

ABN 31 613 847 902

## Bushfire Hazard Assessment Report

REF No. 19.03.073

Address

Lot 4A, 5A 6A & 7A in DP 17157  
Part of Lot 1 in DP 325720; and  
Part of Lot 1 in DP 325784

Dalwood Avenue, Gurney Crescent and  
Callicoma Road  
Seaforth NSW 2092

For

Northern Sydney Local Heath District

The site was inspected on 21<sup>st</sup> March 2019

Report Preparation

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## Executive Summary

We have been engaged by APP on behalf of NSW Ministry of Health - Northern Sydney Local Health District to prepare a Bush Fire Hazard Assessment Report to be a supplement for inclusion in a Planning Proposal (PP) Application to Northern Beaches Council.

The site has been identified as being bushfire prone land and therefore the legislative requirements for any future proposed development would be applicable.

The purpose of this report is to establish if there are any major constraints from a bushfire regulatory perspective for the subdivision of lands (subject to rezoning) and then the construction of residential dwellings upon the created allotments.

This report has found that whilst there would be bushfire related consent conditions applied to the lands at both subdivision and construction phases of development none of these should ultimately be overly restrictive or prohibit development approval by bushfire regulatory provisions.

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## 1.0 Introduction

We have been engaged by APP on behalf of NSW Ministry of Health - Northern Sydney Local Health District the owners of the subject land to prepare a preliminary bush fire hazard assessment report to be a supplement for inclusion in a Planning Proposal (PP) Application to Northern Beaches Council over the subject land.

The site has been identified as being bushfire prone land and therefore the legislative requirements for the proposed development would be applicable at the time of development application for both subdivision and any future construction of dwellings.

### 1.1 Purpose of Report

- To determine the vegetation type, the expected fire behaviour and the threat to the subject lands and future dwellings; and
- To assess the proposal with reference to *Planning for Bush Fire Protection 2006*;
- To assess the proposed construction with reference to the Building Code of Australia Volume 2;
- To determine the level of construction with reference to AS 3959-2009 *Construction of buildings in bushfire prone areas*;
- To identify any other such measures as to improve the chances of building survival during a bushfire event; and
- To assist the consent authority Northern Beaches Council in the determination of the PP Application subject to this proposal.

### 1.2 Scope of Report

The scope of this report is limited to the Bushfire Hazard Assessment for the proposed development site and only contains recommendations for the subject property. Where reference is made to adjacent or adjoining lands, this report does not purport to assess those lands; rather it may discuss bushfire progression on and through those lands with the possible bushfire impact to the subject property and the proposed rezoning.

### 1.3 Regulatory Controls

The preparation of this report has given consideration to the various legislative and regulatory requirements including the *Rural Fires Act 1997*, *Environmental Planning and Assessment Act 1979*, the Building Code of Australia, *Planning for Bush Fire Protection 2006* and AS 3959-2009 *Construction of buildings in bushfire prone areas*.

## 1.4 Methodology

A site inspection for the purpose of assessing bushfire related matters affecting this site was conducted on the 21<sup>st</sup> March 2019 and a review of the proposed Concept Layout Plan as supplied and prepared by APP has taken place.

An assessment of slope was conducted out to a distance of 100 metres and assessment of vegetation to a distance of 140 metres from the proposed land to be rezoned.

The findings were related and assessed with reference to *Planning for Bush Fire Protection* 2006 Addendum to Appendix 3 and section 2 of AS 3959-2009 *Construction of buildings in bushfire prone areas* for the formulation of the preliminary bushfire hazard assessment.

## 1.5 The Proposal

The planning proposal is for an amendment to Manly Local Environmental Plan 2013 on behalf of NSW Ministry of Health. It seeks to rezone Lots 4A, 5A, 6A and 7A in DP 17157, Part of Lot 1 in DP 325720 and Part of Lot 1 in DP 325784 from part SP2 Infrastructure (Health Services Facilities) and part E2 Environmental Conservation to part R2 Low Density Residential and part E4 Environmental Living. The rezoning will accommodate the future establishment of four dwellings on each of the lots.

