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1. TITLE PAGE



COP : Code of Practice

Emergency Preparedness and Response

Moab Khotsong

MANDATORY CODE OF PRACTICE FOR EMERGENCY PREPAREDNESS AND RESPONSE

This Code of Practice was drawn up in accordance with Guideline DMR 16/3/2/1-A5 issued by the Chief Inspector of Mines on 31 January 2011

DMR Mine Code number: 11942

Moab Khotsong Reference Number: MA_COP_GEN_013

Effective Date: 31 January 2011

DMR Date First Issued: 31 January 2011

Next Review Date: November 2024

Revision Date:

- Initial - November 2011
- 1st - November 2013
- 2nd - June 2014
- 3rd - November 2014
- 4th - September 2016
- 5th - September 2017
- 6th - February 2018
- 7th - July 2019
- 8th - September 2020
- 9th - November 2021

General Manager Section 4(1) Appointee	Mine Manager Section 3(1) Appointee	Senior Engineer 2.13.1 Appointee	H&S Committee Representative
Date: 14/12/2021	Date: 14/12/21	Date: 14/12/21	Date: 14/12/2021

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3 STATUS OF MANDATORY CODE OF PRACTICE



- 3.1 This mandatory COP was drawn up in accordance with Guideline DMR Reference Number 16/3/2/1 – A5 issued by the Chief Inspector of Mines on 31 January 2011.
- 3.2 This is a Mandatory Code of Practice in terms of Sections 9(2) and (3) of the Mine Health and Safety Act, 1996 (Act 29 of 1996).
- 3.3 The Code of Practice may be used in an accident investigation / inquiry to ascertain compliance and also to establish whether the Code of Practice is effective and fit for purpose.
- 3.4 The Code of Practice supersedes all previous relevant Code of Practices.
- 3.5 All managerial instructions, recommended procedures (voluntary COPs) and standards on the relevant topics must comply with this Code of Practice and must be reviewed every two years to ensure compliance and if any changes are required after incidents/accidents.

4 MEMBERS OF THE DRAFTING COMMITTEE

- 4.1 In terms of section 9(4) of the Mine Health and Safety Act, the Employer consulted with the Health and Safety Committee on the preparation, implementation and / or revision of this Code of Practice.
- 4.2 The Health and Safety Committee were consulted during the revision of this Code of Practice. After consultation, this Code of Practise was reviewed by the Health and Safety Committee.

4.2.1 Consultation Committee

The table below lists the Consultation Committee who were consulted in reviewing this COP







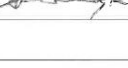



ATTENDANCE REGISTER

NAME OF MEETING: Emergency Preparedness COP Consultation - Review

DATE: 01/12/2021

VENUE: MM Boardroom

Name	Industry Number	Designation	Email	Signature
C SOMERS	P5796886	RISK OFFICER	-	
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4.3 Drafting Committee

The table below lists the Initial Drafting Committee of this COP

Full Name	Designation	Affiliation/s	Experience
Lourens Smit	Occupational Environment Safety and Health Manager	Moab Khotsong and Great Nologwa Mine	Mine Environmental Control Certificate
Hannes Potgieter	Occupational Environment Manager	Kopanang Mine	Mine Environmental Control Certificate
F van der Walt	Occupational Environment Manager	Moab Khotsong and Great Nologwa Mine	Mine Environmental Control Certificate
T. Webb	Snr. Occupational Environment Officer	Mponeng Mine	Mine Environmental Control Certificate
MG Beukes	Manager Occupational Environment	Harmony, SA Region	Mine Environmental Control Certificate
Dries Labuschagne	Occupational Environment Manager	Harmony, SA Region	Mine Environmental Control Certificate
D Wilken	Engineer	Moab Khotsong Mine	Electrical

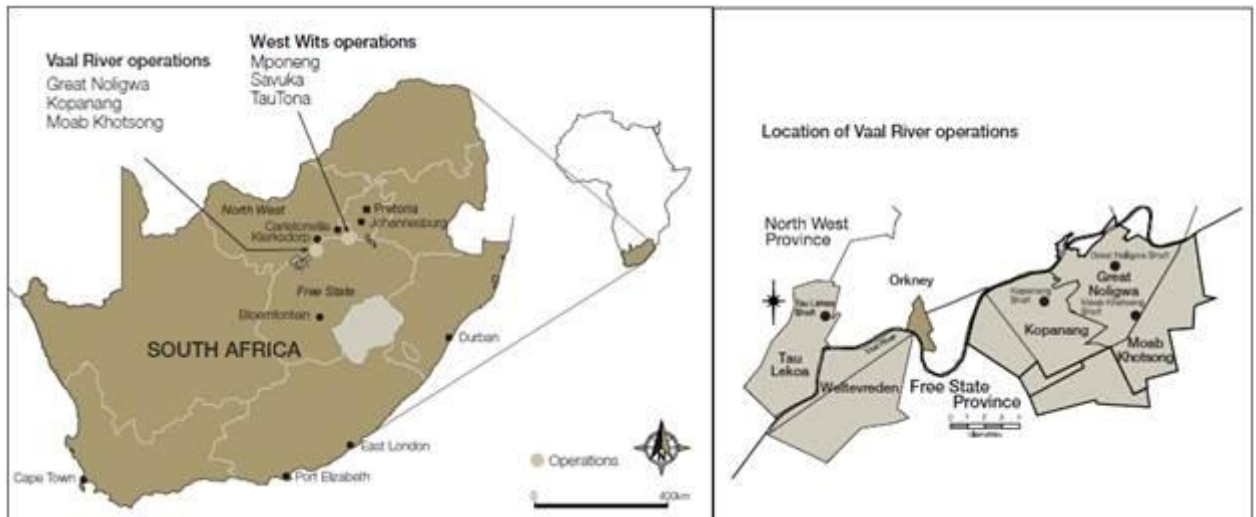
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5 GENERAL INFORMATION

5.1 Locality

Moab Khotsong Gold mine is located on the farms Goldenvaal 562, Kleinfontein 369 and Zaaiplaats 190, just south of the Vaal river, which forms a natural boundary between South Africa's North West and Free State provinces. The mine is located roughly 12km south-east of Orkney, a small mining town located 170km south-west of Johannesburg.

Figure 1 Depict the location of the various operations in South Africa



Moab Khotsong mine is one of the key Harmony Gold Mine business units situated within the Vaal River region. The mine is bounded by the farm Goldenvaal 562 (towards the East), The Die Hoek fault to the North and the Buffels East fault to the South. Both the Die Hoek (40° - 45°) and Buffels East faults (55°) are major South dipping normal faults with vertical displacements in excess of 600m.

Following the successful exploration of the Vaal Reef in the Moab lease area, which lies to the south and is contiguous with Great Nologwa's lease area, a decision was taken in late 1989 to exploit the Moab mineral resource, after which shaft sinking started in 1991 followed by stoping operations in November 2003.

Currently Harmony holds the rights to exploit two distinct portions of the Moab Lease area, namely the Middle Mine (85 Level to 101 Level) and the Lower Mine (101 Level to 118 Level). At the end of June 2008, the SV4 section of Great Nologwa Mine was incorporated into Moab Khotsong and this section is now termed the Top Mine. Figure 1.2 is an illustration of the spatial relationship between the Moab Top, Moab middle (focus area of project) and Moab lower mines.

The Middle Mine comprises of a main shaft system and a sub vertical shaft system which are utilized to exploit the Vaal Reef to depths between -2 600m and -3 054m below surface on the downthrown side of the Die Hoek and Jersey fault complex. Exploration drilling and development is currently underway on the lower Mine (Zaaiplaats). The project will exploit the reef to depths of -3 455m below collar.

Harmony is a gold mining and exploration company which conducts its activities in South Africa, one of the world's best-known gold mining regions, and in Papua New Guinea, one of the world's premier new gold-copper regions. With 68 years of experience, Harmony is South Africa's second largest gold producer.

There are currently nine underground operations in South Africa that is located within the world-renowned Witwatersrand Basin. One in the Klerksdorp goldfields, two in the West Rand and six in the Free State, that is located in the southern portion of the Basin.

In addition, there is an open-pit mine on the Kraaipan Greenstone Belt (Kalgold) as well as several surface treatment operations

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Top Mine uses a twin shaft system and operates over eight main production levels at an average depth of 2400m. Due to the intermediate to deep level mining depths, no incidents of surface subsidence or related damage to surface infrastructure has ever been recorded.

Due to the considerable mining depth, surface features do not influence the strategies adopted for extraction in the underground workings.

Project Zaaiplaats is the lower mining area of Moab Khotsong Mine and is situated directly beneath the farm Zaaiplaats. This project aims to optimally extract the deeper portion of the orebody, focusing on the main, higher-value portion. The aim is to create as continuous a mine as possible. The project will exploit the Vaal Reef to depths of -3455 metres below collar. The development phase of the project is currently ongoing.

5.2 Commodities Produced

Moab Khotsong Mine is a Gold Mine and produces Uranium as a by-product.

5.3 Mining Methods

Moab Khotsong Mine was established to exploit the Vaal Reef to the east and south east of Moab Khotsong and Kopanang Mines on the down throw side of the Die Hoek/Jersey Fault complex. The two inter-levels (88 and 92 Level) between 85 and 95 Level are 100m below and above 85 and 95 levels respectively. 95 and 101 Levels are 150m apart with a single inter-level (98 Level) positioned midway between the two. 85 Level is the top production level of the Middle Mine (-2,604m below collar) with 101 Level being the middle mines lowest production level (- 3,054m below collar).

A scattered mining approach has been planned as a result of the known geological complexity of the Vaal Reef ore body in the adjacent mining lease areas at Kopanang and Moab Khotsong Mines. Haulages, crosscuts and raises will all be pre-developed on a grid system. Raises are spaced 200m apart.

Production is undertaken by traditional drill, blast, and scrape systems in the 0.9m to 2.5m Vaal Reef formation. Mining systems include use of traditional stoping with panels that share a common centre gully and winze. About 1m of the reef is drilled and blasted for a face length of about 25m. Immediate support is offered by use of elongates spaced every 1.8m.

The ore is scraped with winches through to the gully and again scraped to the ore passes where it is ready to be transported to the Shaft Orepass.

During 2014 a decision was made to incorporate Great Nologwa with Moab Khotsong Mine. The reefs mined at Great Nologwa Mine are the Vaal Reef and the 'C' reef. Great Nologwa employs a scattered mining strategy often mining small isolated blocks of ground owing to the geological complexity of the orebody. As the orebody is narrow and tabular in nature, the production rate is measured in m² mined, and averages approximately 6000m² per month. Panels are on average 26m long.

The majority of the mining is focused in the FW and FE area that located to the southern portion of the mine, in close proximity to the Moab Khotsong shaft infrastructure. In addition, the mining in this area is focused across two levels namely 64 and 68 level, with 68 level being the bottom level.

Approximately one third of the mining is taking place in the EE area which is approximately halfway from the Nologwa shaft to the FE/ FW areas and to the East of the shaft infrastructure. Scattered vamping operations are being done throughout the mine with a footprint reduction plan to isolate the entire northern portion of the mine during 215.

The following potential emergency situations have been derived on based on our risk assessment processes and headline risks.

1. FOG gravity/ seismic or large scale earthquakes
2. Vertical Transport (damage to shaft/s, infrastructure or equipment falling down shaft)
3. Flammable gas intersections or ignitions/ water intersections
4. Flooding, inundation or mud-rush

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5. Power Failures (total or partial)
6. Surface or underground fires
7. Bomb threats and riots
8. Chemical spills /refrigeration gas leaks

In accordance with the OHSAS 18001 system all emergency response situations should be reviewed and tested for adequacy.

Attached as **Appendix 5** find a schedule for emergency drills to be conducted.

5.4 Mine Features

The mine is ventilated by three centrifugal surface exhaust fans with a total mass flow of 250 kg/s each. Additional underground auxiliary booster fans are utilised to direct the underground ventilation flow.

The mine is equipped with only one shaft that is linked from surface to shaft bottom. A secondary sub-shaft was sunk from 73 level downwards to 100 level. Due to there being only one egress point to surface the escape routes on 70 and 73 level to Great Nologwa is maintained and in use on a daily basis.

During 2014 a decision was made to incorporate Great Nologwa Mine into Moab Khotsong Mine. The end result will see the shaft infrastructure at Great Nologwa Mine go on care and maintenance while the ore, men and material will be moved to Moab Khotsong Mine.

Infrastructure such as refrigeration plants and booster fans on surface and underground are still being utilized and maintained from Great Nologwa.

