

**Report  
Version – Final**



**April 2023**

**PROJECT STATUS**

<b>Title</b>	Updated Environmental Management Plan for the base and rare metals (copper ore) mining activities on mining claims 74169,74170, 74171, 74172, 74173, 74174, 74175, 74176, 74177 & 74178 situated at Ombuku Village, Opuwo District, Kunene region, Namibia.		
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## ABBREVIATIONS

AIDS	Acquired Immuno-Deficiency Syndrome
ESA	Environmental & Social Assessment
ECC	Environmental Clearance Certificate
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMA	Environmental Management Act
EMP	Environmental Management Plan
GG	Government Gazette
GIS	Geographic Information System
GN	Government Notice
GPS	Global Positioning System
HIV	Human Immuno-deficiency Virus
I&APs	Interested and Affected Parties
NHCN	National Heritage Council of Namibia
PR	Proponent's Representative
Reg.	Regulation
S	Section
TB	Tuberculosis

## 1. INTRODUCTION

Mining is an important sector in the Namibian economy. The sector contributes significantly to GDP, export revenues and government tax receipts. The expansion and development of this sector is however constrained by mainly insufficient investment in mineral exploration. Globalisation has impacted on the market for international investments by increasing the levels of competition for financial resources.

The Government of Namibia recognises that the exploration and development of its mineral wealth could best be undertaken by the private sector. Government therefore focuses on creating an enabling environment through appropriate competitive policy and regulatory frameworks for the promotion of private sector investment coupled with the provision of national geo-scientific data bases essential for attracting competitive exploration and mining (Draft Minerals Policy of Namibia, MME).

The EMP will be a living document, developed in consultation with investors, to be reviewed and updated after two years. More broadly, it will provide a blueprint for handling environmental issues related to copper mining at the mining claims 74169,74170, 74171, 74172, 74173, 74174, 74175, 74176, 74177 & 74178 at Ombuku Village in the Kunene region of Namibia over the next 25 years, within the broader context of environmental and social sustainability.

### 1.1 Benefits and target population

Managing and mitigating environmental problems in the mining sector would yield economic benefits from improved human health and ecosystem functions in the Ombuku Village area where the mining claims are situated. Health benefits will accrue from reduced exposure to environmental pollution and to the risk of accidents. The Project would also indirectly help improve worker health and safety conditions in existing and future mining enterprises, by strengthening the regulatory framework.

The proposed project will indirectly benefit the people of Namibia by removing a potential impediment to new private investments. The proposed project will improve the capacity of mandated national agencies to regulate mining activities. It will strengthen the management and planning capacities of Techmine Investment CC, and of delegated authorizing agencies such as MEFT, and improve the skills of staff from these agencies to do strategic planning, monitoring, and to evaluate environmental issues and proposed mitigation measures. The Project would also help strengthen national capacity in environmental management through consultancies, studies, and targeted training.

## 1.2 The main environmental issues related to mining at the mining claims at Ombuku Village are:

### a) Air Pollution

The major environmental issue on the mining claims is air pollution. Dust can severely affect the health of neighboring populations (especially respiratory problems) in Ombuku village.

### b) Soil Contamination

Leaking hydrocarbons such as oil/diesel/ petrol during mining operations can contaminate soil.

### c) Water pollution

Several ephemeral rivers are found within Epupa and the mining claim areas. This makes the area susceptible to flooding in some areas during the rainy season. Runoff and leakage from existing waste rock dumps may pollute streams flowing out of the mine areas, causing widespread negative impacts downstream from the mines that extend as far as the Kunene River and affect wetlands and tributaries. The pollution has an impact on human health and ecological functions that is not fully determined. Lower water quality leads to increased water treatment costs. The pollution from the waste rock dumps needs to be contained and the sites rehabilitated. There are currently no visible surface water bodies to be considered regarding the proposed mining claim sites, as there are no perennial water sources in the area. However, surface water impacts may be encountered during the operation phase, especially if excavation takes place within the rainy season.

The risk of contaminating such water sources can be increased by accidental spillage of oils and fuels and any other equipment used during operation. This risk is minimised by the fact that the extraction phase will be within the long dry season.

The main foreseen environmental problems at the mining claims (74169,74170, 74171, 74172, 74173, 74174, 74175, 74176, 74177 & 74178) are deforestation, soil contamination, pollution, land dereliction, poor modern sanitation, unplanned makeshift homes around the mines and noxious weeds arising from eutrophication of any nearby water bodies by sewage effluent. The impact of pollution from mining activities is compounded by the fact that nearly ninety per cent of the populations in Ombuku Village are nomadic pastoralists. This has resulted in concentrated demand for natural resources, such as grazing land, water, energy and food. Competing demands for water by livestock and households is already constraining the sustainable use of water resources. Mining and other industrial activities have generated

air, water and land pollution. Over dependence on firewood for fuel and wood to build temporary structures by households has been the main cause of deforestation in the Ombuku Village.

An EMP is one of the most important outputs of the EA process as it synthesises all the proposed mitigation and monitoring actions, set to a timeline and with specific assigned responsibilities. This EMP details the mitigation and monitoring actions to be implemented during the following phases of these copper mining activities:

- Copper ore mining Phase – the period during which the proponent, having dealt with the necessary legislative and administrative arrangements, appoints a contractor to engage in the mining of copper ore from the mining claim site to be transported to the various smelters for commercial value addition & Walvis Bay port for export purposes;
- Transportation Phase- the period during which the proponent transports the copper ore from the mine to the various smelters for commercial value addition & Walvis Bay port for export.
- Operation and Maintenance – the period during which the services infrastructure will be fully functional and maintained.

It should be noted that to date, basic mining equipment such as an excavator, loader and heavy duty hammer from the exploration phase are still on site and these will be added to the plant that will be brought in to carry out the copper ore mining operations going forward.

The decommissioning of these developments is not envisaged any time soon; however in the event that this should be considered some recommendations have been outlined in **Table 12**.

### **1.3 Environmental Management and Monitoring Plan**

This EMP presents a summary of the various impacts as identified from the site visit at mining claims 74169,74170, 74171, 74172, 74173, 74174, 74175, 74176, 74177 & 74178 at Ombuku Village and the mitigation measures that must be put in place at the copper ore mining claims in order to reduce the negative impacts of the project on the environment. The proponent, Mr. Lukas Askel, representing Techmine Investment CC is encouraged to implement the recommendations raised herein. It must be noted that environmental management is an on-going process and must be continuously reviewed in

order to review and correct other impacts that may arise and may not have been obvious at this preliminary stage of the project.

The mining claims owned by Techmine Investment CC are currently at the initial stages of the project cycle, with exploration having being completed. There are no existing infrastructures except the equipment left by the Techmine Investments CC’s exploration team at the claims which should be properly stored at a designated area when the mine becomes operational. **Table 1** outlines the Environmental Management Plan that must be implemented at all the mining claims as the copper ore is extracted and by Mr Lukas Askel/Techmine Investment CC in order to promote environmental sustainability.

**Table 1: Environmental Management Plan**

Construction and mining phase				
Potential Impact	Possible Cause	Mitigation	Monitoring Agent	Time Frame
<b>Physical</b>				
Dust generation	-Grading& gravelling existing access roads -Site clearing for building workers compound, workshop and offices	-Avoid maintaining roads under strong winds -Selective clearing of vegetation -Minimise burning of cleared vegetation -Planting of trees around the mine	Roads Authority, MAWLR., MEFT:DEA	Daily. Weekly, Quarterly
Disturbance and Contamination of ground water	-Drilling of boreholes	-Engage experts in borehole drilling -Boreholes to be approved by MAWLR- Hydrology Dept -Water to be put in settling ponds before discharge to the environment -Recycle as much water as possible	MAWLR	Once off
<b>Biological</b>				
Deforestation and Habitat loss	-Site construction  -Noise from heavy equipment  -Dust from mining operations and site clearing	-Selective cutting down of trees -Re-vegetate cleared areas, where necessary -Machines to be fitted with sound silencers -Regular watering of the mine site to minimise dust	ECO;MAWLR., MEFT:DEA	Weekly, Quarterly



Injury or death of livestock	-Livestock falling in unprotected trenches -Livestock being run over by heavy vehicles	-Fence off the mine workings -No unauthorised entry should be allowed -Put danger warning signs -Barricade the whole project site with a perimeter fence	ECO; MAWLR., MEFT:DEA; MME	Once off
Fire hazard	-No fire guards in place -Haphazard workings  -No explosive box in site	-Establish and maintain fire guards -Establish structures according to the Siting of Works plan approved by the Ministry of Mines & Energy -Engage the Regional Mining Engineer in the licensing of a proper magazine box	ECO;MEFT:DEA ; MME	Biannually
<b>Operational phase</b>				
<b>Physical</b>				
Air and Noise Pollution	-Dust generated from blasting -Dust generated from ore movement activities like loading and transportation -Exhaust fumes from vehicles and other equipment -Noise from drilling and blasting -Noise from heavy vehicles and equipment engines	-Undertake controlled blasting; -Set enough lead times between blasting and mining -Blasting to be done during the day; -Establish blasting times and erect signs to that effect. -The local community should be notified using the prescribed channels via the Otswana Village Traditional Authority and be aware of the blasting schedule and take all the necessary precautions to avoid the blast sites and also plan their daily activities with the full understanding of the blasting activities and mining operations. -Workers to be equipped with ear muffs and inhalers; -Proper vehicle maintenance to reduce exhaust fumes and vehicles should be switched key off when not in operation to reduce noise pollution. -A 10km/hr speed limit should be observed within the vicinity of the copper mine.	ECO;MEFT:DEA ; MME	Daily, weekly, quarterly.

		<ul style="list-style-type: none"> <li>-Put speed warning signs around the mining area</li> <li>-Vehicles to be fitted with silencers</li> <li>-Regular watering of the mining area to suppress dust</li> </ul>		
Land degradation & loss of aesthetic value	<ul style="list-style-type: none"> <li>-Oil and diesel spillages from vehicles and equipment</li> <li>-Land clearing for increased mining operations</li> </ul>	<ul style="list-style-type: none"> <li>-Regular servicing of vehicles</li> <li>-Selective land clearing i.e. clearing where necessary</li> <li>-Mining activities to adhere to Minerals (Prospecting &amp; Mining Act, 1992 (Act No. 33 of 1992)</li> <li>-Avoid vehicle overloading</li> </ul>	ECO;MEFT:DEA ; Ministry of Mines & Energy(MME)	Daily, Weekly
Soil Erosion& Contamination of Surface Water	<ul style="list-style-type: none"> <li>-Surface run off from mine waste water</li> <li>-Contamination due to oil and diesel spills</li> <li>-Dust from ore hauling and loading activities</li> </ul>	<ul style="list-style-type: none"> <li>-Recycling of water</li> <li>-Terrace the steep slopes to minimise surface run off</li> <li>-Oil and diesel spillages should be effectively contained by constantly checking the vehicles and machinery and those with leaks should be fitted with drip trays.</li> <li>-Implement procedures to minimise drop height between the tipper and front-end loader.</li> </ul>	ECO; MAWLR., MEFT:DEA; Ministry of Mines & Energy(MME)	Daily, Weekly
<b>Biological/ Ecological</b>				
Deforestation and loss of biodiversity	<ul style="list-style-type: none"> <li>-Vegetation clearing for mining expansion</li> <li>-Dust settling on foliage</li> </ul>	<ul style="list-style-type: none"> <li>-Any expansion to be approved by the Mining Commissioner and the Regional Mining Engineer</li> <li>-Avoid indiscriminate cutting down of trees</li> <li>-Minimise dust emission</li> <li>-Establish vegetation perimeter around the mining area to trap dust</li> </ul>	ECO; MAWLR., MEFT:DEA; Ministry of Mines & Energy(MME)	Daily, weekly, quarterly
Siltation of nearby stream and Disturbance of Aquatic Life	<ul style="list-style-type: none"> <li>-Dust generated settling in the river</li> <li>-Surface run off from mine site</li> </ul>	<ul style="list-style-type: none"> <li>-Minimise dust by watering the mine area</li> <li>-Encourage water recycling</li> <li>-Water sampling to test impurities</li> </ul>	ECO; MAWLR., MEFT:DEA; Ministry of Mines & Energy(MME)	Daily, Weekly
Impact to ecosystem food chains	<ul style="list-style-type: none"> <li>-Birds migration due to noise and dust from blasting and heavy equipment</li> </ul>	<ul style="list-style-type: none"> <li>-Selective vegetation clearing</li> <li>-Mine water should be recycled</li> <li>-Establish water sampling points</li> </ul>	ECO; MAWLR., MEFT:DEA; Ministry of	Quarterly

