Midcoast
Building and
Environmental

BUSHFIRE HAZARD ASSESSMENT

Proposed Rezoning

Lot 82 DP 263591
Riverview Place
South West Rocks

CLIENT:

R. G and S. K Melville

JULY 2011

41 Belgrave Street, Kempsey NSW 2440 – PO Box 353 Kempsey NSW 2440 – phone 0265631292 – fax 0265624851 – ABN 32098436812

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1.0 INTRODUCTION

As requested a Bushfire Risk Assessment has been carried out for the rezoning of Lot 82 DP 263591 Riverview Place, South West Rocks.

The report is based on a site assessment carried out on the 6th July 2011, and a Preliminary Bushfire Hazard Assessment for the subject site completed by Midcoast Environmental Services in May 2007.

The report is to demonstrate that bushfire risk is manageable for the rezoning. The development would be an integrated development and has a requirement for a Bush Fire Safety Authority under section 100B of the *Rural Fires Act 1997*.

NOTE

The report has been prepared with all reasonable skill, care and diligence.

The information contained in this report has been gathered from field survey, experience and has been completed in consideration of the following legislation.

1. Rural Fires Act 1997.
2. Environmental Planning and Assessment Act 1979.
3. Building Code of Australia.
4. Council Local Environment Plans and Development Control Plans where applicable.
5. NSW Rural Fire Services, Planning for Bushfire Protection, 2006.
6. AS 3959-2009 Construction of Buildings in Bushfire Prone Areas.

The report recognizes the fact that no property and lives can be guaranteed to survive a bushfire attack. The report examines ways the risk of bushfire attack can be reduced where the subdivision site falls within the scope of the legislation.

The report is confidential and the writer accepts no responsibility of whatsoever nature, to third parties who use this report or part thereof is made known. Any such party relies on this report at their own risk.

1.1 Objectives

The objectives of this report are to:

- Ensure that the proposed subdivision meets the aims and objectives of NSW Rural Fire Services, *Planning for Bushfire Protection*, 2006 and has measures sufficient to minimize the impact of bushfires; and
- Reduce the risk to property and the community from bushfire; and
- Comply where applicable with AS3959 – 2009.

1.2 Legislative Framework

In NSW, the bushfire protection provisions of the BCA are applied to Class 1, 2, 3, Class 4 parts of buildings, some Class 10 and Class 9 buildings that are Special Fire Protection Purposes (SFPPs).

The BCA references AS3959 – 2009 as the deemed-to-satisfy (DTS) solution for construction requirements in bushfire prone areas for NSW.

As per the Rural Fire Service's Fast Fact of 01/10 all development on bushfire prone land in NSW should comply with the requirements of Addendum Appendix 3 and other bushfire protection measures identified within *Planning for Bushfire Protection*, 2006. The subdivision is required to obtain a bushfire safety authority from the NSW Rural Fire Service.

1.3 Location

The 2.02 ha lot is located at Lot 82 DP 263591 Riverview Place, South West Rocks which is situated in the Kempsey Shire Council Local Government Area.

