

Appendix 12 Bushfire Assessment

Conacher Environmental Group

June 2008



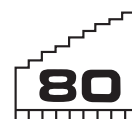
Warner Industrial Park Concept Plan and Project Application

Precinct 14 WEZ

Sparks Rd and Hue Hue Rd

Warnervale

June 2008



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BUSHFIRE ASSESSMENT REPORT

PROPOSED INDUSTRIAL DEVELOPMENT

PRECINCT 14 WYONG EMPLOYMENT ZONE WARNERVALE

**JUNE 2008
(REF: 8035B)**

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**PRECINCT 14
WYONG EMPLOYMENT ZONE
WARNERVALE**

JUNE 2008

Conacher Environmental Group

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SECTION 1

BACKGROUND DETAILS

1.1 INTRODUCTION

This Bushfire Assessment Report has been prepared by *Conacher Environmental Consultants* for the proposed industrial subdivision of Precinct 14 of the Wyong Employment Zone.

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 Rural Fire Service and Council prior to granting a Bushfire Safety Authority (RFS) or development approval (Council).

1.2 DESCRIPTION OF THE PROPERTY

The subject lands are known as Precinct 14 of the Wyong Employment Zone. At present the site is used for rural residential purposes. Precinct 14 occupies a total of 129.92 hectares while the proposed development will occupy approximately 80 hectares. The majority of the proposed development is to be located within previously disturbed areas within the remainder of the site to be retained and managed as the Buttonderry Creek Riparian Corridor and Public Reserves.

1.3 SITE DETAILS

Site Plan

A plan of the subject site is provided in Figure 1.

Location

Precinct 14 is located at Jilliby within the Wyong Local Government Area. It is bounded by the F3 Freeway to the south-east, Sparks Road to the south-west, Hue Hue Road to the north-west and Kiar Ridge Road to the north-east.

Surrounding Land Use

Land use within the site and to the north, south, east and west is currently Rural Residential.

Topography and Drainage

The site is located on a wide relatively flat area (1° to 5° slope) with Buttonderry Creek bisecting the southern half of the site from north to south. The northern parts of the site has some low rises with mixed southerly, and south-westerly aspects with up to 10 to 11° slopes.

Drainage in the southern parts of the site is by overland flow into Buttonderry Creek which flows in a southerly direction into Porters Creek Wetland and then into Wyong River and into Tuggerah Lake. Drainage in the northern parts of the site is in a generally southerly direction and then by overland flow into Buttonderry Creek.

Vegetation

The vegetation within the subject site consists of various vegetation types described in detail within the Flora and Fauna Assessment Report (*Conacher Environmental Group*, April 2008) and within Bell and Murray (2007).

The subject site contains patches of vegetation generally described as the following Map Units (Bell and Murray, 2007):

MU 20aXr	- Alluvial Floodplain Shrub Swamp Forest (Canopy Only);
MU 20f	- Alluvial Floodplain Shrub Swamp Forest (sedge scrub variant);
MU 20Xs	- Alluvial Floodplain Shrub Swamp Forest (regrowth);
MU 28	- Narrabeen Buttonderry Foothills Forest;
MU 28Xr	- Narrabeen Buttonderry Foothills Forest (Canopy Only);
MU 28Xs	- Narrabeen Buttonderry Foothills Forest (Regrowth);
MU 30	- Narrabeen Dooralong Spotted Gum / Ironbark Forest;
MU 30Xr	- Narrabeen Dooralong Spotted Gum / Ironbark Forest (Regrowth);
MU 43a	- Alluvial Riparian Blackbutt Forest (Type Variant);
MU 43aXr	- Alluvial Riparian Blackbutt Forest (Canopy Only);
Xr	- Unspecified Canopy Only.

The proposed development will be located within mostly cleared or highly disturbed areas consisting of remnant native trees within a mixture of native and exotic grasses, herbs and forbs. Other areas containing only slightly disturbed vegetation will be retained as a riparian corridor and as Public Reserves.

