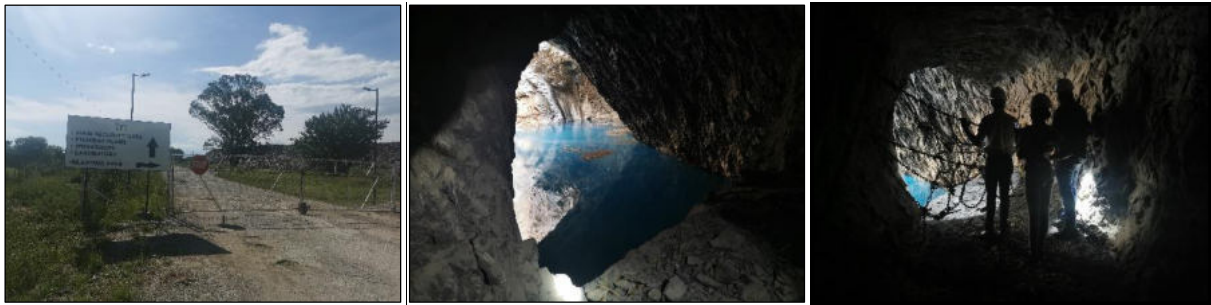


## Draft Environmental Management Plan (EMP)

**The Proposed Dewatering of the Underground Mine, through Asis West (AW) and Asis Far West (AFW) shafts in the Kombat Settlement of the Otjozondjupa Region, Namibia**



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**LIST OF ABBREVIATIONS**

<b>Abbreviation</b>	<b>Meaning</b>
AW	Asis West
AFW	Asis Far West
CSR/CSI	Corporate Social Responsibility/Corporate Social Investment
DEAF	Department of Environmental Affairs and Forestry
DWA	Department of Water Affairs
EA	Environmental Assessment
EAP	Environmental Assessment Practitioner
ECC	Environmental Clearance Certificate
EDS	Excel Dynamic Solutions
EIA	Environmental Impact Assessment
EMA	Environmental Management Act
EMP	Environmental Management Plan
I&APs	Interested and Affected Parties
LOM	Life of Mine
MAWLR	Ministry of Agriculture, Water and Land Reform
MEFT	Ministry of Environment, Forestry and Tourism
ML	Mining License
MME	Ministry of Mines and Energy
PPE	Personal Protective Equipment
Reg / S	Regulation / Section
SHE Officer	Safety, Health & Environmental Officer

# 1 INTRODUCTION

## 1.1 Project Background and Locality

Trigon Mining (Namibia) (Pty) Ltd<sup>1</sup> (hereinafter referred to as *Trigon Mining* or the *Proponent*) intends to dewater the underground of the Kombat Mine to enable underground exploration and mining activities on their Mining Licenses (MLs) No. 73B, 16 & 9, collectively referred to as the Mining License (the old Kombat Mine, hereinafter referred to as *the Mine*). The Mine is located close to the Kombat Settlement on the southern margin of the Otavi Mountain Range in the Otjozondjupa Region (Figure 1-1). Located about 41km east of Otavi on the B8 to Grootfontein, the Mine is a past-producing copper, lead and silver Mine that was intermittently in operation from the early 1900s to 2007, and has been on care and maintenance since early 2008.

The Mine currently comprises three shafts, namely Asis West (#1 shaft) (AW), Asis Far West (AFW) and #3 shaft. Underground mining activities are planned to recommence from AW and AFW shafts and this EMP therefore focuses on the dewatering of these two shafts.

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<sup>1</sup> The Kombat Mine is owned by Namibian company, Trigon Mining (Namibia), which is owned by: 80% - Trigon Metals (Canadian company, listed on the TSX Venture Exchange), 10% - Texel Mining and Exploration (local partner), and 10% - Epangelo Mining Company (Namibian state owned mining company). The Trigon group is focused on copper and silver exploration, development and mining in attractive jurisdictions in Africa

