



Bushfire Threat Assessment Report

**Precinct 1
Hunter Economic Zone**

**Prepared for:
HEZ Nominees Pty Ltd**

Reference 23909 – November 2007



HARPER
SOMERS
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PLANNING › SURVEYING › ECOLOGY

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Client:	<i>HEZ</i>
Our Ref	<i>23909</i>
Date:	<i>NOVEMBER 2007</i>
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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

BFPM – Bush Fire Protection Measures

BFPA – Bush Fire Prone Areas

BTA – Bushfire Threat Assessment

CCC - Cessnock City Council

FMP – Fuel Management Plan

ha – hectare

IPA – Inner Protection Area

LGA – Local Government Area

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

1 INTRODUCTION

RPS - Harper Somers O'Sullivan (RPS - HSO) has been engaged by HEZ Nominees Pty Ltd As Trustees for the HEZ Unit Trust, to undertake a Bushfire Threat Assessment (BTA) for Precinct 1 of the HEZ, hereafter referred to as the 'site' (Figure 1-1). The proposal is to be assessed under Part 3A of the *Environmental Planning and Assessment Act 1979* as amended by the *Environmental Planning and Assessment Act 1997*. The proposal is for an Industrial Concept Plan (Refer to accompanying EDAW plans in Part 3A Environmental Assessment) and the site is zoned as 4(h) – Hunter Employment Zone.

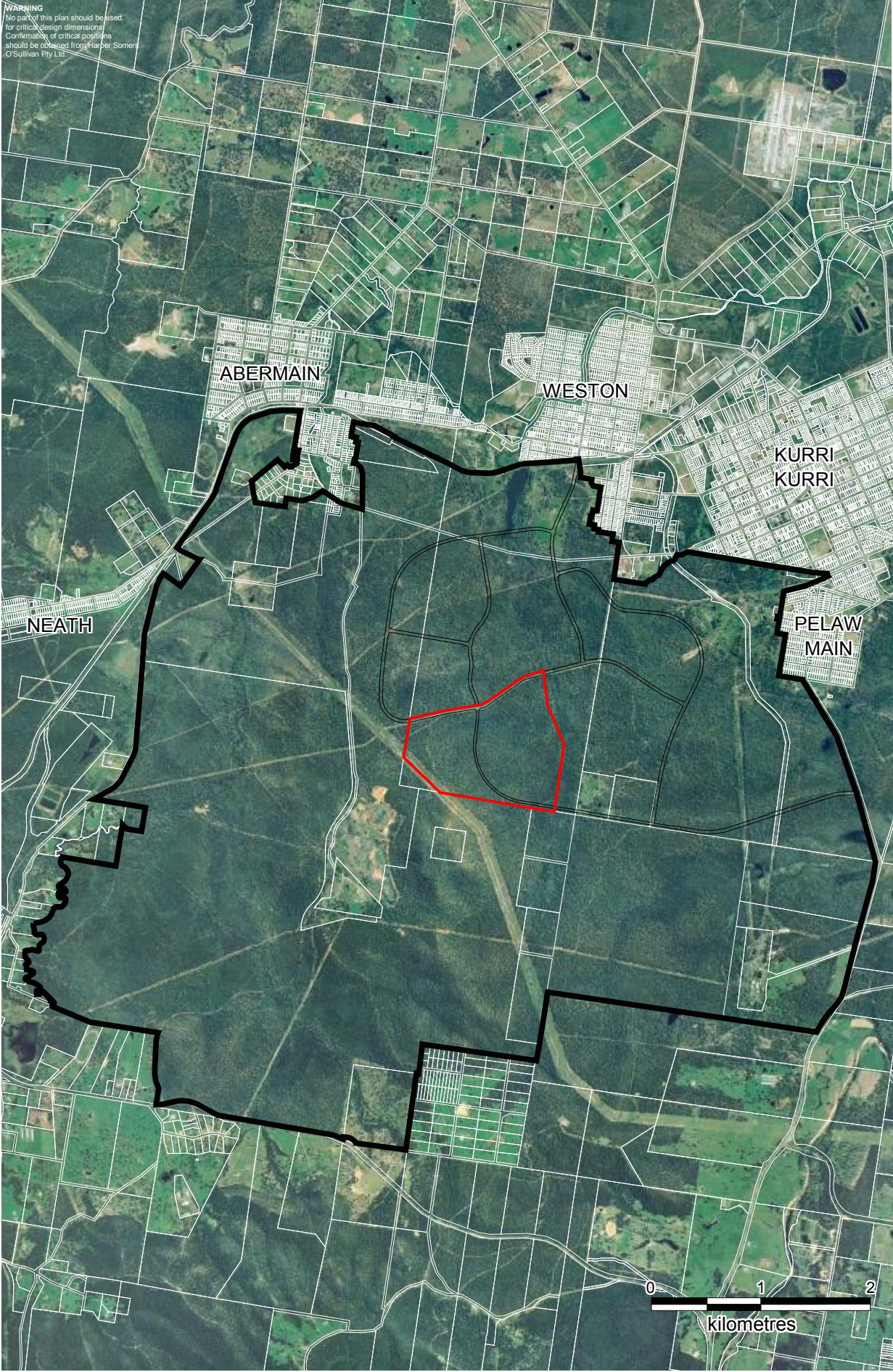
As part of this process the Department of Planning (DoP) has requested that consultation occurs with the NSW Rural Fire Service (NSW, RFS). Consultation has occurred with Mr Peter Murphy, the Development Control Officer of the RFS Hunter Zone-Cessnock. Mr Murphy has reviewed the Concept Plan for the site and he is satisfied that the proposed Bush Fire Protection Measures (BFPMs) to be implemented are adequate.

