

# BUSHFIRE RISK MANAGEMENT PLAN

FOR PROPOSED

RESIDENTIAL / COMMERCIAL DEVELOPMENT

KINGS FOREST STAGE 1

PREPARED BY

**BUSHFIRESAFE**

(AUST) PTY LTD

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### EXECUTIVE SUMMARY

*Bushfiresafe (Aust) P/L has been engaged by Project 28 P/L to undertake a complete Bushfire Risk Assessment for Stage One of the Kings Forest Development. The assessment was conducted in accordance with*

- *Item 6.3 of the NSW Department of Planning Director General's Environmental Assessment Requirements dated 10 September 2010, which state:*

*"In order to ensure the protection of property and assets, a detailed bushfire assessment and management plan prepared by a suitably qualified person must be submitted. The assessment must, at a minimum, demonstrate consistency with the requirements of Planning for Bushfire Protection 2006. All asset protection zones must be clearly specified on the Plan of Development and all affected lots are to be encumbered with a Section 88B instrument under the NSW Conveyancing Act 1919."*

- *Part 3A of the Environmental Planning & Assessment Act (1979), and*
- *section 100B of the Rural Fires Act (1997).*

### PROPERTY DESCRIPTION

*The Kings Forest site is located immediately west of Tweed Coast Road, between Casuarina Town Centre and Kingscliff on the north coast of NSW and covers an area of 880Ha comprising the following land uses (Table 1). The property has previously been sand mined; utilised for turf production, dairying, small cropping, livestock grazing, sugar-cane production; and for pine plantations. Current activities include livestock grazing and harvesting of the mature pine forests growing on the subject land. It is the intention of the proponents to continue with the livestock grazing activity until urban development commences.*

*This Project Application seeks approval for Stage 1 of the Kings Forest project. Development is consistent with the objectives of the Far North Coast Regional Strategy (Dept. Planning, 2006) and will involve a commercial zone on Tweed Coast Road, residential subdivision of Precinct 5 and bulk earthworks across the site*

*This Bushfire Risk Assessment was conducted through an on-site inspection undertaken on 4<sup>th</sup> November, 2009 using the methodology set out in Planning for Bushfire Protection manual (RFS, 2006). The on-site assessment included traversing the subject property and all lands within 140 metres from the proposed subdivision.*

### PRECINCT 1 - COMMERCIAL DEVELOPMENT

*A rural retail development is proposed for the parcel of land on the east side of Tweed Coast Road (Lot 7, DP 875447). The proposal involved 2 buildings, public and staff car parking areas, separate car and truck entries and a designated truck manoeuvring area incorporating a drive-through pickup facility (Plan 2).*

The public car park is located in front of the two buildings and towards the bushfire hazard.

#### Asset Protection Zones (APZ)

The dominant bushfire prone vegetation was assessed as being the Subtropical Floodplain Forest to the south and east of the development. This vegetation is separated from the development by a 50m ecological buffer. Using this information, this bushfire risk assessment concluded that the following asset protection zone should be established, after reference to Table A2.5 Minimum Specifications for Asset Protection Zones (m) for Residential and Rural Residential Subdivision Purposes (for Class 1 and 2 buildings) in FDI 80 Fire Areas, of the Planning for Bushfire Protection manual (RFS, 2006);

| Aspect | Vegetation | APZ (m) | IPA (m) | OPA (m) | Compliance with PBP |
|--------|------------|---------|---------|---------|---------------------|
| South  | Forest     | 20      | 10      | 10      | Yes                 |
| East   | Forest     | 20      | 10      | 10      | Yes                 |

#### Bush Fire Attack Categories

An assessment of the bushfire attack categories applicable to the proposed development in Precinct 1 was carried out using the methodology detailed in Planning for Bushfire Protection (Addendum Appendix 3 2010). This bushfire risk management assessment concluded that commercial Building A will be in the **BAL - 40** Bushfire Attack Category according to Table A 3.4 Determination of Category of Bush Fire Attack FDI 80 (FRS, 2006) with the following site attributes:

- Forest as the Bushfire prone vegetation to the east and south
- This vegetation occurs on a flat slope
- A minimum separation of 20m is achievable from this vegetation

For Building B, a **BAL - 19** Bushfire Attack Category according to Table A 3.4 Determination of Category of Bush fire Attack FDI 80 (FRS, 2006) with the following site attributes:

- Forest as the Bushfire prone vegetation to the east and south
- This vegetation occurs on a flat slope
- A minimum separation of 35m is achievable from this vegetation

#### **PRECINCT 3 –SCHOOL SITE (Special Fire Protection Purpose Development)**

A school site is proposed on land situated within the south-west portion of the precinct. Precinct 3 is located between Precinct 2 to the east and the remediated Depot Road refuse facility (open space / playing fields) to the west on land identified as Part Lot 1, DP 781633. To the north of this Precinct is the northern boundary of the Kings Forest property after which livestock grazing / lifestyle properties occur. To the south occurs the Kings Forest Parkway followed by a proposed residential development (Precinct 5).

### Asset Protection Zones (APZ)

Based on the assessment of the vegetation communities and slopes present on and adjacent to Precinct 3, and in accordance with Appendix 2 Table A2.5, Planning for Bushfire Protection (RFS 2006), this bushfire risk assessment recommends that Asset Protection Zones (APZ), Inner Protection Area (IPA) and Outer Protection Area (OPA) should be established as listed below.

| Aspect                | Vegetation       | APZ (m) | IPA (m) | OPA (m) | Compliance with PBP |
|-----------------------|------------------|---------|---------|---------|---------------------|
| <b>Education Site</b> |                  |         |         |         |                     |
| North                 | Forested Wetland | 50      | 50      | 0       | Yes                 |
| East                  | Forest           | 60      | 20      | 40      | Yes                 |

### Bush Fire Attack Categories

#### **Education Facility:**

An assessment of the bushfire attack categories applicable to the proposed development was carried out using the methodology detailed in Planning for Bushfire Protection (Addendum Appendix 3 2010). The bushfire risk management assessment undertaken in relation to the proposed development concluded a **BAL – 12.5** bushfire attack category for any buildings proposed for within the school site, after reference to Table A 3.4 Determination of Category of Bushfire Attack, FDI 80 in the Planning for Bushfire Protection manual (RFS, 2006) with the following parameters:

- Forested Wetland as the assessed bushfire prone vegetation;
- Flat as the effective slope having the most impact of any bushfire behaviour;
- >50m distance separating the Forested Wetland vegetation and any building.

And

- Forest as the assessed bushfire prone vegetation;
- Flat as the effective slope having the most impact of any bushfire behaviour;
- >60m distance separating the Forest vegetation and any building.

### **PRECINCT 5 - RESIDENTIAL DEVELOPMENT**

Residential development is proposed for the parcel of land located to the south of Kings Forest Parkway and east of the Town Centre Precinct (Part Lot 1, DP 781633 and Part Lot 40, DP 7482). The area is presently cleared of all over-storey vegetation and managed as grazing land. Precinct 5 is bordered by Kings Forest Parkway, vegetated buffer and Cudgen Nature Reserve to the east, a vegetated buffer to a creek line along the southern boundary; open forest to the northeast; a proposed school site (Precinct 3) to the north; and the proposed Town centre (Precinct 4) to the west. The vegetated buffer along the creek line to the south is zoned 7(l) Environmental Protection 'Wetlands and Littoral Rainforest'; the developable land is zone 2(c) Urban Expansion.

