



BUSHFIRE ATTACK LEVEL

FOR

FUTURE DWELLINGS

AT

STAGE 28 NORTH LAKES ESTATE

Prepared by:

Firebird ecoSultants Pty Ltd

ABN – 16 105 985 993

PO Box 354

Newcastle NSW 2300

Mob: 0414 465 990

Ph: 02 4910 3939

Fax: 02 4929 2727

Email: sarah@firebirdeco.com.au





Site Details:	Stage 28 North Lakes Estate
Prepared by:	<p>Sarah Jones B.Env.Sc.,G.Dip.DBPA (Design in Bushfire Prone Areas) Firebird ecoSultants Pty Ltd ABN – 16 105 985 993</p> <p>PO Box 354, Newcastle NSW 2300 M: 0414 465 990 Email: sarah@firebirdeco.com.au T: 02 4910 3939 Fax: 02 4929 2727</p>
Prepared for:	Northlakes Pty Ltd
Reference No.	Stage 28 - Northlakes
Document Status & Date:	Draft for Client Review March 2013

Disclaimer

Notwithstanding the precautions adopted within this report, it should always be remembered that bushfires burn under a wide range of conditions. An element of risk, no matter how small always remains, and although the standard is designed to improve the performance of such buildings, there can be no guarantee, because of the variable nature of bushfires, that any one building will withstand bushfire attack on every occasion.

Executive Summary

This report provides an assessment of the Bushfire Attack Level (BAL) in accordance with AS3959-2009 Construction of Buildings in Bushfire Prone Areas for Stage 28 North Lakes Estate. .

This report and mapping are not to be used to place wholesale restrictions on lots reflecting the resulting BAL mapping presented within. Future development of surrounding stages may result in lower BALs than detailed in this report.

This BAL report has shown that any future dwellings within the site will be able to meet the requirements of both AS3959-2009 and the addendum to Appendix 3 of Planning PBP 2006 (NSW Rural Fire Service NSW).



Sarah Jones
Ecologist / Bushfire Planner
BPAD-A Certified Practitioner (BPD-PA-26512)
B.Env.Sc., G.Dip.DBPA (Design for Bushfire Prone Areas)

Disclaimer:

The BALs as depicted within this report and mapping have been determined by vegetation within 100m of Stage 28 at the time of the assessment March 2013. It should be noted that conditions may change over time that may result in different BALs for the lots.

Terms & Abbreviations

Abbreviation	Meaning
APZ	Asset Protection Zone
AS2419 -2005	Australian Standard – Fire Hydrant Installations
AS3959-2009	Australian Standard – Construction of Buildings in Bush Fire Prone Areas
BAL	Bushfire Attack Level
BCA	Building Code of Australia
BPA	Bush Fire Prone Area (Also Bushfire Prone Land)
BPL Map	Bush Fire Prone Land Map
BPMs	Bush Fire Protection Measures
<i>EPA Act</i>	<i>NSW Environmental Planning and Assessment Act 1979</i>
FDI	Fire Danger Index
FMP	Fuel Management Plan
ha	hectare
IPA	Inner Protection Area
LMCC	Lake Macquarie City Council
LGA	Local Government Area
OPA	Outer Protection Area
PBP	Planning for Bushfire Protection 2006
RF Act	Rural Fires Act 1997
RF Regulation	Rural Fires Regulation

CONTENTS

1	INTRODUCTION	1
1.1	Site Particulars	1
2	METHODOLOGY	2
2.1	Vegetation Assessment	2
2.2	Slope Assessment	2
3	SITE ASSESSMENT	3
3.1	Vegetation and Slope Assessment	3
4	BUSHFIRE ATTACK ASSESSMENT	5
4.1	Bushfire Attack Assessment	5
4.2	Determination of Bushfire Attack Levels	5
5	CONCLUSION	11
6	BIBLIOGRAPHY	12

APPENDIX

	APPENDIX A SALE PLAN	A-1
	APPENDIX B SUMMARY OF AS3959-2009 CONSTRUCTION REQUIREMENTS	B-1
	APPENDIX C ADDENDUM TO APPENDIX 3 OF PBP 2006 – ADDITIONAL BUILDING REQUIREMENTS	C-1

TABLES

	Table 1 –Vegetation & Slope Assessment	3
	Table 4-1: Bushfire Attack Level Assessment	5

FIGURES

	Figure 4-1: BAL Map	10
--	---------------------	----



I INTRODUCTION

Firebird ecoSultants Pty Ltd has been engaged by North Lakes Pty Ltd to undertake a Bushfire Attack Level (BAL) report for Stage 28 North Lakes hereafter referred to as the “site”. Refer to Appendix A for Sales Plan.

