

# Bushfire Threat Assessment

For  
Northern Lands

At  
Minmi / Link Road

Prepared for  
Coal & Allied Operations Pty Ltd  
PO Box 315  
Singleton NSW 2330

Job Reference 24530-2 - January 2009



HARPER  
SOMERS  
O'SULLIVAN



PLANNING > SURVEYING > ECOLOGY

A member of **RPS** Group Plc





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PROJECT: BUSHFIRE THREAT ASSESSMENT – NORTHERN LANDS – MINMI/LINK ROAD	
CLIENT:	COAL & ALLIED OPERATIONS
OUR REFERENCE:	24530-2
DATE:	JANUARY 2009
APPROVED BY:	MATT DOHERTY
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CHECKED BY:	CRAIG ANDERSON
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# EXECUTIVE SUMMARY

## INTRODUCTION

RPS Harper Somers O'Sullivan (RPS HSO) has been engaged by Coal & Allied Operations Pty Ltd to undertake a Bushfire Threat Assessment (BTA) over land at Minmi/Link Road. For the purposes of this assessment the development estates have been separated into six main areas that are approximately 520ha within the Lake Macquarie and Newcastle's (LGA). They are:

- Development Estate 1 – The parcels of land to the east of Minmi township.
- Development Estate 2 – The parcel of land to the west of Minmi township.
- Development Estate 3 – The parcel immediately north of Link Road west.
- Development Estate 4 – The parcel to the east of Blue Gum Hills Regional Park.
- Development Estate 5 – The parcel of land to the north of Link Road east.
- Development Estate 6 – The parcel of land to the south of Link Road east.

This assessment will inform an Environmental Assessment (EA) submission and provides information on measures that will enable the development to comply with 'Planning for Bushfire Protection' (RFS, 2006) (hereafter referred to as 'PBP') and Australian Standard 3959 – Building in Bush Fire Prone Areas. This assessment aims to consider and assess the bushfire hazard and associated potential threats relevant to this proposal, and to outline the mitigative measures that would be required in accordance with the provisions of the *Environmental Planning and Assessment Amendment (Planning for Bush Fire Protection) Regulation 2007* and the *Rural Fires Amendment Regulation 2007 (RF Amendment Regulation, 2007)*. This assessment has been made based on the bushfire hazards in and adjacent to the development estate.

## VEGETATION

The vegetation in and around the development estate boundaries, to a distance of 140m, has been assessed in accordance with PBP (RFS, 2006). The vegetation in all directions from the development estate is classified as Open Forest.

## SLOPE

A slope class map has been produced for land within 140m of the development estate.

The development estate has a predominately northerly aspect, with a elevation ranging from approximately 100m AHD in the southern steep ridge lines of Development estate 5, down to approximately 10m AHD in the more northern sections of Development Estates 1 and 2.

## ASSET PROTECTION ZONES

Asset Protection Zone's (APZ's) from 9 metres to 64 metres will be required from vegetation external to the development estate. The Concept Plan indicates proposed roadways around parts of the development to provide a buffer between the adjacent vegetation and the development estate. The proposed perimeter and public roads

within the development estate are therefore likely to provide for the majority of the required APZs, with the remainder of the APZ being accommodated within the allotments.

## **WATER SUPPLY**

Following any kind of development upon the land, it is expected that water mains will be extended into the development estate. Provision of access to this supply should be provided for fire-crews in the form of readily accessible and easily located fire hydrants. Fire hydrant spacing, sizing and pressure should comply with AS 2419.1 – 2005. Where this cannot be met, the RFS will require a test report of the water pressures anticipated by the relevant water supply authority. In such cases, the location, number and sizing of hydrants shall be determined using fire engineering principles. Hydrants are not located within any road carriageway. All above ground water and gas service pipes external to the building are metal, including and up to any taps.

## **ACCESS / EGRESS**

PBP (RFS, 2006) recommends a perimeter road be designed for any future residential development. The Concept Plan indicates that a perimeter road has been proposed for the majority of the development estate. This complies with PBP 2006. The perimeter road will allow a defensible space between vegetation and housing whilst also acting as an APZ. The exception to this occurs on land where infrastructure design could not allow for perimeter roads.

The Concept Plan provides for internal public roads within the development estate. Many of the proposed internal public roads are dead ends, and thereby will need to comply with the PBP requirements. The proposed design of the road network will need to comply with the requirements of PBP 2006. Any lessening of these requirements will require a performance-based assessment to be undertaken at the future project application stage.

## **DWELLING DESIGN AND CONSTRUCTION**

Assessment of the proposed Concept Plan in accordance with AS3959-1999 Construction of Buildings in Bushfire-prone Areas (AS3959-1999) has indicated that future dwellings within the proposed allotments will be able to comply with this standard if the required APZs are established.