### Asset Protection Zones (APZ)

Based on the assessment of the vegetation communities and slopes present on and adjacent to Precinct 5, and in accordance with Appendix 2 Table A2.5, Planning for Bushfire Protection (RFS 2006), this bushfire risk assessment recommends that Asset Protection Zones (APZ), Inner Protection Area (IPA) and Outer Protection Area (OPA) should be established as listed below.

| Aspect | Vegetation | APZ (m) | IPA (m) | OPA (m) | Compliance with PBP  |
|--------|------------|---------|---------|---------|----------------------|
| East   | Tall Heath | 15      | 15      | 0       | Yes, achieved by the |

|             |           |    |    |   |                                                                               |
|-------------|-----------|----|----|---|-------------------------------------------------------------------------------|
| North, West | Grassland | 10 | 10 | 0 | proposed perimeter road<br>Yes, achieved by the proposed Kings Forest Parkway |
| South       | Forest    | 20 | 15 | 5 | Yes, included within the 50m buffer to zone 7(i) areas                        |

The prescribed Asset Protection Zones are provided by the following features of the concept Plan for Precinct 5 as illustrated in Plan 5.

To the east, a perimeter road, multi-use pathway and landscaped drainage corridor provide a managed buffer along the eastern perimeter that exceeds that required for the APZ. These features shall be constructed within the 20m outer zone of the ecological buffer from Cudgen Nature Reserve. Additionally, a drainage detention basin to be constructed in the northeast corner of the development will contribute to the required APZ.

Along the southern limit of the Precinct 5 development a 50m ecological buffer is required to the zone 7(l) Environmental Protection 'Wetlands and Littoral Rainforest' area. This buffer will include the 20m APZ located towards the residential area and shall include a pedestrian footpath. For the group of allotments at the southwest end of the precinct, the required 20m APZ shall be located within the 50m ecological buffer to the zone 7(l) and zone 7(a) area.

To the west and north, the prescribed APZ is provided by the perimeter roads.

#### Bush Fire Attack Categories

An assessment of the bushfire attack categories applicable to the proposed development in Precinct 5 was carried out using the methodology detailed in Planning for Bushfire Protection (Addendum Appendix 3 2010). This bushfire risk management assessment concluded the following bushfire attack categories are applicable for the proposed development, depending on the separation distance from the assessed bushfire prone vegetation.

| <b>Vegetation</b> | <b>Aspect</b> | <b>Separation distance (m)</b> | <b>Bushfire Attack category</b> |
|-------------------|---------------|--------------------------------|---------------------------------|
| Tall Heath        | East          | 11-<15                         | BAL - 40                        |
|                   |               | 15-<22                         | BAL - 29                        |
|                   |               | 22- <31                        | BAL - 19                        |
|                   |               | 31- <100                       | BAL - 12.5                      |
|                   |               | >100                           | N/A                             |
| Forest            | South         | 16-<21                         | BAL - 40                        |
|                   |               | 21-<31                         | BAL - 29                        |
|                   |               | 31-<42                         | BAL - 19                        |
|                   |               | 42-<100                        | BAL - 12.5                      |
|                   |               | >100                           | N/A                             |
| Grassland         | North, West   | >100m                          | Low                             |

#### Fire Trail

A 6m wide fire trail (4m wide with 1m either side maintained as a grassed verge) is required surrounding proposed allotments along the southern boundary to the Stage

1 development. These allotments are situated to the south of the Perimeter Road. It is recommended that a Fire Trail be constructed within the APZ for these allotments; connecting with the Perimeter Road. This will allow fire fighters access to the bushland interface adjacent to these allotments.

### **ACCESS**

Access to the proposed Precincts will be via Kings Forest Parkway and internal interconnecting roads. All interconnecting roads have been designed less than 200m in length without intersections, the development's roads will be dedicated to Tweed Shire Council and shall comply with the requirements in PBP 2006.

### **SERVICES**

There will be a reticulated water supply to the property. The water supply to this subdivision must use a ring main system with the perimeter road. The fire hydrant spacing, sizing and pressure of this reticulated water supply must comply with AS 2419.1 (2005). Fire hydrants are not located on any carriage way and shall be delineated with blue pavement markers. All above ground water and gas service pipes are metal, including and up to any outside taps. Electrical transmission lines will be underground.

### **CONSTRUCTION STANDARDS**

The Bushfire Risk Management assessment undertaken in relation to the proposed subdivision concluded that the construction standard in accordance with AS 3959 (1999) Construction of Buildings in Bushfire Prone Areas (Standards Australia, 2009) will be assessed and nominated when development applications are submitted for the construction of dwellings on the approved allotments.

### **CONCLUSION**

The proposed development will comply with the minimum requirements for:

- 1). Asset Protection Zones detailed in Table A2.5 Minimum Specifications for Asset Protection Zones for Residential and Rural Residential Subdivision Purposes (for class 1 & 2 buildings) in FDI 80 Fire Areas in the Planning for Bushfire Protection manual (RFS, 2006);
- 2) Access in accordance with section 4.1.3-2 (Property Access) in the Planning for Bushfire Protection manual (RFS, 2006); and
- 3) Development of the Commercial Precinct, Education Precinct and Residential Precinct satisfies the aims of PBP 2006 and will therefore comply with the provisions for Fire Safety under the Building Code of Australia.

# **BUSH FIRE RISK MANAGEMENT PLAN**

## **1.0 SCOPE OF THE PLAN**

The Bushfire Risk Management Plan (BFRMP) is a strategic document which identifies: the level of bush fire risk for human habitation; strategies which will be implemented to manage the bush fire risk identified; and those persons responsible for implementing and maintaining this Bushfire Risk Management Plan.

### **1.1 Area**

This Plan covers the proposed education, residential and commercial development of Stage One of Kings Forest. Kings Forest is situated immediately to the west of Tweed Coast Road, between Casuarina Town Centre and Kingscliff, within Tweed Shire Council Local Government Area.

### **1.2 Period of Operation**

Once a Bush Fire Safety Authority has been issued by the NSW Rural Fire Service and approved by the Local Authority, this Plan will have a period of operation of the life of the development or until such time that further development of the allotments is proposed.

### **1.3 Aim and objectives of the Plan**

The aim of this Plan is to provide for the mitigation of bush fires for the protection of life and property for the habitants, visitors and emergency personnel in bush fire situations Secondly, the Plan aims to reduce the treat to ecological and environmental assets. To achieve this aim, the Bushfire Risk Management Plan must address a number of specific objectives.

- i. Identify the area most at risk from bush fire attack;
- ii. Reduce the risk of bush fire damage to life and property;
- iii. Ensure that the developer/owner/occupier understands their bush fire management responsibilities;
- iv. Reduce the impact of bush fire on the development;
- v. Develop sustainable Asset Protection Zones (APZ) surrounding the proposed building

### **1.4 Bushfire Risk Management Strategies**

This Plan contains a number of strategies, which are directed at addressing the risk to the commercial, retail, school and residential developments from bushfire emergencies. This is achieved through addressing and managing fuel loads, separation distances from the assessed dominant bushfire vegetation, and recommending appropriate bushfire building

standards.

### **1.5 Implementation**

Implementation of the strategies in this Plan is the responsibility of the developer and shall be undertaken as part of the development infrastructure. The ongoing maintenance of the strategies in this Plan shall be the responsibility of the owner/occupiers of each proposed residential allotments to the limit of their property boundaries. Finally, the local authority or their delegated authority, for the life of the development shall monitor this Plan.

