COP : Code of Practice

Black Mountain Mining (PTY) LTD

MANDATORY CODE OF PRACTICE
FOR EMERGENCY PREPAREDNESS AND RESPONSE

This COP was drawn up in accordance with Guideline DME Reference Number DME 16/3/2/1-A5 Issued by the Chief Inspector of Mines dated 31 January 2011

DMR Mine Code number: 0195

Operation Reference Number: BMM-HSE-VOH-COP-0002

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Code of Practise Approval

Compiled By: .... VOH Manager Date: 2025.05.23	**Approved By:** .... NUM Health & Safety Representative Date:	**Approved By:** .... Head of HSE Date:
Approved By: .... Snr. Environmental Supervisor Date: 2025.05.23.	**Approved By:** .... Survey Manager Date: 2025-05-27	**Approved By:** .... Engineering Manager Date: 19/6/2025
Approved By: .... HR Manager Date: 11/06/25	**Approved By:** .... Plant Manager Date: 2025/07/03	**Approved By:** .... Mining Manager Date: 26/06/2025
Approved By: .... General Manager Date: 08/07/2025		

Table of Contents

1. PURPOSE.

To have in place a Code of Practice that will improve emergency preparedness and response, thereby minimising risks to persons affected by emergencies.

2. SCOPE.

This Code of Practice applies to all Black Mountain Mining licenced areas

3. STATUS OF CODE OF PRACTICE.

3.1 This COP was drawn up in accordance with Guideline Reference Number DME 16/3/2/1-A5 issued by the Chief Inspector of Mines

3.2 This is a mandatory COP in terms of section 9(2) and (3) of the MHSA

3.3 The COP may be used in an accident investigation/inquiry to ascertain compliance and also to establish whether the COP is effective and fit for purpose

3.4 The COP supersedes all previous relevant COP’s

3.5 All managerial instructions, recommended procedures (voluntary COP’s) and standards on the relevant topics must comply with the COP and must be reviewed to ensure compliance

4. MEMBERS OF THE DRAFTING\REVIEWING COMMITTEE.

4.1 In terms of section 9(4) of the MHSA, the Health and Safety Committee was consulted on the preparation, implementation or revision of this COP.

4.2 A committee was appointed for the drafting/review of this COP.

4.3 Reviewing Committee:

NAME	DESIGNATION	QUALIFICATION	AFFILIATION	EXPERIENCE	SIGNATURE
Charles Klopper	VOH Manager	Cert in Mine Environmental Control	Mine Ventilation Society (MVS)	25 years	
Marius Magerman	Sectional VOH Officer	Cert in Mine Environmental Control	Mine Ventilation Society (MVS)	19 ~~16~~ years	
Andre Stoffels	Occupational Medical Practitioner	Diploma in Occupational Health	SASOM HPCSA	27 years	
Kotishi Mamosebo	Mining Manager	MMC - Mining	SANIRE	32 years	
Werner Carsten	Mining Manager: Deeps	Mine Overseer Certificate		23 years	
Francois van den Heever	Mining Manager: Swartberg	Mine Overseer Certificate		17 years	
Adrian Landsberg	Manager: Process Plant	NHD		24 years	
Kobus Nel	Plant Production Manager			32 years	
Wessel Sauer	Plant Engineer	B Eng. E & E	AMRE	4 years	
Shane Links	Engineer Manager (Act)	GCC Engineering		13 ~~7~~ years	
Barry Strydom	Shaft Mine Overseer	Certificate: Mine Overseer		26 years	
Llewellyn Barry	Full Time Health & Safety Rep	COMSOC 1 & 2		10 years	
Wendel Freeman	Full Time Health & Safety Rep	COMSOC 1 & 2 SAMTRAC		17 years	
Nkosiyetu Masebeni	NUM	COMSOC 1 & 2 Blasting Certificate	NUM	21 years	
Garth Boersma	HR Manager	P.G. Dip Management		28 years	
Johan Coetzer	Security Manager		PSIRA	31 years	

4.3 Review Committee

2. Review Committee – BMM-HSE-VOH-COP-0002 Code of Practice Emergency Preparedness and Response

Name	Designation	Qualification	Affiliation	Experience
Leonard Magerman	VOH Manager	Cert in Mine Environmental Control. BTech Safety Management	MVS	27 years
Marius Magerman	Sect Vent Officer	Cert in Mine Environmental Control	MVS	22 years
Andre Stoffels	Occupational Medical Practitioner	Diploma in Occupational Health	SASOM HPCSA	30 Years
Werner Carsten	Mine Overseer	Mine Overseer Certificate		26 years
Bernie van den Heever	Mine Overseer	Mine Overseer Certificate		26 years
Barry Strydom	Mine Overseer	Mine Overseer Certificate		28 Years
Lukhanyo Ziphethe	Mine Overseer	Mine Overseer Certificate Mine Manager Certificate Btec – Mining engineering		11 Years
Elias Smit	Plant Production Manager			32 Years
Mduduzi Mdluli	Plant Engineer	GCC Engineering		6 Years
Shane Links	Shaft Engineer	GCC Engineering		10 Years
Eric van den Heever	Fulltime Health & Safety Rep	COMSOC 1&2 Legal Liability Automotive Elect		26 Years
Wendell Freeman	Fulltime Health & Safety Rep	COMSOC 1&2 SAMTRAC		18 Years
Llewellyn Barry	NUM H&S Secretary	COMSOC 1 & 2 SAMTRAC NEBOSH	NUM	14 Years
Johan Coetzer	Security Manager		PSIRA GRADE A	34 Years
Werner Coetzer	Emergency Coordinator	MEC Inter Cert. MRS Advance Cert.		16 Years
Levohna Genis	Safety Officer - Plant	COMSOC 1 & 2 SAMTRAC NEBOSH		16 Years
Mario Carstens	Chief Safety Officer	Blasting Certificate COMSOC1&2		15 Years
Freddie Haefele	Compliance & Risk Officer	COMSOC1&2 OHSAS 18001 ISO 14001 ISO 9001		22 Years
Conray Saal	ALS Paramedic	NADEMC	HPCSA	14 Years
Nolan O'Ryan	Proto Team Captain	N2 Fitter		19 Years
Bronwin Oppel	Proto Team Captain	N2 Fitter		19 Years

Signed for on behalf of the Joint Health and Safety Committee:

Name	Signature	Date
Eric van den Heever		07/10/2024
Wendell Freeman		08/10/2024

Approved: L Roode – General Manager (4.1 Appointee)

Signature: ______________ Date: 08/10/2024

5. GENERAL INFORMATION.

5.1 MINE DESCRIPTION & LOCATION.

Black Mountain is an underground Base Metal mine situated near the town of Aggeneys, 70 km west of Pofadder and 110 km east of Springbok, consisting of the following major areas:

- Deeps section (situated 8 km west of Aggeneys)
- Swartberg section (situated 15 km west of Aggeneys)
- Concentration Plant (situated 10 km west of Aggeneys)

5.2 COMMODITIES PRODUCED.

The following main concentrates are produced at Black Mountain:

- Zinc; Lead; Copper

5.3 MINING METHODS.

Black Mountain is a fully mechanized mine utilizing the Cut & Fill and Blast-hole mining methods. The potential situations and/or sources that could give rise to emergencies are as follows:

No	Potential Situations	U/g	Plant	Surf	Com	Security
1	Fires	x	x	x	x	x
2	Flooding	x	x	x	x	x
3	Mud-rushes	x				
4	Power failures	x	x	x	x	x
5	Falls of ground	x				
6	Accident to decline, shaft or head gear	x				

7	Cyanide spillage / hydrogen cyanide exposure		x			x
8	Other hazardous / chemical exposures		x			(spills on road)
9	Ammonia / Chlorine poisoning			x		x
10	Tailing Storage Facility failure		x			x
11	Vehicle accidents	x	x	x	x	x
12	Cemented Hydraulic Fill (Backfill) barricade failure	x				
13	Unplanned detonation of explosives	x				(depend where)
14	Structural collapse	x	x	x	x	
15	Natural calamities			x	x	x
16	Biological (insects; reptiles; wild animals)		x	x	x	x
17	Assault GBH	x	x	x	x	x
18	Hostage Situation	x	x	x	x	x
19	Bomb Threads	x	x	x	x	x
20	Injuries to Person/s	x	x	x	x	x

No	Potential Sources	U/g	Plant	Surf	Com	Security
1	Mobile diesel equipment	x	x	x	x	x
2	Main and mini sub-stations	x	x	x	x	
3	Diesel storage areas	x		x	x	
4	Underground workshop areas	x				
5	Defective pumps/intersection of water	x	x			
6	Water accumulation in ore/waste pass	x				
7	Faults/unstable hanging, ineffective support	x				
8	Cyanide storage and dosing areas		x			
9	Plant hazardous/chemical storage & dosing areas		x			
10	Chlorine storage/dosing area			x		
11	Storage of other flammable equipment or materials	x	x	x	x	
12	Backfill areas	x				
13	Explosives	x		x		x
14	Structures & buildings, for example Plant infrastructure	x	x	x	x	
15	Natural calamities, for example flooding		x	x	x	x
16	Insects; reptiles; wild animals		x	x	x	x
17	Delivery vehicles (chemical spills)		x	x	x	x
18	Fighting on company premises	x	x	x	x	x

19	Disgruntled employees or community	x	x	x	x	x
20	Reckless driving & Driving Under Influence			x	x	x

5.4 UNIQUE FEATURES TO BLACK MOUNTAIN.

The mine's remoteness:

- This has an influence on the response times and capabilities from outside Emergency Services e.g. Mines Rescue Services, Emergency Medical Services and other mines in the area

Deeps section:

- Deeps has a continuous decline with a length of approximately 15km serving as the second escape way from Shaft Bottom to Surface should the Deeps Main Shaft not be available

Swartberg section:

- Has a continuous decline with a length of about 3 km
- In the event that the decline is not available during emergencies, second escape is by means of proto assisted skyjack and rope rescue through various raise bore holes and the ventilation shafts.

6. TERMS & DEFINITIONS.

As & When Required	This COP will be reviewed and updated after every serious incident relating to the topic covered in the COP or if significant changes are introduced to procedures, mining and ventilation layouts, mining methods, plant or equipment and material.
COP	Code of Practice.
DMR	Department of Mineral Resources.
Emergency	A situation, event or set of circumstances at a mine that could threaten the health or safety of persons at or off the mine, and which requires immediate remedial action, such as the evacuation, rescue or recovery of persons, to prevent serious injury or harm, or further serious injury or harm, to persons.
MHSA	Mine Health & Safety Act, 1996 (Act No. 29 of 1996), as amended.
OMP	Occupational Medical Practitioner.
PLACE OF SAFETY	Any place, which, despite an **emergency**, can sustain life for the duration of the **emergency** and is adequate in size to accommodate the maximum number of affected persons likely to be present in the area served by it. Such place could include, provided it remains safe despite an emergency, the following: • an intake airway commencing from the surface of the mine, which contains no combustible material or in which all combustible material has been rendered fire-resistant and in which no combustible material in quantities sufficient to endanger or likely to endanger the safety of somebody is conveyed during the working shift; or • a development end, not through ventilated, equipped with a sustainable supply of compressed air (with all auxiliary fans in the development end switched off); or a refuge bay as contemplated in SOP 059 and SS 0017.
PPE	Personal Protective Equipment.

Self-Contained Self-Rescuer (SCSR)	A device, which provides respirable air, independent of the surrounding atmosphere to protect the wearer from exposure to irrespirable air.
VOH	Ventilation & Occupational Hygiene.

7. RISK MANAGEMENT.

7.1 RISK ASSESSMENT.

Section 11 of the MHSA requires the employer to identify hazards, assess the health and safety risks to which employees may be exposed while they are at work and to record the significant hazards identified and risk assessed.

A baseline risk assessment was conducted, and it covered all the underground mining sections & workshops as well as surface area such as the plant and main workshops. The assessment systematically identified the risk of all the processes and prioritized these risks.

The main purpose of the assessment was to comply with the relevant Occupational Health and Safety legislation, identify and evaluate current control measures, provide recommendation for control of risks in the workplace and obtain and provide detailed information.

7.2 RELEVANT INFORMATION.

To assist with the risk assessment process all possible relevant information such as accident statistics, ergonomic studies, research reports, manufacturers specifications, approvals, design criteria and performance figures for all relevant equipment were obtained and considered.

