

7 October 2022

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Subject: Bushfire attack level assessment for Stage 2 of Montview Estate – 254 Barrams Road, White Rock, Queensland

1 Introduction

Land and Environment Consultants Pty Ltd (**LEC**) was engaged to undertake a bushfire attack level (**BAL**) assessment for residential lots within Stage 2 of the Montview Estate (**stage 2**) at 254 Barrams Road, White Rock (**the site**), properly described as lot 108/M3174. The approved subdivision plan which shows the stage 2 lots is provided in Appendix 1.

The site is identified as a bushfire prone area by the Queensland State Planning Policy *Bushfire prone area map* and is a 'designated bushfire prone area' under Section 7 of the Queensland *Building Regulation 2021*. As a result, provisions of the *Building Code of Australia* (ABCB 2019) (**BCA**) and the *Queensland Development Code* (QG 2021) (**QDC**) that apply to a designated bushfire prone area apply to any building assessment work for the site.

Residential dwellings will be constructed in the stage 2 lots. A residential dwelling is a BCA class 1a building. Compliance with the BCA and QDC requires BCA class 1a buildings, which are located in a designated bushfire prone area, to be designed and constructed in accordance with the BAL construction standards in the *Australian Standard (AS 3959-2018) Construction of buildings in bushfire prone areas* to reduce the risk of ignition from bushfire.

This report provides a BAL assessment for residential lots in stage 2 and identifies sections of AS 3959-2018 which are relevant to the construction of residential dwellings in the lots.

2 Classified vegetation and radiant heat exposure model

LEC prepared the bushfire management plan (LEC 2021) (**BMP**) for the residential subdivision at the site – Ipswich City Council application number 6226/2018/PDA.

The BMP identifies the areas of vegetation retention and rehabilitation in the linear park to the north and east of stage 2 as being classified vegetation and the likely source of bushfire attack on the residential subdivision.

The radiant heat exposure model of bushfire attack from the linear park was prepared for the BMP and is provided in Appendix 2. It was used in this report to assign BAL ratings to the stage 2 lots shown in the approved subdivision plan in Appendix 1.

3 Bushfire attack level assessment

AS 3959-2018 sets out the requirements for the construction of buildings in bushfire prone areas to improve their safety when they are subjected to burning debris, radiant heat or flame contact generated from a bushfire.

BALs are a means of measuring the severity of a building's potential exposure to ember attack, radiant heat and direct flame contact, using increments of radiant heat expressed in kilowatts/square metre, and are the basis for establishing requirements for construction to improve the protection of building elements to attack by bushfire.

The radiant heat exposure model in Appendix 2 identifies the separation distances required from the classified vegetation adjoining the stage 2 lots to achieve different BAL ratings. The separation distances are summarised in Table 1.

Table 1 BAL separation distances

Bushfire attack scenario	Separation distances to achieve BAL ratings (metres)			
	BAL-29	BAL-19	BAL-12.5	BAL-LOW
Eucalyptus dominated woodland on drainage lines and alluvial plains	8.9-<13.3	13.3-<19.6	19.6-<100	100+

The residential subdivision includes a bushfire management zone which prevents residential dwellings from being located in parts of lots 209-210 which exceed a BAL rating of BAL-29.

The BAL contours over the stage 2 lots and the bushfire management zone in lots 209-210 are shown in Figure 1. The BAL rating of the stage 2 lots is specified in Table 2.