This BAL report assess the application of Australian Standard AS3959-2009 ‘Construction of Buildings in Bushfire Prone Land’ and Appendix 3 of Planning for Bushfire Protection 2006 (PBP, 2006). This report has been prepared to provide guidance to prospective purchasers of what Bushfire Attack Levels (BALs) may be required for future dwellings within the site.

I.1 Site Particulars

Locality:	Stage 28 Seacrest Drive & Blackwood Circuit, North Lakes
LGA:	Lake Macquarie City Council (LMCC)
Forest Danger Index:	100
Current Land Use:	Approved subdivision

2 METHODOLOGY

The Australian Standard for assessing the BAL and providing the detailed requirements for construction has been reviewed and amended with the latest version being adopted for use in bushfire prone areas of NSW in May 2010. This version is titled AS 3959-2009 'Construction of Buildings in Bushfire Prone Areas' (standards Australia 2009, incorporating amendment 1 (November 2009) and amendment 2 (February 2011), with amendment 2 being used in this assessment.

In addition, the NSW method of determining the bushfire attack level, found in Appendix 3 of the document 'Planning for Bushfire Protection 2006' (NSW Rural Fire Service 2006) has also been reviewed and amended to come into line with the process within AS 3959. Therefore, in NSW the methodology with AS 3959 is to be used to determine the bushfire attack level.

2.1 Vegetation Assessment

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

- Aerial Photograph Interpretation to map vegetation cover and extent.
- Confirmation of the vegetation assemblage typology present via a site inspection.
- Allowance for 10m APZ within the Council Reserve.

2.2 Slope Assessment

Slope assessment has been undertaken as follows:

- Aerial Photograph Interpretation in conjunction with analysis of electronic contour maps with a contour interval of 10m.
- On site confirmation of slope measurements.

3 SITE ASSESSMENT

A site inspection was undertaken on the site. The following assessment has been undertaken in accordance with the requirements of PBP (RFS, 2006) and AS3959-2009

3.1 Vegetation and Slope Assessment

An assessment of the slope affecting the bushfire behaviour was undertaken for a distance of 100m from the edge of the lot boundaries in the direction of the bushfire hazard. The slopes leading away from the site have been evaluated to identify both the average slope and by identifying the maximum slope present. These values help determine the level of gradient which will most significantly influence the fire behaviour of the site. Refer to Table 1 for Vegetation and Slope Assessment.

Table 1 –Vegetation & Slope Assessment

Direction from Site	Vegetation Classification	Effective Slope
North	Open Forest occurs greater than 40m away	Upslope
East	Existing residential development	N/A
South	Existing residential development	N/A
West	Future Residential subdivision that has been cleared to the extent of an APZ and managed until such time that development occurs on this land. & Low Threat Vegetation*	Upslope

* Section 2.2.3.2 of AS3959-2009 classifies Low Threat Vegetation where the vegetation is one or a combination of the following:

- a) Vegetation of any type that is more than 100m from the site.
- b) Single areas of vegetation less than 1ha in area and not within 100m of other areas of vegetation being classified.
- c) Multiple areas of vegetation less than 0.25 in area and not within 20m of the site, or each other.
- d) Strips of vegetation less than 20m in width (measured perpendicular to the elevation exposed to the strip of vegetation) regardless of length and not within 20m of the site or each other, or other areas of vegetation being classified.
- e) Non-vegetated areas, including waterways, roads, footpaths, buildings and rocky outcrops



The patch of vegetation to the west of the site is less than 1ha and no vegetation being classified as a bushfire hazard occurs within 100m of this patch of vegetation. Therefore, this patch of vegetation can be classified as Low Threat Vegetation in accordance with Section 2.2.3.2.b) of AS3959-2009. In accordance with AS3959-2009 BAL-LOW applies to Low Threat Vegetation.

