

ENVIRONMENTAL MANAGEMENT PLAN (EMP) FOR THE RENEWAL OF THE ENVIRONMENTAL CLEARANCE CERTIFICATE (ECC) FOR THE CONTINUOUS MINING OPERATION OF BASE AND RARE METALS, INDUSTRIAL MINERALS AND PRECIOUS METALS ON MINING LICENCE (ML) 198, UIS, KUNENE REGION, NAMIBIA



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ABBREVIATION

DEAF	Department of Environmental Affairs and Forestry
DMD	Dauremas Mineral Development
EA	Environmental Assessment
EAP	Environmental Assessment Practitioner
ECC	Environmental Clearance Certificate
ECO	Environmental Compliance Officer
ECS	EnvironClim Consulting Services
EIA	Environmental Impact Assessment
EMA	Environmental Management Act (No. 7 of 2007)
EMP	Environmental Management Plan
FEL	Front End Loader
GIS	Geographical Information System
HIV	Human Immunodeficiency Virus
MAWLF	Ministry of Agriculture, Water and Land Reforms
MEFT	Ministry of Environment, Forestry and Tourism
ML	Mining License
PPE	Personal Protective Equipment
RON	Run of Mine
RWD	Return Water Dam
SHE	Safety, Health and Environment
TSF	Tailing Storage Facility
WHO	World Health Organization

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1. OVERVIEW

1.1 INTRODUCTION

Dauremas Mineral Development (Pty) Ltd a joint venture company is the holder of the Mining License (ML) 198. The company intends to resume mining operation the “De Rust” deposit that mainly constitutes Tantalite in association with Mica, Lithium and Feldspar. The project is a technical low risk operation. The commencement of the mining operation was hindered by Covid19 and operation could not fully take place. Post Covid19 established a basecamp for the workforce and a huge investment was made towards the purchasing of heavy mining equipment’s that includes; excavators, loaders, ripping and dozer machines. The mined ore will be packed into one-ton bags and loaded onto truck to the port of Walvis Bay for shipping to international market.

The project will contribute enormously to the economy of the area. The project will employ about 100 people. These will entail; mining, operation, engineering, administration and technical and support staff. The lifespan of the mine is anticipated to be 10 years and is estimated to cost around 113 million Namibian dollars. The proponent has submitted all the necessary documents to the Ministry of Mine and Energy (MME) and a mining license had been granted on the 25/01/2021 and is valid until 24/01/2031. The issued Environmental Clearance Certificate which had been granted by the Ministry of Environment, Forestry and Tourism (MEFT) on the 14 September 2020 had expired on the 14 September 2023. Therefore, a renewal of the Environmental Clearance Certificate is required for the continuous operation of the mine.

1.2 PROJECT COMPONENTS

The mining operation will optimise an open cast mining technique to extract minerals. A large portion of the ore body concentrated on the slope side of the western ridgeline. The pit will be sunk to a depth of between 40 or 50 metres from the top of the ridge downward. Thereafter, the proponent will explore the possibility of converting the mine to underground from the valley level. The water abstraction permit with a permit number: 11048 was granted by the line ministry and is valid for a period of 5 years. The water abstraction permit has a maximum abstraction of 200 000 m³ and had made specific reference to the boreholes with the following serial numbers; WW 203982 and WW 203983 to be used for water abstraction purposes.

2. PROJECT LOCATION

The ML 198 that belonged to the Dauremas Mineral Development (Pty) Ltd is situated approximately 47 Km north-west of Uis within the Daures Constituency in Kunene Region (see **Figure 1** below). The ML covers an area of 143.9999 Ha and as per the recommendation from the Environmental Impact Assessment (EIA) conducted in 2019 which ultimately led to the issuance of the Environmental Clearance Certificate, the alternative road that will be used during the operational phase is the road which branched out from the C35 road towards the west via Alfa Pos and turn-off shortly towards the north before the De Rust towards Tsabiteros and turn-off towards the west before reaching Tsabiteros. This route has been recommended in the EIA and should be limited to the general public use with strict controlled access.

