APPENDIX J

Bushfire assessment

Cobbora Holding Company Pty Limited

EMM
EMGA Mitchell McLennan

Bushfire assessment

Cobbora Coal Project

Prepared for Cobbora Holding Company Pty Limited | 14 September 2012

Ground Floor, Suite 01, 20 Chandos Street
St Leonards, NSW, 2065

T +61 2 9493 9500
F +61 2 9493 9599
E info@emgamm.com

emgamm.com

Bushfire assessment

Final

Report J11030RP11 | Prepared for Cobbora Holding Company Pty Limited | 14 September 2012

Prepared by	**Mark Roberts**	Approved by	**Philip Towler**
Position	Environmental Consultant	Position	Associate Director
Signature		Signature	
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EMM
EMGA Mitchell McLennan

T +61 (0)2 9493 9500 | F +61 (0)2 9493 9599

Ground Floor | Suite 01 | 20 Chandos Street | St Leonards | New South Wales | 2065 | Australia

emgamm.com

Executive Summary

The Cobbora Coal Project (the Project) is a new open cut coal mine proposed by Cobbora Holding Company Pty Limited (CHC). The primary purpose of the Project is to provide coal for five major NSW power stations. The project application area (PAA) is located approximately 5 km south of Cobbora, 22 km south-west of Dunedoo, 64 km north-west of Mudgee and 60 km east of Dubbo in the central west of NSW.

This bushfire assessment has been prepared to satisfy the Director General's Environmental Assessment Requirements for the Project, which requires assessment of hazards, including bushfires. It has been prepared in accordance with the NSW Rural Fire Service's *Planning for Bush Fire Protection Guideline* (2006).

The Project is on land classified as bushfire prone. Asset protection zones will be provided to enable fire fighting vehicle access and to distance Project buildings from vegetation that presents a fire hazard. Bushfire construction requirements for Project buildings are provided. Mine water carts will be fitted with water cannons and used to supplement fire fighting vehicles if there is a fire. The risk of the Project initiating a bushfire will be minimised through the implementation of the proposed management measures.

CHC is liaising with the Rural Fire Service (RFS) with a view to providing training to local RFS members, CHC staff and CHC contractors. CHC will participate in RFS bushfire risk assessments for the area surrounding the Project and will continue to assist with bushfire risk reduction works. These measures will enhance the area's bushfire fighting capabilities.

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Acronyms

APZ	Asset protection zone
BAA	Bushfire attack assessment
BCA	Building code of Australia
CHC	Cobbora Holding Company Pty Limited
CHPP	Coal handling and preparation plant
DA	Development application
DGRs	Director General's Environmental Assessment Requirements
EMM	EMGA Mitchell McLennan Pty Ltd
FDI	Fire danger index
GL	Gigalitre
IPA	Inner protection area
kV	Kilovolt
LEP	Local environmental plan
LGA	Local government area
Mtpa	Million tonnes per annum
MW	Megawatt
OOP	Out-of-pit waste rock emplacement
OPA	Outer protection area
PBP	Planning for bushfire protection
ROM	Run-of-mine
TCAV	Temporary construction accommodation village

1 Introduction

This bushfire assessment has been prepared by EMGA Mitchell McLennan Pty Ltd (EMM) for the Project, as required by the Director General's Environmental Assessment Requirements (DGRs) issued on 23 December 2011. This bushfire assessment has been prepared in accordance with the NSW Rural Fire Service's *Planning for Bush Fire Protection Guideline* (RFS, 2006) (PBP). It considers the bushfire hazard associated with the Project and describes mitigation measures, in accordance with Appendix 4 of the PBP (Submission requirements for DAs on bushfire prone land).

1.1 Project description

1.1.1 Overview

The Project is a new open cut coal mine that will be developed near Dunedoo in the central west of New South Wales (NSW). The Project Application Area (PAA) is approximately 274 square kilometres (km^2). The primary purpose of the Project is to provide coal for five major NSW power stations.

The mine will extract around 20 million tonnes per annum (Mtpa) of run-of-mine (ROM) coal. From this, approximately 9.5 Mtpa of product coal will be sold to Macquarie Generation, Origin Energy and Delta Electricity under long term contract. In addition, approximately 2.5 Mtpa will be produced for export or for the spot domestic market.

The Project's key elements are:

- an open cut mine;
- a coal handling and preparation plant (CHPP);
- a train loading facility and rail spur;
- a mine infrastructure area; and
- supporting infrastructure including access roads; water supply and storage; and electricity supply.

It is envisaged that construction activities will commence in mid-2013 with coal supplied to customers from the second half of 2015.The mine life will be 21 years.

1.1.2 Open cut mine

Multiple open cut mining pits will be developed within three mining areas:

- Mining Area A north of the infrastructure area;
- Mining Area B south of the infrastructure area; and
- Mining Area C north-east of the infrastructure area.

There will be three out-of-pit waste rock emplacements:

- AC-OOP between mining areas A and C;
- B-OOP E adjacent to Mining Area B on the east side of Laheys Creek; and
- B-OOP W adjacent to Mining Area B on the west side of Laheys Creek.

A conventional load and haul operation is proposed using excavators, front-end loaders and trucks. Initially, trucks will haul waste rock to out-of-pit emplacements. Following this, the majority of the waste rock will be placed in the mined-out voids.