The planning proposal is supported by a Concept Layout Plan (CLP) which demonstrates a boundary adjustment between Lot 7A DP 17157, Lot 1 DP 325720 and Lot 1 DP 325784 to expand Lot 7A. The CLP shows the future indicative locations for each of the four dwellings.



Figure 1; Concept Layout Plan (CLP)

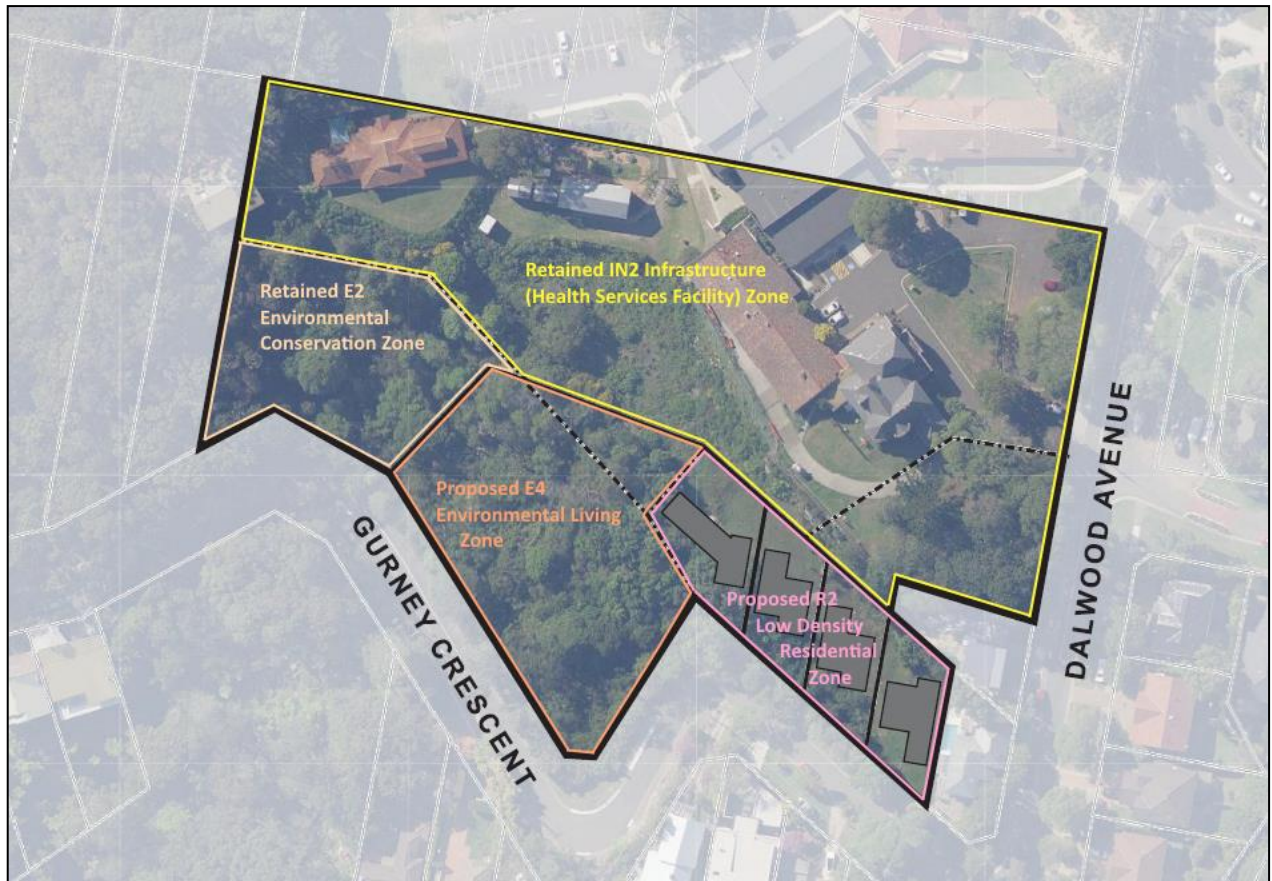


Figure 2; Concept Layout Plan showing Rezoning Detail

## 2.0 Site and Adjacent Developments

The following seeks to describe the site and the adjoining lands.