7.3 PERIODIC REVIEW.

In addition to the periodic review required by Section 11(4) of the MHSA, this COP will be reviewed and updated after every emergency, altered circumstance, or if significant changes are introduced to procedures, mining and ventilation layouts, mining methods, plant or equipment and material. The periodic review will not exceed a period of three (3) years.

8. ASPECTS ADDRESSED IN THE COP.

8.1 EMERGENCY PREPAREDNESS MEASURES.

8.1.1 DETECTION & EARLY WARNING SYSTEMS.

In order to ensure that emergencies are detected as early as practicably possible and persons are warned timeously of such an emergency, the following early warning devices are in use:

8.1.1.1 UNDERGROUND.

a) Fixed Detectors / Early Warning Systems.
Fixed detectors are installed as follows:

- **Deeps Section**:
  - An environmental monitoring system is in the process of being installed, mainly in the intake and return airways of Deeps. This system will report back the 24-hour manned control room on surface at Deeps Shaft. It consists of two types of sensors: an integrated sensor measuring velocity, methane (CH_4), carbon monoxide (CO) and temperature and the second being a smoke sensor
  - Stench gas systems are installed at the Deeps sub-bank area on surface and in the Broken Hill Decline just below surface. Both installations can be operated manually or automatically from the Deeps Control Room
- **Swartberg Section**:
  - An environmental monitoring system is in the process of being installed, mainly in the intake and return airways Swartberg Section. This system will report back the 24-hour manned control room on surface at Deeps Shaft. It consists of two types of sensors: an integrated sensor measuring velocity, methane (CH_4), carbon monoxide (CO) and temperature and the second being a smoke sensor
  - A stench gas system is installed at the Swartberg Decline just below surface and can be operated manually or automatically from the Deeps Control Room

Main Fans

- **Deeps Section**: A telemetry system, linked to the 24-hour manned control room at Deeps shaft, gives a visual warning in the event that the Deeps Main Fans stop operating. Fans can be automatically started/stopped from the control room via this system.
- **Swartberg Section**: Currently only a localized system is installed. A telemetry system, linked to the 24-hour manned control room at Swartberg, are being installed that will give a visual warning in the event that the Swartberg Main Fans stop operating.

Seismic monitoring

- **Deeps Section**: Geophones are strategically installed underground. When the magnitude of the seismic events reaches a set limit, a triggering system is in place to warm the mine, by sending the warning message to the control room and to various responsible persons via sms. In addition, area specific monitoring is conducted as and when required with mobile seismic detection units.
- **Swartberg Section**: Area specific monitoring are conducted as and when required with mobile seismic detection units.

Fire Detection & Suppression

- The Main sub-stations at the Deeps Winder House and main fans are equipment with automated fire detection and/or gas suppression systems.
- Underground main sub-stations: Automated systems are installed at 45 level, 45 Crusher, 50 level and 51 level sub-stations.
- 51 Level conveyor belt: Automated systems are installed at high risk areas along the conveyor belt.
- A pump house with water reticulation & sprays are installed at the Deeps Winder house and main fan sub-station installations.
- Hand-held fire extinguishers, fire hoses and fire hydrants are installed throughout the Deeps surface area. Water supply is by means a dedicated fire pump installation, giving both audible and visual alarms should hydrants be opened.
- Fire detection are also by visual means.

b) Personalized Detectors / Early Warning Systems.
Gas Detection Instruments – Deeps and Swartberg

- Type: Exsens X4 Gas Detection Instruments, monitoring Oxygen, Carbon Monoxide and Methane levels
- Quantity: 45
- Back-up Units: 10% of required – see COP for the Prevention of Flammable Gas

c) Procedures for Personal Issue of Detectors / Early Warning Systems.
The detailed issuing procedures for detectors / early warning systems are stipulated in:

- COP 001 Lamp Rooms
- SOP 069 Lamp Room Procedure

d) Procedures to Ensure Effective Alarm Setting Levels.
Fixed:

- The Head of Mining and the VOH Manager assigns alarm levels to the units
- Settings on the monitoring system will be password protected
- Installation and operating limits of detectors situated underground will be the responsibility of the technicians

Personal:

- These units will be set as per legal requirement by the O.E.M / lamp room personnel in accordance with the OEM specifications and procedures

e) Frequencies of Maintenance, Calibration & Testing Procedures.
Maintenance:

- Maintenance for all monitoring and early warning systems will be done according to the procedure as per OEM specifications. A copy of which is kept in the lamp room.

Calibration:

- Calibration for all monitoring and early warning systems will be done according to the procedure as per OEM specifications. A copy of which is kept in the lamp room.

Testing Procedures:

- Testing for all monitoring and early warning systems will be done according to the procedure as per OEM specifications. A copy of which is kept in the lamp room.
- Personal detectors / early warning devices:
  - Lamp room personnel are responsible for the calibration and maintenance of such instruments.
  - Each designated user of a Personal detector / early warning device is responsible to check and verify that the instrument is operating effectively before proceeding underground.
- Fixed Installations:
  - Technicians are responsible for the calibration and maintenance of such instruments.

8.1.1.2 PLANT.

a) Fixed Detectors / Early Warning Systems.
Concentration Plant:

- A total of 11 (eleven) gas detection instruments are installed in various locations throughout the plant and measures the following: oxygen (O2), sulfur dioxide (SO2), hydrogen sulfide (H2S), hydrogen cyanide (HCN) and ammonia (NH3).

Fire Detection & Suppression

- Fire detection are also by visual means, with a central Fire / Emergency alarm activated from the Plant Control Room, tested every Friday at 11H00.
- A pump house with water reticulation & sprays are installed at the sub-station installations.
- The Main Consumer sub-station and main sub-stations are equipment with automated fire detection and suppression systems.
- Hand-held fire extinguishers, fire hoses and fire hydrants are installed throughout the plant area. Water supply is by means a dedicated plant fire pump installation.

b) Personalized Detectors / Early Warning Systems.
Gas Detection Instruments

- Type: Dräger
- Quantity: 3

c) Procedures for Personal Issue of Detectors / Early Warning Systems.

- Personal detectors are issued to personnel when working in the cyanide dosing area.

d) Procedures to Ensure Effective Alarm Setting Levels.

- These units are set as per legal requirement by the O.E.M / Technician personnel in accordance with the OEM specifications and procedures.

e) Frequencies of Maintenance, Calibration & Testing Procedures.
Maintenance and Calibration:

- Maintenance and calibration for all monitoring and early warning systems are done according to the procedure as per OEM specifications. This is done by OEM on a 6 monthly basis and calibration certificates are kept in Technician Supervisor offices.