4 BUSHFIRE ATTACK ASSESSMENT

4.1 Bushfire Attack Assessment

To determine the bush fire attack and required Bushfire Attack Level (BAL) for the proposed subdivision the following steps were followed:

1. Determination of the vegetation types within 100m of the site, as assessed in section 3 of this report.
2. Determination of the distance between the vegetation and future dwellings has been assessed in section 4.2 of this report.
3. Determination of the effective slope as assessed in section 3 of this report.
4. A FDI of 100 was determined for LMCC LGA.

4.2 Determination of Bushfire Attack Levels

The results from the above steps were used to calculate the required BAL either using Table 2.4.2 of AS3959-2009. The temporary APZs and permanent APZs have been used in this assessment.

The results from this bush fire attack assessment are detailed below in Table 4-1– Bushfire Attack Level (BAL) Assessment and Figure 4-1 Bushfire Attack Level Map.

Table 4-1: Bushfire Attack Level Assessment

Lot Number	Vegetation Type & Direction from future dwellings	Average Slope of Land (degrees)	Separation Distance from Identified Vegetation	Bushfire Attack Level (BAL)	Construction Section
Lot 2801	Open Forest to the north	Upslope	48 – 100m	BAL – 12.5	Sect 3 & 5 of AS3959 and Sect A3.7 of PBP Addendum Appendix 3
Lot 2802	Open Forest to the North	Upslope	48 – 100m	BAL – 12.5	Sect 3 & 5 of AS3959 and Sect A3.7 of PBP Addendum Appendix 3
Lot 2803	Open Forest to the North	Upslope	48 – 100m	BAL – 12.5	Sect 3 & 5 of AS3959 and Sect A3.7 of PBP Addendum Appendix 3
Lot 2804	Open Forest to the North	Upslope	48 – 100m	BAL – 12.5	Sect 3 & 5 of AS3959 and Sect A3.7 of PBP Addendum Appendix 3
Lot 2805	Open Forest to	Upslope	40-48m	BAL-19	Sect 3 & 8 of AS3959

Lot Number	Vegetation Type & Direction from future dwellings	Average Slope of Land (degrees)	Separation Distance from Identified Vegetation	Bushfire Attack Level (BAL)	Construction Section
	the North				and Sect A3.7 of PBP Addendum Appendix 3
			48-100m	BAL-12.5	Sect 3 & 5 of AS3959 and Sect A3.7 of PBP Addendum Appendix 3
Lot 2806	Open Forest to the North	Upslope	40-48m	BAL-19	Sect 3 & 8 of AS3959 and Sect A3.7 of PBP Addendum Appendix 3
			48-100m	BAL-12.5	Sect 3 & 5 of AS3959 and Sect A3.7 of PBP Addendum Appendix 3
Lot 2807	Open Forest to the North	Upslope	40-48m	BAL-19	Sect 3 & 8 of AS3959 and Sect A3.7 of PBP Addendum Appendix 3
			48-100m	BAL-12.5	Sect 3 & 5 of AS3959 and Sect A3.7 of PBP Addendum Appendix 3
Lot 2808	Open Forest to the North	Upslope	40-48m	BAL-19	Sect 3 & 8 of AS3959 and Sect A3.7 of PBP Addendum Appendix 3
			48-100m	BAL-12.5	Sect 3 & 5 of AS3959 and Sect A3.7 of PBP Addendum Appendix 3
Lot 2809	Open Forest to the North and West	Upslope	40-48m	BAL-19	Sect 3 & 8 of AS3959 and Sect A3.7 of PBP Addendum Appendix 3
			48-100m	BAL-12.5	Sect 3 & 5 of AS3959 and Sect A3.7 of PBP Addendum Appendix 3
Lot 2810	Open Forest to the North and West	Upslope	40-48m	BAL-19	Sect 3 & 8 of AS3959 and Sect A3.7 of PBP Addendum Appendix 3
			48-100m	BAL-12.5	Sect 3 & 5 of AS3959 and Sect A3.7 of PBP Addendum Appendix 3