1.4 PROPOSED DEVELOPMENT

The development being assessed in this report is a proposed industrial development of approximately 90 lots. This development is divided into several precincts and is expected to be undertaken as a complete subdivision with the installation of roads and services completed as one project. The proposed development will also include the establishment of the Buttonderry Creek Riparian Zone and the associated buffer areas. Part of this buffer will be comprised of detention basins and other infrastructure for the control of stormwater.

SECTION 2

BUSHFIRE ATTACK ASSESSMENT

2.1 BUSHFIRE ASSESSMENT CRITERIA

Forest Fire Danger Index

The subject site is located within the Wyong Shire Council Local Government Area in the Greater Sydney Region. The Forest Fire Danger Index for the Greater Sydney Region is rated at 100 for use in determining asset protection zone requirements and categories for bushfire attack.

Bushfire Prone Land Map

Wyong Council's Bushfire Prone Land Map shows that the subject site is mapped as mostly Category 1 vegetation with some areas of Buffer located in areas of mostly cleared land.

Vegetation Classification

The site and adjoining property to a distance of 140 metres from the site boundary contains a mosaic of Managed Lands in the form of remnant trees within Pasture, Dry Sclerophyll Forest, Wet Sclerophyll Forest and Tall Heath.

The Open Forest vegetation consists of trees up to 22m with a patchy shrubby understorey typical of disturbed local vegetation. This vegetation type corresponds to Dry Sclerophyll Forest as defined in PBP (RFS, 2006).

There is a vegetated creekline corridor of variable width associated with Buttonderry Creek located in the southern part of the subject site. The creekline riparian area corresponds to Wet Sclerophyll Forest as defined in PBP (RFS, 2006).

The low lying vegetation in the north-eastern parts of the subject site consists of mostly *Melaleuca* species (Paperbarks) to 5 metres with very sparsely scattered emergent trees to 15 metres tall. This vegetation type corresponds to Tall Heath as defined in PBP (RFS, 2006).

Development Category

The proposal is for an industrial development of approximately 90 lots. This is not classified as any particular type of development under Chapter 4 of Planning for Bushfire Protection (RFS, 2006). As the project is included in a Part 3A Application, development consent is required from the Department of Planning for the proposed industrial development and a Bush Fire Safety Authority (BFSA) is required from the Rural Fire Service.

Planning for Bushfire Protection (RFS, 2006)

Planning for Bushfire Protection (RFS, 2006) is primarily concerned with the protection of various types of dwellings (e.g. residential, tourist, nursing homes, motels, mobile home estates etc.). As the proposed development is for industrial allotments, PBP (RFS, 2006) does not strictly apply. However, as the proposed industrial development will be in close proximity to retained and managed vegetation, and therefore in close proximity to a bush fire threat, the development application is required to include a Bushfire Assessment Report

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 Planning for Bushfire Protection (RFS, 2006) as the application for development subdivision has been made in accordance with Part 3A of the EP&A Act.

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

However in this particular situation because the application has been made under Part 3A of the EP&A Act. Section 100B of the Rural Fires Act does not apply. Notwithstanding this the development application and supporting documentation is required to be referred to the Rural Fire Service by the Department of Planning for review and comments as to the acceptability of the proposed bushfire protection measures.

2.2 ADJOINING AND SURROUNDING DEVELOPMENT

The site is situated within an area where rural residential developments are currently located on adjoining land to the south and partly to the west. These adjoining lands are separated from the subject site by the F3 Freeway to the south-east, Sparks Road to the south-west, Hue Hue Road to the west and Kiar Ridge Road to the north. Areas of open forest are located to the north and north-west with Buttonderry Waste Management Facility located to the north-west.

The creekline vegetation located within the southern parts of the subject site extends to the south via a culvert under the F3 Freeway and to the north via an existing riparian corridor that extends for a distance of in excess of 140 metres.

The proposed industrial development is to be located primarily within existing mostly cleared areas consisting of pasture with scattered trees. The proposed development area is adjoined by vegetated areas on various aspects which pose the principal risk of bushfire attack to the development.