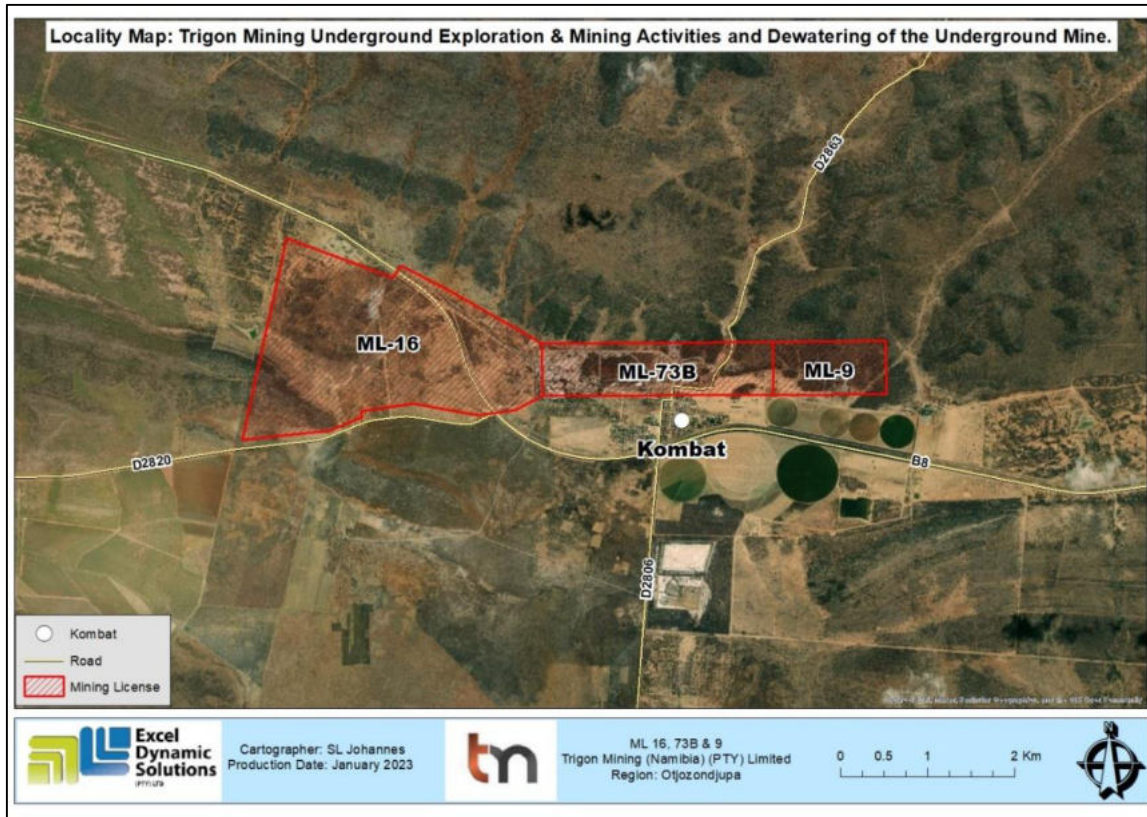


Figure 1-1: The locality map of the Kombat Mine in the Otjozondjupa Region

The three MLs were granted to the Proponent on the 4<sup>th</sup> of June 2021 and expire on the 3<sup>rd</sup> of June 2031, and are therefore active as indicated on the mining portal in Figure 1-2.