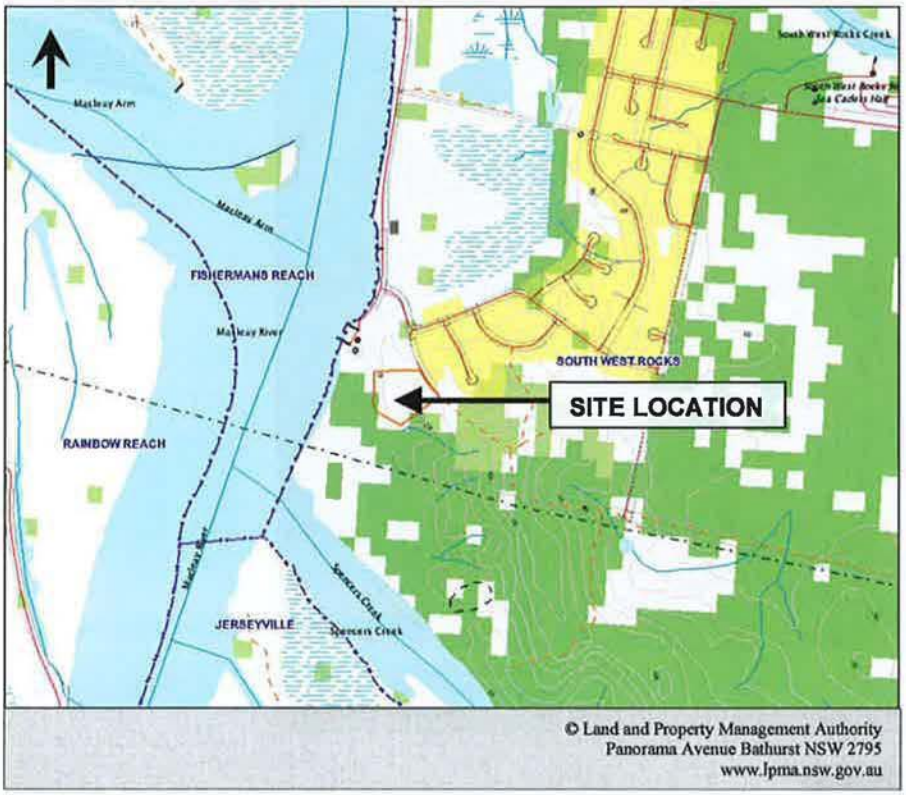
The lot is positioned 37.4km north east of Kempsey and 120m along Riverview Place from Marlin Drive. Marlin Drive leads to Gilbert Cory Street which leads onto Gordon Young Drive. Gordon Young Drive leads to Gregory Street which can be taken to the CBD of South West Rocks or Kempsey.

All of the above mentioned roads are public sealed roads.

Locality – South West Rocks
Local Government Area – Kempsey Shire Council
Closest Rural Fire Service – South West Rocks
Closest Fire Control Centre - Kempsey

The site location of the proposed subdivision can be seen in **Figure 1, 2** and **3** below:

Figure 1: Topographical Map



The sites boundaries adjoin zone 7(d) scenic protection to the south, west and northwest. Residential areas adjoin to the north east and Riverview Place adjoins to the east.

Figure 2: Aerial View

Figure 3: Aerial View Close Up

1.4 Development Proposal

It is proposed to rezone the land at this point with a subdivision proposed at a later date.

A possible subdivision layout can be seen in **Appendix 1.**

1.5 History

The subject site is currently being considered rezoning under the Department of Planning's, *Gateway Process.*

As previously mentioned a Preliminary Bushfire Hazard Assessment for the subject site was completed by Midcoast Environmental Services in May 2007.

2.0 BUSHFIRE HAZARD ASSESSMENT

2.1 Assessment Methodology

Several factors need to be considered in determining the bushfire hazard for the subject site.

These factors are slope, vegetation type, and distance from hazard, access/egress and fire weather. Each of these factors has been reviewed in determining the bushfire protection measures which are applicable to the subject site and proposed development.

An assessment of the slopes and vegetation structures on and surrounding the site was carried out by Midcoast Building and Environmental on 6th July 2011 and in May 2007 (Preliminary Bushfire Hazard Assessment).

The assessment of slope and vegetation being carried out in accordance with Appendix 2 and Appendix 3 of NSW Rural Fire Service, *Planning for Bushfire Protection*, 2006 and Section 2 of AS 3959 - 2009.

2.3 Slope Assessment

Slope is a major factor to consider when assessing the bushfire risk for the proposed development. The slopes affecting the proposed development were measured using a Suunto PM-5/360 PC Clinometer.

In general, the site slopes from the east (Riverview Place) down towards the west (Macleay River).

The slopes within the wet sclerophyll forest to the south and the grassland to the southeast, varies from 5º to 8º downslope; it should be noted that the distance of the downslopes to the south are all less than 50m in length as they reach a gully. Beyond the gully, the slopes then

become upslope of 10º to 15º; as such the slopes adopted in the southern and south eastern hazards have been conservatively assessed.