2.3 VEGETATION IN RELATION TO BUSHFIRE ASSESSMENT

This vegetation of the Buttonderry Creek corridor corresponds to Wet Sclerophyll Forest as defined in PBP (RFS, 2006). This vegetation consists of medium density trees to 22 metres high with a mesic but sparse shrub layer and mesic groundcovers. This area of vegetation is to be retained within a drainage corridor and forms the Core Riparian Zone (CRZ) as defined by the Department of Water and Energy.

The Open Forest vegetation adjacent to the creekline vegetation, and in other locations within Precinct 14, consists of medium density trees to 24 metres tall with various densities and heights of the shrub and ground layers. In most cases the Open Forest vegetation has been grazed for a considerable time period in areas adjacent to the proposed development area. These areas of Open Forest have an almost intact tree layer with a sparse shrub layer and a mostly managed ground layer. This vegetation type corresponds to Dry Sclerophyll Forest as defined in PBP (RFS, 2006).

Some low lying areas within the north-eastern parts of the subject site have a layer of Melaleucas (Paperbarks) to approximately 5 metres tall with very sparse emergent eucalypts to 15 metres tall. The ground layer within this community is comprised of mostly sedges and wetland grasses, herbs and forbs. For the purposes of a bushfire assessment, this

vegetation type corresponds to the Tall Heath vegetation type as defined in PBP (RFS, 2006).

The proposed development will incorporate management and maintenance of the creekline and adjoining Open Forest (buffer) vegetation within the Buttonderry Creek Riparian Zone. At least part of the proposed buffer is to consist of stormwater control infrastructure such as gross pollutant traps and detention ponds.

It is considered that the greatest bushfire threat will be posed by the creekline buffer vegetation and other areas of Open Forest adjoining the development and the low-lying shrubby vegetation which correspond to Dry Sclerophyll Forest and Tall Heath respectively, as defined in PBP (RFS, 2006).

2.4 SLOPE GRADIENTS IN RELATION TO BUSHFIRE ASSESSMENT

The majority of the proposed development will be located on flat to low slope lands with aspects and slopes as shown in Table 2.1 for distances of more than 200 metres.

2.5 BUSHFIRE ATTACK ASSESSMENT

An assessment of the bushfire attack in relation to the adjoining lands, vegetation and slope gradients is provided in Table 2.1.

TABLE 2.1 BUSHFIRE ATTACK ASSESSMENT (from Table A3.3 PBP, 2006)			
Direction	Vegetation Classification (within 40m)	Effective Slope (within 100m)	Recommended Width Of Defendable Space
North-west	Dry Sclerophyll Forest separated from site by Hue Hue Road	1° up	10m
North-west	Wet Sclerophyll Forest separated from site by Hue Hue Road	1° up	10m
North-east	Dry sclerophyll Forest	1 to 3° up	10m
North-east	Tall Heath	1° up	10m
South-east	Dry Sclerophyll Forest, F3 Freeway then Rural / Managed Land	1 to 2° down	10m
South-west	Sparks Road then Commercial / Industrial Managed Land	0 to 3° down	10m

In relation to the subject site and proposed development the principal direction of bushfire attack is from the Dry Sclerophyll Forest located at various aspects around the proposed development. It is recommended that a defendable space 10 metres wide be established and maintained as shown in Figure 1.

SECTION 3

BUSHFIRE PROTECTION MATTERS

3.1 SPECIFIC BUSHFIRE PROTECTION REQUIREMENTS

3.1.1 *Building Construction Level*

Construction Levels in relation to AS3959-1999 are applicable to dwellings but are not applicable to industrial developments.

In relation to future industrial buildings constructed on lots adjoining the bushfire hazard, adequate bushfire protection can be achieved by constructing the industrial facilities from fire resistant materials such as pressed metal or pre-cast concrete panels. Roofing can be constructed from pressed metal and all joints in the roof, walls and between the wall and roof must be sealed so they are ember proof. Any skylights or roof ventilation fixtures can be installed with metal mesh screens with a minimum aperture size of 5mm to prevent the ingress of embers.