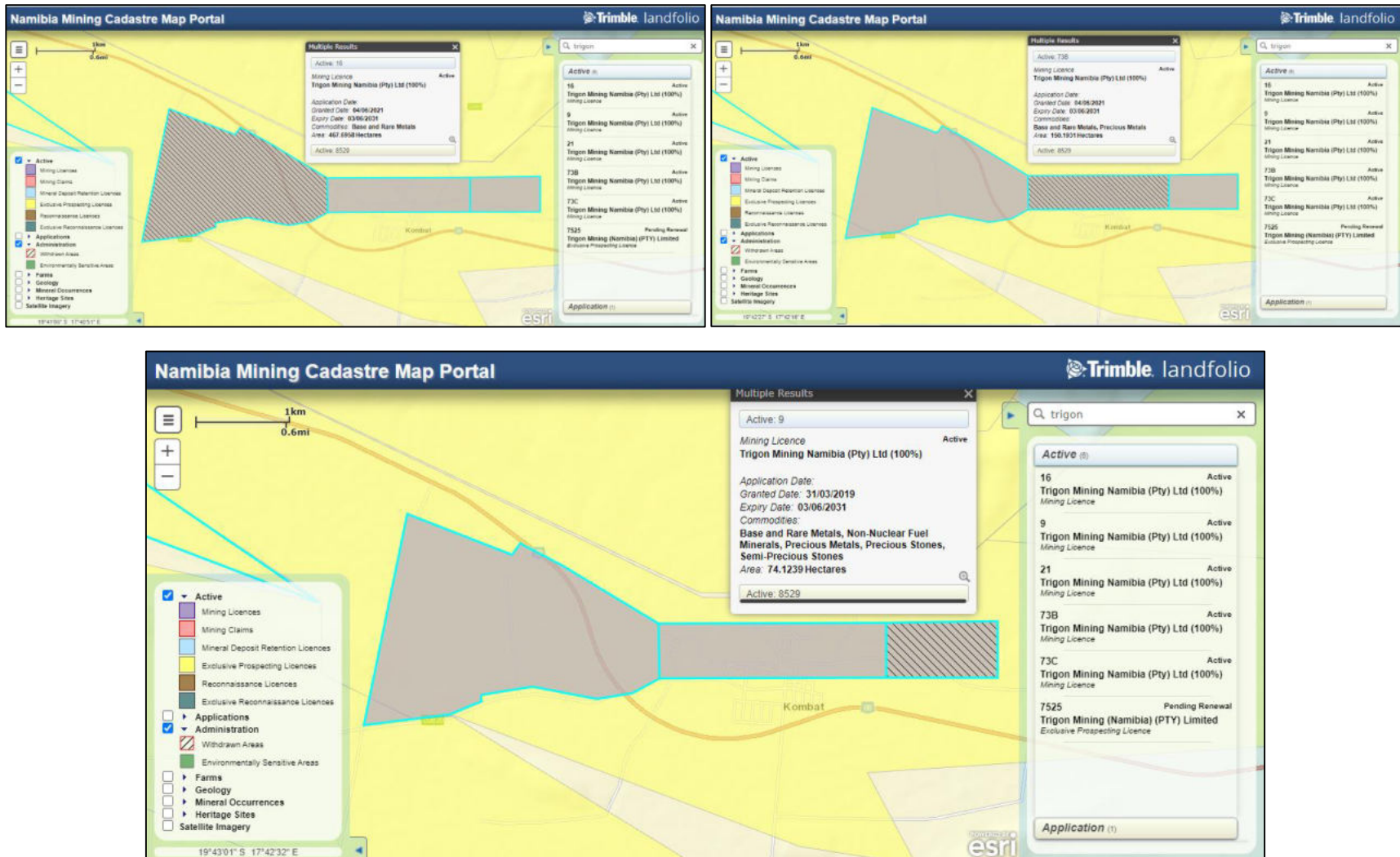


Figure 1-2: ML-73B, 16 and 9 on the Namibia Mining Cadastre Map Portal (source: <https://portals.landfolio.com/namibia/>)



To resume the mining activities, an ECC has been granted for surface mining activities, initially in July 2018 and renewed in June 2021. The Mine intends to expand its operations by undertaking underground exploration and mining works (to which an EIA Study is done concurrently to obtain an ECC). However, due to its location in an area with an abundance of water (Grootfontein-Tsumeb-Otavi Subterranean Water Control Area), the Mine has a history of, and still faces the challenge of, groundwater ingress that hinders mining works, which is anticipated to further impact underground mining activities, if not properly controlled (by managed dewatering). Therefore, the Mine dewatering needs to be done to enable the proposed underground mining works. The water abstracted from the underground mine will be pumped from the Mine through the shaft, from where it is distributed to off-takers such as a nearby commercial farm pipeline, NamWater's Eastern Carrier Water Supply Scheme, Kombat Settlement, Community projects and the Mine Plant (for Mine operations).

It should however be noted that dewatering activities are listed in the EIA Regulation as activities that may not be undertaken without an Environmental Clearance Certificate (ECC). This is stipulated under the Environmental Management Act (EMA) (2007) and its 2012 Environmental Impact Assessment (EIA) Regulations. The listed activities as per EIA regulations as relevant to the proposed activity are listed below:

#### "8. WATER RESOURCE DEVELOPMENTS

- 8.1 *The abstraction of ground or surface water for industrial or commercial purposes,*
- 8.2 *The abstraction of groundwater at a volume exceeding the threshold authorised in terms of a law relating to water resources."*

To fulfil the EMA requirements, Trigon Mining appointed Excel Dynamic Solutions (Pty) Ltd (EDS), independent Environmental Consultants. EDS' tasks are to conduct the required EIA process and submit the ECC application to the Environmental Commissioner at the Department of Environmental Affairs and Forestry (DEAF) at the Ministry of Environment, Forestry & Tourism (MEFT) for evaluation and consideration of the ECC.

Thus, an ECC for dewatering the underground mine environment needs to be applied for and obtained from the Environmental Commissioner upon completion and approval of the EIA Study before dewatering starts.

## 1.2 The Purpose of the Draft Environmental Management (EMP)

Regulation 8(j) of the EIA Regulations (2012) requires that a draft Environmental Management Plan (EMP) shall be included as part of the EIA report. A 'Management Plan' is defined as:

*"...a plan that describes how activities that may have significant environmental effects on the environment are to be mitigated, controlled and monitored."*

An EMP is one of the most important outputs of the EIA process as it synthesizes all the proposed management and mitigation and monitoring actions, set to a timeline and with specific assigned responsibilities. It provides a link between the impacts identified in the EIA process and the required mitigation measures to be implemented during mining. It is important to note that an EMP is a statutory document and a person who contravenes the provisions of this EMP may face imprisonment and/or a fine. This EMP is a living document and can be amended to adapt to address project changes and/or environmental conditions and feedback from compliance monitoring.

The purpose of this document is, therefore, to guide environmental management throughout the dewatering of the underground Mine at Kombat and associated works:

- **Planning and design phase** - This is the stage of the proposed project during which the Proponent prepares all the administrative and technical requirements needed for the activities. The planning includes things like obtaining the necessary permitting and authorization from relevant national authorities (such as the groundwater pumping permit), facilitating the recruitment and services and required goods procurement processes required for dewatering activities.
- **Actual dewatering** - This is the phase when Trigon Mining will commence with the dewatering of the underground Mine to enable underground exploration and mining works.

This Draft EMP will be used by the Proponent, employees and/or contractors to implement management measures to address the environmental impacts identified in the EIA. This is done to ensure that adverse impacts on the environment are avoided or limited if they cannot be avoided completely, while maximizing the associated positive impacts.

The brief description of the proposed activities is provided under Chapter 2.



## 2 PROJECT DESCRIPTION: PROPOSED DEWATERING WORKS

The proposed activities will entail dewatering of the underground Mine to enable underground exploration and mining activities on the three MLs at the Kombat Mine.

The proposed activities are presented under the following subheadings.

### 2.1 Dewatering Activities

When mining operations of the Mine extend below the water table, due to gravity, groundwater will infiltrate into the Mine workings. The constant influx may lead to flooding which would greatly impact the underground operations. This water flow/influx can only be regulated by continually pumping out the water, thus affecting the water table.

