

Appendix EE

Bushfire risk and hazard assessment

Bushfire risk and hazard assessment - McPhillamys Gold Project

Prepared for LFB Resources NL
July 2019

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Bushfire risk and hazard assessment - McPhillamys Gold Project

Report Number

J180395 RP#

Client

LFB Resources NL

Date

11 July 2019

Version

v2 Final

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Table of Contents

1	Overview	1
2	Legislative context	2
2.1	NSW Environmental Planning and Assessment Act 1979	2
2.2	NSW Rural Fires Act 1997	2
2.3	Planning for bushfire protection	5
3	Existing environment	6
3.1	Regional fire weather	6
3.2	History of bushfire and existing ignition sources	6
3.3	Vegetation	7
3.4	Slope	8
4	Assessment of impacts	10
5	Mitigation measures	12
5.1	Defendable space	12
5.2	Fuel reduction	12
5.3	Access	13
5.4	Location and adequacy of services	13
5.5	Location of hazardous material and ignition sources	14
5.6	Construction standards and design	15
5.7	Bushfire preparedness and procedures	15
5.7.1	Maintenance	15
5.7.2	Procedures	17
5.7.3	Monitoring and review	17
5.8	Emergency planning	18
5.8.1	Bushfire awareness	18
5.8.2	Emergency response plan	19
5.8.3	Monitoring and review	20
6	Conclusion	21

Tables

Table 3.1	Vegetation within the disturbance footprint and surrounds	7
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Table 5.1	Building and property maintenance measures	15
Table 5.2	Bushfire awareness measures	18

Figures

Figure 2.1	Bushfire prone land mapping	4
Figure 3.1	Slope classes	9

1 Overview

LFB Resources NL, a 100% owned subsidiary of Regis Resources Limited (Regis), is seeking development consent for the construction and operation of the McPhillamys Gold Project (the project), a greenfield open cut gold mine and associated water supply pipeline in the Central West of New South Wales (NSW). The project comprises two key components:

- the mine site where the ore will be extracted, processed and distributed to market (herein referred to as the mine development); and
- an associated water pipeline which will enable the supply of water from near Lithgow to the mine site (the pipeline development).

This bushfire risk and hazard assessment (BRHA) provides an assessment of potential hazards associated with bushfire for the mine development. The BRHA provides an overview of the legislative framework, existing environment related to bushfire risk and an assessment of the potential bushfire hazards associated with the mine development. Recommendations for bushfire mitigation for the construction, operation and decommissioning of the project are then provided, in order to address how a bushfire impacting on the project, and the risk of fire potentially emanating from the project will be managed, as well as to develop a coordinated response to bushfire risks.

2 Legislative context

2.1 NSW Environmental Planning and Assessment Act 1979

Under Section 10.3 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act), the identification of bushfire prone land is required for all local government areas (LGA). The bushfire prone land mapping for each LGA provides the trigger for consideration of the provisions of *Planning for Bushfire Protection* (PBP) (NSW Rural Fire Service (RFS) 2006 and NSW RFS 2018) for new development on bushfire prone land. Further, a consent authority can refer a development application to the NSW RFS under the provisions of Section 4.15 of the EP&A Act, even where bushfire prone land has not been mapped but the development is potentially exposed to a bushfire threat.

Blayney Shire Council and Cabonne Shire Council Bushfire Prone Land mapping indicate that the eastern boundary of the mine development project area (the project area) is mapped as bushfire prone, vegetation category 1 and vegetation category 2 (see Figure 2.1). Further, the Vittoria State Forest, located north-east of the project area, is mapped as bushfire prone by both Blayney Shire Council and Cabonne Shire Council (see Figure 2.1). Vegetation category 1 is considered the highest risk for bush fire and includes areas of forest, woodlands, heaths, forested wetlands and timber plantations. Vegetation category 2 is considered to be lower bushfire risk than category 1 but higher than excluded areas (RFS 2018). Both categories are given buffers (100 m for vegetation category 1 and 30 m for vegetation category 2), with the buffer also representing bushfire prone land.

The project area is potentially exposed to bushfire threat in the form of grass, woodland and forest fire, and has the potential to cause unplanned ignition of surrounding grassland, woodland and forest. Therefore, bushfire risks associated with the project have been assessed in accordance with PBP, where applicable to the project.

The project is State significant development (SSD) and accordingly, approval is required under Part 4, Division 4.1 of the EP&A Act for the project, encompassing the mine development and associated mine infrastructure. Under Section 4.14 of the EP&A Act, SSD projects are exempt from requiring a bushfire safety authority (BFSA). However, given the scale of many SSD projects, the requirements of PBP should be applied as appropriate, and consultation with RFS is encouraged. Even where comments are sought at the strategic planning stage of a project, further consultation with RFS may be required at subsequent stages of project development (eg during detailed design).

The Environmental Assessment Requirements (EARs) for the project specify assessment of ‘*Hazards - including an assessment of the likely risks to public safety, paying particular attention to potential geochemical and bushfire risks, and storage, handling, transport and use of any dangerous goods*’.

2.2 NSW Rural Fires Act 1997

The objectives of the NSW *Rural Fires Act 1997* (RF Act) are to:

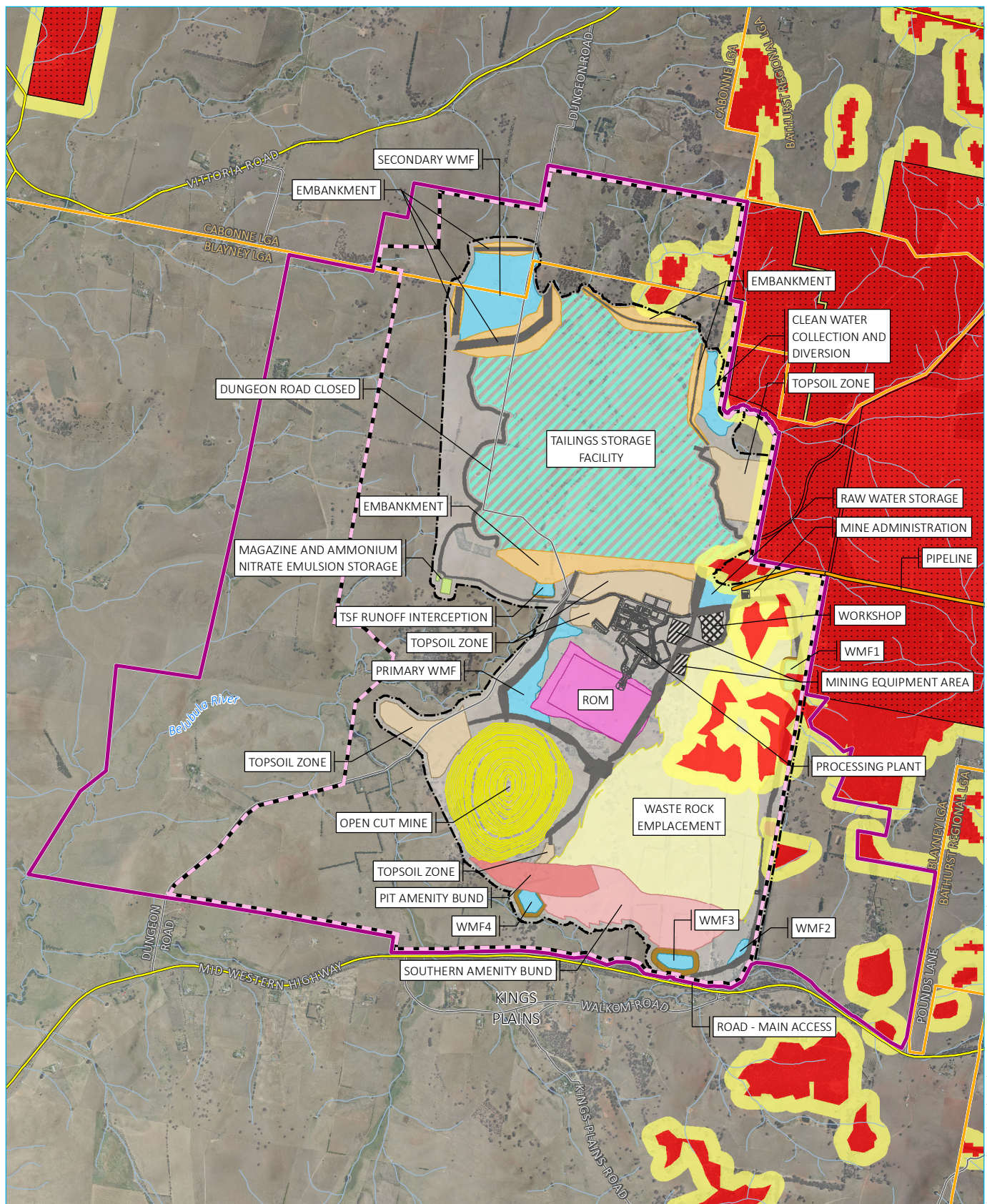
- prevent, mitigate and suppress bush and other fires in NSW;
- co-ordinate bushfire fighting and bushfire prevention throughout the State;
- protect people from injury or death and property from damage as a result of bushfires; and
- protect the environment.

The RF Act places emphasis on cooperative fire management and wildfire suppression planning between the various organisations involved in fire management. With respect to the project, the NSW RFS is the primary response agency for fighting fires within the project area.

Fire and Rescue NSW (FRNSW) will also respond to either assist RFS or to fulfil the role of designated combat agency in the event of a significant fire event either in the project area or in close proximity to the project.

It is also noted that under section 63 of the RF Act, owners and occupiers of land have a duty to take practicable steps to prevent the occurrence of bushfires on, and to minimise the danger of the spread of bushfires on or from that land.

Part 3, division 4 of the RF Act stipulates that the Bush Fire Coordinating Committee (BFCC) must constitute a Bush Fire Management Committee (BFMC) for each area in NSW that is subject to the risk of bushfires. Each BFMC is required to prepare and submit to the BFCC a draft Bush Fire Risk Management Plan (BFRMP), a strategic document that identifies community assets at risk and sets out a five year program of coordinated multi-agency (including RFS and FRNSW) treatments to reduce the risk of bushfire to the assets identified. The project occurs within the Canobolas BFMC area.



Source: EMM (2019); Regis Resources (2019); Survey Graphics (2019); DFSI (2017); RFS (2015); ELVIS (2014)

KEY

- Project application area
 - Mine development project area (2,513.47 ha)
 - Mining lease application area (1,812.99 ha) (Note: boundary offset for clarity)
 - Disturbance footprint
 - Pipeline corridor
- Bushfire prone land
 - Vegetation Category 1
 - Vegetation Category 2
 - Buffer

- Project general arrangement
 - Plant layout
 - Road
 - Water management facility (WMF)
 - Sediment basin structure
- Existing environment
 - Main road
 - Local road
 - Watercourse/drainage line
 - Vittoria State Forest
 - Local government area

Bushfire prone land mapping and mine development

McPhillamys Gold Project
Bushfire risk and hazard assessment
Figure 2.1

2.3 Planning for bushfire protection

Planning for bushfire protection (PBP) is a planning document to link responsible planning and development control with the protection of life, property and the environment. PBP applies to all development applications on land that is classified as bushfire prone land on a council's bushfire prone land mapping.

As part of the project area is mapped as bushfire prone, consideration must be given to the following overall aims and objectives of PBP:

- afford occupants of any building adequate protection from exposure to a bushfire;
- 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 operation 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 the needs of fire fighters (and others assisting in bushfire fighting).

PBP provides an assessment framework for the potential impacts of bushfire upon the proposed new assets and establishes six key bushfire protection measures that are to be addressed and collectively form an effective mitigation strategy in order to reduce the bushfire impacts. The six key bushfire protection measures are:

- the provision of clear separation of buildings and bushfire hazards, in the form of a fuel-reduced APZ;
- construction standards and design;
- appropriate access standards for residents, fire fighters, emergency service 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.