Testing Procedures:

- Testing for all monitoring and early warning systems are done according to the procedure as per OEM specifications. This is done by the OEM on a 6 monthly basis and calibration/test certificates kept in Technician Supervisor offices.
- Personal detectors / early warning devices:
  - Bump tests are done according to the procedure as per OEM specifications
  - Each designated user of a Personal detector / early warning device is responsible to check and verify that the instrument is operating effectively before proceeding in confined spaces. History stored on unit are downloaded once per month and kept in Technician Supervisor office.
- Fixed Installations:
  - Testing for all monitoring and early warning systems are done according to the procedure as per OEM specifications. This is done by the OEM on a 6-month basis and calibration/test certificates kept in Technician Supervisor offices.

8.1.1.3 GENERAL SURFACE AREAS.

- Detection: Visual
- Area specific Fire / Emergency alarms are installed in surface buildings. These units are either electronic or manually operated

8.1.2 COMMUNICATION SYSTEMS.

a) Emergency Communication Systems.

Underground

Types & Location:

- Two-way radios: Two-way radios are utilized as a means of communication and will be utilized as a means of warning to persons. These are installed in mobile machinery and are issued to certain personnel.
- Telephones are installed at the following locations:
  - All shaft stations
  - All refuge bays
  - Sub-stations
  - Pump stations
  - Crushers
  - Tips
  - Conveyor Belts
  - Workshops
  - 45 level office complex

Back-up systems:

- In the event of a total power failure.
  - UPS at Shaft for telephone system.
  - Portable generators: should the UPS fail / battery life run out.
  - Generator at the BMM Clinic.
  - 3 x mobile satellite telephones (at times utilized by the Exploration team should emergency communication be required)
- Barking dog telephones and telephone wire (lifeline) are kept in the Proto room as part of the emergency equipment.
- 2 x 3-Megawatt Diesel driven generators are installed on surface which will be used in the event of an extended total power failure to power one Main Surface Fan and the Man Winder.

Plant.

Types & Location:

- Localized Alarm system and shouting are utilized as warning method(s) in case of emergencies.
- Two-way radios are utilized as a means of communication and will be utilized as a means of warning to persons. Operators, artisans and supervisors are issued with two-way radios.
- Telephones are also utilized as a means of communication and will be utilized as a means of warning to persons in the Plant. Telephones are installed at the following locations:
  - Control room.
  - Offices.

General Surface Areas.

Types & Location:

- Localized Alarm systems, handheld alarms and shouting are utilized as warning method(s) in case of emergencies.
- Two-way radios are utilized as a means of communication and will be utilized as a means of warning to persons. Certain mine personnel are issued with radios.
- Warning to persons. Telephones are installed in most offices across the mine.

b) Communications from the Mine to Outside Parties.

- Telkom telephones and cell phones will be utilized to communicate with outside parties in the event of an emergency.
- 3 x mobile satellite telephones (at times utilized by the Exploration team should emergency communication be required)

c) Testing of the Communication System.

Testing of the communication systems are done as follows to ensure effective communication during an emergency:

- Radios and telephones are used daily. Any defect is reported immediately for rectification.
- Back-up power supply: UPS & generator is tested on a weekly basis and recorded accordingly.

8.1.3 EMERGENCY MEDICAL CARE.

The following Emergency Medical Care facilities are available at Black Mountain (for additional information also refer to the Black Mountain “Emergency Medical Response” Procedure BMM-HSE-VOH-SOP-098):

a) Black Mountain (BMM) Clinic.

- **Location:**
  - Aggeneys town (approximately 7 km from Deeps shaft and plant).
- **Medical Personnel:**
  - Occupational Medical Practitioner (OMP) – on site during office hours, on standby after hours (alternate with GMP).
  - General Medical Practitioner – on site during office hours, on standby after hours (alternate with OMP).
  - General Medical staff – on site during office hours, 24 hour manned emergency center.
- **Emergency Medical Equipment.**
  - Clinic equipment – Advanced Life Support Medical equipment
  - Equipped Ambulance
- **Response Times.**
  - Deeps Shaft: 10 minutes
  - Plant area: 10 minutes
  - Swartberg: 20 minutes

b) Resuscitation Room.

- **Location:**
  - Deeps Shaft (surface)
- **Medical Personnel (2 teams on a four-week cycle):**
  - 1 x Advanced Life Support Paramedic (ALS) – on site during office hours, on standby after hours.
  - 2 x Basic Life Support Paramedic (BLS) – the BLS’s are on a 12-hour shift rotation resulting in 24 hour site coverage.
- **Emergency Medical Equipment:**
  - Resuscitation Room– Advanced Life Support Medical equipment.
  - Equipped emergency Medical Response Vehicle (ALS response vehicle)
  - Equipped Ambulance(s)
- **Response Times:**

  - Deeps Section: Immediate by the BLS Paramedic
  - Swartberg Section: 15 minutes.
  - Concentrator Plant: 5 minutes.

c) Plant Medical Bays.

- **Location:**
  - Behind Milling Plant.
  - Cyanide Plant.
- **Medical Personnel:**
  - First response will be trained First aiders employed in the Plant area.
  - Paramedics and (if necessary) BMM Clinic personnel will be called to site as required.
- **Emergency Medical Equipment:**
  - First aid equipment (and Oxygen) – At demarcated areas in plant.
  - Medication for Cyanide Poisoning
  - Diphoterine for chemical exposure/splashes
- **Response Times:**
  - In the event of a medical emergency the plant and mining personnel trained in first aid will be the first response.
  - Paramedic and (if necessary) BMM Clinic personnel response times as set out in sections above.

d) Additional Emergency Medical Equipment.

In addition to the above facilities and equipment, the following is also available:

- First aid equipment is situated as follows:
  - Deeps underground workings: In all Refuge bays, at shaft station areas, workshops and near entrances to stopes.
  - Swartberg underground workings: In all Refuge bays, workshops and near entrances to stopes.
  - Plant: Control Room, SO_2 Plant and Plant Workshops.
  - General Surface Areas: Stores, workshop areas, offices and at contractor facilities.
- In addition, should the need arise emergency medical services from Gamsberg operation will also be utilized.

e) Medical Evacuation.