## **2.0 LEGISLATIVE BUSHFIRE HAZARD MANAGEMENT RESPONSIBILITIES**

### **2.1 Tweed Shire Council**

The Tweed Shire Council has responsibility, under Section 66 of the Rural Fires Act, to issue a notice in writing requiring an owner / occupier of any land within the LGA to carry out bushfire hazard reduction works on that land. Section 100E of the Rural Fires Act requires the council to issue bushfire hazard reduction certificates for hazard reduction to be undertaken on private lands.

### **2.2 New South Wales Rural Fire Service**

The NSW Rural Fire Service (RFS) has the responsibility for undertaking fire suppression activities, hazard management activities and other functions relative to emergency management, within its areas of operation. Section 73 of the Rural Fires Act (1997) enables the Commissioner to carry out bush fire hazard reduction works on any land as required by a bush fire risk management plan if the work has not been carried out satisfactorily. Incurred costs can be recovered as a debt owed to the Crown.

### **2.3 NSW Fire Brigade**

The NSW Fire Brigade has the responsibility for undertaking fire suppression activities, and other functions relative to emergency management, within its area of operation. Through mutual aid agreements, the NSW Fire Brigade can provide assistance to the NSW Rural Fire Service, particularly for structural fire operations within the NSW Rural Fire Brigade Districts. Furthermore, Hazmat operations within New South Wales are the responsibility of the NSW Fire Brigade.

### **2.4 Far North Coast Bush Fire Management Committee**

The Far North Coast Bushfire Management Committee has the responsibility for planning for co-ordinated fire fighting activities / hazard management activities on a local government level. It is not an operational organisation, a fire fighting organisation or a funding source for

fire management activities. The Bush Fire Management Committee is supported by the following provisions of the Rural Fires Act (1997).

**Section 50** of the Act requires the Bush Fire Co-ordinating Committee to constitute a Bush Fire Management Committee for the whole of the area of any local Council area for which a rural fire district is constituted.

**Section 51(1A)** requires a Bush Fire Management Committee to report to the Bush Fire Coordinating Committee on the implementation of the requirements of the Bushfire Risk Management Plan.

**Section 52** requires each Bush Fire Management Committee to prepare a draft bush fire management plan for their local areas which includes a plan of operations and a bush fire risk management plan.

**Section 54** of the Act specifies that a draft bush fire risk management plan is to 'set out schemes for the reduction of bush fire hazards in the rural fire district or other part of the State'. A draft bush fire risk management plan may also restrict or prohibit the use of fire or other fire hazard reduction activities in all or specified circumstances or places to which the plan applies.

## **2.5 Private Land Owners / Occupiers**

The Rural Fires Act, 1997 provides several legislative opportunities to require land owners and occupiers to manage hazardous fuels. These are listed below:

**Section 63(2)** states that 'it is the duty of the owner or occupier of land to take the notified steps (if any) and any other practicable steps to prevent the occurrence of fires on, and to minimise the danger of the spread of fires on or from that land'. In this section; 'notified steps' means any steps that:

- (a) a bushfire risk management plan (or the Co-ordinating Committee) advises a person to take;
- (b) are included in a bush fire risk management plan that applies to that land.

**Section 87** allows the removal of hazards in the bush fire danger period by the provision of a permit system. The permits are valid for 21 days, excluding total fire ban (TOBAN) days. Section 10 permits are not required to adhere to Part V provisions of the Environmental Planning & Assessment Act (1979) (EP&A Act) in any assessment of impact, except for public authorities. An owner/occupier of private land must obtain from the NSW Rural Fire Service, a bushfire hazard reduction certificate before undertaking hazard reduction works on that land (see Section 100E of the Rural Fires Act (1997)).

## **2.6 NSW Rural Fire District BFRMP**

The Tweed Shire Council's Bushfire Management Options are to:

- (a) **Reduce the hazard** - encourages the development of asset protection zones along the settlement area - bushland interface.
- (b) **Reduce vulnerability** - maintain development and building controls and standards appropriate to the level of hazard.

## **3.0 INTRODUCTION**

Development application on bushfire prone land must be accompanied by a Bush Fire Safety Authority (BFSA) provided by the Rural Fire Service. Application for a BFSA should follow

the requirements of Clause 46, Rural Fires Act, listed as Appendix 4 of the Planning for Bushfire Protection 2006 guidelines (RFS, 2006). In particular, this shall include:

- a) A statement that the site is bush fire prone land, where applicable;
- b) The location, extent and vegetation formation of any bushland on or within 100m of the site;
- c) The slope and aspect of the site and of any bush fire prone land within 100m of the site, which may determine the likely path of any bush fire;
- d) Any features on or adjoining the site that may mitigate the impact of a high intensity bush fire on the proposed development;
- e) A statement of the likely environmental impact of any proposed bush fire protection measures; and
- f) Whether any building complies with AS 3959/1999 in relation to the construction level for bush fire protection.

The Kings Forest Community Concept Plan (06-0318) was approved by the Minister of Planning on 19 August 2010 under SEPP (Major Projects), 2005. This concept plan caters for residential community (including subdivision), educational facility, a town centre, commercial zones; a golf course and club house; a neighbourhood centre and a regional community facility.

For Stage 1 of the Kings Forest development (08-0194), to which this Bushfire Risk Management Plan relates, the Director General's environmental assessment requirements state at Item 6.3:

*"In order to ensure the protection of property and assets, a detailed bushfire assessment and management plan prepared by a suitably qualified person must be submitted. The assessment must, at a minimum, demonstrate consistency with the requirements of Planning for Bushfire Protection 2006. All asset protection zones must be clearly specified on the Plan of Development and all affected lots are to be encumbered with a Section 88B instrument under the NSW Conveyancing Act 1919."*

Whilst Part 3A development applications are assessed differently, there is still the need, through the Director General's environmental assessment requirements listed above, to fully consider the bushfire risk to the proposed development. This is best achieved through reference to the methodology outlined in Appendix 4 of the Planning for Bushfire Protection 2006 guideline (RFS, 2006); this assessment involved the following activities:

- i. Verifying of terrain attributes in relation to the assessed bushfire vegetation.
- ii. Identification of the appropriate bushfire protection for any identified environmental assets.

- iii. Determination of the location of adequate water supplies for fire fighting purposes.
- iv. Identifying the capacity of public roads to handle increased volumes of traffic in a bushfire situation.
- v. Identification of adequacies for implementation of fire trails which link to Public roads in the vicinity.
- vi. Identification of adequacy of arrangements for access and egress from the development for the purposes of an emergency response.
- vii. Identification of construction standards to be used for building elements in the development.
- viii. Identification of adequacy of bushfire maintenance plans and fire emergency procedures for the development.
- ix. Identification of additional bushfire protection measures.

### **3.1 Description of property**

The Kings Forest site is located immediately west of Tweed Coast Road, between Casuarina Town Centre and Kingscliff on the north coast of NSW and covers an area of 880Ha. The property has previously been sand mined; utilised for turf production, dairying, small cropping, livestock grazing, sugar-cane production; and for pine plantations. Current activities include livestock grazing and harvesting of the mature pine forests growing on the subject land. It is the intention of the proponents to continue with the livestock grazing activity until urban development commences.

Within the zone 2(c) Urban Expansion areas, most of the vegetation has been cleared and managed as grassland for livestock grazing. Adjoining these lands are mature pine forests (*Pinus elliottii*) in the process of being harvested. These forests delineate the extent of arable grazing land with the Pine forests being grown in the less-fertile or poorly-draining areas of the subject property. Substantial areas of native vegetation occur within the low-lying flood-prone areas and along the small creeks and gullies that intersect the property; these areas being protected under the zone 7(a) and 7(l) Environmental Protection classifications.

