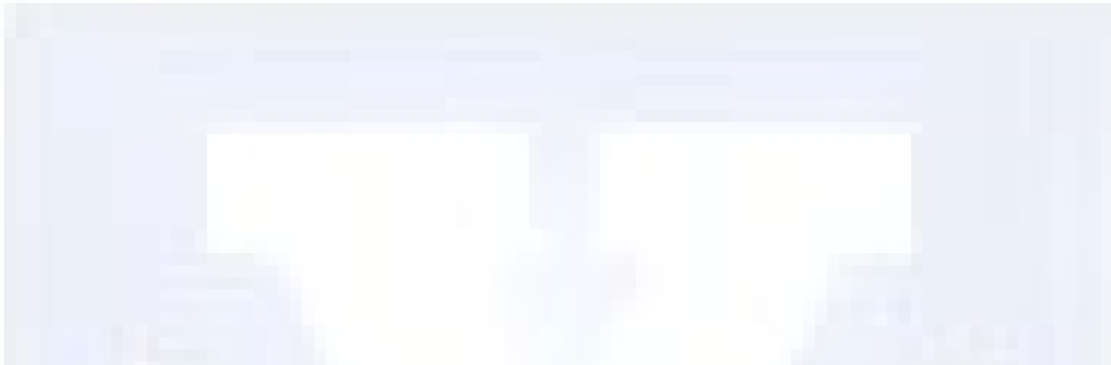
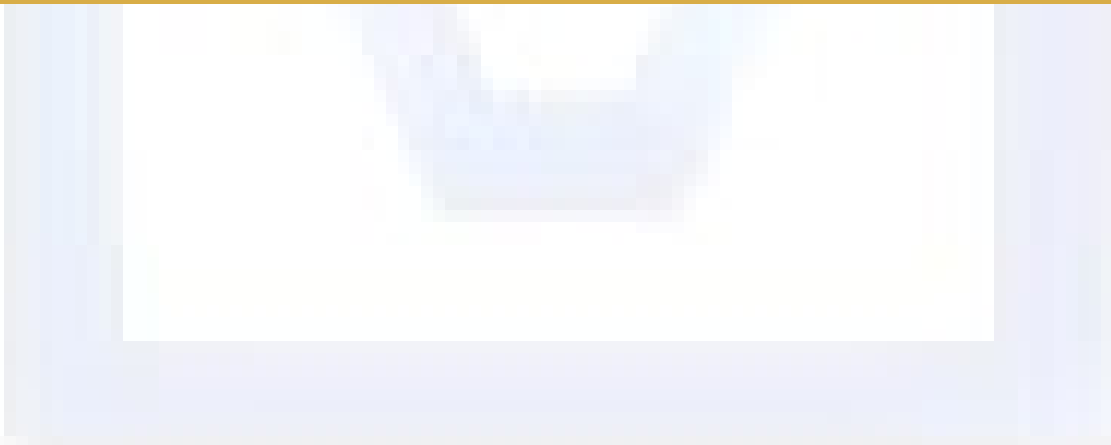




Principal Hazard Management Plan

Fire and Explosion





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1. PURPOSE

The purpose of this PHMP is to identify principal hazards associated with Fire and Explosion at the Vulcan Mine and to specify the management by reducing identified risks to an acceptable level.

This PHMP has been developed to ensure compliance with the following section of the *CMSHA*:

- ***Section 63 and 64 of the Coal Mining Safety and Health Act.***

2. DEFINITIONS

BBRA	Broad Brush Risk Assessment.
CMW	Coal Mine Worker.
JHA	Job Hazard Analysis.
MOP	Mine Operating Procedure.
OCE	Open Cut Examiner.
PHMP	Principal Hazard Management Plan.
HST	Health Safety and Training
SOP	Standard Operating Procedure.
SSE	Site Senior Executive.
SWP	Safe Work Procedure.
TARP	Trigger Action Response Plan.
WRAC	Workplace Risk Assessment and Control.

3. OPERATION OVERVIEW

The Vulcan Mine is an open cut coking coal mine, located approximately 30 kilometres north-west of Dysart and 35 kilometres south-east of Moranbah. The mine is adjacent to BHP Billiton Mitsubishi Alliance's Peak Downs Mine.