For the purposes of this assessment and in keeping with PBP guidelines, the project is considered 'other development', as it is not residential subdivision, residential infill, or Special Fire Protection Purpose (SFPP). No bushfire specific performance requirements are provided in the Building Code of Australia (BCA) for class 5, 6, 7, 8 and 10 buildings (which include offices, factories, warehouses and other commercial or industrial facilities). Therefore, *Australian Standard 3959 - 2009 Construction of Buildings in Bushfire-prone Areas* (AS 3959-2009), does not apply as a set of 'deemed to satisfy' provisions. General fire safety construction provisions are taken as acceptable solutions, but the aims and objectives of PBP apply in relation to other matters such as access, water and services, emergency planning and landscaping/vegetation management.

Mitigation measures as appropriate for the project are discussed in Section 5.

3 Existing environment

The following provides an overview of the existing environment, in regard to bushfire risk factors, of the land within the project area (with a focus on the disturbance footprint) and in the locality more generally.

3.1 Regional fire weather

An analysis of the fire weather experienced in the region provides insight into bushfire behaviour potential within the project area and surrounds. Fire Danger Index (FDI) is based upon the LGA and Fire Weather District, as determined by the NSW RFS, where the development is to be located. As the project occurs in the Blayney Shire Council LGA, an FDI of 80 (Central Ranges Fire Weather District) has been used to inform bushfire behaviour on land within the project boundary (RFS 2017). The project is within the Canobolas BFMC area, which ascribes the following regional weather characteristics:

- the typical/average climate is temperate to cool climate;
- rainfall is generally spread throughout the year with no clear pattern of winter or summer dominance; and
- the bushfire season generally runs from October to March, with the main danger period occurring between December and February.

Prevailing weather conditions associated with the bushfire season in the Canobolas BFMC area are north-westerly winds accompanied by high daytime temperate and low relative humidity. There are also frequent dry lightning storms occurring during the bushfire season (Canobolas BFMC 2017).

3.2 History of bushfire and existing ignition sources

The Canobolas BFMC area has on average 200 bush and grass fires per year, of which 95% are usually contained to less than 10 ha. Approximately 10 fires each year are considered major fires based on their potential and the fire danger rating applicable on that day (Canobolas BFMC 2017).

The main sources of ignition of unplanned fires in the Canobolas BFMC area are reported to be (Canobolas BFMC 2017):

- lightning strikes;
- electrical infrastructure failures;
- arson;
- machinery;
- vehicles; and
- welding/grinding activities.

3.3 Vegetation

Vegetation mapping within the disturbance footprint and surrounds has been undertaken by EMM (2019) as part of the Biodiversity Assessment Report (BAR) for the project (Appendix N of the EIS). Vegetation mapped by EMM within the disturbance footprint and surrounds is listed in Table 3.1 and shown in Figure 13.2 of the EIS.

Table 3.1 Vegetation within the disturbance footprint and surrounds

Plant community type (PCT)	Vegetation formation (Keith 2004)	Condition	PBP classification
727 - Broad-leaved Peppermint – Brittle Gum – Red Stringybark dry open forest of the South Eastern Highlands Bioregion	Dry Sclerophyll Forests (Shrubby sub-formation)	Mod-Good_High Mod-Good_Medium Mod-Good_Poor	Forests (wet sclerophyll forests and dry sclerophyll forests)
951 - Mountain Gum – Manna Gum open forest of the South Eastern Highlands Bioregion	Wet Sclerophyll Forests (Grassy sub-formation)	Mod-Good_Medium Mod-Good_Poor	Forests (wet sclerophyll forests and dry sclerophyll forests)
1330 - Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion	Grassy Woodlands	Mod-Good_High Medium Other Poor	Woodlands
766 - Carex sedgeland of the slopes and tablelands	Freshwater Wetlands	Mod-Good_Poor	Freshwater Wetlands
Open grasslands	Grasslands	Low	Grasslands
Planted pine windrows	-	-	Plantation (pine)
Planted native windrows	-	-	Woodlands
Vittoria State Forest	-	-	Plantation (pine)

As shown in Table 3.1, the native vegetation within the disturbance footprint and surrounds align with the woodland, forest, grassland and freshwater wetland vegetation formations, as classified by Keith (2004). The area of vegetation mapped as open grasslands has been assigned to a vegetation formation as per PBP, based upon predicted fuel load and best fit. Additionally, there are large areas of pine plantation (Vittoria State Forest) and smaller sections of planted windows, consisting of both pine and native species.

The grassland vegetation classification is the most prevalent of the vegetation mapped within the disturbance footprint and surrounds. The grasslands are of varying condition and quality with most areas having been heavily impacted by pastoral activities, particularly grazing, and being dominated by exotic plant species. In some areas, a simplified native cover of species such as Kangaroo Grass (*Themeda triandra*), Red-anthered Wallaby Grass (*Rytidosperma pallidum*) and Weeping Grass (*Microlaena stipoides*) occurs. However, these areas are usually small, and rapidly change over tens of metres to exotic dominated pasture, making discrete mapping problematic.

The BAR included as Appendix N of the EIS (EMM 2019) provides detailed descriptions of the composition of each vegetation community mapped within the disturbance footprint and surrounds.