	-Land clearing -Dissolved nutrients in water drawn from the mine	-Regular monitoring of water quality in nearby rivers	Mines & Energy(MME)	
<b>Socio-Economic</b>				
Occupational health and safety hazards	-Poor sanitary conditions -Poor mechanisation of workings -Lack of proper PPE -Dust related illnesses -High risk of STIs, HIV and AIDS	-Construct proper toilets for workers -Provision of clean and safe water from a borehole -Adequate lighting and ventilation should be provided in the workings -Adequate PPE to be provided to all employees -No machine drilling shall be done dry as per Minerals (Prospecting & Mining) Act, 1992 (Act No. 33 of 1992). -Institute HIV& AIDS awareness programs at the mine -Condoms should be easily accessible at the mine -Provision of a fully equipped First Aid kit with no expired medication.	ECO; Ministry of Health & Social Services (MHSS); Social Security Commission (SSC); Ministry of Mines & Energy(MME)	Quarterly
Injury to people and animals	-Falling into unprotected mine workings -Dangers of flying rocks from blasting -Accidents due to poor OSH procedures	-Establish a perimeter fence around the mine premises -No unauthorised entry into the mine -Barricade the mine workings -Establish blasting times and erect danger warning signs -Blasting to be carried out during the day. -Only primary blasting to be done. -Local community to be notified and aware of the blasting schedule and associated activities. -Implement proper OSH procedures in line with Minerals	ECO; Ministry of Health & Social Services (MHSS); Ministry of Mines & Energy(MME); Social Security Commission (SSC)	Once off

		(Prospecting & Mining Act, 1992 (Act No. 33 of 1992).		
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**1.4 Environmental & Social Monitoring Plan**

An Environmental monitoring plan has been put in place to check on the effectiveness of the proposed Environmental Management Plan in dealing with the impacts identified in this study. Some of the environmental parameters that need to be monitored at the copper mining claims (74169,74170, 74171, 74172, 74173, 74174, 74175, 74176, 74177 & 74178 ) are:

- a) Dissolved Metals and Metals in Sediments:- cadmium, arsenic, chromium, copper, iron, lead, mercury, nickel, silver and zinc
- b) Conductivity
- c) Total Suspended Solids
- d) pH
- e) Safety of workings
- f) Employee Health-TB, asthma, lung cancer, hearing ability, sight, backbone
- g) Workers’ insurance - Social Security Commission (SSC) contributions

Samples of water shall in sunk boreholes once operations are about to start, determining the baseline composition of water with respect to dissolved heavy metals like cadmium, lead, copper, nickel, zinc, chromium, mercury, and arsenic. Quarterly samples must be done so as to determine how the results vary from the baseline studies. The same will be done for conductivity, total suspended solids and pH. Water drawn from boreholes at the mine shall be subjected to quarterly samples so as to determine the degree of leachates as well the pH and conductivity of water.

Quarterly medical checks should be done on employees who work in dusty areas and those that work with heavy machines and their records should be kept at the mine. Aspects to be checked are tuberculosis, asthma, lung cancer, hearing ability and backache, among other issues. This will determine the effectiveness of the mine’s Occupational Safety and Health (OSH) programmes.

Experience has shown that most small mines do not remit moneys they deduct from employees to SSC as per Social Security Act, 1994 (Act No. 34 of 1994), currently read with the Employees’ Compensation Act, 1941 (Act No. 30 of 1941) as amended. Due to that, it is now necessary to monitor such mines and make sure that workers are insured against death or injury at work. Contributions must be remitted as and when they are required. Table 2 details the monitoring program that must be followed at the mine.

**Table 2: Environmental Monitoring plan**

Environmental Aspect	Method of Monitoring	Regulation Body/Org	Frequency
-Dissolved Metals/ Metals in Sediments (cadmium, arsenic, chromium, copper, iron, lead, mercury, silver and zinc) -Conductivity -pH -Total Suspended Solids	-Water sampling at a point in the nearby stream -Borehole water samples	-MAWLR -MEFT:DEA	Quarterly
Safety of Workings -gases, fumes, blasting equipment	-Monitoring before and after blasting	-ECO -Regional Mining Engineer -SSC	Twice daily
Employee Health -TB, asthma, lung cancer, hearing ability, backbone	Medical checks	-ECO -MHSS, -SSC	Quarterly
Workers' insurance	Checking with NSSA	-SSC -Namibia Miners Federation	Monthly

### 1.5 Emergency Response Plan

The Emergency Response Plan is a set of measures that will be implemented, in response to emergency situations that could potentially occur during mining and mining-related activities. The Emergency Response plan addresses emergency response elements including identification of potential emergency scenarios, emergency response organisations and responsibilities, co-ordination with governmental emergency response organisations, emergency alarms and communication, emergency response procedures (including evacuation procedures), emergency response equipment, training and drills for the operation of all Techmine Investment CC' s project facilities at all the mining claims (74169,74170, 74171, 74172, 74173, 74174, 74175, 74176, 74177 & 74178).

#### 1.5.1 Risk Assessment Methodology

For the purposes of this mining project, we will make use of the NOSA HIRA (Hazard Identification and Risk Assessment) methodology. The methodology comprises three parameters, namely:

### (a) Severity

This is an evaluation of the worst conceivable SHE consequence of a hazard. An exponential weighting is used in order to reflect a bias towards the consideration of the severity of the consequences as opposed to frequency or exposure when evaluating a hazard. The criteria for rating severity are shown in Table 3.

**Table 3: Severity Criteria**

Weight Number	Hazard Description	Environment	Safety/ Health
16	CATASTROPHIC	Irreversible ecological damage	Multiple fatalities due to injury or occupational diseases
8	MAJOR	Reversible ecological damage with potential long term impact	Fatality or number of disabilities/ disabling diseases
4	MODERATE	Ecological disturbance, can be rehabilitated	Disabling injuries or occupational illness
2	MINOR	Short-term ecological impacts. Requires intervention	Minor injuries or exposure requiring medical attention
1	INSIGNIFICANT	Low impact, natural rehabilitation	First Aid treatment required

### (b) Frequency /Probability

Frequency/ Probability are a linear evaluation of how often a hazard has resulted in a consequence (incident history). In the absence of incident history how often a hazard may result in a known consequence (established through industry standards and research and assumption if needed) may be used. The Frequency/ Probability criteria are shown in the Table 4.

**Table 4: Frequency/ Probability Criteria**

Weight Number	1	2	3	4	5
<b>Evaluation Description</b>	Rare	Infrequent	Frequent	Often	Consistent
<b>Frequency</b>	Less than once every 5 years	Every 1- 5 years	Multiple times per year	Monthly	Daily/weekly

### (c) Exposure

Exposure is the percentage of a workforce exposed to a particular hazard and or the duration of the exposure. Its rating is shown in Table 5.

**Table 5: Exposure Criteria**

Weight Number	1	2	3	4	5
<b>Evaluation Description</b>	Minimal	Restricted	Local	Widespread	Extensive
<b>Safety/ Health Exposure</b>	A few of the workforce, minimal time	A few of the workforce, some of the time / some of the workforce minimal time	Some of the workforce, some of the time	Most of the workforce, some of the time or / some of the workforce, most of the time	Most of the workforce, most of the time
<b>Environmental Exposure</b>	Incident site	Localised	Plant wide	Immediate neighbours	Community exposure

NB: Risk is calculated as follows: **Risk= Severity × Frequency × Exposure**

**Table 6: Emergency Response Plan**

Risk	Contingency Plan
Fire hazard	<ul style="list-style-type: none"> <li>-Fire extinguishers to be put in place</li> <li>-Workers training on use of extinguishers</li> <li>-Fire Brigade contact numbers to be clearly displayed</li> <li>-Emergency numbers to be given to every worker</li> <li>-Establish an Assembly point</li> <li>-Fire drills</li> <li>-Fireguards</li> </ul>
Power generator failure	<ul style="list-style-type: none"> <li>-Standby generator to be put in place</li> <li>-Standby fuel storage facility to be kept separately</li> </ul>
Outbreak of infectious disease	<ul style="list-style-type: none"> <li>-Isolate the infected person(s)</li> <li>-Take the person to hospital</li> <li>-Mine vehicle to be on site every time</li> <li>-Calling the ambulance</li> <li>-Emergency numbers to be given to every worker</li> </ul>

## 2 ROLES AND RESPONSIBILITIES

Techmine Investment CC, who is the proponent, is ultimately responsible for the implementation of the EMP, from the planning and design phase to the decommissioning phase (when these mining operations are no longer financially viable). The proponent will delegate this responsibility as the project progresses

through its life cycle. The delegated responsibility for the effective implementation of this EMP will rest on the following key individuals:

- Proponent’s Representative;
- Environmental Control Officer; and
- Contractor (Techmine Investment CC ).

### 2.1 PROPONENT’S REPRESENTATIVE

The mining company should assign the responsibility of managing all aspects of these mining activities for all lifecycle phases (including all contracts for work outsourced) to a designated member of staff, referred to in this EMP as the Proponent’s Representative (PR). The mining company may decide to assign this role to one person for the full duration of these mining activities or may assign a different PR to each of the lifecycle phases – i.e., one for the copper ore mining phase, one for the transportation phase and one for the mine rehabilitation phase. The PR’s responsibilities are as follows:

**Table 7: Responsibilities of PR**

Responsibility	Project Phase
Making sure that the necessary approvals and permissions laid out in <b>Table 9</b> are obtained/adhered to	Throughout the lifecycle of this project.
Suspending/evicting individuals and/or equipment not complying with the EMP	<ul style="list-style-type: none"> <li>• <b>Copper ore mining</b></li> <li>• <b>Transportation of copper ore</b></li> <li>• <b>Mine rehabilitation</b></li> </ul>
Issuing fines for contravening EMP provisions	<ul style="list-style-type: none"> <li>• <b>Copper ore mining</b></li> <li>• <b>Transportation of copper ore</b></li> <li>• <b>Mine rehabilitation</b></li> </ul>

### 2.2 ENVIRONMENTAL CONTROL OFFICER



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The PR should assign the responsibility of overseeing the implementation of the whole EMP on the ground during the copper ore mining & mine rehabilitation phases to a designated member of staff, referred to in this EMP as the Environmental Control Officer (ECO). The PR/ Techmine Investment CC may decide to assign this role to one person for all three activities or may assign a different ECO for each activity. The ECO will have the following responsibilities during the mining, operation and rehabilitation phases of these developments:

- Management and facilitation of communication between the Proponent, PR, the contractors, and Interested and Affected Parties (I&APs) with regard to this EMP;
- Conducting regular inspections (recommended minimum frequency is once every six months) with respect to the implementation of this EMP (monitor and audit the implementation of the EMP);
- Assisting the Contractor in finding solutions with respect to matters pertaining to the implementation of this EMP;
- Advising the PR on the removal of person(s) and/or equipment not complying with the provisions of this EMP;
- Making recommendations to the PR with respect to the issuing of fines for contraventions of the EMP; and
- Undertaking an annual review of the EMP and recommending additions and/or changes to this document.

### 2.3 CONTRACTOR

Contractors appointed by the Proponent are automatically responsible for implementing all provisions contained within the relevant chapters of this EMP. Contractors will be responsible for the implementation of this EMP applicable to any work outsourced to subcontractors. Table 10 applies to contractors appointed during the copper ore mining phase and Table 11 to those appointed during the Mine rehabilitation phase. In order to ensure effective environmental management the aforementioned chapters should be included in the applicable contracts for outsourced construction, operation and maintenance work.

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The tables in the following chapter (**Chapter 3**) detail the management measures associated with the roles and responsibilities that have been laid out in this chapter.

### 3.0 MANAGEMENT ACTIONS

The aim of the management actions in this chapter of the EMP is to avoid potential impacts where possible. Where impacts cannot be avoided, measures are provided to reduce the significance of these impacts.

The following tables provide the management actions recommended to manage the potential impacts rated in the scoping-level EA conducted for these activities. These management actions have been organised temporally according to project phase:

- Applicable legislation (**Table 9**);
- Copper ore mining Actions (**Table 10**);
- Mine rehabilitation Management Actions (**Table 11**); and
- Decommissioning phase management actions (**Table 12**).

The responsible persons from the proponents' team have assessed these commitments in detail and have committed to the specific management actions where indicated in the tables below.

### 3.1 ASSUMPTIONS AND LIMITATIONS

This EMP has been drafted with the acknowledgment of the following assumptions and limitations:

- This EMP has been drafted based on the scoping-level Environmental Assessment (EA) conducted for the EPL containing the mining claims 74169,74170, 74171, 74172, 74173, 74174, 74175, 74176, 74177 & 74178. HEEC will not be held responsible for the potential consequences that may result from any alterations to the existing situation on the ground.
- It is assumed that mine labourers will be sourced mostly from the Ombuku Village area and that migrant labourers (if applicable) will be housed in established accommodation facilities within Ombuku Village.
- The engineering designs carried out for the mine upgrade & of the associated services infrastructure (roads, potable water, storm water, sewerage, and electrical reticulations) will be informed by the engineers' plans and designs.

### 3.2 APPLICABLE LEGISLATION

Legal provisions that have relevance to various aspects of these developments are listed in **Table 9: Legal provisions relevant to the proposed development below**. The legal instrument, applicable corresponding provisions and project relevance details are provided.