A Concept Plan has been prepared for Precinct 1 that will enable key site parameters to be resolved up front. The Concept Plan for Precinct 1 incorporates the indicative industrial allotments as well as the proposed BFPMs that will be implemented to satisfy the broad aims and objectives of Planning for Bushfire Protection (PBP) (RFS, 2006). Such BFPM's would be applicable to the future development of the site, whether or not the future lot boundaries differ from those shown in the indicative masterplan.



1.1 Site Particulars

- **Locality** - The proposal is located within the HEZ LEP area, specifically within the Zone No. 4(h) – Hunter Employment Zone.
- **LGA** – Cessnock.
- **Current land use** – The site contains native bushland.

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LEGEND

-  HEZ Study Area
-  Subject Site

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PROJECT: BUSHFIRE THREAT
ASSESSMENT

CLIENT: HEZ

TITLE: SITE LOCATION

CONTOUR INTERVAL:	N/A	DATUM:	MSA Zone 56 (GDA 94)
SCALE:	1: 50000 at A4 Size	JOB NUMBER:	23909
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DRAWN:	E. Graham		

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1.2 Aims and Objectives

The assessment aims to consider and assess the bushfire hazard and associated potential threats relevant to such a proposal, and to outline the minimum BFPM's that would be required to satisfy the broad aims and objectives of Planning for Bushfire Protection (PBP) (RFS, 2006).

There are six key BFPM's in a development assessment context being:

- The provision of clear separation of buildings and bush fire hazards, in the form of fuel-reduced Asset Protection Zone (APZ) and their components being Inner Protection Areas (IPAs), Outer Protection Areas (OPAs) and defensible space);
- 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.

The aim of PBP is to use the NSW development assessment system to provide for the protection of human life (including fire fighters) and to minimise impacts on property from the threat of bush fire, while having due regard to development potential, on site amenity and protection for the environment.

More specifically, the objectives are to:

- Afford occupants of any building adequate protection from exposure to a bush fire;
- Provide for a defensible space to be located around buildings;
- Provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent direct flame contact and material ignition;
- Ensure that safe operational access and egress for emergency service personnel and residents is available;
- Provide for ongoing management and maintenance of bush fire protection measures, including fuel loads in the APZ; and
- Ensure that utility services are adequate to meet the needs of fire fighters (and others assisting in bush fire fighting).

In circumstances where these aims and objectives as detailed are not met, then additional construction requirements for bushfire protection will need to be considered.

In order to determine whether the proposed development is bushfire-prone, and if so, which setbacks and other relevant BFPM's will be appropriate, this assessment adheres to the methodology and procedures outlined in "Planning for Bushfire Protection" (NSW Rural Fire Service, 2006) (hereafter referred to as 'PBP 2006').