The subject land is bordered to the north and west of rural grazing land and/or tropical fruit orchards. The disused refuse facility immediately to the north of the subject site is being remediated to playing fields by Tweed Shire Council. Cudgen Nature Reserve, including Cudgen Lake (State Environmental Planning Policy No. 14 Coastal Wetlands), occurs to the south and east of the property.

### 3.2 Proposal

This Project Application seeks approval for Stage One of the Kings Forest project. Development is consistent with the objectives of the Far North Coast Regional Strategy (Dept. Planning, 2006) and will involve a commercial precinct, a school site and residential areas in accordance with the Concept Plan (JBA Urban Planning Consultants, 2008). The land subject to this proposal is the north east portion of the Property and comprises the following precincts as illustrated on the concept plan (Plan 1).

- Precinct 1 - Commercial development situated to the east of Tweed Coast Rd*
- Precinct 3 - Education facility / 3 future development lots, north of Kings Forest Parkway*
- Precinct 5 - Residential development*

Each precinct is assessed according to the methodology outlined in Appendix 4, Planning for Bushfire Protection 2006 and presented in the following 5 sections.

### 3.3 Ecological buffers

As part of SEPP (Major Development) 2005 Amendment No. 10, gazetted in November, 2006 (Government Gazette No. 135, p. 9515) 50m wide ecological buffers are required from any lands designated as zone 7(a) or zone 7(l) Environmental Protection. Development within any ecological buffer must meet the objectives outlined in clause 7(2) and 7(3) of Part 6 Kings Forest Site, Schedule 3 State Significant Sites of SEPP (Major Development) 2005 as listed below:

- a) To protect wetlands or areas of particular habitat significance;
- b) To restrict development so that, as far as practicable, it does not occur within ecological buffers;
- c) To help ensure that development is designed, sited and managed so as to minimise its impact on the ecological and hydrological functions of the ecological buffers; and
- d) To encourage the restoration and maintenance of the native vegetation and ecological processes of the land within and adjacent to wetlands or areas of particular habitat significance.

Vegetation management to achieve the standard for an Asset Protection Zone requested by the Rural Fire Service (RFS, 2006) should be undertaken within the 20m wide outer zone to any ecological buffer adjacent to any proposed development. This will satisfy the objectives of an ecological buffer in protecting the environmentally sensitive areas. Consequently, the inclusion of any APZ within the outer margin to the ecological buffer should be permissible with consent (James Warren & Associates, 2009).

#### **4.0 PRECINCT 1 COMMERCIAL DEVELOPMENT**

A commercial development is proposed for the parcel of land on the east side of Tweed Coast Road (Lot 7, DP 875447). The proposal involves 2 buildings, public and staff car parking areas, separate car and truck entries and a designated truck manoeuvring area incorporating a drive-through pickup facility (Plan 2). The public car park is located in front of the two buildings and towards the bushfire hazard. This Precinct adjoins State Environmental Planning Policy (SEPP) 14 'Coastal Wetlands' to the south and east that is protected as Zone 7(a) Environmental Protection "Wetland and Littoral Rainforest". There is a 50m ecological buffer to be established along the southern and eastern margins of the developable area of this Precinct between the 7(a) zone and any development. This is a requirement of the SEPP (Major Projects) Amendment No. 10 as illustrated in Attachment 2.

#### **4.1 Vegetation classification**

The vegetation for this precinct and adjacent properties up to 140m (where practicable) from the proposed development were assessed during a site visit on 4<sup>th</sup> of November, 2009. The vegetation communities present were identified and classified into formations as described in Keith (2004). Appendix A2.3 of Planning for Bushfire Protection (PBP) manual (RFS, 2006) outlines the methodology for determining the predominant bushfire prone vegetation to the distance of at least 140 metres in all directions from the future development on the site. Vegetation is classified using Table A2.1 of Planning for Bushfire Protection 2006, which classifies vegetation types into the following groups:

- |                                                                  |                            |
|------------------------------------------------------------------|----------------------------|
| (a) Forests [wet & dry sclerophyll forests];                     | (g) Freshwater Wetlands;   |
| (b) Woodlands;                                                   | (h) Saline Wetlands        |
| (c) Plantations – being pine plantations not native plantations; | (i) Alpine Complex;        |
| (d) Forested Wetlands;                                           | (j) Semi – arid Woodlands; |
| (e) Tall Heath lands;                                            | (k) Arid Woodlands; and    |
| (f) Short Heath lands;                                           | (l) Rainforests            |

#### **4.2 Vegetation communities present on Precinct 1**

*Community 1 Managed Grassland:* The northern portion of the land is cleared of all over-storey vegetation and maintained as grassland.

*Community 2 Forest:* A narrow (c. 20m wide) area of Subtropical Lowland Forest is present to the south and east towards Cudgen Creek (boundary to Precinct) merging into Littoral Rainforest near Cudgen Creek. This vegetation is within the 7(a) Environmental Protection

(Wetland and Littoral Rainforest) LEP zone. Subtropical Floodplain Forest and Littoral Rainforest are endangered ecological communities and protected under the NSW Threatened Species Conservation Act (1995). The Concept Plan provides for a 50m ecological buffer from this vegetation, consisting of a 30m vegetated inner zone as a barrier to weed invasion and a 20m outer zone that shall include roads, footpaths, cycle-ways, stormwater management, passive recreation and Asset Protection Zones for bushfire protection.

#### **4.3 Vegetation within 140m from Precinct 1**

Existing exotic pine plantations (*Pinus elliottii*) in the process of being harvested are present immediately to the north and northeast of the subject land. Cleared grazing / lifestyle residences are present beyond the Pine Plantations. Cudgen Creek and riparian vegetation (Subtropical Floodplain Forest and Littoral Rainforest) is present to the east and southeast. Cudgen Nature Reserve, comprising a Banksia-dominated Tall Heath community occurs to the south; whilst to the west is the Tweed Coast Road reserve and developed residences.

#### **4.4 Assessed Dominant Bushfire Vegetation in Relation to the Precinct**

The Subtropical Floodplain Forest / Littoral Rainforest area is assessed as Category 1 Bushfire prone vegetation, according to the Tweed Shire Bush Fire Prone Lands (TSBPL) map (Tweed Shire Council, 2004) with the remainder of the subject land within the 100m buffer to this vegetation.

The onsite bushfire hazard assessment identified the Subtropical Floodplain Forest and Littoral Rainforest to the south and east of the subject land as the dominant bushfire prone vegetation in relation to the development of Precinct 1.

#### **4.5 Landform assessment**

Inspection of published topographic maps and an on-site assessment using a clinometer verified the following land forms were present over this Precinct. The land comprises alluvial flats that are generally flat towards the banks of Cudgen Creek.

#### **4.6 Assessed Dominant Slope in relation to identified bushfire prone vegetation**

Appendix 2 of Planning for Bushfire Protection (RFS, 2006) recommends that slopes should be assessed, over a distance of at least 100m from a development site and that the dominant gradient of the land should be determined on the basis of which will most significantly influence the fire behaviour at the site. The terrain is flat for the vegetation to the east and south; flat towards Tweed Coast Road and the residential development to the west; and upslope to the north.

#### 4.7. Environmental considerations

The Subtropical Floodplain Forest and Littoral Rainforest areas are protected as endangered ecological communities. No removal of this vegetation is permitted under the Tweed LEP or proposed in the Concept Plan for the development. A 50m ecological buffer is proposed to separate any development from this vegetation.