6 TERMS AND DEFINITIONS

COP	Code of Practice
Emergency	Means 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 evacuation, rescue or recovery of persons, to prevent serious injury or harm, or further serious injury or harm to persons.
DMRE	Department of Mineral Resources and Energy
MHSA	Mine Health and Safety Act, 1996 (Act No. 29 of 1996)
Place of safety	Means any place, which, despite an emergency, can sustain life for the duration of the emergency and is adequate in size to accommodate the maximum amount of 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 surface of the Mine, which contains no combustible material or in which all combustible material in quantities sufficient to endanger or likely to endanger the safety of somebody is conveyed during the working shift; A refuge bay as contemplated in Annexure I, which is attached for information purposes.
FOG	Fall of Ground
OHSAS 18001	Internationally recognised Safety Management System to which Harmony Gold Mining Company conforms to
ISO14001	Internationally recognised Environmental Management System to which Harmony Gold Mining Company conforms to
RCCR	Risk Critical Control Register

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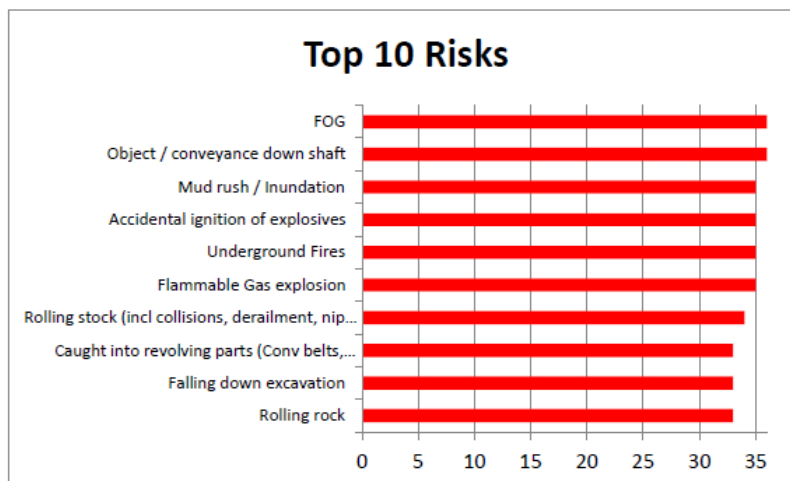
TARP	Trigger Action Response Plan
COVID-19	A potentially severe respiratory illness caused by a coronavirus and characterized by fever, coughing, and shortness of breath.
OE	Occupational Environment
CIC	Control, Instrumentation and Communication
Co	Carbon Monoxide
Co2	Carbon Dioxide
Ch4	Flammable gas (Methane Gas)
Emergency Care	All immediate and appropriate medical care required by any persons injured or experiencing any medical emergency at the mine, ranging from basic first aid to the most advanced emergency medical care
EMS	Emergency Medical Services
FA	Functional Assessment
H2	Flammable Gas (Hydrogen Gas)
Health Care Facility	A hospital, medical clinic or doctors surgery that has the capability of providing emergency medical care
NH3	Ammonia Gas
GDI	Gas Detecting Instrument used to test and detect flammable gases (Early warning system)
LIB Drilling	Long Incline Bore hole – method of exploration drilling deployed by Geologist as the machine can drill extended distances
OEM	Original Equipment Manufacturer
ASHAS	Automatic Seismic Hazard Assessment System
SREO	Senior Rock Engineering Officer
MHSC	Mine Health & Safety Committee
ER24	Emergency Medical service employed by the mine for emergency situations.
HR	Human Resources
FGMI	Flammable Gas Measuring Instrument
RAW	Return Airway
RV Shaft	Rock and Vent Shaft
OH&S	Occupational Health and Safety
SHRIMS	Safety Health and Risk Integrated Management System
BRA	Baseline Risk Assessment
Recovery	All activities intended to return the mine and / or community to normal after the impact of an emergency
Response	Includes all emergency response activities following the impact of an emergency (Including those actions taken immediately prior to impact for an event that has some warning)
Preparedness	Includes those activities concerned with preparing the mine and / or community for emergencies
Prevention	Encompasses all those activities designed to prevent emergencies from occurring, or to mitigate the effects on the mine and / or community

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7 RISK MANAGEMENT

7.1 To identify and mitigate risks on the mine, Moab Khotsong follows the Harmony Risk Management Process which is in line with the requirements of the Act. In line with the aforementioned the mine has conducted a Baseline Risk Assessment that was reviewed during May of 2014. The following Top 10 risks derived from the assessment:

Risk Profiles



7.2 A copy of the aforementioned baseline risk assessment is available on the Harmony Intranet site (Services, HRM, Controlled Documents, Operational Baselines) and at the Legal Department.

In order to determine how the different risks must be dealt with the mine conducts a bow-tie assessment on the identified unwanted risks and other identified headline risks. The intended outcome of the bow-tie analysis is to identify the RCCR (Risk Critical Control register) and TARP (Triggered Action Response Plan)



Relevant Information such as accident statistics, research reports, manufacturer's specifications and approvals were obtained and considered during the Baseline Risk Assessment.

All relevant Information with regards to fire accidents, research reports, ergonomic studies, manufacturer's specifications, approvals, design and performance criteria for all equipment were obtained and used during the Risk Management Process.

7.3 In addition to the two (2) yearly review, the COP will also be reviewed if relevant after every serious incident relating to the topic covered in the COP, or if significant changes are introduced to procedures, processes, process layout, process methods, ventilation layouts, plant equipment and material.

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8 EMERGENCY PREPAREDNESS MEASURES

8.1.1 Detection and Early Warning Systems

8.1.1.1 Fire and Gas Detection

- a. The mine has installed an Environmental Monitoring system, the main function of the system is early detection of any fires, flammable/ noxious gas or smoke.
- b. Fire detector heads or sensors are installed in fixed positions as per the Snr OE Officer Ventilation layouts and approved by the Manager.
- c. All main intake Haulages/ Station areas are equipped with a fire detector head to ensure that the shaft and station areas are covered in the event of any fire in the shaft or surface area close to the shaft.
- d. All Return Airways are equipped with a fire detector head at strategic positions, as determined by the Snr OE Officer and approved by the Manager; these heads serve as back-up detectors.
- e. All working places, stopes and development ends are also equipped with a fire detector heads as far as reasonably practical and in close proximity where practicable. The head is usually installed at the return air side of the working place.
- f. Surface cable tunnels as well as the Refrigeration Plants on surface and underground are equipped with the required detectors dependant on the specific requirement and type required. The ammonia plants on Moab Khotsong mine are equipped with adequate number of ammonia sensors which will provide early warning in the event of any leaks.
- g. Smoke detectors are also used in certain circumstances where required or recommended to do so. All conveyor belt installations on the mine are equipped with fire detection units which can detect large quantities of smoke.
- h. Alarm levels and blast zones are updated and reviewed by the OE Department on a 6-monthly basis or as the need arise after big vent change over affecting the vent flow or emergency strategy for the mine. It is further the Snr OE Officer's responsibility to ensure that the emergency Control room plans as well as the equipment in the control room are kept up to date. The emergency procedures must be updated by the relevant Snr OE Officer and approved by the relevant Section Manager on a 6-monthly basis or as the need arose as explained above.
- i. The Instrumentation department is overall responsible for the installation, maintenance and care of the system. They are furthermore responsible to ensure sufficient equipment is available as well as back-up equipment in the event of an emergency. The Chief Instrument technician will be responsible to ensure monthly inspections are carried out on all fire detector heads. All fire detector heads must be checked and calibrated within a 90-day period. On a daily basis, an exceptional report must be generated which indicate fire heads that was faulty or off line during the previous 24 hours. This must be investigated without delay and brought to the attention of the OE Department.
- j. Hydrogen detector heads are installed in Battery Charging bays in consultation with the Snr OE Officer, Manager and relevant Engineer where required.
- k. Flammable gas detector heads will be installed at active flammable gas sources where required in consultation with the responsible Manager and Snr OE Officer.
- l. On Moab Khotsong Mine the most commonly used detector head are:
 - Co – Carbon Monoxide
 - Co2 – Carbon Dioxide (fire situations)
 - Ch4 - Flammable Gas
 - NH3 – Ammonia
 - H2 - Hydrogen

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- m. As per the Mine`s COP for the prevention of flammable gas explosions specific employees will be issued with a GDI dual gas instrument. The instrument is carried on the person and also provides for early detection and warning of flammable gas and Carbon Monoxide in the general atmosphere. Also, refer to Moab Khotsong flammable gas - MK_COP_GEN_4 and the Procedure on the allocation and use of the Schauenburg Gas Detection Instrument – MKP-SHV 3.23.
- n. The OE Manager will in conjunction with the Senior Engineer and Mine Manager decide on the type of Flammable Gas Warning Device / Measuring Instrument to be issued to persons in the respective job categories. Gas Detection Instrument's (GDI's) may only be issued to employees with valid flammable gas competency certificates.
- o. The following list of persons must have GDI's allocated to them for daily use, and all other persons who are trained in the use thereof must be issued with spare instruments whenever required on an ad hoc basis:
 - OE Officers
 - Union men (Mining) and (Ventilation)
 - Boilermakers
 - Other Artisans e.g. Electrician required to do LPG hot work
 - Competent "A" persons
 - Diamond Drill Crew Leaders – 2 x GDI's
 - LIB Hole Operators – 2 x GDI's Magna type
 - Raise and Blind Boring Operators
 - Outside Contractors - (all persons as above and in similar positions)
 - Surveyors
 - Grade Officers
 - Development Shift Bosses
 - Dedicated Conveyor Belt Attendant (1 belt per level per shift)
 - Dedicated Pump Attendant (1 per pump station per shift)
- p. The name, designation, company number and type of equipment to be issued shall be submitted in writing to the Lamp Room Supervisor by the responsible Mine Overseer, Engineering Foreman or Section Head. The Lamp Room Supervisor will allocate the required instrument to a person and record the instrument number against the employee's company number on the Lamp Room Management System. He will also ensure that the Time and Attendance link is activated as to block the employee from going underground without an instrument or with a faulty instrument.
- q. Prior to proceeding underground, the designated user will collect his GDI, or if issued more than one, all his GDI, s from their charging racks and visually inspect them for damage and that the serial numbers correspond to those issued to him.
- r. Each instrument to be inserted into the test bench and if a green light is obtained the underground access gate block will be lifted and the user may proceed underground. Note: Magna type GDI's can only be tested in the Magna type test bench.
- s. If a red light is obtained, the instrument did not pass the test and the underground access gate block will be activated. The user must hand the faulty instrument to the Lamp Room Supervisor and request a spare instrument for the day. The lamp room supervisor will remove the instrument from the user's name and allocate a spare instrument. Spare instruments must be tested as per 7.4.2 in the procedure (MKP-SHV 3.23) in order for the shaft underground gate block to be lifted.
- t. At the end of his shift the user will return his GDI instrument to its charging rack.

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- u. Instruments that became faulty during the shift must be handed to the Lamp Room Supervisor for repairs.
- v. If an Instrument went into alarm during the shift by either detecting flammable gas and/or CO, the user would enter this onto a book in the Lamproom stating the working place, maximum gas detected and reason thereof.
- w. Users of instruments not returned to the charging racks at the end of the shift will be blocked at the shaft access gate when leaving the shaft.
- x. The Lamproom Supervisor shall ensure that:
 - Equipment is checked, tested and calibrated in accordance with this Code of Practice and in accordance with OEM Specifications prior to issuing of same. Results of such tests and calibrations must be logged. Checking calibration and testing of the Flammable Gas Measuring Instruments and Gas Warning Devices are enforced as part of the Lamproom Management System.
 - If equipment is found to be faulty, such unit shall be withdrawn from service until rectified and a spare instrument must be issued to the designated user and the Spare Equipment Daily Issue Register must be completed
 - Any instrument not inspected or calibrated by the OEM or Accredited Authority within a period of 1 (one) month is withdrawn from service by the Lamproom Supervisor until such inspection is done. The OEM or Accredited Authority must provide the Mine with a monthly report showing all instruments not inspected and calibrated within the mentioned month period.
 - Flow-meters (Rotameters) are calibrated and certified by the OEM at intervals not exceeding 3 (three) months for the specified flow rate, and a copy of the Certificate must be displayed (Flow-meter Calibration Procedure).
 - Non-certificated gasses are not used for conducting any tests or calibration of equipment.
 - All piping between gas bottles and testing points are permanently installed with tubing that does not absorb gas.
 - Ensure that equipment is only issued as authorised by the Mine Overseer or Section Head.
 - Ensure that adequate spare equipment is available to replace faulty units and to allow for a calibration cycle:
 - Multi-gas Warning Instruments - 10% spare
 - Gas Warning Device (CO) – 10% spare
- y. A quarterly Surface fire drill is being conducted and recorded. During the fire drill the effectiveness and compliance towards the drill is analysed and recorded. Pre-established assembly points are clearly demarcated at various positions on the shaft.
- z. Moab Khotsong is also an ISO 14001 and OHSAS 18001 approved operation and part of the requirements is that the mine has certain emergency preparedness procedures and requirements in place (See MKP-Env 14.4.4.7). Moab Khotsong Mine has assessed and manages its peril risks through the AURISK Process. The next step in identification was done in the baseline risk assessment process and the following issues were identified and all probable emergencies are addressed:
 - Falls of Ground / Rock Bursts
 - Horizontal Transport
 - Vertical Transport
 - Major injury or health effects
 - Major property damages

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- Major process loss
- Major environmental damage
- Fires
- Flammable gas
- Flooding
- Chemical spills
- Chemical Accidents
- Power failure
- Shift bopss / Explosions
- Etc. (bomb threats, civil disturbances, riots...)

aa. With regards to the ISO 14001 process The Environmental Aspects Procedure (MKP-ENV 14.4.3.1) was used as guidance during the identification of potential emergency situations and the following have been identified and formalized in an emergency preparedness document (ENV 14.4.4.7)

- Lamp Room
- PPE Store
- BAC Tower
- Pre-Cooling Tower
- Refrigeration Plants
- Water Storage Dams
- Workshops
- Paint Store
- IMS and Capital Store
- Decontamination Yard
- Bulk Diesel Tank
- Oil Store
- Offices
- Canteen
- Change House
- Veld Fire
- Main Consumer Sub Station
- Hoist Room
- Cable Tunnel
- Polluted dam (1:50 years Flood)
- Parking Area
- Kuluma Lapa
- Possible formation of Sinkholes

bb. Seismicity

- Overview of the ASHAS (Automatic Seismic Hazard Assessment System)
- ASHAS
- The system is based on the change in seismic hazard of an area. The system is not linked to any colours and only has two rating categories. The two rating categories to be used are based on the seismic hazard value, these being:
 - 1 < 6 and

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- ≥ 6
 - This procedure details the actions required when an area's seismic hazard value is greater or equal to 6.
 - It should be noted however, that the ASHAS serves as a method of displaying seismic hazard information and changes in each working area on a daily basis. The ASHAS is not a prediction of seismic activity, which would require the specification of X, Y, Z co-ordinates and time.
 - The system categorizes each polygon or series of panels into one of the two seismic hazard value categories of <6 or ≥ 6 , in order to indicate the seismic hazard state.
 - It is important that the ratings are communicated timeously to persons working in the area.

