

## **BUSHFIRE ASSESSMENT REPORT**

### **PROPOSED RESIDENTIAL DEVELOPMENT**

**LOT 22 DP 1070182  
PACIFIC HIGHWAY  
SANDY BEACH NORTH**

**SEPTEMBER 2008  
(REF: 8108)**

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**LOT 22 DP 1070182  
PACIFIC HIGHWAY  
SANDY BEACH NORTH**

**SEPTEMBER 2008**

**Conacher Environmental Group**

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## PREFACE

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A Bushfire Protection Assessment Report has been prepared by *Conacher Environmental Group* at the request of Sandy Shores Developments Pty Ltd for the proposed residential subdivision of Lot 22 DP 1070182 Pacific Highway, Sandy Beach North.

The development is classified as Integrated Development within a bushfire prone area. This requires the Commissioner of the NSW Rural Fire Service to consider the issue of a Bushfire Safety Authority provided that the proposed development conforms with the requirements of '*Planning for Bushfire Protection 2006*'.

This report provides an assessment of the bushfire protection measures required for the development to guard against the potential impact of bushfires. Recommendations have been made in respect of fuel management, construction standards / building protection, access, bushfire education and land ownership responsibility.

This document provides an assessment of the bushfire attack potential and the necessary bushfire protection strategies for the proposed residential subdivision. Aspects in relation to the Bushfire Assessment Report include; vegetation type, slopes, water supplies, entry and egress access, provision of defendable space, maintenance of defendable space, responsibilities for the upkeep of defendable space and construction standards for the existing dwellings.

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# SECTION 1

## INTRODUCTION

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### 1.1 INTRODUCTION

This Bushfire Assessment Report has been prepared by *Conacher Environmental Group* on behalf of Sandy Shores Development Pty Ltd for a proposed residential development of land at Lot 22 DP 1070182 Pacific Highway, Sandy Beach North.

The objectives of this Report are to:

- i) Address the relevant requirements of Planning for Bushfire Protection (Rural Fire Service 2006);
- ii) Identify if the development complies with the aims and objectives of Planning for Bushfire Protection (RFS 2006);
- iii) Prepare a Report that supplies the relevant information for the New South Wales Rural Fire Service (RFS) and Council prior to granting a Bushfire Safety Authority (RFS) or development approval (Council).

### 1.2 PROPOSED DEVELOPMENT

It is proposed to subdivide the existing Lot 22 DP 1070182 into residential allotments with mixed densities. The subject site will be developed as a Community Title subdivision with the management of the open space / reserve areas undertaken in accordance with a management plan adopted by the Community organisation. This management plan will identify amongst other matters, procedures for the management of bushfire asset protection zones, ground fuel levels and emergency vehicle access.

The proposed subdivision is located on the northern, southern, eastern and western shores of Hearn's Lake. An open space / environmental protection zone of between 70 to 120 metres wide will be retained between the high water level of Hearn's Lake and the residential allotments where required. Parts of this open space area will be managed as a bushfire asset protection zone and will incorporate a shared cycleway.

Vehicle access to the proposed development will be provided from the Pacific Highway and two connecting roads joining to the existing residential areas to the south.

A network of minor roads is also proposed specifically for the development site providing access to the individual allotments.

### 1.3 SITE DETAILS

#### ***Property Description***

The subject site Lot 22 DP 1070182 covers approximately 49 hectares and is located on the eastern side of the Pacific Highway adjacent to the northern extent of existing development at Sandy Beach. The site is located on stable hind dunes and flat land and also contains a lake, (Hearn's Lake).

#### ***Site Plan***

A plan of the subject site is provided in Figure 1. The site is irregular in shape and occupies approximately 49 hectares.

**Location**

The site is situated approximately 12 kilometres north of Coffs Harbour (3km south of Woolgoolga) and is located on the eastern side of the Pacific Highway. The irregular shaped property abuts the Highway on its western boundary and Crown Reserve and Ocean Beach on its eastern boundary. The site is irregular in shape with a western frontage to the Pacific Highway of 1049 metres. The southern boundary of 701 metres adjoins the existing residential area of Sandy Beach. Approximate MGA map co-ordinates for the site are 518800-E 6665500-N.

**Surrounding Land Use**

The site is currently undeveloped land used for cattle grazing. The adjoining waters of Hearn's Lake are used for occasional recreation activities (canoeing and sail boarding) while the adjoining reserve and beach are used for low intensity recreational activities associated with the beach and surf. Residential land uses are present to the south. The land to the west comprises the Pacific Highway and road reserve identified for future highway widening and undeveloped grazing land with scattered trees with a grassland to woodland structure.