#### 3.2.1 Regulatory Framework for Environmental Management in the Mining Sector

The objective of the intended Environmental Management Plan (EMP) is thus needed in order to assess the potential social and environmental impacts associated with the intended mining activities for copper ore, on mining claims 74169,74170, 74171, 74172, 74173, 74174, 74175, 74176, 74177 & 74178 at Ombuku Village, Opuwo District, Kunene Region and also to formulate methods of rehabilitation of the mines once they have been excavated for further processing.

The above is a listed activity in terms of the Environmental Management Act (No. 7 of 2007) and Environmental Impact Assessment Regulations (Government Notice No. 30 of 2012). Dumps, including overburden dumps and tailings dams, are similarly regulated.

In terms of the Environmental Management Act (No. 7 of 2007) and Environmental Impact Assessment Regulations (Government Notice No. 30 of 2012), the following listed activities in **Table 8** were triggered by the proposed project:

**Table 8: List of triggered activities identified in the EIA Regulations which apply to the proposed project**

Activity description and No(s):	Description of relevant Activity	The portion of the development as per the project description that relates to the applicable listed activity
<b>Activity 3.1</b> (Mining and Quarrying Activities)	The construction of facilities for any process or activities which requires a licence, right or other form of authorisation, and the renewal of a licence, right or other form of authorisation, in terms of the Minerals (Prospecting and Mining Act), 1992.	The proposed project includes the mining of copper ore for export purposes/ further processing.
<b>Activity 3.2</b> (Mining and Quarrying Activities)	Other forms of mining or extraction of any natural resources whether regulated by law or not.	The proposed project includes the mining of copper ore for export purposes/ further processing.
<b>Activity 3.3</b> (Mining and Quarrying Activities)	Resource extraction, manipulation, conservation and related activities.	The proposed project includes the mining of copper ore for export purposes/ further processing.

The above activities will be discussed in more detail in this EMP. Healthy Earth Environmental Consultants CC (HEEC) undertook an independent site specific scoping Environmental & Social Assessment (ESA) in order to formulate detailed mitigation measures for the above activities on behalf of the proponent, Techmine Investment CC. The competent authority is the Ministry of Environment and Tourism: Department of Environmental Affairs (MEFT: DEA).

There are multiple legal instruments that regulate and have a bearing on good environmental management in Namibia. **Table 9** below provides a summary of the legal instruments considered to be relevant to this development and the environmental assessment process.

**Table 9: Legislation applicable for the establishment and mining of copper ore on mining claims 74169,74170, 74171, 74172, 74173, 74174, 74175, 74176, 74177 & 74178 at Ombuku Village, Opuwo District, Kunene Region.**

LEGISLATION/POLICIES	RELEVANT PROVISIONS	RELEVANCE TO PROJECT
The Constitution of the Republic of Namibia as Amended	<p>Article 91 (c) provides for duty to guard against “the degradation and destruction of ecosystems and failure to protect the beauty and character of Namibia.”</p> <p>Article 95(l) deals with the “maintenance of ecosystems, essential ecological processes and biological diversity” and sustainable use of the country’s natural resources.</p>	Sustainable development should be at the forefront of management of the intended mining activities.
Environmental Management Act No. 7 of 2007 (EMA)	<p>Section 2 outlines the objective of the Act and the means to achieve that.</p> <p>Section 3 details the principles of Environmental Management</p>	The management of this project should be informed by the EMA.
EIA Regulations GN 28, 29, and 30 of EMA (2012)	<p>GN 29 Identifies and lists certain activities that cannot be undertaken without an environmental clearance certificate.</p> <p>GN 30 provides the regulations governing the environmental assessment (EA) process.</p>	<p><b>Activity 3.1 (Mining and Quarrying Activities)</b> The construction of facilities for any process or activities which requires a licence, right or other form of authorisation, and the renewal of a licence, right or other form of authorisation, in terms of the Minerals (Prospecting and Mining Act), 1992.</p> <p><b>Activity 3.2 (Mining and Quarrying Activities)</b> Other forms</p>

LEGISLATION/POLICIES	RELEVANT PROVISIONS	RELEVANCE TO PROJECT
		of mining or extraction of any natural resources whether regulated by law or not. <b>Activity 3.3 (Mining and Quarrying Activities)</b> Resource extraction, manipulation, conservation and related activities.
Convention on Biological Diversity (1992)	Article 1 lists the conservation of biological diversity amongst the objectives of the convention.	The copper ore mining activities should consider the impact it will have on the biodiversity of the area.
Draft Procedures and Guidelines for conducting EIAs and compiling EMPs (2008)	Part 1, Stage 8 of the guidelines states that if a proposal is likely to affect people, certain guidelines should be considered by the proponent in the scoping process.	The ESA process should incorporate the aspects outlined in the guidelines.
Namibia Vision 2030	Vision 2030 states that the solitude, silence and natural beauty that many areas in Namibia provide are becoming sought after commodities and must be regarded as valuable natural assets.	Care should be taken that the copper ore mining activities do not lead to the degradation of the natural beauty of the area.
Water Act No. 54 of 1956	Section 23(1) deals with the prohibition of pollution of underground and surface water bodies.	The pollution of water resources should be avoided during the copper ore mining activities.
The Ministry of Environment and Tourism (MEFT) Policy on HIV & AIDS	MEFT has recently developed a policy on HIV and AIDS. In addition it has also initiated a programme aimed at mainstreaming HIV and gender issues into environmental impact assessments.	The proponent and its contractor have to adhere to the guidelines provided to manage the aspects of HIV/AIDS. Experience with similar projects has shown that a significant health risk is created when migrant mine workers/labourers interact with local communities.
Labour Act No. 11 of 2007	Chapter 2 details the fundamental rights and protections.	Given the employment opportunities presented by the

LEGISLATION/POLICIES	RELEVANT PROVISIONS	RELEVANCE TO PROJECT
	Chapter 3 deals with the basic conditions of employment.	copper ore mining activities, compliance with the law is essential.
Public and Environmental Health Act of 2015	This Act (GG 5740) provides a framework for a structured uniform public and environmental health system in Namibia. It covers notification, prevention and control of diseases and sexually-transmitted infections; maternal, ante-natal and neo-natal care; water and food supplies; infant nutrition; waste management; health nuisances; public and environmental health planning and reporting. It repeals the Public Health Act 36 of 1919 (SA GG 979).	The copper ore mining activities are to comply with these legal requirements.
Nature Conservation Ordinance No. 4 of 1975	Chapter 6 provides for legislation regarding the protection of indigenous plants.	Indigenous and protected plants have to be managed within the legal confines.
Environmental Assessment Policy of Namibia (1995)	The Policy seeks to ensure that the environmental consequences of development projects and policies are considered, understood and incorporated into the planning process, and that the term ENVIRONMENT is broadly interpreted to include biophysical, social, economic, cultural, historical and political components.	This EMP considers this term of Environment.
Minerals (Prospecting and Mining) Act, 1992 (Act 33 1 of 1992)	To provide for the reconnaissance, prospecting and mining for, and disposal of, and the exercise of control over, minerals in Namibia; and to provide for matters incidental thereto. "mineral" means any substance, whether in solid, liquid or gaseous form, occurring naturally in, on or	The intended activity involves the mining of copper ores for export purposes/further processing.

LEGISLATION/POLICIES	RELEVANT PROVISIONS	RELEVANCE TO PROJECT
	<p>under any land and having been formed by, or subjected to, a geological process, excluding -(c) subject to the provisions of subsection (2), soil, sand, clay, gravel or stone (other than rock material specified in Part 2 of Schedule 1) if they are bona fide required for purposes of -</p> <p>(i) agriculture, building works, fencing or road making;</p> <p>(ii) the manufacture of bricks and tiles;</p>	
<p>Soil Conservation Act 6 of 1969 Ministry of Agriculture, Water and Forestry</p>	<p>This Act covers the prevention and combating of soil erosion; the conservation, improvement and manner of use of the soil and vegetation; and the protection of water sources</p>	<p>Open pits left behind after copper ore mining should not be polluted or left un-rehabilitated.</p>

**This EMP was formulated and compiled in accordance with the EIA Regulations.**



**3.3 PROJECT LOCATION**

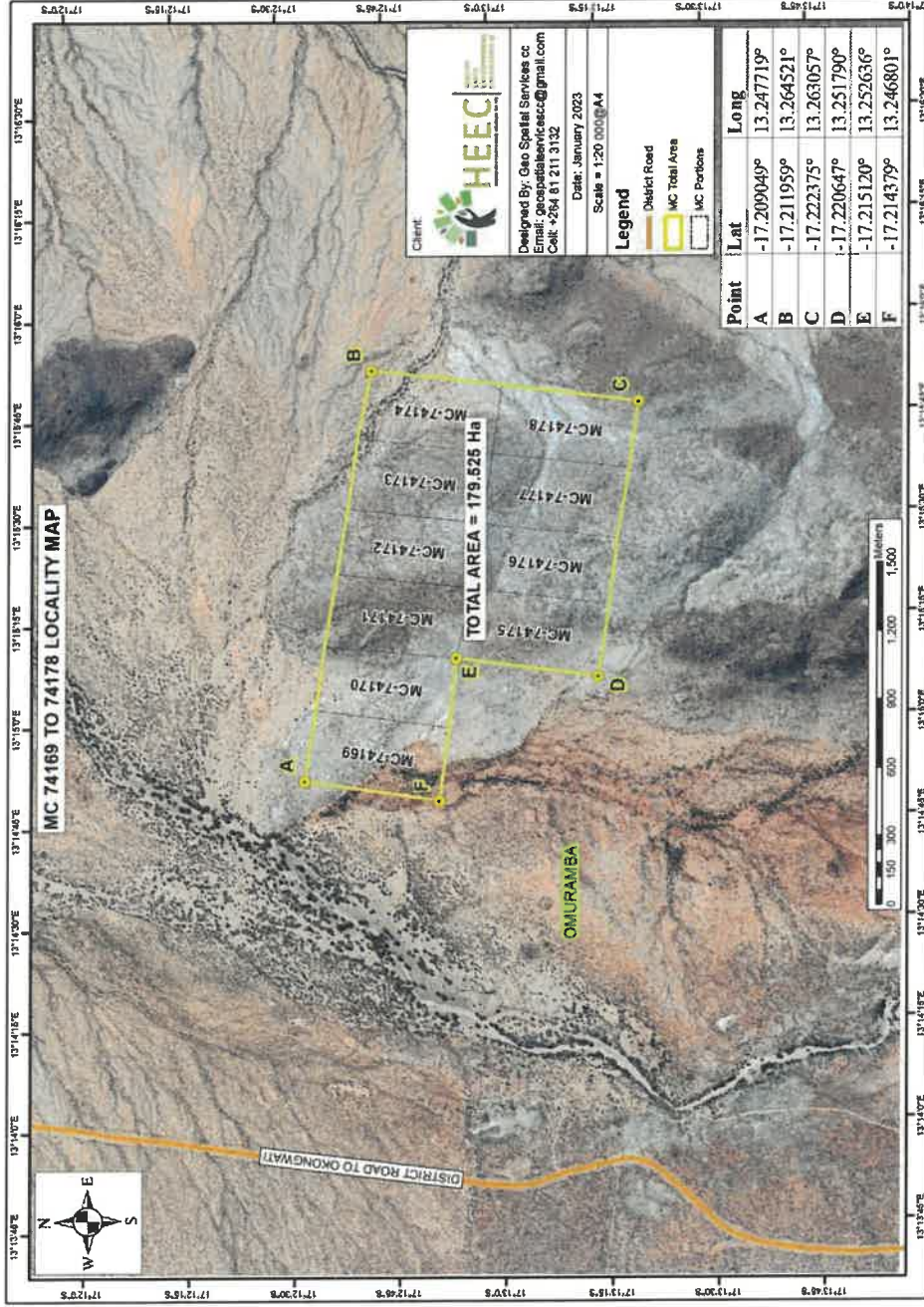


Figure 1: Location of the Mining Claims 74169, 74170, 74171, 74172, 74173, 74174, 74175, 74176, 74177 & 74178 in Ombuku Village, Opowo District, Karas Region, Namibia (HEEC, 2023).

### 3.4 COPPER ORE MINING PHASE

The PR should ensure that the management actions detailed in **Table 10**, below should be adhered to during the operation of the copper ore mining activities.