8.1.2 Communication Systems

8.1.2.1 IMS

- a. Three reports are being generated during a 24-hour cycle. Two of the reports are generated by an automated computer system. These two reports are only used to identify large events.
- b. If the two automated reports raise concerns a seismologist will contact the Rock Engineering department and the necessary steps will be followed as per the daily report actions required.
- c. The third report is compiled by a seismologist during dayshift. This report will serve as the basis from which decisions and actions will be derived.
- d. The assessment will be done by a seismologist (morning) and this will be completed before 12h00.
- e. The above report is to be communicated by e-mail to the Rock Engineering Department.
- f. The Rock Engineering department will scrutinize the report and initiate further actions as required as well as notify the responsible line personnel.

Actions required, when area has a rating ≥ 6

8.1.2.2 Rock Engineering

The rock engineering practitioner will:

- a. The relevant polygons would have been set up with the above in mind so that the immediate past, current and immediate future mining would be taken into account.
- b. Once a rating of ≥ 6 is reported the area of activity needs to be assessed so that the risk of an event can more clearly established. All hazardous structures and concerns for the mining area must be identified.

8.1.2.3 Section Manager, Mine Overseer and Rock Engineering

The Section Manager and SREO must have a meeting to scrutinise the plans and seismic history of the area.

The following will be considered:

- Do people need to be withdrawn?
- Do certain panels need to be stopped to rectify face shape?
- Do support requirements in that area need to be increased?
- Do special precautions need to be put in place?
- Does a specific mining sequence need to be introduced to rectify any deficiencies?
- Do panels need to be stopped or alternated to reduce mining volumes?

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Actions required, when area has a rating ≥ 6 – Nightshift.

8.1.2.4 Nightshift Shift boss

Visit the specified area and ensure that hazards have been identified and that appropriate remedial action has been taken regarding these hazards.

8.1.2.5 Nightshift Cleaner

The nightshift cleaner using the **Rating ≥ 6 checklists** (Form: MKP-RE 10.7.1) will ensure that:

- Early examination procedure has been carried out correctly, especially the quality of barring.
- All hazardous areas have been identified and either additional support has been installed or the hazardous area has been barricaded off.
- Ensure that gullies are being cleaned or are clean.
- Communicate all hazardous areas to the dayshift team leader.
- Notify the dayshift team leader that the concessions in this workplace have been withdrawn and the team leader must wait for the miner before entering the working place.

Special attention must be paid to:

- Gullies.
- All areas where geological features intersect the workings.
- Bottom of panel.
- Panels that have been standing for more than 5 days.
- Entrances to stopes where faults and dykes are present.
- Damaged or missing support in working areas up to back area barricade to be replaced.
- Changes in in-stope pillars during last few shifts.
- Ensure second escape way is open and safe for travelling purposes.

8.1.2.6 Nightshift Mine Overseer

The nightshift mine overseer will ensure that all the above has been carried out.

Action Required. When area has a rating ≥ 6 – Dayshift

8.1.2.7 Miner

The miner using the **Rating ≥ 6 checklist** (Form: MKP-RE 10.7.1) will:

- Personally, do the re-entry examination and ensure the quality of barring is of high standard.
- Ensure that all hazardous areas have been identified and either additional support has been installed or the hazardous area has been barricaded off.
- Communicate all identified hazardous areas to the dayshift shift boss.

Special attention must be paid to:

- Gullies
- All areas where geological features intersect the workings

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- Bottom of panels
- Panels that have been standing for more than 5 days
- Entrances to stopes where faults and dykes are present.
- Damaged or missing support in working areas up to back area barricade to be replaced.
- Changes in in-stope pillars during last few shifts.
- Ensure second escape way is open and safe for travelling purposes.

The following must be done during the shift:

- Ensure that the temporary support is according to standard.
- Ensure that the permanent support is according to standard.
- Pay particular attention to drilling and blasting practices.
- Ensure that escape routes are clean and demarcated according to standard and escape gullies are within standard distance from the face.
- The Miner will ensure that permanent support is installed within 1.0m from the face before blasting the panel.

8.1.2.8 Dayshift Shift boss

The dayshift Shiftboss will over-inspect the above area and do a re-assessment in order to ensure that hazards have been identified and that appropriate remedial action has been taken regarding these hazards.

The shift boss will as a result of the inspection initiate remedial actions to correct deficiencies in any of the hazards observed *and record any instructions pertaining to these hazards in his logbook.*

8.1.2.9 Dayshift Mine Overseer

The Mine Overseer will ensure that all the above has been carried out. All hazards identified by the miner and Shiftboss and actions to be taken will be communicated to the Section Manager.

8.1.2.10 Communication channel

There is a set level in terms of communication on Moab Khotsong Mine. The levels of this communication channel network looks as follows:

- EXCO & MANCOM (Selected members)
- Management (D-Lower to Mine Manager)
- Supervisors (C-Upper)
- Skilled workers (C-Lower)
- Semi-skilled workers (B-band)
- Team Leaders (Gr 8)
- Workmen (Gr 3-7)

It is the duty of each Supervisor, from Mine Overseer down to Miner level to ensure that the correct information is briefed to all employees. Follow-up must be done during underground visits to verify whether meetings are held to brief employees to the lowest level.

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8.1.2.11 Additional communication mediums

In addition to the set and structured communication channels, the following communication mediums are also in place on Moab Khotsong Mine:

- Workplace risk management communication board (bulletin boards)
- Early morning waiting place meetings
- Communication bulletin boards on surface
- Communication handover books between shifts
- Electronic medium such as e-mails and websites
- Audio media such as the communication done to the shift on the crush sound system
- Employee surveys and suggestions schemes
- Incident reporting system
- Monthly scrutiny
- Quarterly results mass meeting with CU and above
- Management lead Visibility Tours
- Safety launch / focus meetings
- NUM Branch Committee meeting
- NUM S&H Subcommittee meeting

The minimum communication that must be displayed on a workplace risk management communication boards is as follows:

- Health and Safety Policy
- Major Loss / Achievement announcements
- Briefs and Memo's
- Safety Officer / Vent Officer / Rock Star audit report forms
- Escape routes
- Safety topics
- Any other related information.

External communication also includes, but not limited to, any communication with one or more of the following parties:

- Local authorities
- Organised forums
- General public
- Complainants
- Non-Governmental organisations
- Media representatives / reporters

A communication book is available at the Mine Manager's Office for communication, complaints or comments from the general public, farmers in the close radius of Moab Khotsong Mine as well as all interested parties.

The environmental significant aspect register (Refer ENV 14.4.3.1 Environmental Aspect Register) and policy will be made available to the public on request.

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Telecommunication

Majority of the underground working places are equipped with a telephone, this is usually at the nearest waiting place, shop or store. In certain cases, telephones have been installed inside working places. All Refuge Bays on the Mine, which are within 750m from the working place, are equipped with telephones.

8.1.2.12 Frequency Spectrum Management

With the proliferation of underground Radio Frequency (RF) communications, Harmony Gold Mining Company will have to enforce RF spectrum management in order to ensure that there is no interference between systems. Suppliers will have to fit their technology within the predefined spectrum of operations.

Spectrum:

- 402 - 406 MHz Man & Asset Tracking
- 433.05 - 434.79 MHz Driver – Guard signal
- 903 - 918 MHz Loco Remote control/Winch Control
- 150 - 173 MHz Leaky Feeder
- 300 - 800 KHz Rescue Radios
- 100 - 128 KHz Ecam Plus PED system – Centralized Blasting
- 1,2 GHz Video
- 2,4 - 2,5 GHz Spread Spectrum Radio LAN's

8.1.2.13 Quality Assurance Provisions

Harmony QSP 101 shall apply.

8.1.2.14 Equipment Specifications

- All equipment and installations must meet the minimum standard set by Moab Khotsong.
- All components to be used in the system must comply with Moab Khotsong' s list of Approved Components and Equipment.
- All new equipment not listed in above document must be approved by Moab Khotsong Management before installation.
- All enclosures to be rated IP65 and 316 Stainless Steel as minimum standard
- All control cubicles must comply with Harmony's standards (634/4 issue 1).

8.1.2.15 Power Requirements

- The Refuge Bay/Emergency Telephone System must have its own backup power supply (batteries), to be used in case of power failures, which must be installed in the Surface Control Room. The standby time span must be not less than 8 hours. The system must be designed in such a way that no additional power supplies are necessary on the rest of the system. All power supplies must also be installed on the surface area.
- The system will be additionally supplied by power from the UPS and Standby Generator installation at the Surface Control Room.
- The supply voltage to the system must be 220Vac.

8.1.2.16 Communication Backbone

- The communication backbone for the refuge Bay/Emergency Telephone system will consist of 2 x 20 pair Shaft Telephone cables. Where the first cable will be installed from surface and looped into

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each level from 1200 up to 85 level. The second cable will be installed from surface to 85 level and then looped to each level up to 102 level. The reason for installing two cables is to establish a sort of redundancy on the system.

- The “on level” cable core count to each junction box are illustrated on drawing MKM-GD-RFB-1.
- With reference to the above drawing the core count for each zone must be a single pair. The system must be designed in such a way that the quantity of phones on each zone must have at least the capacity to facilitate 40 Refuge Bay telephones.

8.1.2.17 System Components

a. Operator Console:

An Operator Console must be installed in the Surface Control Room from where the Operator can phone a selected station by means of a standard type of phone.

The following are requirements for the Operators Console:

- Only one Zone must be selected at a time
- Indication must be available when a Zone is active
- The selection of a Zone must be cancelled by putting down the console phone for longer than three seconds.
- Indication must be available on console to indicate a short or overload on the specific zone line.
- Indication must be available on console to indicate an open line on the specific zone line.
- Indication must be available on console, LED display, to indicate from which Zone telephone a call is received.
- Indication and audible warning must be available on console to indicate and warn the Operator that a call is made from a Zone telephone.
- Battery backup power must be available on console to enable operation during a power failure.

b. Zone Telephone:

The Zone telephone must have the following functions:

- The Zone telephone’s number must be set up on two switches.
- The Zone telephone will not have a keypad available on the instrument to enable the dedicated use only on the Refuge Bay/Emergency Telephone system.
- The number of the phone must be dialled automatically whenever the Press to Talk switch is operated and held in continuously for more than one second.
- The Zone telephone number must display on the telephone console until either the Zone Telephone Press to Talk is released, or the console telephone is placed on the hook.
- The Zone telephone’s construction must have Industrial specifications for underground use.

c. General:

The system must have the following general specifications:

- The system must have the capacity to service a minimum of 15 zones’
- A minimum capacity of 40 Zone telephones per Zone.
- The recommended ringing line voltage must be 48Vdc and not more than 90Vdc.
- The maximum of 1pair telephone cable per Zone.

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- System operation for a maximum length of 10-kilometre telephone cable with core thickness of 0,9mm.
- Power supply units must display diagnostics on the power supply unit.
- Power supply units must have full short protection on each unit.
- Each zone must have its own power supply.

8.1.3 Emergency Medical Care

8.1.3.1 Paramedic Agreement and Pre-Arrangements

- a. A total of 5 Paramedics will be stationed at the 3 Business Units to render medical assistance and life support during emergencies.
- b. One paramedic will be placed at each Business Unit during dayshift. (From 07h00 to 19h00).
- c. A “shared paramedic” with a response vehicle will be stationed at Kopanang during nightshift. (From 19h00 to 07h00). This Paramedic will act on emergency calls from any of the three Business Units.
- d. Paramedics will work on a rotating shift basis.
- e. Health services also employ several doctors and in an emergency situation these doctors would also be available to assist dependent on the situation.
- f. Moab Khotsong also have a fully equipped Medical station which is manned 24/7 by Health Services employees. The staff in the Medical station`s primary function is to service the Moab Khotsong employees and to render back-up to the paramedics in any emergency situation.
- g. Furthermore, the mine is also equipped with a stabilizing station/ resuscitation room at the surface bank area where employees will be stabilized before handed over to the ER 24 ambulance staff and transported to Hospital.
- h. All the paramedics on the Mine will be registered at the Health Profession Council and be in possession of at least a BLS (Basic Life Support) certificate.
- i. From the time of the incident the paramedics will be contacted and dispatched in the shortest time possible to render assistance within the golden hour as far as reasonably possible.
- j. In the event of more serious accidents we have an advanced life support paramedic which is on standby on a 24-hour basis. The aforementioned paramedic has a vehicle which is equipped with advanced life support equipment which can be used in any emergency situation.