#### 4.8 Asset Protection Zones

Based on the assessment of the vegetation communities and slopes present on and adjacent to Precinct 1, and in accordance with Appendix 2 Table A2.5, Planning for Bushfire Protection (RFS 2006), this bushfire risk assessment recommends that Asset Protection Zones (APZ), Inner Protection Area (IPA) and Outer Protection Area (OPA) should be established as listed in Table 2.

There is no requirement to establish an Asset Protection Zone for bushfire protection for this development for the north and west aspects since there will be no bushfire prone vegetation within 100m in the Precinct boundary in these directions once the Pine Plantations have been removed. A 20m Asset Protection Zone is recommended for bushfire protection to the east and south; comprising a 10m Inner Protection Area and 10m Outer Protection Area. This APZ is obtained by utilising the 20m outer margin of the ecological buffer to the Subtropical Floodplain Forest and Littoral Rainforest endangered ecological communities. All available land to the east of Building A shall be incorporated in the APZ; this area is proposed to be developed as delivery vehicle unloading and manoeuvring areas and meets the requirements for an APZ. The required APZ are illustrated on Plan 2.

**Table 2 Asset Protection Zones for Precinct 1**

| Aspect | Vegetation | APZ (m) | IPA (m) | OPA (m) | Compliance with PBP |
|--------|------------|---------|---------|---------|---------------------|
| South  | Forest     | 20      | 10      | 10      | Yes                 |
| East   | Forest     | 20      | 10      | 10      | Yes                 |

#### 4.9 Assessed Bushfire Attack Category

An assessment of the bushfire attack categories applicable to the proposed development in Precinct 1 was carried out using the methodology detailed in Planning for Bushfire Protection (Addendum Appendix 3 (2010)). This bushfire risk management assessment concluded that commercial Building A will be in the **BAL - 40** Bushfire Attack Category according to Table A 3.4 Determination of Category of Bush Fire Attack FDI 80 (FRS, 2006) with the following site attributes:

- Forest as the Bushfire prone vegetation to the east and south
- This vegetation occurs on a flat slope

- A minimum separation of 20m is achievable from this vegetation

For Building B, a **BAL - 19** Bushfire Attack Category according to Table A 3.4 Determination of Category of Bush fire Attack FDI 80 (FRS, 2006) with the following site attributes:

- Forest as the Bushfire prone vegetation to the east and south
- This vegetation occurs on a flat slope
- A minimum separation of 35m is achievable from this vegetation

#### **4.10 Services (Electricity Supply, Water, Gas)**

Where possible electrical transmission lines should be underground; where overhead electrical transmission lines are installed, lines should be installed with short pole spacing, unless crossing gullies, gorges or riparian areas. No part of a tree should be closer to a power line than the distance set by the appropriate authority. Regular inspection of lines is required to ensure they are not fouled by branches.

Reticulated water is available to the development and will be supplied to each allotment through the town mains system in accordance with local water authority, council development control plans (DCPs) or any other policies and procedures.

- a) External fire hydrants will be installed and located in accordance with Australian Standard 2419-1, the hydrants shall be installed so as a clear unobstructed path to each designated building envelope, and
- b) The fire hydrants shall be installed at a maximum distance of 80m from the furthest extremity of the building/s, and
- c) The location of fire hydrants shall be delineated by blue pavement markers in the centre of the road, and
- d) All delivery water lines shall be installed underground to a minimum depth of three hundred millimetres (300mm), with all points above ground using metal pipes or raisers with a minimum internal diameter of nineteen millimetres (19mm).

#### **4.11 Public Road Capacity to Handle Increased Volumes of Traffic in a Bushfire Emergency**

The public road (Tweed Coast Road) in the vicinity of the subject property is adequate to handle increased volumes of traffic in a bushfire emergency. This road;

- has a bitumen surface;
- is two-way, allowing traffic to pass in opposite directions; and
- has the capacity to carry fully loaded fire fighting vehicles

Access to the proposed Precinct will be via constructed driveways from Tweed Coast Road. This will involve separate car and truck entries. There is also provision for vehicles to gain access to the rear storage areas via a driveway along the northern margin and where required, to enter the drive-through pickup area and return to Tweed Coast Road via a exit in front of the public car park.

Fire Trails are not required since the bushfire hazard can be accessed from the proposed access roads and car park areas. The Delivery / Pickup vehicle entry along the northern boundary and the public car park serve as a perimeter road providing adequate access to the bushland interface.

### **5.0 PRECINCT 3 SCHOOL SITE (SPECIAL FIRE PROTECTION PURPOSE DEVELOPMENT)**

A school site is proposed on land situated within the south-west portion of the precinct. The remaining land within this precinct presently has undetermined future uses. Precinct 3 is located between Precinct 2 to the east and the remediated Depot Road refuse facility (open space / playing fields) to the west on land identified as Part Lot 1, DP 781633. To the north of this Precinct is the northern boundary of the Kings Forest property after which livestock grazing / lifestyle properties occur. To the south occurs the Kings Forest Parkway followed by a proposed residential development (Precinct 5).

Development applications for Special Fire Protection Purposes (SFPP) such as this school that are on bush fire prone land must be accompanied by a bush fire assessment report that demonstrates compliance with the aim and objectives of the Planning for Bushfire Protection (PBP) guidelines. Whilst there is a continuance of applying the principle of adopting a number of bushfire protection measures in combination; for a Special Fire Protection Purpose development, there is more of an emphasis on the space surrounding the dwellings as defensible space and Asset Protection Zones and less on the standard of building construction.

### **5.1 Vegetation classification**

The vegetation for this Precinct and adjacent properties up to 140m (where practicable) from the proposed development were assessed during a site visit on 4<sup>th</sup> of November, 2009. The vegetation communities present were identified and classified into formations as described in Keith (2004).

*Community 1 Managed Grassland:* All of the developable area of Precinct 3 has been cleared of all over-storey vegetation and maintained as grassland.

*Community 2 Forested Wetland:* An area of Swamp Mahogany (*E. robusta*) occurs to the north of Depot Road in a low lying drainage area. This vegetation has zone 7(l) Environmental Protection 'habitat' protection under the Tweed LEP as important Koala habitat. A 50m ecological buffer must be provided from this vegetation to any development as required by the SEPP (Major Development) 2005 Amendment No. 10.

*Community 3 Riparian (Rainforest equivalent) vegetation:* A narrow drainage channel bisects the Precinct area from near the south-western corner towards the drainage area and Community 2 to the northeast. This community comprises Broad-leaved Paperbark (*M. quinquenervia*) and Swamp Mahogany (*E. robusta*) and is generally quite open (tree spacings greater than 5 metres). Whilst the vegetation is not identified as requiring special protection under any planning instrument, all trees have been marked by spray paint and retained during previous site clearing activities (Figure 5). Any Koala food resources should be retained within any development of this school site.



**Figure 5: Koala resource trees presently retained within a narrow drainage channel during site clearing (Photographs, S. Cotter).**

## **5.2 Vegetation within 140m from Precinct 3**

*Community 4 Managed Grassland:* The Depot Road refuse facility is being remediated to open space / playing fields for recreational use. This area will be managed by Tweed Shire Council under their Parks and Gardens schedule to a low closed grassland community structure. Similar vegetation occurs to the north and south of the Precinct as livestock grazing land.

