of the property. A patch of Forest Classified Vegetation occurs with an effective slope of 5-10°.

Much of the site is cleared and is currently managed grassland.

A creek line / watercourse runs adjacent to the Northern boundary of the site and the vegetation along it is classified as a Riparian Corridor. Vacant grassland occurs to the North as well as several rural residential properties. Surrounding properties in all directions consist of rural residential block with predominantly cleared blocks.

The rural residential block to the East consists of a small patch of vegetation which will be managed as an APZ for the accompanying subdivision proposed. The vegetation occurring directly adjacent the Eastern border of the site is considered Forest for the purpose of this bushfire assessment with an effective down slope in relation to the proposed development.

The block to the South (74 & 96 Bells Lane) of the site are rural properties sloping down in relation to the proposed development however no significant vegetation has been identified on the block within 140m.

The property is identified as Bushfire Prone Land, containing predominantly Category 3 Bushfire Hazard Vegetation and a small area of Category 1 Bushfire Hazard Vegetation to the North-East of the subject Lot.



Image 5 – Aerial view of the subject Lot (NSW Government 2019)

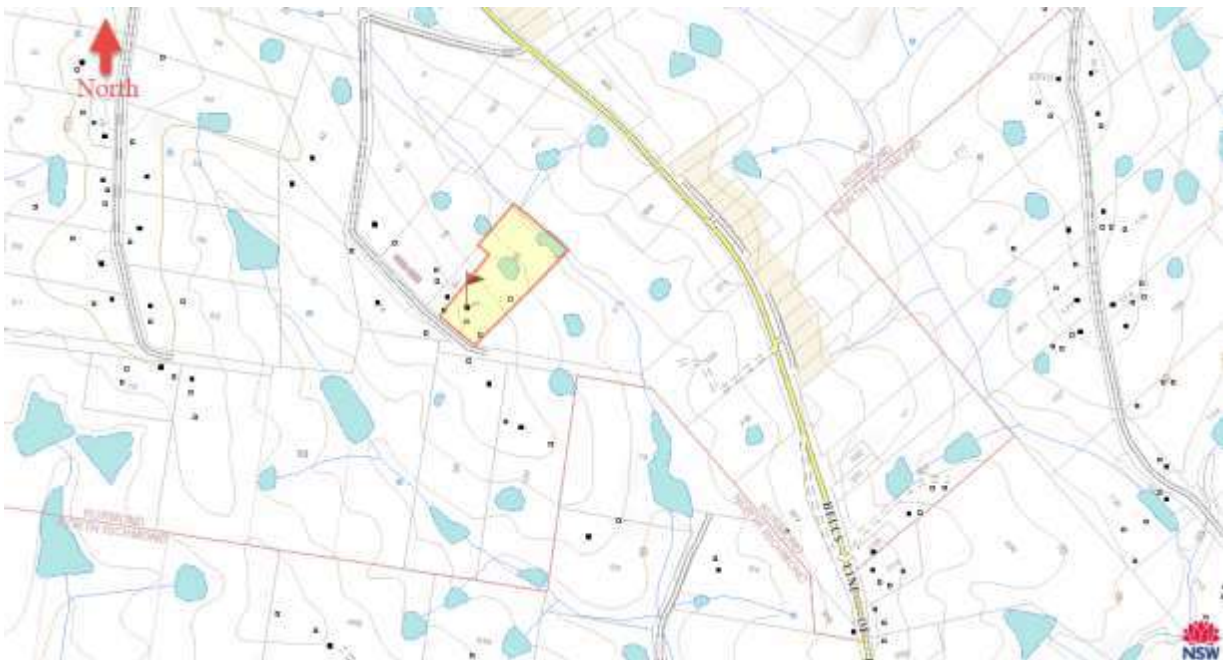


Figure 3 - Street Location of Property (NSW Government 2019)



Image 6 – Proposed subdivision layout (Montgomery Planning Solutions 2019)

10.2 Bushfire Prone Land

The land has been identified on the Hawkesbury City Council LGA Bush Fire Prone Land Map which covers the entire site.