The Jupiter hard coking coal target was mined from 2021 until the end of 2024 via a single pit. This pit and associated out of pit dump are being rehabilitated inline with sites progressive rehabilitation and closure plan (PRCP). The Vulcan South Project at the same complex was approved in late 2024, with further open cut developments in Vulcan North, Vulcan Main and Vulcan South are being mined at a rate of 1.95Mtpa. In addition to the open cut pits, Vitrinite has commenced its highwall mining operation in the North of the Vulcan South Project.



Mining will be conducted by open cut mining in compliance with the conditions of the Mining Lease with progressive backfilling of the pit. In summary, the mining method comprises the following stages:

- Clearing and grubbing;
- Topsoil removal and stockpiling;
- Drilling and blasting;
- Overburden, inter-burden and partings removal and dumping;
- Selective coal mining to maximise recovery and minimise dilution;
- Coal haulage to ROM stockpile;
- Crushing and dry-sorting;
- Operate and maintain reject co-disposal system;
- Manage and maintain all site services;
- Mine planning and development;
- Progressive re-contouring of waste dumps; and
- Re-spreading of topsoil.

As mining commences, exploration activities are planned to continue. This work will include all aspects for exploration, including field mapping, drilling, seismic surveys and environmental surveys, etc.

4. SCOPE

This plan applies to all mining operations conducted on the site, including but not limited to:

- Open-cut and Highwall mining activities
- Drilling, blasting, excavation, and loading
- Haulage and material transfer
- Crushing, screening, and processing
- Construction and maintenance activities
- Exploration drilling and rehabilitation works
- Maintenance and servicing activities.

This PHMP references the sites Standard Operating Procedures (SOPs) and other site documentation for identifying and controlling the Fire and Explosion risks that may arise and forms part of the sites safety and health management system.

5. Fire and Explosion Prevention

5.1. HAZARD MANAGEMENT

Fire and Explosion was prescribed as a principal hazard by RSHQ. As a result, a Risk Assessment was conducted as per **VUL-MOP-049- Risk and Hazard Management** to identify hazards and controls to be implemented to manage fire and explosion risk at Vulcan Mine.

The risk assessment considered the following matters:

- Sources of ignition



- The presence of combustible material
- The presence of explosive gases and atmospheres
- The storage of incompatible substances

The Risk Assessment forms part of the site's Safety and Health Management System (SHMS) and is stored on the site's intranet system.

A considerable risk event at Vulcan is that the temperature of combustible material may rise its ignition temperature, due to self-heating and/or other environmental factors, resulting in auto-ignition and cause a fatal fire or explosion. The key threats to this event are as follows:

- Mobile or Fixed Plant mechanical failure / damage
- Mobile or fixed plant hydraulic failure / damage
- Mobile or fixed plant electrical component failure / damage
- Diesel makes contact with hot surface during refuelling
- Ignition source present and exposed to flammable gases.
- Ignition source present in the area containing flammable liquids.
- Equipment strikes concealed power services.
- Hot Work
- Frictional Heating - Conveyor systems.
- Bush Fires
- Lightning Strikes
- Tyre Fire
- Fire fighting capability
- Spontaneous combustion

5.2. Mobile or Fixed Plant

Plant is checked and maintained in accordance with site and OEM standards.

Risk management techniques should be used to determine the relevant controls required to manage fire risks associated with mining equipment and evaluate the effectiveness of mining equipment fire detection and suppression management systems as outlined in **VUL-MOP-049- Risk and Hazard Management**.

AS 5062 Fire Protection for Mobile and Transportable Equipment specifies fire risk management procedures and the minimum requirements for fire protection system design, installation, commissioning and maintenance for use on mobile and transportable equipment.

Automatic/manual fire detection/suppression systems can be a combination of foam, dry chemical powder and gas systems fitted to mobile equipment.

To assist with preventing deterioration of plant, plant-specific maintenance regimes are developed and captured by the site's Maintenance Management System in accordance with **VUL-MOP-071 Equipment Compliance**.

In the event of component failure, damage, overheating or leakage, (and whenever practicable installation is possible), plant is fitted with warning devices that alert the operator of the situation. Operators are trained in the correct action to take in response to these alarms.

Where such devices are not practical, physical protection shall be put in place. E.g. fire walls, hose wrapping/guarding, etc.



VUL-SOP-037-Action to be taken on Discovery of Fire provides the procedure to be followed upon discovery of a fire.