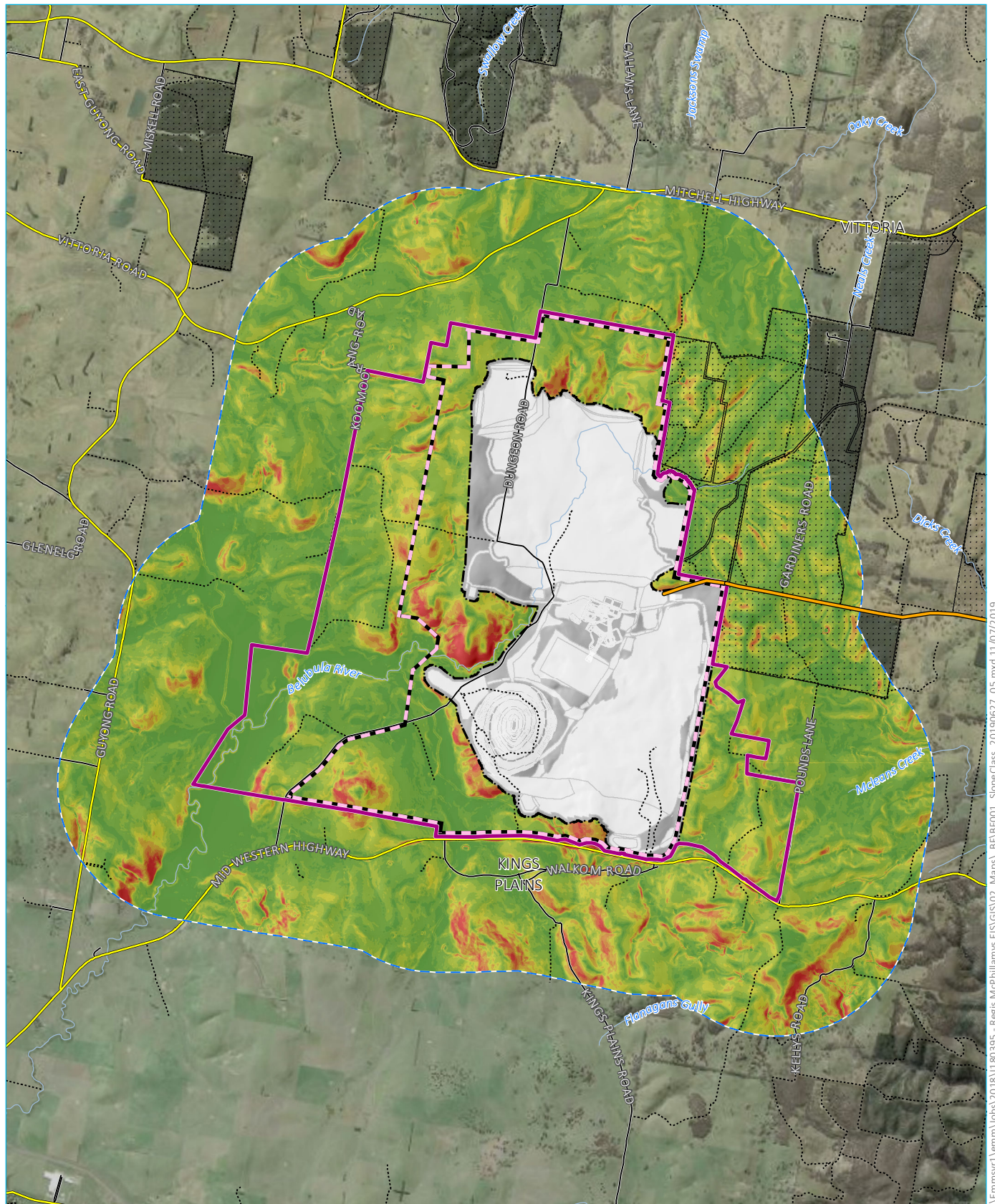
3.4 Slope

Slope is an important contributor to a bushfire's rate of spread. A bushfire will spread more quickly up a steep slope in comparison with a gradual slope or over flat land. Slopes are classified in accordance with the provisions of PBP and are combined with vegetation classes in an area to determine APZs for a development type. Slopes are classified according to the following PBP categories:

- all flat and upslope vegetation (considered 0°);
- >0 to 5 degrees (°) downslope vegetation;
- >5 to 10° downslope vegetation;
- >10 to 15° downslope vegetation; and
- >15 to 18° downslope vegetation.

A slope analysis that encompasses the land surrounding the disturbance footprint and for a 1.5 km buffer beyond the mine development project area has been undertaken. This allows understanding of the slope classifications and potential fire behaviour surrounding the disturbance footprint, project area and immediate surrounds.

As shown in Figure 3.1, the disturbance footprint and surrounds are dominated by a gently undulating landscape with some areas of steeper slopes associated with low hills and various permanent and ephemeral water courses. As shown in Figure 3.1, slopes immediately adjacent to the disturbance footprint vary in gradient from 0 degrees (°) (flat land) to isolated areas that are over 20° in gradient. These steeper gradients are associated with larger hills and lower lying areas associated with permanent and ephemeral watercourses or valley floors. The steepest slopes occur mostly under grassland vegetation but also under some areas with woodland vegetation, the most notable being the woodland to be retained north-west of the open cut mine and ROM pad.



Source: EMM (2019); Regis Resources (2019); DFSI (2017); ELVIS (2014)

0 1 2 km
GDA 1994 MGA Zone 55

KEY

1,500 m buffer

Project application area

Mine development project area
(2,513.47 ha)

Mining lease application area (1,812.99 ha)
(Note: boundary offset for clarity)

Pipeline corridor

Disturbance footprint

Project general arrangement

Existing environment

Main road

Local road

Vehicular track

Named watercourse

Vittoria State Forest

Slope

0 - 2.5°

2.5° - 5°

5° - 7.5°

7.5° - 10°

10° - 12.5°

12.5° - 15°

15° - 17.5°

17.5° - 20°

20°+

Slope classes

McPhillamys Gold Project
Bushfire risk and hazard assessment
Figure 3.1

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4 Assessment of impacts

Bushfire is capable of damaging infrastructure associated with the project and consequently impacting upon the safety of staff and contractors on the project. Bushfire emanating from the project poses a human safety and property threat within the locality, as well as threatening native flora, fauna and ecosystems within the locality of the project. Fire suppression operations can be made more challenging as a result of bio-physical risk factors, as discussed in Section 3. This includes weather conditions, vegetation characteristics, terrain and aspect, and existing potential ignition sources, which can contribute to the risk of bushfire originating from outside the project in surrounding areas. The addition of activities associated with the project adds additional risks.