Trucks will haul excavated ROM coal to the CHPP where it will be tipped into dump hoppers above the primary crushers or onto secondary ROM stockpiles for later rehandling.

1.1.3 Coal handling and preparation plant

The CHPP will treat up to 20 Mtpa of ROM coal to produce a product coal that meets the sizing and coal quality requirements of the customers. Subject to the level of impurities (rejects) in the coal and washability characteristics, the ROM will be either crushed and bypassed or treated (washed) in the preparation plant. The rejects will typically include waste rock from above and below the coal seam as well as material dispersed within the coal.

The CHPP processes will be typical of those used in the majority of CHPPs in NSW with product coal separated from rejects in a series of coal cleaning circuits. The CHPP area will also contain a truck dump station; crushing plants; coal stockpiles; and the infrastructure to move and stockpile the coal. Rejects from the CHPP will be disposed within the footprint of the mining area.

1.1.4 Train loading facility and rail spur

Coal will be transported by rail to the Project's customers, including Bayswater and Liddell power stations in the Upper Hunter Valley and Eraring, Vales Point and Munmorah power stations on Lake Macquarie on the NSW Central Coast.

Product coal will be loaded onto trains from an overhead train loading bin located on a rail spur balloon loop. Approximately five trains will be loaded each day. The rail spur will be approximately 28 km long and will join the Dunedoo-Gulgong rail line near Tallawang. A locomotive provisioning facility and a siding for fuel delivery may be located adjacent to the balloon loop.

1.1.5 Mine infrastructure area

The mine infrastructure area will be located adjacent to the mining areas. It will include workshops; hardstand and lay-down areas; bulk storage buildings; bulk fuel storage and a fuelling station; office buildings; an operations building and change-house; parking; an explosives magazine; and vehicle washdown bays.

1.1.6 Supporting infrastructure

i Access roads

The main access to the mine will be from the Golden Highway to the north of the operations, via a road diversion that will replace an existing section of Spring Ridge Road. There will be limited light vehicle access from the south via Spring Ridge Road.

Internal roads will connect the access road to the workshop, administration buildings and to the mine infrastructure area. Internal roads will also connect the various areas of the Project.

ii Water supply

The Project will require water primarily for the CHPP and for dust suppression. Water will be sourced by intercepting surface water and by pumping groundwater that enters the mine pits in accordance with the relevant permits and licences. Water will also be sourced from the Cudgegong River and pumped approximately 26 km to the primary raw water dam south-east of the mining area. Pre-existing high security water access licences have been purchased for the Project to allow up to 3.3 gigalitres (GL) of water to be extracted from the river.

iii Electricity supply

The Project will require approximately 20 megawatts (MW) of electrical power. The Project will be connected to the grid at a small switching yard adjacent to the Castlereagh Highway. A power line, generally running parallel to the rail spur, will deliver the electricity to a substation in the mine infrastructure area.

An 11 kV powerline will supply the Cudgegong River pump station from the existing grid approximately 2 km south of the pump station site.

1.1.7 Workforce and operating hours

The proposed mine construction workforce will average approximately 350 persons, peaking at approximately 550 persons over a 26 month period covering Q3 2013 to Q2 2016.

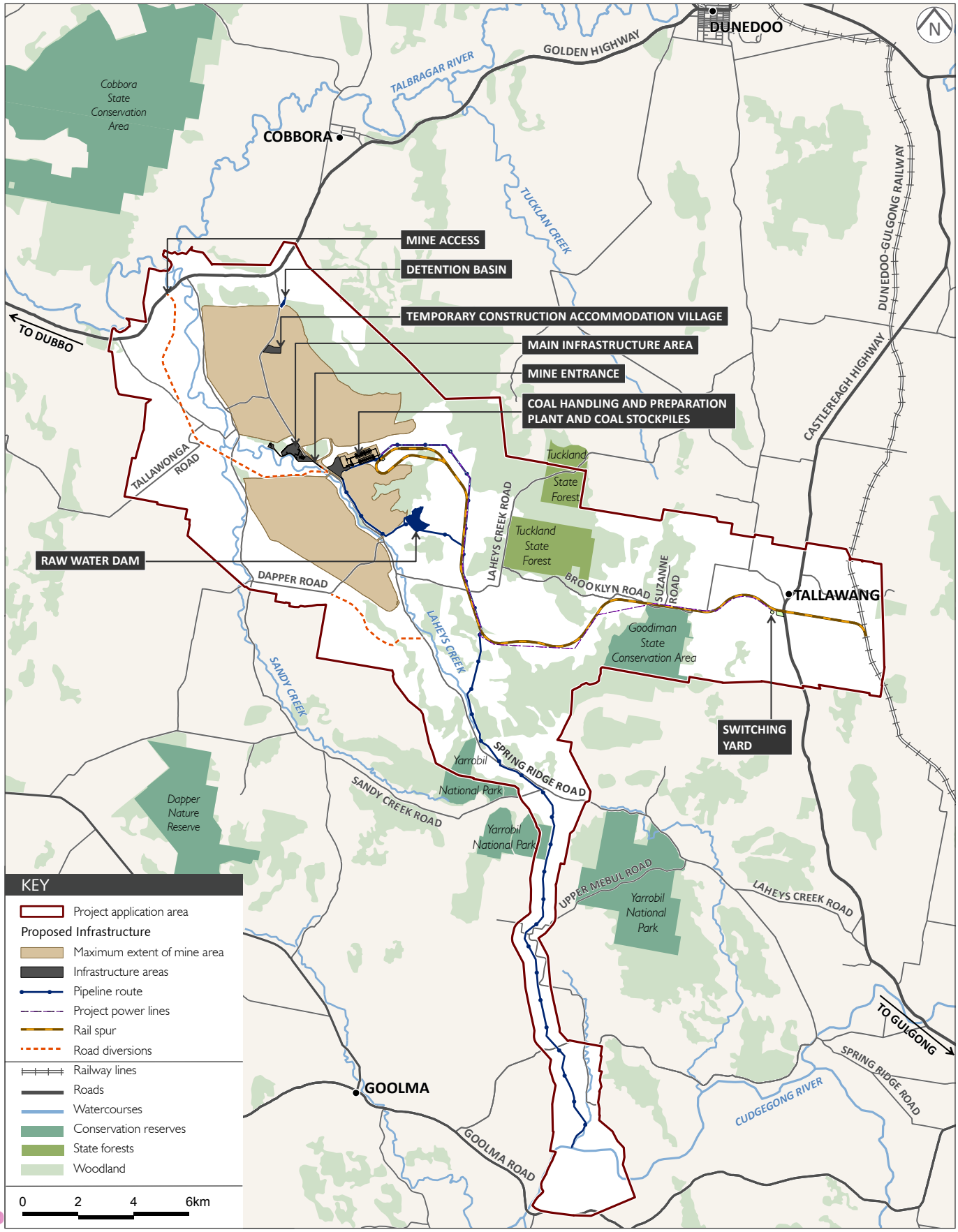
The proposed mine operation workforce is estimated to be 300 persons during the first two years of full production in 2016 and 2017. This will increase steadily over the next ten years to reach a peak level of approximately 590 persons between 2027 and 2030.