- Evacuation of injured persons from underground will be as follows:
  - Deeps section: to the appropriate shaft station, and then with the man cage to surface. If circumstances do not permit the use of Deeps shaft, the Main decline will be utilized using vehicles.
  - Swartberg section: via the decline to surface using vehicles. If the decline cannot be unitized, a series of ventilation raise bore holes by means of rope rescue & the ventilation shafts will be used by the Proto Team.
  - Injured personnel will be transferred to an ambulance once transported to surface.

8.1.4 MINE EVACUATION & ESCAPE PROCEDURES.

a) Escape and/or Rescue Procedures.

Each working area (surface and underground) is supplied with its own Escape Route Plan outlining the general escape route in case of emergencies. However, the location and prevailing circumstances of the emergency must be taken into account to determine the appropriate escape route to a place of safety.

Underground: Single and Multi-Entry Workings.

- Single entry workings are generally limited to development ends and sill drives. Should normal escape routes from these workings be blocked:
  - First option – if safe, remove blockage. The system of removal will depend on the type of blockage (fall of ground, equipment, etc).
  - Second option – if a raise bore machine is available on-site, it can be mobilized to drill an escape hole to the area; the proto team(s) will then be utilized through rope rescue to extract personnel.
- Evacuation of persons from underground will be as follows, depending on circumstances and type of emergency:
  - Deeps
    - Via the Main decline to the appropriate shaft station, and then with the man cage to surface.
    - If circumstances do not permit the use of Deeps shaft, the Main decline will be utilized using vehicles.
    - Escape drills are done quarterly for underground areas.
  - Swartberg
    - Via the Swartberg decline using vehicles
    - If circumstances do not permit the use of the decline, through various raise bore holes using rope rescue and the ventilation shafts by the Proto.
    - Escape drills are done quarterly for underground areas.

Plant:

- Elevated workplaces in the plant normally have a number of escape routes (stairways).
- Escape drills done as per plant schedule – each area is covered at least twice per annum.
- Confined Spaces: All work in such areas is done in accordance with the "Black Mountain Procedure for Confined Spaces"
- Elevated places – All work in such areas is done in accordance with the "Black Mountain Safe Operating Procedures"
- Structural collapses – each situation will be assessed on own merit, but should the need arise the BMM Proto team trained in rope rescue can be utilized as part of the rescue team. In addition, "Jaws of Life" equipment can also be utilized should the need arise

General Surface Areas.

- Escape plans for each area / building are displayed on notice boards
- Escape routes are demarcated with the appropriate symbolic signs
- Emergency assembly points are demarcated for each area
- Structural collapses – each situation will be assessed on own merit, but should the need arise the BMM Proto team trained in rope rescue can be utilized as part of the rescue team. In addition, "Jaws of Life" equipment can also be utilized should the need arise

b) Provision of Places of Safety.
Underground.
Refuge Bays:

- Refuge Bays are sited, established and equipped in accordance with SOP 059 and SS 0017.
- Self-Contained Self-Rescuers (SCSR) are in use on the mine; the Chamber of Mines Research Organization (COMRO) document - 'Resqpacs: How to calculate safe traveling distances' – is consulted in calculating safe traveling distances to Refuge bays.

Places of Safety:
Fresh air intake airways can be utilized as places of safety in the case of persons not being able to access refuge bays. This includes:

- Broken Hill Shaft
- Deeps Shaft:
  - 34 level
  - 40 level
  - 45 level
  - 50 level
  - 51 level
- Swartberg:
  - Surface via decline.
  - 754 level (additional intake/downcast shaft)
- Force Ventilated / Development ends:
  - In emergencies where refuge bays or the shaft areas cannot be accessed, development ends (force ventilated ends) can be utilized as places of safety, permitted that it is not through ventilated and equipped with a sustainable supply of compressed air (with all auxiliary fans in the development end switched off)

Plant & General Surface Areas.

- Emergency assembly points are situated as and where required.
- All “Emergency Assembly Points” are demarcated with the appropriate symbolic signs.

8.1.5 TRAINING & AWARENESS.

a) Emergency Training – Content & Frequency (Section 10(2)(d) of MHSA).

i) Induction / Annual Refresher Training.

- Induction Training is utilized as a means to train people in the general requirements for escape in case of emergencies. Annual refresher training is done for all persons.
- Training in the use of self-rescuers is done during initial / annual refresher induction. Refresher training is conducted on a six-monthly basis.

ii) Escape Route Drills & Emergency Simulations - Underground.

- Escape route drills for all areas is done on a quarterly basis. Records of such training are kept.
- New / transferred employees – Escape route training will be done as part of the site induction for new / transferred employees, but not exceeding seven (7) days of the person starting in an area. Records of such training will be kept.
- Emergency Simulations will be done bi-annual to test Emergency Preparedness and Response capabilities. Records of such simulations will be kept.

iii) Plant.

- Escape drills / simulation done as per plant schedule – each area is covered at least twice per annum. Records of such training will be kept.
- New/transferred employees – Escape route drills will be done as part of the site induction for new/transferred employees but not exceeding seven (7) days of a person starting in an area. Records of such training are kept.

iv) General Surface Areas.

- Escape route drills for all areas is done as per surface schedule – each area is covered at least twice per annum. Records of such training are kept.
- New / transferred employees – Escape route drills will be done as part of the site induction for new/transferred personnel but not exceeding seven (7) days of a person starting in an area. Records of such training will be kept.
- Emergency Simulations will be done bi-annually to test Emergency Preparedness and Response capabilities. Records of such simulations will be kept.

b) Procedures & Appropriate Action to be taken during emergencies, including simulation exercises.

- Induction Training is utilized as a means to train people in the general requirements for escape in case of emergencies. Annual refresher training is done for all persons.
- Training in the use of self-rescuers is done during initial / annual refresher induction. Training units are used for this purpose. Refresher training is conducted on a six-monthly basis.
- Emergency situations are also simulated as part of training.

c) Emergency Equipment Procedures & Applications.

- Personnel are trained in the use of emergency equipment relevant to them
- Training is as per OEM specifications
- Advanced training for specialized Response personnel, for example Proto and Surface Fire Teams, are conducted through accredited service providers.

d) Location and Description of Shutdown Controls / Lock-out devices.