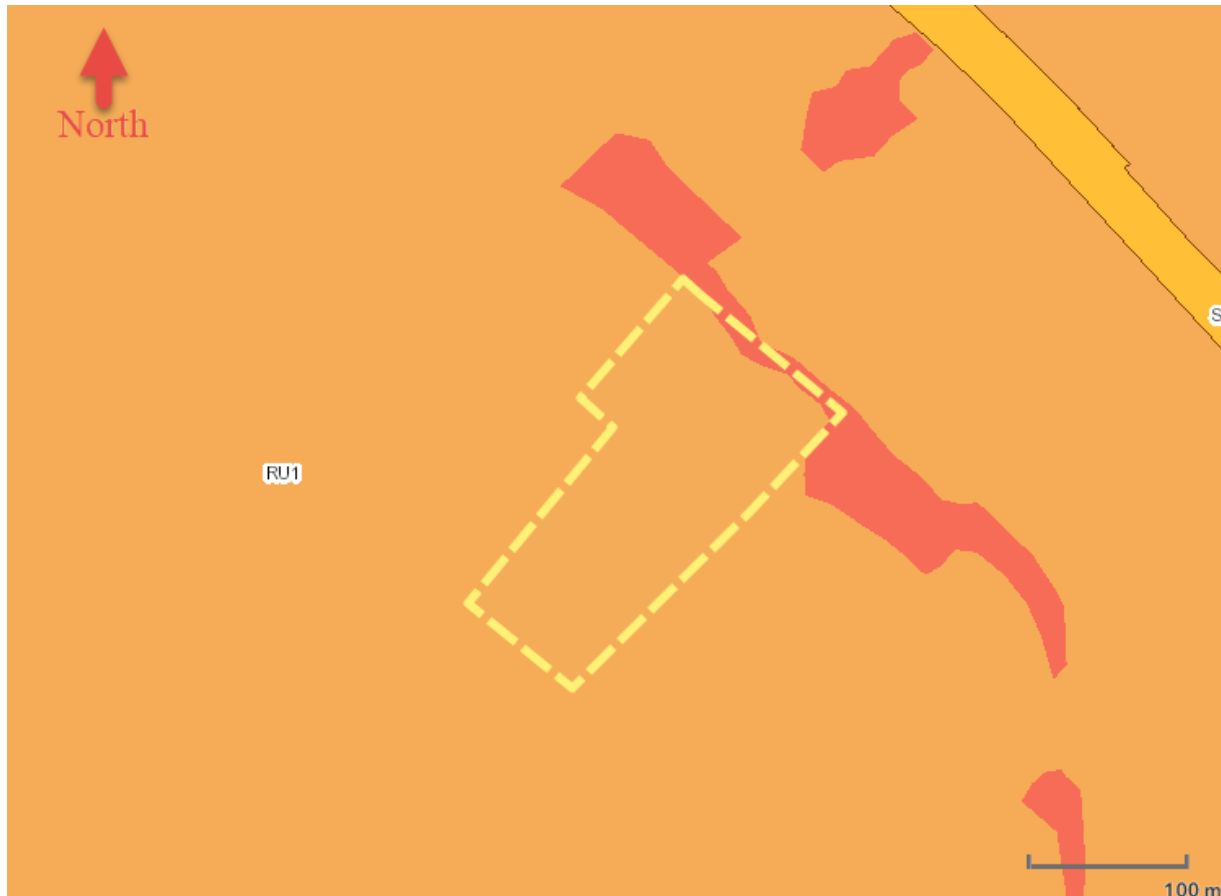


Figure 4 – Indicates that 95 Bells Lane, Kurmond is within both a Category 1 & Category 3 Bushfire Hazard Vegetation Zone (NSW Government 2019)

Hazard

Bushfire Prone Land

- Vegetation Category 1
- Vegetation Category 2
- Vegetation Category 3
- Vegetation Buffer

10.3 Existing Vegetation Description and Slope

The Riparian Corridor areas adjacent the creek line will be retained to a distance of 15m without any vegetation clearing. The effective slope surveyed on site was recorded to be 8° placing it within the 0-5° downslope range. Vegetation further South of the creek line is proposed to be managed as an APZ.

Offsite to the North, the vegetation to the consists of a small amount of creek line vegetation (Riparian Corridor) which is upslope before changing to cleared pastureland.

Adjacent the North Eastern corner the vegetation is Forested Classified Vegetation. The effective slope is within the 5-10° downslope range.

There is no significant vegetation to the South of the property within 140 m.

To the West of the site is currently managed land with a small number of trees, as mentioned above the proposal intends to construct additional houses in this area and vegetation will be managed as an APZ.



Photo 5 – Indicates the Riparian Classified Vegetation to the North of proposed subdivision (Simon Doberer 2018).



Photo 6 – Indicates the Forest Classified Vegetation to the North-East of the proposed subdivision (Simon Doberer 2018)

10.4 Hazard Assessment for BAL-29

Aspect	North
Local Government Area	Hawkesbury City Council
Forest Fire Danger Index	100
Vegetation Classification	Riparian
Slope under the vegetation	5°- 10°downslope
Current Asset Protection Zone (APZ)	<1m
Asset Protection Zone required by Table Appendix 2.4 of PBP 2006	15m
Minimum APZ distance required by AS3959 for BAL-29 Construction	15m
BAL-Rating	BAL-29

Table 6 – BAL Assessment to the North

Aspect	South
Local Government Area	Hawkesbury City Council
Forest Fire Danger Index	100
Vegetation Classification	N/A
Slope under the vegetation	N/A
Current Asset Protection Zone (APZ)	100+m
Asset Protection Zone required by Table Appendix 2.4 of PBP 2006	N/A
Minimum APZ distance required by AS3959 for BAL-29 Construction	N/A
BAL-Rating	BAL-LOW

Table 7 – BAL Assessment to the South

Aspect	East
Local Government Area	Hawkesbury City Council
Forest Fire Danger Index	100
Vegetation Classification	Forest
Slope under the vegetation	5°- 10°downslope
Current Asset Protection Zone (APZ)	<1m
Asset Protection Zone required by Table Appendix 2.4 of PBP 2006	35m
Minimum APZ distance required by AS3959 for BAL-29 Construction	33m
BAL-Rating	BAL-29

Table 8 – BAL Assessment to the East

Aspect	West
Local Government Area	Hawkesbury City Council
Forest Fire Danger Index	100
Vegetation Classification	N/A
Slope under the vegetation	N/A
Current Asset Protection Zone (APZ)	100+m
Asset Protection Zone required by Table Appendix 2.4 of PBP 2006	N/A
Minimum APZ distance required by AS3959 for BAL-29 Construction	N/A
BAL-Rating	BAL-LOW

Table 9 – BAL Assessment to the West

Asset Protection Zones in Forest and Woodland vegetation formations may be maintained as Outer and Inner protection areas. Outer protection areas may account for the outer 10m of the Asset Protection Zone.

Existing distances between the subject Lot and hazardous bushfire vegetation do not meet the Asset Protection Zone distances required by Table Appendix 2.4 of PBP 2006 for proposed Lot 4. The required APZs for Lot 4 are indicated in the Tables above for both PBP 2006 and AS3959-2009. All other proposed Lots exceed the requirements of Table Appendix 2.4 of PBP 2006.

For the purpose of this assessment the entire APZ will be an Inner Protection Area within the boundaries of the proposed Lots. i.e. no Outer Protection Areas.

Asset protection zones will be managed in accordance with the requirements of Standards for Asset Protection Zones (NSW RFS 2005).

The implementation and maintenance of Asset Protection Zones aims to prevent the spread of fire within and across property boundaries. Landscaping will be managed adjacent to all proposed dwellings and associated buildings to maintain a defensible space for property protection and to prevent flame contact with the dwelling.

The potential impacts on native vegetation of managing APZs is addressed in the Flora and Fauna Report.



Image 7 – Indicates the APZs for the Classified Vegetation to the North and East of the proposal (Montgomery Planning Solutions 2019), The APZ to the North is from the vegetation on the banks of the creek line.

10.5 Roads and access

The proposed subdivision will have access to Bells Lane. The access to the subdivision is a two-wheel drive road and is designed to meet the requirements for emergency access for fire fighters, emergency service workers and residents. The access to the proposed Lot 4 will have minimum carriageway width of 4m.

The roads have a cross fall of the road not more than 10 degrees and the maximum gradient of the roads shall not exceed 15 degrees.

The capacity of the road surfaces will be sufficient to carry fully loaded firefighting vehicles.

10.6 Water supply, services and utilities

The proposed subdivision will be connected reticulated mains pressure water supply and the proposed fire hydrant spacing, sizing and pressures are to be compliant with AS 2419.1 – 2005. Any proposed hydrants are not to be located in any road carriage way. All above ground water pipes external to the building are metal, including and up to any taps.

Electricity transmission will be underground supply lines.

Reticulated or bottled gas is installed and maintained in accordance with AS 1596 and the requirements of relevant authorities. Metal piping is to be used. All fixed gas cylinders are kept clear of all flammable materials to 10m and shielded on the hazard side of the installation. If gas cylinders need to be kept close to the building, the release valves are directed away from the building and at least 2m away from any combustible material, so that they do not act as a catalyst to combustion. Connections to and from gas cylinders are metal.