8.1.3.2 Paramedic Process per Business Unit

a. Reporting Structure

- The Paramedic will report to the Chief Safety Officer at the Business Unit.
- The Paramedic’s line function will be ER24.

b. Location

The Paramedics will be located at the Shaft area during dayshift. Nightshift emergencies will be dealt with as described in the Call Out process.

c. Induction

The HR Manager will be responsible to ensure that formal induction is given to all the Paramedics and that such induction is updated as and when required or with the introduction of a new Paramedic on the Business Unit.

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8.1.3.3 Paramedic Call Out Process – Day Shift

- On day shift the normal call out procedure will apply i.e. the emergency gets reported from the nearest telephone at the scene of emergency to the Control centre.
- The Mimic Controller calls the Paramedic on the shaft and informs him of the situation.
- The shaft paramedic immediately initiates the call through the Mimic Controller for an ambulance from West Vaal Hospital as needed.
- The ambulance may only be cancelled once the Paramedic has assessed the situation and is absolutely certain that it is not required.

8.1.3.4 Paramedic Call Out Process – Night Shift

- a. During nightshift, the same reporting process from the scene of the injury to the Control room as in dayshift will apply.
- b. To dispatch the paramedics based at Kopanang to any of the other Business Units the Mimic Controller will inform West Vaal Hospital who will inform the Paramedic at Kopanang.
- c. It must be noted that on night shift, the “shared paramedic” will only have a dispatch vehicle and not an ambulance, so the Mimic Controller needs to inform West Vaal Hospital to dispatch an ambulance to the applicable Business Unit.
- d. The Kopanang Security department and Mimic Controller will be responsible for ensuring that the Paramedic and Response vehicle is not delayed to make sure proper and quick access is facilitated during the “Golden Hour”.
- e. It will be the responsibility of the Security and Shaft Operations/Mimic Controller who calls for the Paramedic to ensure quick access for the response vehicle at the applicable Business Unit.

8.1.3.5 Guidelines when to Call Paramedics

- a. All head injuries
- b. Severe bleeding
- c. Amputations
- d. Heat illness
- e. Any fractures
- f. Spinal injuries
- g. Unconscious persons / altered level of consciousness
- h. Burns over large part of the body / face
- i. Inhalation toxic gasses
- j. Respiratory difficulty

8.1.3.6 Emergency Medical Care

- a. The ambulances, resuscitation room and Medical station being used on Moab Khotsong Mine will be equipped for intermediate life support.
- b. The advanced life support paramedic has a vehicle that is fully equipped for advanced life support and this vehicle, with equipment is available on a 24-hour basis.

8.1.4 Mine Evacuation and escape procedures

8.1.4.1 Intersection of Flammable Gas

In the event of water being intersected and/or the presence of flammable gas >0.5% in the general atmosphere is detected, the following shall be implemented:

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- a. All persons shall immediately stop all work and withdraw to the 2nd connecting crosscut, upstream from the source or at least 300 meters upstream from the source. Alternatively, people may withdraw to the nearest Refuge Bay.
- b. All people working in the surrounding or affected areas to be withdrawn as well.
- c. All fans shall be kept running.
NOTE: (upstream = against ventilation flow)
- d. Notify blasting certificate holder and or Snr. Official as well as the OE Department.
- e. If positive results are obtained a barricade must be erected, people withdraw and people in return side notified.
- f. Notify Shaft Operations Controller (1911)
- g. Also, refer to Mandatory Code of Practice – MA_COP_GEN_4_ Prevention of Flammable Gas Explosions

8.1.4.2 Exposure to Carbon Monoxide (Noxious Gas during a Fire or Explosion) (Carbon Monoxide is present during a fire, explosions and blasting operations)

- a. Noxious gas is detected using the Flammable Gas Monitoring Instrument (FGMI) that has an audible alarm that sounds when the CO level reaches 100ppm. The alarm becomes more rapid when gas readings increase to 400ppm.
- b. Start the evacuation procedure immediately at the first level of alarm.
- c. All personnel must be evacuated from the affected areas to the nearest fresh air point or to the designated refuge bay.
- d. Once a place of safety is reached inform the Shaft Operations Controller immediately (1911) and the nearest Senior Official.
- e. Positions of explosive boxes will be indicated in the shift boss logbook. Explosive boxes will also be indicated on the Mine Ventilation and Rescue Plan.

8.1.4.3 If exposed to blasting fumes and / or noxious gas, the following must be done:

The person in charge or the first respondent encountering employees exposed, to

- a. Remove employees from the hazardous area.
- b. Take company numbers of all involved and duration of exposure.
- c. Immediately inform the Shift Boss or nearest official.
- d. Phone the Shaft Operations Controller (1911) and inform him of the situation.
- e. Request conveyance to transport the exposed employees to surface.

Submit the following:

- a. Your name and designation
- b. Section of employees exposed
- c. Number of employees exposed
- d. Workplace where exposed
- e. Duration of exposure
- f. Seriousness of event (mild, moderate, severe)
- g. Request medical assistance
- h. Company numbers of affected employees

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- i. Accompany affected employees to surface or arrange with the Competent "A" person or a responsible person to do same.

8.1.4.4 Unacceptable Environmental Conditions

No person is allowed to work in the following unacceptable and dangerous environmental conditions:

- a. Wet bulb temperature: > 32,5°C
- b. Dry bulb temperature: >37,0°C
- c. Stope face velocity: < 0,30m/s
- d. Development raise lines volumes: < 0,30m³/s/m²
- e. Development flat ends volumes: < 0,30m³/s/m²

Personnel working in these conditions must immediately withdraw to an area with acceptable environmental conditions. They must not be allowed to return to such workings until acceptable conditions have been restored.

Work in sub-standard conditions may only be conducted to restore or improve on the existing conditions under supervision and under authorization from the Manager. Detailed plan and instructions to be in place and carried out.

8.1.4.5 Potential Hanging Wall instability

The following may be indicators of an impending large hanging wall collapse (this includes dome and wedge collapse):

- a. A sudden and increased / accelerated failure of support units – easily observable in elongates.
- b. Opening up of cracks, fractures, joints, veins, dyke contacts and fault planes.
- c. A sudden increase in the number of small falls of ground.
- d. Excessive and accelerated closure during shift.
- e. A dramatic increase in localized strain bursts on the face.
- f. Excessive spans

In the event of any of the above, workers are to retreat to a safe area via the safest route and the situation must be evaluated by the Blasting Certificate Holder and responsible Official. Areas of accelerated failure of support units and unsafe areas must be barricaded off immediately and communicated to the entire team.

In the case of excessive unsupported spans, workers to withdraw until instructions have been given to install support under supervision from a supervisor – this always from an already supported area.

Responsible Supervisor must report such instances to his Mine Overseer and Rock Engineering Department.

8.1.4.6 Fire in Underground Environment

The success of any fire suppression depends on speed in:

- a. Evacuation of personnel from affected area.
- b. Reporting the outbreak of a fire.
- c. Locating the fire.
- d. Providing adequate quantity of water at the base of a fire (excluding electrical fires).
- e. Deciding on the method of control.
- f. Provision of facilities – equipment, men and material.
- g. Sealing off of the area if the fire cannot be controlled.

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8.1.4.7 Actions, Duties & Responsibilities

Person discovering the fire to:

- a. Immediately evacuated all persons from the affected area to the nearest fresh air point or dedicated refuge bay.
- b. Attempt to suppress the fire by means of water – excluding electrical fires (read note on Battery Bays and Workshops).
- c. Use applicable dry powder fire extinguishers on all equipment and materials including electrical components.
- d. Where possible remove explosives, acetylene and oxygen bottles, fuels, oils, etc., from the affected area.
- e. Send a message to the nearest Official and / or phone the Shaft Operations Controller (Mimic Tel 1911).
- f. Remain at the telephone for further instructions if not in danger.
- g. The position of explosive boxes will be indicated in the shift boss logbook. Explosive boxes will also be indicated on the Mine Ventilation and Rescue Plan.

Shift Boss or first respondent to:

Continue with evacuation of personnel.

- a. Place Guards in through ventilation on upstream side to prevent access into the affected area.
- b. If possible, assess the extent of the fire (without endangering yourself or anyone else) and report finding to the Shaft Operations Controller (Mimic Tel.1911).
- c. Never attempt to enter a smoke / gas filled area under any circumstances.
- d. Switch off all electrical equipment including stope isolators – with the exception of ventilating fans.
- e. Battery Bays, Workshop, etc.,
- f. Always used dry powder fire extinguishers as a first defence against electrical fires.
- g. If unsuccessful, switch off all electrical equipment in the affected area except fans to RAW (where applicable) and close fire doors.
- h. Open valve on manual fire suppression system (water spray system) and place a Guard at a safe place in through ventilation upstream of the affected area.
- i. Notify Control Room and nearest Senior Official.
- j. Warn people on the return side when possible.
- k. The position of the explosive boxes will be indicated in the shift boss logbook. Explosive boxes will also be indicated on the Mine Ventilation and Rescue Plan.

8.1.4.8 Electrical Power Failure / Complete Power Outage

A main power failure will become evident in the workplace when:

- a. Ventilation flow reduces, stop or reverse.
- b. Electrical fans and winches cease to operate.
- c. Lighting goes out.
- d. Compressed air pressures reduce and gradually fail.
- e. Heat pick up.

8.1.4.9 Actions, Duties & Responsibilities

On becoming aware of power failure, all personnel will:

- a. Suspend all blasting operations
- b. Immediately withdraw all crews and other personnel from their working places to the main haulage – remember first aid bags and stretchers or alternatively to the nearest Refuge bay.

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- c. Switch off engines of all diesel driven equipment.
- d. From the nearest telephone, contact Shaft Operations Control (Mimic Tel.1911) on further action to be taken.
- e. If no instruction is received from Shaft Operations Control (Mimic Tel.1911)
- f. Immediately proceed to the shaft level station with all workers.
- g. Ensure that all persons proceed at a slow pace to minimize the effect of heat.
- h. If there is no Shift Boss, Miner or Senior Official present to take charge of the situation Competent "A" persons and Safety Representative to move people in an orderly fashion and in a group to the station.

Officials at the level stations to:

- a. Contact the Shaft Operations Controller (1911) for detail of the situation.
- b. Check that all personnel are accounted for.
- c. Take charge of persons on the station and maintain order – put personnel at ease (make use of Competent "A" Persons).
- d. Control the disposal of excreta – if no toilet facility is available, make use of hoppers nearby.
- e. Check on availability of first aid equipment and stretchers.
- f. Attend to injured and sick persons.
- g. Check availability of drinking water and guard against wastage.
- h. Take census of all people. Appoint a person(s) / persons to assist in this regard.
- i. When above duties have been carried out, report to shaft Operations Control (Mimic Tel.1911) and give a status report.
- j. If there is more than one senior official on the level station and his assistance is not required, advise Emergency Control in order that he / she might be posted elsewhere, if necessary.
- k. Ensure that only the minimum number of cap lamps is switched on at any one time to prolong operative time of batteries.
- l. Maintain control and keep morale at a high point.
- m. Keep personnel well informed of the situation.
- n. Allocate seating position and keep passages clear.

Senior Engineer to:

- a. Ensure that a Senior Official takes control of the Emergency Control Centre.
- b. Contact the Harmony Regional Electrical Department to inform them of the power failure. The Electrical Department to liaise with Eskom to determine the extent of the failure and how long it will last.
- c. Start and run one surface main fan when emergency power is available from the emergency generation station at Moab Shaft.
- d. Liaise with the Mine Manager as regards the order of priority for hoisting personnel when emergency power is available from the emergency generation station at Moab Shaft. (Lower Mine from bottom level first)
- e. Liaise with the Chief Electrician the priorities if limited power is available.
- f. If hoisting to surface is not possible, liaise with the Shaft Operations Control (Mimic Tel 8222) at Great Nologwa Mine to confirm their **status** and arrange for transport on 76 and 70 Level.

When power is restored:

- a. Liaise with the Chief Electrician the start-up sequence of large electrical equipment in order of priority. Hoisting, ventilation, pumping and refrigeration.
- b. Arrange to hoist the shift – preference to be given to the injured and sick.

Restore ventilation:

- a. Surface main fans.
- b. Underground booster fans.

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- c. All underground auxiliary fans to be started in sequence as per the electrical interconnection. Fans to be started manually and only after tests for flammable gas have been conducted by relevant Shift Bosses / Foreman.
- d. If the power failure / outage occurred during blasting time, underground fans must be restarted from the upper levels working down to the lower levels.
- e. In designated flammable gas areas or flammable gas stopped ends, fans must only be restarted under the supervision of OE Officer accompanied by the Shift Boss / Foreman in charge.