**Table 10: Copper ore Mining Phase Management Actions**

Aspect	Management Actions	Responsibility
Environmental Incidents	<ul style="list-style-type: none"> <li>• The ECO on site shall maintain a register of all environmental incidents occurring as a result of the activities associated with the project. Environmental incidents that shall be recorded include (but are not limited to):               <ul style="list-style-type: none"> <li>➤ Fires;</li> <li>➤ Drowning;</li> <li>➤ Accidents (e.g. traffic);</li> <li>➤ Spills of hazardous materials, contaminating soil or water resources;</li> <li>➤ Non-compliances with applicable legislation; and</li> <li>➤ Non-compliances with this EMP.</li> </ul> </li> <li>• Environmental incident reports shall include (as a minimum) a description of the incident, the actions taken to contain any damage to the environment, personnel, or the public, and the actions taken to repair / remediate any such damage.</li> <li>• Additional measures shall be prescribed that may be required to remediate damage resulting from the incident and / or to prevent similar incidents occurring in the future.</li> </ul>	ECO
Traffic	<ul style="list-style-type: none"> <li>• Ensure that road junctions have good sightlines.</li> <li>• Limit the type of vehicle (heavy trucks) allowed on site.</li> <li>• Adhere to the speed limit. If permissible, caution signs and 40 km/hr signs shall be placed at regulation distance from heavy vehicle crossing signs at the intersections of the access tracks and the D3700 road.</li> <li>• Designate no-drive zones.</li> <li>• Implement traffic control measures where necessary by keeping a number plate register of all vehicles transporting copper ores at the site and restricting access to authorised contractors.</li> </ul>	ECO

Aspect	Management Actions	Responsibility
Copper ore mining claim areas (74169,74170, 74171, 74172, 74173, 74174, 74175, 74176, 74177 & 74178).	<ul style="list-style-type: none"> <li>• Copper ores should be sourced from mining claims with a valid ECC.</li> <li>• The copper ore mining claims must be clearly demarcated by means of a perimeter stock-proof fence with a lockable gated entrance.</li> <li>• Copper ore mining and resultant operations shall only take place within this demarcated area/claim.</li> <li>• A detailed photographic record of the demarcated mining claim areas, prior to any mining activities, shall be taken. These records are to be kept by the Proponent and PR for reference purposes during the rehabilitation of the site.</li> <li>• There will be <b>'No unauthorised access'</b> signs at the mining claim gates until to restrict entry and/or harm to people not involved in the copper ore mining operations.</li> </ul>	ECO
EMP training	<ul style="list-style-type: none"> <li>• <b>All workers at the site are to undergo EMP training that should include as a minimum the following:</b></li> <li>• <b>Explanation of the importance of complying with the EMP.</b></li> <li>• <b>Discussion of the potential environmental impacts of the intended copper ore mining and Mine rehabilitation activities.</b></li> <li>• <b>Employees' roles and responsibilities, including emergency preparedness and response requirements.</b></li> <li>• <b>Explanation of the mitigation measures that must be implemented when work groups carry out their respective activities.</b></li> <li>• <b>The potential consequences of departure from specified operating procedures; and rewards for enhancing mitigation measures or avoiding negative environmental effects.</b></li> </ul>	ECO & Contractor
Fauna and Flora	<ul style="list-style-type: none"> <li>• <b>Prevent the destruction of protected tree species.</b></li> <li>• <b>Encourage the regrowth and regeneration of trees with exposed roots at the site.</b></li> <li>• <b>The excavation of the copper ores should incorporate existing trees<sup>1</sup>.</b></li> <li>• <b>The Contractor should compile a Tree Management Plan which should include the following as a minimum:</b></li> </ul>	ECO & Contractor

<sup>1</sup>a "tree" is defined as an indigenous woody perennial plant with a trunk diameter ≥150 mm

Aspect	Management Actions	Responsibility
	<ul style="list-style-type: none"> <li>• Trees if not already accounted for in an existing Geographic Information System (GIS), should be surveyed, co-ordinates/location incorporated into the Contractor's GIS, marked with paint (or other means so as to be readily visible) and protected;</li> <li>• Trees, which are impossible to conserve, need to be identified and their location recorded on a map;</li> <li>• The Contractor should apply to the relevant authority (Ministry of Agriculture, Water &amp; Forestry) for a permit to remove these trees.</li> <li>• A list should be compiled of all trees to be removed detailing the location of the tree, the species as well as which trees will be planted to replace these. The nursery where these trees will be sourced from should also be included;</li> <li>• Each tree that is removed needs to be replaced with an indigenous tree species;</li> <li>• Some of these trees can be obtained at the nearest forestry office or at a commercial nursery such as the Forestry office in Opuwo. Assistance can be sought from the nearest forestry office regarding nearby nurseries where additional trees may be bought and advice sought.</li> <li>• Only a limited width +/- 5 m on the side of the access roads may be partially cleared of vegetation.</li> <li>• Workers are prohibited from collecting wood or other plant products on or near the site.</li> <li>• No alien species may be planted on or within the existing site.</li> <li>• Prevent contractors from collecting wood and veld food such as amphibians, migrating birds, etc. during the copper ore mining phase.</li> <li>• Prevent contractors from fishing in the nearby ephemeral rivers or catching aquatic species.</li> </ul>	
<p>Lay-down areas and materials camp</p>	<ul style="list-style-type: none"> <li>• Suitable locations for the contractors lay-down areas and materials camp should be identified with the assistance of the PR and the following should be considered in selecting these sites:</li> <li>• The areas designated for the services infrastructure should be used as far as possible.</li> <li>• Second option should be degraded land.</li> </ul>	<p>ECO &amp; Contractor</p>

Aspect	Management Actions	Responsibility
Hazardous waste	<ul style="list-style-type: none"> <li>• <b>Avoid sensitive areas (e.g. wetlands/rivers/drainage lines)</b></li> <li>• <b>All heavy duty vehicles and equipment on site should be provided with a drip tray.</b></li> <li>• <b>All heavy duty delivery vehicles should be maintained regularly to prevent oil leakages.</b></li> <li>• <b>Maintenance and washing of vehicles should take place only at a designated workshop area.</b></li> <li>• <b>Spilled cement and/or concrete (wet or dry) should be treated as hazardous waste and disposed of by the end of each day in the appropriate hazardous waste containers.</b></li> <li>• <b>All hazardous substances (e.g., fuel etc.) or chemicals should be stored in a specific location on an impermeable surface that is bunded - with a volume of 120 % of the largest single storage container or 25 % of the total storage containers, whichever is greater.</b></li> </ul>	ECO & Contractor
Surface and Ground Water Impacts	<ul style="list-style-type: none"> <li>• It is recommended that copper ore mining takes place outside of the rainy season in order to limit erosion &amp; flooding on site and surface water pollution.</li> <li>• No dumping of waste products of any kind in or in close proximity to surface water bodies.</li> <li>• Heavy duty vehicles should be kept out of any surface water bodies and the movement of vehicles should be limited where possible to the existing access roads and tracks.</li> <li>• Contaminated runoff from the sites should be prevented from entering the surface water bodies.</li> <li>• Workers should be given ablution facilities at the sites that are located at least <b>30 m</b> away from any surface water and regularly serviced.</li> <li>• Washing of personnel or any equipment should not be allowed on site.</li> </ul>	ECO & Contractor
Topsoil	<ul style="list-style-type: none"> <li>• <b>When excavations are carried out, topsoil<sup>2</sup> should be stockpiled in a demarcated area and used in profiling and rehabilitating of the depleted, open pits around the mining claim sites.</b></li> </ul>	ECO & Contractor

<sup>2</sup> Topsoil is defined here as the top 150mm of surface material, which accounts for the seedbank.

Aspect	Management Actions	Responsibility
	<ul style="list-style-type: none"> <li>• Stockpiled topsoil should be used to rehabilitate post-harvesting degraded areas and/or other nearby degraded areas within the Ombuku Village Constituency in consultation with the Traditional Authority/ Chief Kapika.</li> </ul>	
Soil Erosion	<ul style="list-style-type: none"> <li>• Clear the vegetation of the project area in phases during the copper ore mining period in order to keep the soil more compacted as well as to limit overall disturbance to the area over time.</li> <li>• It is recommended that most copper ore mining takes place outside of the rainy season in order to limit potential flooding and the run off of loose soil causing further erosion.</li> <li>• Appropriate erosion control structures must be put in place where soil may be prone to erosion.</li> <li>• Checks must be carried out at regular intervals to identify areas within the mining claim site where erosion is occurring. Appropriate remedial actions are to be undertaken wherever erosion is evident.</li> </ul>	ECO & Contractor
Rehabilitation	<ul style="list-style-type: none"> <li>• Upon completion of the copper ore mining phase consultations should be held with the local community/property owner(s) regarding the post-copper ore mining use of remaining excavated areas (if applicable) and to identify priority areas.</li> <li>• Sand/rubble at the site should be levelled so it can be reclaimed for other purposes once the copper ore mining has ceased and rather than leaving the mines open which will pose a threat to people and animals in the area.</li> <li>• In the event that no post-operation uses are requested, all excavated/degraded areas need to be rehabilitated as follows:                             <ul style="list-style-type: none"> <li>• Excavated areas may only be backfilled with clean or inert fill. No material of hazardous nature (e.g. sand removed with an oil spill) may be dumped as backfill.</li> <li>• Rehabilitated excavated areas need to match the contours of the existing landscape.</li> <li>• The rehabilitated area should not be higher (or lower) than nearby drainage channels. This ensures the efficiency of re-vegetation and reduces the chances of potential erosion.</li> </ul> </li> </ul>	ECO & Contractor

Aspect	Management Actions	Responsibility
	<ul style="list-style-type: none"> <li>• Topsoil is to be spread across excavated areas evenly.</li> <li>• Deep ripping of areas to be rehabilitated is required, not just simple scarification, so as to enable rip lines to hold water after heavy rainfall.</li> <li>• Ripping should be done along slopes, not up and down a slope, which could lead to enhanced erosion.</li> </ul>	
HIV/AIDS and TB awareness	<ul style="list-style-type: none"> <li>• The Contractor should approach the Ministry of Health and Social Services to co-opt a health officer to facilitate HIV/AIDS and TB education programmes periodically on site during the project operation.</li> <li>• A wellness program should be initiated to raise awareness on health issues, especially the impact of sexually transmitted diseases.</li> <li>• Provide free condoms in the workplace and to local community throughout project operation.</li> <li>• Facilitate access to Antiretroviral medication</li> <li>• Personnel should not overnight at the copper ore mining claim sites, but only the security personnel.</li> </ul>	ECO & Contractor
Road safety	<ul style="list-style-type: none"> <li>• Demarcate roads clearly.</li> <li>• Off-road driving should not be allowed.</li> <li>• All vehicles that transport materials to and from the site must be roadworthy.</li> <li>• Drivers that transport materials should have a valid driver's license and should adhere to all traffic rules.</li> <li>• Loads upon vehicles should be properly secured to avoid items falling off the vehicle.</li> <li>• Limit and control the number of access points to the mining claim sites.</li> <li>• The road leading to the mining claims should be properly maintained so as to reduce dust emissions when heavy vehicles travel on them.</li> <li>• Consideration should be given to possibly tar the road leading to the mining claims which could reduce dust emissions onsite.</li> </ul>	ECO & Contractor
Safety around work sites	<ul style="list-style-type: none"> <li>• Excavations/pits should be left open for the shortest time possible.</li> <li>• Excavate short lengths of trenches and box areas for services or foundations in a manner that will not leave the trench unattended for more than 24 hours.</li> </ul>	ECO & Contractor

Aspect	Management Actions	Responsibility
	<ul style="list-style-type: none"> <li>• Demarcate excavated areas and topsoil stockpiles with danger tape.</li> <li>• Provide additional warning signage in areas of movement and in “no personnel” areas where workers are not active.</li> <li>• Mine pits are to be fenced-off with stock-proof perimeter fencing.</li> <li>• Work areas must be set out and isolated with danger tape on a daily basis.</li> <li>• All materials and equipment are to be stored only within set out and demarcated work areas.</li> <li>• Only copper ore mining personnel authorised by Techmine Investment CC will be allowed within these work areas.</li> <li>• 2 fire extinguishers should be available at fuel storage areas.</li> <li>• Comply with all waste related management actions stated above in this table.</li> </ul>	
Ablutions	<ul style="list-style-type: none"> <li>• Separate toilets should be available for men and women and should clearly be indicated as such.</li> <li>• Portable toilets (i.e. easily transportable) should be available at the Mine site: <ul style="list-style-type: none"> <li>• 1 toilet for every 15 females.</li> <li>• 1 toilet for every 30 males.</li> </ul> </li> <li>• Sewage needs to be removed on a regular basis to an approved (municipal) sewage disposal site. Alternatively, sewage may be pumped into sealable containers and stored until it can be removed.</li> <li>• Workers responsible for cleaning the toilets should be provided with latex gloves and masks.</li> </ul>	ECO & Contractor
Open fires	<ul style="list-style-type: none"> <li>• No open fires may be made anywhere on the mining claim sites.</li> </ul>	ECO
General health and safety	<ul style="list-style-type: none"> <li>• A fully stocked first aid kit should permanently be available on-site as well as an adequately trained member of staff capable of administering first aid.</li> <li>• All workers should have access to the relevant personal protective equipment (overalls, hard toe boots, goggles, dust masks, sun hats heavy duty gloves etc.).</li> <li>• Sufficient potable water reserves should be available to workers at all times.</li> </ul>	ECO & Contractor