The FDI measures the degree of danger of fire in Australian vegetation and assumes a credible worst case scenario and an absence of any other mitigating factors relating to aspect or prevailing wind. The 1:50 year fire weather scenario for most of NSW is determined as FDI 80, and is the FDI for the project area and surrounds. Prevailing weather conditions associated with the bushfire season in the Canobolas BFMC area are north-westerly winds accompanied by high daytime temperature and low relative humidity.

Slope is an important contributor to a bushfire's rate of spread and effective slope is considered to be the slope that supports vegetation which will most significantly influence bushfire behaviour for any given aspect. Slopes within and surrounding the project area vary in gradient from 0° (flat land) to isolated areas that are over 20° in gradient. The steepest slopes occur mostly under grassland vegetation but also under some areas with woodland vegetation, the most notable being the woodland to be retained north-west of the open cut mine and ROM pad.

Native vegetation within the project area and surrounds align with the woodland, forest, grassland and freshwater wetland vegetation formations, as classified by Keith (2004). Additionally, there are large areas of pine plantation (Vittoria State Forest) and smaller sections of planted windows, consisting of both pine and native species. The grassland vegetation classification is the most prevalent of the vegetation mapped within the project area and surrounds. The risk posed by grass fires is different to that of fires in other vegetation classifications. Grass fires burn at a higher intensity and spread more rapidly with a shorter residence time. Embers produced by grass fires are smaller and fewer in number than those produced from forest fires (PBP 2018). Those areas of woodland and forest within the project area and surrounds are likely to contain four main categories of fuel, being the relatively compact surface layer of fine fuels and decaying leaf litter, the elevated and relatively well aerated near surface and shrub layers, the canopy and the bark. Fires in woodland and forest result in a different set of challenges for fire suppression as fuel loads in these vegetation types can be more readily available to fire, with fires burning for a longer time and producing more embers. Steeper slopes under forest and woodland vegetation types present a greater risk, particularly as canopy fuels are more available to the fire, reducing the advantage of having an APZ on steep slopes. As outlined within Section 3.3, woodland and forest fragments are sparse within the disturbance footprint and surrounds, however, the risk of grassland fire will remain around the project area.

The potential ignition of unplanned bushfires from the construction and decommission phases of the project are likely to be from the following sources:

- diesel generators;
- storage of flammable liquids (eg fuel storage);
- vehicle and machine movement over long grass;
- sparks generated from hot works (eg welders and grinders); and
- human error, such as non-compliance of hot works procedures or incorrect disposal of cigarette butts.

The potential of ignition of unplanned bushfires from the operation of the project are likely to be the same as those sources listed above, with the addition of fire risks associated with overhead powerlines, blast activities, explosives storage and transportation, and fire or explosion of project infrastructure.

The bushfire prevention and protection measures described in Section 5 will assist in mitigating bushfire during the construction, operation and decommissioning of the project.

5 Mitigation measures

The key principles for bushfire prevention and protection for the project are:

- the provision of clear separation between structures and bushfire hazards in the form of fuel-reduced APZs and/or defensible space;
- appropriate access and egress for staff, contractors, visitors and emergency services;
- adequate water supply;
- suitable location of services and other infrastructure that pose potential ignition risk;
- suitable construction standards and design of buildings; and
- suitable management plans for the provision and maintenance of mitigation measures as well as for appropriate emergency response.

The key principles for fire prevention and protection listed above will be applied as fire protection and prevention measures during the construction, operation and decommissioning of the project, as discussed in the following sections. A bushfire management plan (BFMP) for the project will be prepared. Section 5.7 provides further detail on the BFMP.

5.1 Defensible space

AS 3959 - 2009 and associated APZs are not considered as a set of 'deemed to satisfy' provisions for commercial and industrial facilities. However, in many instances, these types of developments will require access roads, on-site parking and hardstand/loading areas. In these cases, it is prudent to place these facilities in the most appropriate location in order to establish defensible space for fire-fighting purposes, as well as to mitigate the potential for ignition of surrounding grassland from project sources.

Chapter 8 of the pre-release of *Planning for Bush fire Protection 2018* (RFS 2018), provides further advice on APZs for 'other development', including mining (underground and open cut). As a minimum, a 10 m APZ from the structures, associated buildings and infrastructure is recommended to be maintained to the standard of an Inner Protection Area (IPA) for the life of the development.

In consideration of the above, a minimum 10 m defensible space will be provided around project infrastructure that is at risk of bushfire or has potential to ignite surrounding vegetation. The defensible space will permit unobstructed fire vehicle access and be maintained to the standard of an IPA. This will be in the form of perimeter roads, hardstand areas, car parks or mown grass. As a guide, grass within an IPA will be kept to no more than 100 mm in height, with leaves and vegetation debris removed (RFS 2018).

5.2 Fuel reduction

To reduce the risk of grass fires starting within the project area, the fuel load will be monitored and mechanically slashed, sprayed with herbicides, or leased and grazed. This will reduce the risk of grass fires starting within the project area and ensure that fires originating from outside the project area do not intensify as a consequence of entering the disturbance footprint and mining lease application area.

Currently, much of the land within the project area is leased from Regis for grazing. This is expected to continue in some areas within the project area that are not required for mining operations. Slashing and spraying of grassland to reduce fuel load will be on an as-needed basis.

Vegetation management actions, as related to bushfire fuel reduction, for the construction, operation and decommissioning phases will be included in the BFMP.

5.3 Access

The project will be accessed via a new intersection off the Mid-Western Highway, which will be constructed during the construction phase of the project. During construction the existing access from Dungeon Road will be used until the construction of the new access off the Mid-Western Highway. After this time, Dungeon road will be closed at the project area boundary, however will continue to provide emergency access as required. Emergency access points will be identified as part of the project's emergency response plan (ERP). The primary site access point, emergency access points and project roads will comprise of a combination of sealed and unsealed roads, detailed design of which will consider:

- minimum carriageway width of 4 m;
- the capacity for fire fighting vehicles to pass by;
- avoiding grades greater than 15 degrees (°) if sealed and 10° if unsealed;
- minimum vertical clearance of 4 m to any overhanging obstructions, including tree branches;
- will not have a cross fall of more than 10°;
- the capacity to carry a fully loaded fire fighting vehicle (which may be up to 28 tonne);
- appropriate drainage and erosion controls; and
- all weather access is provided.