All operators must report all defects that are identified during pre start inspections in accordance with ***VUL-SOP- 098-Reporting & Rectifying Defects.***

5.3. Monitoring / Detection Systems

Monitoring / detection systems appropriate to the fire and explosion related risk shall be installed in appropriate locations and on relevant items of plant and equipment. This includes smoke detectors located in camp, office, warehouse and workshop areas.

Inspection requirements, testing, calibration and maintenance of the fire and explosion detection monitoring systems shall be conducted in accordance with Original Equipment Manufacturer (OEM) specifications and the relevant Australian Standard. ***VUL-SOP-073-Checking Mobile Plant***

The installation of fire and explosion detection and monitoring systems shall be conducted by suitably qualified and competent persons considering the risk assessment and design process in reference to ***AS5062 Fire protection for mobile and transportable equipment.***

Modifications or variations to the fire and explosion detection and monitoring system must be fully assessed and approved prior to undertaking such modifications or variations.

Fire and explosion detection and monitoring equipment shall be commissioned in line with the Original Equipment Manufacturer (OEM) requirements.

Fire and explosion detection and monitoring equipment shall be tested and validated that the equipment is in working condition as per the relevant maintenance regime.

Operation and maintenance manuals for fire and explosion detection and monitoring equipment shall be provided to the owner with sufficient information on design, commissioning, inspection, testing, maintenance, risks and safe work procedures.

All operators must report all defects that are identified during pre start inspections as per ***VUL-SOP- 098-Reporting & Rectifying Defects***

5.4. Explosion Risks

5.4.1. Explosives

Hazard Management of explosive devices and/or products at Vulcan Mine are outlined in ***VUL-PHMP-01-Explosives.***

5.4.2. Electrical

VUL-PLN-021- Electrical Management contains standards for the installation, commissioning, of certified explosion protected electrical equipment e.g., flameproof/intrinsically safe electrical equipment, to reduce the risk of an explosion.

5.4.3. Flammable and Toxic Gases

Where the potential for explosive gases exists, ***VUL-SOP-142-Flammable and Toxic Gas in the Work Environment*** provides controls to assist in the management of any existing hazards.



5.4.4. Highwall Mining Operations

Explosive gasses identified during Highwall Mining activities shall be controlled as per ***VUL-TAR-010-Highwall Mining Gas Management (Trigger Action Response Plan)***.

5.5. Refuelling

Guidelines for managing health, safety and environmental risks when servicing, lubricating and fuelling mobile equipment are identified in ***VUL-SOP-072h-Servicing, Lubricating & Refuelling***.

5.6. Tyre Management

The potential for tyre fires and explosions is recognised and managed in accordance with ***VUL-SOP-072a Tyres, Wheels & Rims Management*** and ***VUL-SOP-037-Action to be taken on Discovery of Fire***.

5.7. Flammable liquids and Materials

All flammable or combustible liquids shall be stored with consideration given to segregation of incompatible substances in accordance with the information that is provided in the relevant Safety Data Sheet are outlined in ***VUL-SOP-056 Hazardous Substances***.

5.8. Frictional Heating

Coal accumulation under and around conveyor belts shall be regularly cleared away to reduce the fuel source for a fire. Inspections of conveyor belts shall be conducted checking for frictional heating as per ***VUL-SOP-073-Checking Mobile Plant***.

The conveyor belt system and motors shall be maintained in line with scheduled maintenance in accordance with ***VUL-SOP-072c-Assembly, Disassembly and Maintenance of Plant in its Operational Location***.

5.9. Hot Work

Procedures for conducting hot work tasks using cutting and welding equipment in all conditions and environments at Vulcan are documented in ***VUL-SOP-096c(ii)- Hot Work***.

The ***VUL-FRM-02-05-Hot Work Hazard Assessment*** is to be completed to determine if a specific activity on Vulcan Mine requires a Hot Work Permit.

The ***VUL-FRM-19-05-Hot Work Permit*** is required for all surface hot work tasks, including grinding, welding, thermal or oxygen cutting or heating, and other related heat-producing or spark-producing operations, conducted outside of a designated hot work area to prevent the possibility of fire or explosion.