- Deeps section:
  - Electrical power can be locked out at the Deeps and Broken Hill main sub stations
  - Water can be shut down on surface at the valve at the Deeps and Broken Hill shafts

- Swartberg section:
  - Electrical power can be locked out at the Swartberg main substation.
  - Water can be shut down on surface at the valve at the Swartberg decline entrance

- Plant.
  - Electrical power can be locked out at the MCC
  - Water can be shut down at the main feed valve feeding from the dam area

e) Instruction in the use of Self-Contained Self-Rescuers (SCSR).

The OEM or their Approved Authority are utilized to train "On-site Trainers" in the use of SCSR's, with refresher training of these trainers taking place on an annual basis.
Training of employees / visitors is done by these "on-site trainers" and records are kept of such training.

- Permanent underground employees:
  - Initial and annual induction (return from leave)
  - Every six (6) months at the Deeps lamp room
  - In the event of any change to equipment specification
- Visitors:
  - Before proceeding underground

f) Locality of copies of the Emergency Procedures and Instructions.
Updated versions of Procedures and Instructions are kept electronically on the BMM Intranet – all printed copies are regarded as uncontrolled copies.

8.2 EMERGENCY RESPONSE MEASURES.

8.2.1 RESCUE & RESPONSE CAPABILITIES.

a) Rescue & Response Capabilities.
Due to the remoteness of the mine, Black Mountain will endeavor to maintain two fully trained and equipped proto teams at all times (Please note: this may not always be possible due to the non-retention of people).

b) Mines Rescue Service Provider.
Black Mountain is in contract with the Mine's Rescue Services (Welkom branch) as required by the Mine Health & Safety Act (Act 29 of 1996), Regulation 16.5(1)(c).

c) Additional Instruments & Equipment to maintain rescue brigades.
Any additional instruments or equipment as specified from time to time by MRS were acquired (means to detect carbon monoxide, carbon dioxide, flammable gas and oxygen) to maintain the rescue and response capabilities of the proto teams.

8.2.2 MANAGEMENT OF EMERGENCIES.

a) Updating of Emergency Manuals.
Emergency manuals will be reviewed and updated as follows:
After every emergency, altered circumstances, or if significant changes are introduced to procedures, mining and ventilation layouts, mining methods, plant or equipment and material. The periodic review will not exceed a period of three (3) years.

b) Contacts of Neighboring Mines.
A contacts list for neighboring mines is kept in the emergency control room in conjunction with "BMF 034 Emergency Call-out List".

c) Contacts of Emergency Services.
An updated contacts list for Emergency Services is kept in the emergency control room. This includes MRS, emergency medical personnel and emergency services. The BMM standby roster is also utilized and updated on a weekly basis.

d) Internal and External Telephone Directory.
Updated / current internal and external telephone directories are also kept in the emergency control center.

e) Emergency Control Centre.
i) Plant.
All emergencies controlled initially via Deeps control room. However, should the need arise, an emergency control room will be established at the Plant to deal with Plant specific emergencies. A dedicated emergency control telephone line has been established in the Plant for this purpose –telephone number 9988

ii) Underground.

Initially Emergencies will be controlled from the Deeps control room, but depending on the circumstances, extend and duration of the emergency, be moved to the Deeps emergency control room (ECR):

- The ECR is established at the Deeps shaft area.
- Its size is approximately 16m² (4 x 4 m).
- The ECR is equipped as follows: adequate table space for plans, but with limited seating; a small locked stationary cupboard stocked with the necessary stationary; a rescue team control board.
- Mine "Ventilation & Rescue Plans", which are updated on a three-monthly basis.
- Telephones & Communication: fixed Telkom / intercom telephones and radio are installed in the emergency control room.

f) Duties & Responsibilities during an Emergency.

- Duties and responsibilities of all relevant personnel are as per the "Duties & Responsibilities in the Emergency Control Room" documents.
- An Emergency Management Plan have also been compiled and includes: Incident, Emergency and Crises Management – Reference VOH-SOP-002A Emergency Management Plan.
- To support the process, an Emergency Flow Chart has been compiled to assist in the management of emergencies.

g) Procedures to deal with adverse environmental conditions.

Please consult the below documents for more detail with regards to emergency procedures pertaining to:

- COP 004: Thermal Stress
- COP 006 Airborne Pollutants
- COP 007 Prevention of Flammable Gas Exposions
- BMM Emergency Preparedness Procedure – BMM-VOH-SOP-
- Duties & Responsibilities in the Emergency Control Room

8.3 REPORTING & RECORDING.

a) Inspection, Testing & Maintenance of Emergency equipment.

Intervals will be as per OEM Specifications by the relevant and trained Responsible person(s).

b) Reporting, Recording & Archiving System.

- The responsible Line management will keep records of all relevant training, emergency drills and emergency simulations for his / her area of responsibility for a minimum period of two (2) years.
- The Training Department will keep records of all training related to emergency preparedness and response given to employees on the employee's personal training record.

8.4 EMERGENCY ASPECTS ADDRESSED IN OTHER MANDATORY COP's & RELATED DOCUMENTS.

Certain emergency aspects that have an influence on this COP are addressed in the following COP's, SOP's and related documentation:

- VOH-COP 001: Lamp rooms
- VOH-SOP 001A: Lamp rooms
- VOH-COP 004: Thermal Stress
- VOH-COP 006 Airborne Pollutants

- VOH-COP 007: Prevention of Flammable Gas Explosions in Mines Other than Coal Mines
- VOH-COP 010: Prevention of Fires
- VOH-COP 011 Management of Self-Contained Self-Rescuers
- COP 008: Cyanide Management
-
- HSE-VOH-SOP-002A Emergency & Crisis Management V3
- VOH-BMF 001A Emergency Management Duties & Flow Chart
- SOP 002: Emergency procedures to deal with adverse environmental conditions
- SOP 098 Medical Emergency Response (& Medical Evacuation Response Plan)
- VOH-BMF 034: Emergency Call-Out Procedure
- Related Risk Assessments

PART D: IMPLEMENTATION.