### 2.1 Site Description

The site is identified as; “Dalwood Home”

Dalwood Avenue, Gurney Crescent and Callicoma Road  
Seaforth NSW 2092

LGA Northern Beaches Council

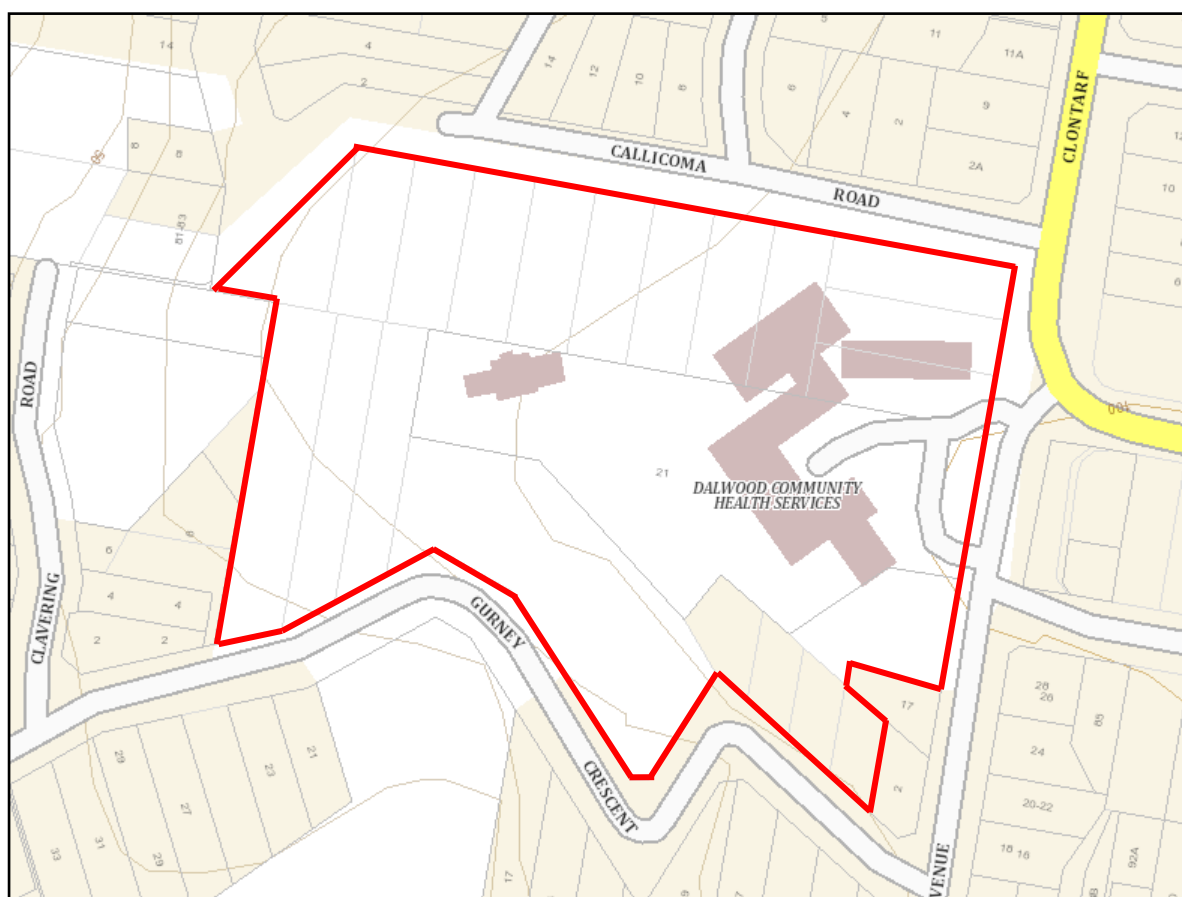


Figure 3; Address validation ex Dept of Lands

The Dalwood Home site is approximately 3.7 hectares bounded by Callicoma Road to the north, Dalwood Avenue to the east, Gurney Crescent to the south and private residential allotments to the west, within the Northern Beaches Council Local Government Area.