The dewatering process is planned for the Asis West (Shaft 1) and Asis Far West shafts both at 800m depths of the Mine.

#### 2.1.1 Planning and Design

Therefore, upon issuance of the ECC to Trigon Mining, they will plan for and design the dewatering systems and commence with the dewatering works onsite. For underground mines, to keep groundwater ingress under control, the following need to be considered by the Proponent:

- Removing potential water hazards,
- Installing water diversion systems,
- Installing a system (both on the surface and underground) to monitor hydrogeological and geotechnical aspects,
- Projecting hydrological and hydrogeochemical development of the Mine's water.

#### 2.1.2 Project Inputs (Resources)

Inputs and resources to undertake the proposed activities will include:

- Dewatering / pumping systems.
- Pumped water diversion and storage systems.
- Water monitoring systems (boreholes/wells).
- Power supply (to power the dewatering systems): The proposed dewatering systems will be powered by the existing Mine power supply system.

- Potential Accidental Fire Outbreaks: A minimum of two fire extinguishers and associated fire control measures will be readily available onsite throughout the dewatering duration.

### 2.1.3 Dewatering Phase

Once the system is designed and installed underground (and surface, where necessary), Trigon Mining will commence with groundwater pumping from underground to the surface.

To ensure that the pumped water from underground is contained and/or put to good use, thus preventing surface flooding, this water will be pumped from the Mine through the shaft system, from where it is distributed to offtakers.

#### 2.1.3.1 Current Water Arrangements and Volumes (Surface Mining)

The water pumped from the Mine as part of surface mining activities is currently handled through the following ongoing engagements with:

- NamWater currently pump water to the eastern water carrier at around 600m<sup>3</sup>/h from Shaft 1. The NamWater infrastructure can accommodate a pumping rate of 1,200m<sup>3</sup>/hr.
- Mr. Von Biljon (local farmer) pumps water from Shaft 3 for irrigation purposes at a rate of 300m<sup>3</sup>/hr.
- The mine currently supplies Kombat town with 100m<sup>3</sup>/hr from Shaft 1 via the mine's existing pumping infrastructure.

#### 2.1.3.2 Proposed Water Offtakers and Volume (Underground Mine)

The key offtakers for the pumped water from underground mine include a nearby commercial farm pipeline, NamWater's Eastern Carrier Water Supply Scheme, Kombat Settlement, Community projects and the Mine Plant (for Mine operations). The pumped water will be allocated to offtakers as presented in Table 2-1 below.

**Table 2-1: The planned volumes of water to be allocated to offtakers during dewatering (Trigon Mining (Namibia), 2023)**

Dewatering offtake		Month 1	Month 2	Month 3	Month 4	Month 5
No 1 shaft submersible pump rate	m <sup>3</sup> /hr	1 600	1 720	1 720	1 720	1 720
Water offtake						
NamWater	m <sup>3</sup> /hr	1 200	1 200	1 200	1 200	1 200
H v Biljon farmer	m <sup>3</sup> /hr	300	300	300	300	300
Kombat town	m <sup>3</sup> /hr	100	100	100	100	100
Processing plant	m <sup>3</sup> /hr	0	120	120	120	120
Asis Ost old workings	m <sup>3</sup> /hr	0	0	0	0	0
Sum of offtake	m <sup>3</sup> /hr	1 600	1 720	1 720	1 720	1 720

For AW, a total of 6.1 million cubic metres (6,100,000m<sup>3</sup>) will be pumped over a period of 5 months at an installed pump capacity of 2,000m<sup>3</sup> per hour and actual pumping rate of 1,720m<sup>3</sup> per hour.

There is also an opportunity to include the Asist Ost old workings as an additional offtaker at a capacity of approximately 200,000m<sup>3</sup>. The excavation is on farm land and the farm owner also needs the water. If this is done, the total pumping time for dewatering will be reduced by approximately half a month (15 days).

Pumping from AFW will only commence once water levels at AW have reached a steady state pumping requirement of 1,200m<sup>3</sup>/h to maintain water levels underground. Dewatering of AFW will then commence at a rate of 400m<sup>3</sup>/h over a 1 month period.

The dewatering activities are governed by certain legal requirements, and these are provided under the next chapter.

### 3 LEGAL FRAMEWORK: PERMITTING AND LICENSING

The Proponent has the responsibility to ensure that all the dewatering and associated activities conform to the principles of the EMA and other relevant legal requirements as listed in the EIA Report. Table 3-1 below lists the requirements of an EMP as stipulated by Section 8 (e) of the EIA Regulations and associated governing legal requirements, primarily on specific approvals and permits that may be required for the proposed project activities.