3.1.2 *Additional Bushfire Protection Measures*

Due to the presence of the Dry Sclerophyll Forest and Tall Heath vegetation adjacent to the proposed development, it is considered that additional safeguards against ember and flame attack are warranted. Some specific measures to reduce the potential for damage from ember and flame attack during a bushfire event include:

- i) Provision of a defensible space between the industrial structures and the bushfire threat.
- ii) Defensible space should not be utilised for storing flammable materials.
- iii) Provision of adequate water supplies in the form of a water reticulation system and an adequate number of fire hydrants placed at strategic locations in accordance with AS2419.1 – 2005.
- iv) Provision of leaf barriers on gutters and roof valleys with a flammability index of less than 5 (AS1530.2);
- v) Provision of steel or bronze mesh screens on opening windows and doors on any aspect facing bushland for units adjoining the bushfire hazard;
- vi) Maintenance of the areas of managed land, curtilage or other gardens within the development as an inner Asset Protection Zone in accordance with PBP (RFS 2006).
- vii) Regular maintenance of garden / courtyard areas to reduce fuel loads and removal or replacement of fire sensitive vegetation and surface mulching;

3.2 DEFENDABLE SPACE AND ASSET PROTECTION ZONE

A defensible space of 10 metres width is recommended to be established on any aspect of the development that adjoins retained vegetation. The locations of the defensible space proposed for this development are shown in Figure 1. These defensible spaces are to be wholly contained within the industrial zoned development area. They are not to be established within any conservation zoned land. The defensible spaces and can be incorporated into roadways, landscaped and managed gardens, or some nutrient or stormwater control structures such as grassy swales.

These defensible spaces will provide adequate separation distance for the industrial buildings within the development.

With regards to the APZ required for any staged construction of precincts near vegetation yet to be cleared, it is recommended that a temporary APZ of 10 metres width be established around the extent of any Stages to provide an adequate defensible space. Future internal roads may be incorporated within the 10m temporary APZs. 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 in consultation with the Rural Fire Service and Council's Bushfire Management Committee.

3.3 ACCESS

Section 4.1.3 – Property Access in Planning for Bushfire Protection (RFS, 2006) makes a number of recommendations for access in urban areas however, many of these recommendations can be applied to industrial developments. These include:

- The use of perimeter roads wherever possible, these roads can be incorporated into the APZs,
- Perimeter roads are to be two-way with a carriageway minimum of 8 metres wide,
- Minimum dimensions of public roads that are not perimeter roads are defined in AS2890.2 – 2002,
- The perimeter road is to be linked to the internal road system at an interval no greater than 500 metres,
- Public roads have a cross fall of not more than 3 degrees,
- All roads are through roads, but if dead-ends are unavoidable then they are not more than 200 metres in length, and incorporate a minimum 12 metres outer radius turning circle, and are clearly signposted as a dead-end,
- There is a minimum vertical clearance to a height of four metres above the road at all times.

It is most likely that fire appliances will generally operate from the public road system or from hydrants placed strategically within each allotment (eg at the rear of allotments where the allotment is greater than 70 metres long).

Section 4.2.7 – Access / Internal Roads in Planning for Bushfire Protection (RFS, 2006) states that :-

“The public road system in a bush fire prone area should provide alternative access or egress for firefighters and residents during a bush fire emergency if part of the road system is cut by fire.”

It is expected that the proposed development will provide multiple ingress and egress routes to enable the safe evacuation of workers while simultaneously enabling access for emergency services.

In general it is expected that the road system within an industrial development will comply with the requirements for access for fire fighting appliances. The roads within an industrial development will generally be suitable for large, long and heavy vehicles. Page 35 of PBP (RFS, 2006) lists a number of acceptable solutions such as, internal roads should be sealed all-weather roads, internal roads ideally should be two-way with a minimum width of 6

metres, through roads are best and dead-end roads should not be more than 100 metres in length from a through road, turning circles at the head of dead-ends should have a minimum 12 metre outer radius and are clearly signposted as a dead-end, a minimum vertical clearance of 4 metres, the internal road surfaces must have the capacity to carry a fully loaded firefighting vehicle (15 tonnes) and parking areas do not obstruct the minimum paved width of 6 metres, nor should hydrants be located in parking areas.