10.7 Environmental Impact

The proposed subdivision is not expected to have a negative impact on the environment.

11 Site Constraints

Significant environmental features

A man-made dam was observed on site had water in it at the time of inspection. A watercourse and natural dam are present on the Northern boundary of the site. A vegetation retention buffer of 20m from the edge of the creek and natural dam has been incorporated into the design.

Threatened Flora and Fauna

A desktop review of the Vegetation community maps prepared by Tozer et al was undertaken and revealed the potential presence of shale/sandstone transition forest and is considered as Endangered Ecological Community (EEC). Minimal clearing has been incorporated into the design. The nature, extent and validity of this mapping has not been undertaken for the purpose of this assessment. However, we have reviewed the flora and fauna report prepared by Envirotech on the 30/11/2018.

Aboriginal and Heritage Significant sites

A search of the NSW OEH database for Archaeological, Heritage and Aboriginal Significant sites was undertaken in relation to the site. No features were identified. The client is unaware of any Aboriginal items on the site.

12 Compliance with Planning for Bushfire Protection 2006

The proposed subdivision must also comply with the specification and requirements of Chapter 4 of Planning for Bush Fire Protection 2006. This assessment is provided below in detail.

Performance requirement chapter 4 PBP	Acceptable Solution	Compliance
<p>in relation to Asset Protection Zones:</p> <ul style="list-style-type: none"> • A defensible space is provided onsite. • An asset protection zone is provided and maintained for the life of the development. 	<p>APZ determined in accordance with Appendix 2 and section 3.3</p> <p>Exceptional Circumstances for APZs.</p>	<p>Complies</p> <p>The proposed APZs meets the requirements of section 3.3</p> <p>Exceptional Circumstances for APZs and Appendix 2.</p>
<p>in relation to siting and design:</p> <ul style="list-style-type: none"> • The existing building are sited and designed to minimise the risk of bush fire attack. 	<p>Buildings are designed and sited in accordance with the siting and design principles of section 4.3.5.</p>	<p>Complies</p> <p>Yes – future structures will be in a cleared area allowing for firefighting on all sides and evacuation</p>
<p>in relation to construction standards:</p> <ul style="list-style-type: none"> • It is demonstrated that the proposed building can withstand bush fire attack in the form of wind, smoke, embers, radiant heat and flame contact. 	<p>Construction determined in accordance with Appendix 3.</p>	<p>Complies</p> <p>Future dwellings will be constructed in accordance with Appendix 3.</p>
<p>in relation to access requirements:</p> <ul style="list-style-type: none"> • safe, operational access is provided (and maintained) for emergency services personnel in suppressing a bush fire while residents are seeking to relocate, in advance of a bush fire. 	<p>Compliance with section 4.1.3 for property access roads.</p> <p>Compliance with section 4.2.7 for access standards for internal roads.</p>	<p>Complies</p> <p>Access to the proposed Lots is via Bells Lane and an access road for proposed Lot 4. A minimum carriageway width of 4m.</p>

Performance requirement chapter 4 PBP	Acceptable Solution	Compliance
		<p>A minimum vertical clearance of 4m is achieved from any overhanging obstructions, including tree branches.</p> <p>Road curves have a minimum inner radius of 6m and are minimal in number to allow for rapid access and egress.</p> <p>The minimum distance between inner and outer curves is 6m.</p> <p>The crossfall of the road is not more than 10 degrees.</p> <p>The maximum grades for sealed roads do not exceed 15 degrees and not more than 10 degrees for unsealed roads.</p>
<p>in relation to water and utility services:</p> <ul style="list-style-type: none"> • adequate water and electricity services are provided for fire- fighting operations • gas and electricity services are located so as not to contribute to the risk of fire to a building. 	Compliance with section 4.1.3 for services - water, electricity and gas.	<p>Complies</p> <p>Reticulated water supplies are easily accessible. Electrical transmission lines are underground.</p> <p>Gas services will be installed and maintained in accordance with the requirements of AS 1596.</p>
<p>in relation to landscaping:</p> <ul style="list-style-type: none"> • it is designed and managed to minimise flame contact and radiant heat to buildings, and the potential for wind driven embers to cause ignitions. 	Compliance with Appendix 5.	<p>Complies</p> <p>No significant planting under windows or other exposed elements of house.</p>

13 Conclusion

The proposed subdivision for 95 Bells Lane, Kurmond NSW 2757 can meet the planning requirements of Planning for Bush Fire Protection (NSW RFS 2006). The proposed Asset Protection Zones determined from Table 2.4 of PBP 2006 will meet the intent of Section 3.3 of PBP 2006.

In accordance with the bushfire measures contained with this report and the site-specific assessment as per PBP and AS3959, it is our opinion that combined will provide a satisfactory level of bushfire safety to the property and satisfies the requirements of the RFS and Councils obligations for this area.

The potential impacts on native vegetation of managing APZs is addressed in the Flora and Fauna Report.

It is the opinion of Envirotech Pty Ltd that the proposed development, with recommendations from this Report will provide a satisfactory level of bushfire safety to the property and satisfies the requirements of the NSW Rural Fire Service and Hawkesbury City Council's obligations for this area.

Envirotech Pty Ltd considers that Hawkesbury City Council can determine the matter as complying with the specifications and requirements of Planning for Bushfire Protection (NSW RFS 2006) and Section 4.14 of the Environmental Planning and Assessment Act 1979; and that the NSW Rural Fire Service may approve the proposed subdivision to 95 Bells Lane, Kurmond NSW 2757 in respect to bushfire requirements.

14. 100 Bells Lane, Kurmond NSW 2757

14.1 Site Description

The site is known as 100 Bells Lane, Kurmond NSW 2757 (Lot 50 DP 7565). The site currently consists of a single residential property and associated garage on the northern half of the site. A shed is located to the East of the house. The site is approximately 4.8 hectares in size. The proposal is to subdivide the subject Lot into three (3) Lots.

The topography on site varies, most of the site slopes to the South / South-East of the current dwelling. To the North of the current dwelling the land is sloped to the North-East. The site is predominantly cleared and is currently managed grassland. A creek line occurs, on site, close to the Southern boundary of proposed Lot 3 which is vegetated and is classified as a Riparian Corridor (i.e. classified as Rainforest as per Appendix 2 of PBP 2006).



Image 8 – Proposed Lot plan of 100 Bells Lane, Kurmond (Montgomery Planning Solutions 2019).