The riparian (rainforest) vegetation to the west is positioned on a short steep bank (9º to 18º downslopes) that runs along the western boundary of the site. The slope to the west of the steep bank is low lying flat estuarine mangrove wetland. The short steep slope to the west is not considered to be the gradient within the hazard vegetation that is likely to most significantly influence fire behaviour for this aspect. It is considered any fire attack to the site from the vegetation to the west would be across the slope from the south west or northwest. Therefore a slope of 0º to 5º downslope was used to assess the hazard to the west.

The slope in the riparian (rainforest) vegetation to the northwest has also been assessed as a 0º to 5º downslope.

The following table shows the results:

Table 1 – Hazard Vegetation Slopes

Proposed Lot	Hazard Aspect	Slope	Upslope/Downslope or Flat
All Proposed Lots	South – Forest	5º to 10º	Downslope
	West – Rainforest	0º to 5º	Downslope
	North West – Rainforest	0º to 5º	Downslope
	South East - Grassland	5º to 10º	Downslope

2.4 Vegetation Assessment

The vegetation on and surrounding the subject site was assessed over a distance of 140m from the proposed development. The vegetation formations were classified using the system adopted as per Keith (2004) initially for the Asset Protection Zone calculation and then converting Keith to Specht using Table A3.5.1 of Appendix 3 (2010) for assessment of the Bushfire Attack Level.

2.4.1 Vegetation on and Adjoining/Adjacent to the Subject Lot

The hazard vegetation is located to the south, west, north west and south east of the proposed subdivision site.

The vegetation to the south adjoins the subject lot along the boundary and consists of wet sclerophyll forest; however the wet sclerophyll forest adjoining the south eastern corner is considered grassland. This area of grassland is positioned 51m along the lots southern boundary from the north (Riverview Place), the grassland then heads 29m to the south, away from the subject lot (this grassland has been noted in **Appendix 2**).

The western vegetation is a strip (approximately 20m wide) of riparian vegetation positioned on a steep bank adjoining the western boundary of the lot, however there is also a small area of riparian vegetation in the north western corner of the site (the remainder of the subject lot contains managed grasslands). The riparian hazard adjoins mangrove estuarine wetland to the west (at the base of the slope of the riparian vegetation). In accordance with PfBP, 2006 riparian areas which areas no greater than 20m in width are treated the same as rainforests.

The vegetation adjoining the subject lot to the northwest is a continuation of the strip of riparian vegetation from the west. There are managed grasslands adjoining the subject lot to the north. There are also managed grasslands to the east beyond Riverview Place.

Figure 4: Photograph showing Wet Sclerophyll Forest to the South

Figure 5: Photograph showing Grassland to the South East

Figure 6: Photograph showing Managed Grasslands on the Subject Lot then Riparian Vegetation to the West

Figure 7: Photograph showing Riparian Vegetation to the North West

Figure 8: Photograph showing Managed Grasslands to the North

Figure 9: Photograph showing Managed Grasslands to the East

2.2 Hazard

As previously mentioned, the hazards are located to the south, west, northwest and south east of the proposed subdivision site.

The hazard to the south adjoins the subject lot along the boundary and consists of wet sclerophyll forest; however the wet sclerophyll forest adjoining the south eastern corner has a grassland section towards the road. This area of grassland is positioned 51m along the lots

southern boundary from the north (Riverview Place), the grassland then heads 29m to the south away from the subject lot (as noted in **Appendix 2**).

The western hazard is a strip (approximately 20m wide) of riparian hazard positioned on a steep bank adjoining the western boundary of the lot, however there is also a small area of riparian hazard in the north western corner of the lot. The riparian hazard adjoins mangrove estuarine wetland to the west (at the base of the slope of the riparian hazard). In accordance with PfBP, 2006 riparian areas which areas no greater than 20m in width are treated the same as rainforests.

The hazard adjoining the site to the northwest is a continuation of the strip of riparian hazard from the west.

An aerial image showing the vegetation hazards in relation to the subdivision site as can be seen in ***Figure 10*** below.