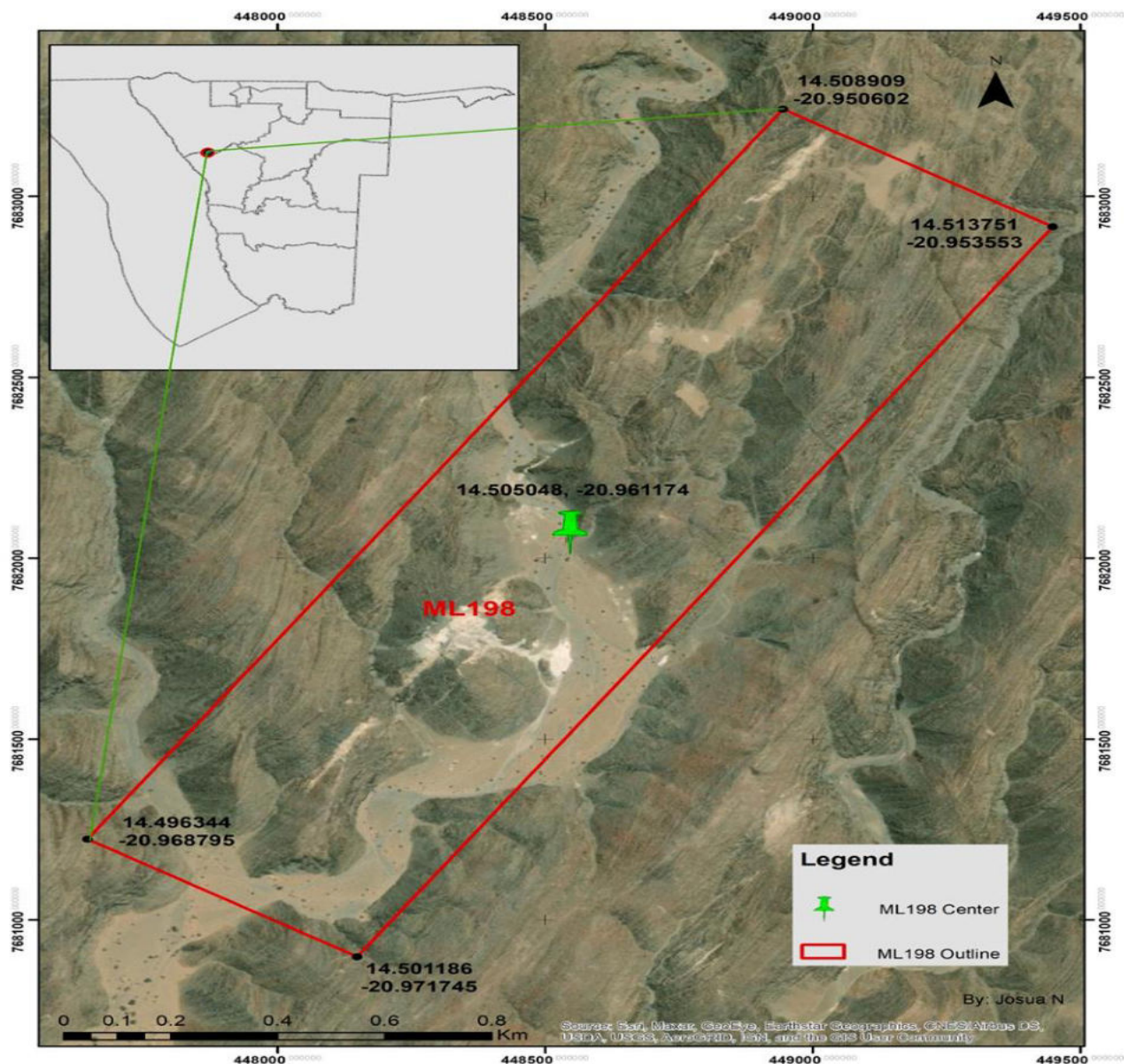


Figure 1: Location of ML 198, Uis, Daures Constituency in Kunene Region (geo-reference point -20.96000S, 14.504167E).

3. PURPOSE OF THE EMP

This Environmental Management Plan (EMP) is a risk strategy that outline logical and empirical framework, monitoring programs, mitigation measures, and management control strategies to minimize potential environmental impacts to a marginal level. Furthermore, it outlines the roles and responsibility of persons involved in the proposed mining project. This EMP include formulated mitigation measures for the continuous mining operation of base and rare metals, industrial minerals and precious metals on Mining Licence (ML) 198, Uis, Kunene Region, Namibia.