Table 2 BAL ratings of lots

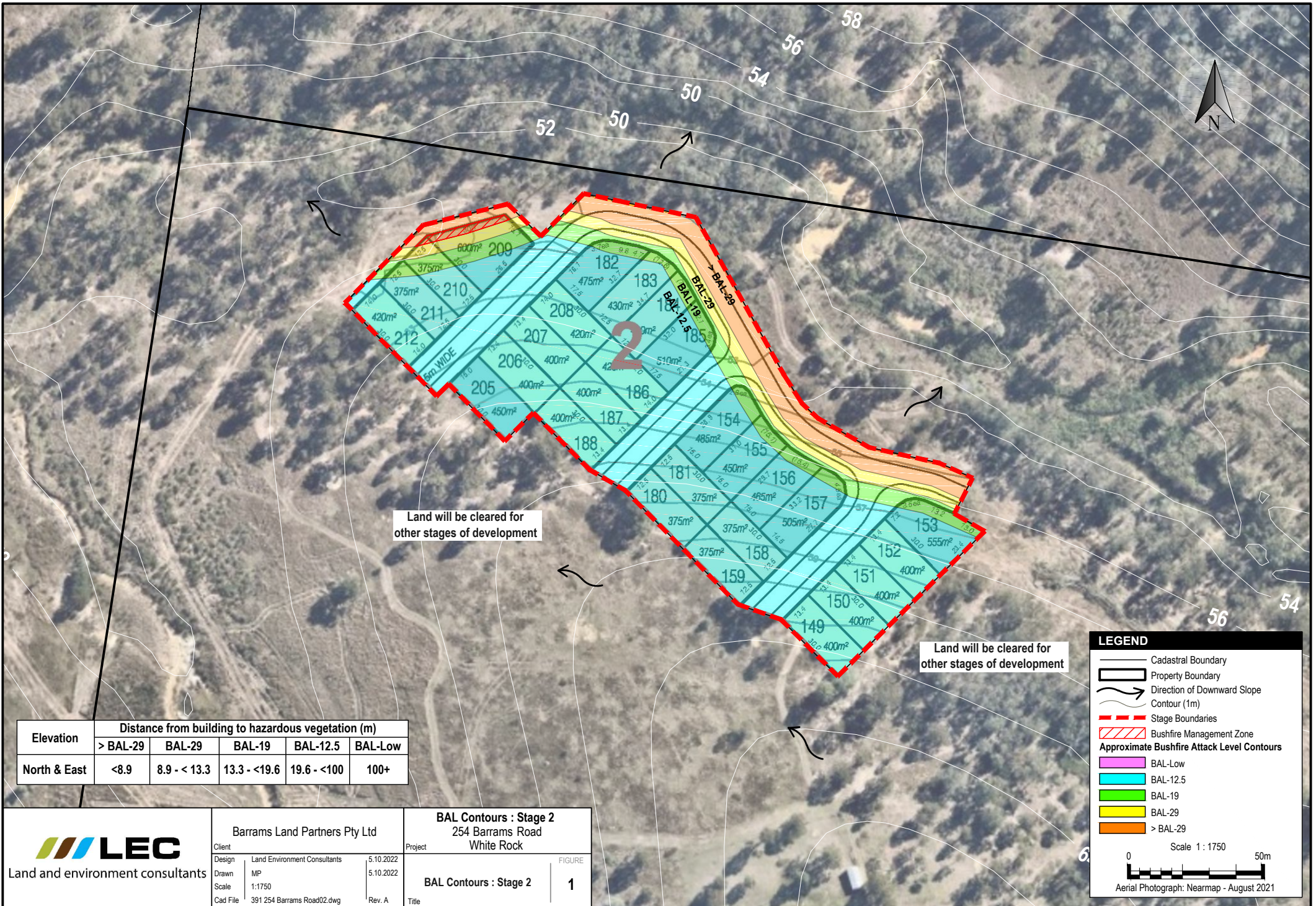
Lot number	BAL LOW	BAL-12.5	BAL-19	BAL-29
-		149, 150, 151, 152, 158, 159, 180, 181, 186, 187, 188, 205, 206, 207, 208 and 212	153, 154, 155, 156, 157, 182, 183, 184, 185 and 211	209 and 210

4 BAL construction requirements

Residential dwellings must be constructed in accordance with the relevant BAL requirements of AS 3959-2018. The sections of AS 3959-2018 which are relevant to the construction of residential dwellings in the stage 2 lots are specified in Table 3.