## **SUMMARY OF RECOMMENDATIONS**

In summary, the following key recommendations have been generated to ensure that the Concept Plan for the development estate meets the relevant legislative requirements:

- APZ's from 10 metres to 64 metres will be required between the bushland and urban interface (dwellings). For the majority of the development a perimeter road has been implemented between bushfire hazards and future dwellings, this will form all or part of the required APZ's. Any remaining APZ or part of APZ will be established within allotments where required. A strategic approach was undertaken over the concept design process to predictively design

allotments to provide for an adequate building envelope within allotments requiring an APZ.

- A Core Riparian Zone (CRZ) and Vegetated Buffer (VB) from 10 metres to 40 metres, inclusive, will be established for all riparian corridor around creeklines. This merit assessment will be based upon the order and riparian functionality of the watercourse, the site and long term land use. These corridors have been included within the Concept Plan and APZ designed upon these.
- Any proposed development be linked to the existing mains pressure water supply and that suitable hydrants be clearly marked and provided for the purposes of bushfire protection. Fire hydrant spacing, sizing and pressure should comply with AS2419.1, 2005.
- Roads be constructed in accordance with section 4.1.3 (1), PBP 2006 as outlined in section 6 of this report.
- Any future dwelling within the development estate should have due regard to the specific considerations given in the BCA, which makes specific reference to the Australian Standard (AS3959 – 1999) construction of buildings in bushfire prone areas. Assessment of the Concept Plan in accordance with AS3959-1999 has shown that future dwellings within the development estate will be able to comply with this standard.
- It is recommended that a Fuel Management Plan (FMP) be prepared for the development estate. This plan will detail the required strategies to create the required APZ's and management of these APZ's in such a manner to preserve the natural and cultural features of the development estate, while reducing the risk of bushfire.

***Finally, it is believed that the implementation of the measures and recommendations forwarded within this report would contribute to the amelioration of the potential impact of any bushfire upon the development estate, but they do not and cannot guarantee that the area will not be affected by bushfire at some time.***





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## GLOSSARY OF TERMS AND ABBREVIATIONS

APZ – Asset Protection Zone

AS2419.1 - 2005 – Australian Standard – Fire Hydrant Installations

AS3959-1999 – Australian Standard – Construction of Buildings in Bush Fire Prone Areas

BCA – Building Code of Australia

BFPA - Bush Fire Prone Area

BFPL – Bush Fire Prone Land

BFPLM – Bush Fire Prone Land Map

BFPA – Bush Fire Prone Areas

BFPB - Bush Fire Protection Measures

C&A – Coal & Allied

CCC – Cessnock City Council

Conservation OR Offset Lands – Land proposed for dedication to NSW Government (as per MOU)

Development Estate – Proposed Development Lands

CRZ – Core Riparian Zone

DECC – NSW Department of Environment and Climate Change (formerly NSW Department of Environment and Conservation)

DGEAR's – Director General's Environmental Assessment Requirements

DNR – NSW Department of Natural Resources (formerly Department of Infrastructure, Planning and Natural Resources)

DoP – NSW Department of Planning

EA – Environmental Assessment

EAR – Ecological Assessment Report

EMP – Environmental Management Plan

*EPA Act – NSW Environmental Planning and Assessment Act 1979*

FMP – Fuel Management Plan

ha – hectare

IPA – Inner Protection Area

LGA – Local Government Area

LHRS – Lower Hunter Regional Strategy

LMCC – Lake Macquarie City Council

MoU – Memorandum of Understanding

NSWG – NSW Government

NNC – Newcastle City Council

OPA – Outer Protection Area

PBP - Planning for Bushfire Protection 2006

RF Amendment Regulation – Rural Fires Amendment Regulation 2007

RPS HSO – RPS Harper Somers O'Sullivan

SSS - State Significant Site

VB – Vegetated Buffer

# 1 INTRODUCTION

RPS Harper Somers O'Sullivan (RPS HSO) has been engaged by Coal & Allied Operations Pty Ltd to undertake a Bushfire Threat Assessment (BTA) over land at Minmi/Link Road. The proposal is for a Concept Plan for the future development of land at Minmi and north and south of Link Road comprising new residential precincts and includes commercial, open space, community and educational land uses. The proposal is to be assessed under Part 3A of the *Environmental Planning and Assessment Act 1979*. For the purposes of this assessment the development estates have been separated into six main areas that are approximately 520ha within the Lake Macquarie and Newcastle (LGA). These are:

- Development Estate 1 – The parcels of land to the east of Minmi township.
- Development Estate 2 – The parcel of land to the west of Minmi township.
- Development Estate 3 – The parcel immediately north of Link Road west.
- Development Estate 4 – The parcel to the east of Blue Gum Hills Regional Park.
- Development Estate 5 – The parcel of land to the north of Link Road east.
- Development Estate 6 – The parcel of land to the south of Link Road east.

The Lake Macquarie City Council (LMCC) and Newcastle City Council (NCC) Bush Fire Prone Land Map (BFPLM) maps the development estate as containing Bushfire Vegetation Category 1 (Figure 1-2). Therefore, the proposed development needs to consider the document 'Planning for Bushfire Protection' (RFS, 2006) (hereafter referred to as 'PBP 2006').