1.3 Legislative Requirements

Environmental Planning and Assessment Act 1979

This report is specifically aimed at addressing the proposed development in terms of the threat from bushfire in accordance with the *Environmental Planning and Assessment Act 1979* (NSW) (EP&A Act). Particularly with regard to the following:

- Section 79C(1) of the EPA Act 1979

In determining a development application, a consent authority is to take into consideration the following matters as are of relevance to the development:

- *the likely impacts of the development; and*
- *the suitability of a site for development.*

Rural Fires Act 1997 (Amended)

Section 63 (1) and 63 (2) require public authorities and owners / occupiers of land to take all practicable steps to prevent the occurrence of bushfires on, and to minimise the danger of spread of bushfires on or from that land.

Planning for Bushfire Protection 2006 (PBP)(NSW RFS, 2006)

PBP (RFS, 2006) is a joint publication prepared by Planning and Environment Services and NSW Rural Fire Service in co-operation with the Department of Planning. This document provides bushfire protection measures for residential development, such as minimum width setbacks, and landscaping. These measures are provided as part of a strategy to address bushfire threat, with the aim of reducing risk to life and property.

The substantially revised 2006 edition of *Planning for Bush Fire Protection 2006* is intended for use by councils, town planners, NSW fire authorities, developers, planning and bush fire consultants, surveyors, and building practitioners (including accredited certifiers). The new document is more user friendly and incorporates clearer legislative provisions and performance criteria, together with more options for achieving compliance when building in a bush fire prone area.

For industrial type developments the aims and objectives of PBP (RFS, 2006) still require consideration.

Bushfire Management Strategy (BMS) Hunter Employment Zone, Tomalpin (November, 2003)

This document is in draft and was prepared by Conacher Travers Pty Ltd for Cessnock City Council, and reviews the bushfire hazards surrounding the wider HEZ study area and provides management and mitigation measures for the land within the HEZ.

1.4 Scope and Purpose

The scope and purpose of this BTA is to review the overall bushfire threat to the site and to review the capability of the site to provide a safe development environment through:

- assessment of all vegetation on and within 140 metres of the site boundary;
- assessment of the effective slope on site and to a distance of 100m;
- ensuring adequacy of public roads and property access to provide safe and operational access to structures in the vicinity, and to withstand increased traffic in a bushfire emergency;
- ensuring correct siting and adequate services of water for fire fighting purposes; and
- determining appropriate setback / Asset Protection Zone (APZ) distances from identified bushfire hazards.

2 BUSHFIRE THREAT ASSESSMENT

The methodology as detailed within Appendix 2 of PBP (RFS, 2006) was adopted to determine the expected bushfire attack.

2.1 Vegetation Assessment

In accordance with PBP (2006), an assessment of the vegetation over a distance of 140m in all directions from the site boundary was undertaken. This assessment has been made using a combination of aerial photograph interpretation and ground truthing exercises.

At the time of this assessment, one vegetation community was identified within the site and to a distance of 140m, this being Open Eucalypt Forest.

In accordance with Table A2.1 (PBP 2006), the Open Eucalypt Forest constitutes “Dry Sclerophyll Forest”. This vegetation assemblage occurs over the site and surrounding land (with the exception of existing roads and tracks). The area is characterised by the dominance of *Corymbia maculata* (Spotted Gum) and *Eucalyptus fibrosa* (Red Ironbark).

For the purposes of this assessment the Open Eucalypt Forest is referred to in this report as **Open Forest**.