Image 9– Site Aerial (NSW Government 2019)

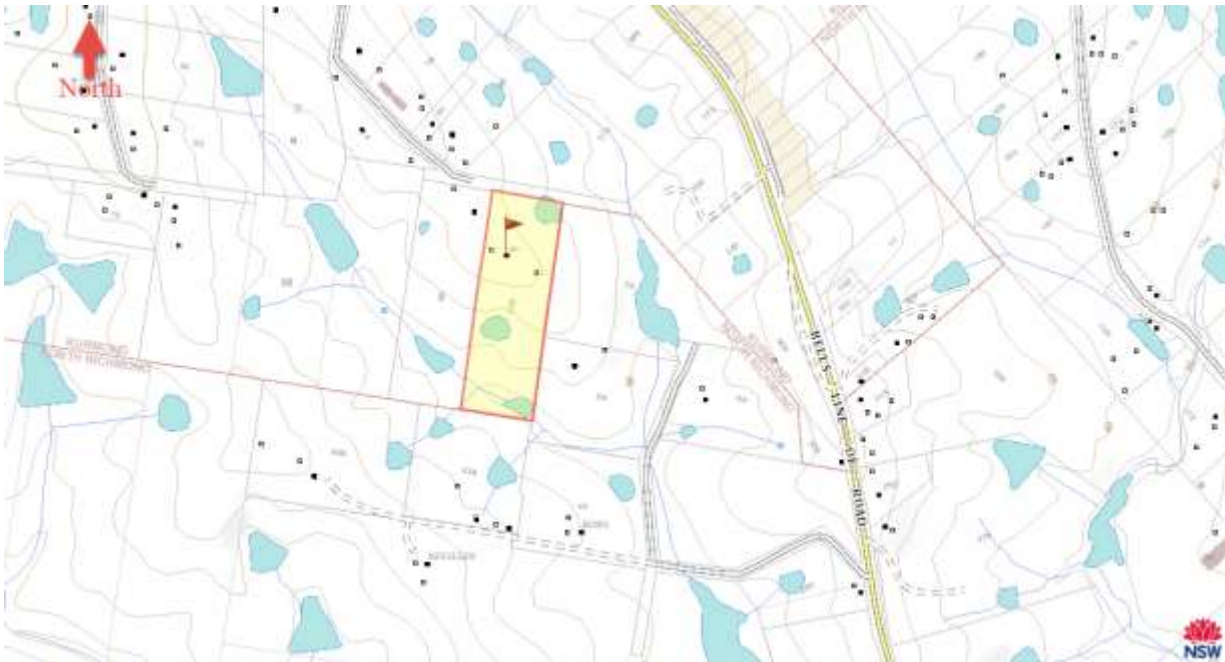


Figure 5 - Street Location of Property (NSW Government 2019)

14.2 Bushfire Prone Land

The land has been identified on the Hawkesbury City Council LGA Bush Fire Prone Land Map which covers the entire site.

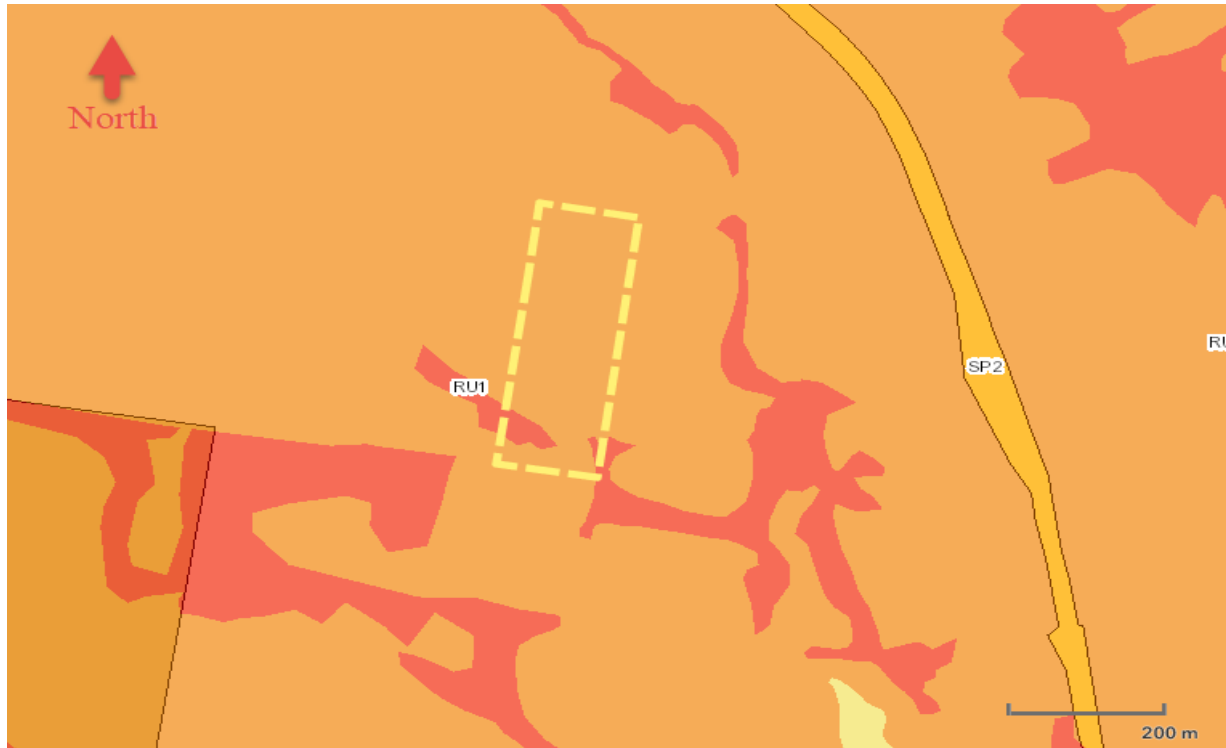


Figure 6 – Indicates that 100 Bells Lane, Kurmond is within both a Category 1 & Category 3 Bushfire Hazard Vegetation Zone (NSW Government 2019)

14.3 Existing Vegetation Description and Slope

Hazardous Bushfire Hazard Vegetation is present along the watercourse, at the Southern end of the proposed Lot 3, which is identified as a Riparian Corridor. The depth of the Riparian Corridor is approx. 10m and is in 5°- 10° downslope range. The Southern side of the Riparian Corridor is upslope. As per Appendix 2 of PBP the Riparian Corridor will be rated the same as Rainforest Classified Vegetation for the purpose of this assessment.