1. IMPLEMENTATION PLAN.

1.1 The implementation plan for this COP covers the following: Organizational structures, responsibilities of functionaries and programs and schedules for the COP that will enable proper implementation of the COP

1.1.1 The overall programme on emergency preparedness & response is an integrated approach that requires planning, co-ordination and co-operation between various departments.
The main focus is placed on the prevention of emergencies in the workplace and provide the necessary assurance on the success of the control programme. Emphasis is therefore placed on the maintenance of standards and design specifications on equipment and processes used in the mining and concentrating processes.

a) Risk Assessment

- Risk assessments for emergency scenarios, including fires, have been conducted and taken into account relevant information from creditable sources.

b) Continuous Risk Assessment

- The risk profiles mentioned above will be reviewed on the basis of information gathered through the programme for continuous risk assessment

c) Functions & Responsibilities

- The functions and responsibilities of departments, committees and disciplines are depicted below:

➢ **Mine Management**

The owners of the mine must take responsibility for health and safety in terms of the Act. However, the management of that responsibility is delegated to Mine Management. The Act also requires that a health and safety committee, represented by Management and Employees, be established for consultation on health and safety issues.
Other responsibilities relating to the emergency preparedness & response include:

- The compilation and implementation of the mine’s health and safety policy.
- Approval of specific procedures and standards.
- The delegation of responsibilities.

➢ **VOH Department**

The main function of this department with regards to emergency preparedness & response is the planning, co-ordination and control. In that respect it is important that all departments involved in emergency preparedness & response be represented on the health and safety committee. Specific duties include:

- Assessment of standards for compliance. Those standards include international benchmarks, local regulatory standards or mine standards (procurement, monitoring, etc.).
- Review of the applicable standards and, on that basis, recommend to management the actions that may be taken.

- Ensuring compliance with policy decisions.

➢ **Safety Department**
From a safety perspective the responsibilities include:
- Audits and reporting of non-conformances.

➢ **Line Management**
The main function of Line Management is to create a culture of prevention of emergency situations by:
- Inclusion of emergency preparedness & response in their normal competency training programme.
- The implementation and maintenance of control engineering procedures and systems.
- Competencies on the implementation of the training in the workplace must be audited/verified by the Training Department.

➢ **Training**
The Training Department is responsible for:
- The induction and refresher training of employees in the first instance and also to report, for review purposes, on training statistics.

➢ **Supply Chain**
The contribution of the Supply Chain is to:
- Implement the mine specifications (developed in consultation with the hygiene discipline) in the tendering and purchasing process.
- Ensure the necessary documentation with regards to the risk assessments are obtained from the OEM, Supplier or Importer of equipment.
- Administer the specifications and standards information and the purchasing of equipment and protection.
- Report, for review purposes, on procurement statistics.

➢ **Original Equipment Manufacturers (OEM's), Suppliers & Importers**
Local legislation imposes "duty of care" responsibilities on the manufacturers of machinery and equipment. Accordingly, it is incumbent upon manufacturers to assess the potential risks imposed on users of their products:
- It should be noted that, if a hazard is associated with equipment supplied to mines that could lead to an emergency, the supplier can only relinquish his responsibility with regard to these risks if these characteristics of the equipment are specified, the necessary precautions are stipulated and the mine management has accepted, in writing, the responsibility of implementing those precautionary measures.
- Therefore, equipment can only be accepted after the relevant documentation of acceptance has been duly completed.

1.2 Graphical representations are / will be utilized to facilitate easy interpretation of data and to highlight trends.

2. COMPLIANCE WITH THE COP.

Measures to ensure compliance is instituted through auditing from first, second- and third-party auditors.

3. ACCESS TO THE COP & RELATED DOCUMENTS.

3.1 A complete electronic COP, with related documents, is kept readily available at the mine for examination by any affected person. Hard copies, when printed, are treated as uncontrolled copies. Line supervisors and management have direct access to these electronic copies and can distribute it to affected employees when required. On written request to the Manager, any other affected person will be supplied with copies. A register will be kept of such persons or institutions to facilitate updating.

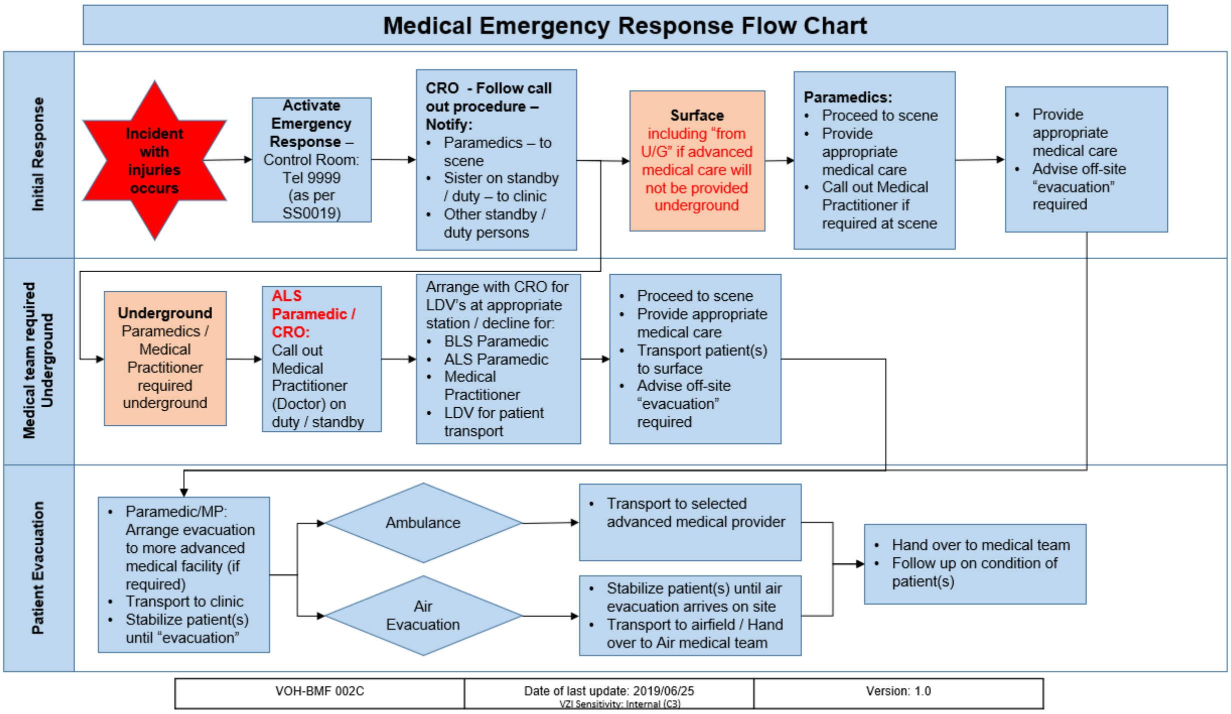
3.2 The registered Trade Unions and Full Time Health and Safety Representative will be supplied with copies of this COP on written request to the Manager. A register will be kept of such persons or institutions to facilitate updating.