Chapter 4.2.7 (RFS, 2006) also states that for internal roads, at least one alternative access road needs to be provided for individual dwellings or groups of dwellings more than 200 metres from a public through road. This alternative road requirement is also equally applicable to the proposed industrial development.

3.4 WATER SERVICES

The existing infrastructure in the local area has reticulated water mains which will be extended to service the proposed industrial area. It is expected that the proposed development will extend the existing water reticulation from the surrounding infrastructure therefore a supplementary form of water supply will not be necessary for fire fighting purposes. The current proposal is for the extension of the 355mm diameter water main from Burnett Street, along Sparks Road to Hue Hue Road. From here the main will transform to a 200mm diameter pipe extending along the road reserve to Kiar Ridge Road. 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

There are no known heritage matters affecting the subject site. An assessment of Aboriginal Heritage places and relics has not been undertaken on the site. The site is wholly managed and historically has suffered from long-term use as pasture.

The site is affected by significant environmental constraints with regards to the riparian and buffer vegetation along Buttonderry Creek. This area is mapped as Map Unit 43a – Alluvial Riparian Blackbutt Forest within the Natural Vegetation of the Wyong Local Government Area (Bell, 2002). Map Unit 43a corresponds to River Flat Eucalypt Forest on Coastal Floodplains which is an Endangered Ecological Community listed in the TSC Act (1995). These areas of River Flat Eucalypt Forest on Coastal Floodplains are to be wholly retained within the subject site.

In addition, some of the other vegetation communities elsewhere within Precinct 14 such as the Tall Heath can be classified as Swamp Sclerophyll Forest on Coastal Floodplains which is also an Endangered Ecological Community listed in the TSC Act (1995).

The proposal has been subjected to detailed ecological assessment under the requirements issued by the Director General of the Department of Planning. A separate Biocertification Report has also been prepared for the proposal in accordance with these requirements. These reports have assessed the provision of compensatory measures (both financial and ecological) to offset the loss of vegetation and fauna habitats.

The subject site has no known geological features of note.

The main drainage feature within the site is Buttonderry Creek located in the central / southern parts of the site. This creek enters the site from the north and exits to the south. This creekline and its riparian and buffer vegetation is proposed to be wholly retained and managed in conjunction with the proposed development.

SECTION 4

CONCLUSIONS AND RECOMMENDATIONS

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 fire resistant building construction. Some additional measures (gutter guards, mesh screens, fuel free gardens and external areas etc) are recommended to provide additional protection from the Dry Sclerophyll Forest fire hazard adjacent to the proposed industrial development.

Objective 2

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

A temporary defensible space (APZ) of 10 metres width is to be established around any staged sections or precincts of the development.

A permanent defensible space of 10 metres width is to be established to all aspects of the development that are adjacent to retained and managed bushland. This defensible space is may include roadways, landscaped and managed gardens, or some nutrient or stormwater control structures such as grassy swales.

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 separation distance of 10 metres between the industrial buildings and the bushfire hazard is recommended to provide a defensible space for fire fighting operations. In addition the adequate supply of water via reticulation systems and strategically placed hydrants will assist fire fighting personnel with their task. These factors combined 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;*

The proposed road layout provides ingress/egress to both Hue Hue Road and Sparks Road. The internal road system provides for roadways with a 13 to 14 metre road way with footpaths 3.5 to 5.5 metres wide. This provides a total roadway width of between 21 to 24 metres wide. These road widths exceed the widths recommended in Planning for Bushfire Protection.

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) of each allotment will undertake regular inspections and undertake management of the defendable space.

Objective 6

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

The existing water service will be extended to the proposed development and is expected to be constructed and installed according to AS 2419.1 – 2005. A certification or test report from the Water Supply Authority it to be provided to demonstrate that the requirements of AS2419.1 – 2005 can be achieved during a bushfire event.