8.1.4.10 Escape Routes and Evacuation Drill

- a. Escape routes / ways to refuge bays and alternative fresh air routes shall be clearly marked on a plan to be kept on surface in the Emergency Control Room. These plans shall be updated quarterly or whenever major ventilation changes occur by the Senior OE Officer.
- b. Escape routes must be clearly demarcated underground with recognized symbolic signs or other physical means by the responsible mining / engineering section in whose responsibility area these routes fall.
- c. Supervisors shall ensure that all workers are familiar with escape route by doing emergency fire drills on a monthly basis and full withdrawal to their respective refuge bays at intervals not exceeding 3 months. When a person is employed for the first time or transferred to a new working place he / she must be inducted with regard to escape routes, refuge bays and emergency procedures. (All information in this regard to be recorded in the Shift Boss / Foreman logbook and Induction Checklist.)
- d. All roving personnel, e.g. Surveyors, Samplers, etc., must familiarize themselves with the location of the nearest refuge bay in the area where they are working before commencement of such work.
- e. Management to ensure that all persons (mine employees, as well as contractors) are adequately trained to act in the event of an emergency. Records to be kept of all emergency drills. The Mine Overseer / Foreman will be responsible to ensure that an up to date escape route plan exists for each working place and that copy of the escape routes plan is displayed at the waiting place communication board at each waiting place, Workshop, Battery Bay, etc.
- f. It will be the responsibility of the Mine Overseer / Foreman to ensure that all relevant First aid equipment is available in his section/area of responsibility. It will also be his / her duty to ensure that all personnel are informed to take first aid equipment and, if possible, stretchers to the refuge facilities if an emergency situation arise.

8.4.1.11 Refuge Bay Procedure / Emergency Procedure

- a. When inside refuge bays, close the door and open compressed air (do not sprag the door in a closed position).
- b. The most senior person must take control of the emergency situation.
- c. Do not panic, put all others at ease.
- d. Take roll call.
- e. Phone Shaft Operations Control (Mimic Tel 1911) and state the situation, i.e.:
 - Number of persons in refuge bay.
 - Any personnel missing or injured (seriousness of injuries).
 - In need of Proto and/or Medic assistance.
 - First aid equipment needed and stretchers.
- f. Instruct personnel to open the door only to allow other employees in, otherwise keep the door closed.
- g. Sound the air whistle.
- h. Visually check to see whether smoke is entering the refuge bay and attempt to seal.
- i. Keep only \pm 10% of cap lamps on at any one time.
- j. Record any person missing and where last seen.
- k. Reassure and keep employees calm.

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- i. No person is to leave the refuge bay until instructions from management and Proto members have been received to do so.

8.1.4.12 Inter Shaft escape ways

If hoisting to surface is not possible due to the main shaft inoperative the following inter shaft escape routes are available:

Top Mine

- 70 Level escapes via 70 Level to Great Nologwa Mine.
- 73 Level escapes to 73 Level station and then via 76/73 material incline to 76 Level and then via 76 Level to Great Nologwa Mine.
- 76 Level escapes via 76 Level to Great Nologwa Mine.

Middle Mine

- All levels hoisted to 76 Level via R/V Shaft and then escape via 76 Level to Great Nologwa Mine.

64 Level

- Alternative A - If Pipe Shaft Lift is operational, escape to 76 Level and then via 76 Level to Great Nologwa Mine.
- Alternative B – Remain on 64 Station until a Great Nologwa Mine Rescue Team arrive and escape via 64 Level's 49 x/c along 64 South Haulage to Great Nologwa Mine accompanied by the Rescue Team.

1200 level

- Level not manned 24/7, but occasional maintenance personnel may be trapped.
- No inter shaft escape way available. Wait at the shaft telephone or Refuge bays for further instructions.
- Food (emergency Morvite supply) and water (dam level) available.

8.1.5 Training and Awareness

8.1.5.1 Procedure

- a) Each employee must undergo induction after returning from leave (every 12 months not exceeding 18 months) or subsequent to being engaged as a new employee. This induction includes amongst others training/review on Emergency Preparedness.
- b) Procedures and required actions during Emergencies are included in the Induction and work place induction for new Employees and Employees turning from leave.
- c) The Procedures and application of emergency equipment forms part of the Induction process.
- d) Shutdown controls and lock out devices are covered in Review training and in the Managerial Instruction with regards to Lockout Procedures MA_MI_SAF_032.
- e) The use of self-contained self-rescuers are covered in the Induction process and in the Operational Procedure MA_OP_SAF_009.
- f) All Emergency procedures or instruction are obtainable from the Harmony Intranet site (SHERQ Portal, Operations Working Documents under Moab Khotsong). Copies of these are also available from the Legal Department.

8.1.5.2 Initial Induction

All employees engaged at Moab Khotsong Mine will be given an initial induction at the Business Unit. Upon engagement, the HR Communications Department will induct the employees as per the Induction Programme with specific emphasis to:

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- Training in local OH&S arrangements, hazards, risks, and precautions to be taken and procedures to be followed.
- Training and awareness programmes for contractors, temporary workers and visitors, according to the level of risk to which they are exposed.
- Topics handled during induction are subject to annual revision.

8.1.5.3 On the job Induction (C-induction)

All ex-leave and new employees are further required to be inducted at their respective working places by their respective Line Supervisors.

The HR Department will upon introducing the new employee (or transferred employee) to his Supervisor give written notification in this regard to the Supervisor. The Supervisor will be responsible to conduct the on the job induction.

The HR Department will issue the employee with the on the job induction checklist that needs to be completed by the Line Supervisor and returned to the HR Department within 3 working days by the employee.

The induction checklist must be used to induct the employee and to record the follow-up induction within one week. Shift Bosses and Foreman are to record all inductions in their Log Books and a copy of the checklist handed to the HR Department for filing.

8.1.5.4 Creating Occupational Health and Safety Awareness

Employees need to be made aware of the hazards and risks associated with their day to day activities as well as the consequences for not performing the tasks safely and according to procedure, and the benefits of performing to standards. Therefore, the roles and responsibilities in terms of OH&S need to be clarified and the employees need to be trained on these procedures to ensure conformity.

The training lesson plan makes provision for training employees on a specific task, highlighting the hazards and risks involved, indication the consequences of non-conformance to the procedure as well as the benefits of personal performance. The C-induction process explains to the employees the emergency evacuation process using the emergency evacuation plan situated on that specific area's waiting place.

Every employee is trained in basic risk assessment, as part of the training strategy. This assists in equipping the employees in basic risk identification techniques.

The employees of Moab Khotsong Mine each have a responsibility towards their own health and safety. They need to know that it is their responsibility to work safely and constantly identify workplace hazards and risks that might pose a threat to their health and safety. Many ways are used to ensure employees are made aware of this. Herewith a list of all processes and documentation that contains reference to the employees' duty toward occupational health and safety:

- a. Induction (With special reference to Chapter 23 MHSA)
- b. Initial training
- c. Refresher / follow-up training
- d. Competency assessments
- e. Lesson plans (The consequences of deviating from these is explained in cause and effect segment of the lesson plan)
- f. Unit standards
- g. Do it right sessions
- h. Quarterly safety awareness campaigns
- i. Standard Task Procedures
- j. Planned Task Observations
- k. Pre-planning
- l. Appointments
- m. Managerial Procedures

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- n. Issue Base Risk Assessments
- o. Developing and Stopping workplace standards
- p. Safety Representative election, training and appointment
- q. Special instructions, etc.
- r. Emergency drills

8.2 Emergency Response Measures

8.2.1 Rescue and response capabilities

- a. Prompt, effective emergency response reduces accidental losses and the consequences of natural and man-made disasters. There is not enough time during an emergency to decide who is in charge, to survey outside agencies to identify sources of help, or to train people for emergency response. These actions must be taken prior to the emergency.
- b. An effective safety and health program will firstly ensure that a general emergency plan exists which establishes evacuation procedures, assigns responsibilities to specific individuals, provides for notification of outside agencies, establishes means of communication, provides for in-house emergency response, and prepares the facility for other effective actions. The next step is to customize the general emergency plan to specific emergency situations likely to occur.
- c. The principle of the critical few should be applied when formulating customized emergency plans (i.e., develop plans first for those emergency situations that are most likely to occur and/or possess the greatest potential for loss.
- d. Moab Khotsong Mine is staffed as per the legal requirement (Reg 16.5(1)) with three proto teams of which each has his own Captain. A proto Manager situated on the shaft is responsible for the two teams as well as all the emergency equipment and the maintenance thereof. Each proto member has received the necessary training and undergoes the required training at set intervals. They are furthermore equipped with the required emergency equipment as prescribed by Mines Rescue Services. All members have received training in specialized equipment; the respective equipment is checked and maintained on a monthly basis as per the requirement.
- e. Neighbouring shafts in the Vaal River area is dually staffed in this regard and is always available in the event of an emergency. Moab Khotsong Mine is in very close proximity of Great Nologwa Mine and Kopanang Mine and within a very short time the members from those Mines can be made available.
- f. MRS (Mines Rescue Services) as well as neighbouring Mines are informed of all major or big emergencies after which MRS will deploy to the shaft to render assistance in all aspects of the emergency situation.
- g. The proto teams are responsible to have sufficient Drager tubes, Draggers and Flammable Gas Measuring Instruments for the testing of Noxious and flammable gases (high range and low range tubes) such as Carbon Monoxide, Carbon Dioxide, Flammable Gases and Oxygen. The Snr OE Officer on the Mine in addition will also keep stock of various Drager tubes that will be available as back-up for the proto teams.

8.2.2 Management of emergencies

8.2.2.1 Underground emergency preparedness and response

The underground emergency preparedness and response process is dealt with in depth in MKP SHV 3.27 - Crises and evacuation in the underground environment (Including Refuge Bay Procedure).

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8.2.2.2 Surface emergency preparedness and response

The underground emergency preparedness and response process is dealt with in depth in MKP SHV 3.75 - Emergency action for surface fire.

8.2.2.3 Review of the emergency procedure

The response to an emergency situation should be clearly documented, so that it can be reviewed at an agreed time period after the emergency situation has passed. This will enable the scrutiny of the effectiveness and applicability of the emergency procedure during an actual emergency situation.

This emergency procedure should be reviewed after each accident/ emergency situation, as well as at agreed intervals (e.g. on 3 yearly basis).

8.2.2.4 Testing of emergency procedure

The emergency procedure should be tested, to test the practicability of the procedure and the expected response time. After testing the response, the procedure should be reviewed, to incorporate any additional recommendations or changes as a result of the testing. Records of these tests are kept by the OE Department (Refer to MKP ENV 14.4.4.7 – Emergency preparedness and response). Fire drills are done on a quarterly basis and recorded in the Foreman logbook.

8.2.2.5 Needs of relevant interested parties

When an emergency arises at Moab Khotsong Mine it is likely that we will need the help of relevant interested parties e.g. ER24 ambulance services and paramedics, Mines Rescue Services (MRS), the Fire brigade, etc. A complete telephone list for Moab Khotsong is available in the Emergency Control Room which is manned 24/7. Contact details for Neighbouring Mines and Emergency Services:

- Kopanang Mine - 018 478 9201/2
- Emergency Services ER24 - 076 739 6283/084 767 7206
- SAPS Orkney - 018 473 8320
- SAPS Klerksdorp - 018 464 5080

8.2.2.6 Action to be taken by the First Respondent or Person observing the Accident/ Incident or Emergency situation.

- a. In case of injury to person(s), immediately administer First Aid treatment.
- b. In case of a Fire first try to extinguish the fire (if it can be done safely)
- c. Assess the visual damage
- d. Phone the Shaft Operations Controller / Mimic and communicate the following:
- e. Your name and designation
- f. Level from which you are phoning
- g. Type of accident or incident i.e. FOG, Fire, Injury etc.
- h. Medical assistance required
- i. Number of injured persons
- j. Number of stretcher cases
- k. The visible damage to shaft system
- l. Your telephone number
- m. Remain at the telephone and await further instructions.

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8.2.2.7 Action to be taken by the Shaft Operations Controller

- a. Record all events on the Event Control Register
- b. Immediately inform the Shaft Operations Controller at Great Nologwa Mine.
- c. Call out the following persons:
 - Senior Engineer
 - Shaft Engineer
 - Shaft Mine Overseer
 - Shaft Foreman
 - Mechanical Foreman (Shaft)
 - Electrical Foreman (Shaft)
 - Senior Human Resources Manager
 - Standby Paramedic (in case of emergency)
 - Nursing Unit Administrator (in event of emergency)
 - Chief Safety Officer
- d. Notify the following persons:
 - Mine Manager
 - Snr OE Officer
- e. The most senior person to arrive at the Shaft during or after hours will take charge of the emergency control room and give constant feedback to all relevant stakeholders such as Management and Union and Associations.
- f. In the event of serious accident communication to outside and affected party's procedure must be followed (Communication, Participation and Consultation MKP-RS 18.4.4.3).

8.3 Reporting and Recording

- 8.3.1 All underground and surface Emergencies, Accidents and Incidents will be reported to the Shaft Operations Controller/Mimic.
- 8.3.2 The Shaft Operations Controller/Mimic will report the Emergency, accident or Incident to the Chief Safety Officer which will report to the relevant Manager, Engineer and Head of Departments.
- 8.3.3 If it is required, an Emergency Control Room will be established with an appointed Manager in Control.
- 8.3.4 The appointed Manager in control will determine the required Managers, Engineers and Head of Departments to be present in the Control Room.
- 8.3.5 All instructions and communication will be recorded in the Emergency Control Book and will be kept locked in the Control Room after each Emergency, Accident or Incident. Once the Emergency Control Book is full, the book will be kept at the Legal department for a period of 5 years.
- 8.3.6 Any instruction or recommendation or a reply on any instruction will be kept at the Legal Department after each Emergency, Accident or Incident.
- 8.3.7 Any Emergency, Accident or Incident will be communicated by the Manager to the Unions and Department of Mineral Recourses and Energy.
- 8.3.8 Findings and learning from any Emergency, Accident or Incident will be communicated with the relevant people on the shaft.