Lot Number	Vegetation Type & Direction from future dwellings	Average Slope of Land (degrees)	Separation Distance from Identified Vegetation	Bushfire Attack Level (BAL)	Construction Section
Lot 2811	Open Forest to the North and West	Upslope	40-48m	BAL-19	Sect 3 & 8 of AS3959 and Sect A3.7 of PBP Addendum Appendix 3
			48-100m	BAL-12.5	Sect 3 & 5 of AS3959 and Sect A3.7 of PBP Addendum Appendix 3
Lot 2812	Open Forest to the North and West	Upslope	40-48m	BAL-19	Sect 3 & 8 of AS3959 and Sect A3.7 of PBP Addendum Appendix 3
			48-100m	BAL-12.5	Sect 3 & 5 of AS3959 and Sect A3.7 of PBP Addendum Appendix 3
Lot 2813	Open Forest to the North and West	Upslope	40-48m	BAL-19	Sect 3 & 8 of AS3959 and Sect A3.7 of PBP Addendum Appendix 3
			48-100m	BAL-12.5	Sect 3 & 5 of AS3959 and Sect A3.7 of PBP Addendum Appendix 3
Lot 2814	Open Forest to the North and West	Upslope	40-48m	BAL-19	Sect 3 & 8 of AS3959 and Sect A3.7 of PBP Addendum Appendix 3
			48-100m	BAL-12.5	Sect 3 & 5 of AS3959 and Sect A3.7 of PBP Addendum Appendix 3
Lot 2815	Open Forest to the North and West	Upslope	48 – 100m	BAL – 12.5	Sect 3 & 5 of AS3959 and Sect A3.7 of PBP Addendum Appendix 3
Lot 2816	Open Forest to the North and West	Upslope	48 – 100m	BAL – 12.5	Sect 3 & 5 of AS3959 and Sect A3.7 of PBP Addendum Appendix 3
Lot 2817	Open Forest to the North and West	Upslope	48 – 100m	BAL – 12.5	Sect 3 & 5 of AS3959 and Sect A3.7 of PBP Addendum Appendix 3
Lot 2818	No hazard	N/A	>100m	BAL LOW	Section 4 of AS3959
Lot 2819	No hazard	N/A	>100m	BAL LOW	Section 4 of AS3959

Lot Number	Vegetation Type & Direction from future dwellings	Average Slope of Land (degrees)	Separation Distance from Identified Vegetation	Bushfire Attack Level (BAL)	Construction Section
Lot 2820	No hazard	N/A	>100m	BAL LOW	Section 4 of AS3959
Lot 2821	No hazard	N/A	>100m	BAL LOW	Section 4 of AS3959
Lot 2822	No hazard	N/A	>100m	BAL LOW	Section 4 of AS3959
Lot 2823	No hazard	N/A	>100m	BAL LOW	Section 4 of AS3959
Lot 2824	Open Forest to the North	Upslope	48-100m	BAL-12.5	Sect 3 & 5 of AS3959 and Sect A3.7 of PBP Addendum Appendix 3
			>100m	BAL LOW	Section 4 of AS3959
Lot 2825	Open Forest to the North	Upslope	48-100m	BAL-12.5	Sect 3 & 5 of AS3959 and Sect A3.7 of PBP Addendum Appendix 3
			>100m	BAL LOW	Section 4 of AS3959
Lot 2826	Open Forest to the North	Upslope	48-100m	BAL-12.5	Sect 3 & 5 of AS3959 and Sect A3.7 of PBP Addendum Appendix 3
Lot 2827	No hazard	N/A	>100m	BAL LOW	Section 4 of AS3959
Lot 2828	No hazard	N/A	>100m	BAL LOW	Section 4 of AS3959
Lot 2829	No hazard	N/A	>100m	BAL LOW	Section 4 of AS3959
Lot 2830	No hazard	N/A	>100m	BAL LOW	Section 4 of AS3959
Lot 2831	No hazard	N/A	>100m	BAL LOW	Section 4 of AS3959
Lot 2832	No hazard	N/A	>100m	BAL LOW	Section 4 of AS3959
Lot 2833	No hazard	N/A	>100m	BAL LOW	Section 4 of AS3959
Lot 2834	No hazard	N/A	>100m	BAL LOW	Section 4 of AS3959
Lot 2835	No hazard	N/A	>100m	BAL LOW	Section 4 of AS3959
Lot 2836	No hazard	N/A	>100m	BAL LOW	Section 4 of AS3959
Lot 2837	No hazard	N/A	>100m	BAL LOW	Section 4 of AS3959