Table 3 BAL construction requirements


Lot number	BAL rating	AS 3959-2018 construction section
149, 150, 151, 152, 158, 159, 180, 181, 186, 187, 188, 205, 206, 207, 208 and 212	BAL-12.5	Sections 3 and 5
153, 154, 155, 156, 157, 182, 183, 184, 185 and 211	BAL-19	Sections 3 and 6
209 and 210	BAL-29	Sections 3 and 7



Land will be cleared for other stages of development

Land will be cleared for other stages of development

Elevation	Distance from building to hazardous vegetation (m)				
	> BAL-29	BAL-29	BAL-19	BAL-12.5	BAL-Low
North & East	<8.9	8.9 - < 13.3	13.3 - <19.6	19.6 - <100	100+

 LEC Land and environment consultants	Barrams Land Partners Pty Ltd Client		BAL Contours : Stage 2 254 Barrams Road White Rock Project	
	Design	Land Environment Consultants	5.10.2022	FIGURE 1
	Drawn	MP	5.10.2022	
	Scale	1:1750		
Cad File	391 254 Barrams Road02.dwg	Rev. A	Title	

LEGEND

- Cadastral Boundary
- Property Boundary
- Direction of Downward Slope
- Contour (1m)
- - - Stage Boundaries
- ▨ Bushfire Management Zone

Approximate Bushfire Attack Level Contours

- ▭ BAL-Low
- ▭ BAL-12.5
- ▭ BAL-19
- ▭ BAL-29
- ▭ > BAL-29

Scale 1 : 1750

0 50m

Aerial Photograph: Nearmap - August 2021

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5 Closing

This report provides a BAL assessment for stage 2 lots shown in the approved subdivision plan in Appendix 1 and identifies sections of AS 3959-2018 which are relevant to the construction of residential dwellings in the new lots.

Please contact the undersigned if you have any questions about this report.

Yours sincerely,



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Disclaimer

Notwithstanding the precautions adopted in this report, it should always be remembered that bushfires burn under a range of conditions. An element of risk, no matter how small always remains, and although AS 3959-2018 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.

It should be noted that upon lodgement of a development proposal, State Government, council and/or the fire service may recommend additional construction requirements.

Although every care has been taken in the preparation of this report, Land and Environment Consultants Pty Ltd accept no responsibility resulting from the use of the information in this report.

References

Australian Building Codes Board (ABCB) 2019, *National Construction Code Series, Building Code of Australia Class 1 and Class 10 Buildings, Volume 2*, Australian Government and States and Territories of Australia, Version 2.1 July 2020

Land and Environment Consultants (LEC) 2021, *Bushfire management plan – 254 Barrams Road, White Rock*, Report 21084 Final, 15 November 2021

Queensland Government (QG) 2021, *Queensland Development Code*, accessed online at <https://www.business.qld.gov.au/industries/building-property-development/building-construction/laws-codes-standards/queensland-development-code>, last updated March 2021

Standards Australia Limited (Standards Australia) 2018, *Australian Standard 3959-2018 Construction of buildings in bushfire prone areas*, Fourth edition, November 2018

Appendix 1 Approved subdivision plan

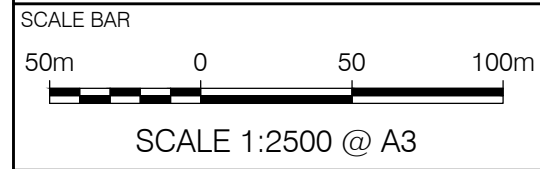


CLIENT **RP PROPERTY VENTURES PTY. LTD.**

PROJECT
PROPOSED RECONFIGURATION LOT 108 ON M3174
 (200-218 & 254 Barrams Road, South Ripley)

LOCAL AUTHORITY
 ECONOMIC DEVELOPMENT QUEENSLAND

NOTES
 (i) This plan was prepared for the purpose and exclusive use of RP PROPERTY VENTURES PTY. LTD. to accompany an application to ECONOMIC DEVELOPMENT QUEENSLAND for approval to reconfigure the land described in this plan and is not to be used for any other purpose or by any other person or corporation.
 LandPartners Pty Ltd accepts no responsibility for any loss or damage suffered howsoever arising to any person or corporation who may use or rely on this plan in contravention of the terms of this clause or clauses (ii), (iii) or (iv) hereof.
 (ii) The contours shown in this plan are suitable only for the purposes of this application. The accuracy of the contours has not been verified and no reliance should be placed upon such contours for any other purpose other than the purpose of this application for reconfiguration.
 (iii) The dimensions, areas, number of lots, size and location of improvements & flood information (if shown) are approximate only and may vary.
 (iv) This plan may not be copied unless these notes are included.