This BTA report will assist in the concept planning phase of the development estate, taking into consideration the surrounding bushfire threats. This assessment will inform an Environmental Assessment (EA) submission and provides information on measures that will enable the development to comply with PBP 2006 and Australian Standard 3959 – Building in Bush Fire Prone Areas (AS3959 –1999).

This assessment aims to consider and assess the bushfire hazard and associated potential threats relevant to such a proposal, and to outline the minimum mitigative measures which would be required in accordance with the provisions of the *Environmental Planning and Assessment Amendment (Planning for Bush Fire Protection) Regulation 2007* and the *Rural Fires Amendment Regulation 2007 (RF Amendment Regulation, 2007)*. This assessment has been made based on the bushfire hazards in and around the development estate at the time of the site inspection (June 2007 – July 2008).

## 1.1 Background Information

Coal & Allied owns approximately 4,187 hectares of land in the Lower Hunter Region located within the four local government areas of Newcastle, Cessnock, Lake Macquarie, and Wyong (located in Northern Central Coast region). The sites are not required for future mining or other operational purposes.

Coal & Allied's Lower Hunter lands including Minmi/Link Road are included in the Lower Hunter Regional Strategy (LHRS) for urban development and conservation. Coal & Allied is one of four major landowners within the region that play a significant role in achieving the LHRS's environmental and conservation outcomes and sustainable growth.

In finalising the LHRS, the NSW Government reached agreement with Coal and Allied for the dedication of 3,322 ha (80 per cent) of Coal & Allied land for conservation corridors and development rights on 848 ha (20 per cent). The details of the negotiations are set out in a Memorandum of Understanding (MoU) between Coal & Allied and the NSW Government.

The proposed conservation lands are areas of high conservation value in the nominated green corridors that will be dedicated to the public. The conservation lands are similarly identified in the draft Lower Hunter Regional Conservation Plan prepared by the Department of Environment and Conservation.

A Concept Plan has been prepared for Minmi/Link Road which will enable key site parameters associated with land use, infrastructure delivery and timing, and environmental conservation to be resolved up front, with subsequent detailed stages being submitted for approval progressively. Refer To Figure 1-3.

In July 2007, the Director General Environmental Assessment Requirements (DGEARs) were issued for the site. The requirements for Bushfire are:

*Demonstrate compliance with the current version of Planning for Bushfire Protection and Australian Standard 3959- Building in Bush Fire Prone Areas. The EA is to identify the ongoing arrangements of any proposed APZs.*

## **1.2 Scope and Purpose**

The scope and purpose of this BTA is to review the overall bushfire threat to the development estate and to review the capability of the development estate to provide a safe environment. This assessment will include information on ability of the development estate to comply with the requirements of PBP (RFS, 2006).

This will be achieved by providing/undertaking:

- An assessment of all vegetation on and adjacent to the development estate within 140 metres from all elevations from the development estate boundary;
- An assessment of topography (slope) on and adjacent to the subject property to a distance of 140 metres from the development estate boundary;
- Adequacy of public roads in the vicinity to handle increased traffic in a bushfire emergency;
- Recommendations for appropriate setback (APZ) distances from the identified bushfire hazards;
- Information on water supply for fire fighting purposes; and
- Review of the Concept Plan for the development estate.

### 1.3 *Aims and Objectives*

This assessment has been undertaken in accordance with clause 46 of the RF Regulation 2007. This BTA also addresses the six key Bush Fire Protection Measures (BFPMs) in a development assessment context being:

- The provision of clear separation of buildings and bush fire hazards, in the form of fuel-reduced APZ (and their components being Inner Protection Areas (IPA's) and Outer Protection Areas (OPA's);
- Construction standards and design;
- Appropriate access standards for residents, fire-fighters, emergency workers and those involved in evacuation;
- Adequate water supply and pressure;
- Emergency management arrangements for fire protection and / or evacuation; and
- Suitable landscaping, to limit fire spreading to a building.

This assessment adheres to Chapter 4.1.3 of PBP (RFS, 2006) 'Standards for Bush Fire Protection Measures for Residential and Rural Residential Subdivision' and AS3959-1999.

### 1.4 *Development Estate Particulars*

**Locality** – The development estate occurs at Minmi/Link Road to the north and south of the Newcastle Link Road. The site encompasses a large area of land that surrounds the Minmi township to the east, west and south.

**LGA** – Lake Macquarie and Newcastle City Councils

**Site Title(s) Entire Land Holdings** – 71 DP 1065169, Lot 352 DP 1108608 (formerly Lot 35 DP 800036), Lot 6 DP 1044574, Lots 2 and 3 DP 877349

**Area** – The Minmi/Link Road area is divided into six separate parcels of land that collectively encompass an area of approximately 520ha.