*Community 5 Forest:* To the south of Kings Forest Parkway and east of this Precinct, on land designated an zone 7(l) Environmental Protection 'habitat' is an open forest dominated by Broad-leaved Paperbark (*Melaleuca quinquenervia*), Scribbly Gum (*Eucalyptus signata*), Swamp Turpentine (*Lophostemon suaveolens*) Rough-barked Apple (*Angophora subvelutina* x *robur*) and Slash Pine (*Pinus elliotii*) escapes with a heathy understorey of Black She-Oak (*Allocasurina littoralis*), Coast Banksia (*Banksia serrata*) and Tea trees (*Leptospermum* sp.).

### 5.3 Assessed Dominant Bushfire Vegetation in Relation to the Proposed Precinct

The eastern portion of this Precinct, north of the existing Depot Road (Kings Forest Parkway) is assessed as Category 1 Bushfire prone vegetation, according to the Tweed Shire Bush Fire Prone Lands (TSBPL) map (Tweed Shire Council, 2004); with Category 2 vegetation immediately to the west followed by the 100m Buffer Zone. To the south of Kings Forest Parkway, the eastern portion of the Precinct is within the 100m buffer to bushfire prone vegetation with the remaining areas not classified.

The onsite bushfire hazard assessment identified the Forest vegetation to the south and the Swamp Mahogany forest to the north and within the development site as the dominant bushfire prone vegetation in relation to the development of Precinct 3.

### 5.4 Landform assessment

Inspection of published topographic maps and an on-site assessment using an inclinometer verified that the land is entirely flat and surrounded by level ground for greater than 100m in all directions. The small narrow drainage channel bisects the Precinct from the south west to the north east. This channel is less than 5m in width with shallow sloping banks.

### 5.5. Environmental considerations

The Swamp Mahogany vegetation present along the small drainage area near the northern boundary represents an important Koala habitat. As part of the Threatened Species management plan for the proposed development, a 50m buffer is required surrounding this drainage area. Development within this ecological buffer must meet the objectives listed above.

### 5.6 Asset Protection Zones

Based on the assessment of the vegetation communities and slopes present on and adjacent to Precinct 3, and in accordance with Appendix 2 Table A2.5, Planning for Bushfire Protection (RFS 2006), this bushfire risk assessment recommends that Asset Protection Zones (APZ), Inner Protection Area (IPA) and Outer Protection Area (OPA) should be established as listed in Table 6.

**Table 6: Asset Protection Zones for Precinct 3**

| Aspect                | Vegetation       | APZ (m) | IPA (m) | OPA (m) | Compliance with PBP |
|-----------------------|------------------|---------|---------|---------|---------------------|
| <b>Education Site</b> |                  |         |         |         |                     |
| North                 | Forested Wetland | 50      | 50      | 0       | Yes                 |
| East                  | Forest           | 60      | 20      | 40      | Yes                 |

It is recommended that the recommended Asset Protection Zones include playing fields and open space as well as non-vegetated uses such as roads, paths and cycle ways, playgrounds, equipment sheds, amenities buildings and car parking areas.

The prescribed APZ for the east elevation towards the forest vegetation is partly provided by the proposed Kings Forest Parkway road reserve (c. 40m in width).

## **5.7 Assessed Bushfire Attack Category**

### **Education Site:**

An assessment of the bushfire attack categories applicable to the proposed development was carried out using the methodology detailed in Appendix 3 of Planning for Bushfire Protection (RFS, 2006). The bushfire risk management assessment undertaken in relation to the proposed development concluded a **BAL – 12.5** bushfire attack category for any dwellings proposed for within the school site, after reference to Table A 3.4 Determination of Category of Bushfire Attack, FDI 80 in the Planning for Bushfire Protection manual (RFS, 2006) with the following parameters:

- Forested Wetland as the assessed bushfire prone vegetation;
- Flat as the effective slope having the most impact of any bushfire behaviour; and
- >50m distance separating the Forested Wetland vegetation and any building.

And

- Forest as the assessed bushfire prone vegetation;
- Flat as the effective slope having the most impact of any bushfire behaviour; and
- >60m distance separating the Forest vegetation and any building.

The **BAL – 12.5** category for bush fire attack protection as listed in PBP (RFS, 2006) indicates that attack by burning debris may be significant, whilst radiant heat is unlikely to threaten building elements. Specific construction requirements are only warranted for ember protection and/or flammable debris accumulation.

## **5.8 Services (Electricity Supply, Water, Gas)**

Where possible electrical transmission lines should be underground; where overhead electrical transmission lines are installed, lines should be installed with short pole spacing, unless crossing gullies, gorges or riparian areas. No part of a tree should be closer to a power line than the distance set by the appropriate authority. Regular inspection of lines is required to ensure they are not fouled by branches.

Reticulated water is available to the development and will be supplied to each allotment through the town mains system in accordance with local water authority, council development control plans (DCPs) or any other policies and procedures.

- e) External fire hydrants will be installed and located in accordance with Australian Standard 2419-1, the hydrants shall be installed so as a clear unobstructed path to each designated building envelope, and
- f) The fire hydrants shall be installed at a maximum distance of 80m from the furthest extremity of the building/s, and
- g) The location of fire hydrants shall be delineated by blue pavement markers in the centre of the road, and
- h) All delivery water lines shall be installed underground to a minimum depth of three hundred millimetres (300mm), with all points above ground using metal pipes or raisers with a minimum internal diameter of nineteen millimetres (19mm).

### **5.9 Public Road Capacity to Handle Increased Volumes of Traffic in a Bushfire Emergency**

The public roads (Tweed Coast Road, Kings Forest Parkway) in the vicinity of the subject property are adequate to handle increased volumes of traffic in a bushfire emergency. These roads;

- have a bitumen surface;
- are two-way, allowing traffic to pass in opposite directions; and
- have the capacity to carry fully loaded fire fighting vehicles

Access to the proposed Precinct will be via a constructed driveway from Kings Forest Parkway. It is recommended that any staff car parking areas are located between the school buildings and any bushfire hazard, and can be located within the agricultural buffer zone.

Fire Trails are not required since the bushfire hazard can be accessed from the proposed access roads and car park areas providing adequate access to the bushland interface.

### **5.10 Additional Protection measures**

During emergencies, the risk to fire-fighters and other emergency services personnel can be great through prolonged exposure, where door-to-door warnings are being given and exposure to the bush fire is imminent. As such, a specific objective for Special Fire Protection Purposes developments requires the preparation of a bush fire emergency management plan to minimise the risks to personnel (RFS, 2006). It is a recommendation of this report, that, prior to an occupation certificate for the development be granted, a Bushfire Emergency Management Plan be submitted for approval by the Rural Fire Service.

## **6.0 PRECINCT 5 RESIDENTIAL DEVELOPMENT**

Residential development is proposed for the parcel of land located to the south of Kings Forest Parkway and east of the Town Centre Precinct (Part Lot 1, DP 781633 and Part Lot 40, DP 7482). The area is presently cleared of all over-storey vegetation and managed as grazing land. Precinct 5 is surrounded by the Cudgen Nature Reserve to the east, a vegetated buffer to a creek line along the southern boundary and residual pine plantations; open forest to the northeast; and a proposed school site (Precinct 3) to the north. The vegetated buffer along the creek line to the south is zoned 7(a) Environmental Protection 'Littoral Rainforest and Wetland', whereas the developable land is zone 2(c) Urban Expansion.

The residential development will comprise a range of dwelling types (mews, plexes, zero-lot, conventional, terrace homes, SOHO and medium density dwellings), generally serviced by a perimeter road, interconnecting roads and cul-de-sacs. A central open space / park of 1.86 Ha is proposed with a drainage detention basin located in the northeast portion of the development.