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AREA	STATISTICS							TOTAL
	STAGE 1	STAGE 1a	STAGE 2	STAGE 3	STAGE 4a	STAGE 4b	STAGE 5	
Villa Lots	1	3	-	-	11	13	-	28
Courtyard Lots (1)	20	17	8	13	23	5	-	86
Courtyard Lots (2)	10	6	11	27	4	2	-	60
Traditional Lots	10	6	9	13	3	4	-	45
Future Development	-	-	-	-	-	1	1	1
TOTAL	41	32	28	53	41	24	1	220
ROAD 17m	-	165m	-	45m	-	-	-	210m
ROAD 15m	470m	210m	400m	415m	310m	-	-	1805m
ROAD 13m	-	-	-	150m	535m	-	-	685m
Laneway	65m	-	90m	125m	-	-	-	280m
BARRAMS ROAD	285m	195m	-	-	330m	-	-	810m
Barrams Road Widening	0.218ha	0.194ha	-	-	0.138ha	-	-	0.55ha
SW Bio-Basin	0.172ha	-	0.419ha	0.064ha	-	-	-	0.655ha
Local Park	-	-	-	0.5ha	-	-	-	0.5ha
Linear Park	6.24ha	-	0.613ha	1.369ha	-	-	-	8.22ha
Environmental Protection	1.178ha	-	-	-	-	-	-	1.178ha

LEGEND			
	SUBJECT SITE		STAGE BOUNDARY
	Q100 FLOODLINE		PROPOSED ROAD WIDENING
	25m BUFFER TOP OF BANK		RIPARIAN BUFFER

NOTE: ALL DIMENSIONS AND AREAS ON THIS PLAN ARE SUBJECT TO SURVEY AND REQUIREMENTS FOR LODGEMENT OF SURVEY PLANS IN THE DEPARTMENT OF NATURAL RESOURCES, MINES AND ENERGY.

UDN **BRSS7277-000-58-20**

Appendix 2 Radiant heat exposure model

Bushfire attack from the linear parks to the north and east of stage 2

- Forest fire danger index - 58
- Vegetation – VHC 16.2 *Eucalyptus* dominated woodland on drainage lines and alluvial plains
- Total fuel load – 21.6 t/ha²
- Understorey fuel load – 11.6 t/ha¹
- Effective slope – 0° slope
- Site slope – 0° slope
- Flame width – 100 m

Note 1 Fuel load taken from *Bushfire Resilient Communities Technical Reference Guide for the State Planning Policy State Interest 'Natural Hazards, Risk and Resilience – Bushfire'* (QFES 2019) (**Bushfire resilient communities**).
 2 10 t/ha added to understorey fuel to determine total fuel load.



Calculated August 6, 2021, 1:06 pm (MDC v.4.9)

J21084

Minimum Distance Calculator - AS3959-2018 (Method 2)			
Inputs		Outputs	
Fire Danger Index	58	Rate of spread	0.8 km/h
Vegetation classification	Woodland	Flame length	7.83 m
Understorey fuel load	11.6 t/ha	Flame angle	54 °, 64 °, 73 °, 78 °, 80 ° & 85 °
Total fuel load	21.6 t/ha	Elevation of receiver	3.17 m, 3.52 m, 3.74 m, 3.83 m, 3.86 m & 3.9 m
Vegetation height	n/a	Fire intensity	9,010 kW/m
Effective slope	0 °	Transmissivity	0.885, 0.874, 0.855, 0.834, 0.822 & 0.75
Site slope	0 °	Viewfactor	0.5848, 0.4349, 0.2907, 0.196, 0.1598 & 0.0438
Flame width	100 m	Minimum distance to < 40 kW/m ²	6.6 m
Windspeed	n/a	Minimum distance to < 29 kW/m ²	8.9 m
Heat of combustion	18,600 kJ/kg	Minimum distance to < 19 kW/m ²	13.3 m
Flame temperature	1,090 K	Minimum distance to < 12.5 kW/m ²	19.6 m
		Minimum distance to < 10 kW/m ²	23.7 m

Rate of Spread - Mcarthur, 1973 & Noble et al., 1980

Flame length - NSW Rural Fire Service, 2001 & Noble et al., 1980

Elevation of receiver - Douglas & Tan, 2005

Flame angle - Douglas & Tan, 2005

Radiant heat flux - Drysdale, 1999, Sullivan et al., 2003, Douglas & Tan, 2005