Mine construction is expected to occur up to 12 hours per day. However, construction may occur up to 24 hours per day at times (eg during major concrete pours).

Mine operation will occur up to 24 hours per day, 7 days per week, 52 weeks per year.

1.1.8 Major Project application

A Major Project application under Part 3A of the NSW *Environmental Planning and Assessment Act 1979* (NSW) (EP&A Act) was submitted to the NSW Department of Planning on 5 January 2010 (application number MP 10_0001). The DGRs for the Project were issued on 4 March 2010. Revised DGRs were issued for the Project on 23 December 2011 in response to changes in the proposed Project and government assessment requirements.



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Indicative Cobbora Coal Project Layout

Cobbora Coal Project - Bushfire Assessment

Figure 1.1

1.2 Bushfire assessment statutory requirements

Section 79BA of the EP&A Act requires developments on bushfire prone land to conform to the specifications in the PBP. However, section 75R(1) of Part 3A exempts Major Project applications from having to consider this section, unless otherwise stated. Therefore, since the Project is a Major Project, it is not strictly required to conform to the specifications in the PBP.

Notwithstanding, section 2.5 of the PBP requires proponents of Major Projects to "consult" the PBP when undertaking environmental assessments. The DGRs for the Project also require assessment of bushfire hazards. This assessment has been prepared in accordance with the PBP.

Section 63(2) of the NSW *Rural Fires Act 1997* requires the owners of land to prevent the ignition and spread of bushfires on their land. The recommended measures in this bushfire assessment, and any measures in a subsequent bushfire management plan for the Project, will ensure that the risk of bushfire ignition and spread will be as low as practically possible.

The Coolah Local Environmental Plan (LEP) 2000 covers that part of the project application area within the Warrumbungle LGA. Clause 26 (a, b and c) of the LEP requires Council to consider whether adequate provision has been made for fire fighting vehicle access, fire buffers and water supplies before granting consent to buildings on land subject to bushfire hazards. All land in Warrumbungle LGA is subject to bushfire hazards (see Section 2.1).

The Project will be determined under Part 3A of the EP&A Act, meaning council approval is not required. Notwithstanding, this bushfire assessment has been prepared in accordance with the PBP, which covers the items in clause 26 of the Coolah LEP.

The draft Wellington Local Environmental Plan 2011 and Mid-Western Regional Interim Local Environmental Plan 2008 are not considered in this bushfire assessment because there are no Project related buildings in the Wellington LGA and the only Project related building in the Mid-Western LGA is not on bushfire prone land (see Section 2.1).

1.3 Objective and scope

1.3.1 Objective

The Project is categorised in section 1.1 of the PBP as 'other development', that is, development which is not an 'integrated development' such as residential/rural residential subdivision or special fire protection purposes. 'Other development' is required to satisfy the aim and objectives of the PBP.

The aim of the 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 bushfire, while having due regard to development potential, onsite amenity and protection of the environment*" (RFS, 2006).