**Zoning** – Land within the Lake Macquarie City Council area:

- Predominantly zoned 7 (2) Conservation (Secondary)
- Minor areas zoned 10 Investigation (Urban/Conservation) and 5 Infrastructure

Land within the Newcastle City Council area:

- 2(a) Residential
- 7(b) Environmental
- 7(c) Investigation

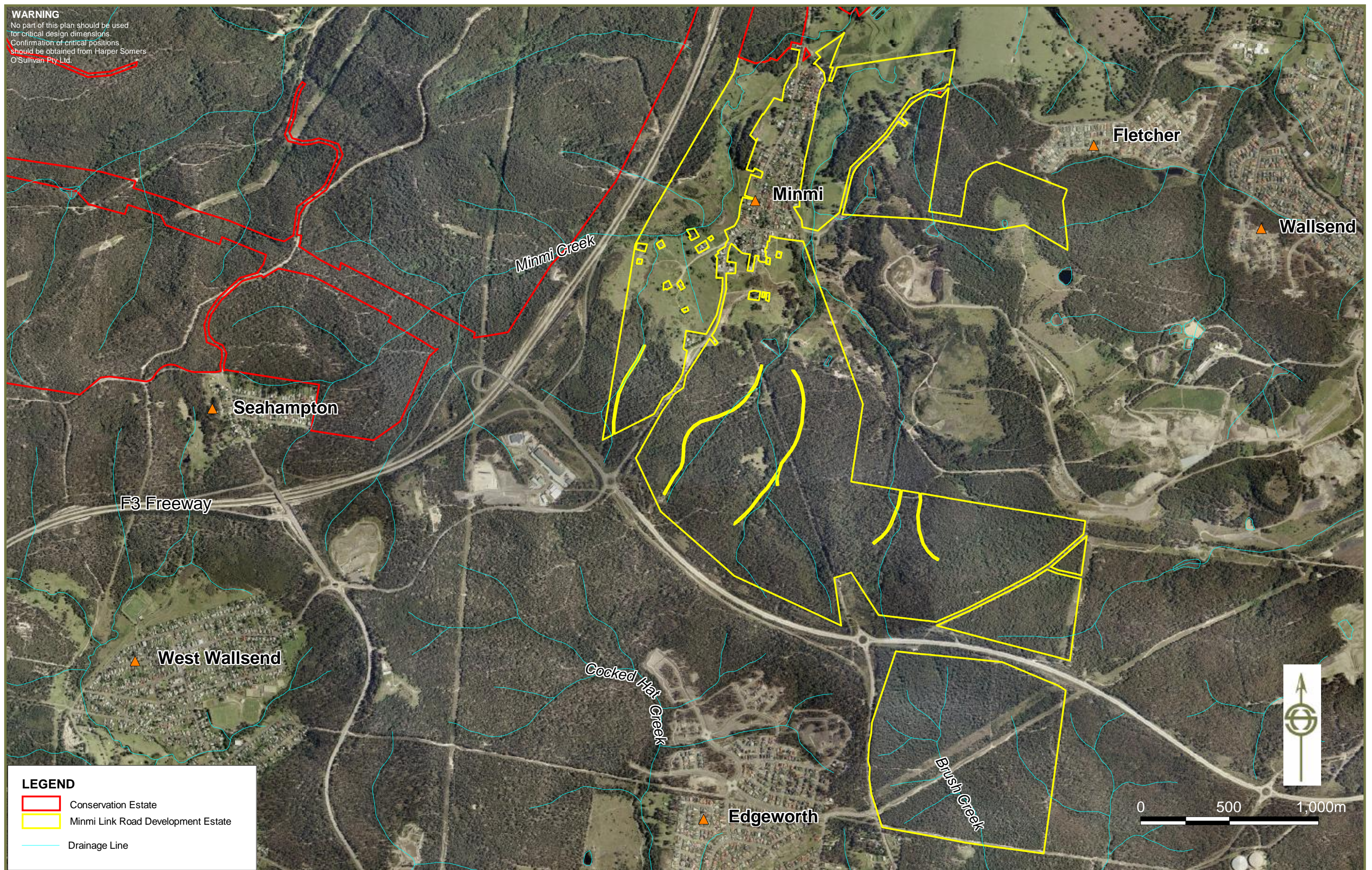
**Boundaries** – The majority of the site is bounded to the south by the Newcastle Link Road, with a small portion to the south of Link Road. The F3 Motorway occurs to the west of the site with Fletcher occurring to the east. Bushland, that includes the Blue Gum Hills Regional Park, abounds the majority of the development estate.

**Current Land Use** – The parcels of land to the south and north of Link Road are vegetated and are currently vacant land. The parcels of land immediately surrounding Minmi contains rural residential land with vegetated land occurring to the north, east south and west. These vegetated areas are largely vacant land. The cleared areas are currently used for paddocks and general rural residential properties.

**Topography** – The development estate has a predominately northerly aspect, with a elevation ranging from approximately 100m AHD in the southern steep ridge lines of Development estate 5, down to approximately 10m AHD in the more northern sections of Development Estates 1 and 2.