For the purpose of this assessment for the subject Lot, the entire APZ will be an Inner Protection Area on the proposed Lots and the Outer Protection Area will be the access driveway to Lots 2 & 3.

To the North of the site there is a residential property consisting of managed pasture and Forest Classified Vegetation. A distance of 28m separates the edge of the Forest and the Northern boundary of the site. The slope is considered to be within the 0°- 5°downslope range.

To the North-East of the property is a patch of Forest Classified Vegetation with an effective slope in the 0°- 5°downslope range. The distance from the Forest Classified Vegetation to the North-East corner of the site is 20m.

Located on the subject Lot to the Southern sector, where Lot 3 is proposed, is a strip of vegetation along a creek line. This vegetation has been determined as a Riparian Corridor (Rainforest) with a width <20m and it has an effective slope in the 5°- 10°downslope range.

To the South-West of the property is a patch of Forest Classified Vegetation at approximately 55m with an effective upslope.

To the East of the site is a Forest Classified Vegetation with an effective slope of 5°- 10° from the Eastern boundary. A minimum distance of 15 m separates the edge of the vegetation and the Eastern boundary.

To the West of proposed Lot 3 is a Riparian Corridor (Rainforest) and the slope is considered in the 5°- 10°downslope range.



Photo 5 – Indicates the Forest Classified Vegetation to the East (Simon Doberer 2018)



Photo 7 – Indicates the trees on proposed Lot 3 which will be part of the Inner Protection Area as they have less than 15% canopy area for the IPA (Steve Brooks 2019)



Photo 8 – Indicates the understory in the Riparian Corridor on proposed Lot 3 (Steve Brooks 2019)



Photo 9 – Indicates the understory of the Northern side of the Riparian Corridor (Steve Brooks 2019)

14.4 Hazard Assessment for BAL-29

Aspect	North
Local Government Area	Hawkesbury City Council
Forest Fire Danger Index	100
Vegetation Classification	Forest
Slope under the vegetation	0°- 5°downslope
Current Asset Protection Zone (APZ)	28m
Asset Protection Zone required by Table Appendix 2.4 of PBP 2006	25m
Minimum APZ distance required by AS3959 for BAL-29 Construction	27m
BAL-Rating	BAL-29

Table 10 – BAL Assessment to the North

Aspect	North-East
Local Government Area	Hawkesbury City Council
Forest Fire Danger Index	100
Vegetation Classification	Forest
Slope under the vegetation	0°- 5°downslope
Current Asset Protection Zone (APZ)	20m
Asset Protection Zone required by Table Appendix 2.4 of PBP 2006	25m
Minimum APZ distance required by AS3959 for BAL-29 Construction	27m
BAL-Rating	BAL-29

Table 11 – BAL Assessment to the North-East

Aspect	East
Local Government Area	Hawkesbury City Council
Forest Fire Danger Index	100
Vegetation Classification	Forest
Slope under the vegetation	5°- 10°downslope
Current Asset Protection Zone (APZ)	15m
Asset Protection Zone required by Table Appendix 2.4 of PBP 2006	35m
Minimum APZ distance required by AS3959 for BAL-29 Construction	33m
BAL-Rating	BAL-29

Table 12 – BAL Assessment to the East

Aspect	South
Local Government Area	Hawkesbury City Council
Forest Fire Danger Index	100
Vegetation Classification	Riparian/Rainforest
Slope under the vegetation	5°- 10°downslope
Current Asset Protection Zone (APZ)	0m
Asset Protection Zone required by Table Appendix 2.4 of PBP 2006	15m
Minimum APZ distance required by AS3959 for BAL-29 Construction	15m
BAL-Rating	BAL-29

Table 13 – BAL Assessment to the South (along creek line)

Aspect	South-West
Local Government Area	Hawkesbury City Council
Forest Fire Danger Index	100
Vegetation Classification	Forest
Slope under the vegetation	Upslope/Flat
Current Asset Protection Zone (APZ)	55m
Asset Protection Zone required by Table Appendix 2.4 of PBP 2006	20m
Minimum APZ distance required by AS3959 for BAL-29 Construction	21m
BAL-Rating	BAL-12.5

Table 14 – BAL Assessment to the South-West

Aspect	West
Local Government Area	Hawkesbury City Council
Forest Fire Danger Index	100
Vegetation Classification	Riparian/Rainforest
Slope under the vegetation	5°- 10°downslope
Current Asset Protection Zone (APZ)	0m
Asset Protection Zone required by Table Appendix 2.4 of PBP 2006	15m
Minimum APZ distance required by AS3959 for BAL-29 Construction	15m
BAL-Rating	BAL-29

Table 15 – BAL Assessment to the West

Asset Protection Zones in Forest and Woodland vegetation formations may be maintained as Outer and Inner protection areas. Outer protection areas may account for the outer 10m of the Asset Protection Zone.

For the purpose of this assessment the entire APZ will be an Inner Protection Zone within the boundaries of the proposed Lots and an Outer Protection Zone being the access driveway to proposed Lots 3 & 4.

Trees in the Southern sector of proposed Lot 3 (photo 6 above) can be included as part of the Inner Protection Zone as the canopy is $\leq 15\%$.

Asset protection zones will be managed in accordance with the requirements of Standards for Asset Protection Zones (NSW RFS 2005).

Existing distances between the subject Lot and hazardous bushfire vegetation do not meet the Asset Protection Zone distances required by Table Appendix 2.4 of PBP 2006 for proposed Lots 1, 2 & 3. The required and APZs for Lots 1, 2 & 3 are indicated in the tables above.

The implementation and maintenance of Asset Protection Zones aims to prevent the spread of fire within and across property boundaries. Landscaping will be managed adjacent to all proposed dwellings and associated buildings to maintain a defensible space for property protection and to prevent flame contact with the dwelling.

The potential impacts on native vegetation of managing APZs is addressed in the Flora and Fauna Report.



Image 10 - Indicates the min APZs required for compliance with PBP 2006 and AS3959-2009. Note APZs are located only on the subject Lot and not in neighbouring properties. Note the APZs in this image is for BAL-29 Contrsuction.

14.5 Roads and Access

The proposed subdivision will have access to Bells Lane. The access to the subdivision is a two-wheel drive road and is designed to meet the requirements for emergency access for fire fighters, emergency service workers and residents. The access to East of the proposed Lots will have minimum carriageway width of 4m.

The roads have a cross fall of the road not more than 10 degrees and the maximum gradient of the roads shall not exceed 15 degrees.

The capacity of the road surfaces will be sufficient to carry fully loaded firefighting vehicles.