The objectives of the PBP are as follows (RFS, 2006):

- *afford occupants of any building adequate protection from exposure to a bushfire;*
- *provide for a defendable 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 bushfire protection measures, including fuel loads in the asset protection zone (APZ); and*

- *ensure that utility services are adequate to meet needs of firefighters (and other assisting in bushfire fighting).*

1.3.2 Scope

The PBP focuses on protection of habitable buildings from bushfire. However, the preliminary hazard assessment for the Project *Cobbora Coal Project: Preliminary Hazard Assessment* (EMM, 2012a) found that fires and explosions in the mining and infrastructure areas and could result in a bushfire. Therefore, this report also assesses the bushfire hazard near Project buildings and describes management measures for these areas.

2 Existing environment

This section determines if Project buildings will be on bushfire prone land and describes vegetation and slope within 100 m of proposed buildings, as required by Appendix 4 of the PBP.

2.1 Bushfire prone land

The Project has components in the Warrumbungle, Mid Western and Wellington LGAs. The majority of Project buildings (Table 3.1) are in the Warrumbungle LGA. Of these areas, all are mapped as bushfire prone land on the LGA's bushfire prone land map. However, the substation (66kv) is not within 100 m of any native vegetation and is not assessed herein. The pump station on the Cudgegong River and switching yard are in the Mid-Western LGA and are not within 100 m of bushfire prone land, and therefore do not require assessment under the PBP. There are no Project related buildings in the Wellington LGA.

2.2 Vegetation

Dr David Keith compiled broad scale native vegetation classifications and maps between 2001 and 2004 for NSW (the Keith formations) (Keith 2004). The PBP uses the Keith formations to classify bushfire hazard vegetation (the PBP classifications). Vegetation surveys of the Project area were conducted between 2011 and 2012 (EMM 2012b). The Keith formations, distance and direction of native vegetation within 100 m of Project buildings on bushfire prone land are shown in Table 2.1 and on Figure 2.1. In areas where there are two or more vegetation types, the PBP states that the vegetation type providing the greatest bushfire hazard should be considered as predominant. The predominant PBP vegetation classification near Project buildings is shown in Table 2.1 and on Figure 2.1, and is used to determine 'asset protection zones' (see Section 3.1).

Table 2.1 Vegetation within 100 m of proposed Project buildings

Buildings	Vegetation type	Keith (2004) formation	The PBP predominant bushfire hazard vegetation	Distance to existing vegetation (m)	Direction from building or section of building within vegetation
Main infrastructure area:					
First aid	Box gum grassy woodland	Grassy woodland	Forest	60	West
	Blue leaved ironbark woodland	Dry sclerophyll forest (shrubby sub formation)		65	North-east
Bathhouse/ administration building	Box gum grassy woodland	Grassy woodland	Forest	Adjacent	West

Table 2.1 Vegetation within 100 m of proposed Project buildings *(Cont'd)*

Buildings	Vegetation type	Keith (2004) formation	The PBP predominant bushfire hazard vegetation	Distance to existing vegetation (m)	Direction from building or section of building within vegetation
	Blue leaved ironbark woodland	Dry sclerophyll forest (shrubby sub formation)		80	North-east
Vehicle maintenance bays/heavy mine vehicles store	Box gum grassy woodland	Grassy woodland	Woodland	Adjacent	East
Heavy mining vehicle refuelling bays	Box gum grassy woodland	Grassy woodland	Woodland	50	South-west
Light vehicle refuelling bay/fuel farm	Box gum grassy woodland	Grassy woodland	Woodland	20	South-east and south-west
Tyre shed	Box gum grassy woodland	Grassy woodland	Woodland	20	South-east
Explosives magazine/ dangerous goods depot	Rough barked apple woodland	Grassy woodland	Forest	Adjacent	West
	Red stringy bark woodland	Dry sclerophyll forest (shrub/grass sub formation)		Adjacent	West and north
	Box gum grassy woodland	Grassy woodland		30	South
Coal handling and preparation plant	Dwyer's red gum woodland	Semi arid woodland (scrubby sub formation)	Forest	Within	South-west section
	Regrowth	Tall heath (scrub)		Within	South-west section
	Blue leaved ironbark woodland	Dry sclerophyll forest (shrubby sub formation)		Within	South-west section
	Grey box woodland	Grassy woodland		Within	South-east section
Rail siding	Blue leaved ironbark woodland	Dry sclerophyll forest (shrubby sub formation)	Forest	Adjacent	South-east section
	Blue leaved ironbark woodland	Dry sclerophyll forest (shrubby sub formation)	Forest	90	North
Temporary construction accommodation village	Regrowth	Tall heath (scrub)	Forest	Within	Majority of the building except the western section
	Grey box woodland	Grassy woodland		Adjacent	West

Table 2.1 Vegetation within 100 m of proposed Project buildings (Cont'd)

Buildings	Vegetation type	Keith (2004) formation	The PBP predominant bushfire hazard vegetation	Distance to existing vegetation (m)	Direction from building or section of building within vegetation
	Red stringy bark woodland	Dry sclerophyll forest (shrub/grass sub formation)		70	North

Source: EMM (2012b).

The majority of the buildings shown in Table 2.1 will be on currently cleared land, with exceptions being some sparse regrowth in the south-west section of the coal handling and preparation plant and the temporary construction accommodation village (TCAV). Vegetation in these areas will be cleared to enable construction of these buildings and to provide asset protection zones (see Section 3.1). Presently cleared land in the Project area may be left to regenerate. It is assumed that regenerating vegetation will be similar to nearby vegetation formations. Vegetation near buildings will be managed as APZs (see Section 3).