Emergency Equipment

- 8.3.9 All Proto equipment/facilities are inspected weekly, monthly, quarterly and yearly depending on the type of equipment. In addition, the Mine Rescue Services conducts quarterly and yearly inspections on equipment/facilities.
- 8.3.10 Emergency generators (20KVA) on Moab Khotsong are inspected monthly (Genset) by an appointed person.

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8.3.11 Emergency generators (V12) on Moab Khotsong and 1# are maintained by the Harmony Services Department.

8.4 Emergency Aspects Addressed in Other Mandatory COPs

Mandatory Code of Practice – Prevention of Flammable Gas Explosions in Mines Other than Coal Mines MA_COP_GEN_005.

Mandatory Code of Practice – Prevention of Fires at Mines MA_COP_GEN_021.

Mandatory Code of Practice – Management of Self Contained Self Rescuers in Mines MA_COP_GEN_025.

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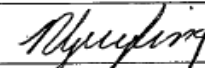
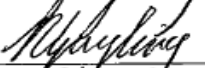
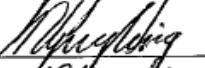


PART D

1. IMPLEMENTATION PLAN

The implementation plan is required to illustrate how the information contained within the COP will be distributed and made available to all concerned employees at Moab Khotsong mine, Refer to Appendix C.

The Health & Safety Department will monitor compliance of the implementation plan and completion dates where applicable and report any deviations to the Mine Health and Safety Committee for action.

Appendix C

<u>Action required</u>	<u>Completion date</u>	<u>Responsible person</u>	<u>Signature</u>
Consultation with Unions	1/12/2021	R Greyling	
Review with Unions	14/12/2021	R Greyling	
Approval by HOD's	20/12/2021	R Greyling	
Publish on Intranet	7/1/2022	R Greyling	
Distribute/communicate to all relevant parties concerned	22/12/2021	R Greyling	

2. COMPLIANCE WITH THIS COP

Line personnel will conduct inspections as required by the mine procedures and conduct over-inspections (audits) at intervals as determined by the risk profile of each working place/location to monitor and ensure compliance with this COP.

Designation	Responsibility of functionaries
General Manager (section 4.1 and section 7(2) MHSA appointee)	<ul style="list-style-type: none"> To take reasonable steps to ensure compliance with the relevant provisions of legislation which is binding thereunder' To observe and enforce any codes of practice, instructions, procedures, directions, permissions, exemptions and similar documents issued by Harmony, the COO – South African Operations, and the DMR.
Mine Manager (section 3.1(a) and section 7(4) MHSA appointee)	<ul style="list-style-type: none"> Appoint persons with qualifications as described in the regulations to perform any aspect of the functions assigned to the General Manager. Ensure that resources are made available to implement, monitor and control the codes of practices on the mine through the Joint Mine Health and Safety Committee, Peril meetings, Standard's Committee etc. Monitor progress at the monthly Joint Mine Health and Safety Committee.
Section Manager (Regulation 2.16.1 and 28.13 – 16 Minerals Act Regulations and section 7(4) MHSA appointee)	<ul style="list-style-type: none"> Ensure long term planning conforms to Industry best practice, set standards, procedures, COP's etc. Monitor implementation. Ensure his direct support team is adequately trained, capable and competent. Review analysis of the critical few non-conformances done by the Mine Overseers in their respective sections and take appropriate action to minimize similar deviations. Appoint persons to assist with the functions assigned to him. Ensure copies of the code of practice are made available to employees

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	without computer facilities within his section when required.
Mine Overseer (section 7(4) MSHA and Regulations 2.14.1 and 2.13.12 appointee)	<ul style="list-style-type: none"> • Ensure long term planning conforms to Industry best practice, set standards, procedures, COP's etc. • Ensure adherence/compliance to Industry best practice, set standards, procedures, COP's etc. • Timeously report and record on noncompliance to PPE, if observed, to the section manager and senior Risk and safety manager on the Mine. • Ensure his direct support team is adequately trained, capable and competent. • Review analysis of the critical few non-conformances done by his shift bosses in their respective sections and take appropriate action to minimize similar deviations. • Analyse, action and keep records of all relevant safety system documentation i.e. Records of PPE inspections by Shift bosses as recorded in logbooks. • Appoint persons to assist with the functions assigned to him.

3. ACCESS TO THE COP AND OTHER RELATED DOCUMENTS

3.1 The COP and related documents are readily available at Legal Admin for examination by any affected person electronically or hard copy. Supervisors have access to these documents on the website of Harmony.

3.2 The registered trade unions are part of the drafting/ reviewing committees and involved in the signing off and implementation of this COP. This ensures employees, trade unions and management are participants in the Health and Safety of all employees at Moab Khotsoang.

The signed off COP communicated to the relevant parties, through the Mine Health and Safety Committee, Task Teams, Managers, Supervisors, Training Centre, and Health and Safety representatives.

3.3 The General Manager will ensure that all employees are fully conversant with those sections of the COP relevant to their respective areas of responsibilities.

THE MINE USED THE FOLLOWING ANNEXURES FROM THE GUIDELINE AS GUIDE WHEN DETERMINING MINIMUM STANDARDS:

- Annexure 1: Refuge Bays
- Annexure 2: Emergency Control Centre; Structure and Procedure
- Annexure 3: Duties and Responsibilities in the Emergency Control Centre
- Annexure 4: Schedule of additional References
- Annexure 5: Emergency Preparedness and Response Procedure – Scheduled Drills
- Annexure 6: Controls and Measures to prevent Covid-19 Infections
- Annexure 7: List of related Codes of Practices and Management Standards
- Annexure 8: Referenced Documents

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Annexure 1 – Refuge Bays

ANNEX I - REFUGE BAYS

(For information purposes only)

1. OBJECTIVE

To provide a general framework for the siting, construction, equipping and maintenance of refuge bays.

2. SITING/LOCATION

The position of a refuge bay should be determined by the employer. Refuge bays are to be positioned in areas free of combustible material or combustible material rendered inert, within an appropriate distance from the working places. Further due consideration must be given to factors such as:

- The travelling conditions from the workplace e.g. height, walking surface, gradient, possible disorientation, etc.
- The duration of the self-contained self-rescuers used on the mine.

3. CONSTRUCTION/DESIGN

- 3.1 Refuge bays should be of robust construction and where there is a significant risk of explosions it must be able to withstand the effects of such an explosion.
- 3.2 The size of the refuge bay should be determined by the maximum number of persons likely to be present in the area served by the refuge bay, with a minimum floor area of 0.6 m² per person.
- 3.3 Life-sustaining services installed to the refuge bay should be of fire resistant material or else be fire protected.
- 3.4 A refuge bay must be air tight and sealed in such a way so as to ensure a positive pressure that will make the refuge bay inaccessible to air containing noxious smoke, fumes or gases.
- 3.5 Access arrangements into the refuge bay should be such that it does not negatively affect the integrity or size of the refuge bay.
- 3.6 Refuge bays should be provided with a man door, and where there is a significant risk of an explosion, a flexible type of door that would not be rendered ineffective in the event of an explosion should be considered.
- 3.7 Refuge bays should be provided with seating arrangements where practicable.
- 3.8 Where applicable, such as at collieries, a surface borehole system, for the provisioning of

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respirable air to the refuge bay, may be provided. Access requirements for equipment and vehicles to the borehole site must be taken into account.

3.9 An identification system of refuge bays must be implemented and must be clearly indicated on the inside and on the outside of the refuge bay. Where a surface borehole system is used such corresponding identification must also be indicated at the borehole site on surface. This corresponding identification must be indicated on the Mine Rescue Plan contemplated in regulation 17(19).

3.10 Where the life-sustainability of a refuge bay is dependent on compressed air, the supply to the inside of the refuge bay should be tamper-free, with a control valve on the inside of the refuge bay.

4. EQUIPMENT/FACILITIES

All refuge bays should have-

4.1 A supply of potable water (a minimum of 2 litres per person for 24 hours is recommended).

4.2 An effective communication system to surface, with operating instructions. The appropriate emergency contact details must be displayed.

4.3 A clearly visible reflective type "Refuge Bay" symbolic sign should be displayed at the entrance to the refuge bay.

4.4 A conspicuous light with a reliable independent power supply, or any other physical means placed in such a position in the travelling way so as to indicate the location of the refuge bay.

4.5 An audible device positioned outside the refuge bay that can be activated from the inside.

4.6 Toilet facilities.

4.7 First aid equipment.

4.8 Flushing and pressurization tests must be conducted on all refuge bays before being commissioned and at appropriate intervals.

4.9 A notice board inside the bay, displaying the correct procedure to be followed during occupation in an emergency, for example:

- Activate the ventilation arrangements.
- Activate the audible device.
- The most senior person to take charge of the operations and to contact the attendant at the surface control room or any other senior official on the mine.

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- Take roll call.
- Remain calm and do not move around unnecessarily.
- Conserve lights. Keep only enough caplamps on at any one time to provide sufficient illumination.
- Persons to remain in the refuge bay until otherwise instructed by the official in charge at the control centre, or rescued.
- Keep the door closed during occupation.

5. VENTILATION ARRANGEMENTS

The refuge bay must be provided with a reliable supply of respirable air so as to ensure proper flushing and to create a positive pressure. Where compressed air is used an arrangement for silencing must be provided.

6. ESCAPE ROUTES

Escape routes to refuge bays and alternative fresh air routes must be clearly indicated with any physical means e.g. standard symbolic signs, directional cone escape rope, life line, etc., and should be kept free of any obstructions.

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Annexure 2 – Emergency Control Centre: Structure and Procedure

ANNEX II - EMERGENCY CONTROL CENTRE; STRUCTURE AND PROCEDURE

(For information purposes only)

1. Forward

A well-designed and efficient control centre is the key to success in controlling an emergency operation.

The control centre is the nerve centre during a crisis where information is gathered and analysed. From this analysis, a strategy emerges for translation into action plans.

The execution of planned action by clear and comprehensive briefing of rescue teams and personnel will greatly enhance operational efficiency and limit loss.

Spontaneous "off the cuff" decision making leads to poor and often contradicting instructions, with the result that confusion and poor worker motivation and performance occur.

2. The Emergency Control Centre

Objectives

To ensure an orderly and efficient transition from routine operations to effective mine emergency response.

Supportive objectives:

- Gathering and analysing information.
- Effective communication between various components.
- Planning strategy
- Briefing and instructing of operational staff and rescue teams.
- Co-ordinating planned action.
- Direct operation.
- Involve all key personnel.
- Record keeping.
- Ensure safety of operational personnel.
- Limit loss through effective management of the emergency.
- Initial re-organisation of mining operations.

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3. PHYSICAL FEATURES AND EQUIPMENT OF A CONTROL ROOM

3.1 Size

There is no prescribed minimum size of a control room. However it is advantageous to separate the control room from the rescue team briefing room. The briefing room could also house the Gas Chromatograph, radios, batteries and battery chargers as well as the mine ventilation and rescue plan and location plan. The mines rescue service provider representative should have a separate office with outside communication facilities.

A dimension of 35m² is adequate. A large room encourages convergence of unnecessary personnel who hinder the efficient running of the control room/centre.

3.2 Plans

In addition to the Mine Ventilation and Rescue plan, as required by the **MHSA** regulation 17(19), adequate up to date copies must be available for every rescue team proceeding underground.

Location plans - Large-scale locality plans and small scale plans of area to be available.

The master working plan, laid flat on a table must be continuously updated during the emergency with the following information:

- Position of Fresh Air Base (FAB) (with telephone numbers)
- Exact location of all seals and stoppings completed and under construction
- Position of rescue teams, whether at FAB or performing a task. (use detachable adhesive decals)
- Demarcation of numbered monitoring points with the latest results. (Detachable labels showing time of measurement and result)
- Depict airflow directions and quantities.
- Escape routes
- Position of explosive boxes.
- Sub- stations and electrical gear.
- First aid stations.
- Telephone positions and numbers.
- Refuge bays.
- Water and air valves.
- Vent doors and regulators (opened or closed);
- Fire doors;
- Identified risks e.g. open orepasses, fall of ground, gas emissions, water accumulations, etc.

Other plans should be available indicating:

- Water reticulation.
- Compressed air reticulation.

It must be stressed that the plan issued to rescue teams must be identical to the master plan to avoid any confusion.

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The numbering of stoppings, gas monitoring points and any other relevant information must be entered on all plans (coding of these points must correspond with rescue teams reports).

3.3 Telephone and Communication

No emergency operation can function efficiently without a good communication system.

To achieve this, it is management's responsibility to ensure the following systems are immediately established:

- A fixed line unrestricted by area dialling, to facilitate calls for example to emergency equipment (material) suppliers and the requisitioning of rescue teams by mines rescue service provider;
- Internal (PABX type) telephone system for mine calls;
- Telephone communication with the FAB; and
- A dedicated line or an interface from the control room/centre down the mine to the FAB to facilitate communications between the sub- strata radios and telemetering systems.

3.4 Furniture and Fittings

Adequate table space must be available for work on plans.

The scribe, keeping the records of all procedures should be slightly detached from the desk of the manager in control to prevent him from being interrupted from other activities.

If a separate rescue team briefing area cannot be provided, then sufficient space and table layout should be made available to accommodate at least 2 teams concurrently.

A small stationery cupboard, kept locked when not in use for the supply of coloured pens, writing materials, graph paper, detachable labels, team briefing, instruction sheets and a copy of this file should be provided.

Plan covers, available from mines rescue service provider should also be available in order to protect plans taken underground.

Pin boards, fixed to the wall should be of sufficient size to accommodate plans of all the mine workings mentioned in section under Plans.