*To Note: The construction requirements for the next lower BAL than that determined for the site may be applied to an elevation of the building where the elevation is not exposed to the source



of the bushfire attack. An elevation is deemed to be not exposed to the source of bushfire attack if all the straight lines between that elevation and the source of bushfire attack are obstructed by another part of the building. However, this does not apply to BAL-12.

No BALs applies to any future dwelling built greater than 100m from the Open Forest.

This report and mapping are not to be used to place wholesale restrictions on lots reflecting the resulting BAL mapping presented within. Building location and design will influence the application of the required BALs. For example, a lot indicated as being affected by BAL-40 may have those facades that are not exposed to the bushfire threat constructed to a lower BAL (i.e. BAL-29), reducing the costs of construction and providing more flexibility in choice of external building materials. Refer to Appendix B for Summary of AS3959-2009 Construction Standards and Appendix C for Additional Building Requirements.

Disclaimer
 The BALs as depicted on this map have been determined by vegetation within 100m of Stage 28 at the time of the assessment in February 2013. It should be noted that conditions may change over time, that may result in different BALs for the site. Although every care has been taken in the preparation of this map, North Lakes Estate and the author accept no responsibility for any misprints, errors, omissions, inaccuracies in these maps or damages resulting from the use of this information.



FIGURE 1-1: BUSHFIRE ATTACK LEVELS

CLIENT North Lakes Pty Ltd
SITE DETAILS Stage 28 Northlakes Estate
DATE 27 February 2013

Legend
 Subject Site
 100m Buffer
 APZ
 60m APZ
 Open Forest
 BAL 19
 BAL 12.5
 Drainage

0 50 100 150
 SCALE 2500 @ A3



Firebird ecologists Pty Ltd
 ABN - 16 105 985 993
 Level 1, 146 Hunter Street, Newcastle NSW 2300
 P O Box 354 Newcastle NSW 2300



DISCLAIMER
 This document and the information shown shall remain the property of Firebird ecologists Pty Ltd. The document may only be used for the purpose and the terms of engagement for the commission. Unauthorised use of this document in any way is prohibited.



5 CONCLUSION

This report provides an assessment of the Bushfire Attack Level (BAL) in accordance with AS3959-2009 Construction of Buildings in Bushfire Prone Areas for Stage 28 North Lakes Estate. .

This report and mapping are not to be used to place wholesale restrictions on lots reflecting the resulting BAL mapping presented within. Future development of surrounding stages may result in lower BALs than detailed in this report.

This BAL report has shown that any future dwellings within the site will be able to meet the requirements of both AS3959-2009 and the addendum to Appendix 3 of Planning PBP 2006 (NSW Rural Fire Service NSW).



Sarah Jones
Ecologist / Bushfire Planner
FPA BPAD-A Certified Practitioner (BPD-PA-26512)
B.Env.Sc. G.Dip.DBPA (Design for Bushfire Prone Areas)

Disclaimer:

The BALs as depicted within this report and mapping have been determined by vegetation within 100m of Stage 28 at the time of the assessment March 2013. It should be noted that conditions may change over time that may result in different BALs for the lots.



6 BIBLIOGRAPHY

NSW Rural Fire Service (RFS) 2006. Planning for Bushfire Protection: A guide for Councils, Planners, Fire Authorities, Developers and Home Owners. Australian Government Publishing Service, Canberra.

Standards Australia. 2009. Construction of buildings in bushfire-prone Areas, AS3959, Third Edition 2009, Incorporating Amendment 1, Standards Australia International Ltd Sydney