2.3 Slope

Slope is an important contributor to a bushfire's rate of spread. A bushfire will spread quicker up a steep slope compared to a gradual slope or flat land. Slopes are classified according to the PBP, and are combined with vegetation classes in an area to determine appropriate 'asset protection zones' (see Section 3.1). The slope over a distance of 100 m from Project buildings on bushfire prone land was determined using a digital terrain model (1 m height resolution). The slopes were classified according to the PBP:

i) All upslope vegetation (considered 0°);

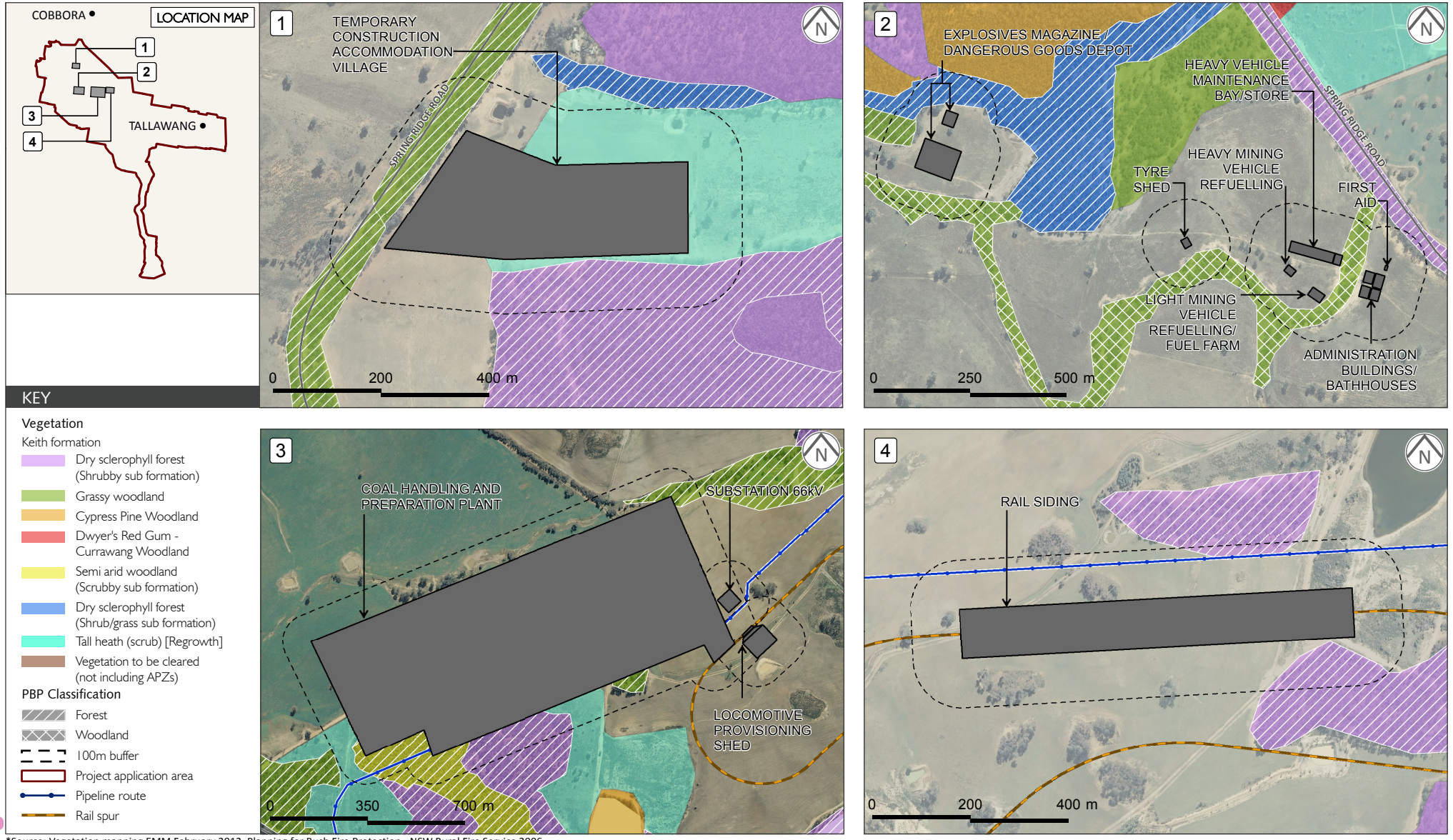
ii) >0 to 5° downslope vegetation;

iii) >5 to 10° downslope vegetation;

iv) >10 to 15° downslope vegetation; and

v) >15 to 18° downslope vegetation.

Project buildings on bushfire prone land will be constructed on flat areas. However, there are slopes up to 18° near the explosives magazine/dangerous goods store. There are areas of extreme slopes along the banks of Laheys Creek, but they were not considered in this assessment because there is no significant bushfire hazard vegetation on the sloping sections of the creek's banks. Slopes are shown in Table 2.2 and on Figure 2.2.



*Source: Vegetation mapping EMM February 2012, Planning for Bush Fire Protection - NSW Rural Fire Service 2006. Refer to bushfire assessment report for PBP classification method.