**Topography and Drainage**

The site is located on low lying flat land and dune slopes, generally with an easterly or westerly aspect and a slope of less than 5% or approximately 3 degrees.

Drainage within the site is by overland flow into Hearn's Lake located in the central and northern parts of the site, then into the Tasman Sea.

**Vegetation**

The vegetation within the subject site consists of Open or Closed Forest variants, Wet Heath, Low Wallum Heath and Sedgeland. The vegetation composition and structure varies considerably in response to changes in micro-topography, drainage, soil conditions and past land uses.

## SECTION 2

### BUSHFIRE ATTACK ASSESSMENT

#### 2.1 BUSHFIRE ASSESSMENT CRITERIA

##### ***Bushfire Prone Land Map***

The areas with tree canopy within the subject site have been mapped as Category 1 vegetation within Coffs Harbour City Councils Bushfire Prone Land Mapping. The majority of the remainder of the subject site has been mapped as Vegetation Buffers.

##### ***Forest Fire Danger Index***

The subject site is located within the Coffs Harbour Council Local Government Area in the North Coast Region. The Forest Fire Danger Index for the North Coast Region is rated at 80 for use in determining asset protection zone requirements and categories for bushfire attack.

##### ***Vegetation Classification***

The site and adjoining properties to the north and west to a distance of 140 metres from the site boundary contains a mosaic of open and closed Forest, Heath and Sedgeland. Some parts of the subject site have been used as grazing land. There is existing urban development to the south-west and south.

The following vegetation types as described in the Ecological Survey and Assessment Report (*Conacher Environmental Group* 2008 Ref: 8108F) have been correlated to the standard vegetation types used for assessment purposes within Planning for Bushfire Protection (RFS 2006).

Vegetation Description (Conacher Environmental Group 2008)		Vegetation Formation (RFS 2006)
A	Low Forest ( <i>Banksia</i> dominated)	Tall Heath
B	Forest ( <i>Eucalypt</i> dominated)	Forest
C	Swamp Sclerophyll Forest	Forested Wetlands
B/C	Eucalypt / Swamp Sclerophyll Transition Forest	Forest
D	Sandplain Forest ( <i>Melaleuca</i> / <i>Corymbia</i> dominated)	Tall Heath
E	Wet Heath	Tall Heath
F	Wallum Heath	Short Heath
G	Sedgeland	Freshwater Wetlands
H	Disturbed Woodland	Woodland
I	Sandplain Forest ( <i>Melaleuca</i> / Mesophyllic sp. dominated)	Woodland

The correlated vegetation formations (RFS 2006) will be used later within this document to determine the bushfire threat and required asset protection zones.

##### ***Development Category***

The proposal is for a residential subdivision consisting of mixed density residential areas. This is classified as a 'residential subdivision' under Chapter 4 of PBP (RFS 2006). Development consent is required from the Council for subdivision and a Bushfire Safety Authority is required from the Rural Fire Service. Development Consent, or a Complying Development Certificate is then required for individual dwellings.

This development is not being assessed as 'infill development' within the meanings and requirements of Section 4.3.5 of PBP (RFS 2006).

### ***Planning for Bushfire Protection (RFS, 2006)***

Due to the presence of a bush fire threat from the vegetation adjoining the proposed development, and the site being mapped as occurring within or adjacent to Category 1 vegetation or its associated buffer area on the Bushfire Prone Land Map, the development application is required to include a Bushfire Assessment Report prepared in accordance with the requirements of PBP (RFS 2006).

### ***State Legislation***

The proposal is not subject to Section 79 BA of the *Environmental Planning and Assessment Act* which requires the consent authority (Council) to consider the requirements of PBP (RFS 2006).

In relation to the *Rural Fires Act* Section 100 of this Act does apply to the proposed development as the proposed is for a subdivision of land. This will thus require an application to the RFS for a Bushfire Safety Authority.

### ***Adjoining and Surrounding Development***

The site is situated within an area where existing residential developments are located on adjoining land to the south and south-west. Future development is planned for the property to the west of the Pacific Highway and the subject site. None of the existing urban development adjoining the subject site provide a bushfire risk to the subject site.

## **2.2 BUSHFIRE ATTACK ASSESSMENT**

Due to the nature of the proposed development with precincts proposed in the western, southern and eastern parts of the site and the sites topographical and vegetation characteristics the bushfire protection assessment has been undertaken for three separate areas of the proposal. These are:

### **1) WESTERN PRECINCT**

The western parts of the site are bounded by the Pacific Highway to the west, retained vegetation to the north, Hearn's Lake to the east and existing residential development to the south.