As part of the detailed design, and in consultation with RFS and FRNSW, requirements for emergency access points will be determined to provide additional emergency access and egress points in those areas that are a distance from the main project access point.

Once inside the disturbance footprint, the defensible space (perimeter roads, hardstands, carparks, mown grass) outlined within Section 5.1 will provide access around project infrastructure.

The ERP for the project will detail the access and egress points for the project. Section 5.8.2 provides further detail on emergency planning for the project.

5.4 Location and adequacy of services

Whilst there are no specific provisions for the location and adequacy of services for 'other development' within PBP, the following objectives will be applied to project infrastructure in relation to water and services:

- to provide adequate supplies of water for the protection of project infrastructure during and after the passage of bushfire; and
- to locate electricity supply so as not to contribute to the risk of bushfire.

There is a raw water storage facility located within the disturbance footprint that may be accessible to fire-fighting vehicles, however there are potential access constraints associated with dam water supply.

Fire water will be stored in designated tanks in the processing plant. The fire water system will comprise of a fire water main around the processing plant and infrastructure buildings including administration offices and mining equipment area and workshop. It is expected that the source of the fire water will be raw water from the pipeline development. The fire water ring main will be feed by an electric and diesel fire water pumps. These pumps will be arranged in a duty/standby arrangement and will include a jockey pump to maintain the fire ring main system pressure. The fire water pumps and ring main will be designed to provide discharge pressures and flows to meet the required Australian Standards for fire system design.

The fire water system will provide:

- static water supply (in the form of fire water tanks) that comply with the provisions as set out in PBP and in liaison with RFS and FRNSW - the fire water tanks should be positioned so as to provide strategic areas of fire protection advantage for fire-fighting vehicles and should comply with the provisions as set out in PBP in terms of construction materials, fittings and access for fire trucks; and
- procedures for fire water tanks to be topped up at the beginning of the fire season and repeatedly throughout the season as required (refer to Section 5.7).

The mine development will have an electricity requirement of 26 megawatts (MW) to 28 MW. The project is currently exploring two separate options for the mine developments primary power supply. The first option is the duplication of the existing 66 kV line from Bathurst. The second option under assessment is to supply the site from the Transgrid 132 kV system Line 948 which passes between Bathurst and Orange approximately 14 kilometres to north of the processing plant. The vegetation within the duplicated 66 kV line corridor proposed for the project will be:

- managed by the relevant network service provider, so as to limit the possibility of ignition of surrounding vegetation; and
- managed as per the specifications in ISSC3 Guide for the management of vegetation in the vicinity of electricity assets (Resources and Energy NSW 2016).

The BFMP for the project will detail the specifications and maintenance of dedicated fire water sources to assist in fire suppression and to prevent bushfires igniting during the construction, operation and decommissioning of the project. Section 5.7 provides further detail on the BFMP for the project. The ERP for the project will also detail the locations of the fire water supply. Section 5.8 provides further detail on emergency planning for the project.

5.5 Location of hazardous material and ignition sources

Section 4 identified potential ignition sources related to the construction, operation and decommissioning of the project, including diesel generators, fuel storage, sparks generated from hot works, vehicle movement over long grass, human error, overhead powerlines, blast activities, explosives storage and transportation, and fire or explosion of project infrastructure. In relation to potential ignition sources, the BFMP for the project will include:

- the provisions for diesel generators and associated fuel storage tanks to be designed, housed and maintained so as not serve as an unacceptable risk to surrounding grassland – diesel generators and associated fuel storage tanks should be located away from the hazard, wherever possible; and
- the provisions for specific measures and procedures to prevent ignition of grassland from hot works or from vehicles driving over long grass.

The BFMP for the project will detail measures and procedures to minimise the risk of fires igniting during the construction, operation and decommissioning of the project.

5.6 Construction standards and design

The project infrastructure are industrial and commercial and, therefore, do not have bushfire construction levels specified in AS 3959 – 2009. Notwithstanding, PBP requires that such buildings comply with the general bushfire construction requirements in section 3 of AS 3959 – 2009. Further, to prevent embers, buildings that enclose combustible infrastructure will include ember protection similar to AS 3959 - 2009 BAL 12.5 standards (including the additional construction requirements outlined in Appendix 3 Addendum of PBP, in relation to ember protection). This generally requires no gaps greater than 3 mm and sealing or screening areas with gaps exceeding this.

Further, commercial buildings must also have fully compliant fire safety systems in accordance with AS and BCA requirements and as appropriate to each building, including some or all of the following features:

- fire extinguishers;
- fire hose reels;
- fire hydrant systems; and
- automatic sprinkler systems.

The commercial buildings for the project will be constructed and routinely serviced to comply with the specific requirements, as relevant to each building.

5.7 Bushfire preparedness and procedures

Specific management actions will be undertaken to ensure suitable bushfire preparedness is undertaken as part of the project and ahead of the bushfire season, as well as specific procedures to limit the risk of ignition of surrounding grassland resulting from the project.

5.7.1 Maintenance

Table 5.1 outlines the measures that will be implemented as part of the BFMP for the project, and in advance of and throughout the bushfire season (typically running from October to March).

Table 5.1 Building and property maintenance measures

Feature	Responsibility	Maintenance strategy (including frequency/timing)
Access	Regis or construction /operation site manager	All access roads and tracks must be inspected annually and management actions undertaken if roads and tracks are considered unsuitable for emergency vehicle passage (inspect for erosion, fallen timber, locked gates, and dead end tracks). Where locked gates are required, keys will be provided to RFS and FRNSW (if required). Ensure gates are in good condition for entry and exit of fire fighting vehicles (in advance of bushfire season).