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No part of this plan should be used  
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**TITLE: FIGURE 1-1 SITE LOCATION  
MINMI - LINK ROAD**

**CLIENT:** Coal & Allied  
Operations Pty Ltd

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**SCALE:** 1: 20000 at A3 Size

**DRAWN:** A. McConville

**APPROVED:** M. Doherty

**DATUM:** MGA Zone 56 (GDA 94)

**DATE:** 13/02/2008

**LAYOUT REF:** J:\JOBS\24K\24530 Hunter Valley\Drafting\Ecology\Northern Lands\ALL WORK...  
BlackHillReport\24530-2 Figure 1-4.MinmiLinkRoad.SiteLocation.A-A3.WOR

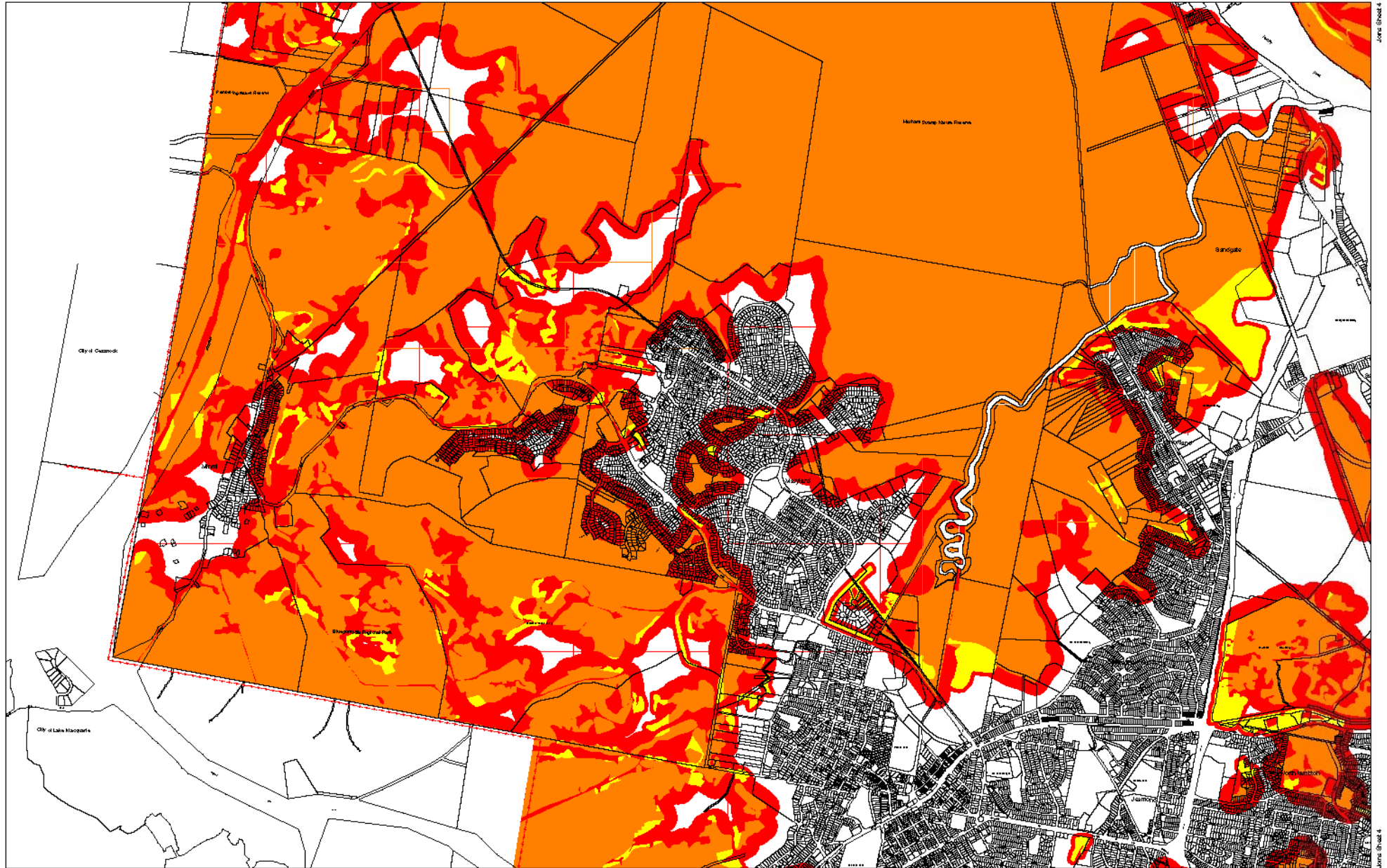
**CONTOUR INTERVAL:** N/A

**JOB REF:**

**24530-2**







LEGEND

- Vegetation Category 1
- Vegetation Category 2
- Vegetation Buffer - 100 metre and 30 metre

# Newcastle City Council Bush Fire Prone Land Mapping

Map 3

Disclaimer: The City of Newcastle Council does not accept any liability for the use of the information contained in this map. The information is provided as a guide only and should not be relied upon for any purpose.



NORTH  
Scale: 1:10000











## 2 VEGETATION ASSESSMENT

The vegetation in and around the development estate boundaries, to a distance of 140m, has been assessed in accordance with PBP 2006. This assessment has been made via a combination of aerial photo interpretation and ground truthing exercises.