### **2) EASTERN (BEACH) PRECINCT**

The eastern precinct is bounded by Hearn's Lake to the west, the coastal dune / beach to the east and retained vegetation to the south and north.

### **3) SOUTHERN PRECINCT**

The southern precinct is bounded by the lake edge vegetation of Hearn's Lake to the north, the existing residential development to the south, the proposed western precinct to the west and coastal dune / beach vegetation to the east.

A summary of the assessment for each Precinct is provided in the tables below.



<b>TABLE 2.1</b> <b>BUSHFIRE ATTACK ASSESSMENT</b> <b>WESTERN PRECINCT</b> (from Table A3.4 PBP, 2006)					
Direction	Vegetation Classification (within 140m) + = greater threat	Effective Slope (within 100m)	Recommended Width of APZ (metres)		
			Level 3	Level 2	Level 1
North	Forest+ and Woodland	0° cross slope	17 to <25	25 - <35	35 - 100
South	Woodland+ and Short Heath	2° down slope	12 - <17	17 - <25	25 - 100
East	Forested Wetland+ Woodland, Tall Heath and Short Heath	2° down slope	17 - <24	24 - <34	34 - 100
West	Managed Land	2° cross slope	N/A	N/A	N/A

<b>TABLE 2.2</b> <b>BUSHFIRE ATTACK ASSESSMENT</b> <b>EASTERN (BEACH) PRECINCT</b> (from Table A3.4 PBP, 2006)					
Direction	Vegetation Classification (within 140m) + = greater threat	Effective Slope (within 100m)	Recommended Width of APZ (metres)		
			Level 3	Level 2	Level 1
North	Tall Heath+ and Freshwater Wetlands	3° down slope	15 - <22	22 - <31	31 - 100
South	Tall Heath+ and Freshwater Wetlands	2° up slope	13 - <19	19 - <27	27 - 100
East	Tall Heath+	4° up slope	13 - <19	19 - <27	27 - 100
West	Tall Heath+ and Freshwater Wetland	4° down slope	15 - <22	22 - <31	31 - 100

<b>TABLE 2.3</b> <b>BUSHFIRE ATTACK ASSESSMENT</b> <b>SOUTHERN PRECINCT</b> (from Table A3.4 PBP, 2006)					
Direction	Vegetation Classification (within 140m) + = greater threat	Effective Slope (within 100m)	Recommended Width of APZ (metres)		
			Level 3	Level 2	Level 1
North	Forested Wetlands+ Woodland	2° down slope	17 - <24	24 - <34	34 - 100
South	Managed Land	2° up slope	N/A	N/A	N/A
South-east	Woodland+	2° up slope	9 - <14	14 - <20	20 - 100
East	Tall Heath+	4° up slope	13 - <19	19 - <27	27 - 100
West	Forested Wetlands+ and Woodland	0° cross slope	19 - <19	19 - <28	28 - 100

In relation to the Western Precinct, the principal direction of bushfire attack is from the Forest vegetation to the north, Woodland vegetation to the south and Forested Wetland to the East.

The principal direction of bushfire attack for the Eastern (Beach) Precinct is from the Tall Heath vegetation to the north, south, east and west.

The principal direction of bushfire attack for the Southern Precinct is from the Forested Wetland vegetation to the north and west, from the Tall Heath vegetation to the east and from the Woodland vegetation to the south-east.

## SECTION 3

### BUSHFIRE PROTECTION MATTERS

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#### 3.1 SPECIFIC BUSHFIRE PROTECTION REQUIREMENTS

##### 3.1.1 *Building Construction Level*

Construction Levels 1, 2 or 3 in relation to AS3959-1999 can be achieved by establishing and maintaining Asset Protection Zones (APZs) of varying widths around the residential precincts as shown in Figure 1 and in Tables 2.1, 2.2 and 2.3.

Construction for dwellings within the majority of the development are expected to be constructed to Level 1 Construction Standards (AS-3959). Dwellings on the outer fringes of the precincts that directly face a bushfire threat are most likely to require construction to Level 2 Construction Standards to reduce the necessity of wider external precinct APZs.

##### **For the Western Precinct**

Level 1 Construction Standards (AS3959-1999) can be achieved by the establishment and maintenance of bushfire Asset Protection Zones (APZs) with minimum widths of 35 metres to the north, and 34 metres width to the east and 25 metres to the south.