Figure 10: Hazards

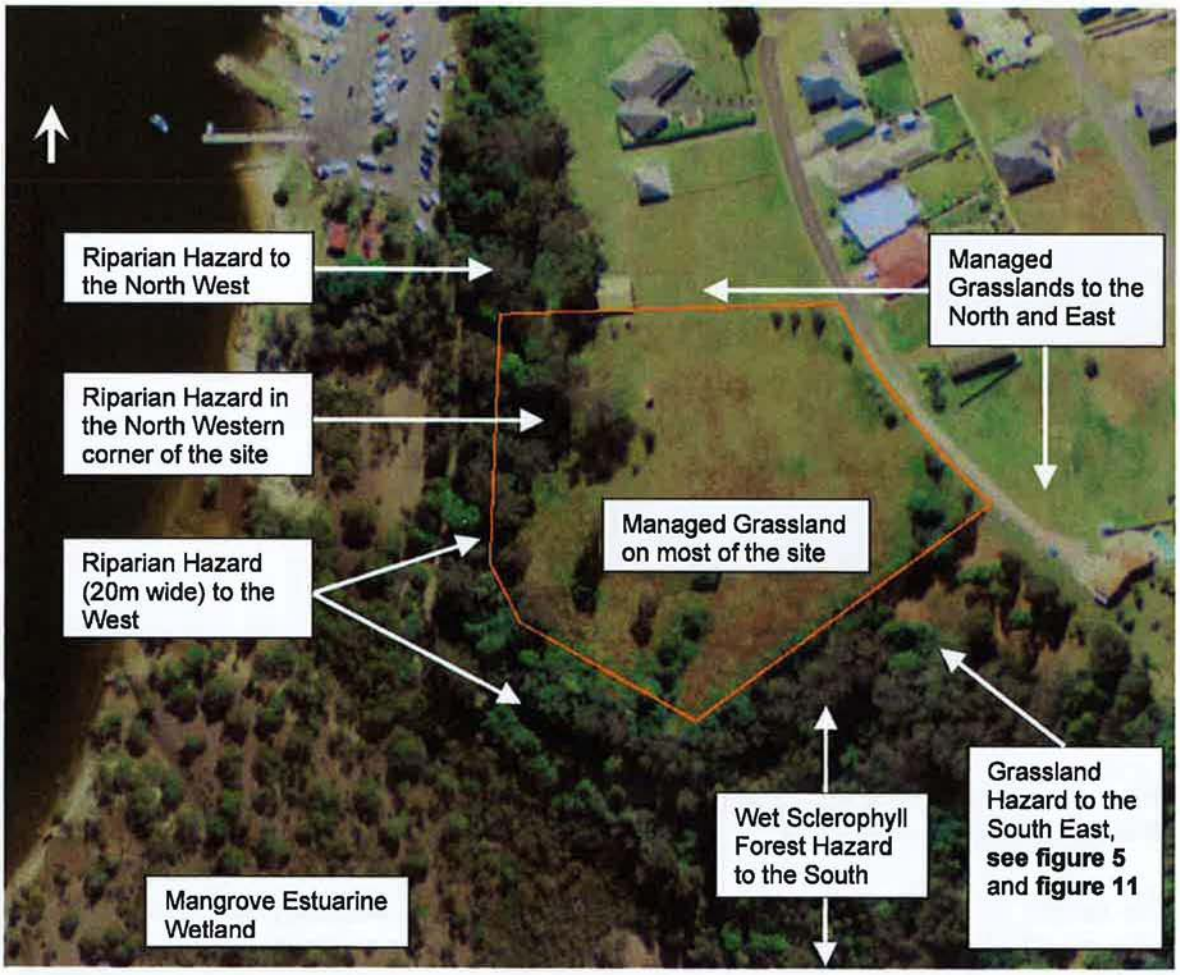


Figure 11: Southeastern Grassland Hazard Detail

2.4.2 Hazard Summary

The hazard vegetation identified for determination of APZ for proposed lots are summarized as follows;

Table 2 – Summary of Vegetation Characteristics

ASPECT	VEGETATION CLASSIFICATION – (Keith, 2004)	VEGETATION CLASSIFICATION – (Specht)	Slope
South	Wet Sclerophyll Forest	Forest	Downslope
West	Rainforest	Rainforest	Downslope
North West	Rainforest	Rainforest	Downslope
South East	Grassland	Grassland	Downslope

The slopes referenced above are indicative only.