The Dalwood site is a combination of well maintained gardens and lawns within the north eastern section of the site that transition into unmanaged forest vegetation upon the steeply descending slopes over the southern and western areas of the site.

The vegetation in the southern areas of the site are dominated by heavy weed infestation with numerous large areas of lantana and other weed species of shrubs and ground layer fuels.

In the western area the vegetation is less influenced by weed infestation although this area is not completely free of invasive plant types.

The terrain of the site in broad terms is described as being reasonably level within the north eastern section of the parcel before rapidly descending with large areas of slope in excess of 20 degrees downslope.

There is a secondary plateau of level ground directly south of the main administration building where by consultation with Dalwood staff confirmed that physical earthworks were undertaken many years ago for a proposed building development that never actually eventuated.

The structural improvements are located on level areas in the north eastern section of the site and these are currently being used for a variety of health and community facilities although it is noted that none of these are residential.

The built area is dominated by a historic large sandstone two storey building identified as “Dalwood Home”. This building is currently used by the Northern Sydney Local Area Health for administration purposes.

There are also other buildings on the site which are used for storage of welfare goods, a Family Care Centre and a preschool centre together with some sections of buildings that are currently not utilised and are considered vacant.

All buildings in the area are connected to existing mains power and water infrastructure. It is assumed that the buildings are provided with suitable water supplies for structural fire protection purposes in accordance with Building Code of Australia (BCA) requirements although such an assessment.

The site is shown on the Northern Beaches Bushfire Prone Land Map (Figure 3) to be within a combination of Category 1 vegetation (shown red) and Category 1 vegetation buffer zone (shown yellow).



The site inspection and interpretation of aerial photography for the site confirms that whilst this image is reasonably accurate, the Category 1 vegetation does extend across the southern sections of Lots 5A, 6A and 7A.