For level 2 Construction Standards, APZs of minimum 25 metres width is required to the north and 24 metres width to the east and 17 metres to the south. The existing road reserve for the Pacific Highway provides adequate separation distance to the west.

##### **For the Eastern Precinct**

Level 1 Construction Standards (AS3959-1999) can be achieved by the establishment and maintenance of bushfire Asset Protection Zones (APZs) with minimum widths of 31 metres to the north and west, and 27 metres width to the south and east.

For level 2 Construction Standards, APZs of minimum 22 metres width is required to the north and west while a 19 metre wide APZ is required to the south and east.

##### **For the Southern Precinct**

Level 1 Construction Standards (AS3959-1999) can be achieved by the establishment and maintenance of bushfire Asset Protection Zones (APZs) with minimum widths of 34 metres to the north, 20 metres to the south-east, 27 metres to the east and 28 metres to the west.

For level 2 Construction Standards, APZs of 24 metres width is required to the north, 19 metres width to the east and west and a 14 metre wide APZ is required to the south-east.

##### 3.1.2 *Additional Bushfire Protection Measures*

Due to the presence of various vegetation formations within the subject site that pose a number of degrees of threat, it is considered that additional safeguards against ember attack are warranted. Some specific measures to reduce the potential for damage from ember attack during a bushfire event include:

- i) Provision of leaf barriers on gutters and roof valleys with a flammability index of less than 5 (AS1530.2);
- ii) Provision of steel or bronze mesh screens on opening windows and doors on any aspect directly facing a threat;

- iii) Maintenance of the areas of Managed Lands or household gardens within the development as an inner Asset Protection Zone in accordance with PBP (RFS 2006);
- iv) Regular maintenance of garden / courtyard areas to reduce fuel loads and removal or replacement of vegetation likely to promote the transmission of fire;
- v) Prohibition of the use of surface mulching such as fine peaty material or wood chips.

### **3.2 ASSET PROTECTION ZONE AND BUSHFIRE HAZARD MANAGEMENT**

Asset Protection Zones (APZs) are to be established as shown in Figure 1 and in Tables 2.1, 2.2 and 2.3. These APZs are to be measured from the extremities of the dwellings.

These APZs will provide adequate defensible space and separation distance for the dwellings within the development, provided the dwellings on the outer fringes of the precincts that directly face a bushfire threat are constructed to Level 2 standards (AS3959-1999) and the dwellings within the centre parts of the precincts (ie. Those dwellings that are at or in excess of the required minimum separation distance for level 1 construction) are constructed to Level 1 Construction Standards (AS3959-1999).

The Asset Protection Zones (APZs) shall be maintained as an Inner Protection Area (IPA) in accordance with the standards described in Section 4.1.3 of PBP (RFS, 2006). The responsible party for the inspection and maintenance of the APZs will be the owners of the land.

### **3.3 ACCESS**

The proposed development will have an internal road system that connects to three separate entry / egress points. One entry / egress point is directly to the Pacific Highway, while a further two will be via the existing urban development to the south.

### **3.4 WATER SERVICES**

The existing urban development in the local area has reticulated water mains. It is expected that the proposed development will use the existing water reticulation from the surrounding infrastructure therefore a supplementary form of water supply will not be necessary for fire fighting purposes. This water supply arrangement is in compliance with '*Planning for Bushfire Protection, 2006*' in respect of water supply. The reticulated water supply, fire hydrant spacing, sizing and pressure is to comply with the requirements of AS2419.1 – 2005. A certification or test report from the Water Supply Authority is to be provided to demonstrate that the requirements of AS2419.1-2005 can be achieved during a bushfire event.

### **3.5 ENVIRONMENT AND HERITAGE ISSUES**

An aboriginal heritage assessment was completed within the site in December 2004. Two areas of interest were found. The site has historically suffered from various long-term pastoral uses.

No threatened flora or endangered populations were observed on the subject site (*Conacher Environmental Group* 2008).

Seven threatened fauna species were detected during surveys of the site. These were Wallum Froglet, Osprey, Glossy Black-cockatoo, Grey-headed Flying-fox, Black-necked

Stork, Eastern Freetail Bat and Greater Broad-nosed Bat (*Conacher Environmental Group* 2008).

Two listed endangered ecological communities, Swamp Sclerophyll Forest on Coastal Floodplains and Coastal Saltmarsh were recorded on the site. No threatened flora species have been recorded within the site.