2.5 Fire Danger Index

The fire weather for the site is assumed on the worst-case scenario. In accordance with NSW Rural Fire Services, *Planning for Bushfire Protection*, 2006 and Table 2.1 of AS3959 - 2009, the fire weather for the site is based upon the 1:50 year fire weather scenario and has a Fire Danger Index (FDI) of 80.

3.0 BUSHFIRE THREAT REDUCTION MEASURES

3.1 NSW Rural Fire Services, *Planning for Bushfire Protection*, 2006

The following provisions of PfBP 2006 have been identified in relation to the proposed subdivision.

3.1.1 Defendable Space/Asset Protection Zone

To ensure that the aims and objectives of NSW Rural Fire Services, *Planning for Bushfire Protection*, 2006, are achieved for the development, a defendable space between the asset and the hazard should be provided. The defendable space provides for, minimal separation for safe fire fighting, reduced radiant heat, reduced influence of convection driven winds, reduced ember viability and dispersal of smoke.

The proposed development is not considered to be subject to the Special Fire Protection Purpose requirements which are applicable to schools, (the proposed development is not a school).

It is recommended that the defendable space for the proposed development be based upon the minimum requirements for Asset Protection Zones as set out in NSW Rural Fire Services, *Planning for Bushfire Protection*, 2006.

Table 3 - Asset Protection Zone Requirements (PfBP 2006) for the Proposed Lots on the Subdivision

Proposed Lot	Direction of Hazard	Vegetation Type	IPA	OPA	Total APZ Required
Hazard Vegetation on Adjoining/Adjacent Land					
All Lots (1-9)	South	Wet Sclerophyll Forest	15m	15m	33m
	West	Rainforest	10m	-	11m
	North West	Rainforest	10m	-	11m
	South East	Grassland	10m	-	10m

As can be seen in the attached subdivision layout (**Appendix 1**) the APZs can be achieved for all 9 proposed lots (within the proposed lot boundaries). The above APZ's provide the minimum BAL – 29 construction requirements for lots 3-9, with lots 1 and 2 falling into a BAL – 12.5.

3.1.2 Operational Access and Egress

Access to and egress from each of the proposed lots will be via a public road (located off Riverview Place) to be completed as part of the subdivision.

Riverview Place leads to Marlin Drive. Marlin Drive leads to Gilbert Cory Street which leads onto Gordon Young Drive. Gordon Young Drive leads to Gregory Street which can be taken to the CBD of South West Rocks or Kempsey. All of these roads are sealed public roads.

Based on the conservative assessment of the hazard, and therefore the distance of the hazard to the dwellings it is considered that the relevant acceptable solutions as provided for by 4.1.3 of NSW Rural Fire Service, Planning for Bushfire Protection, 2006 are capable of being complied with and as such the intent for the provisions of services can be achieved.

3.1.3 Services - Water, Gas and Electricity

As set out in Section 4.1.3 of NSW Rural Fire Services, *Planning for Bushfire Protection*, 2006, developments in bushfire prone areas must maintain a water supply for fire fighting purposes.

Reticulated water supply is available and connected to the site. If it is not possible for the Council to guarantee water supply then water in accordance with PfBP, 2006 is required to be supplied.

Electricity supply is available and will be connected to the subdivision site.

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

It is considered that the relevant acceptable solutions as provided for by 4.1.3 and of NSW Rural Fire Services, PfBP, 2006 are capable of being complied with and as such the intent for the provision of services to the proposed dual occupancy can be achieved.

3.1.4 Landscaping

Landscaping is a major cause of fire spreading to buildings, and therefore any landscaping proposed in conjunction with the proposed development will need consideration when planning, to produce gardens that do not contribute to the spread of a bushfire.

When planning any future landscaping surrounding any proposed building, consideration should be given to the following:

- The choice of vegetation – consideration should be given to the flammability of the plant and the relation of their location to their flammability and on going maintenance to remove flammable fuels.
- Trees as windbreaks/firebreaks – Trees in the landscaping can be used as windbreaks and also firebreaks by trapping embers and flying debris.
- Vegetation management – Maintain a garden that does not contribute to the spread of bushfire.
- Maintenance of property – Maintenance of the property is an important factor in the prevention of losses from bushfire.