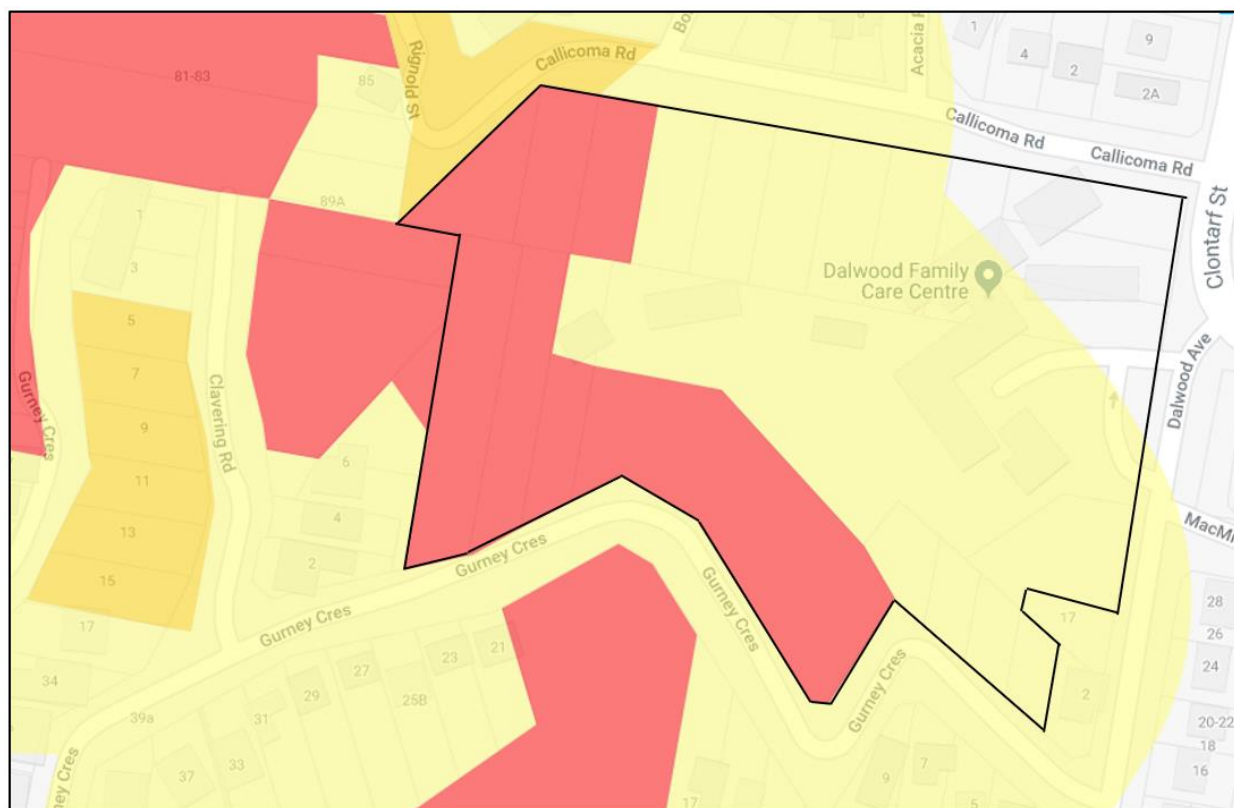


Figure 4; Section Northern Beaches LGA Bushfire Prone Land Map

## 2.2 Description of Adjoining Lands

To the north and east of the Dalwood Home site is well established residential developments with no significant areas of bushfire hazardous vegetation.

To the south of the site is the carriageway of Gurney Crescent and beyond is established residential dwellings. However, there is also a bushland reserve of approximately two (2) hectares which has the potential to carry a bushfire event into the forest located within the proposed lands to be rezoned.

To the west and northwest of the subject parcel is a combination of residential dwellings and unmanaged forest vegetation on steeply descending slopes above the foreshores of Middle Harbour.

The vegetation on these slopes has direct linkage to the subject parcel and it is envisaged that a bushfire front could easily enter the Dalwood Home site from this direction and aspect.



### **3.0 Environmental Considerations**

The scope of this report has not been to provide an environmental survey.

It is envisaged that some vegetation removal will be required to provide for areas of asset protection zones and that studies will be undertaken by others to assess the effects of the rezoning from a flora and fauna perspective which is beyond the expertise of the author of this report.

## 4.0 Bushfire Hazard Assessment

The bushfire hazard assessment was conducted for the Proposal, using the procedures as outlined in *Planning for Bush Fire Protection 2006*, Addendum to Appendix 3 and section 2 of AS 3959-2009 *Construction of buildings in bushfire prone areas* procedure to determine the bushfire attack level (BAL) likely for the development.

The assessment was conducted on the assumption of the building footprint being positioned as described in section 1.5 The Proposal and Figure 1 of this report and the site plan.

### 4.1 Classification of Vegetation, Distance from Proposed Development

The vegetation was assessed for a distance of 140 metres from the proposed development in each of the following directions. To the west and southwest being the general direction adjacent and away from the proposed development site.