The development proposes the retention of substantial areas of habitat including the endangered ecological communities, Coastal Saltmarsh and Swamp Sclerophyll Forest on Coastal Floodplains to aid the conservation of biodiversity and the threatened species observed within the subject site.

The proposal includes the retention of higher quality habitats and vegetation types and establishment of corridor systems and areas to minimise impacts upon locally occurring flora and fauna

The subject site has no known geological features of note.

The main drainage feature is Hearn's Lake within the central parts of the site. This feature and its vegetation is not part of the proposed development area and is to be retained.

## SECTION 4

### CONCLUSION AND RECOMMENDATION

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#### 4.1 AIM AND OBJECTIVES OF PLANNING FOR BUSHFIRE PROTECTION

*“The aim of Planning for Bushfire Protection is to use the NSW development assessment system to provide for the protection of human life and to minimise impacts on property from the threat of bushfire, while having due regard to development potential, on site amenity and protection of the environment” (PBP pg 1).*

The preparation of this Bushfire Assessment Report and subsequent assessment by Council and the Rural Fire Service ensures compliance with the aim of Planning for Bushfire Protection.

The following comments are provided in relation to satisfying the objectives of PBP.

##### *Objective 1*

- (i) afford occupants of any building adequate protection from exposure to a bush fire;*

Measures have been identified which can be implemented within the proposed development in regard to separation distance (APZ) and building construction to comply with Level 1 and level 2 Construction Standards. Some additional measures for the dwellings (gutter guards, mesh window screens, fuel free gardens and external areas etc) are recommended to provide additional protection from the fire hazard present.

##### *Objective 2*

- (ii) provide for a defensible space to be located around buildings;*

A permanent APZ of minimum widths as shown in Tables 2.1, 2.2 and 2.3 and as shown in Figure 1 will allow Level 1 construction standards for the majority of dwelling within the central parts of the precincts and Level 2 construction standards for the dwellings on the outer edges of the precincts. These minimum width Asset Protection Zones are to be established as shown in Figure 1 and as described in Tables 2.1, 2.2 and 2.3. These APZs are expected to be managed as Inner Protection Areas (IPAs) in accordance with PBP (RFS, 2006).

##### *Objective 3*

- (iii) provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent direct flame contact and material ignition;*

The required separation distance between the dwellings and the bushfire hazard has been determined from PBP (RFS, 2008). The required minimum widths for the Asset Protection Zones (APZs) is deemed to comply with the separation distances required. These APZs combined with other protective measures will provide appropriate separation between the hazard and buildings which will prevent direct flame contact and material ignition.

##### *Objective 4*

- (iv) ensure that safe operational access and egress for emergency service personnel and residents is available;*

It is noted that multiple ingress / egress routes to the existing through roads are incorporated into the existing urban design. This will ensure multi-path safe operational ingress for emergency services and also simultaneous safe egress for residents during an emergency.

**Objective 5**

- (v) *provide for ongoing management and maintenance of bush fire protection measures, including fuel loads in the asset protection zone (APZ);*

The owners / managers (or their agents) will undertake regular inspections and undertake management of the Asset Protection Zones. This will include maintenance of the vegetation and fuel loads within the APZ as an Inner Protection Area (IPA) in accordance with PBP (RFS, 2006).

**Objective 6**

- (vi) *ensure that utility services are adequate to meet the needs of fire fighters (and others assisting in bush fire fighting)*

With respect to the adequate supply of water services the proposed development is expected to comply provided that the water services are extended from the surrounding supply infrastructure and constructed and installed according to AS 2419.1 – 2005. A certification or test report from the Water Supply Authority is to be provided to demonstrate that the requirements of AS2419.1 – 2005 can be achieved during a bushfire event.

## **4.2 CONCLUDING COMMENTS**

The proposed development has various vegetated bushfire threats located at various aspects to the proposed precincts. The vegetation that posed the greater threat at various aspects was classified as Forest, Forested Wetlands, Tall Heath and Woodland for bushfire assessment purposes. These vegetation formations are described in detail in PBP (RFS 2006).

With the implementation of the measures recommended, and outlined in Section 3 of this Report, the overall aims and objectives of Planning for Bushfire Protection (RFS, 2006) can be achieved for the proposed development.

## **4.3 RECOMMENDATIONS**

The following recommendations are provided in relation to reducing the potential for loss of life and property by the impact of bushfire.

