

APPENDIX E

Bushfire Threat Assessment, RPS Australia East Pty Ltd, June 2010



Bushfire Threat Assessment

Lot 32, DP 1014864 Masonite Road, Heatherbrae

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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 subject lands assessed herein, but they do not and cannot guarantee that the area will not be affected by bushfire at some time.

Executive Summary

RPS Australia East Pty Ltd (RPS) has been commissioned by Sandvik Mining and Construction Australia Pty Ltd to undertake a Bushfire Threat Assessment (BTA) in relation to a “Major Development” lodged under the Major Development SEPP (and Part 3A of the EP&A Act, 1979) for Lot 32 DP 1014864 Masonite Road, Heatherbrae.

The proposal consists of a manufacturing, assembly, fabrication, warehouse and aftermarket industrial buildings with associated infrastructure such as office, carparks, guard station and amenities.

The proposed development will require the removal of up to 13.5ha of native vegetation and 1.5ha of predominantly cleared land. Approximately 1ha of vegetation will be retained in the south-east of the site.

Buildings are classified within this type of development as Class 5 – 8 within the BCA. Therefore, the provisions of PBP 2006 do not strictly apply. The site is however within an area that is classified as Bushfire Prone, and the surrounding vegetation represents a potential threat to the proposed development.

Notably the assessment and recommendations contained within this report are based on Industrial Development.

This BTA found the majority of land surrounding the site to support vegetation consistent with Open Forest as described by PBP (2006).

In summary, the following key design recommendations have been generated to enable the proposed development to comply with PBP 2006:

- 10m Asset Protection Zones (APZ's) are recommended between the proposed industrial subdivision and the vegetation to the South, South-east and west of the site. These will be established within the site and will be maintained to the standard of an IPA.
- Any vegetation within the development area, not including 1ha parcel of retained vegetation situated in the south-east the of the site should be managed in accordance with specifications for an IPA as listed in Section 5.1.
- Access roads as a minimum be formalised to a width capable of being used by fire fighting vehicles (standard minimum width is 8m kerb to kerb with shoulders on each side).
- Future buildings should have due regard to the specific considerations given in the Building Code of Australia and recommendations made in Section six.

Terms and Abbreviations

Abbreviation	Meaning
APZ	Asset Protection Zone
AS2419 -2005	Australian Standard – Fire Hydrant Installations
AS3959-1999	Australian Standard – Construction of Buildings in Bush Fire Prone Areas
BCA	Building Code of Australia
BPA	Bush Fire Prone Area (Also Bushfire Prone Land)
BPL Map	Bush Fire Prone Land Map
BPMs	Bush Fire Protection Measures
<i>EPA Act</i>	<i>NSW Environmental Planning and Assessment Act 1979</i>
FDI	Fire Danger Index
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 Act	Rural Fires Act 1997
RF Regulation	Rural Fires Regulation

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Concept Plan

I Introduction

RPS Australia East Pty Ltd (RPS) has been commissioned by Sandvik Mining and Construction Australia Pty Ltd to undertake a Bushfire Threat Assessment (BTA) in relation to a “Major Development” lodged under the Major Development SEPP (and Part 3A of the EP&A Act, 1979) for Lot 32 DP 1014864 Masonite Road, Heatherbrae.

Buildings are classified within this type of development as Class 5 – 8 within the BCA. Therefore, the provisions of PBP 2006 do not strictly apply. The site is however within an area that is classified as Bushfire Prone, and the surrounding vegetation represents a potential threat to the proposed development.

Notably the assessment and recommendations contained within this report are based on Industrial Development.

1.1 Site Particulars

Locality – Masonite Road, Heatherbrae, NSW.

LGA – Port Stephens.

Area – The area to be affected by the proposal is approximately 16 ha.

Zoning – The area is currently zoned as 4(a) industrial.

Bushfire Prone Fire Danger Index rating of 100.

Land Map

Zoning & FDI

Current Land Use – The site is currently unused with most covered by relatively undisturbed native vegetation, with the exception of vehicle tracks. Land within the north east corner of the site has been disturbed by previous agricultural/commercial disturbances and building activity relating to an old disused shed and mulch storage facilities. Native vegetation occurs to the south of the site and industrial / commercial development to the north, east and west of the site.

Topography – The site low lying and relatively flat with a minor depression in the south-east of the site.