5.10. Excavation of Concealed Electrical Services.

To effectively manage the risks associated with using plant near electricity refer to:-

VUL-SOP -135-Using Plant Near Electricity

VUL-FRM-19-12-Penetration Excavation Permit

VUL-MOP-088-Concealed Services



VUL-FRM-19-19-Using Plant Near Electricity Permit

Isolation of the power source as per ***VUL-SOP-078– Isolation and Tagging***

5.11. Bush Fires

The Vulcan lease is bordered by a boundary of cattle fencing. Vulcan maintains a fire breaks around the blast re-load compound, magazine and boundary fence lines in accordance with ***VUL-SOP-116 (a,b,c,d,e,f) Transporting, Storage & Handling Explosives.***

The Mine has a fully equipped fire response vehicle and mines rescue vehicle located on site in accordance with ***VUL-PLN-035-Emergency Planning & Response.***

5.12. Coal Dust

Where an accumulation of coal dust that could present and a fire or explosion risk has been identified, regular housekeeping exercises such as hosing shall also be carried out to minimise the fire and explosion risks associated with coal dust.

Coal dust generated from the transport and transfer of coal shall be minimised through the use of water suppression refer to ***VUL-SOP-129 Maintain and Water Mine Roads***

6. Control of Fire and Explosions

Coal mine workers are required to take certain emergency actions in response to a fire being detected are outlined ***VUL-SOP-037-Action to be taken on Discovery of Fire.***

Emergency response actions for fire and explosion hazards are outlined in ***VUL-PLN-035 – Emergency Planning and Response Plan.***

All relevant personnel are trained in these Guidelines (dependant on their position requirements as determined by the site's Training Needs Analysis). Additionally, all Vulcan employees receive training in the use of fire extinguishers.

7. Fire Fighting Equipment

The Mine has a fully equipped fire response vehicle and mines rescue vehicle located on site.

Water trucks are available for emergency fire response. Water fill points are on-site for refilling water trucks. Water trucks have been fitted with the following fire response equipment:

- a) Remote operated monitor
- b) Hose reel

Fire extinguishers of suitable type, size and quantity shall be located on or near equipment and installations identified as a control for potential fire hazards.

All fire extinguishers shall be inspected and maintained in accordance with the relevant Australian Standards.

7.1. Water Supply

All hydrant outlets, couplings, hoses and foam induction hardware should be of a type that is compatible with the equipment used by the Queensland Fire and Rescue Service – i.e. 'Queensland Round' outlets.



7.2. Firefighting Capability

As per **VUL-PLN-035 – Emergency Planning and Response Plan**, an adequately staffed Emergency Response Team (ERT), are in place to respond to fires and explosions.

Training will be provided to personnel appointed as Fire Wardens. Training shall be in accordance with nationally accredited competency PUAWER005B “Operate as part of an emergency control organisation”. This course covers the training requirements as listed in Australian Standard 3745-2010 Planning for emergencies in facilities.

8. Spontaneous combustion

Risk Management of Spontaneous Combustion is detailed in **VUL-SOP-138 (a) (b) – Work on or Near Product Stockpiles and Coal Waste Dumps**.

9. Lightning

The monitoring of lightning activity is carried by the OCE/Supervisors and communicated with actions enacted as per **VUL-TAR-005-Lightning** for site activities.

10.IMPLEMENTING AND MAINTAINING THE PLAN

10.1.Training

CMWs shall receive training during site inductions covering the **VUL-05-PHMP-Fire and Explosion Principal Hazard Plan**

Requirements for competencies required by coal mine workers, including requirements from industry competency standards are specified within the VUL-MOP-082-Training Scheme.

10.2.Communicating the Plan

The SSE is accountable for ensuring the PHMP and an overview of its content is communicated to all affected people, including contractors.

The effectiveness of this PHMP relies on all employees playing an active role and notifying other people of any potentially hazardous areas.

Any potential hazards shall be communicated to workers at shift prestart meetings or toolbox meetings.

10.3.Document Control

All documents associated with this PHMP will be stored within the Vulcan Mine SHMS. The electronic version is the controlled copy, and any hard copy document must be reviewed in the light of the controlled copy.

10.3.1. Records

Vulcan Mine will maintain records that demonstrate conformance with this PHMP. These records shall include but not be limited to:



- training records.
- results of risk assessments, audits and reviews.
- monitoring data, including survey; and
- pit designs and traffic management plans.