Appendix 5 of NSW Rural Fire Services, *Planning for Bushfire Protection*, 2006, contains standards that are applicable to the provision and maintenance of landscaping. Any landscaping proposed to be undertaken in conjunction with the proposed development is to comply with the principles contained in Appendix 5 of NSW Rural Fire Services, *Planning for Bushfire Protection*, 2006.

Compliance with Appendix 5 of NSW Rural Fire Services, *Planning for Bushfire Protection*, 2006, will satisfy the intent of the bush fire protection measures that are applicable to the provision of landscaping.

3.2 Construction of Buildings

3.2.1 General

The deemed-to-satisfy provisions for construction requirements are detailed in AS 3953-2009. The relevant Bushfire Attack Level and Construction Requirements have been determined in accordance with Appendix 3 (2010) of *Planning for Bushfire Protection*, 2006 and Section 2 of AS 3959-2009. The additional construction requirements with respect to A3.7 of Appendix 3 (2010) of PfBP (2006) are required to be added to the standards for each Bushfire Attack Level.

3.2.2 Vegetation

To complete the assessment under AS 3959-2009 the vegetation, as originally assessed in accordance with Keith, has to be converted to Specht. The following table shows the conversion:

Table 8 – Summary of Vegetation Characteristics

ASPECT (All Proposed Lots)	VEGETATION CLASSIFICATION – (Keith, 2004)	VEGETATION CLASSIFICATION – (Specht)
South	Wet Sclerophyll Forest	Forest
West	Rainforest	Rainforest

North West	Rainforest	Rainforest
South East	Grassland	Grassland

3.2.3 AS3959 – 2009 Construction of Buildings in Bushfire Prone Areas

The following construction requirements in accordance with AS 3959 – 2009 Construction of Buildings in Bushfire Prone Areas is required for the bushfire attack categories.

Bushfire Attack Level (BAL)
BAL - LOW (No construction requirements under AS 3959-2009)
BAL - 12.5
BAL - 19
BAL - 29
BAL - 40
BAL - FZ

There is a proposed lot layout plan in **Appendix 2** that shows the BAL-29 contour line and therefore the required APZs.

Compliance with these requirements will ensure that any new dwelling of the proposed subdivision complies with the requirements of AS3959-2009 Construction of Buildings in Bushfire Prone Areas, for the siting, design and construction of any proposed new dwelling.

5.0 REQUIREMENTS

The following requirements are considered to be integral to this bushfire risk assessment:

1. An Asset Protection Zone as detailed in section 3.1.1 of this report is to be provided.
2. The rezoning is to comply with the relevant performance criteria/acceptable solutions as provided for by 4.1.3 and of NSW Rural Fire Services, *Planning for Bushfire Protection*, 2006.
3. Adopt landscaping principals in accordance with section 3.1.5 of this report.

6.0 CONCLUSION

It is suggested that with the implementation of this report, and its recommendations, that the bushfire risk for the proposed rezoning is manageable and will be consistent with the acceptable bushfire protection measure solutions, provided for in Section 4.3.5 of NSW Rural Fire Services, *Planning for Bushfire Protection*, 2006.

The report provides that the required APZ's can be achieved and that any proposed new dwelling can be constructed so as to comply with the requirements of AS 3959-2009 and

Appendix 3 of *Planning for Bushfire Protection*, 2006, Construction of Buildings in Bushfire Prone Areas.

This report is however contingent upon the following assumptions:

Assumptions

1. There are no re-vegetation plans in respect to hazard vegetation and therefore the assumed fuel loading will not alter.

2. The vegetation characteristics of the subject site and surrounding land remains unchanged from that observed at the time of inspection.