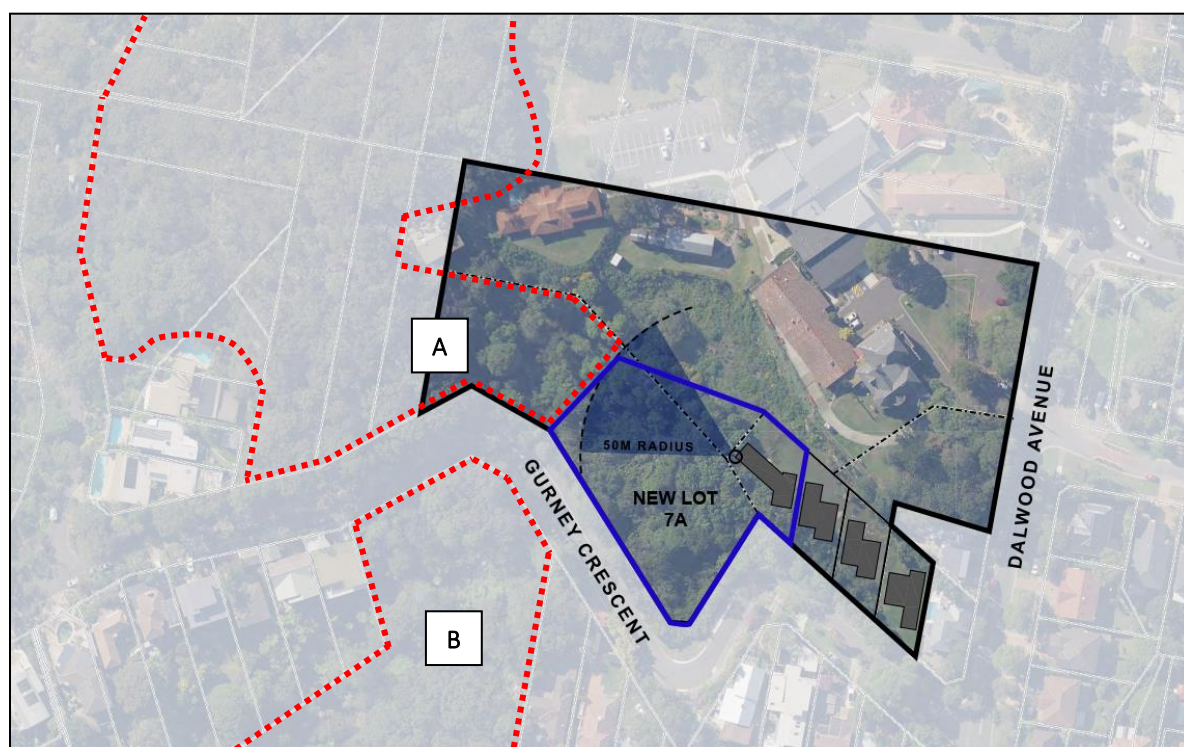


Figure 5; Vegetation study area

The proposed residential development is shown above as the four (4) allotments within the south eastern section of the overall Dalwood site illustrated by the solid red line ( ——— ).

It is also proposed to establish an area of asset protection zone illustrated by the green dashed line ( - - - - - ) as a component of the western most allotment which would then create a benefit to the other three parcels rather than establish an easement for the asset protection zone, over the Dalwood Home site.

As a consequence the areas of vegetation hazard illustrated by the dashed red line ( ..... ) to the west being Area A and to the southwest Area B would have a minimum separation distances to the individual potential dwelling locations as follows;

Allotment	Area A (metres)	Area B (metres)
4A	109	109
5A	89	93
6A	71	81
7A	50	67

## 4.2 Slope Assessment

The slope was assessed for a distance of 100 meters within the bushfire hazardous vegetation and reference to slope classifications has been undertaken considering the procedure specified within section 2 of AS 3959-2009 *Construction of buildings in bushfire prone areas*.



Figure 6; Slope assessment study area Image ex Nearmap

The **effective slope** of the land, out to a distance of 100 metres from the proposed scope of works (that is, the slope of the land most likely to influence bushfire behaviour for the purposes of calculating the Category of Bushfire Attack and Asset Protection Zones), has been assessed (using a clinometer) and desktop analysis as being;

- Area A – Forest - > 10 to 15 degrees downslope (assumed) (elevation 9 met / dist. 41 met = 12.38 degrees)
- Area B – Forest - > 15 to 20 degrees downslope (assumed) (elevation 27 met / dist. 90 met = 16.70 degrees)

## 4.3 Category of Bushfire Attack

The bushfire attack level (BAL) for the proposed development was determined by using the information gathered with respect to the separation distances, the classification of the vegetation, the effective slope and provision of asset protection zones specified in this report.