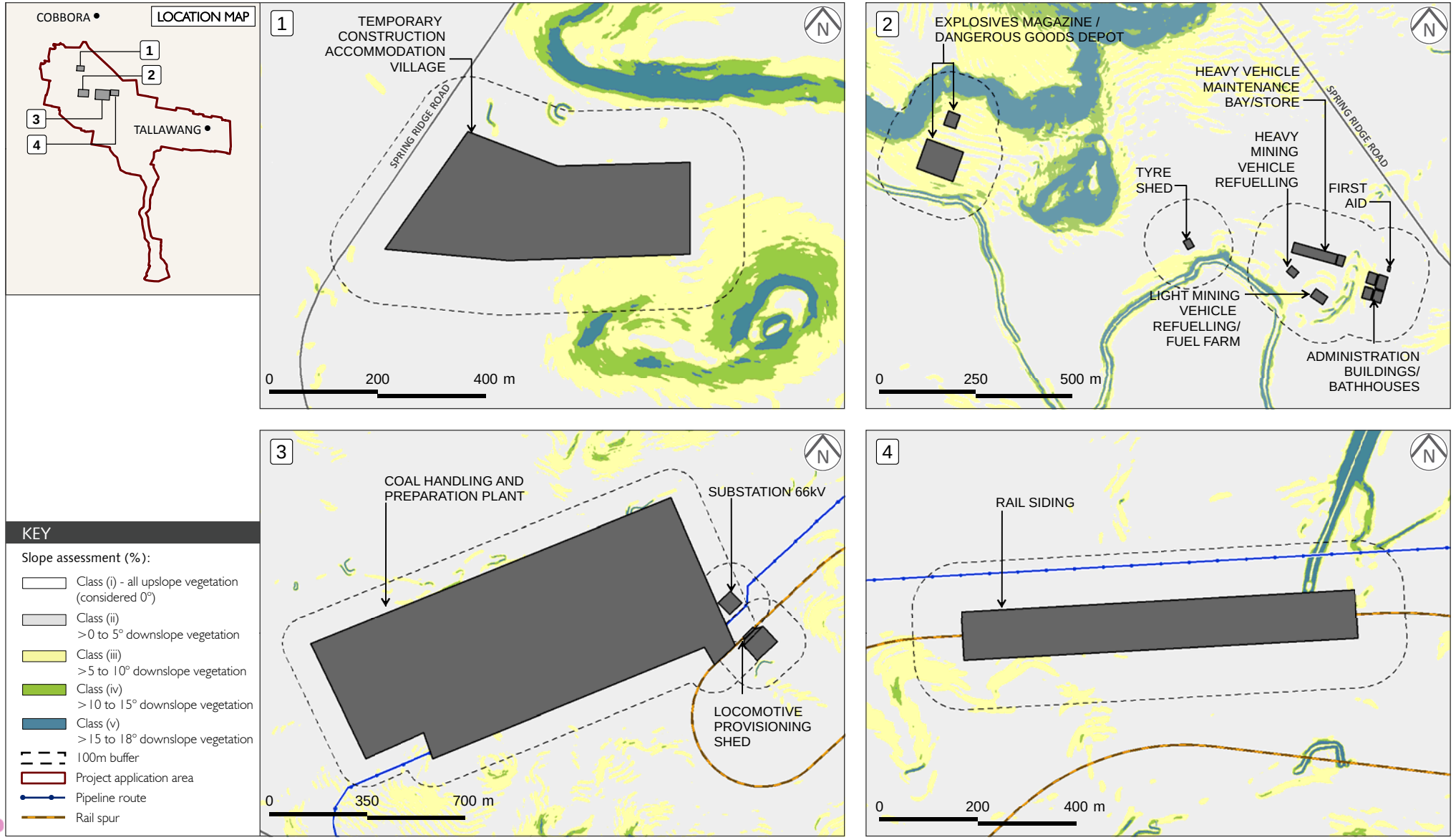
Predominant Bushfire Hazard Vegetation Near Indicative Locations of Proposed Project Buildings

Cobbora Coal Project - Bushfire Assessment

Figure 2.1

Table 2.2 Slope within 100 m of proposed Project buildings

Buildings	The PBP slope class in direction of bushfire hazard vegetation							
	N	NE	NW	S	SE	SW	E	W
Main infrastructure area:								
First aid	-	(ii)	-	-	-	-	-	(ii)
Bathhouse/administration building	-	(ii)	-	-	-	-	-	(iii)
Vehicle maintenance bays/heavy mine vehicles store	-	-	-	-	-	-	(ii)	-
Heavy mining vehicle refuelling bays	-	-	-	-	-	(ii)	-	-
Light vehicle refuelling bay/fuel farm	-	-	-	-	(ii)	(ii)	-	-
Tyre shed	-	-	-	-	(iii)	-	-	-
Explosives magazine/dangerous goods depot	(v)	(v)	(v)	(iii)	(iii)	(iii)	(iii)	(v)
Coal handling and preparation plant	-	-	-	(i)	-	-	-	(iii)
Rail siding	-	-	-	(ii)	-	-	-	(iii)
Temporary construction accommodation village	(ii)	-	-	(iii)	-	-	(ii)	(ii)



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Slope Near Indicative Locations of Proposed Project Buildings

Cobbora Coal Project - Bushfire Assessment

Figure 2.2

3 Bushfire prevention and protection

This section identifies APZs, including appropriate widths, maintenance requirements and specifications for service and access provision as provided in Chapter 4 of the PBP.