**Table 3-1: The list of applicable of legal requirements and permits to the proposed dewatering**

Legislation/Policy/ Guideline: Custodian	Relevant Provisions	Implications for this project
Environmental Management Act (No. 7 of 2007)  2012 Environmental Impact Assessment (EIA) Regulations:  <b>Ministry of Environment, Forestry and Tourism (MEFT)</b>	The EMA has stipulated requirements to complete the required documentation to obtain an Environmental Clearance Certificate (ECC) for permission to undertake certain listed activities.	The ECC should be renewed every 3 years (counting from the date of issuance) at least 3 months before expiry date.  The contact details at the Department of Environmental Affairs and Forestry (DEAF), Ministry of Environment, Forestry and Tourism (MEFT), Office of the Environmental Commissioner  <b>Mr. Timoteus Mufeti</b>  <b>Tel: +264 61 284 2701</b>
Petroleum Products and Energy Act (No. 13 of 1990) Regulations (2001): <b>Ministry of Mines and Energy (MME)</b>	Regulation 3(2)(b) states that “No person shall possess or store any fuel except under authority of a licence or a certificate, excluding a person who possesses or stores such fuel in a quantity of 600 litres or less in any container kept at a place outside a local authority area”  A consumer installation certificate is required in terms of Regulation 19 (5) of the Act.	The Proponent has fuel storage tanks of more than 600 litres onsite, and the Permit (Consumer Installation Certificate No. CI/2806/2021) was granted (issued by the Minister of Mines and Energy) on 30 July 2021.  <b>Mr. Carlo Mcleod (Ministry of Mines and Energy: Acting Director – Petroleum Affairs)</b>  <b>Tel: +264 61 284 8291</b>

Legislation/Policy/ Guideline: Custodian	Relevant Provisions	Implications for this project
Water Act 54 of 1956: <b>Ministry of Agriculture, Water and Land Reform (MAWLR)</b>	Prohibits the pollution of water and implements the principle that a person disposing of effluent or waste has a duty of care to prevent pollution (S3 (k)).  Provides for control and protection of groundwater (S66 (1), (d (ii)).  Liability of clean-up costs after closure/abandonment of an activity (S3 (l)). (l)).	The permits and license required thereto should be obtained from MAWLR's relevant Departments and ensure compliance to stipulated conditions and timely renewals.  These permits include Borehole Drilling Permits, Groundwater Abstraction & Use Permits, and most importantly a special permit to dewater the underground Mine.
Water Resources Management Act (No 11 of 2013): <b>Ministry of Agriculture, Water and Land Reform (MAWLR)</b>	Ensure that the water resources of Namibia are managed, developed, used, conserved and protected in a manner consistent with, or conducive to, the fundamental principles set out in Section 66 - protection of aquifers, Subsection 1 (d) (iii) provide for preventing the contamination of the aquifer and water pollution control (S68).	<b>Contact: Mr. Franciskus Witbooi</b> <b>Division: Water Policy and Water Law Administration Division</b> <b>Tel: +264 61 208 7158</b>  Where necessary, and when required, the Wastewater / Effluent Discharge Permit should be applied from MAWLR.  <b>Water Environment Division</b> <b>Contact: Ms. Elise Mbandeka</b> <b>Tel: +264 61 208 7167</b>

The EMP implementation at the Mine will be done by different parties involved in the project activities, and these roles and responsibilities are provided under the next chapter.

## 4 EMP IMPLEMENTATION ROLES AND RESPONSIBILITIES

Trigon Mining (Namibia) is ultimately responsible for the implementation of the EMP (management and mitigation measures provided under the next chapter). However, Trigon Mining may delegate this responsibility or part of it to someone else at any time, as they deem necessary. The roles and responsibilities of all delegates/parties involved in the effective implementation of this EMP are set in Table 4-1.

**Table 4-1: The persons and institutions responsible for the Implementation of the Draft EMP**

Role (Person and or Institution)	Responsibilities
Trigon Mining (Namibia) (Pty) Ltd. (Proponent)	<ul style="list-style-type: none"> <li>-Managing the implementation of this EMP and updating and maintaining it when necessary.</li> <li>-Management and monitoring of individuals and/ or equipment on-site in terms of compliance with this EMP and issuing fines for contravening EMP provisions.</li> </ul>
General Manager / VP Operations	<p>This individual will be responsible to ensure that all the associated works of the project are completed on time, and therefore, their responsibilities are to:</p> <ul style="list-style-type: none"> <li>-Ensure that relevant commitments contained in the EMP are adhered to.</li> <li>-Ensure relevant staff are trained in procedures entailed in their duties.</li> <li>-Maintain records of all relevant environmental documentation for the project.</li> <li>-Review the EMP annually and amend the document when necessary.</li> <li>-Issue fines to individuals who may be in breach of the EMP provisions and if necessary, remove such individuals from the site.</li> <li>-Cooperate with all relevant Interested and Affected Parties (I&amp;APs) /stakeholders.</li> <li>-Develop and manage schedules for daily activities</li> </ul>
Safety, Health & Environmental (SHE) Officer	<p>The SHE Officer will have the following responsibilities:</p> <ul style="list-style-type: none"> <li>-Management and facilitation of communication between the Proponent, and Interested and Affected Parties (I&amp;APs) or stakeholders regarding this EMP.</li> <li>-Conducting site inspections of all areas with respect to the implementation of this EMP (monitor and audit the implementation of the EMP).</li> <li>-Advising the Proponent or General Manager on the removal of person(s) and/or equipment not complying with the provisions of this EMP.</li> </ul>