14.6 Water supply, services and utilities

The proposed subdivision will be connected reticulated mains pressure water supply and the proposed fire hydrant spacing, sizing and pressures are to be compliant with AS 2419.1 – 2005. Any proposed hydrants are not to be located in any road carriage way. All above ground water pipes external to the building are metal, including and up to any taps.

Electricity transmission will be underground supply lines.

Reticulated or bottled gas is installed and maintained in accordance with AS 1596 and the requirements of relevant authorities. Metal piping is to be used. All fixed gas cylinders are kept clear of all flammable materials to 10m and shielded on the hazard side of the installation. If gas cylinders need to be kept close to the building, the release valves are directed away from the building and at least 2m away from any combustible material, so that they do not act as a catalyst to combustion. Connections to and from gas cylinders are metal.

14.7 Environmental Impact

The proposed subdivision is not expected to have a negative impact on the environment.

15 Site Constraints

Significant Environmental Features

A riparian corridor including creek line and dam were observed on site close to the southern border of the site.

Threatened Flora and Fauna

A desktop review of the Vegetation community maps prepared by Tozer et al was undertaken and revealed the potential presence of shale/sandstone transition forest and is considered as Endangered Ecological Community (EEC). Minimal clearing has been incorporated into the design. The nature, extent and validity of this mapping has not been undertaken for the purpose of this assessment. However, we have reviewed the flora and fauna report prepared by Envirotech on the 30/11/2018.

Aboriginal and Heritage Significant sites

A search of the NSW OEH database for Archaeological, Heritage and Aboriginal Significant sites was undertaken in relation to the site. No features were identified. The client is unaware of any Aboriginal items on the site.

16 Compliance with Planning for Bushfire Protection 2006

The proposed subdivision must also comply with the specification and requirements of Chapter 4 of Planning for Bush Fire Protection 2006. This assessment is provided below in detail.

Performance requirement chapter 4 PBP	Acceptable Solution	Compliance
<p>in relation to Asset Protection Zones:</p> <ul style="list-style-type: none"> • A defensible space is provided onsite. • An asset protection zone is provided and maintained for the life of the development. 	<p>APZ determined in accordance with Appendix 2 and section 3.3</p> <p>Exceptional Circumstances for APZs.</p>	<p>Complies</p> <p>The proposed APZs meets the requirements of section 3.3</p> <p>Exceptional Circumstances for APZs and Appendix 2.</p>
<p>in relation to siting and design:</p> <ul style="list-style-type: none"> • The existing building are sited and designed to minimise the risk of bush fire attack. 	<p>Buildings are designed and sited in accordance with the siting and design principles of section 4.3.5.</p>	<p>Complies</p> <p>Yes – future structures will be in a cleared area allowing for firefighting on all sides and evacuation</p>
<p>in relation to construction standards:</p> <ul style="list-style-type: none"> • It is demonstrated that the proposed building can withstand bush fire attack in the form of wind, smoke, embers, radiant heat and flame contact. 	<p>Construction determined in accordance with Appendix 3.</p>	<p>Complies</p> <p>Future dwellings will be constructed in accordance with Appendix 3.</p>
<p>in relation to access requirements:</p> <ul style="list-style-type: none"> • safe, operational access is provided (and maintained) for emergency services personnel in suppressing a bush fire while residents are seeking to relocate, in advance of a bush fire. 	<p>Compliance with section 4.1.3 for property access roads.</p> <p>Compliance with section 4.2.7 for access standards for internal roads.</p>	<p>Complies</p> <p>Access to the proposed Lots is via Bells Lane and an access driveway for proposed Lots 2 & 3. A minimum carriageway width of 4m.</p>

Performance requirement chapter 4 PBP	Acceptable Solution	Compliance
		<p>A minimum vertical clearance of 4m is achieved from any overhanging obstructions, including tree branches.</p> <p>Road curves have a minimum inner radius of 6m and are minimal in number to allow for rapid access and egress.</p> <p>The minimum distance between inner and outer curves is 6m.</p> <p>The crossfall of the road is not more than 10 degrees.</p> <p>The maximum grades for sealed roads do not exceed 15 degrees and not more than 10 degrees for unsealed roads.</p>
<p>in relation to water and utility services:</p> <ul style="list-style-type: none"> adequate water and electricity services are provided for fire- fighting operations gas and electricity services are located so as not to contribute to the risk of fire to a building. 	Compliance with section 4.1.3 for services - water, electricity and gas.	<p>Complies</p> <p>Reticulated water supplies are easily accessible. Electrical transmission lines are underground.</p> <p>Gas services will be installed and maintained in accordance with the requirements of AS 1596.</p>
<p>in relation to landscaping:</p> <ul style="list-style-type: none"> it is designed and managed to minimise flame contact and radiant heat to buildings, and the potential for wind driven embers to cause ignitions. 	Compliance with Appendix 5.	<p>Complies</p> <p>No significant planting under windows or other exposed elements of house.</p>

17 Conclusion

The proposed subdivision for 100 Bells Lane, Kurmond NSW 2757 can meet the planning requirements of Planning for Bush Fire Protection (NSW RFS 2006). The proposed Asset Protection Zones determined from Table 2.4 of PBP 2006 will meet the intent of Section 3.3 of PBP 2006.

In accordance with the bushfire measures contained with this report and the site-specific assessment as per PBP and AS3959, it is our opinion that combined will provide a satisfactory level of bushfire safety to the property and satisfies the requirements of the RFS and Councils obligations for this area.

The potential impacts on native vegetation of managing APZs is addressed in the Flora and Fauna Report.

It is the opinion of Envirotech Pty Ltd that the proposed development, with recommendations from this Report will provide a satisfactory level of bushfire safety to the property and satisfies the requirements of the NSW Rural Fire Service and Hawkesbury City Council's obligations for this area.

Envirotech Pty Ltd considers that Hawkesbury City Council can determine the matter as complying with the specifications and requirements of Planning for Bushfire Protection (NSW RFS 2006) and Section 4.14 of the Environmental Planning and Assessment Act 1979; and that the NSW Rural Fire Service may approve the proposed subdivision to 100 Bells Lane, Kurmond NSW 2757 in respect to bushfire requirements.

18 457 Bells Line of Road, Kurmond. NSW 2757

18.1 Site Description

The site is identified as Lot 31 of Deposited Plan 7565. The site currently consists of a single residential property and associated shed. The site is approximately 2.1 hectares in size.

On site topography slopes to the South. Much of the site is cleared and is currently managed grassland. The vegetation on site is sparse and considered remnant for the purposes of the bushfire hazard assessment.

To the North of the site is Bells Line of Road and then a number of residential properties extending beyond 140m.