3.1 Asset protection zones

The PBP does not provide APZ specifications for 'other development', including industrial buildings. However, such development is required to comply with the objectives of the PBP, including provision of buffers between buildings and bushfire prone vegetation. Appendix 2 of the PBP (see Section 1.3.1) provides a procedure for determining APZs for habitable buildings, which has been adopted in this bushfire assessment.

An APZ is the distance that buildings are set back from vegetation that represents a bushfire hazard (see Appendix 2 of the PBP). APZs are provided for the following reasons:

- to provide sufficient separation from buildings for safe fire fighting;
- to reduce radiant heat at buildings;
- to reduce the influence of convection driven winds;
- to reduce the threat of ember attack on buildings; and
- to allow for dispersal of smoke.

APZs are divided into an 'inner protection area' (IPA) and an 'outer protection area' (OPA) where there is adjacent forest vegetation. Only an IPA is required where there is adjacent woodland vegetation. The IPA provides a defendable space and reduces heat intensities near buildings. The OPA helps reduce the length of flames, the speed of fire advance and the likelihood of fire spread by 'crowning'.

APZs are determined by referring to tables A2.5 and A2.7 (for forest and woodland vegetation) in the PBP, which compare predominant fire hazard vegetation formations (see Table 3.1), highest slope classes near subject buildings (see Table 3.2) and fire weather at a site. The fire weather or 'fire danger index' (FDI) for Warrumbungle LGA is 80 (Table A2.3 in the PBP). The resulting APZs for the Project are shown in Table 3.1.

The APZs will comprise roads, fire trails and vegetation maintained as described in Section 3.1.1.

APZs will be provided on all sides of buildings if vegetation is allowed to regenerate in presently cleared areas.

Table 3.1 Asset protection zones

Buildings	Asset protection zone (m)		Direction from building (excluding any regeneration)
	Inner protection area	Outer protection area	
Main infrastructure area:			
First aid	15	5	West and north-east
Bathhouse/ administration building	15	15	West and north-east
Vehicle maintenance bays/heavy mine vehicles store	15	-	East
Heavy mining vehicle refuelling bays	15	-	South-west
Light vehicle refuelling bay/fuel farm	15	-	South-east and south-west
Tyre shed	20	-	South-east
Explosives magazine/dangerous goods depot	25	20	West, north and south
Coal handling and preparation plant	15	15	South-west and south-east
Rail siding	15	15	South-east and north
Temporary construction accommodation village	15	15	North, south and west

3.1.1 Maintenance of APZs

The APZs will be maintained in a manner that prevents accumulation of fine flammable debris on the ground so that fuel quantities are reduced, thus lessening flame heights and potential crowning. General maintenance guidelines are described in Appendix 2 of the PBP.

The IPAs will be maintained as follows:

- canopy cover kept at less than 15% of total surface area and at least 2 m from the roof line of a building;
- garden beds and shrubs not to be located under trees and sited at least 10 m from any exposed windows or doors; and
- lower limbs of trees up to 2 m above the ground are removed.

The OPAs will be maintained as follows:

- canopy cover kept at less than 30% of total surface area; and
- understorey mowed annually before the fire season (usually September) to remove shrubs and long grasses.

3.2 Services

Water, gas and electricity services will be located and installed in a manner that reduces the potential for them to contribute to fire hazard. Detailed design has not taken place for the Project. However, the specifications given below will be incorporated into the detailed Project design.

3.2.1 Water

The availability of water is a critical element in the control of a bushfire. Water for the Project will be supplied by a pipeline from the Cudgegong River, raw water dam and water tanks at buildings. There will be two 100,000 L water carts fitted with water cannons at the start of operations. This number will increase as operations expand. These will be available to supplement fire fighting vehicles, as required, if there is a fire. There will be fire hydrants at buildings which will be spaced, sized and pressured in accordance with *Australian Standard 2419.1-2005 Fire hydrant installations – System design, installation and commissioning*. The RFS will require a test report of the water pressures if the standard cannot be met. If this is the case, engineering principles will be used to determine location, sizing and number of hydrants.

3.2.2 Electricity and gas

Electricity and gas services will be located so they do not contribute to the risk of fire to a building. The following guidelines will be followed during detailed Project design (from Chapter 4 of the PBP):

- it is preferable to place electrical transmission lines underground. However, If overhead electrical transmission lines are to be used, they will be installed and managed in accordance with Ausgrid 2010 *NS179 Vegetation Safety Clearances*;
- *AS/NZS 1596:2008 The storage and handling of LP gas* will be followed for bottled gas installation and maintenance. Metal piping will be used;
- there will be minimum 10 m distance between fixed gas cylinders and flammable materials and shielding will be placed on the hazard side of the cylinders; and
- release valves on gas cylinders close to buildings will be directed away from the building and minimum 2 m from combustible material. Metal connections will be used.

3.3 Access

The Project will be accessed via the existing Spring Ridge Road during construction and via a realigned Spring Ridge Road during operations. The existing Spring Ridge Road north of the mine infrastructure area will be upgraded during construction so that it satisfies the Austroads 2009 *Guide to Road Design* guidelines for heavy vehicles. The realigned Spring Ridge Road will be designed in accordance with the same guideline. This will enable ease of access for fire fighting vehicles.