Role (Person and or Institution)	Responsibilities
	<ul style="list-style-type: none"> <li>-Making recommendations to the General Manager with respect to the issuing of fines for contraventions of the EMP.</li> <li>-Undertaking an annual review of the EMP and recommending additions and/or changes to this document.</li> </ul>
Public Relations Officer (PRO)	<p>The PRO will be responsible for the following tasks:</p> <ul style="list-style-type: none"> <li>-Liaison between the affected communities and the Proponent.</li> <li>-Ensure effective communication with stakeholders, local and neighbouring communities, media (if necessary) and the public.</li> <li>-Organising and overseeing public relations activities, and managing public relations issues.</li> <li>-Preparing and submitting public relations reports, if required.</li> <li>-Collaborating with personnel and maintaining project-related open communication among personnel.</li> </ul>

The next chapter presents the key impacts identified and for which the management and mitigation measures were prepared for implementation. The measures are provided under subheading 5.2.



## 5 ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

### 5.1 Identified Key Potential Impacts

The potential positive and negative impacts that have been identified from the proposed dewatering activities are listed below:

Positive impacts	Negative (adverse) impacts
<ul style="list-style-type: none"> <li>• Employment opportunities for the dewatering team</li> <li>• Improve the viability of the Mine: the target copper ore body on the Mine lies beneath the water table. Therefore, to mine (extract) the ore, dry conditions (by dewatering) should be created so that mining can be carried out,</li> <li>• Increase mine production and potential life of the Mine,</li> <li>• Improve the geotechnical stability and efficiency of mining operations onsite, and</li> <li>• Improve Mine safety and efficiency of working conditions.</li> </ul>	<ul style="list-style-type: none"> <li>• Potential lowering of groundwater level downstream and affecting local aquifers (affecting the downstream users depending on the same groundwater resource).</li> <li>• Impact on biodiversity such as vegetation that depends on the groundwater at the current (pre-dewatering) water table.</li> <li>• Occupational health and safety risks associated with operating and maintenance of dewatering systems (machinery and equipment).</li> <li>• Land subsidence due to excessive groundwater pumping (abstraction) from of the rock environment.</li> </ul>

### 5.2 The Environmental Management and Mitigation Measures

The management actions are aimed at avoiding the above-listed potential negative impacts, where possible. Where it is impossible to avoid these impacts, measures are provided to reduce the impacts' significance while maximizing the project benefits (positive impacts).

The management and mitigation measures recommended for the potential impacts described and assessed in the EIA Report are provided in Table 5-1 and Table 5-2.

Table 5-1: The Environmental Management and Measures for the Planning of Dewatering Works

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
<b>Planning and Design</b>					
EMP implementation and training	Lack of EMP awareness and implications thereof	<ul style="list-style-type: none"> <li>-A Comprehensive Health and Safety Plan for the activities should be compiled.</li> <li>-An EMP non-compliance penalty system should be implemented on site.</li> <li>-The ECC should be renewed on time (at least 3 months prior to expiry date).</li> <li>-Appoint a Safety Health Environmental (SHE) Officer to manage the EMP implementation and monitoring.</li> </ul>	<ul style="list-style-type: none"> <li>-All required EMP implementation plans/ systems are in place.</li> <li>-Timely ECC Renewal</li> <li>-Bi-Annual Environmental reporting</li> <li>-Appointed SHE Officer</li> </ul>	<ul style="list-style-type: none"> <li>-Proponent</li> <li>-General Manager</li> </ul>	-Pre-dewatering
Authorizations	Lack of Permits/ Licenses	<ul style="list-style-type: none"> <li>-All the required agreements and licenses / permits should be obtained before dewatering activities commence, or as required. The permits, agreements referred to herein mainly include:</li> <li>(a) Groundwater Abstraction &amp; Use / Distribution permit from MAWLR</li> </ul>	<ul style="list-style-type: none"> <li>-Applicable permits and licenses are obtained from relevant authorities.</li> <li>-Agreements/permits signed and obtained from on time.</li> </ul>	<ul style="list-style-type: none"> <li>-Proponent</li> <li>-General Manager</li> </ul>	-Pre-dewatering and when necessary, throughout
Dewatering systems	Poor designs and subsequent failures	-The dewatering pumps and associated systems should be properly designed (up-to-standard) and installed to ensure that there are no failures that may lead to catastrophe such as flooding owing to broken or burst water pipelines and pump system failures.	-The dewatering systems comply with international best practice	-Proponent	-Pre-dewatering

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
Socio-economy	Creation of employment opportunities:  The conflicts and tension arising owing to giving employment opportunities to outsiders over locals	-Opportunities for the training of unskilled and skilled workers from local communities should be maximized and employed for dewatering related works.  -Minimize the influx of outsiders into the area for works that can be done by the locals by prioritizing the employment of more local people.	-Number of locals employed for mining activities are mainly from the local communities for all the work that they can do.	-General Manager	Pre-dewatering and when necessary, throughout
	Procurement of goods and services: The conflicts arising owing to offering opportunities to outsiders over locals for locally	-Preference should be given, where practically and economically possible and feasible, to Namibian companies with strong local participation, when of procuring services and goods.	-Record of hired or contracted companies or services providers	-Proponent  -General Manager	Pre-dewatering