Vegetation Community classification have been undertaken across the development estate and within 140m of the development estate by RPS HSO. The vegetation communities were delineated using the following regional vegetation community mapping package

- Lower Hunter and Central Coast Regional Biodiversity Strategy (NPWS 2000; House 2002); and

Vegetation communities were identified within the development estate and within 140m of the development estate as follows;

Vegetation Community	Classification of Vegetation Formation
<b>Development Estate 1</b>	
Alluvial Tall Moist Forests	<b>Wet Sclerophyll Forests (Tall Open Forest)</b>
Coastal Foothills Spotted Gum - Ironbark Forest	<b>Dry Sclerophyll Forests (Open Forest)</b>
Coastal Plains Smooth - barked Apple Woodland	<b>Dry Sclerophyll Forests (Open Forest)</b>
Swamp Mahogany - Paperbark Swamp Forest	<b>Dry Sclerophyll Forests (Open Forest)</b>
<b>Development Estate 2</b>	
Alluvial Tall Moist Forests	<b>Wet Sclerophyll Forests (Tall Open Forest)</b>
Coastal Foothills Spotted Gum - Ironbark Forest	<b>Dry Sclerophyll Forests (Open Forest)</b>
Coastal Plains Smooth-barked Apple Woodland	<b>Dry Sclerophyll Forests (Open Forest)</b>
Lower Hunter Spotted Gum – Ironbark Forest	<b>Dry Sclerophyll Forests (Open Forest)</b>
Swamp Mahogany - Paperbark Swamp Forest	<b>Dry Sclerophyll Forests (Open Forest)</b>
<b>Development Estate 3</b>	
Alluvial Tall Moist Forests	<b>Wet Sclerophyll Forests (Tall Open Forest)</b>
Coastal Foothills Spotted Gum - Ironbark Forest	<b>Dry Sclerophyll Forests (Open Forest).</b>
Coastal Plains Smooth-barked Apple Woodland	<b>Dry Sclerophyll Forests (Open Forest).</b>
Lower Hunter Spotted Gum – Ironbark Forest	<b>Dry Sclerophyll Forests (Open Forest).</b>

<b>Development Estate 4</b>	
Coastal Foothills Spotted Gum - Ironbark Forest	<b>Dry Sclerophyll Forests (Open Forest).</b>
Lower Hunter Spotted Gum – Ironbark Forest	<b>Dry Sclerophyll Forests (Open Forest).</b>
Alluvial Tall Moist Forests	<b>Wet Sclerophyll Forests (Tall Open Forest)</b>
Weeds and Disturbed Areas	<b>Open Forest</b>
<b>Development Estate 5</b>	
Coastal Foothills Spotted Gum - Ironbark Forest	<b>Dry Sclerophyll Forests (Open Forest).</b>
Coastal Plains Smooth-barked Apple Woodland	<b>Dry Sclerophyll Forests (Open Forest).</b>
Lower Hunter Spotted Gum – Ironbark Forest	<b>Dry Sclerophyll Forests (Open Forest).</b>
Alluvial Tall Moist Forests	<b>Wet Sclerophyll Forests (Tall Open Forest)</b>
Hunter Valley Moist Forest	<b>Wet Sclerophyll Forests (Open Forest)</b>
<b>Development Estate 6</b>	
Coastal Foothills Spotted Gum - Ironbark Forest	<b>Dry Sclerophyll Forests (Open Forest).</b>
Coastal Plains Smooth-barked Apple Woodland	<b>Dry Sclerophyll Forests (Open Forest).</b>
Lower Hunter Spotted Gum – Ironbark Forest	<b>Dry Sclerophyll Forests (Open Forest).</b>
Alluvial Tall Moist Forests	<b>Wet Sclerophyll Forests (Tall Open Forest)</b>
Hunter Valley Moist Forest	<b>Wet Sclerophyll Forests (Open Forest)</b>