Internal roads to buildings will be designed in accordance with the Austroads 2009 *Guide to Road Design* and the following PBP guidelines:

- a minimum vertical clearance of 4 m to any overhead obstructions including branches;
- bridges and pavements capable of carrying more than 15 t; and
- dead end roads are not recommended by PBP. However, some will be unavoidable. Turning circles at dead ends installed with a minimum 12 m outer radius.

3.3.1 Fire trails

Parts of APZs may comprise fire trails, which will provide for an acceptable level of fire fighting access. Fire trails will be designed in accordance with the following PBP guidelines:

- minimum carriageway of 4 m with 1 m clearance on each side;
- maximum grades of 15 degrees if sealed and not more than 10 degrees if unsealed;
- minimum vertical clearance of 4 m to any overhead obstructions including branches; and
- crossfall of not more than 10 degrees.

3.4 Mine operations

A fire or explosion in the mining or infrastructure areas could initiate a bushfire. The risk of this occurring will be reduced if the following measures are implemented:

- refuelling will be undertaken in designated refuelling bays and in the active pits (there will not be any vegetation in these areas). Vehicles will be refuelled only in designated refuelling bays when the fire danger rating is very high or above;
- fire extinguishers will be maintained in buildings, vehicles and refuelling areas;
- there will be no smoking in, or adjacent to, vegetated areas of the Project;
- water carts will be made available to assist with fire fighting when required;
- blasting preparation and execution will only occur in active pits and at cleared areas; and
- spill response kits will be available should there be a spill of flammable substances.

The severity of a fire may be reduced by implementing the following:

- a bushfire management plan will be prepared and implemented;
- a UHF/VHF communication system will be established, enabling rapid response to emergencies;
- risk reduction, such as slashing, will be undertaken where appropriate, such as along fencelines; and
- the RFS will be contacted if there is a fire.

3.5 Cooperation with the Rural Fire Service

The Project is in the Dapper RFS district. This area is serviced by a brigade which has limited membership, training and equipment. The nearest large RFS brigade is at Gulgong. At the time of writing, CHC is liaising with the Gulgong RFS to provide training to Dapper RFS members, CHC staff and CHC contractors to enhance the region's bushfire fighting capabilities.

CHC will participate with Gulgong RFS in bushfire risk assessments for the area surrounding the Project. CHC will continue to contribute to bushfire risk reduction works in the area.

4 Bushfire construction levels

Section A4.1 of the PBP requires an assessment of whether specified non industrial buildings are capable of complying with the bushfire construction levels described in *Australian Standard 3959 – 2009 Construction of buildings in bushfire prone areas* (AS 3959 – 2009). The specified buildings are classified by the *Building Code of Australia* (2011) as class 1, 2, 3, and 4 buildings; and some class 9 and 10 buildings.

The majority of Project buildings are industrial and therefore do not have bushfire construction levels specified in AS 3959 – 2009. Notwithstanding, the PBP requires that industrial buildings comply with the general bushfire construction requirements in section 3 of AS 3959 – 2009. The industrial buildings for the Project will be constructed to comply with these requirements.

The TCAV will provide approximately 100 dwellings which could be BCA building class 1, 2 or 3. Detailed design of the TCAV is yet to occur. Addendum: Appendix 3 of the PBP requires a bushfire attack assessment (BAA) for classes 1, 2 and 3. The BAA for buildings at the periphery of the TCAV most susceptible to bushfire attack is as follows:

1. Determine vegetation

The predominant bushfire hazard vegetation surrounding the TCAV is 'forest' (Table 2.1).

2. Determine distance to vegetation

There will be vegetation adjacent to each side of the TCAV, except to the west. However, a predominantly cleared APZ of 30 m should be provided around the TCAV (Table 3.1) and this distance has been used in the BAA.

3. Determine slope

The highest slope class near the TCAV is (iii), that is, the slope is higher than 5° and less than 10° (Table 2.2).

4. Determine the fire danger index

The FDI for Warrumbungle LGA is 80 (Table A2.3 in the PBP).

5. Determine bushfire attack level (BAL)

The vegetation, distance to vegetation, slope and FDI are used in AS 3959 – 2009 to determine the BAL and subsequent level of construction. The BAL for the TCAV is 40 (Table 2.4.3 in AS 3959 – 2009).

6. Bushfire construction level

Peripheral buildings in the TCAV will meet the requirements of section 8 of AS 3959 – 2009, which applies to class 1, 2 or 3 buildings within a zone with a BAL of 40. An APZ of 30 m will be maintained around the perimeter of the village.

5 Conclusion

The Project will be on bushfire prone land and this assessment describes measures to enable the Project to comply with the objectives of the PBP. Specifically, APZs will be provided and managed to enable fire fighting vehicle access and to distance Project buildings from vegetation which represents a fire hazard. Mine water carts will be fitted with water cannons and used to supplement fire fighting vehicles if there is a fire. The risk of the Project initiating a bushfire will be minimised through the implementation of management measures.

References

Australian Building Codes Board 2011, *Building Code of Australia* (BCA), Australian Government.

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