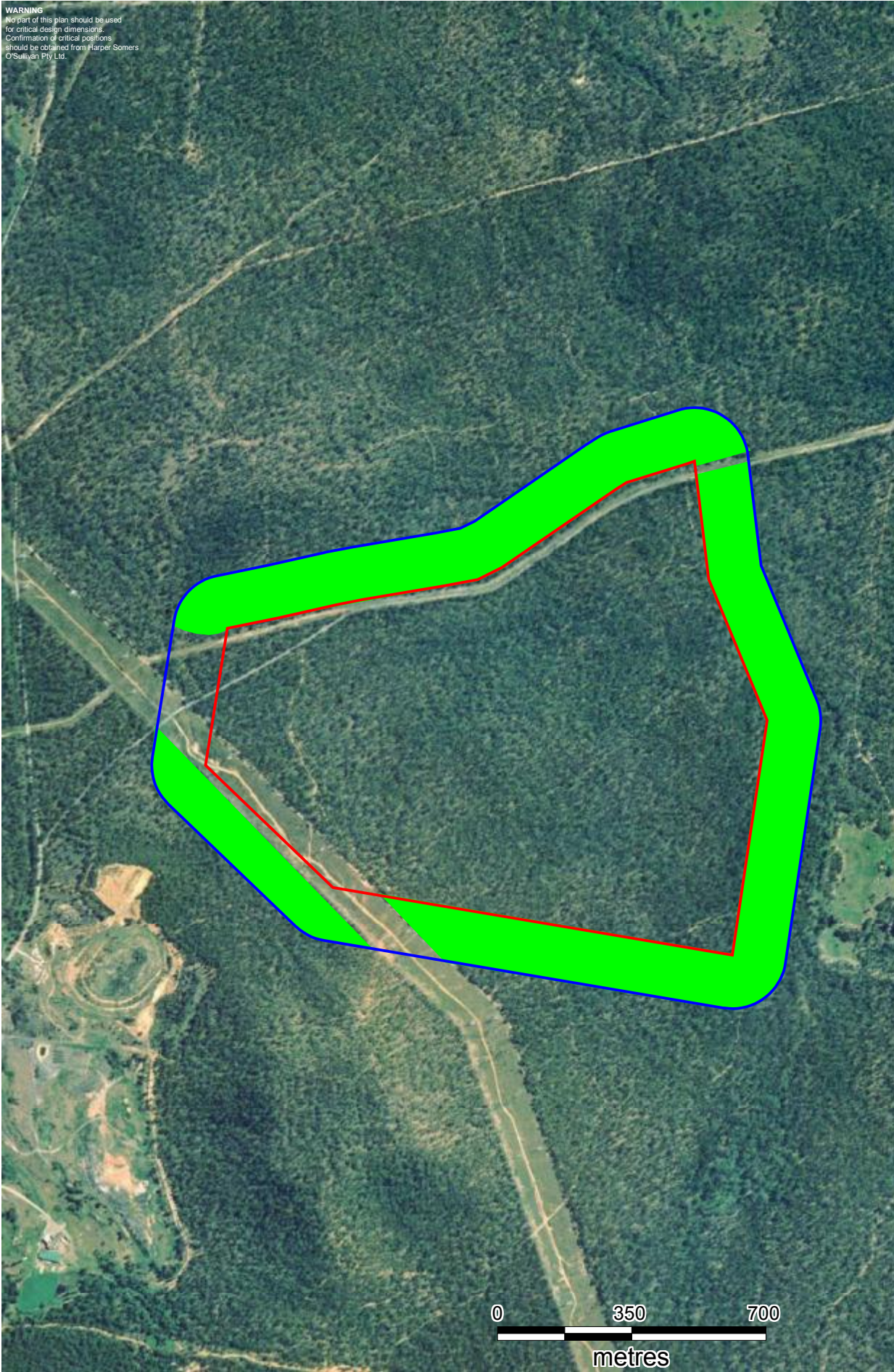
The majority of the Open Forest within the site will be cleared to accommodate the proposed development. However, some native vegetation will be retained for conservation purposes within the site, such as drainage lines and landscape buffers. The landscape buffers will not form a bushfire hazard post-development.

The site is surrounded by Open Forest. Refer to Figure 2-1 for Vegetation Map.

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LEGEND

-  Site Location
-  140m Buffer
-  Open Forest



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PROJECT: BUSHFIRE THREAT
ASSESSMENT

CLIENT: HEZ

TITLE: VEGETATION MAP

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FIGURE: 2-1
PAGE: 7



**HUNTER
ECONOMIC
ZONE**
Where industry thrives

CONTOUR INTERVAL:	N/A	DATUM:	MGA Zone 56 (GDA 94)
SCALE:	1: 50000 at A4 Size	JOB NUMBER:	23909
DATE:	27/11/2007		
DRAWN:	E. Graham		