Regards

Tim Mecham
Midcoast Building and Environmental

7.0 REFERENCES

NSW Rural Fire Services, ***Planning for Bushfire Protection***, 2001

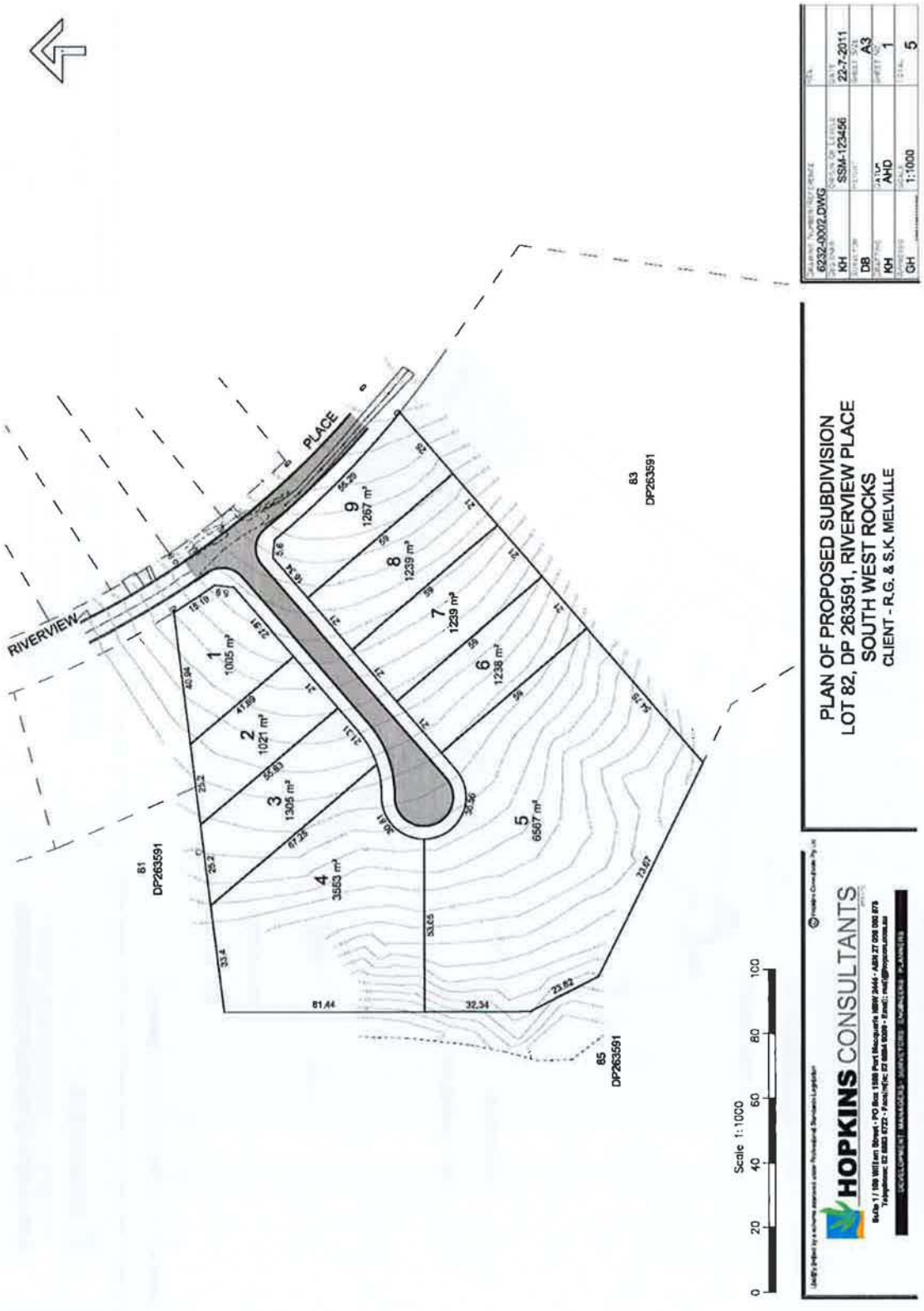
NSW Rural Fire Services, ***Planning for Bushfire Protection***, 2006

AS 3959-2009 ***Construction of Buildings in Bushfire Prone Areas***

Keith David 2004, Ocean ***Shores to Desert Dunes, The Native Vegetation of New South Wales and the ACT***, Department of Environment and Conservation
NSW State Government (1997) Rural Fires Act 1997

NSW Rural Fire Service – ***Guideline for Bushfire Prone Land Mapping 2002***

APPENDIX 1 - Subdivision Layout



APPENDIX 2 – Subdivision Layout Showing BAL-29 Contour Line