Aspect	Management Actions	Responsibility
	<ul style="list-style-type: none"> <li>• <b>No person should be allowed to smoke close to fuel storage facilities or portable toilets (if toilets are chemical toilets – the chemicals are flammable).</b></li> <li>• <b>No workers should be allowed to drink alcohol during work hours.</b></li> <li>• <b>No workers should be allowed on the mining claims if under the influence of alcohol.</b></li> </ul>	
Dust	<ul style="list-style-type: none"> <li>• <b>A watering truck should be used on gravel roads with the most heavy vehicle movement especially during dry and windy conditions. However, due consideration should be given to water restrictions during times of drought.</b></li> <li>• <b>The use of waterless dust suppression means (e.g. lignosulphonate products such as Dustex) should be considered.</b></li> <li>• <b>Cover any stockpiles with plastic to minimise windblown dust.</b></li> <li>• <b>Dust protection masks should be provided to workers if they complain about dust.</b></li> <li>• <b>During high wind conditions the contractor must make the decision to cease works until the wind has calmed down.</b></li> </ul>	ECO & Contractor
Noise	<ul style="list-style-type: none"> <li>• <b>Work hours should be restricted to between 08h00 and 17h00 where excavation involving the use of heavy equipment, power tools and the movement of heavy vehicles is less than 500 m from residential areas. If an exception to this provision is required, all residents and business owners within the 500 m radius should be given 1 week’s written notice.</b></li> <li>• <b>If workers are to be exposed to noise levels above 85dB for continuous extended periods of more than two hours, they are to be provided with ear muffs and allowed to take 10-15 minute breaks away from the noise source.</b></li> </ul>	ECO & Contractor
Recruitment of labourers	<ul style="list-style-type: none"> <li>• <b>The Contractor should compile a formal recruitment process including the following provisions as a minimum:</b></li> <li>• <b>Adhere to the legal provisions in the Labour Act No. 11 of 2007 for the recruitment of labour (target percentages for gender balance, optimal use of local labour and SME’s, etc.).</b></li> <li>• <b>Recruitment should not take place at the copper ore mining claim site.</b></li> </ul>	ECO & Contractor

Aspect	Management Actions	Responsibility
	<ul style="list-style-type: none"> <li>• Ensure that all sub-contractors are aware of recommended recruitment procedures and discourage any recruitment of labour outside these agreed upon procedures.</li> <li>• All contractors should give preference in terms of recruitment of sub-contractors and individual labourers to those who are qualified and from the project area and only then look to surrounding towns.</li> <li>• Clearly explain to all job-seekers the terms and conditions of their respective employment contracts (e.g. period of employment etc.) – make use of interpreters where necessary.</li> </ul>	
Communication plan	<ul style="list-style-type: none"> <li>• The Contractor or PR should draft a Communication Plan, which should outline as a minimum the following:</li> <li>• How Interested and Affected Parties (I&amp;APs), who require on-going communication for the duration of the operation period, will be identified and recorded and who will manage and update these records;</li> <li>• How these I&amp;APs will be consulted on an on-going basis;</li> <li>• Make provision for grievance mechanisms – i.e. how concerns can be lodged/ recorded and how feedback will be delivered as well as further steps of arbitration in the event that feedback is deemed unsatisfactory.</li> </ul>	ECO & Contractor
General communication	<ul style="list-style-type: none"> <li>• The PR must appoint an ECO to liaise between the Contractor, I&amp;APs and Techmine Investment CC .'s management.</li> <li>• The Contractor shall at every bi-monthly site meeting report on the status of the implementation of all provisions of the EMP.</li> <li>• The Contractor should implement the EMP awareness training as stipulated above in this table.</li> <li>• The Contractor must list the I&amp;APs of the project and their contact details with whom on-going communication would be required for the duration of the contract. This list, together with the Communication Plan must be agreed upon and given to the PR before operation commences/resumes.</li> <li>• The Communication Plan, once agreed upon by the Traditional Authority, shall be legally binding.</li> </ul>	ECO & Contractor

Aspect	Management Actions	Responsibility
	<ul style="list-style-type: none"> <li>• A copy of the EMP must be available at the site office and should be accessible to all I&amp;APs.</li> <li>• Key representatives from the above-mentioned list need to be invited to attend monthly site meetings to raise any concerns and issues regarding progress to rehabilitate the excavated areas and surrounding mines/ pits.</li> <li>• The Contractor should liaise with the proponent regarding all issues related to community consultation and negotiation before operation commences/resumes.</li> <li>• A procedure should be put in place to ensure that concerns raised have been followed-up and addressed.</li> <li>• All people on the I&amp;APs list should be informed about the availability of the complaints register and associated grievance mechanisms in writing by the PR prior to the commencement of site activities.</li> </ul>	
Archaeology	<ul style="list-style-type: none"> <li>• Should a heritage site or archaeological site be uncovered or discovered during the copper ore mining phase of the project, a “chance find” procedure should be applied in the order they appear below:</li> <li>• If operating machinery or equipment stop work;</li> <li>• Demarcate the site with danger tape;</li> <li>• Determine GPS position if possible;</li> <li>• Report findings to the site foreman;</li> <li>• Report findings, site location and actions taken to superintendent;</li> <li>• Cease any works in immediate vicinity;</li> <li>• Visit find site and determine whether work can proceed without damage to findings;</li> <li>• Determine and demarcate exclusion boundary;</li> <li>• Site location and details to be added to a Geographic Information System (GIS) for field confirmation by archaeologist;</li> <li>• Inspect site and confirm addition to copper ore mining site GIS;</li> <li>• Advise the National Heritage Council (NHC) and request written permission to remove findings from work area; and</li> <li>• Recovery, packaging and labelling of findings for transfer to National Museum.</li> </ul>	ECO & Contractor

Aspect	Management Actions	Responsibility
	<ul style="list-style-type: none"> <li>• <b>Should human remains be found, the following actions will be required:</b></li> <li>• <b>Apply the chance find procedure as described above;</b></li> <li>• <b>Schedule a field inspection with an archaeologist to confirm that remains are human;</b></li> <li>• <b>Advise and liaise with the NHC and Police; and</b></li> <li>• <b>Remains will be recovered and removed either to the National Museum or the National Forensic Laboratory.</b></li> </ul>	

**3.5 MINE REHABILITATION PHASE (Continuous)**

The management actions included in **Table 11** below applies during the continuous mine rehabilitation phase of the mining operations.

**Table 11: Mine Rehabilitation Phase Management actions**

Environmental Feature	Management Actions	Responsibility
EMP training	<p>All contractors appointed for the transportation of the copper ores on mining claims 74169,74170, 74171, 74172, 74173, 74174, 74175, 74176, 74177 &amp; 74178 must ensure that all personnel are aware of necessary health, safety and environmental considerations applicable to their respective work.</p>	ECO & Contractor
Monitoring	<p>The ECO should monitor the implementation of the EMP:</p> <ul style="list-style-type: none"> <li>• The ECO should regularly inspect the conditions around the copper ore mining claim site before work starts; and</li> <li>• The ECO should inspect the mining claim site at the end of the extraction period.</li> </ul>	ECO
Water and waste management	<ul style="list-style-type: none"> <li>• Ensure that the infrastructure at the copper ore mining site is connected to the mine drainage and wastewater reticulation.</li> <li>• Regular preventative maintenance should be carried out on the infrastructure to ensure that risks of overflows are minimised.</li> </ul>	ECO & Contractor

Environmental Feature	Management Actions	Responsibility
	<ul style="list-style-type: none"> <li>• A no-go buffer area of at least <b>30 m</b> should be allocated to any water bodies in the area.</li> <li>• No dumping of waste products of any kind in or in close proximity to any surface water bodies.</li> <li>• Sufficient weather and scavenger-proof bins (with lids, to prevent the escape of litter) shall be provided, and be easily accessible at all points where wastes are generated.</li> <li>• The site shall be kept clean and free of litter and no litter from the site shall be allowed to disperse to surrounding areas.</li> <li>• All personnel shall be instructed to dispose of all waste in the proper manner.</li> <li>• The Contractor shall identify and separate materials that can be reused or recycled to minimise waste e.g. metals, packaging and plastics, and provide separate marked bins for these items.</li> <li>• All materials (e.g. bags of cement) must be suitably stored and protected, so that they do not become damaged and unusable.</li> <li>• The Contractor shall be responsible for the regular disposal (at a suitable waste rock dumpsite) of all waste generated as a result of the copper ore mining.</li> <li>• Contaminated runoff from the various operational activities should be prevented from entering any surface water bodies.</li> <li>• Ensure that surface water accumulating on-site are channelled and captured through a proper storm water management system to be treated in an appropriate manner before disposal into the environment.</li> <li>• Disposal of waste from the mining claims should be properly managed.</li> <li>• No waste may be burned on site.</li> </ul>	

Environmental Feature	Management Actions	Responsibility
	<ul style="list-style-type: none"> <li>The frequency of collections will be such that waste containment receptacles do not unduly accumulate or overflow.</li> </ul>	
Energy efficiency	<ul style="list-style-type: none"> <li>The use of solar energy should be encouraged to provide for general lighting and heating of water and buildings around the mine site.</li> <li>The use of water saving initiatives should be incorporated within the mine workers' housing design in order to reduce water demand.</li> </ul>	Contractor

### 3.6 DECOMMISSIONING PHASE

With time all mines will close. This phase normally presents a complete new set of impacts to the environment that require serious attention of the mining company and other local authorities. To that effect a well-planned mine closure programme should be put in place.

It is recommended that in the event of mine closure, decommissioning be carried as per guidelines stated in relevant extracts of the Minerals (Prospecting & Mining) Act, 1992 (Act No. 33 of 1992). Rehabilitation must be taken as an on-going process to ensure that corrective measures are implemented on time. **Table 12** is a guideline to the decommissioning plan, whereby an active care mine closure is going to be implemented.

**Table 12: Decommissioning plan**

Decommissioning Phase			
Possible Impact	Mitigation	Responsibility	Monitoring Agent
<b>Physical/Biological</b> -Land degradation & loss of aesthetic value	-Establish a vegetation cover as soon as possible (stabilization) -Vegetate cleared area with indigenous trees -Fencing of the dangerous areas	MINE OWNER	-ECO -MEFT, -MAWLR
-Injury to people and livestock	-Complete filling up of the trenches -Barricade the old workings with concrete -Fencing of the dangerous areas	MINE OWNER	-ECO -MEFT, -MAWLR

-Contaminated surface and underground water. -Soil pollution. -Acid water drainage	-clean up spills (chemicals, diesel and oil) -Water quality analysis. -Monitor soil and water quality for a specified time after closure. -Aquatic life monitoring	MINE OWNER	-ECO -MEFT, -MAWLR
Resurgence of hazardous chemicals	-Treatment of hazardous chemicals (if any) -Neutralization -Precipitation, oxidation, reduction and acid/alkali hydrolysis	MINE OWNER	-ECO -MEFT, -MAWLR -MHSS
Accumulated solid waste	-Disposal of solid waste through source sorting, recycling, aerobic decomposition (composition), incineration or depositing in wasterock dumpsite and levelling of dumpsite to match the natural contours of the surrounding topography.	MINE OWNER	-ECO -MEFT, -MAWLR -MHSS
Loss of biodiversity	-Eliminate environmental damage through reclamation. -Site restoration through regeneration of the forest. -Restore chemical, biological and physical stability of site. -Allow productive land use.	MINE OWNER	-ECO -MEFT, -MAWLR
Compacted soil	-Rehabilitate areas affected by excessive soil compaction and oil spillage	MINE OWNER	-ECO -MEFT, -MAWLR -MME
<b>Social/Economic</b> -Laying off workers -Loss of income -Drop in the standard of living	-Catering of welfare of laid off workers -Pension schemes -Creation of income generating projects for laid off workers -Secure alternative employment for workers	MINE OWNER	-ECO -SSC
-Infrastructure may become derelict -Derelict building may detract from the value of surrounding properties	-Return of community access to infrastructure -Educate locals on the utilization of the mining infrastructure.	MINE OWNER	Ministry of Works and Transport
-Possible outbreaks of diseases	Educate communities on dangers of STIs and waterborne diseases	MINE OWNER	Ministry of Health & Social Services(MHSS)
Damaged roads	Repair damaged roads	MINE OWNER	-Roads Authority

In addition to the plan above, decommissioning should also be carried out as per the following guidelines:

- The Proponent/Owners and Managers of all mines should be capable of implementing responsible environmental management practices. The preparation of environmental management plans will facilitate this process and is strongly encouraged.
- All mines should be rehabilitated either progressively or at the end of mining. Each mining claim site should be left in a safe well drained and maintenance-free state, blending in as much as possible with the surrounding landscape.
- Mine operators should ensure that funds are available for progressive and final site (closure) rehabilitation.
- Unless otherwise approved (by an Inspector of mines) at mining closure, all machinery structures and buildings should be removed from the site and concentrate slabs broken up and buried. The site should be ripped; top soiled (if available), fertilized and re-vegetated using indigenous plant species. Alternatively, if approved, certain structures can remain for the benefit of the next land user.
- Surface and ground waters should be effectively managed to prevent contamination by mining operations.
- Effluent from mining and milling operations, i.e tailings should be effectively contained and only released into the environment if the water quality satisfies the standards of the **Water Quality Guidelines (Annexure B)**.
- Measures to be taken to control noise and dust from mining/milling/hauling operations to ensure a comfortable and health working environment as specified in the **Labour Act No. 11 of 2007**.
- Measures should be taken to minimise excessive ground vibrations and air-blasts over pressure due to blasting. Peak particle velocities of 5 mm/sec and air-blasts over pressures of 120 dB (peak) should not be exceeded at the boundaries of the mining claim areas.
- Mine operators should ensure that refuse is deposited in proper containers and disposed of responsibly. Fuel and oil spills should be effectively contained.
- Where practical, buildings, processing plant, stockpiles and dumps should be designed and located to reduce visual impact. Advantage should be taken of natural topography and exciting vegetation and if this not a practical option, a screen of trees should be established.
- Measures should be taken to prevent or minimise soil erosion.
- As far as is practical, top soil should be stripped from all areas to be distributed by mining operations/milling and used immediately if possible or preserved for later rehabilitation.
- Areas disturbed by mining should be re-vegetated as far as is practical using indigenous grass or tree species. However, on sites such as tailings/waste dumps, where it is important to establish a vegetative cover as soon as possible on difficult growing mediums, the use of fast growing exotic species is acceptable. Care should be taken to prevent the entry and spread of noxious plants.
- Diversion channels or ephemeral river course diversion should be constructed in accordance with sound engineering principles to ensure that soil erosion is minimised.
- Cyanide, mercury, dynamite and other toxic materials should be transported stored and handled in a safe and acceptable manner. They should be stored in safe place, fenced to prevent entry of unauthorised persons. The owner /manager should ensure that toxic materials do not escape into the surrounding rivers/ground waters.
- Mine operators should strive to conserve local flora and fauna species and avoid unnecessary destruction of both.