4. COMPLIANCE TO THE EMP

This EMP is a legally binding document as given under the provisions of the Environmental Management Act, 2007 (Act No. 7 of 2007). The project proponent and its contractors must therefore adhere to the framework of this document. It should be noted further that the EMP is a living document and is subjected to amendments depending on the changing environments and new information that may be available in the future, hence it must be revised accordingly with the provision of the EMA.

5. LEGAL AND POLICY FRAMEWORK

The proposed project shall be established and operated under the provision of the relevant statutory framework of Namibian and international laws of which Namibia is signatory.

Table 1. Legal Requirements for the proposed project

Legislation	Summary	Applicability
The Namibian Constitution	The Namibian constitution is the supreme law of the country which is committed to sustainable development. Article 95(1) of the Constitution of Namibia states that: - "The State shall actively promote and maintain the welfare of the people by adopting policies aimed at ... The maintenance of ecosystems, essential ecological processes and biological diversity of Namibia and utilization of living natural resources on a sustainable basis for the benefit of all Namibians, both present and future".	To undertake the EIA in order to maintain the ecological process and diversity of ecosystem.
The Environmental Management Act	The Environmental Management Act No 7 of 2007 aims to promote the sustainable management of the environment and the use of natural resources and to provides for a process of assessment and control of activities which may have significant effects on the environment; and to provide for incidental matters. The acts provide a list of activities that may not be undertake without an environmental clearance certificate. Further, the Act ensures that; Further, the Act ensures that; (a) Potential threats are considered timeously	Legal requirement to undertake an EIA

Legislation	Summary	Applicability
	<p>(b) A comprehensive stakeholder's consultation is conducted, and all Interested and affected parties are given an opportunity to comment on the project</p> <p>(c) Decision are robust by considering the above-mentioned activities.</p>	
Atmospheric Pollution Prevention Ordinance Act (No.11 of 1976)	<p>This Ordinance serves to control air pollution from point sources, but it does not consider ambient air quality. This ordinance is being repealed by the proposed Pollution Control and Waste Management Bill. Any person carrying out a 'scheduled process' which are processes resulting in noxious or offensive gases typically pertaining to point source emissions have to obtain a registration certificate from the Department of Health.</p>	<p>Generation of greenhouse gases from emission from vehicles and mining equipment.</p>
Draft Pollution Control and Waste Management Bill	<p>This Bill serves to regulate and prevent the discharge of pollutants to air and water as well as providing for general waste management. The Bill will repeal the Atmospheric Pollution Prevention Ordinance (11 of 1976) when it comes into force. The Bill also provides for noise, dust or odour control that may be considered a nuisance. Further, the Bill advocates for duty of care with respect to waste management affecting humans and the environment and calls for a waste management licence for any activity relating to waste or hazardous waste management.</p>	<p>Possible fuel spill and leakages may pollute ground and surface water.</p>
Environmental Policy framework (1995)	<p>This policy subjects all developments and project to environmental assessment and provides guideline for the Environmental Assessment. Its provision mandate that</p>	<p>Provision of the EIA and guidelines</p>

Legislation	Summary	Applicability
	Environmental Assessment take due consideration of all possible impacts and incorporate them in the development or planning stages.	
The Occupational Safety and Health Act No. 11 of 2007;	<p>Safety: A safety risk is a statistical concept representing the potential of an accident occurring, owing to unsafe operation and/or environment. In the working context “SAFETY” is regarded as “free from danger” to the health injury and to properties.</p> <p>Health: Occupational Health is aimed at the promotion and maintenance of the highest degree of physical, mental and social wellbeing of workers in all occupations. This is done by ensuring that all work-related hazards are prevented and where they occur, managed.</p>	<p>Operating mining equipment has the potential risk of injuries.</p> <p>Provision of clean ablution facility, routine health check-ups for employees, HIV/AIDS awareness etc.</p>
Public Health Act No. 36 of 1919	The Act serves to protect the public from nuisance and states that no person shall cause a nuisance or shall suffer to exist on any land or premises owned or occupied by him or of which he is in charge any nuisance or other condition liable to be injurious or dangerous to health.	Ensure public safety from noise, dusts, and air pollution.
Water Resources Management Act (2013)	This Act provides a framework for managing water resources based on the principles of integrated water resources management. It provides for the management, development, protection, conservation, and use of water resources. Furthermore, any	Ensure that the riverine systems are not polluted and implement pollution control mechanism to avoid water pollution.