Climate / Fire History – The site lies within a geographical area with a Fire Danger Index rating of 100. Extreme bushfire weather is therefore associated with long periods of drought, high temperatures, low humidity and gusty often north-westerly winds.

Figure 1-1 shows the general location of the site within the local region.

WARNING
 No part of this plan should be used for critical design dimensions. Confirmation of critical positions should be obtained from RPS Newcastle.



Legend

Site Boundary

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SCALE: 1:60000 AT A4 SIZE

TITLE: FIGURE 1-1 SITE LOCATION

LOCATION: MASONITE ROAD

DATUM: DATUM
 PROJECTION: MGA ZONE 56 (GDA 94)

DATE: 2/6/2010
 PURPOSE: BTA

LAYOUT REF: PR104099 Figure 1-1 Site Location A A4
 VERSION (PLAN BY): B A4 (NW)

CLIENT: SANDVIK MINING AND CONSTRUCTION AUSTRALIA PTY LTD
 JOB REF: 104099

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1.2 Description of Proposal

The site is proposed to be developed by Sandvik Mining and Construction Australia Pty Ltd. The proposal consists of a manufacturing, assembly, fabrication, warehouse and aftermarket industrial buildings with associated infrastructure such as office, carparks, guard station and amenities. The current concept plan for the site is shown in Appendix 1.

The proposed development will require the removal of up to 13.5ha of native vegetation and 1.5ha of predominantly cleared land. Approximately 1ha of vegetation will be retained in the south-east of the site.

1.3 Objectives of Assessment

This assessment has been undertaken to address the following in relation to Industrial developments:

- 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 asset protection zone (APZ); and
- Ensure that utility services are adequate to meet the needs of fire-fighters (and others assisting in bush fire fighting).

2 Methodology

2.1 Vegetation Assessment

Vegetation surveys and vegetation mapping carried out on the site has be undertaken as follows:

- Aerial Photograph Interpretation to map vegetation cover and extent.
- Confirmation of the vegetation assemblage typology present via a site inspection
- Direct measurement of leaf litter depth.

2.2 Slope Assessment

Slope assessment has been undertaken as follows:

- Aerial Photograph Interpretation in conjunction with analysis of electronic contour maps with a contour interval of 10m.
- On site confirmation of slope measurements using a hand-held inclinometer.

3 Vegetation Assessment

In accordance with PBP (RFS 2006), an assessment of the vegetation over a distance of 140m in all directions from the site was undertaken. Vegetation that may be considered a bushfire hazard was identified in all directions from the site. Refer to Table 3-1 and Figure 3-1 for vegetation description and location.





Table 3-1: Vegetation Classification

Direction	Vegetation Community	Classification of Vegetation Formations
North	Industrial Development	No Hazard
South - East	Industrial Development	Rainforest*
South	Smooth barked Apple / Blackbutt Forest	Open Forest
West	Smooth barked Apple / Blackbutt Forest	Open Forest

*The proposal includes the retention of vegetation in the south-eastern portion of the site. This vegetation is approx 1ha in area and as such under the provisions of PBP (2006) will be assessed as 'Rainforest'.

WARNING
 No part of this plan should be used for critical design dimensions. Confirmation of critical positions should be obtained from RPS Newcastle.

LEGEND

-  Site Boundary
-  140m Buffer
-  Open Forest
-  Retained Vegetation

N
↑



SCALE: 1: 3000 AT A3 SIZE

4 Effective Slope Assessment

In accordance with PBP (RFS 2006), an assessment of the slope affecting the bushfire behaviour was undertaken for a distance of 100m from the edge of the site boundary in the direction of the bushfire hazard.

The slopes leading away from the site have been evaluated to identify both the average slope and by identifying the maximum slope present. These values help determine the level of gradient which will most significantly influence the fire behaviour of the site.

The slope of vegetation surrounding each development estate to 140m is documented in Table 4-1 below.

Table 4-1: Slope Assessment

Direction of Vegetation	Vegetation Type	Slope Classes
South	Open Forest	0-5° Downslope
West	Open Forest	Cross-slope

5 Determining Appropriate Setbacks

The proposed development is classified as Industrial development. Buildings are classified within this type of development as Class 5 - 8 within the BCA. Therefore, the provisions of PBP 2006 do not strictly apply. The site is however within an area that is classified as Bushfire Prone, and the surrounding vegetation represents a potential threat to the proposed development.