### **6.1 Vegetation classification**

The vegetation for this precinct and adjacent properties up to 140m (where practicable) from the proposed development were assessed during a site visit on 4<sup>th</sup> of November, 2009. The vegetation communities present were identified and classified into formations as described in Keith (2004).

*Community 1 Managed Grassland:* All of the developable area of Precinct 5 has been cleared of all over-storey vegetation and maintained as grassland.

### **6.2 Vegetation within 140m from Precinct 5**

*Community 2 Tall Heath:* Cudgen Nature Reserve to the east of the subject land comprises a Tall Heath community dominated by Coast Banksia (*Banksia serrata*), with Tea trees (*Leptospermum* sp.), Rough-barked Apple (*Angophora subvelutina x robur*) and Slash Pine (*Pinus elliotii*) escapes with occasional Scribbly Gum (*Eucalyptus signata*) as emergent trees (Figure 10).



**Figure 10: Tall Heath vegetation within Cudgen Nature Reserve (Photograph, S. Cotter).**

*Community 3 Open Forest:* To the south of Kings Forest Parkway, on land designated an zone 7(l) Environmental Protection 'habitat' is an open forest (Figure 13) dominated by Broad-leaved Paperbark (*Melaleuca quinquenervia*), Scribbly Gum (*Eucalyptus signata*), Swamp Turpentine (*Lophostemon suaveolens*) Rough-barked Apple (*Angophora subvelutina* x *robur*) and Slash Pine (*Pinus elliotii*) escapes with a heathy understorey of Black She-Oak (*Allocasurina littoralis*), Coast Banksia (*Banksia serrata*) and Tea trees (*Leptospermum* sp.).



**Figure 11: Tall Open Forest to the south of Kings Forest parkway Photograph, S. Cotter).**

*Community 4 Subtropical Floodplain Forest:* Regenerating Floodplain Forest forms the vegetated buffer with the creek line along the southern boundary of this Precinct. This vegetation is protected as part of the zone 7(l) Environmental Protection 'habitat'.

### **6.3 Assessed Dominant Bushfire Vegetation in Relation to the Proposed Precinct,**

The eastern and southern margins of this Precinct are assessed as within the 100m buffer to Category 1 Bushfire prone vegetation, according to the Tweed Shire Bush Fire Prone Lands (TSBPL) map (Tweed Shire Council, 2004) with the remaining land not classified as being bushfire prone land. The Subtropical Floodplain Forest and Littoral Rainforest along a tributary to Cudgen Creek to the south and the Tall Heath (Cudgen Nature Reserve) to the east were assessed as the bushfire prone vegetation most influencing development within this Precinct.



**Figure 12: Subtropical Floodplain Forest vegetation – zone 7(l) along the southern margin of the Precinct (photograph, S. Cotter).**

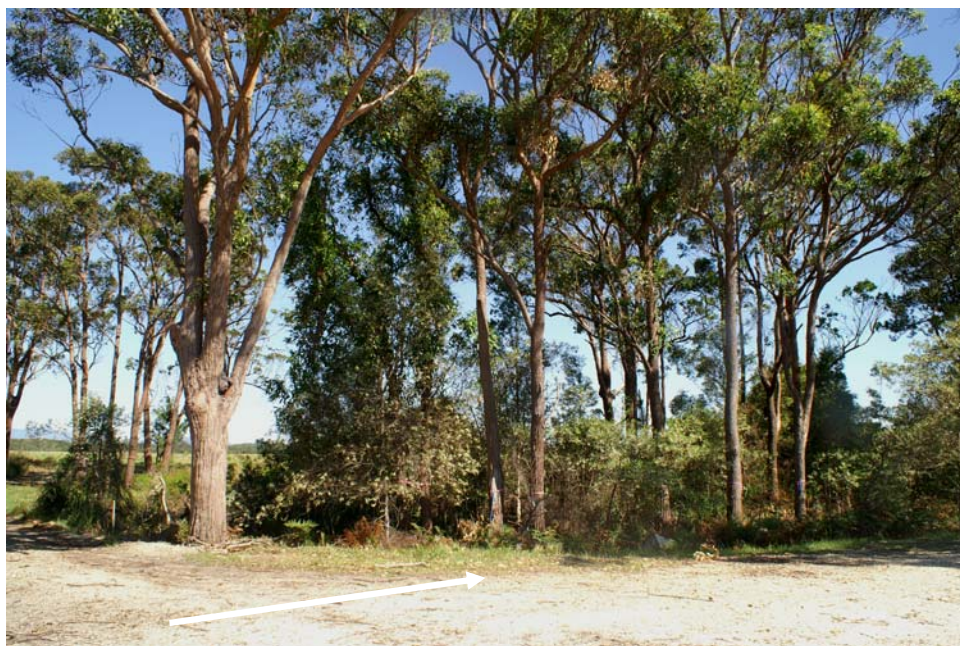
### **6.4 Landform assessment**

Inspection of published topographic maps and an on-site assessment using an inclinometer verified that the land is generally flat and is surrounded by level ground for greater than 100m to the north, west and east. To the south the ground surface slopes downwards at between 0 and 5° towards the tributary to Cudgen Creek.

### **6.5. Environmental considerations**

The Subtropical floodplain Forest and Littoral Rainforest areas are protected as endangered ecological communities. No removal of the vegetation is permitted under the Tweed LEP or

proposed in the Concept Plan for the development. This vegetation represents Primary Koala Habitat and hence all known Koala-preferred tree species shall be retained for the development (Figure 13).



**Figure 13: Koala-preferred Swamp Mahogany trees within a small gully, marked with flagging tape (arrow) to be retained (Photograph, S. Cotter).**

## 6.6 Asset Protection Zones

Based on the assessment of the vegetation communities and slopes present on and adjacent to Precinct 5, and in accordance with Appendix 2 Table A2.5, Planning for Bushfire Protection (RFS 2006), this bushfire risk assessment recommends that Asset Protection Zones (APZ), Inner Protection Area (IPA) and Outer Protection Area (OPA) should be established as listed in Table 8.

**Table 8: Asset Protection Zones for Precinct 5**

| Aspect      | Vegetation | APZ (m) | IPA (m) | OPA (m) | Compliance with PBP |
|-------------|------------|---------|---------|---------|---------------------|
| East        | Tall Heath | 15      | 15      | 0       | Yes                 |
| North, West | Grassland  | 10      | 10      | 0       | Yes                 |
| South       | Forest     | 20      | 15      | 5       | Yes                 |

The prescribed Asset Protection Zones are provided by the following features of the concept Plan for Precinct 5 as illustrated in Plan 5.

To the east, a perimeter road, multi-use pathway and landscaped drainage corridor provide a managed buffer along the eastern perimeter that exceeds that required for the APZ. These features shall be constructed within the 20m outer margin of the ecological buffer from

Cudgen Nature Reserve. Additionally, a drainage detention basin to be constructed in the northeast corner of the development will contribute to the required APZ.

Along the south eastern limit of Precinct 5, a 50m ecological buffer is required from the zone 7(l) Environmental Protection 'habitat' lands. The 20m outer margin of this buffer will include the required APZ including a pedestrian footpath.

For the south western limit, a 50m ecological buffer is required from the zone 7(l) Environmental Protection 'habitat' and zone 7(a) 'Wetlands and Littoral Rainforest' lands. The 20m outer margin of this buffer will include the required APZ.