The separation distances nominated have determined by reference to Appendix 2 Table A2.4 of *Planning for Bush Fire Protection 2006* – Minimum Specifications for Asset Protection Zones for Residential and Rural Residential Subdivision Purposes (for Class 1 and 2 buildings) in Fire Danger Index (FDI) 100 Fire Areas to achieve less than 29kW/m<sup>2</sup> radiant heat exposure on any building element.

This maximum permissible level of radiant heat exposure is a baseline requirement of the NSW Rural Fire Service within the subdivision approval process. It is also referred to within AS 3959-2009 *Construction of buildings in bushfire prone area* as Bushfire Attack Level (BAL) 29.

For allotments effected by the Forest vegetation with consideration of the effective downslope of > 10 to 15 degrees beneath the vegetation hazard a minimum distance of separation of 50 metres is required.

For allotments effected by the Forest vegetation with consideration of the effective downslope of > 15 to 20 degrees beneath the vegetation hazard a minimum distance of separation of 61 metres is required.

Clearly the CLP supplied for perusal within the context of formulating this report, shows that these minimum separation distances are very easily achieved and it is actually envisaged that distances of separation would ultimately be well in excess of the minimum requirements of *Planning for Bush Fire Protection 2006*.

## **5.0 Assessment of the extent to which the development potentially conforms or deviates from Chapter 4 of *Planning for Bush Fire Protection 2006***

### **5.1 Asset Protection Zones**

The provision of asset protection zones for any future subdivision, subsequent to a rezoning, must be fully provided for onsite to satisfy the requirements of *Planning for Bush Fire Protection 2006*.

The maintenance of the majority of area upon the subject allotment particularly within the existing and proposed Lot 7A currently would not satisfy the requirements of an inner protection area of an asset protection zone as contained in *Planning for Bush Fire Protection 2006*.

The following is a summary of the requirements for an asset protection zone inner protection area as described within the documents *Planning for Bush Fire Protection 2006* and *NSW RFS Standards for Asset Protection Zones*.

#### **Inner Protection Area**

An IPA should provide a tree canopy cover of less than 15% and the tree canopy should be located greater than 2.0 metres from any part of the roof line of a dwelling. Garden beds of flammable shrubs should not be located under trees and should be located not closer than 10 metres from an exposed window or door. Trees should have lower limbs removed up to a height of 2.0 metres above the ground.

Ground fuels such as fallen leaves, twigs (less than 6mm in diameter) and branches should be removed on a regular basis, and grass needs to be kept closely mown and where possible green.

A report formulated for the purposes of subdivision will recommend that the entire site within Lot 4A, 5A, 6A and 7A where not built upon is maintained to the requirements of an inner protection area of an asset protection zone and managed to these provisions for the lifetime of the development.

The site inspection undertaken for the purposes of the rezoning application noted the site is primarily dominated by regrowth vegetation of weed infestation and significant stands of bamboo.

The other native trees were reasonably sparse in spatial arrangement and it would not be likely that a substantial number would need removal to accommodate asset protection zones arising from any future development.

In terms of shrub and ground layer fuels these are easily managed by regular slashing or mowing.



It is my opinion that the provision of adequate and complying areas asset protection zones could be easily achieved over the subject allotment in the context of the CLP supplied for consideration.

### **5.3 Construction Level**

The Building Code of Australia contains both the performance requirements and the 'deemed to satisfy' provisions relating to construction of class 1, 2 & 3 buildings that are proposed for *construction in bushfire prone areas*. To satisfy the performance provision P2.3.4 of the Building Code of Australia Vol. 2, a Class 1a building that is constructed in a designated bushfire prone area must be designed and constructed to reduce the risk of ignition from a bushfire while the fire front passes.