As a precautionary approach 10m APZ's should be installed around the proposed industrial development and between the retained vegetation in the south-east and buildings. This 10m setback should be maintained in accordance with the specifications for an IPA as detailed in Section 5.1 below. The proposed 10m APZ to the south and west will be established within the site itself. Refer to Figure 5-1 for required APZ's.

The allocation of 10m APZ's will also allow a defensible space around the perimeter of the development so that in the event of a bushfire fire fighters have suitable space to defend the development.

5.1 Inner Protection Area

The IPA ensures that the presence of fuels are minimised close to a development, thereby minimising the impact of direct flame contact and radiant heat. The performance of the IPA must be such that:

- there is minimal fine fuel at ground level which could be set alight by a bushfire; and
- any vegetation in the IPA does not provide a path for the transfer of fire to the development – that is, the fuels are discontinuous.
- The presence of a few shrubs or trees in the IPA is acceptable provided that they:
 - do not touch or overhang any buildings;
 - are well spread out and do not form a continuous canopy;
 - are not species that retain dead material or deposit excessive quantities of ground fuel in a short period or in a danger period; and
 - are located far enough away from any dwelling so that they will not ignite the dwelling by direct flame contact or radiant heat emission.

Woodpiles, wooden sheds, combustible material storage areas, large areas / quantities of garden mulch, stacked flammable building materials etc. should not be permitted in the IPA, although the IPA can include lawns, discontinuous gardens, fire-trails, perimeter roads, access roads, car parking facilities and driveways.

6 Dwelling Design and Construction

The Building Code of Australia (BCA) does not provide for any bush fire specific performance requirements and as such AS 3959-2009 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 of PBP apply in relation to other matters such as access, water and services, emergency planning and landscaping/ vegetation management. These matters have been addressed in this report.

In accordance with the BCA the buildings will be designed and constructed to reduce the risk of ignition while a fire front passes. It is recommended that design features in any future development include but not be limited to:

- external walls facing the hazard will not include any combustible materials – walls be constructed of colorbond sheeting and concrete construction;
- walls of the buildings facing any hazard will be completely enclosed;
- floors will be enclosed with non-combustible materials;
- no windows will face the direction of the hazard;
- gutters will be eliminated or if fitted will be protected with metal gutter guards to stop leaves collecting in the gutters; and
- the boundary fence along the hazard should be constructed of non combustible materials – colorbond or chain mesh fencing with appropriate access.

7 Access

The following road specifications are considered as acceptable solutions as detailed within PBP (RFS, 2006). Deviations from these solutions for access may be considered (depending on the situation) through a performance-based assessment.

In the event of a serious bushfire threat to the proposed development, it will be essential to ensure that adequate evacuation routes are provided and that access to all areas of retained adjacent vegetation (both on-site and adjacent) is feasible. Therefore it is recommended that multiple access / egress routes be provided for any proposed development upon this site, and that all internal roads be designed to the specifications outlined below during the subsequent design stages.

According to PBP (2006), the design specifications for Public Access Roads require:

- Urban perimeter roads are two-way, that is, at least two traffic lane widths (carriageway eight metres minimum kerb to kerb);
- Public roads are two-wheel drive, all weather roads;
- The perimeter road is linked to the internal road system at an interval of no greater than 500 metres in urban areas;
- Public roads have a cross-fall not exceeding 3°;
- All roads are through roads. Where dead end roads are unavoidable, dead ends are not more than 200 metres in length and incorporate a minimum 12 metre outer radius turning circle and are clearly signposted as a dead end;
- Curves of roads (other than perimeter roads) are a minimum inner radius of six metres;
- Maximum grades for sealed roads do not exceed 15° and an average grade of not more than 10°;
- There is a minimum vertical clearance to a height of four metres above the road at all times;
- The capacity of road surfaces and bridges is sufficient to carry fully loaded fire fighting vehicles (15 tonnes for areas with reticulated water, 28 tonnes for all other areas);
- Public roads greater than six and a half metres wide to locate hydrants outside of parking reserves;
- Public roads between six and a half metres and eight metres wide are to have No Parking on one side with the hydrants located on this side;
- Parking bays are a minimum of 2.6 metres wide from kerb edge to road pavement; and
- Public roads directly interfacing the bush fire hazard vegetation provide roll top kerbing to the hazard side of the road.

The current design layout allows for a 10m wide perimeter road surrounding the development and multiple access/egress routes to car parking for quick evacuation.

8 Water

Following any kind of development upon the land, it is expected that water mains will be extended into the development. 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.