- 
- Unique archaeological, historical, geological and scenic features should be protected at all mining and exploration sites.
  - Residents of Ombuku Village in the vicinity of the mine should not be subjected to excessive airborne emissions (including dust, gases and smokes), liquid effluent, noise, ground vibrations and air blast from mining/milling/refining/haulage operations.
  - Mine tailings and slimes should be disposed of/stored in impoundments constructed in accordance with sound engineering principles. The dams should be sited to avoid the encountering of permeable sub-soil and/or fracture systems and an adequate drainage system should be incorporated in the design. They should be sited so that their catchments are minimal and should be designed to withstand significant rainfall events.
  - Unless otherwise approved, at the cessation of mining, or earlier if practical, waste rock dumps should be stabilized by reducing the slope angle and re-vegetated. Topsoil should be used if practicable.
  - All shafts not being used should be securely capped/otherwise made safe to prevent the entry of persons/livestock/wild animals.
  - The final land use of open cast mine /quarry should be determined prior to the cessation of mining. For example, if the site is to be used for water storage, then at the end of the mine life, drainage could be directed into the pit. If the pit/quarry is to be used for any other purpose then drainage should not be diverted around the site.
  - The final land use will dictate the amount of reshaping required on the pit faces. Where practical the slope of the steep faces should be reduced and benches top soiled (if available) to facilitate re-vegetation and blending with the surrounding landscape.
  - If practical quarry faces should be oriented to minimise their visual impact from public areas.
  - Dangerous excavations should be made safe to prevent entry of persons/stock.
  - In strip mining operations, overburden material, which is adverse to plant growth, should be buried and every effort should be made to recover and store top soil from mining path for later rehabilitation.
  - Heap leach operations should be designed to ensure that there is zero discharge of process fluid on surface waters or ground waters.
  - Unless otherwise approved, heap leach pads should be rehabilitated after leaching by detoxification, re-contouring, re-top soiling and re-vegetation so that they will be in stable maintenance free condition. Alternatively the heaps could be used to backfill nearby pits.
  - In general mining activities should not be carried out closer than 30 metres from the present course of any ephemeral river. In special circumstances, where it can be demonstrated that sedimentation can be mined, provided that present river banks remained undisturbed.
  - Mine rehabilitation should be carried out progressively to ensure that a minimum of ground is disturbed at any one time. A maximum of 2 hectares shall be un-rehabilitated at any one time unless otherwise approved.
  - The mining and rehabilitation method should ensure each layer disturbed should be replaced to its original sequence at topsoil as its final layer. All disturbed areas should be progressively rehabilitated.
  - Tailings and Slimes from wasting plants should be expounded in properly constructed dams unless otherwise approved.
  - Air and water emissions from mining and smelters should be effectively treated before release to the environmental to ensure that they are of acceptable quality.

- All exploration drill holes should be capped, plugged/filled in, either progressively or at the end of the program.
- All drilling sites, trenches and pits should be rehabilitated (i.e. backfilled and re-vegetated) after the cessation of exploration.
- Each site should be left in a clean and tidy condition with all refuse removed.

Mine closures can be planned for and should form part of an integrated land use strategy that involves the community. The decommissioning of the copper ore mining at the claim sites is envisaged in the future. Planned closure, in consultation with the community, provides the opportunity to develop alternative land uses through rehabilitation, and to use the remaining infrastructure for other economic purposes such as livestock farming. When the event occurs some recommendations have been outlined in **Table 13**.

**Table 13: Decommissioning phase management actions**

Environmental Feature	Management Actions
Deconstruction activity	Many of the mitigation measures prescribed for the copper ore mining & mine rehabilitation activities ( <b>Table 10 &amp; 11</b> above) would be applicable to some of the decommissioning activities. These should be adhered to where applicable.
Rehabilitation	In the event that decommissioning is deemed necessary, excavations need to be rehabilitated according to the management actions laid out in <b>Table 10 &amp; 11</b> above.

#### 4.0 CONCLUSION AND RECOMMENDATIONS

The proposed mining at Mining Claims 74169,74170, 74171, 74172, 74173, 74174, 74175, 74176, 74177 & 74178 in Ombuku Village will bring both positive and negative impacts. If implemented, the proposed copper ore mine will benefit and bring development to the surrounding communities in the Epupa area. Some major impacts of the project are expected during the operation phase. Vegetation will be cleared from the site, the existing ecosystems will be greatly affected. Mine vehicles and equipment will bring noise and oil spillages. Most of the projected impacts will be significant and hence the need for a comprehensive and strict environment management plan to be implemented along the entire project life span and decommissioning phases. Management of residual impacts also need to be monitored and mitigated to offset the footprint of the copper ore mine. On the basis of the above preliminary analysis and taking cognizance of the fact that the proponent has proved financially and environmentally credible, it is our recommendation that the project be allowed to go on provided the mitigation measures suggested in this EMP are strictly adhered to as deemed necessary by MEFT:DEA.

It is anticipated that the environmental management plans outlined in this report will be enforced not only as a policy obligation but to benefit Techmine Investment CC and the surrounding community in the Ombuku Village & Epupa area. It should be noted that environmental management is still a challenge to small-scale mining projects hence it is imperative for them to be always monitored by the responsible authorities so as to achieve environmental protection. It is hoped that this EMP report will assist Techmine Investment CC towards reducing the negative impacts of this project for the benefit of the next land user.

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In line with the above, it is recommended that Techmine Investment CC embark on the following:

- Appoint a qualified mine manager in terms of Minerals (Prospecting & Mining) Act, 1992 (Act No. 33 of 1992).
- Solid Waste Disposal guidelines should be obtained for best practice at the MEFT:DEA.
- Establish all infrastructures as per a Siting of Works plan approved by the Ministry of Mines and Energy.
- Register the boreholes with Ministry of Agriculture, Water and Forestry.
- Appoint an environmental consultant (HEEC) to perform environmental audits and prepare biannual reports about the project's progress
- Get inspection certificates from the Mining Commissioner as and when they are due
- Involve the Epupa community and employ locals first

The usual practice with EMPs is that they indicate how an investor (Techmine Investment CC ) will comply with established environmental and social standards. The set of investor (Techmine Investment CC ) and Counterpart EMPs (this document) will provide a good basis for addressing environmental and social issues at the base and rare metal mining sites, with copper ore being the target mineral. However, they will not provide an adequate understanding of the impact of mining activities on public health and ecosystem functions downstream from mining operations, or provide an adequate basis for setting mitigation priorities. This will require biennial environmental compliance auditing by the consultants (HEEC) or additional work beyond the scope of the site specific mining operations and Counterpart EMPs, or the cumulative Environmental Impact Assessments for the exploratory prospecting activities that provided the original baseline.

ANNEXURE A: PREVIOUSLY ISSUED ECC-00398

ECC - 00398 Serial: HQ6/Ha398



**REPUBLIC OF NAMIBIA**  
**MINISTRY OF ENVIRONMENT AND TOURISM**  
OFFICE OF THE ENVIRONMENTAL COMMISSIONER

**ENVIRONMENTAL CLEARANCE CERTIFICATE**  
ISSUED


In accordance with Section 37(2) of the Environmental Management Act (Act No. 7 of 2007)

TO

**Techmine Investment CC**  
P. O Box 23432, Windhoek, Erf 890, Tal Street, Old Brewery Centre


**TO UNDERTAKE THE FOLLOWING LISTED ACTIVITY**

Establishment and mining of base and rare minerals on mining claims 70911 - 70920 at Ombuku Village, Opuwo District, Kunene Region

  
**DEPUTY ENVIRONMENTAL COMMISSIONER**

Issued on the date: 2019-12-13  
Expires on this date: 2022-12-13

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**ANNEXURE B: CURRENT SITE PHOTO PLATES**












**MEFT REF#: 221212000672**

	<b>MONITORING AND EVALUATION REPORTS FOR THE CONTINUOUS MINING OPERATION OF BASE AND RARE METALS ON MINING CLAIMS; 74169,74170, 74171, 74172, 74173, 74174, 74175, 74176, 74177 &amp; 74178 AT OMBUKU VILLAGE, EPUPA CONSTITUENCY, KUNENE REGION, NAMIBIA</b>		
<b>HEEC Reference</b>	HEEC0152022		
<b>Proponent</b>	Techmine Investment CC CC/2018/03059 Extension 1 Otuzemba, Opuwo, Namibia P.O. Box 23432, Windhoek, Namibia		
<b>Author</b>	Tanaka D. Nyatoro	<b>Signature</b>	
<b>Status</b>	MONITORING AND EVALUATION REPORT (BI ANNUAL REPORTS)	<b>Reporting Period</b>	December 2019 – December 2022

## HEALTHY EARTH ENVIRONMENTAL CONSULTANTS CC (HEEC)

*Sustainable development solutions for life*

### ***Our consultancy Portfolio / Specialisation is composed of:***

- STRATEGIC ENVIRONMENTAL IMPACT ASSESSMENTS
- ENVIRONMENTAL AUDITING AND MONITORING
- WATER QUALITY MONITORING AND MANAGEMENT
- WATER PROSPECTING
- WASTE MANAGEMENT
- ENVIRONMENTAL POLICY REVIEWS
- ENVIRONMENTAL AWARENESS AND TRAINING
- ENVIRONMENTAL MANAGEMENT SYSTEM (ISO14001) IMPLEMENTATION
- ENVIRONMENTAL CONSULTATION
- ECOSYSTEM EVALUATION
- ENVIRONMENTAL SAFETY, HEALTH AND MANAGEMENT
- FLORA IDENTIFICATION
- GEOGRAPHICAL INFORMATION SYSTEM (GIS) AND REMOTE SENSING
- BIOHAZARD MONITORING (AIR AND RADIATION POLLUTION MONITORING)
- GREEN CLAIMS AND CARBON TAX
- LANDSCAPING AND GREEN HOUSE IRRIGATION SUPPLIES AND MAINTENANCE
- MINING
- BUSH ENCROACHMENT CONTROL
- DATA COLLECTION AND ANALYSIS
- AGRICULTURE EXTENSION SERVICES

## 1. INTRODUCTION

Techmine Investment CC has appointed Healthy Earth Environmental Consultants (HEEC) to undertake the Environmental Assessment process for the renewal of the previously issued Environmental Clearance Certificate for the continuation of mining activities on the mining claims located about 120 km North of Opuwo when using the C43 road and drive along the D3700 road to arrive at the mining claims at Ombuku Village. The actual mining is taking place on a block of 10 mining claims namely: 74169,74170, 74171, 74172, 74173, 74174, 74175, 74176, 74177 & 74178 at Ombuku Village, Epupa Constituency, Kunene Region, Namibia. The base and rare metals (raw copper ore) will be transported to local smelters for further processing.

The proponent has valued the safeguarding of the environment and has adopted environmental resilience in their daily operation. In compliance with the legal requirement the proponent was issued with an Environmental Certificate (ECC), on 13 December 2019 in for their operation which has since expired on 13 December 2022. The ECC had specified conditions that have to be adhered to during the operational phase of the mine; in particular it calls for unremitting monitoring and evaluations on environmental performance to be carried out as well as the setting and monitoring of the targets for improvement. It is against this background that Healthy Earth Environmental Consultants (HEEC) has been appointed by Techmine Investment CC to carry out the monitoring and evaluation process for mining of base and rare metals (copper) on the 10 mining claims; 74169,74170, 74171, 74172, 74173, 74174, 74175, 74176, 74177 & 74178 at Ombuku Village, Epupa Constituency, Kunene Region, Namibia.