Australian Standard 3959-2009 *Construction of buildings in bushfire prone areas* is referenced by the NCC as the deemed to satisfy construction standard for residential dwellings in designated bushfire prone areas with the exception that the requirements shall be varied to comply with the Addendum to Appendix 3 of *Planning for Bushfire Protection 2006*.

As noted previously any construction of dwellings or proposed buildings footprints must not be exposed to greater than BAL 29 and this can be easily achieved within the context of the CLP supplied.

### **5.4 Access / Egress**

#### **5.4.1 To the Proposed Development**

The access to the subject site for the proposed residential allotments is from Gurney Crescent which is a sealed two lane road in a well maintained condition and under most conditions should provide adequate access and egress for both residents and emergency service vehicles.

Gurney Crescent links to other through roads in an easterly direction which would afford the residents the ability to evacuate the area to a location not being directly implicated by the mechanisms of bushfire attack, although under most bushfire or grassfire conditions this would generally not be required.

#### **5.4.2 Within the Site**

No construction of access roads is required by the provisions of *Planning for Bush Fire Protection 2006*.

### **5.5 Utility Supplies**

#### **5.5.1 Water**

The locality of Seaforth is serviced by a mains reticulated water system and the site inspection noted that this system is within the carriageway of Gurney Crescent.

The provisions of *Planning for Bush Fire Protection 2006* will require that if the mains water is integrated within any future development it should be undertaken to satisfy AS 2419 – 2005 *Fire hydrant installations*.

### **5.5.2 Electricity**

The preferred methodology for the connection of electricity is by underground cabling as stated within *Planning for Bush Fire Protection 2006*.

### **5.5.3 Gas**

At the time of report preparation it was not known if it is proposed to connect gas supply to the subject allotment. However any future connection to either mains or portable gas supply should be undertaken and maintained to the provisions of AS 1596-2002 *Storage and handling of LP Gas*. All piping associated with the installation must be metal.

### **5.6 Landscaping**

A formal landscaping plan was not supplied for perusal at the time of formulating this report however this must be undertaken to satisfy Appendix 5 of *Planning for Bushfire Protection 2006*.

## 6.0 Conclusion

After consideration of the aims and objectives of *Planning for Bush Fire Protection* 2006 in the context of the PP and the CLP for future residential development on the site, it is my professional opinion that the provisions of bushfire regulatory requirements could be achieved and that the relevant consent authorities would be likely to approve future dwellings on the 4 lots.



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### Caveat

Quote from *Planning for Bush Fire Protection* 2006, '*notwithstanding the precautions adopted, it should always be remembered that bushfire burn under a wide range of conditions and an element of risk, no matter how small always remains.*'

Quote from Standards Australia, '*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.*'

## References

Planning for Bush Fire Protection 2006 Planning NSW in conjunction with NSW Rural Fire Service

Building Code of Australia Volume 2 2005 Australian Building Codes Board

AS 3959 –2009 Construction of buildings in bushfire prone areas Standards Australia & Australian Building Codes Board

Landscape and building Design for Bushfire Areas Ramsay C. & Rudolph L. CSIRO 2003

Quantifying bushfire penetration into urban areas in Australia Keping Chan & McAneny J. Geophysical Research Letters, Volume 31, L12212, doi:10.1029/2004GL020244,2004

Bushfires in Australia Luke R.H. & McArthur CSIRO 1978

Performance of Building Elements in Bushfire Prone Areas Poon S.L. & England J.P. Warrington Fire Research Australia

Address Validation Search Department of Lands [www.maps.nsw.gov.au](http://www.maps.nsw.gov.au)

Standards for Asset Protection Zones NSW Rural Fire Service 2005

Ocean Shores to Dessert Dunes Keith D. Department of Environment and Conservation Sydney 2004