The neighbouring property to the East (435 Bells Line of Rd) is an occupied residential block with vegetation across the site, the area of the vegetation is less than 1 ha (rated as Rainforest for this assessment as per Appendix 2.3 of PBP)

The block to the South (3 Bells Lane) of the site has is a rural residential property, a small patch of remnant vegetation is present on site (rated as Rainforest for this assessment as per Appendix 2.3 of PBP) approximately 22m South of the edge of the property.

The property to the West is managed Grasslands with no significant vegetation present on site. The land is identified as Bushfire Prone Land, containing predominantly Category 3 Bushfire Hazard Vegetation.



Image 11 – Aerial View of the proposed subdivision.

18.2 Bushfire Prone Land



Figure 7 – Indicates that 457 Bells Line of Road Kurmond is within a Category 3 Bushfire Hazard Vegetation Zone (NSW Government 2019)

Hazard

Bushfire Prone Land

- Vegetation Category 1
- Vegetation Category 2
- Vegetation Category 3
- Vegetation Buffer

18.3 Existing Vegetation Description and Slope

Onsite

Most of the vegetation will be proposed to be cleared for the purpose of the subdivision.

The separation canopies are such that the vegetation does not constitute a significant hazard and as such has not been assessed.

Adjacent Properties

North – To the North of the site there is managed residential properties. The slope is considered Upslope/Flat.

East - To the East of the site is a residential property with a small area of vegetation present on site. The size of the vegetation is less than 1 Ha and as such is considered Rainforest for the purpose of the Bushfire Attach Level Assessment. The effective slope is Upslope/Flat.

South - To the South of the site is remnant vegetation of less than a hectare (Rainforest) with a downslope of 0-5°. A separation of 19m in the form of the road occurs.

West – The predominant vegetation to the West is considered grassland with an effective downslope to the south-west of 0-5°.



Photo 10 - Vegetation to the East – managed land with Remnant Vegetation (Simon Doberer 2018).



Photo 11 - Vegetation to the South, remnant vegetation across road (Simon Doberer 2018).

18.4 Hazard Assessment for BAL-29

Aspect	North
Local Government Area	Hawkesbury City Council
Forest Fire Danger Index	100
Vegetation Classification	Managed Land
Slope under the vegetation	Upslope
Current Asset Protection Zone (APZ)	>100+m
Asset Protection Zone required by Table Appendix 2.4 of PBP 2006	N/A
Minimum APZ distance required by AS3959 for BAL-29 Construction	N/A
BAL-Rating	BAL-LOW

Table 16 – BAL Assessment to the North

Aspect	South
Local Government Area	Hawkesbury City Council
Forest Fire Danger Index	100
Vegetation Classification	Rainforest (Remnant Vegetation)
Slope under the vegetation	0-5°
Current Asset Protection Zone (APZ)	14m minimum
Asset Protection Zone required by Table Appendix 2.4 of PBP 2006	10m
Minimum APZ distance required by AS3959 for BAL-29 Construction	14m
BAL-Rating	BAL-29

Table 17 – BAL Assessment to the South.

Aspect	East
Local Government Area	Hawkesbury City Council
Forest Fire Danger Index	100
Vegetation Classification	Managed Land
Slope under the vegetation	Upslope
Current Asset Protection Zone (APZ)	>11m
Asset Protection Zone required by Table Appendix 2.4 of PBP 2006	10m
Minimum APZ distance required by AS3959 for BAL-29 Construction	11m
BAL-Rating	BAL-29

Table 18 – BAL Assessment to the East.

Aspect	East
Local Government Area	Hawkesbury City Council
Forest Fire Danger Index	100
Vegetation Classification	Grassland
Slope under the vegetation	0-5°
Current Asset Protection Zone (APZ)	>10m
Asset Protection Zone required by Table Appendix 2.4 of PBP 2006	N/A
Minimum APZ distance required by AS3959 for BAL-29 Construction	10m
BAL-Rating	BAL-29

Table 19 – BAL Assessment to the West

Asset Protection Zones in Forest and Woodland vegetation formations may be maintained as Outer and Inner protection areas. Outer protection areas may account for the outer 10m of the Asset Protection Zone.

For the purpose of this assessment the entire APZ will be an Inner Protection Zone within the boundaries of the proposed Lots.

Asset protection zones will be managed in accordance with the requirements of Standards for Asset Protection Zones (NSW RFS 2005).

Existing distances between the subject Lot and hazardous bushfire vegetation do not meet the Asset Protection Zone distances required by Table Appendix 2.4 of PBP 2006 for proposed Lots 1, 3 & 4. The required APZs for Lots 1, 3 & 4 are indicated in the tables above and Image 12 below to achieve a building footprint of BAL-29.

The implementation and maintenance of Asset Protection Zones aims to prevent the spread of fire within and across property boundaries. Landscaping will be managed adjacent to all proposed dwellings and associated buildings to maintain a defensible space for property protection and to prevent flame contact with the dwelling.

The potential impacts on native vegetation of managing APZs is addressed in the Flora and Fauna Report.



Image 12 – Indicates the potential locations for a building envelope regarding the vegetation type and slope to ensure that the BAL does not exceed BAL 29. The APZ required for the Grassland Classified Vegetation to the West is 10m minimum; the APZ required for the South is 14m minimum and; the APZ for the East 11m minimum. There is sufficient room on the proposed allotments for a dwelling and necessary APZ areas.

18.5 Roads and Access

The current road access is via Bells Lane and will provide a satisfactory access and egress to the site. The proposed access to the subdivision will be via Bells Lane which has access to the Bells Line of Road.

Two of the proposed Lots in the subdivision will have direct access to Bells Line of Road and will be satisfactory for access/egress purposes. Both Bells Lane and Bells Line of Road are surfaced two-wheel drive roads and suitable for fire appliances.

The cross fall of the road is not more than 10 degrees. The maximum gradient of the roads does not exceed 15 degrees.

Access is suitable.

18.6 Water supply, services and utilities

The proposed subdivision will be connected reticulated mains pressure water supply and the proposed fire hydrant spacing, sizing and pressures are to be compliant with AS 2419.1 – 2005. Any proposed hydrants are not to be located in any road carriage way. All above ground water pipes external to the building are metal, including and up to any taps.

Electricity transmission will be underground supply lines.

Reticulated or bottled gas is installed and maintained in accordance with AS 1596 and the requirements of relevant authorities. Metal piping is to be used. All fixed gas cylinders are kept clear of all flammable materials to 10m and shielded on the hazard side of the installation. If gas cylinders need to be kept close to the building, the release valves are directed away from the building and at least 2m away from any combustible material, so that they do not act as a catalyst to combustion. Connections to and from gas cylinders are metal. proposed hydrants are not to be located in any road carriage way. All above ground water pipes external to the building are metal, including and up to any taps.