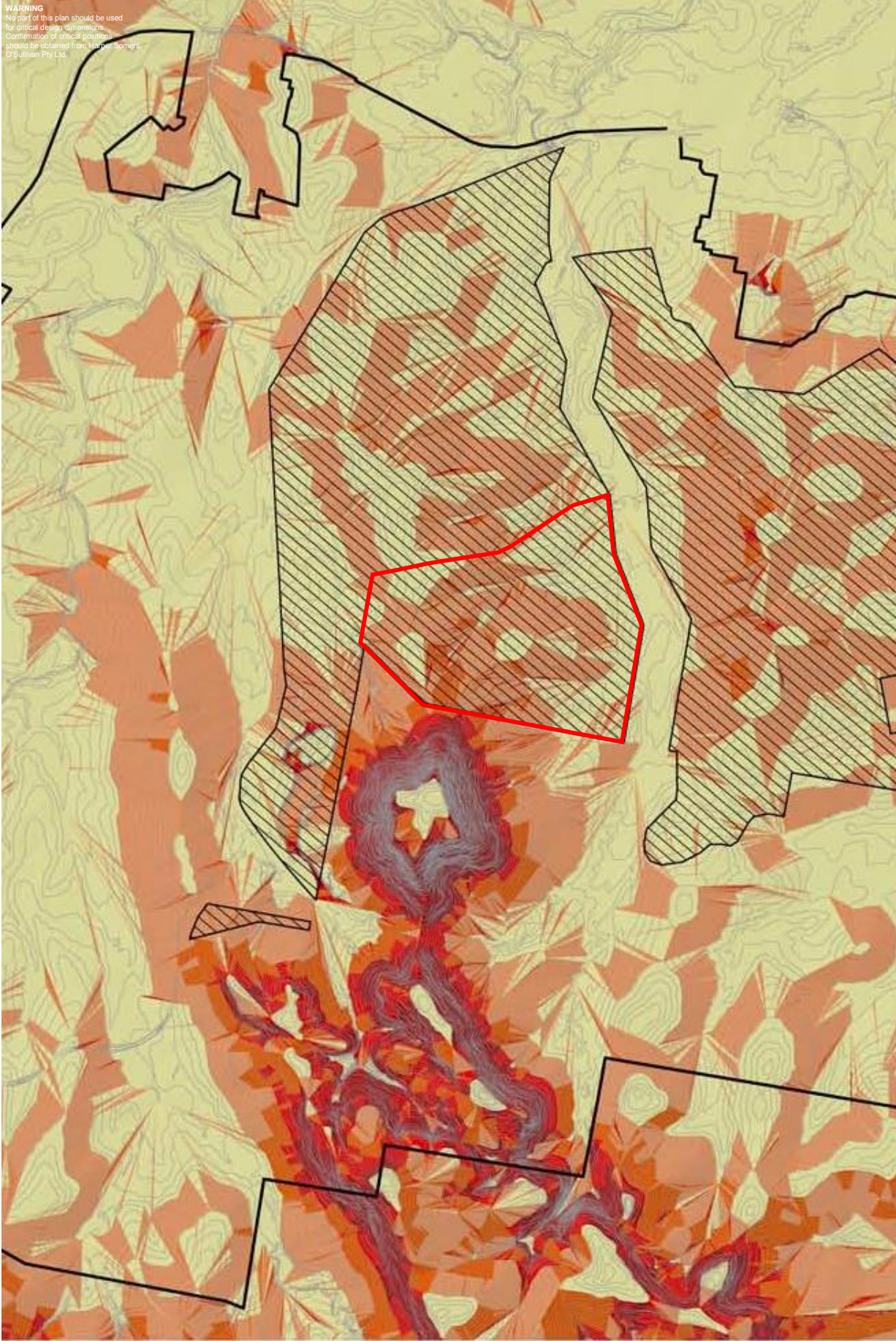
2.2 Slope Assessment

An assessment of the slope was undertaken to a distance of 140m in all directions from the site boundary was undertaken. The slopes leading away from the site have been evaluated to identify the average and maximum slope present. These values help determine the level of the gradient which will most significantly influence fire behaviour at the site.







To the north of the site, Open Forest occurs on a cross-slope. The vegetation to the east of the site is initially downslope and leads to a drainage line from which the slope then becomes upslope. Open Forest south of the site is either cross-slope or upslope 0 – 10 degrees from the site boundary, whilst Open Forest to the west of the site is gently downslope at 0 –5 degrees.

The dominant slope classes present within 140m from the site boundary are illustrated in Figure 2-2.

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LEGEND

-  Site Location
-  0-5 degrees
-  6-10 degrees
-  11-15 degrees
-  16-20 degrees
-  > 20 degrees



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PROJECT: BUSHFIRE THREAT
ASSESSMENT

CLIENT: HEZ

TITLE: SLOPE CLASS MAP

SLOPE CLASS DATA AND IMAGE PROVIDED COURTESY OF EDWA

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CONTOUR INTERVAL:	N/A	DATUM:	MGA Zone 56 (GDA 94)
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DATE:	27/11/2007		
DRAWN:	E. Graham		

3 BUSHFIRE PROTECTION MEASURES (BFPM)

The intent of the BFPM's is to minimise the risk of bush fire attack and provide protection for emergency services, personnel, residents and others assisting firefighting activities. There are six BFPMs:

- APZs;
- Construction standards and design;
- Appropriate access standards for residents, fire fighters, emergency services 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.