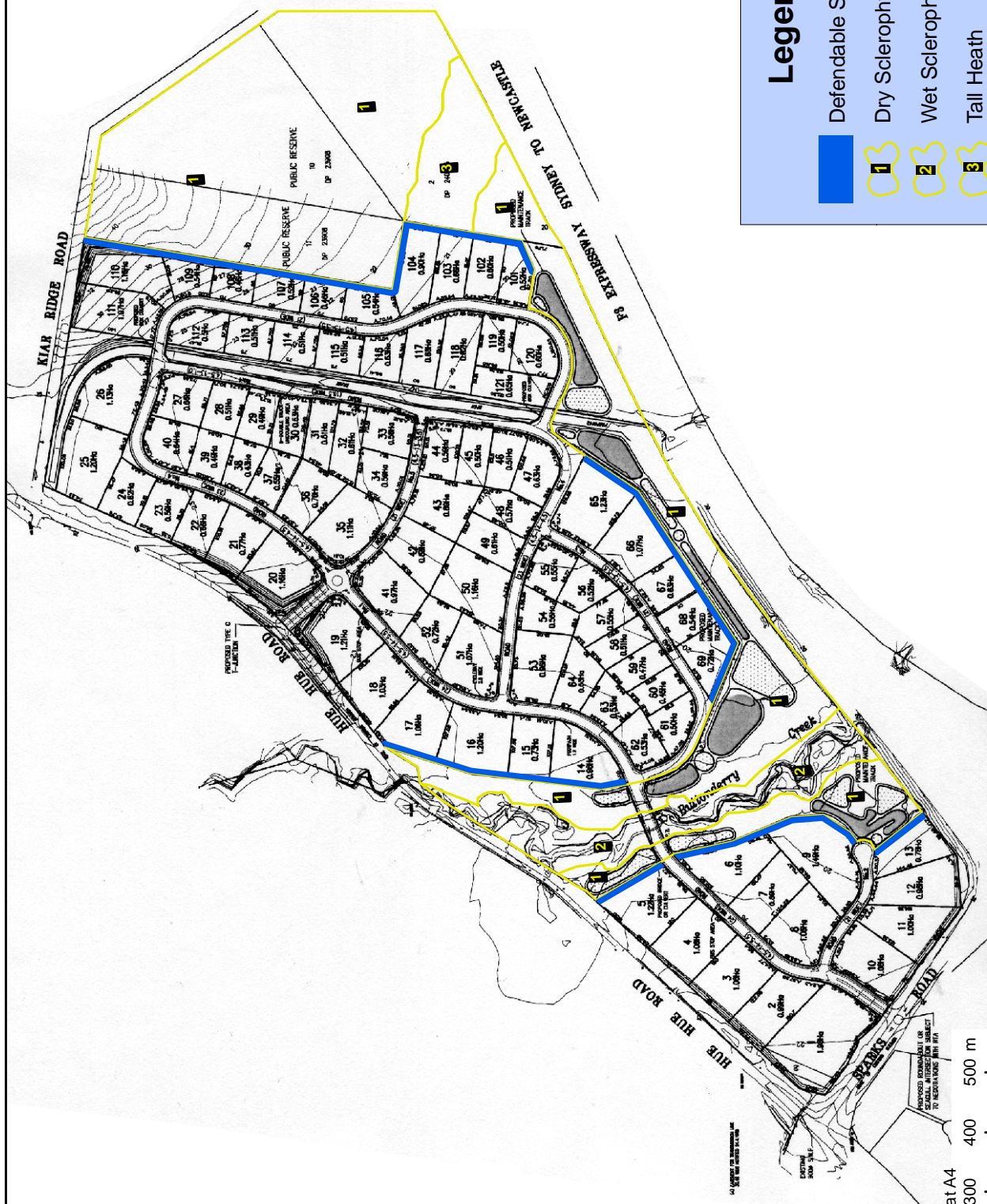
4.2 RECOMMENDATIONS

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. Establishing and maintaining a temporary Asset Protection Zone (APZ) with a separation distance of 10 metres around any stage or precinct adjoining any retained bushland.
- ii. No construction standards (AS3959 - 1999) are required for any industrial development, however it is recommended that the buildings be constructed from fire resistant materials such as pressed metal, or prefabricated concrete panels. All joints are to be sealed against ember attack.
- iii. Establishing and maintaining a defendable space with a separation distance of 10 metres to any aspect of the development that faces retained bushland as shown in Figure 1.
- iv. Installation of metal mesh screens with an aperture size of less than 5mm on all windows, doors, skylights and roof ventilation shafts that are likely to come under ember attack.
- v. Provision of leaf barriers on gutters and roof valleys with a flammability index of less than 5 (AS1530.2);
- vi. Regular maintenance of garden / courtyard areas to reduce fuel loads and replacement or removal of fire sensitive vegetation and surface mulching;
- vii. An emergency evacuation and bushfire suppression plan should be prepared for the development.

TABLE 4.1 - CHECKLIST		
Factor	Comment	
Adjoining / Surrounding Development	North Rural Residential and native vegetation East – F3 Freeway and native vegetation West – Rural Residential and native vegetation South – Rural Residential	
Vegetation	Site – Pasture with scattered trees, Wet sclerophyll Forest, Dry Sclerophyll Forest and Tall Heath. Adjoining threat – Dry sclerophyll Forest, Wet Sclerophyll Forest	
Slope Gradients	Variable – 0 to 3 degrees downslope and 0 – 3 degrees upslope	
Distance to Bushfire Threat	Generally 10m to various aspects	
Category of Bushfire Attack	Not Applicable	
Level of Construction Required	Not Applicable – generally fire resistant	
Specific Protection Requirements	<ul style="list-style-type: none"> - 10m wide defendable space to various aspects as shown in Figure 1, - Leaf Barriers on Guttering, - Mesh Screens on doors and windows on any aspect facing bushland. 	