Legislation	Summary	Applicability
	watercourse on/or in close proximity to the site and associated ecosystems should be protected in alignment with the listed principles.	
Water Act No, 54 of 1956	<p>This act states that, all water resources belong to the State. It prevents pollution and promotes the sustainable utilization of the resource. To protect these resources, this act requires that permits are obtained when activities involve the following;</p> <ul style="list-style-type: none"> (a) Discharge of contaminants into water sources such as pipe, sewer, canal, sea outfall and (b) Disposal of water in a manner that may cause detrimental impact on the water resources 	Contaminated water, such as sewage sludge must not be dumped into the ephemeral river.
Petroleum Product and Energy Act No, 13 of 1990 Explosive Act No 26 of 1956	This Act provides a framework for handling and distribution of petroleum products which may include purchase, sale, supply, acquisition, possession, disposal, storage or transportation thereof.	Safe handling of the petroleum products such as fuel and lubricants.
Labour Act No. 11 of 2007	This Act aims to regulate labour in general and includes the protection of the health, safety and welfare of employees. The 1997 Regulations relating to the Health and Safety of employees at work sets out the duties of the employer, welfare and facilities at the workplace, safety of machinery, hazardous substances, physical hazards, medical provisions, construction safety and electrical safety.	Follow legal labour requirements such as safety, remuneration etc.
Regional Council Act, 1992 (Act No. 22 of 1992)	The Regional Councils Act legislates the establishment of Regional Councils that are responsible for the planning and coordination of regional policies and development.	Observe the regional by laws

Legislation	Summary	Applicability
	The main objective of this Act is to initiate, supervise, manage and evaluate development at regional level.	
Soil Conservation Act No. 76 of 1969	This act promotes the conservation of soil, prevention of soil erosion.	Coordinate movement of mining equipment to prevent soil erosion. Ensure conservation of topsoil.
Hazardous Substances Ordinance No. 14 of 1974	This ordinance gives provision to control the handling of hazardous substance in all circumstances, such as manufacturing, imports and exporting of these to ensure human and environmental safety.	Handling of fuel, fire and explosion risks
National Heritage Act No. 27 of 2004	The Act makes provision for the protection and conservation of places and objects of heritage significance and the registration of such places and objects. Part V Section 46 of the Act prohibits removal, damage, alteration or excavation of heritage sites or remains, while Section 48 sets out the procedure for application and granting of permits such as	Mining activities such excavation and trenching may unearth archaeological material.
Word's Best Practises	<p><i>Precautionary Approach Principle</i></p> <p>This principle is worldwide accepted when there is a lack of sufficient knowledge and information about the possible threats to the environment. Hence if the anticipated impacts are greater, then precautionary approach is applied. In this project, there are no eminent uncertainty however in cases when they arise, this approach should be applied.</p>	Mining mineral particularly in the area with biodiversity and underground water can be detrimental to the ecosystem and underground water resource. Therefore, precaution must be taken when doing excavation and trenching during mining.

Legislation	Summary	Applicability
	<p><i>Polluter Pays Principle</i></p> <p>This principle ensures that proponents take responsibility of their actions. Hence in cases of pollution, the proponent bears the full responsibility to clean up the environment.</p>	<p>In the event of any damage of biodiversity and pollution of underground water, the proponent must be responsible to compensate for the damages.</p>

6. ROLES & RESPONSIBILITIES

6.1. Environmental Compliance Officer (ECO)

The Ministry of Environment, Forestry and Tourism is the custodian of environmental protection. The Environmental Compliance Officer shall be an appointed Environmental Officer from the Directorate of Environmental Affairs delegated to impose compliance as per the provision of the EMA. The ECO may carry out inspection at any given time to enforce compliance. Depending on his/her work schedule, the ECO shall visit the site at any time for environmental inspection and monitoring.

6.2. The Proponent

Dauremas Mineral Development (Pty) Ltd shall resume the overall responsibility of environmental management through acceptable implementation of the environmental management plan. Furthermore, it shall be a full responsibility of the proponent to implement the following activities.