9 Fire Fighting Capability

The Raymond Terrace branch of the NSW Fire Brigade would attend any fire within the site in the first instance. Response time would be expected to be approximately five to ten minutes. To facilitate quick and efficient action by the Fire Brigade / Rural Fire Service upon arrival, it is recommended that all necessary connections / pumps etc be clearly marked and visible, and in good working order.

10 Fuel Management

Given that fuel reduction resulting from initial clearing and development of the site will greatly reduce the risk to a large proportion of the site, careful thought must be given to the type and physical location of any proposed site landscaping. Inappropriately selected and positioned vegetation has the potential to 'replace' the previously removed fuel load.

Once an appropriate APZ to the satisfaction of the RFS has been created, ongoing maintenance is required to ensure that re-growth and fuel load replacement does not occur.

Bearing in mind the desired aesthetic and environment sought by site landscaping, some basic principles have been recommended to help minimise the chance of such works contributing to the potential hazard on site.

Whilst it is recognised that fire-retardant plant species are not always the most aesthetically pleasing choice for site landscaping, the need for adequate protection of life and property requires that a suitable balance between visual and safety concerns be considered. The areas of the development estate occurring within the extent of the APZ should avoid landscaping with highly flammable species and dense, connected plantings of species.

In terms of landscaping and maintenance of the site, it is recommended that the following occur:

- Any landscaped areas are managed to the specifications of an IPA. Refer to Section 5.1 of report.
- Shrubs or ground covers not to be planted against proposed building;
- Fire retardant plants or plants of low flammability be used. Characteristics of these plants include high salt resistance and moisture content / low volatile oil content with the lowest branches being raised from the ground (such plants are commercially available).
- The owner is aware of the importance of an ongoing maintenance regime for bushfire protection.

It is reiterated again that it is essential that any landscaped areas and surrounds are subject to ongoing fuel management and reduction to ensure that fine fuels do not build up.

11 Conclusion and Recommendations

The proposal consists of a manufacturing, assembly, fabrication, warehouse and aftermarket industrial buildings with associated infrastructure such as office, carparks, guard station and amenities.

The proposed development will require the removal of up to 13.5ha of native vegetation and 1.5ha of predominantly cleared land. Approximately 1ha of vegetation will be retained in the south-east of the site.

This BTA found the majority of land surrounding the site to support vegetation consistent with Open Forest as described by PBP (2006).

In summary, the following key design recommendations have been generated to enable the proposed development to comply with PBP 2006:

- 10m Asset Protection Zones (APZ's) are recommended between the proposed industrial subdivision and the vegetation to the South, South-east and west of the site. These will be established within the site and will be maintained to the standard of an IPA.
- Any vegetation within the development area, not including 1ha parcel of retained vegetation situated in the south-east the of the site should be managed in accordance with specifications for an IPA as listed in Section 5.1.
- Access roads as a minimum be formalised to a width capable of being used by fire fighting vehicles (standard minimum width is 8m kerb to kerb with shoulders on each side).
- Future buildings should have due regard to the specific considerations given in the Building Code of Australia and recommendations made in Section six.

In conclusion, should the recommendations above be duly considered and incorporated, the fire hazard present should be reduced to a level considered necessary to provide an adequate level of protection to life and property of the site.

12 Bibliography

- Department of Bush Fire Services (undated). *Bush Fire Readiness Checklist*.
- NSWFB (1988). *Hazard Reduction for the Protection of Buildings in Bushland Areas*. New South Wales Fire Brigades.
- NSW Rural Fire Service (1997). *Bush Fire Protection for New and Existing Rural Properties*. September 1997, NSW Government.
- NSW Rural Fire Service (2006). *Planning for Bushfire Protection – A Guide for Councils, Planners, Fire Authorities, Developers and Home Owners*.
- NSW Rural Fire Service (2005). Standards for Asset Protection Zones. NSW Rural Fire Service.
- NSW Rural Fire Service (2002). *Circular 16/2002: Amendments to the Rural Fires Act 1997 – hazard reduction and planning requirements*.
- Ramsay, GC and Dawkins, D (1993). *Building in Bushfire-prone Areas – Information and Advice*. CSIRO and Standards Australia.
- Rural Fires and Environmental Assessment Legislation Amendment Act 2002*.
- Standards Australia (1999). *AS 3959 – 1999: Construction of Buildings in Bushfire-prone Areas*.

Appendix I

Concept Plan