Lighting must, for obvious reasons, be excellent. Make provision for standby lighting in case of a power failure.

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Seating facilities in the control room must be limited to prevent the natural tendency of well-intentioned people with no specific function to distract control management with unimportant matters.

A rescue team control board showing the times and movement of teams should be a permanent fixture.

All colliery control rooms should be equipped with a barometer and a graph for plotting the result of gas samples.

Provide for easy access/facilities to monitor gas detector trends and major ventilation equipment status.

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4. GENERAL ORGANISATIONAL STRUCTURE OF A CONTROL ROOM

4.1 Personnel Requirements

During the immediate post disaster period, control efficiency is downgraded due to 3 main reasons.

- (a) Lack of accurate information regarding the severity, extent and the exact location of the incident.
- (b) The summoning of key personnel not fully utilised.
- (c) From (a) and (b) above - no clear plan of action having been formulated.

During this period, people milling around the control room trying to establish emergency procedures and systems hamper management's decision making. These persons should not have access to the control room. Once the initial stage is resolved and a strategic plan has been adopted, the control room should be manned by the following personnel:

4.1.1 Manager in Charge

For further reference, detailed "Duty Checklists" (Annex III) are enclosed. These checklists should serve as the initial action strategy.

This person, usually of senior status, takes overall charge and responsibility during his shift in the control room.

Consequently all decision-making revolves around him, and only he should brief rescue teams, give instructions and communicate with rescue teams.

All special instructions given, known hazards and hazards reported by teams during the incident should be clearly and fully recorded in a situation log that is kept on a 24-hour clock system.

It is imperative that shift changeovers be performed thoroughly, and that the incumbent personnel in control is completely au fait with:

- (a) The overall strategy
- (b) Progress thus far achieved
- (c) Available resources, both human and material
- (d) Ventilation flows and gas sampling records and trends.
- (e) Temperatures, visibility and any other relevant information.

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(f) Location of operating, back-up and standby rescue teams

(g) Oxygen pressures of the teams breathing apparatus

Only once the above has been communicated the incoming manager, the outgoing manager may take leave of the control room.

The manager in charge should strive to avoid deviating from the pre-planned strategy. Changes of instructions lead to confusion and time wastage and also portrays a lack of leadership and credibility.

The Manager in control must impart an attitude of urgency, efficiency, calmness, friendliness and discipline. (Be in control of the incident)

NB: Avoid placing a person in charge that has insufficient knowledge and experience of the area, fire fighting or rescue operations.

The manager must be receptive to accepting advice and not be dogmatic about his personal views. He should continuously refer to back-up documentation and the identified checklist.

Before any rescue team is deployed, the possibility of other risks associated with the emergency must be considered and assessed as far as reasonably practicable.

Decisions should be recorded and be based on:

- State of the ventilation;
- State of the atmosphere in the mine (in or near explosive range);
- Source of ignition. Great care should be exercised if spontaneous combustion is suspected;
- Presence of gas due to walls of sealed areas being damaged;
- Likelihood of survivors.

4.1.2 Media Relations

Any emergency, particularly those that involve multiple fatalities, or missing employees are likely to be of public interest and liable to warrant the attention of the media.

Handling the media can be a sensitive matter.. An early, open and technically accurate interview or statement with regular updates can result in fair and sympathetic reporting under what can be adverse circumstances.

It is well known that some media reporting can be emotive, speculative or inaccurate. This fact should be kept in mind when dealing with the media.

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All statements issued by the mine to the media should be officially issued by the owners, mine manager or designated media liaison officer. No off-the-cuff interviews and ad-hoc comments should be given by other officials.

They should refer any media queries to the above mentioned persons and avoid reporting "good news" without being sure of the facts.

4.1.3 Environmental Control

An experienced senior environmental official plays an invaluable role in fire and environmental control. His knowledge and advice on airflow, quantities and expertise in identifying sealing sites for the construction of stoppings makes him an integral member of the control room team. (It may be necessary to call upon expertise of previous officials with knowledge of historical incidents).

By interpretation of gas samples and temperatures trends, coupled with knowledge of air movement across a fire, the environmental specialist can, with fair accuracy, interpret the fire behaviour and effectiveness of the total strategy.

This department should be consulted in the following matters:

- Planning of reconnaissance patrols;
- Locating the incident using their up to date and comprehensively detailed mine ventilation and rescue plans;
- Giving advice whether normal work can continue or be restarted in other areas.
- Provide gas detection instruments and environmental staff to assist underground.
- The stopping and starting of any fans.
- Check on all matters relating to the environmental systems affected by the fire.

4.1.4 The Scribe

This should be a person well versed in mining operations, with the experience in how to record the sequence of events.

The scribe's function is to maintain accurate comprehensive records of all proceedings, instructions and reports during the incident. These records can be in either a formal minute book or on prescribed forms, which are kept on file.

The Scribe duties include recording the following:

All special instructions from the manager in control and hazards reported or known.

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All information reported from the FAB or team captains via sub-strata radios or speakerphone.

Material requirements from underground and deliveries thereto.

Maintenance of the rescue team control board.

Safekeeping of rescue team pre-operational medical examination forms

A separate book for task progress to be maintained in collaboration with the manager in control.

Should keep a list or documentation regarding e.g. contact no's, gas analysis monitoring form, O₂ pressure.

Gather duty rosters from discipline heads and display at a conspicuous place.

4.1.5 Mines rescue service provider official

This official will automatically be present throughout the deployment of visiting rescue teams. They are also available whenever requested by management.

This official has vast experience in various disasters and incidents and this experience can be well utilised in the formulation of a strategic plan and the ensuing control of operations.

This official's functions at an incident include but are not limited to:

- Advice and recommendations on options of fire control methods including types of equipment and materials available.
- Arranging for the supply of this equipment/material.
- Advice on rescue team modus operandi.
- Rescue team protection.
- Radio communication
- Hot and humid atmospheres
- Continuous gas monitors.
- Potential hazards identified by teams operating in area (risk assessment) or in the event where it is the first team entering the area.
- Obtaining of other specialist's knowledge.
- Current technology available.
- The control and requisitioning of additional rescue teams.

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- Repairs and maintenance to breathing apparatus as well as spot checks on leakage tests/systems checks.
- Meeting teams and informing them of strategies in progress and history of the fire.
- Ensuring Rescue Team Members compliance to code of practice with respect to inter alia:
 - Modus Operandi.
 - Ancillary and safety equipment.
 - Medical examinations.
 - Leakage/Systems checks on breathing apparatus.
 - Competency levels to special tasks.

The aforementioned designated persons are all that is necessary to remain permanently in the control room. However, other skills and expertise are required frequently, and these people should be available if required, depending on the incident.

4.1.6 Runner

Usually of supervisor status. This person is required to ensure material is loaded for transport down the mine, deliver messages and perform general tasks which would otherwise compromise the duties of the control room team.

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4.1.7 Engineering Department

A senior member of this department must be on immediate call for breakdowns or stoppages e.g. fans, pumps etc. It is also his duty to ensure continuous communication systems and an adequate water supply to the effected area.

He must alert ESCOM or other Electricity Suppliers to ensure uninterrupted electric power to the mine.

Arrange for 24-hour back up from the engineering workshop.

4.1.8 Survey Department

Personnel on immediate call for the supply of plans or other related matters. i.e. telephone numbers available, of potential hazards (Dykes, Fissures, Faults, New holings, open orepasses etc.)

4.1.9 Human Resources Department

Their responsibility includes:

- Compiling duty rosters to ensure continuity of service departments.
- Change-house facilities for visiting teams.
- Arrange guides and bearers for rescue teams.
- Arrange food and beverages
- Press/news media control.
- Ensure tight security at mine entrances.
- Arrange transport and accommodation for teams if required.

4.1.10 Stores

Required for the issuing and control of material and equipment.

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4.1.11 Medical Staff

Required for the examination of the mines rescue teams if necessary and to provide coverage for any emergency during the operation.

4.1.12 Gas Monitoring/Analysis Personnel

Analysis of gas samples can be done by making use of for example, the Gas Chromatograph and the Mobile Gas Analysing Laboratory (MOGAL) on collieries and the Trugas - analyser for goldmines.

4.1.13 Fresh Air Base Official

Where possible each FAB must be manned around the clock by an official. There is no job category for this official, but senior supervisor level is preferable.

Cognisance should be taken of persons with an intimate knowledge of the history of the effected area e.g. previous fires/vent. breakdowns etc.

The functions of this person is *inter alia* to control the labour at the FAB, ensure efficient off-loading of materials and equipment, the removal of empty material cars, preventing unauthorised entry past the FAB, manning the radio, ensure communication services with management in control.

Local knowledge of the area is of great importance to rescue teams and it is obviously advantageous if this official has this local knowledge.

It must be stressed however, that the line of communication between team captain and manager in control is direct, and no instructions to the teams should be given by the FAB official.

Shifts of the FAB official ought to be of 8-hour (12 hours bank to bank) duration and rosters must be timeously drawn up and displayed.

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4.1.14 Security Department

Personnel are required to ensure crowd control and no unauthorised entry onto the mine. They would further be utilised for asset protection.

4.2 Conclusion and Recommendations

The most important components to achieve success in directing emergency operations are:

- 4.2.1 A clear, concise Emergency Procedures Manual, regularly reviewed and updated which all key personnel are thoroughly familiar with. (All key personnel to keep a copy at home)
- 4.2.2 An effective Control Room/Centre.
- 4.2.3 An effective Fresh Air Base/s.
- 4.2.4 Conversant with all related hazards and effective treatment of the risk.
- 4.2.5 Correct Deployment of teams.
- 4.2.6 Availability of and speedy flow of Material down the mine.
- 4.2.7 Accurate monitoring of Ventilation Air and Gas Analysis.
- 4.2.8 Availability of Specialised Literature and Persons for consultation.
- 4.2.9 An effective two-way Communication System.
- 4.2.10 Access to Specialised Equipment.
- 4.2.11 An efficient Water Reticulation system.
- 4.2.12 Keeping in mind and treat them as such: Rescue brigade team members are well trained motivated persons but.....HUMAN
- 4.2.13 Prompt return to operation is essential in reducing the financial impact on an organisation of the loss of its ability to operation due to an emergency. Once the emergency has passed, a post mortem of the incident should be held. The procedures, instructions and strategy should be subject to reviewed. Any review, even if there are no changes, must be dated and signed by the responsible persons.

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Annexure 3 – Duties and Responsibilities in the Emergency Control Centre (Checklist)

ANNEX III - DUTIES AND RESPONSIBILITIES IN THE EMERGENCY CONTROL CENTRE (CHECKLIST)

(For information purposes only)

1. INTRODUCTION

When any **emergency** arises, it is essential that those involved are fully aware of their duties and responsibilities. This requirement extends to all levels of personnel and should be part of any **emergency** control centre.

Initially, the most senior technically qualified person takes charge and issues such immediate instructions deemed necessary to safe guard life and property. This person then contacts the appropriate subordinates putting into action the required response from each department.

These checklists are intended to ensure that actions required are carried out diligently and that information is retained for future reference during enquiries.

Kindly note that the checklists are generic to assist during most incidents, however, each incident may pose unique instructions that should be included on the checklist.

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2. DUTIES AND RESPONSIBILITIES IN THE CONTROL CENTRE

1. THE MANAGER

No.	ACTION	RESPONSIBLE PERSON	COMPLETED	SIGNATURE
1	Only one legal technical qualified manager take control.			
2	Establish a Record Logbook and arrange for a Scribe.			
3	Notify Rescue Manager to arrange for two own rescue teams to report to control.			
4	Notify mines rescue service provider regarding rescue team utilisation and assistance.			
5	Notify Department of Mineral Resources.			
6	Notify police in event of any fatalities.			
7	Arrange for press liaison personnel if applicable.			
8	Gather information from responsible persons and ask relevant questions.			
9	Identify affected areas. Evacuate employees from affected areas and clear shift.			
10	Identify critical equipment needed and delegate arrangement of it.			
11	Identify services needs and ensure availability.			
12	Brief all responsible persons accordingly (include contractors).			
13	Ensure all applicable persons sign a declaration of non-disclosure of information			
14	Barricade areas off and plot on plans.			
15	Decide on strategies in conjunction with management team.			
16	Set objectives. (Minimise loss or exposure of men, material, environment, costs)			
17	Draw up a duty roster. (Be flexible – the situation will determine the need. Ideal is to have two manager on twelve hour shifts continuity)			
18	Set times for progress report meetings and to re-assess strategies. Update pin board accordingly.			
19	Measure effectiveness of strategy plan to set objectives. Alternate plan if initial objectives cannot be met.			
20	Any changes to set objectives or entry to affected area must be approved by the manager in control.			
21	Determine labour requirements for the incident.			
22	Re-deploy other production labour.			
23	Notify other shaft or mines that may be affected.			
24	Brief and issue instructions to rescue teams.			
25	Ensure rescue teams documentation is in order.			
26	Record findings of teams in Record Logbook			
27	Debrief rescue teams.			
28	Brief management, service departments, DMR, Union, Health and Safety Representatives on situation, planned objectives, progress and strategy.			
29	Ensure rescue teams sign a disclosure of information document.			
30	Brief medical personnel on potential assistance needed (possible number of casualties).			
31	Issue rescue teams with a body recovery document if applicable.			
32	Issue rescue teams with a "Rescue from Refuge Chamber" document – if applicable			
33	Obtain fire/incident cost code form Accounting Department.			