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
	available services				

Table 5-2: The Environmental Management and Measures for the Dewatering Works

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
<b>Dewatering Phase</b>					
EMP implementation and training	Lack of EMP awareness and implications thereof	<ul style="list-style-type: none"> <li>-EMP training should be provided to all workers on site.</li> <li>-All site personnel should be aware of necessary health, safety, and environmental considerations applicable to their respective work.</li> <li>-The implementation of this EMP should be monitored.</li> <li>The site should be inspected, and a compliance audit done throughout <b><u>the project activities, monthly.</u></b></li> <li>-Implement an EMP non-compliance penalty system.</li> </ul>	<ul style="list-style-type: none"> <li>-Compliance monitoring conducted bi-annually and should be recorded.</li> <li>-The ECC is renewed every 3 years</li> <li>-Records of EMP training conducted.</li> </ul>	-SHE Officer	Throughout the project cycle
Communication between the Proponent and affected communities (farmers)	Lack of communication (proper liaison) between affected water users and Proponent with	-The contact details of the PRO or Community Liaison Officer should be provided to affected farmers and Kombat Settlement Office for easy communication and receiving of grievances and complaints for addressing.	<ul style="list-style-type: none"> <li>-PRO is part of the project personnel.</li> <li>-Communities grievances are addressed to satisfaction</li> </ul>	-General Manager  -PRO	Throughout the project cycle

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
	regards to groundwater pumping	-The Proponent should compile a clear communication procedure / plan which should include a grievance and response mechanism.			
Groundwater	Lowering of water levels in downstream boreholes	<p>-Establish a dedicated mine operated ground- and surface water monitoring network to monitor the impact of dewatering and possible ground- and surface water pollution due to the planned mining operations. Monitoring by other stakeholders, i.e. irrigation farmers with abstraction permit, DWAF and NamWater should be continued on a routine basis.</p> <p>-A Groundwater abstraction permit should be obtained from the Department of Water Affairs (DWA) for the dewatering of the underground mine, AW and AFW Shafts and water supply of the mining operations. This has to be coordinated with NamWater who are pumping from dedicated production boreholes intersecting the mine workings near Shaft 1 and plan to abstract more than 700m<sup>3</sup>/h for supplementary water supply to the Central Areas of Namibia. It was agreed between the two parties to apply for a joint abstraction permit with the DWA.</p> <p>-Inflow into AFW shaft should chemically sealed where possible to reduce impact on surrounding groundwater levels and avoid the abstraction of excess water.</p>	<p>-Water levels from boreholes on and around Kombat, are taken and recorded in a database for annual auditing</p> <p>-A Groundwater Monitoring programme is established and updated as required (monthly for water levels) and quarterly (for water quality)</p>	<p>-General Manager</p> <p>-SHE Officer / Geologist</p>	Throughout the project cycle

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
		<p>-The SLR Namibia 2018 modelling report and groundwater model should form the basis for the abstraction permit application and the permit will specify what frequency and type of groundwater monitoring is required. Where required by authorities to update the model, this should be done accordingly.</p> <p>-The continuous monitoring of groundwater will allow the assessment of possible negative impacts of abstraction on farmers and other water users in the surroundings of the Kombat Mine. If a user is negatively impacted, e.g. the water level dropped due to the additional abstraction for mining purposes and the borehole does not yield the usual volumes then the Kombat Mine should compensate the user. That could be the deepening of a boreholes, the drilling of a new borehole or the supply of water by other means.</p> <p>-Groundwater levels before mine dewatering should be taken from boreholes on and around Kombat at least 3 consecutive months prior to mining activities to establish the baseline groundwater information. This information should be recorded in a Groundwater Monitoring Program database and shared with affected communities, when requested.</p> <p>-Within a minimum 2km radius of the Mine, groundwater levels should be recorded every month from the first month of mine dewatering. The data should be recorded</p>			

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
		<p>in a database for inclusion in Environmental monitoring reporting.</p> <p>-The volumes and pumping frequency of water approved by the DWA at the MAWLR should be adhered to, i.e., adhere to the pumping threshold to minimize the impact on other water users and the environment, while allowing sustainable mining works.</p> <p>-Groundwater levels should be recorded every month from the first month of dewatering. The data should be recorded in a database for inclusion in Environmental monitoring reporting.</p>			
Water Resources Use	Over-abstraction (water demand and availability)	<p>-Water should be used efficiently, and reuse/recycling methods should be implemented as far as practicable onsite.</p> <p>-Water conservation awareness and saving measures training should be provided to all the project workers so that they understand the importance of conserving water and become accountable.</p>	<p>-Water supply agreements are in place</p> <p>-Water permits are obtained</p>	-SHE Officer / Geologist	<p>Throughout the project cycle</p> <p>Once off supply agreement</p>
Land subsistence induced by different rock damage mechanisms	Excessive groundwater pumping trigger ground movement	<p>-The hydrogeological conditions of the underground workings should be constantly monitored to ensure the balance between mining operations and rock stability.</p> <p>To mitigate against land subsistence, the following method is recommended :</p>	<p>-Geotechnical and hydrogeological monitoring stations</p> <p>-Regular reporting on the rock stability</p>	<p>-General Manager</p> <p>-SHE Officer</p>	Throughout the project cycle



Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
		<p><u>-Backfill:</u></p> <p>When stopes are being mined, and when mined out, fill the stopes with backfill material. Backfill material will consist of waste rock, or cemented tailings, or a combination of these.</p>			
Occupational Health and safety	<p>General health and safety associated with dewatering (handling of machinery and equipment)</p>	<p>-Provide personnel with adequate and appropriate personal protective equipment (PPE) such as coveralls, gloves, safety boots, earplugs, dust masks, safety glasses, etc.</p> <p>-Commit to and make provision for annual full medical check-up for all personnel at site to monitor the impact of project related activities on them.</p> <p>-Heavy vehicle, equipment and fuel storage site should be properly secured, and appropriate warning signage placed where visible.</p> <p>-Project personnel should be provided with an awareness training of the risks of mishandling equipment and materials on site as well as health and safety risk associated with their respective jobs.</p> <p>-An emergency preparedness plan should be compiled, and all personnel appropriately trained.</p> <p>-Personnel must not be allowed to consume alcohol while working nor allowed onsite when under the influence.</p>	<p>-Comprehensive health and safety plan for all activities compiled.</p> <p>-Occupational Health and Safety Personnel</p> <p>Health and Safety Trainings</p> <p>-Well-furnished first aid kits</p> <p>-Trained worker to administer first aid</p>	<p>-Proponent</p> <p>-General Manager</p> <p>-SHE Officer</p>	<p>Throughout the project cycle and trainings offered as and when required</p>

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
	Potential increase of prevalence of HIV/AIDS, and other sexually transmitted diseases (STDs)	<ul style="list-style-type: none"> <li>-The workers should be engaged in health talks and training about the dangers of engaging in unprotected sexual relations which results in contracting HIV/AIDS and other sexual related infections.</li> <li>-Provision of condoms and sex education through distribution of pamphlets and health trainings. These pamphlets can be obtained from local health facilities.</li> </ul>	<ul style="list-style-type: none"> <li>-No new infections recorded linked to project workers</li> <li>-Occupational health and safety personnel</li> <li>-Sex and Health Education / Awareness</li> </ul>	<ul style="list-style-type: none"> <li>-General Manager</li> <li>-SHE Officer</li> </ul>	Throughout the project cycle and trainings offered as and when required
	Accidental fire outbreak	<ul style="list-style-type: none"> <li>-Sufficient portable, and frequently serviced fire extinguishers should be provided on site.</li> <li>-No open fires to be created by project personnel, both surface and underground.</li> <li>-Potential flammable areas and structures such as fuel storage tanks should be marked as such with clearly visible signage.</li> </ul>	<ul style="list-style-type: none"> <li>-No open fires onsite</li> <li>-Fire extinguishers (1 per vehicle), and 1 per working site</li> </ul>	<ul style="list-style-type: none"> <li>-General Manager</li> <li>-SHE Officer</li> </ul>	Throughout the project cycle
Littering and waste management (general waste and sanitation)	Environmental Pollution	<ul style="list-style-type: none"> <li>-Project personnel should be sensitized to dispose of waste in a responsible manner and not to litter.</li> <li>-Ensure that there are no wastes left at the working sites at the end of each day.</li> <li>-All domestic and general operational waste produced daily should be contained onsite until such that time it will be transported to the surface for disposal to the nearest designated waste management sites.</li> </ul>	<ul style="list-style-type: none"> <li>-No visible litter within and around the working areas</li> <li>-Provision of sufficient waste storage containers</li> <li>-Waste management awareness</li> </ul>	-SHE Officer	Throughout the project cycle

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
		<ul style="list-style-type: none"> <li>-Burying and burning of waste onsite is prohibited.</li> <li>-Underground working sites should be equipped with separate waste bins for different waste types.</li> <li>-Sewage waste, if not connected to sewage system, should be stored as per the portable chemical toilets supplied on site and regularly disposed of at the nearest treatment facility</li> <li>-An emergency plan should be available for major/minor spills at the site and during the transportation of the product(s) such as fuel to site.</li> <li>-Ensure careful storage and handling of fuels on site.</li> </ul>	<ul style="list-style-type: none"> <li>-Waste disposal permits to municipalities</li> <li>-Environmental, Health and Safety Statements and Policy</li> </ul>		
	<p>Wastewater generated by personnel onsite</p>	<ul style="list-style-type: none"> <li>-Pollutants such as hydrocarbons (fuels) and wastewater should be contained on site and disposed of in accordance with municipal hazardous and wastewater discharge standards to prevent groundwater pollution.</li> <li>-Provide sufficient and functioning toilet facilities for workers (mobile/portable chemical toilet).</li> <li>-Open defecation is not allowed on surface nor underground areas. Make use of provided toilets.</li> <li>-Emptying the chemical toilets according to the manufacturer's specifications.</li> </ul>	<ul style="list-style-type: none"> <li>-Adequate toilet and basic ablution facilities.</li> <li>-Sewage removal operator</li> <li>-Waste treatment agents/chemicals</li> </ul>	<ul style="list-style-type: none"> <li>-General Manager</li> <li>-SHE Officer</li> </ul>	<p>Throughout the project cycle</p>