The bi-annual reports will be submitted to the Office of the Environmental Commissioner to necessitate the renewal of the ECC. In preparation of the monitoring and evaluation report, HEEC conducts bi-annual site visits and inspection at the mine at Ombuku Village, Epupa Constituency. The site inspection entailed three integral components; ground truthing which includes visual inspection and ground truthing throughout the mining area, consultation with the Mine Manager and verbal feedback on distinct identified impacts and mitigation measures as defined in the Environmental Management Plan (EMP).

The inspection and reporting to the management of the mine, the mitigation measure and the intensity of compliance have given three (3) ranks namely; rank one (1) ranked as non-compliance and require certain critical intervention, rank two (2) indicating a medium level of compliance and require improvement and rank three (3) high level compliance and it should be maintained or even

ameliorated.

## **2. MANAGEMENT ACTIONS**

The Environmental Management Plan (EMP) tailor-made for mining activity for base and rare metals (copper) on mining claims; 74169,74170, 74171, 74172, 74173, 74174, 74175, 74176, 74177 & 74178 at Ombuku Village, Epupa Constituency, Kunene Region, Namibia has been formulated with the aims of identifying the management actions significant to mitigate the likely negative impacts associated with this project. Where impact cannot be mitigated, measures have been put in place to moderate the significance of such impacts. The reflection made during the site inspection over the past 3 year period have been outlined in the following section including site photos. A synopsis of the assessments and reflection will be outlined for the impacts and mitigation measures derived from the EMP.

### **2.1 Fauna and Flora**

This impact has been ranked two (2) and indicating a medium level of compliance and requires improvement. During the initial six months of the project, Techmine Investment CC has to a large extent cleared the area with a good deposit of base and rare metals mainly copper without restoration although they tried to avoid certain plant occurring within the mining claim areas. A large section of the intrusion with a good grade of copper has been excavated and only few individual plants left on the bank of the pit.

### **2.2 Surface and Ground water**

This impact has been ranked three (3) indicating high level compliance and it should be maintained or even ameliorated. Techmine Investment CC has been ensuring that their mining equipment such as bull-dozers, front-end loaders and trucks are regularly serviced and there are no records of oil leakage which will eventually seep into the ground to contaminate the underground water. There were no signs of surface water bodies contaminated in the mining claim areas, therefore this impact has been ranked three (3). The company has also complied with the water abstraction permit conditions and implemented water conservation measures at the site.

### **2.3 Visual and Sense of Place**

Most of the mitigation measures for these impacts have been ranked two (2) indicating a medium level compliance and require improvement. The intrusion

with a good grade of copper has been excavated, without taking into consideration the camouflage of the excavated area with the natural environment and there are no back-filling at some sections of the pits where excavation has taken place. These pits are likely to cause injuries to both human and wild animals. The aesthetic value of the area has been lost and a certain level of rehabilitation is required to be carried out and need to be concurrent with mining activities.

#### 2.4 Archeology and Heritage

There are no known artifacts or heritage significance found in the mining claim areas and the site manager is not aware of any artifacts or areas of heritage significance. However, any discovery or finding will be reported to the relevant authority which is the NHC, hence this mitigation measures have been ranked three (3) indicating high level compliance and it should be maintained or even ameliorated.

#### 2.5 Healthy, Safety and Security

All the mitigation measures have been ranked three (3) indicating high level compliance and it should be maintained or even ameliorated. Techmine Investment CC renders occupational health, safety and environment training to his employees in their respective fields and regular site meetings held onsite (tool box talks) put emphasis on safety and environment. All employees are provided with the necessary Personal Protective Equipment's (PPE). Upon entering the mining area there is permanent access control point and only authorized people are allowed onsite and it is mandatory to wear the masks and under-go for temperature checks. The company has a rotational shift system in place to ensure workers are well rested and alert to avoid stress and injuries.

#### 2.6 Social

Locals have the privilege of employment opportunities which improve the livelihoods of many people at Ombuku village and Kunene region at large. Techmine Investment CC has supported the community of Ombuku village. This mitigation measure is ranked; three (3) high level compliance and it should be maintained or even ameliorated.

## 2.7 Economic

The mine is among the active economic activities existing in Epupa Constituency. The mine has employed 10 people on fixed term contract and most of the outsourced contracts are given to the local SMEs which provide additional employment opportunity which improve the livelihoods of many people at the region. The mine also hires mining equipment and buys consumables from local companies. This mitigation measure is ranked; three (3) high level compliance and it should be maintained or even ameliorated.

## 2.8 Traffic

The mine uses the already existing established internal access gravel roads within the Ombuku villages. Any creation of unintended pathways has been avoided. Vehicles are kept in good condition, with a dedicated and qualified technical team responsible for all maintenance works. The movement of the vehicles is kept to the optimum standard and abide to the speed limit. Although the road is graded regularly there is a need to commence with watering the road during grading in order to suppress the dust. Furthermore, parking bays should be clearly marked, and road signs should be erected along the road leading to the mine. The mitigation measures for this impact have been ranked two (2) indicating a medium level compliance and requires improvement.

## 2.9 Noise

The mine business operation is from 07h00 am to 17h00 pm. Blasting is only carried out when there are bedrocks or overburden on the pit. The farm owner and the community are always notified well in advance. All employees have access to PPE where feasible. These mitigation measures have been ranked; three (3) high level compliance and it should be maintained or even ameliorated.

## 2.10 Air Quality

Air quality monitoring is among the few items that requires some level of urgent attention at the mine. The mitigation measure for this impact is ranked one (1) ranked as non-compliance and require certain critical intervention. Certain mitigation measure of concern has been identified; this includes regular airborne dust sampling.

## 2.11 Solid Waste

This impact is ranked two (2) indicating a medium level of compliance and requires improvement. The mine has few waste bins onsite. Additional waste bins should be made available onsite with colour codes for different waste fractions. The RRR (Reduce, Reuse and Recycle) should be adopted as an approach for waste management. In-house waste management training should be conducted to ensure that the employees have a better understanding of different waste fractions and the importance of recycling should be highlighted. The visual aids should be used this includes; the use of images of waste category allowed in each bin.

## 2.12 Hazardous substances

The hazardous substance impact has been ranked three; (3) high level compliance and it should be maintained or even ameliorated. Appropriate storage facility is provided for these substances.

## 2.13 Land use alteration and degradation

The mitigation measures for this impact are ranked two (2) indicating a medium level of compliance and require improvement. The mitigation measures for this impact entails issues such as updating the Environmental Management Plan (EMP) as new impacts emerge, this will ensure continuous management and compliance to set mitigation measures and perform site rehabilitation on a continuous basis.

## 2.14 Existing service infrastructure

The mine is currently using diesel powered machines to supply power to the facilities at the mine. Currently the energy requirement for household is minimal due to the fact that only the site manager stays onsite with few staff members including the security guard. The rest of the staff member are from Karibib. In terms of cooking the gas stove is used for the kitchen and the gas bottle is enclosed in the cages outside the kitchen for safety reasons. The mine envisaged to set up a 5 MW solar power plant to supply electricity to the mine and feed into the national grid (REFIT Program) and the negotiations are underway with the relevant authority. This will reduce energy cost in the area and reduces the impact of climate change. This impact is ranked two (2) indicating a medium level of compliance and requires improvement.

## 2.15 Environmental Management Plan (EMP) Training

Techmine Investment CC has prioritized safety, health, and environment in the daily operation of the mine and employees are acquainted with the relevant safety, health, and environmental matters. Environmental training and safety has been given the highest priority and is one of the highlighted topics in the agenda of the regular site meetings being held. Techmine Investment CC has a service level agreement with Healthy Environmental Consultants cc (HEEC) to carry out all environmental monitoring, reporting and advisory roles.

## 2.16 Monitoring

In accordance with the mitigation measures, HEEC will carry out the monitoring and evaluation services. The site inspections are carried out on a bi-monthly basis, and bi-annual reports are to be submitted to the Office of the Environmental Commissioner, hence this report serves as the initial compilation of the bi-annual reports.



### **3. ANNEXURE A**

Inspection reports

**December 2019 – December 2021**

Due to the Covid19 Pandemic no Environmental Monitoring and Evaluation Inspections were carried out during this period as they were minimal mining activities being carried out due to the lockdown restrictions.

## January 2022-June 2022

Report on Environmental Monitoring and Evaluation Inspection for the mine belonged to Techmine Investment CC, at Ombuku Village, Epupa Constituency, Kunene Region, was formulated based on the information provided by the Mine Owner and Site Manager.

In accordance with the service level agreement between Healthy Earth Environmental Consultant (HEEC) Techmine Investment CC, the site inspection was carried out in March 2022 at the mine where mining of base and rare metal (copper ore) is taking place and the report was based on the information provided and the ground truthing at the site. To ensure that the condition of the Environmental Clearance Certificate are being adhered to, it is imperative to take note that the Environmental Management Plan (EMP) is the main document outlining the intended mitigation and remedial actions that should be undertaken in various stages of a development, for this purpose the operation phase of the mine at Ombuku Village, Epupa Constituency, Kunene Region. The EMP should be considered as a living and vibrant document that should be altered to improve the continuous mining operation.

To maintain convenience of reference a tabular form of reporting was adopted highlighting on the management actions detailed in the EMP that was approved by the Environmental Commissioner in 2019. During the site visit and inspection, the consultants were accompanied by Mr. Lucas Aktsel who is the site manager and owner of the mine. The inspection comprised of two components the initial component entails; ground truthing which includes visual inspection and authentication throughout the mining area and secondly verbal feedback on distinct identified impacts and mitigation measures as defined in the Environmental Management Plan (EMP).

The mitigation measures and the level of compliance therefore have been ranked by means of three ranks, namely rank one (1); ranked as non-compliance and require certain critical intervention, rank two (2) indicating a medium level of compliance and require improvement, rank three (3) high level compliance and it should be maintained or even ameliorated. The legend provides the meaning of the different ranks. Special focus should be given to the mitigation measures ranked one (1) since it is considered to be critical as it reflect non-compliance.

Recommendation and views have been provided on the mitigation measures ranked one (1) as well as the mitigation measures ranked two (2).

Yours faithfully,

  
Dzikamayi Tanaka Nyatoro

<b>Legend</b>	
High level compliance and it should be maintained or even ameliorated.	Rank three (3)
Medium level of compliance and require improvement	Rank two (2)
Non-compliance and require certain critical intervention	Rank one (1)

<b>OPERATIONAL PHASE IMPACTS</b>		
<b>Impact</b>	<b>Mitigation Measures</b>	<b>Rank</b>
	<ul style="list-style-type: none"> <li>Clearing of the mining area during the operational phase should be carried out in phases.</li> <li>Protected plants occurring in the mining area should be marked and avoided at all cost.</li> </ul>	Rank two (2)
Fauna and Flora	<ul style="list-style-type: none"> <li>Restore the lost indigenous plant species as compensation of any lost vegetation due to mining.</li> <li>Continuous monitoring of any alien plants growing in the project area.</li> </ul>	Rank two (2)
		A restoration program should be commission.
		Alien plant task force is recommended.
Surface and Ground water	<ul style="list-style-type: none"> <li>Dumping of waste products of any kind in or close proximity to any surface water bodies is not permitted.</li> <li>Contaminated runoff from the various operational activities such as fuel, oil, grease and so forth should be prevented from entering</li> </ul>	Rank three (3)

	any surface or ground water bodies and where these happened, immediate remedial actions should be taken.			
	<ul style="list-style-type: none"> <li>Washing of equipment is not permitted onsite.</li> <li>Avoid the spillage of fuel.</li> <li>Constantly monitor fuel tanks and supply lines to detect leakages.</li> <li>In the event of accidental fuel spillage, the effluent should be contained separately as soon as possible.</li> </ul>	Rank three (3)	Rank three (3)	All cleaning of equipment should be done at the car wash with proper storm water system at Karibib.
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Visual and Sense of Place	<ul style="list-style-type: none"> <li>The mine pit should blend in with the natural surrounding environment.</li> <li>The natural appealing of the area should be maintained and improved by planting indigenous trees.</li> </ul>	Rank two (2)	Rank two (2)	Stockpiles should be used to maintain the blending of the surrounding natural environment. These plants can be sourced from local forestry nurseries in the region and beyond or Namib Trees CC in Windhoek.
Archaeology and Heritage	<ul style="list-style-type: none"> <li>The proponent or proponent representative should report any discovery or finding of any archaeological or heritage aspects to the relevant authorities such as</li> </ul>	Rank three (3)	Rank three (3)	The National Heritage Council shall be contracted to carry out the archeological assessment in the project area.