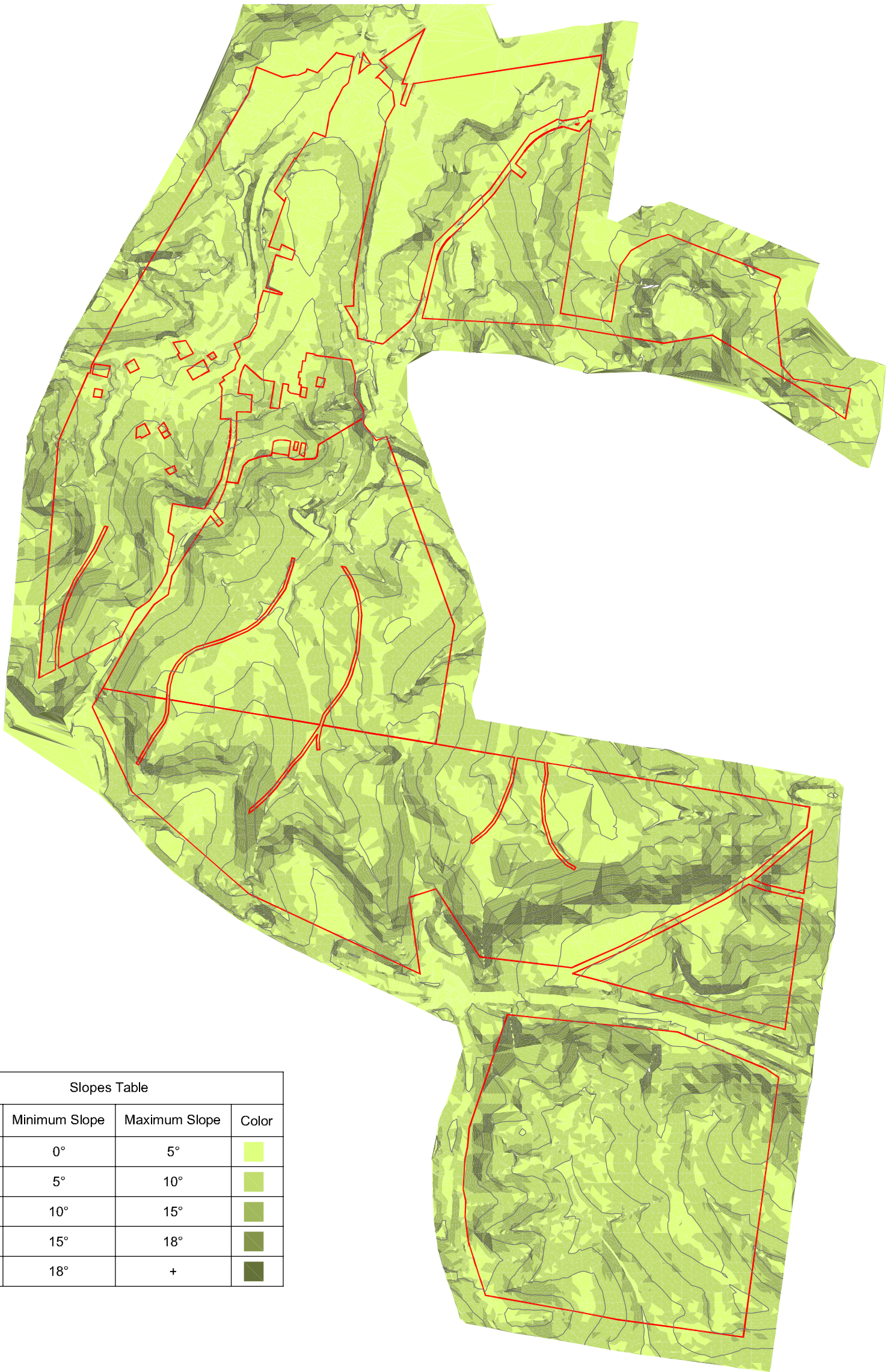
These vegetation communities have been classified for bushfire purposes into structure and formation using the system adopted by Keith (2004) and using Table A2.1 within PBP (RFS, 2006). The vegetation type adjacent to the proposed development estate (with the exception of existing residential development of Minmi), in all directions is Open Forest

Note: Under this assessment, it has been assumed that retained vegetation within lots will be managed to an APZ standard. Riparian and drainage line vegetation retained for stormwater, ecological and visual purposes, the majority being classified as Open Forest to an approximate width of 40m have been assessed under the provisions outlined within PBP 2006. Those creeklines that will be retained with an approximate width of 20m have been classified as Rainforest vegetation in accordance with page 52 of PBP 2006. PBP 2006 states that:

*‘Riparian areas are those areas in width which are no greater than 20 metres in width and are found on either bank of a river, creek or stream identified on a BFPLM, and are treated the same as rainforest’.*







Slopes Table			
Number	Minimum Slope	Maximum Slope	Color
1	0°	5°	
2	5°	10°	
3	10°	15°	
4	15°	18°	
5	18°	+	



FIGURE 3-1  
SLOPE CLASS MAP

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DATE: 8TH OCTOBER 2008

DRAWN:

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CONTOUR INTERVAL: 10m

AUTOCAD REF: 24530-SLOPE ANALYSIS

LAYOUT REF:

JOB REF:

APPROVED: S.BISHOP

SHEET 1 OF 1

24530





**WARNING**  
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Note that this Vegetation Community Map depicts clearly defined boundaries between vegetation communities that are the product of individual interpretation and are not distinguished by clearly defined boundaries on the ground.  
Therefore, this map should only be treated as an indication of approximate peripheries between delineated vegetation communities.  
Caution should therefore be exercised when using this data for purposes requiring high levels of accuracy. Furthermore, no account for intergrading areas between delineated vegetation communities has been made.