Asset Protection Zone	Temporary 10m wide APZ to any aspect facing bushland during any staged development	
Hazard Management	Maintenance of gardens as an Inner Protection Area in accordance with PBP (RFS, 2006)	
Access	Perimeter Roads – minimum - sealed two way, 13m wide carriageway. Internal Roads – minimum - sealed two way, 13m wide carriageway as per AS2890.2 – 2002	
Water Services	Town Supply as per AS2419.1 – 2005	
Environment Issues	Retention and management of of Endangered Ecological Community - River Flat Eucalypt Forest (Core Riparian Zone and buffers) along Buttonderry Creek	
Heritage Issues	Site Assessment not undertaken	
Aims and Objectives	Deemed To Comply	Comments
1. Adequate protection from Bushfire	Yes	Provided adequate fire resistant construction is achieved and 10m wide defendable space is established and maintained
2. Provide defendable space around buildings	Yes	Provided a 10m wide defendable space is established and maintained
3. Provide appropriate separation to prevent direct flame contact	Yes	Provided a 10m wide defendable space is established and maintained
4. Ensure safe operational access and egress	Yes	Provided perimeter roads are constructed as per PBP (RFS, 2006) and internal roads are constructed to AS2890.2 – 2002 or greater
5. Provide ongoing management & maintenance in APZ	Yes	Responsibility = owner / occupants
6. Ensure utility services are adequate	Yes	Provided water reticulation is constructed to AS2419.1 – 2005 and certified by the water supply authority.



1:10,000 Approximate at A4

0 100 200 300 400 500 m

Legend

Defendable Space 10m Wide

1 Dry Sclerophyll Forest

2 Wet Sclerophyll Forest

3 Tall Heath

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Plan for indicative purposes only.
Not for detailed measurement.
Flora survey locations are approximate and
have not been fixed by land survey.
Original plan produced in A4 colour

Drawing No. 8035

Date 16/04/08

Drawn By JM

Date 11/06/08

Amendment

A New plan layout

B

C

Figure 1 -

Bushfire Protection Measures

Precinct 14, Wyong Employment Zone

Source: TREHY INGOLD NEATE, 2007.