3.1 Asset Protection Zones

In order to comply with the intent and performance criteria of section 4.1.3 of PBP 2006 the development proposal must achieve the following:

The intent of APZs: *to provide sufficient space and maintain reduced fuel loads, so as to ensure radiant heat levels at buildings are below critical limits and to prevent direct flame contact with a building.*

Table 1 details the performance criteria of APZs and how the proposal satisfies the intent of this BFPM.

Table 1 Performance Criteria - APZ

Performance Criteria	Compliance
Radiant heat levels at any point on a proposed building will not exceed 29kW/m ²	<p>Complies - APZs have been established along the boundaries of the site. These APZs include the following:</p> <ul style="list-style-type: none"> • An APZ of 20m has been established along the northern boundary of the site. This APZ incorporates the road and road reserve being 20m wide. • An APZ of 20m has been established along the eastern boundary of the site where the site abuts the 7(b) Environmental Protection (Scenic) Zone. • No APZs are required along the southern boundary of the site due to existing / proposed infrastructure including roads and electricity easements. • A 20m APZ has been established along the western boundary of the site where the site abuts Open Forest.
APZs are managed and maintained to prevent spread of fire towards the building.	A monitoring and Fuel Management program will be prepared for the site.
APZ maintenance is practical, soil stability is not compromised and the potential for crown fires is negated.	APZs are not located on lands with a slope greater than 18 degrees.

The above APZs are detailed on the Concept Plan (Refer to accompanying Precinct 1 prepared by EDAW). This Concept Plan has been referred to the NSW RFS (Peter Murphy- Development Control Officer) for comment and they are satisfied with the APZs.

3.2 Access – Public Roads

The intent of Public Roads: to provide safe operational access to structures and water supply for emergency services, while residents are seeking to evacuate from an area.

Table 2 details the performance criteria of Access and how the proposal satisfies the intent of this BFPM.

Table 2 Performance Criteria - Access

Performance Criteria	Compliance
Firefighters are provided with safe all weather access to structures (thus allowing more efficient use of firefighting services)	Complies – public roads are two-wheel, all weather roads.
Public road widths and design that allow safe access for firefighters while residents are evacuating an area	Complies – This being: <ul style="list-style-type: none"> • The public roads are two traffic lane widths with a width of greater than 8m wide. • Traffic management devices are constructed to facilitate access by emergency services vehicles. • All roads are through roads with the exception of one dead end road that is not greater than 200m in length and incorporates a 12m outer radius turning circle. This dead end road will be clearly signposted as a dead end road. • The proposed road network will connect with an extension to Station Street. • The maximum grade of roads does not exceed 15 degrees. • There is a minimum vertical clearance to a height of four metres above the road at all times.
The capacity of road surface and bridges is sufficient to carry fully loaded firefighting vehicles	Complies – The capacity of the road surfaces and bridges is sufficient to carry fully loaded firefighting vehicles.
Roads that are clearly signposted (with easily distinguishable names) and buildings / properties that are clearly numbered	Complies – Roads will be clearly signposted.
There is clear access to reticulated water supply	Complies – there will be clear access to reticulated water supply for fire-fighting.
Parking does not obstruct minimum paved width	Complies – parking does not obstruct the minimum paved width for the road.

The proposed public road complies with the intent of this BFPM. It is also noted that the NSW RFS has been consulted and they are satisfied that the road network is adequate and provides safe access / egress for fire fighters, emergency services workers and those involved in evacuation.

3.3 Services – Water, Electricity & Gas

The intent of the water supply: to provide adequate services of water for the protection of buildings during and after the passage of a bush fire, and to locate gas and electricity so as not to contribute to the risk of fire to a building.

Table 3 details the performance criteria of water, electricity and gas and how the proposal satisfies the intent of these services.