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2. THE ENGINEER

No.	ACTION	RESPONSIBLE PERSON	COMPLETED	SIGNATURE
1	Report to Control Centre frequently.			
2	Ensure preferential treatment from power supplier (ESCOM).			
3	Supply control room personnel with telephone number of affected area.			
4	Notify other shafts/mines regarding power supply problems.			
5	Prepare contingency plan in event of loosing a fan.			
6	Ensure availability of hoists.			
7	Re-arrange scheduled shaft times if applicable			
8	Brief all responsible persons accordingly.			
9	Maintain dam level (plus 80% if possible).			
10	Be aware that pH of water will change.			
11	Notify other affected shafts of Point. 10.			
12	Ensure clearance of stations at affected levels.			
13	Ensure availability of transport where applicable.			
14	Ensure availability of equipment operators (Locos, Incline winches & Surface trucks).			
15	Arrange for applicable artisans to be placed on standby.			
16	Ensure availability of communication lines to Fresh Air Base.			
17	Ensure isolation of applicable services to affected area.			
18	Utilise and arrange necessary equipment/material from other shafts/mines.			
19	Arrange frequent inspections of fan blades in affected areas (tar accumulation).			
20	Ensure continuity of power supply to control room.			
21	Establish duty roster of applicable engineering personnel with sound knowledge of affected areas, detector heads where applicable and mine.			

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3. ENVIRONMENTAL

No.	ACTION	RESPONSIBLE PERSON	COMPLETED	SIGNATURE
1	From detector heads available, define the probable location of the fire (affected area).			
2	Identify affected areas and affected shift workers.			
3	Locate fire vent districts.			
4	Plan reconnaissance patrols if applicable.			
5	Identify safest routes to evacuate affected shift.			
6	Warn adjoining shafts/mines.			
7	If available, supply previous master fire plans of affected area.			
8	Identify dedicated chimney (borne risk in mine, consider as high risk area all the time).			
9	Schedule duty roster (shifts to overlap with manager in control. Do not change shift the same time as the manager).			
10	Provide/supply gas detectors, monitors, gas tubes.			
11	Interpret the fire behaviour and effectiveness of the total strategy. What effect will any changes have on the strategy?			
12	Advise management where work can continue without putting any employee at risk.			
13	Monitor	Status of main and booster fans		
		Pressure of sealed off area		
		Fire chimney conditions		
		Gas detector trends		

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4. SURVEY

No.	ACTION	RESPONSIBLE PERSON	COMPLETED	SIGNATURE
1	Supply control centre with plans and always have at least 3 complete sets of plans available.			
2	Ensure plans are updated accordingly after monthly planning sessions.			
3	Supply updated locality plans as required of affected area for rescue teams usage.			
4	Update rescue plans and colour as per master plan.			
5	Identify and mark current workings on plans. Add "self-stick notes" on plans with work group names and number of employees in the area.			
6	Highlight fire districts on plans.			
7	Highlight natural barriers on plans.			
8	Highlight faults on plans.			
9	Highlight boundary pillars and any hollows through them.			
10	Supply section plans for suspect areas.			
11	Identify reference pegs on plans.			
12	Schedule duty roster survey personnel conversant with affected area.			
13	Ensure access to survey office after hours.			

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5. HUMAN RESOURCES

No.	ACTION	RESPONSIBLE PERSON	COMPLETED	SIGNATURE
1	Ensure clearing of shift, report missing person(s).			
2	Supply updated telephone list of all related control personnel.			
3	Parade required employees needed for assistance.			
4	Ensure affected area personnel crush control.			
5	Arrange union and safety representatives.			
6	Arrange meetings when requested.			
7	Arrange update/progress meetings unions.			
8	Arrange/control media.			
9	Arrange security personnel when/where required (access control).			
10	Receive rescue teams and arrange change house accommodation.			
11	Supply meals and beverages to control personnel.			
12	Supply meals and beverages to rescue teams as required.			
13	Notify family member in cases of disaster.			
14	Arrange transport for family members when required.			
15	Arrange accommodation for family members when required.			
16	Arrange briefing times and area with family members.			
17	Arrange designated area for press releases if/when required (refreshment).			
18	Arrange necessary documentation in case of accidents or fatalities.			
19	Arrange guides/bearers for rescue teams if available.			
20	Arrange posttraumatic treatment for rescue teams if necessary.			
21	Arrange posttraumatic treatment for applicable employees involved with disaster if necessary.			
22	Arrange medical observation for employees and rescue teams being in contact with body fluids			
23	Arrange correspondence to management of assisting mines (thank you letters).			
24	Arrange parking and security for vehicles of rescue teams.			
25	Schedule duty roster to ensure continuity of service departments.			

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6. SECURITY

No.	ACTION	RESPONSIBLE PERSON	COMPLETED	SIGNATURE
1	Arrange access for mines rescue service provider and equipment.			
2	Arrange access for rescue teams, equipment and parking.			
3	Ensure access control of public.			
4	Ensure access control of press/media.			
5	Direct press/media to predetermine designated area (liaise with the Human Resource Department).			
6	Direct public to predetermined designated area (liaise with the Human Resource Department).			
7	Notify manager in control of press/public/media attendance.			
8	Barricade off area around shaft to ensure access for ambulance if applicable.			
9	Ensure crowd control.			
10	Ensure traffic control.			
11	Escort people into and out of mining area.			
12	Arrange investigation teams, if applicable (arson).			
13	Ensure equipment control from stores to underground.			

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7. MEDICAL

No.	ACTION	RESPONSIBLE PERSON	COMPLETED	SIGNATURE
1	Be available to conduct medical examination of mine rescue teams if required and enter findings on appropriate documents.			
2	Notify hospital(s) and other emergency medical personnel of incident magnitude, possible number of casualties, and type of injuries.			
3	Prepare medical facilities to be in state of readiness.			
4	Notify ambulance personnel to be on standby.			
5	Ensure readiness to proceed underground when required.			
6	Schedule medical staff for duration of incident.			
7	Supply manager in control with emergency telephone number of other emergency services available, if requested.			
8	Inform hospital(s) personnel in the event of rescue team members being in contact with body fluids.			

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Annexure 4 – Schedule of Additional References

ANNEX IV – SCHEDULE OF ADDITIONAL REFERENCES

(For information purposes only)

- Chamber of Mines Research Organization (COMRO) '*ResQpacs; How to calculate safe travelling distances*';
- The Lamproom Guidance Note issued by the Chief Inspector of Mines, OH-11-2003 dated 30-06-2003);
- Safety in Mines Research Advisory Committee, SIMRAC, research report COL 805 '*A Manual for best practice for emergency response procedures*';
- Safety in Mines Research Advisory Committee, SIMRAC, research report COL 801 '*Analysis of Emergency Care Provided for Injured Miners in the South African Mining Industry, and Recommendations for the provision of Emergency Care*';
- Disaster Management Act, Act No 57 of 2002;

Note: The above list is not exhaustive and it is recommended that publications from Mine Professional Organisations, SIMRAC, DMR, etc. could be consulted.

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Annexure 5 – Emergency Preparedness and Response Procedure – Scheduled Drills

Emergency Situation	Action Item	Responsible Person
Power Failures (Total and Partial)	Conduct annual power failure simulation to co-inside with ESKOM maintenance	Senior Engineer
Injury to an employee or employees	Conduct an annual simulation where rescue operations are required – such as proto teams or paramedics OR Serious injuries such as FOG accidents will be accepted as a drill only if a proper emergency control room is set up, a Manager take charge and all actions are logged.	Mine Manager
Damage to shaft/s or infrastructure	Conduct an annual simulation of action to be taken in the event of damage to the shaft or infrastructure	Senior Engineer
Flammable gas intersections or ignition	Conduct an annual simulation of flammable gas intersection and actions required OR Where a flammable gas intersection necessitated a full withdrawal, the incident can be reviewed with all actions taken and shortcomings addressed. Must be documented as such.	Snr OE Officer
Underground water intersections	Conduct an annual simulation of water intersection and actions required. OR Where a water intersection necessitated a full withdrawal, the incident can be reviewed with all actions taken and shortcomings addressed. Must be documented as such	Geology Manager Mine Manager
Surface and underground fires	Surface: Conduct quarterly fire drills Underground: Conduct monthly fire drills with crews and full withdrawal to refuge bays quarterly	Snr OE Officer Mine Manager
Flooding	Conduct an annual simulation in to the actions required should a flooding occur	Senior Engineer
Bomb threats and riots	Conduct an annual simulation to coincide with the surface fire drills	Security Superintendent
Chemical Spills	Annual testing of the procedure to be done as depicted in the ISO 14001 system	Senior Engineer

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Annexure 6 – Controls and Measures to prevent Covid-19 Infections

The Annexure forms part of this COP to be complied with and gives more detail regarding specific controls and measures to mitigate and manage COVID-19.

1. General controls to mitigate and manage COVID-19 infections
 - 1.1 Wear a mask at all times when at the mine
 - 1.2 Where queuing takes place maintain social distancing at all times 1-2 m
 - 1.3 When coughing or sneezing do so in your elbow and if using a tissue dispose thereof in a bin and immediately wash your hands
 - 1.4 Wash your hands frequently with soap and water for at least 20 seconds or sanitise
 - 1.5 All areas, equipment, desktops, instruments etc. where frequently touched must be wiped down with a cloth disinfected with a chemical suitable to mitigate the virus and used only for that purpose to prevent cross contamination.
 - 1.6 Immediately report when you feel ill with any of the symptoms as described in the training material and posters observed at the mine.
 - 1.7 Employees not to share bottles, food or food containers.

2. Specific controls related to this COP implemented to contain and prevent the spread of the virus
 - 2.1 All early warning systems to be disinfected with a cloth and a chemical that can eliminate the spread of the virus as supplied by the manager for that purpose
 - 2.2 Communication systems and apparatus to be wiped down with a disinfected cloth used for that purpose only to prevent cross contamination with a chemical that can eliminate the spread of the virus as supplied by the manager.
 - 2.3 The emergency room to be disinfected with a fog sprayer and wiped down with a disinfected cloth used for that purpose only to prevent cross contamination with a chemical that can eliminate the spread of the virus as supplied by the manager.
 - 2.4 All first aid equipment, stretchers bags, boxes, blankets etc., to be wiped down with a disinfected cloth used for that purpose only to prevent cross contamination with a chemical that can eliminate the spread of the virus as supplied by the manager.
 - 2.5 First aiders must wear the required PPE when tending to an injured person, paramedic to wear PPE as per standard requirements, non-sterile gloves, face shield or any other equipment as may be required for the emergency.
 - 2.6 All equipment to be wiped down with a disinfected cloth used for that purpose only to prevent cross contamination with a chemical that can eliminate the spread of the virus as supplied by the manager.
 - 2.7 Transport modes for emergencies to be disinfected with a fog sprayer and wiped down with a disinfected cloth used for that purpose only to prevent cross contamination with a chemical that can eliminate the spread of the virus as supplied by the manager.
 - 2.8 Refuge chambers to be disinfected with a fog sprayer and wiped down with a disinfected cloth used for that purpose only to prevent cross contamination with a chemical that can eliminate the spread of the virus as supplied by the manager.
 - 2.8.1 All telephone systems, controls, valves, first aid boxes door handles wiped down with a disinfected cloth used for that purpose only to prevent cross contamination with a chemical that can eliminate the spread of the virus as supplied by the manager.
 - 2.9 Where there is first aid boxes it must be wiped down with a disinfected cloth used for that purpose only to prevent cross contamination with a chemical that can eliminate the spread of the virus as supplied by the manager.

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Annexure 7 – List of related Codes of Practices and Management Standards

LIST OF RELATED CODES OF PRACTICES AND MANAGEMENT STANDARDS

(Forms part of this COP)

Document Title	Reference Number	Status of document
Record of Emergency Drills	ENV 14.4.4.7	Signed Off
Emergency Investigation	ENV 14.4.4.7.2	Signed Off
ENV Contractor Contact List	ENV 14.4.4.7.3	Signed Off
ENV Emergency Telephone List	ENV 14.4.4.7.4	Signed Off
Emergency Preparedness and response	ENV 14.4.4.7	Signed Off
Control of Records	MKP-ENV 14.4.5.4	Signed Off
Crises and evacuation in the underground environment (Including Refuge Bay Procedure).	MKP SHV 3.27	Signed Off
Refuge Bays	SHV 3.39	Signed Off
Baseline Risk Assessment	BRA	Signed Off

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Annexure 8 – Referenced Documents

REFERENCE DOCUMENTS

(For information, only)

References

1. Cook AP - "GAP 504". - The Occurrence, Emission and Ignition of Combustible Strata Gases in Witwatersrand Gold Mines and Bushveld Platinum Mines, and Means of Ameliorating Related Ignition and Explosion Hazards, 1999.
2. Chamber of Mines of South Africa - "Flammable Gas in Metal Mines". - A Guide to Managers.
3. The Mine Ventilation Society of South Africa - "Environmental Engineering in South African Mines".
4. "Mine Health and Safety Act" - Act No. 29 of 1996.
5. DMR "Code of Practice for Lamprooms".
6. DMR "Guidelines for the Prevention of a Flammable Gas Explosion in Mines other than Coal Mines"
7. SIMRAC report COL 605: Feb 2000 - Manual for best practice for emergency response procedure (Part 1,2,3,4).
8. Flammable Gas Measuring Instruments and Warning Devices SANS 1515-1:2002