**LEGEND**

Conservation Estate

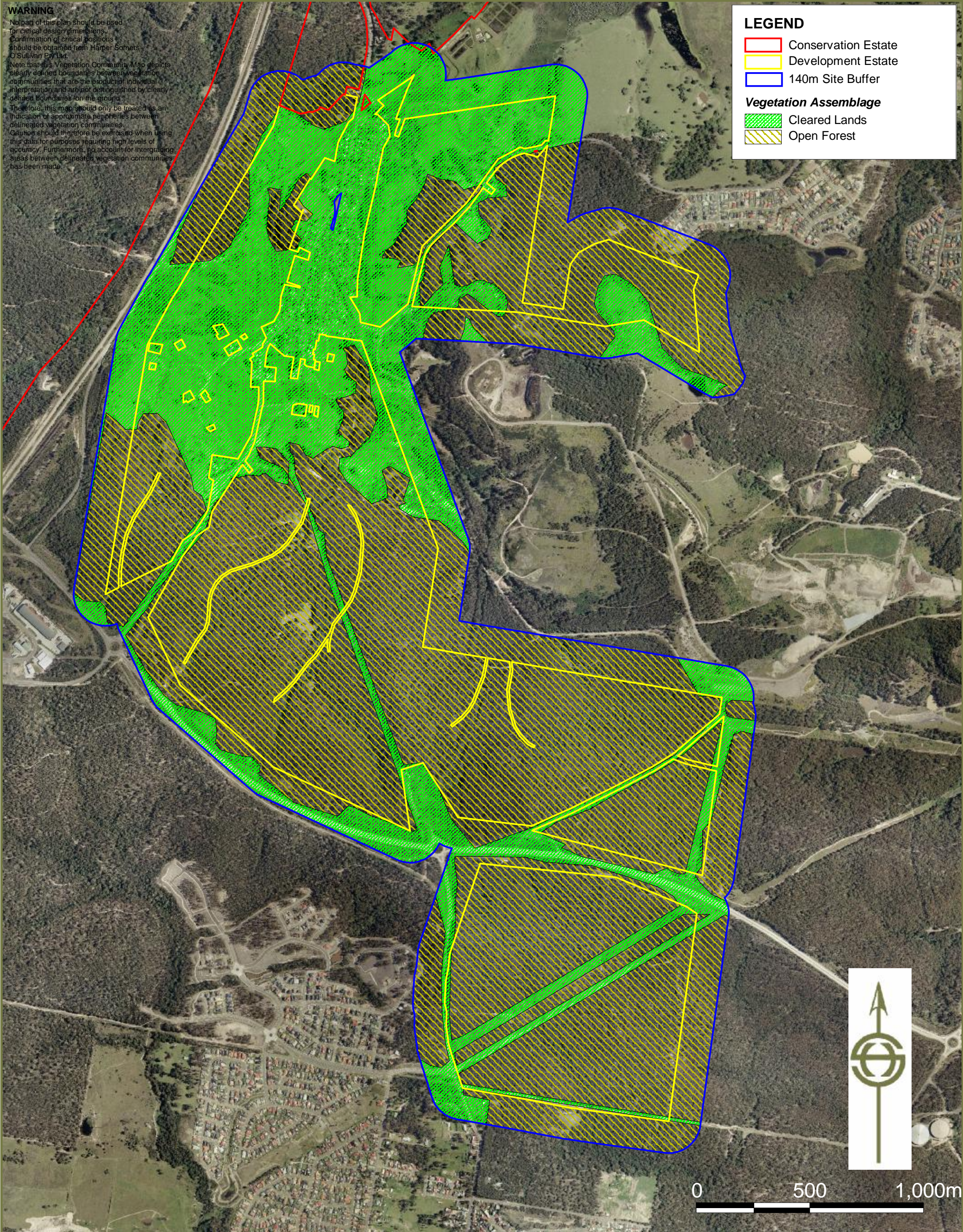
Development Estate

140m Site Buffer

**Vegetation Assemblage**

Cleared Lands

Open Forest



TITLE: Figure 2-1 Vegetation within 140m of Site

CLIENT: Coal & Allied Operations Pty Ltd

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SCALE:	1: 14998.5 at A3 Size	DRAWN:	S. Corry	APPROVED:	S. Bishop
DATUM:	MGA Zone 56 (GDA 94)	DATE:	18/11/2008	LAYOUT REF:	J:\JOBS\24k\24530 Hunter Valley\Drafting\Bushfire Northern Lands\ALL WORKSPACES\Report Figures
CONTOUR INTERVAL:	N/A	JOB REF:	24530-2		





### 3 SLOPE ASSESSMENT

In accordance with PBP (2006), an assessment of the slope throughout the development estate and for 140m around was undertaken to identify both the average slope and by identifying the maximum slopes present. These values help determine the level of gradient which will most significantly influence fire behaviour on the development estate. Refer to Figure 3-1 and Appendix B for each of the development estates.

#### 3.1 *Slope Classes*

A Slope Class Map (Figure 3-1) has been produced for land within 140m of the proposed development estate. Further detail of the slope assessment for each of the development estates is shown in Section 3.2 Slope by degrees. The Slope Class Map has been produced using five slope classes as follows:

- 0 - 5 degrees;
- 10 degrees;
- 10 - 15 degrees;
- 15 – 18 degrees; and
- 18+ degrees.

The development estate has a predominately northerly aspect, with a elevation ranging from approximately 100m AHD in the southern steep ridge lines of Development estate 5, down to approximately 10m AHD in the more northern sections of Development Estates 1 and 2.