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Health, Safety and Security	<ul style="list-style-type: none"> <li>• Provide occupational health and safety training to all employees.</li> </ul>	Rank three (3)	Training should be an on-going exercise.
	<ul style="list-style-type: none"> <li>• Ensure that there is a first aid kit available on-site always and a well-trained employee to administer first aid when required.</li> </ul>	Rank three (3)	
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	<ul style="list-style-type: none"> <li>All employees must adhere to all the relevant occupational health and safety requirements.</li> <li>The workers should be supplied with all the necessary Personal Protective Equipment where appropriate and should safety gears at all time.</li> </ul>	Rank three (3)	Ensure compliance to health protocol and COVID19 regulations.
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Social	<ul style="list-style-type: none"> <li>Ensure that the local people receive the highest economic benefit in term of corporate social responsibilities.</li> </ul>	Rank three (3)	
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Traffic	<ul style="list-style-type: none"> <li>There should be only one access and exist points to the mine to monitor movement.</li> <li>Ensure that road junctions have good line of sight.</li> <li>Vehicles used at the mine must be</li> </ul>	Rank three (3)	
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	road worthy and properly serviced at all time.	(3)	
	<ul style="list-style-type: none"> <li>Transport the materials in the least quantity of trips as possible.</li> </ul>	Rank three (3)	
	<ul style="list-style-type: none"> <li>Comply to the speed limit of 40km/h.</li> </ul>	Rank three (3)	
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	<ul style="list-style-type: none"> <li>Limit the type of activities that generate excessive noise within the mining area.</li> </ul>	Rank three (3)	
	<ul style="list-style-type: none"> <li>All areas where noise level exceeds 85 dB should be managed and controlled in line with the relevant guidelines.</li> </ul>	Rank one (1)	
	<ul style="list-style-type: none"> <li>Noise monitoring levels should be carried to ensure that a noise level doesn't exceed acceptable level.</li> </ul>	Rank one (1)	
	<ul style="list-style-type: none"> <li>Equipment's should be serviced regularly to avoid emitting excessive noise.</li> </ul>	Rank three (3)	
	<ul style="list-style-type: none"> <li>Control activities that contribute to air pollution.</li> </ul>	Rank two (2)	
<b>Air Quality</b>	<ul style="list-style-type: none"> <li>Ensure that emissions from any activity within the mining area</li> </ul>		It is recommended that regular dust



	<p>is within the World Health Organisation (WHO) Air Quality Guidelines.</p> <ul style="list-style-type: none"> <li>• Carry out regular airborne dust sampling.</li> <li>• Ensure elusive dust does not exceed applicable limits.</li> <li>• Wet loose dust areas.</li> <li>• Consider the application of dust suppressants such as Dustex to reduce dust from getting airborne.</li> <li>• Restrict speed of vehicles movement at the onsite.</li> <li>• The site manager, overseeing the operational activities of the mine should stop the operation during strong wind events and only commence when the wind calms down.</li> <li>• Avoid over-loading of vehicles.</li> <li>• Pre and regular testing of employees for effect of exposure to dust emissions at recognized health facility.</li> <li>• Implement an Integrated Solid Waste Management System onsite.</li> </ul>	<p>Rank one (1)</p> <p>Rank one (1)</p> <p>Rank two (2)</p> <p>Rank one (1)</p> <p>Rank three (3)</p> <p>Rank three (3)</p> <p>Rank three (3)</p> <p>Rank one (1)</p> <p>Rank one (1)</p> <p>Rank one (1)</p>	<p>sampling should be carried out to ensure compliance to WHO, Air Quality Guidelines. The sampling can be conducted at pre-determined intervals.</p>
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Solid Waste	<ul style="list-style-type: none"> <li>Place priority on waste prevention, reduction and waste recycling.</li> </ul>	Rank one (1)		
	<ul style="list-style-type: none"> <li>Avoid burning waste</li> </ul>	Rank three (3)		
	<ul style="list-style-type: none"> <li>Place distinct bins to separate and collect various types of waste.</li> </ul>	Rank one (1)		
	<ul style="list-style-type: none"> <li>Contract a local SME to collect and discard waste at the designated landfill with a valid ECC.</li> </ul>	Rank two (2)		
	<ul style="list-style-type: none"> <li>Substantial number of waste bins must be placed around the mine.</li> </ul>	Rank one (1)		
	<ul style="list-style-type: none"> <li>Enough skip containers should be placed at the designated area for heavy waste.</li> </ul>	Rank one (1)		
	<ul style="list-style-type: none"> <li>In the absence of the above solid waste can be collected and disposed of at an appropriate landfill in Opuwo in consultation with the Opuwo Town Council.</li> </ul>	Rank three (3)		
	Hazardous substances	<ul style="list-style-type: none"> <li>All workers should be trained on how to handle chemical and hazardous substances this must as well include First Aid.</li> </ul>	Rank three (3)	
		<ul style="list-style-type: none"> <li>Storage area for all substances should be properly secure and in position to hold 120% of the total volume of a given substance stored on site.</li> </ul>	Rank three (3)	

Land use alteration and degradation	<ul style="list-style-type: none"> <li>Develop a site plan to avoid haphazard excavation and trenching.</li> </ul>	Rank three (3)	
	<ul style="list-style-type: none"> <li>Limit mining activities within the boundaries of the mining claims area.</li> </ul>	Rank three (3)	
	<ul style="list-style-type: none"> <li>Access routes must be clearly marked to prevent conflict with movement.</li> </ul>	Rank three (3)	
	<ul style="list-style-type: none"> <li>Rehabilitation of the mine pit must be carried out on a continuous basis; rehabilitate the pit as soon as mining in a targeted area has been completed.</li> </ul>	Rank one (1)	
Existing service infrastructure	<ul style="list-style-type: none"> <li>Continue to explore the establishment of a solar energy plant.</li> </ul>	Rank one (1)	
	<ul style="list-style-type: none"> <li>Obtain an Environmental Clearance Certificate for the solar energy plant.</li> </ul>	Rank one (1)	
	<ul style="list-style-type: none"> <li>Explore initiative focusing on water conservation such as rain water harvesting and waste water in line with applicable local authority by-laws.</li> </ul>	Rank one (1)	
	<ul style="list-style-type: none"> <li>Re-use of treated waste water should be considered wherever</li> </ul>	Rank one (1)	

	possible to reduce the consumption of portable water.		
	<ul style="list-style-type: none"> <li>Comply with the water quality guideline in term of The Water Act, 1956.</li> </ul>	Rank three (3)	
Environmental Management Plan (EMP) Training	<ul style="list-style-type: none"> <li>All employees must undergo through an induction course and all the necessary health, safety and environmental consideration should be emphasized.</li> </ul>	Rank three (3)	
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Monitoring	<ul style="list-style-type: none"> <li>An Environmental Practitioner should monitor the execution of the Environmental Management Plan and recommend any modification where necessary.</li> </ul>	Rank three (3)	
	<ul style="list-style-type: none"> <li>The Environmental Practitioner should inspect the site on regular basis if possible, on monthly or bi-monthly.</li> </ul>	Rank three (3)	
	<ul style="list-style-type: none"> <li>Biannual reports are to be submitted to the Ministry of Environment, Forestry and Tourism.</li> </ul>	Rank three (3)	

July 2022-December 2022

Report on Environmental Monitoring and Evaluation Inspection for the mine belonged to Techmine Investment CC, at Ombuku Village, Epupa Constituency, Kunene Region, was formulated based on the information provided by the Mine Owner and Site Manager.

In accordance with the service level agreement between Healthy Earth Environmental Consultant (HEEC) Techmine Investment CC, the last site inspection was carried out in December 2022 at the mine where mining of base and rare metal (copper ore) is taking place and the report was based on the information provided and the ground truthing at the site. To ensure that the condition of the Environmental Clearance Certificate are being adhered to, it is imperative to take note that the Environmental Management Plan (EMP) is the main document outlining the intended mitigation and remedial actions that should be undertaken in various stages of a development, for this purpose the operation phase of the mine at Ombuku Village, Epupa Constituency, Kunene Region. The EMP should be considered as a living and vibrant document that should be altered to improve the continuous mining operation.

To maintain convenience of reference a tabular form of reporting was adopted highlighting on the management actions detailed in the EMP that was approved by the Environmental Commissioner in 2019. During the site visit and inspection, the consultants were accompanied by Mr. Lucas Akseel who is the site manager and owner of the mine. The inspection comprised of two components the initial component entails; ground truthing which includes visual inspection and authentication throughout the mining area and secondly verbal feedback on distinct identified impacts and mitigation measures as defined in the Environmental Management Plan (EMP).

The mitigation measures and the level of compliance therefore have been ranked by means of three ranks, namely rank one (1); ranked as non-compliance and require certain critical intervention, rank two (2) indicating a medium level of compliance and require improvement, rank three (3) high level compliance and it should be maintained or even ameliorated. The legend provides the meaning of the different ranks. Special focus should be given to the mitigation measures ranked one (1) since it is considered to be critical as it reflect non-compliance.

Recommendation and views have been provided on the mitigation measures ranked one (1) as well as the mitigation measures ranked two (2).

Yours faithfully,

  
Dzikamai Tanaka Nyatoro

<b>Legend</b>	
High level compliance and it should be maintained or even ameliorated.	Rank three (3)
Medium level of compliance and require improvement	Rank two (2)
Non-compliance and require certain critical intervention	Rank one (1)

<b>OPERATIONAL PHASE IMPACTS</b>		
<b>Impact</b>	<b>Mitigation Measures</b>	<b>Rank Remarks</b>
Fauna and Flora	<ul style="list-style-type: none"> <li>Clearing of the mining area during the operational phase should be carried out in phases.</li> <li>Protected plants occurring in the mining area should be marked and avoided at all cost.</li> </ul>	Rank two (2)
	<ul style="list-style-type: none"> <li>Restore the lost indigenous plant species as compensation of any lost vegetation due to mining.</li> </ul>	Rank two (2) A restoration program should be commission.
	<ul style="list-style-type: none"> <li>Continuous monitoring of any alien plants growing in the project area.</li> </ul>	Rank three (3) Alien plant task force is recommended.
Surface and Ground water	<ul style="list-style-type: none"> <li>Dumping of waste products of any kind in or close proximity to any surface water bodies is not permitted.</li> </ul>	Rank three (3)
	<ul style="list-style-type: none"> <li>Contaminated runoff from the various operational activities such as fuel, oil, grease and so forth should be prevented from entering</li> </ul>	Rank three (3)

	any surface or ground water bodies and where these happened, immediate remedial actions should be taken.			
	<ul style="list-style-type: none"> <li>Washing of equipment is not permitted onsite.</li> <li>Avoid the spillage of fuel.</li> <li>Constantly monitor fuel tanks and supply lines to detect leakages.</li> <li>In the event of accidental fuel spillage, the effluent should be contained separately as soon as possible.</li> </ul>	Rank three (3)	Rank three (3)	All cleaning of equipment should be done at the car wash with proper storm water system at Karibib.
		Rank three (3)	Rank three (3)	
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Visual and Sense of Place	<ul style="list-style-type: none"> <li>The mine pit should blend in with the natural surrounding environment.</li> <li>The natural appealing of the area should be maintained and improved by planting indigenous trees.</li> </ul>	Rank two (2)	Rank two (2)	Stockpiles should be used to maintain the blending of the surrounding natural environment. These plants can be sourced from local forestry nurseries in the region and beyond or Namib Trees CC in Windhoek.
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	<ul style="list-style-type: none"> <li>• Ensure that there is a first aid kit available on-site always and a well-trained employee to administer first aid when required.</li> </ul>	Rank three (3)	
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	<ul style="list-style-type: none"> <li>All employees must adhere to all the relevant occupational health and safety requirements.</li> <li>The workers should be supplied with all the necessary Personal Protective Equipment where appropriate and should safety gears at all time.</li> </ul>	Rank three (3)	Ensure compliance to health protocol and COVID19 regulations.
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	road worthy and properly serviced at all time.	(3)	
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<b>Noise</b>			
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	<p>is within the World Health Organisation (WHO) Air Quality Guidelines.</p> <ul style="list-style-type: none"> <li>• Carry out regular airborne dust sampling.</li> <li>• Ensure elusive dust does not exceed applicable limits.</li> <li>• Wet loose dust areas.</li> <li>• Consider the application of dust suppressants such as Dustex to reduce dust from getting airborne.</li> <li>• Restrict speed of vehicles movement at the onsite.</li> <li>• The site manager, overseeing the operational activities of the mine should stop the operation during strong wind events and only commence when the wind calms down.</li> <li>• Avoid over-loading of vehicles.</li> <li>• Pre and regular testing of employees for effect of exposure to dust emissions at recognized health facility.</li> </ul>	<p>Rank one (1)</p> <p>Rank one (1)</p> <p>Rank two (2)</p> <p>Rank one (1)</p> <p>Rank three (3)</p> <p>Rank three (3)</p> <p>Rank three (3)</p> <p>Rank one (1)</p>	<p>sampling should be carried out to ensure compliance to WHO, Air Quality Guidelines. The sampling can be conducted at pre-determined intervals.</p>
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