18.7 Environmental Impact

The proposed subdivision is not expected to have a negative impact on the environment.

19 Site Constraints

The site has no significant Environmental Features upon it.

Threatened Flora and Fauna

A desktop review of the Vegetation community maps prepared by Tozer et al was undertaken and revealed the potential presence of shale/sandstone transition forest and is considered as Endangered Ecological Community (EEC). Minimal clearing has been incorporated into the design. The nature, extent and validity of this mapping has not been undertaken for the purpose of this assessment. However, we have reviewed the flora and fauna report prepared by Envirotech on the 30/11/2018.

Aboriginal and Heritage Significant sites

A search of the NSW OEH database for Archaeological, Heritage and Aboriginal Significant sites was undertaken in relation to the site. No features were identified. The client is unaware of any Aboriginal items on the site.

20 Compliance with Planning for Bushfire Protection 2006

The proposed subdivision must also comply with the specification and requirements of Chapter 4 of Planning for Bush Fire Protection 2006. This assessment is provided below in detail.

Performance requirement chapter 4 PBP	Acceptable Solution	Compliance
<p>in relation to Asset Protection Zones:</p> <ul style="list-style-type: none"> • A defendable space is provided onsite. • An asset protection zone is provided and maintained for the life of the development. 	<p>APZ determined in accordance with Appendix 2 and section 3.3</p> <p>Exceptional Circumstances for APZs.</p>	<p>Complies</p> <p>The proposed APZs meets the requirements of section 3.3</p> <p>Exceptional Circumstances for APZs and Appendix 2.</p>
<p>in relation to siting and design:</p> <ul style="list-style-type: none"> • The existing building are sited and designed to minimise the risk of bush fire attack. 	<p>Buildings are designed and sited in accordance with the siting and design principles of section 4.3.5.</p>	<p>Complies</p> <p>Yes – future structures will be in a cleared area allowing for firefighting on all sides and evacuation</p>
<p>in relation to construction standards:</p> <ul style="list-style-type: none"> • It is demonstrated that the proposed building can withstand bush fire attack in the form of wind, smoke, embers, radiant heat and flame contact. 	<p>Construction determined in accordance with Appendix 3.</p>	<p>Complies</p> <p>Future dwellings will be constructed in accordance with Appendix 3.</p>
<p>in relation to access requirements:</p> <ul style="list-style-type: none"> • safe, operational access is provided (and maintained) for emergency services personnel in suppressing a bush fire while residents are 	<p>Compliance with section 4.1.3 for property access roads.</p> <p>Compliance with section 4.2.7 for access standards for internal roads.</p>	<p>Complies</p> <p>Access to the proposed Lots is via Bells Lane and Bells Line of Road. A minimum carriageway width of 4m.</p>

Performance requirement chapter 4 PBP	Acceptable Solution	Compliance
seeking to relocate, in advance of a bush fire.		<p>A minimum vertical clearance of 4m is achieved from any overhanging obstructions, including tree branches.</p> <p>Road curves have a minimum inner radius of 6m and are minimal in number to allow for rapid access and egress.</p> <p>The minimum distance between inner and outer curves is 6m.</p> <p>The crossfall of the road is not more than 10 degrees.</p> <p>The maximum grades for sealed roads do not exceed 15 degrees and not more than 10 degrees for unsealed roads.</p>
<p>in relation to water and utility services:</p> <ul style="list-style-type: none"> adequate water and electricity services are provided for fire- fighting operations gas and electricity services are located so as not to contribute to the risk of fire to a building. 	Compliance with section 4.1.3 for services - water, electricity and gas.	<p>Complies</p> <p>Reticulated water supplies are easily accessible.</p> <p>Electrical transmission lines are underground.</p> <p>Gas services will be installed and maintained in accordance with the requirements of AS 1596.</p>
<p>in relation to landscaping:</p> <ul style="list-style-type: none"> it is designed and managed to minimise flame contact and radiant heat to buildings, and the potential for wind driven embers to cause ignitions. 	Compliance with Appendix 5.	<p>Complies</p> <p>No significant planting under windows or other exposed elements of house.</p>

21 Conclusion

The proposed subdivision for 457 Bells Line of Road, Kurmond NSW 2757 can meet the planning requirements of Planning for Bush Fire Protection (NSW RFS 2006). The proposed Asset Protection Zones determined from Table 2.4 of PBP 2006 will meet the intent of Section 3.3 of PBP 2006.

In accordance with the bushfire measures contained with this report and the site-specific assessment as per PBP and AS3959, it is our opinion that combined will provide a satisfactory level of bushfire safety to the property and satisfies the requirements of the RFS and Councils obligations for this area.

The potential impacts on native vegetation of managing APZs is addressed in the Flora and Fauna Report

It is the opinion of Envirotech Pty Ltd that the proposed development, with recommendations from this Report will provide a satisfactory level of bushfire safety to the property and satisfies the requirements of the NSW Rural Fire Service and Hawkesbury City Council's obligations for this area.

Envirotech Pty Ltd considers that Hawkesbury City Council can determine the matter as complying with the specifications and requirements of Planning for Bushfire Protection (NSW RFS 2006) and Section 4.14 of the Environmental Planning and Assessment Act 1979; and that the NSW Rural Fire Service may approve the proposed subdivision to 457 Bells Line of Road, Kurmond NSW 2757 in respect to bushfire requirements.

References

Environmental Planning and Assessment Act 1979 (NSW).

Keith, D.A. (2004) From ocean shores to desert dunes: the vegetation of New South Wales and the ACT. Hurstville: Department of Environment and Conservation.

National Construction Code 2016, Building code of Australia, Volume 2: BCA Class 1 and Class 10 buildings. Canberra: Australian Buildings Code Board.

NSW RFS 2005, *Standards for asset protection zones*, NSW Rural Fire Service, Sydney.

NSW RFS 2006, *Planning for bushfire protection*, NSW Rural Fire Service, Sydney.

Rural Fires Act 1997 (NSW).

Standards Australia 2009, *Construction of buildings in bushfire-prone areas*. AS 3959-2009. Available from: Standards Australia Online. [8 September 2014].

Standards Australia 2014a, *The storage and handling of LP gas*. AS 1596-2014. Available from: Standards Australia Online. [8 September 2014]

NSW Government Sixmaps 2019

NSW Government E-Planning Spatial Viewer 2019