11. REVIEWS AND AUDITS

This PHMP shall be audited (internally) annually and reviewed at least every five years or if the any of the following occur:

- a significant vehicle interaction incident.
- proposed changes that may impact on vehicle movement risks e.g. mining methods or road design;
- a change in relevant legislation, codes and standards; or
- evidence of vehicle interaction risks that are not satisfactorily managed by the PHMP.

12. ROLES AND RESPONSIBILITIES

Position	Responsibilities
Coal Mine Operator	• Ensure that a PHMP has been developed. • Conduct audits of the SHMS. Provide adequate resources for ongoing implementation of the PHMP.
Site Senior Executive	• Review the control monitoring and effectiveness requirements as defined by this PHMP. • Ensure adequate resources are available for the ongoing implementation of the PHMP. • Understand the intent and content of this PHMP. • Ensure the PHMP is audited and reviewed as required and audits are actioned in a timely manner. Ensure statutory obligation are met.
Operations Manager	• Ensure the control monitoring and effectiveness system is implemented and operational. • Ensure adequate resources are available for the ongoing implementation of the PHMP. • Ensure that the systems and procedures established as part of the PHMP are implemented and followed. Oversee the mining operations and adherence to the PHMP.
HST Manager	• Ensure the control monitoring and effectiveness system is implemented and operational. • Ensure adequate resources are available for the ongoing implementation of the PHMP. • Ensure surface mobile equipment is fit-for-purpose. Verify that all persons with responsibilities under this PHMP, including external service providers, have the necessary competencies and resources available to them to comply with this PHMP.
Technical Services Superintendent	To ensure that the mine is designed to comply with all the requirements of this PHMP.
Open Cut Examiners	• Comply with the requirements of the PHMP and monitor that the systems and procedures established as part of the PHMP are being implemented and followed. • Ensure that all work areas and traffic flow areas are maintained in a satisfactory condition. • Ensure that all findings and actions are recorded and communicated to all coal mine workers. Promptly highlight any hazards to all Coal Mine Workers.



Position	Responsibilities
Supervisors	- Comply with the requirements of the PHMP and monitor that the systems and procedures established as part of the PHMP are being implemented and followed in practice. - Ensure personnel under their direction remain aware of their responsibilities under the PHMP and carry them out. - Ensure that only competent and authorised personnel operate mobile equipment. Promptly highlight to the OCE any increased risk of an incident related to operation of mobile equipment.
Coal Mine Workers	Observe the requirements of this PHMP.

13. REFERENCES

Coal Mining Safety and Health Act 1999 (Qld)
Coal Mining Safety and Health Regulation 2017 (Qld)
Vulcan Mine Broad Brush Risk Assessment
AS 5062 Fire Protection for Mobile and Transportable
VUL-PLN-021- Electrical Management Plan
VUL-MOP-071 Equipment Compliance
VUL-SOP -135-Using Plant Near Electricity
VUL-SOP-116 (a,b,c,d,e,f) Transporting, Storage & Handling Explosives
VUL-SOP-073-Checking Mobile Plant
VUL-SOP-142-Flammable and Toxic Gas in the Work Environment
VUL-SOP-056-Hazardous Substances
VUL-SOP-096c(ii)-Hot Work
VUL-FRM-19-05-Hot Work Permit
VUL-SOP-037-Action to be taken on Discovery of Fire
VUL-PLN-035-Emergency Planning and Response Plan
VUL-SOP-072c-Assembly, Disassembly and Maintenance of Plant in its Operational Location
VUL-MOP-088-Concealed Services
VUL-PLN-021-Electrical Management Plan
VUL-FRM-19-19-Using Plant Near Electricity
VUL-MOP-049- Risk and Hazard Management
VUL-FRM-19-12-Penetration Excavation Permit
VUL-SOP-072h-Servicing, Lubricating & Refuelling
VUL-TAR-010-Highwall Mining Gas Management (Trigger Action Response Plan).
VUL-SOP- 098-Reporting & Rectifying Defects



VUL-FRM-02-05-Hot Work Hazard Assessment

VUL-SOP-078– Isolation and Tagging

VUL-SOP-129 Maintain and Water Mine Roads

VUL-SOP-138 (a) (b) – Work on or Near Product Stockpiles and Coal Waste Dumps

VUL-TAR-005-Lightning

14.AMENDMENTS

Version	Date	Description	Document Controller
1	27/08/2025	Document Created	Kelly Jensen