Table 5.1 Building and property maintenance measures

Feature	Responsibility	Maintenance strategy (including frequency/timing)
Building maintenance	Regis or construction /operation site manager	Ensure that there are no overhanging branches or objects that would prevent access within the development footprint, ie minimum 4 m vertical clearance (in advance of and throughout bushfire season).
		Ensure all pumps and water sources are working, clearly marked and easy to find (in advance of and throughout bushfire season).
		Ensure all fittings are compatible with RFS and FRNSW fire trucks (in advance of bushfire season).
		Ensure all security clearances, communication and access arrangements have been updated and confirmed with RFS and FRNSW in readiness for upcoming season (in advance of bushfire season).
		Ensure perimeter roads and defensible space is free of obstacles to provide access for RFS and FRNSW fire-fighting appliances and personnel (in advance of and throughout bushfire season).
		Ensure hoses and hose reels are not perished and fittings are tight and in good order (in advance of and throughout bushfire season).
		Ensure removal of material such as litter from roofs and gutters (in advance of and throughout bushfire season).
		Store flammable liquids away from buildings or in approved storage compounds (in advance of and throughout bushfire season).
		Ensure combustible materials are well away from the buildings (in advance of and throughout bushfire season).
		Ensure rooflines have no broken or dislodged roofing material and there are no gaps in the roof or eaves (in advance of and throughout the bushfire season).
Fuel reduction	Regis or construction /operation site manager	Ensure screens on windows and doors are in good condition without breaks, tears or holes that allow penetration of airborne embers into the building in the event windows are open (in advance of and throughout the bushfire season).
		Commercial buildings must have fully compliant fire safety systems in accordance with AS and BCA requirements and as appropriate to each building (inspect systems in advance of and throughout the bushfire season, as well as per AS and BCA requirements).
Water supply	Regis or construction /operation site manager	Ensure that, where fitted, drenching or spray systems are regularly tested (before the commencement of the bushfire season and as per AS and BCA requirements).
		Ensure doors are fitted with draught seals and well maintained (before the commencement of the bushfire season).
Fuel reduction	Regis or construction /operation site manager	Inspect and maintain the defensible space as per IPA and <i>Standards for Asset Protection Zones</i> (NSW vis) (in advance of and throughout the bushfire season).
		The powerline corridor is managed as per the specifications in <i>ISSC3 Guide for the management of vegetation in the vicinity of electricity assets</i> (Resources and Energy NSW 2016) (in advance of and throughout the bushfire season).
Water supply	Regis or construction /operation site manager	Inspect static water supply levels and top up if required (in advance of and throughout the bushfire season).

5.7.2 Procedures

The BFMP should also include appropriate work procedures, so as to limit the potential of ignition of surrounding grassland, and will include:

- specific storage and maintenance procedures for potential ignition sources;
- a hot works procedure;
- hot work activities will be required to attain internal work permits;
- no hot works on total fire bans and/or conditions associated with severe fire weather outside of designated areas to minimise the chance of fires being started;
- all vehicles will be provided with portable fire extinguishers that comply with relevant Australian Standards;
- fire-fighting equipment will be kept on active sites at all times for potential ignition of grassland. Equipment may include (but not be limited to) a 4WD striker with slip on water unit equipped with diesel pump, hoses, extinguishers, knap sacks, hand tools and appropriate personal protective equipment (PPE);
- to reduce the risk of ignition of surrounding grassland, it is recommended that project staff are comprehensively and regularly trained to undertake safe first attack fire-fighting operations. Training is recommended to specifically include the extent of first attack fire operations that can be undertaken without endangering the safety of persons engaged in fire-fighting activities. The maintenance of equipment related to this requirement (the point above) will be specifically addressed in the BFMP;
- provide local RFS with regular updates (frequency to be determined as needed) on activities that have the potential to ignite surrounding grassland, particularly during the bushfire season, to ensure weather conditions are appropriate;
- immediate notification to the local RFS of the location and nature of any accidental ignition of surrounding grassland, that was either able to be successfully extinguished using the fire-fighting equipment or that otherwise has spread into surrounding grassland; and
- assist RFS in the investigation of the cause of any unplanned grass fires in proximity to the project, should they occur.

5.7.3 Monitoring and review

The BFMP should be reviewed after incidents of bushfire or other fire as well as annually at the end of each bushfire season (reviewed during the period April-August) and amended, if required, to ensure continual improvement. This process will allow any scheduled tasks not undertaken when originally planned to be incorporated into subsequent management activities. A monitoring and review process should include, as a minimum:

- monitor against the aims and objectives of the BFMP;
- update the BFMP based on current best practice guidelines;
- assess the risk, obligations and management measures against any new legislative changes;

- ensure the reporting of any bushfires including ignition source, location, size and assets impacts, response and suppression activities and if RFS, FRNSW or other emergency services attended, is captured; and
- review and update of management actions should be undertaken annually at the end of each bushfire season.

5.8 Emergency planning

The project has the potential to expose staff and contractors to bushfire. In the event that grassland vegetation is ignited from a project-related source, the project has the potential to impact upon neighbouring landholders and the community more generally. Bushfire emergency management procedures are proposed that include bushfire awareness, emergency response and evacuation, and monitoring and review procedures.

5.8.1 Bushfire awareness

Bushfire awareness planning is based on predicted potential bushfire behaviour for combinations of fuel types and fire danger levels, as well as awareness on the specific fire hazards associated with a mine. Table 5.2 outlines the minimum recommended mechanisms to develop bushfire awareness at the project, to be included as part of the ERP.

Table 5.2 Bushfire awareness measures

Feature	Responsibility	Awareness strategy and frequency/timing
Induction process	Regis or construction /operation site manager	Provide bushfire awareness training to all new staff members and contractors, prior to and during the bushfire season for bushfire specific awareness and regularly for other fire awareness (eg structure fire and ignition sources).
Staff briefings and pre-season drills	Regis or construction /operation site manager	Provide details of requirements for staff briefings and pre-season fire drills in the ERP and work procedures. Briefings and fire drills to be coordinated by Regis (or suitably qualified delegate), prior to the bushfire season.
Formal meetings	Regis or construction /operation site manager	Formal meetings to be conducted prior to the bushfire season (as part of bushfire awareness), when higher fire weather is forecast or there are fire events in the surrounding area. Potential participants to include staff, contractors, neighbouring community representatives and external fire authorities and land managers (eg RFS and FRNSW).
Induction process	Regis or construction /operation site manager	Provide bushfire awareness training to all new staff members and contractors, prior to and during the bushfire season for bushfire specific awareness and regularly for other fire awareness (eg structure fire and ignition sources).
		The recognition of very high or greater fire danger days triggering a requirement to view the fire information page (Fires Near, Major fire updates) on the RFS website (RFS 2019).
		Staff, contractors and visitors to be aware of and to respond accordingly to the three levels of alert under the national bushfire warning system (Advice, Watch and Alert, Emergency Warning).
Standard procedures	Regis or construction /operation site manager	Prepare and implement standard procedures associated with potential ignition sources.