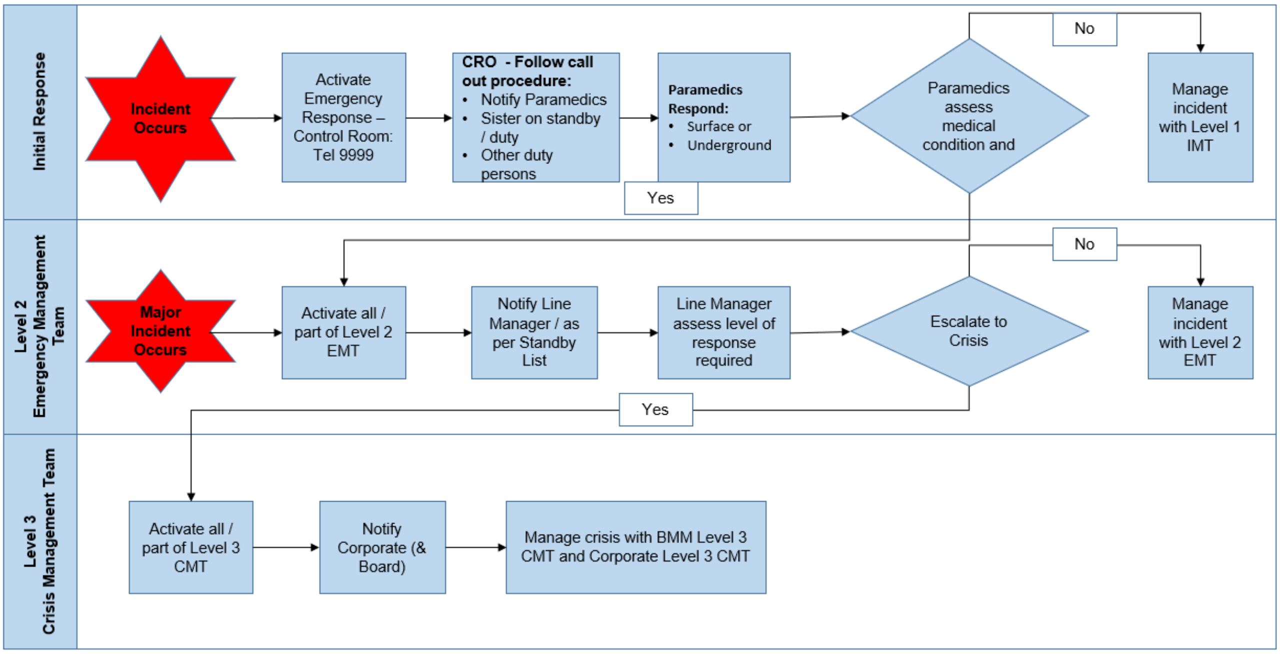
3.3 The employer will ensure that all employees are fully conversant with those sections of this COP relevant to their respective areas of responsibility.

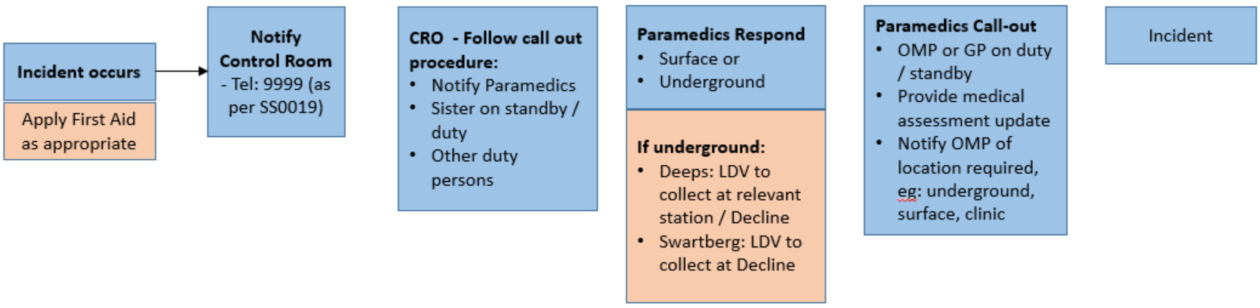
4. Distribution and Access

- The latest revision of this document is available as a read only on the document on the Intranet. The Compliance Officer shall maintain an authorised hard copy of this policy/procedure in the relevant location.
- Line Managers, who have staff reporting to them that do not have access to the Intranet, shall ensure that these personnel are adequately guided and informed.

Annexure A


Medical Emergency Response Flow Chart
Initial Response
Incident with injuries occurs
Activate Emergency Response – Control Room: Tel 9999 (as per SS0019)
CRO - Follow call out procedure – Notify:
• Paramedics – to scene
• Sister on standby / duty – to clinic
• Other standby / duty persons
Surface including "from U/G" if advanced medical care will not be provided underground
Paramedics:
• Proceed to scene
• Provide appropriate medical care
• Call out Medical Practitioner if required at scene
• Provide appropriate medical care
• Advise off-site "evacuation" required
Medical team required Underground
Underground Paramedics / Medical Practitioner required underground
ALS Paramedic / CRO: Call out Medical Practitioner (Doctor) on duty / standby
Arrange with CRO for LDV's at appropriate station / decline for:
• BLS Paramedic
• ALS Paramedic
• Medical Practitioner
• LDV for patient transport
• Proceed to scene
• Provide appropriate medical care
• Transport patient(s) to surface
• Advise off-site "evacuation" required
Patient Evacuation
• Paramedic/MP: Arrange evacuation to more advanced medical facility (if required)
• Transport to clinic
• Stabilize patient(s) until "evacuation"
Ambulance
Air Evacuation
• Transport to selected advanced medical provider
• Stabilize patient(s) until air evacuation arrives on site
• Transport to airfield / Hand over to Air medical team
• Hand over to medical team
• Follow up on condition of patient(s)
VOH-BMF 002C
Date of last update: 2019/06/25
Version: 1.0





- CRO: Control Room Operator
- OMP: Occupational Medical Practitioner
- GP: General Medical Practitioner