Table 3 Performance Criteria of Water, Electricity & Gas

Performance Criteria	Compliance
Reticulated Water Supplies Water Supplies are easily accessible and located at regular intervals.	Complies - Hunter Water Corporation is currently developing a water servicing strategy and it is expected that in the event of a bushfire, water will be sourced from the reticulated mains water supply extended through the site. It is therefore important that mains supply outlets and hydrants are clearly marked and tested regularly.
Electricity Services Location of electricity services limits the possibility of ignition of surrounding bushland or the fabric of buildings Regular inspections of lines is undertaken to ensure they are not fouled by branches	Complies – Electricity will be underground.
Gas Services Location of gas services will not lead to the ignition of surrounding bushland or the fabric of buildings.	Complies- If reticulated or bottled gas is installed it will be maintained in accordance with AS 1596 and the requirements of relevant authorities.

The proposed services will comply with the intent of these measures.

4 BUILDING STANDARDS

PBP 2006 is applicable to Class 1, 2 and 3 residential developments as defined within the Building Code of Australia (BCA, 2004). The proposed development is for an industrial subdivision, therefore, future buildings within the site will be classified as Class 5 - 8 within the BCA. The BCA does not provide for any bush fire specific performance requirements and as such AS 3959 does not apply as a set of 'deemed to satisfy' provisions. The general fire safety construction provisions are taken as acceptable solutions, but the aim and objectives apply in relation to other matters

such as access, water and services, emergency planning and landscaping / vegetation management.

In circumstances where the aim and objectives of PBP are not met, then the construction requirements for bush fire protection will need to be considered on a case-by-case basis.

5 CONCLUSION

This BTA has been undertaken for a proposed industrial subdivision. This development will be assessed under Part 3A of the *Environmental Planning and Assessment Act 1979* as amended by the *Environmental Planning and Assessment Act 1997*. As part of the process the DoP has requested that consultation occurs with the NSW RFS. Consultation has occurred with Peter Murphy the Development Control Officer for the Hunter Zone – Cessnock NSW RFS. Peter Murphy has assessed the Concept Plan and is satisfied with the BFPs proposed for Precinct 1 of HEZ.

In summary, the following BFPs have been generated to enable the proposed development to comply with the aims and objectives of Planning for Bushfire Protection (PBP 2006):

Asset Protections Zones

Issue: *Sufficient space and maintenance of reduced fuel loads is required to ensure radiant heat levels at buildings are below critical limits and to prevent direct flame contact with a building.*

Response:

- An APZ of 20m will be established along the northern boundary of the site. This APZ will be maintained by the road and road reserve and therefore no internal setbacks will be required from this direction.
- An APZ of 20m will be established along the eastern boundary of the site where the site adjoins the 7(b) Environmental Protection (Scenic) Zone.
- No APZs are required along the southern boundary of the site due to existing / proposed infrastructure including roads and electricity easements.
- A 20m APZ will be established along the western boundary of the site where the site abuts Open Forest.

Construction Levels

Issue: *The Building Code of Australia does not provide for any bush fire specific performance requirements for Class 5 – 8 buildings and as such AS 3959 does not apply as a set of 'deemed to satisfy' provisions.*

Response:

- Although AS3959 does not apply to Class 5 – 8 buildings, the general fire safety construction provisions will apply to the proposed buildings within the site.

Water Supply

Issue: Adequate water services and supply are required for the protection of buildings during and after the passage of a bush fire.

Response:

- Hunter Water Corporation is currently developing a water servicing strategy and it is expected that in the event of a bushfire, water will be sourced from the reticulated mains water supply extended through the site. It is therefore important that mains supply outlets and hydrants are clearly marked and tested regularly.

Electricity and Gas

Issue: Gas and electricity should be located so as not to contribute to the risk of fire to a building.

Response:

- No part of any tree should be closer to a power line than the distance set out in accordance with the specifications in 'Vegetation Safety Clearances' issued by Energy Australia (NS179, April 2002).
- If reticulated or bottled gas is installed it will be maintained in accordance with AS 1596 and the requirements of relevant authorities

Access

Issue: Safe operational access to structures and water supply is required for emergency services.

Response:

- The proposed road network as detailed in the Concept Plan satisfies the requirements of access roads. No additional firetrails are required due to the adequate combination of built roads and APZs.

If the recommendations regarding bushfire hazard mitigation contained within this assessment are duly considered and incorporated, then it is considered that the fire hazard present is containable to a level considered necessary to provide an adequate level of protection to life and property on site. Any lessening of the requirements would require a Performance Based Assessment to be undertaken and would necessitate assessment and approval of such deviation by the NSW Rural Fire Service.

Finally, whilst 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 this study area, they do not and cannot guarantee that the area will not be affected by bushfire at some time.

6 REFERENCES

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