5.8.2 Emergency response plan

In the case of a bushfire emergency, the optimal mitigation response to protect human life is evacuation. Therefore, there will be a high reliance on the procedures for emergency response and off-site evacuation.

An ERP will be required for the project and should incorporate all relevant safety procedures and normative management recommendations detailed in the relevant acts, regulations and AS.

The ERP will address all requirements as detailed in the development consent, and may include:

- requirements for pre-bushfire season and continual fire awareness of staff and contractors (see Section 5.8.1);
- requirements for immediate notification to the local RFS and FRNSW of accidental ignition of surrounding grassland (see Section 5.7.2);
- the appropriate risk control measures that would need to be implemented in order to safely mitigate potential risks to the health and safety of fire fighters and other first responders (eg first attack fire-fighting operations by project staff members);
- the circumstances under which different evacuation types are to be implemented, in response to a bushfire or fire emergency;
- a mechanism for the early relocation of staff in the event of a bushfire in the locality, noting that on days of catastrophic fire weather, RFS recommends leaving early as the only safe option;
- detailed plans of all Emergency Assembly Areas including 'on-site' and 'off-site' arrangements;
- requirements for appropriate on-site refuge area signage and communications;
- details of infrastructure layout that show all relevant information (ie access points, fences, locked gates, water supply, areas of electrical hazard);
- transportation arrangements (eg number of vehicles required), designated assembly points and time required to have transportation available;
- the specific structure and role of emergency control on-site (eg fire wardens) - relevant staff will require training consistent with their responsibilities within the emergency control organisational structure and with the equipment provided;
- the requirements for training in preparation for response to an emergency, including trial emergency evacuations;
- the requirements for clarifying a safe egress route and an understanding of the extent/spread of local fires before allowing the evacuating persons to leave the site;
- the requirements for egress and communication in the scenario that persons are leaving the project as emergency services are attending;
- mechanisms for communication with RFS and FRNSW on suitable egress routes and an understanding of the impacts that the egress of high numbers of project staff may have on the local road network and the local community's ability to safely egress from the locality; and

- two copies of the ERP are to be stored in a prominent 'Emergency Information Cabinet' which is in a position directly adjacent to each of the main entry points.

Although the project is not classified as Special Fire Protection Purpose (SFPP under PBP), the construction stage of the project will require large numbers of staff (approximately up to 480 people per day, split into two shifts, during peak construction), some of whom may have little or no previous experience with bushfire or other fire. In addition, there may be communication barriers and logistical problems with high numbers of people. Hence, it is critical that Regis ensures its construction contractors apply suitable measures to prepare staff and subcontractors for any potential bushfire or other fire event. Where applicable, the ERP should be developed to be consistent with the requirements and approach of:

- *A Guide to Developing a Bush Fire Emergency Management and Evacuation Plan* (NSW RFS 2014); and
- Australian Standard 3745-2010 *Planning for emergencies in facilities* (Standards Australia 2010).

It may be suitable to develop an ERP that is specific to the construction of the project, and once constructed, another ERP that is specific to the operation of the project, which encompasses the control measures specific to the unique hazards associated with operation.

During the preparation of the ERP, Regis or its contractors will make contact with:

- the relevant local emergency management officer (LEMO) and local emergency management committee (LEMC), via Blayney Shire Council. This is required to proactively develop a comprehensive inter-agency local emergency procedure for the project;
- Kings Plains RFS; and
- liaise with Canobolas BFMC in regard to the Canobolas BFRMP (New Canobolas BFMC 2016) to ensure that the project is incorporated into future risk management plans.

Copies of the ERP for the project should be provided to RFS, FRNSW, the LEMO/ LEMC and the Canobolas BFMC for information prior to commencement of construction. Any subsequent versions of the ERP, as a result of updates to the plan (as a minimum on a yearly basis), should be re-issued to the agencies and committees.

5.8.3 Monitoring and review

The ERP should be reviewed after incidents of bushfire or other fires as well as annually at the end of each bushfire season (ie reviewed during the period April-August) and amended, if required, to improve the effectiveness of the plan. A monitoring and review process should include, as a minimum:

- monitoring against the aims and objectives of the ERP;
- updating the ERP based on current best practice guidelines;
- assessing the risk, obligations and management measures against any new legislative changes; and
- reviewing and updating emergency procedures annually at the end of each bushfire season (April through August), and after any fire incident.

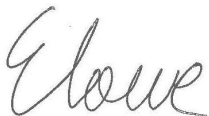
6 Conclusion

This BRHA has provided an assessment of potential hazards and risks associated with bushfire for the mine development, including:

- existing environmental and bio-physical factors such as fire weather, vegetation, slope and potential ignition sources that have the potential to cause bushfire originating from outside the project area in surrounding areas;
- potential risks associated with the project, including risk of ignition of unplanned bushfire originating from activities associated with the construction, operation and decommission phases of the project; and
- the risk of bushfire damaging infrastructure associated with the project and consequently impacting upon the safety of staff and contractors on the project, as well as bushfire emanating from the project posing a human safety and property threat within the locality.

A comprehensive suite of recommendations for bushfire mitigation for the construction, operation and decommissioning of project have been provided, in order to address how a bushfire impacting on the project, and the risk of fire potentially emanating from the project will be managed, as well as to develop a coordinated response to bushfire risks.

Yours sincerely,



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