These recommendations are:

- i. The future development should be sited as indicated on the site concept proposal and depicted in Figure 1.
- ii. Establish and maintain an Asset Protection Zone (APZ) on various aspects of the development as shown in Figure 1. These APZs are to be maintained as Inner Protection Areas (IPAs) as described in PBP (RFS, 2006) and are to be measured from the extremities of the dwellings.
- iii. It is expected that the dwellings on the outer edge of the precincts that directly face a bushfire threat will be constructed to Level 2 Construction Standards (AS-3959), other dwellings within the central parts of the precincts will require construction to Level 1 Construction Standards (AS-3959) unless they are in excess of 100 metres from any bushfire hazard.

- iv. Regular inspections and maintenance of the APZs within the subject site is to be undertaken by the owners / managers (or their agents) according to PBP (RFS, 2006).
- v. Provision of leaf barriers on gutters and roof valleys with a flammability index of less than 5 (AS1530.2) for dwellings constructed to Level 1 and Level 2 standards;
- vi. Installation of wire mesh screens (as recommended in Planning for Bushfire Protection – RFS 2006) on all doors and windows that directly face a bushfire threat.
- vii. Regular maintenance of garden / courtyard areas to reduce fuel loads and removal or replacement of vegetation likely to promote the transmission of fire.
- viii. Prohibition of the use of surface mulching such as fine peaty material or wood chips.



<b>TABLE 4.1 - CHECKLIST</b>		
<b>Factor</b>	<b>Comment</b>	
Adjoining / Surrounding Development	Existing Residential to the South, Pacific Highway to the west, beach / dunes to the east and coastal /dune vegetation to the north.	
Vegetation	Adjoining vegetation types posing a bushfire threat to various aspects of the proposed precincts = Forest, Forested Wetlands, Tall Heath and Woodland	
Slope Gradients	Various – 0 to 4 degrees up and down slope	
Distance to Bushfire Threat	Various as shown in Tables 2.1, 2.2 & 2.3 & Fig 1	
Category of Bushfire Attack	Medium to Low	
Level of Construction Required	Level 2 (AS3959) for some outer lots Level 1 (AS3959) for most other lots	
Specific Protection Requirements	<ul style="list-style-type: none"> <li>– As shown in Tables 2.1, 2.2 &amp; 2.3 &amp; Fig 1</li> <li>– Leaf Barriers on Guttering,</li> <li>– Mesh Screens on doors and windows on aspects facing any threat.</li> </ul>	
Asset Protection Zone	As shown in Tables 2.1, 2.2 & 2.3 & Fig 1	
Hazard Management	Maintenance of all gardens and APZs as IPAs in accordance with PBP (RFS, 2006)	
Access	Urban Road network – sealed two way, 8m wide carriageway, 3x ingress / egress routes.	
Water Services	Town Supply as per AS2419.1 – 2005	
Environment Issues	<ul style="list-style-type: none"> <li>- None within proposed development area.</li> <li>- Retention of Hearn's Lake &amp; buffer zone</li> </ul>	
Heritage Issues	Site Assessment not undertaken	
<b>Aims and Objectives</b>	<b>Deemed To Comply</b>	<b>Comments</b>
a) Adequate protection from Bushfire	Yes	Provided minimum APZs are established and maintained as per Figure 1
b) Provide defensible space around buildings	Yes	Provided minimum APZs are established and maintained as per Figure 1
c) Provide appropriate separation to prevent direct flame contact	Yes	Provided minimum APZs are established and maintained as per Figure 1
d) Ensure safe operational access and egress	Yes	Provided roads are constructed as per PBP (RFS, 2006) and to AS2890.2 – 2002
e) Provide ongoing management & maintenance in APZ	Yes	Responsibility = occupants / owners
f) Ensure utility services are adequate	Yes	Provided water reticulation is constructed to AS2419.1 – 2005 and certified by the water supply authority.





Original plan produced in A3 colour. Plan for indicative purposes only. \*Subject Site boundary subject to final survey. Not for detailed measurement. Survey locations are approximate and have not been fixed by land survey.

### Legend

Proposed Development Layout	Level 1 - Bushfire Asset Protection Zone	Freshwater Wetland	Forest	Short Heath
Subject Site Boundary	Level 2 - Bushfire Asset Protection Zone	Forested Wetlands	Tall Heath	Woodland

Width of Asset Protection Zones are marked. Asset Protection Zones are taken 6m from building frontages or 2m from the sides of buildings where Asset Protection Zones extend outside of lot boundaries.



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**Figure 1**  
**Bushfire Protection Measures**  
Pacific Highway, Sandy Beach

Source: Aerial © Department of Lands (2008)