To the west and north, the prescribed APZ is provided by perimeter roads (Kings Forest Parkway and un-named future roads.

## 6.7 Assessed Bushfire Attack Category

*An assessment of the bushfire attack categories applicable to the proposed development in Precinct 5 was carried out using the methodology detailed in Planning for Bushfire Protection (Addendum Appendix 3 (2010)). This bushfire risk management assessment concluded the following bushfire attack categories are applicable for the proposed development, depending on the separation distance from the assessed bushfire prone vegetation. (Table 9).*

**Table 9: Bushfire Attack categories applicable to Precinct 5**

| Vegetation | Aspect      | Separation distance (m) | Bushfire Attack category |
|------------|-------------|-------------------------|--------------------------|
| Tall Heath | East        | 11-<15                  | BAL - 40                 |
|            |             | 15-<22                  | BAL - 29                 |
|            |             | 22- <31                 | BAL – 19                 |
|            |             | 31- <100                | BAL – 12.5               |
|            |             | >100                    | N/A                      |
| Forest     | South       | 16-<21                  | BAL - 40                 |
|            |             | 21-<31                  | BAL - 29                 |
|            |             | 31-<42                  | BAL – 19                 |
|            |             | 42-<100                 | BAL – 12.5               |
|            |             | >100                    | N/A                      |
| Grassland  | North, West | >100m                   | Low                      |

## 6.8 Services (Electricity Supply, Water, Gas)

Where possible electrical transmission lines should be underground; where overhead electrical transmission lines are installed, lines should be installed with short pole spacing, unless crossing gullies, gorges or riparian areas. No part of a tree should be closer to a

power line than the distance set by the appropriate authority. Regular inspection of lines is required to ensure they are not fouled by branches.

Reticulated water is available to the development and will be supplied to each allotment through the town mains system in accordance with local water authority, council development control plans (DCPs) or any other policies and procedures.

- i) External fire hydrants will be installed and located in accordance with Australian Standard 2419-1, the hydrants shall be installed so as a clear unobstructed path to each designated building envelope, and
- j) The fire hydrants shall be installed at a maximum distance of 80m from the furthest extremity of the building/s, and
- k) The location of fire hydrants shall be delineated by blue pavement markers in the centre of the road, and
- l) All delivery water lines shall be installed underground to a minimum depth of three hundred millimetres (300mm), with all points above ground using metal pipes or raisers with a minimum internal diameter of nineteen millimetres (19mm).

#### **6.9 Public Road Capacity to Handle Increased Volumes of Traffic in a Bushfire Emergency**

The public roads (Tweed Coast Road, Kings Forest Parkway) in the vicinity of the subject property are adequate to handle increased volumes of traffic in a bushfire emergency. These roads;

- have a bitumen surface;
- are two-way, allowing traffic to pass in opposite directions; and
- have the capacity to carry fully loaded fire fighting vehicles

Access to the proposed Precinct will be via a dual carriageway from the un-named road along the western boundary of this Precinct with linkage to Kings Forest Parkway. All internal roads for the Precinct are either interconnecting or form a perimeter road ensuring unimpeded traffic flows within the Precinct. All roads are less than 200m in length and shall be dedicated to Tweed Shire Council as part of the proposed development.

#### **6.10 Fire Trail**

A 6m wide fire trail (4m wide with 1m either side maintained as a grassed verge) is required in three (3) locations within the southern portion of precinct 5. These allotments are situated to the south of the Perimeter Road. It is recommended that a Fire Trail be constructed within the APZ for these allotments; connecting with the Perimeter Road. This will allow fire fighters access to the bushland interface adjacent to these allotments.

## **9.0 ACCESS REQUIREMENTS**

Consideration should be given to the following requirements for access to the proposed development as outlined in the Planning for Bushfire Protection manual (RFS, 2006).

- (a) Access roads should have a minimum trafficable width of 4 metres with a metre on each side, maintained as a bushfire fuel free area;
- (b) Roads should be through roads. Dead end roads are not recommended, but if unavoidable, dead ends should not be more than 200m in length, incorporate a minimum 12m radius turning circle, and should be clearly sign posted as dead end;
- (c) The capacity of road surfaces and bridges should be sufficient to carry fully loaded fire-fighting vehicles (approximately 27 tonnes or 9 tonnes per axle);
- (d) Curves should have a minimum inner radius of 6m and be minimal in number to allow for rapid access and escape;
- (e) The minimum distance between inner and outer curves should be 6m;
- (f) Maximum grades should not exceed 15° and preferably not more than 10° or gradient specified by road design standards, whichever is the lesser gradient;
- (g) There must be a minimum vertical clearance to a height of 4 metres above the road at all times;
- (h) Roads should not traverse a wetland or other land potentially subject to periodic inundation (other than flood or storm surge);
- (i) Roads should be clearly sign-posted (with easily distinguished names) and buildings should be clearly numbered. Bridges should clearly indicate load rating;

## **8.0 BUSHFIRE CONSTRUCTION STANDARDS**

The bushfire risk management assessment undertaken in relation to the proposed subdivision concluded that the construction standard in accordance with AS 3959 (1999) Construction of Buildings in Bushfire Prone Areas (Standards Australia, 2001) will be assessed and nominated when development applications are submitted for the construction of dwellings on the approved allotments.

## **9.0 LANDSCAPING AND PROPERTY MAINTENANCE – BUSHFIRE PROVISIONS**

According to the PBP manual, the principles of landscaping for bush fire protection are to: prevent flame impingement on the dwelling; provide a defensible space for property protection; reduce fire spread; deflect and filter embers; provide shelter from radiant heat; and reduce wind speed. Careful consideration of the species selection, their location relative to their flammability, and on-going maintenance to readily remove flammable fuels (leaf litter, twigs and debris) is critical to providing for bushfire protection (RFS, 2006).

## **10.0 EXTENT OF COMPLIANCE AND/OR DEVIATION FROM SPECIFICATIONS**

The proposed development will comply with the minimum requirements for:

- 1). Asset Protection Zones detailed in Table A2.5 (Minimum Specifications for Asset Protection Zones (APZ) for Residential and Rural Residential Subdivision Purposes (for class 1 & 2 buildings) in FDI 80 Fire Areas); and
- 2) Access in accordance with section 4.1.3-2 (Property Access) in the manual for Planning for Bushfire Protection (RFS, 2006).
- 3) Development of the Commercial Precinct, Education Precinct and Residential Precinct satisfies the aims of PBP 2006 and will therefore comply with the provisions for Fire Safety under the Building Code of Australia.

## **GLOSSARY**

|          |                                                      |
|----------|------------------------------------------------------|
| APZ      | Asset Protection Zone                                |
| BFRMP    | Bushfire Risk Management Plan                        |
| EEC      | Endangered Ecological Community                      |
| EP&A     | Environmental Planning and Assessment Act            |
| IPA      | Inner Protection Area                                |
| KPoM     | Koala Plan of Management                             |
| LEP      | Local Environment Plan                               |
| LGA      | Local Government Area                                |
| OPA      | Outer Protection Area                                |
| PBP      | Planning for Bushfire Protection manual              |
| RFS      | Rural Fire Service of New South Wales                |
| SEPP     | State Environmental Planning Policy                  |
| TOBAN    | Total Fire Ban                                       |
| TSBPL    | Tweed Shire Bush Fire Prone Lands map                |
| TSC Act  | Threatened Species Conservation Act (1995)           |
| TSCA Act | Threatened Species Conservation Amendment Act (2002) |

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