- Appoint a site Manager;
- Ensures that all workers and contractors are conversant with the Environmental Management Plan (EMP) and are inducted on safety measures pertaining to mining of base and rare metals, industrial minerals and precious metals on Mining Licence (ML) 198, Uis, Kunene Region, Namibia.
- Ensure a safe and healthy working environment;
- Provide workers with appropriate Personal Protective Clothing (PPE);
- Monitor the employees works with regard to safety;
- Ensure good environment performance and compliance;
- Appoint an environmental officer or Environmental Practitioner to carry out environmental audits.

6.3. Site Manager

The Site Manager shall represent **Dauremas Mineral Development (Pty) Ltd** will be responsible for monitoring daily operations and ensure acceptable adherence of workers and contractors to the EMP. The Site Manager must ensure that a copy of the EMP is available on site at all times and every worker is acquainted with the EMP.

6.4. Employees and Contractors

All stakeholders, especially employees and contractors must;

- Adhere to the EMP;
- Ensure to wear personal protective clothing at all time when working;
- Report worn out PPE and request for replacement;
- Adhere to the company rules and policies.

7. DISCIPLINARY ACTION

The EMP is a legally binding document. Non-compliance to the EMP must result in punishable legal action against the proponent such as;

- Suspension of work;
- Financial penalties.

The disciplinary action shall be determined as per the provision of EMA and relevant statutory framework. Under Section 27 (4), *Any person who contravenes subsection (3) commits an offence and is on conviction liable to a fine not exceeding N\$500 000 or to imprisonment for a period not exceeding 25 years or to both such fine and such imprisonment*".

8. THE ENVIRONMENTAL MANAGEMENT PLAN

The scope of this EMP is with reference the mining activities for the continuous mining operation of base and rare metals, industrial minerals and precious metals on Mining Licence (ML) 198 and decommissioning phase of the planned project. This EMP is structured by considering Social, Environmental, Safety and Occupational Health aspects associated with this project as summarised in **Table 2** below.

Table 2 : Environmental Management Plan (EMP)

Activity	Objectives
A – Staff Induction	Induction
	Communication
B – Health and Safety	General safety at workplace
	Ablution facilities
	Dust and Noise Exposure
C – Pollution and Waste Management	Material waste, domestic waste
	Mining equipment and vehicle emissions, dust and noise
	Fuel spillage and leakages Oil and lubricant leakages
D – Environment	Soil
	Water
	Biodiversity
	Rehabilitation
E – Cultural Heritage	Archaeological and Heritage
F – Socio- Economic	Employment
	Alcohol and drug abuse
	Working hours
	Capacity building
	HIV / AIDS
	Traffic

SECTION A: STAFF INDUCTION

Table 3. Staff Induction Mitigation Measures

Environmental or Social Aspects	Objective	Proposed Mitigation Measures	Monitoring Indicators	Responsibility
Staff Induction	To ensure that all staff / employees are familiar with the requirements of the EMP	<ul style="list-style-type: none"> All employees and contractors must go through an intensive induction course on all the provisions of the EMP. There must be an annual induction course for all the workers. New employees must not start work without going through the induction course. 	<p>Induction minutes and attendance register signed by each staff member.</p> <p>Induction report</p>	Management or Site Manager
	Disciplinary	<ul style="list-style-type: none"> Company must adopt a disciplinary system to discipline staff for non-compliance, such as not using ablution facilities and disposing off waste uncontrollably etc. Strict measure must be put in place, any employee found contravening 	<p>Disciplinary meetings and actions</p> <p>Disciplinary letters / Warnings</p>	Management or Site Manager

Environmental or Social Aspects	Objective	Proposed Mitigation Measures	Monitoring Indicators	Responsibility
		provisions of the EMP, must be granted a warning letter.		
	Availability of the EMP on site for ease of reference	<ul style="list-style-type: none"> • Ensure that a copy of the EMP is kept on site and accessible 	Physical view of the EMP	Management or Site Manager
Communication	To ensure effective communication	<ul style="list-style-type: none"> • The project must develop a communication strategy • Correspondences must be in writing • The contact numbers for the Site Manager must be available displayed onsite in case of emergencies. • There must be an alarm bell for emergency communication. • All the neighbouring land users should be informed regarding the dates and times for blasting. 	Communication Strategy Letters, e-mail, notices, minutes Display of site manager and emergency numbers on site	Management or Site Manager

SECTION B: HEALTH AND SAFETY

Table 4. Health and Safety Measures to be implemented

Environmental / Social Aspects	Objective	Mining Phase Mitigation Measures	Monitoring Indicators	Monitoring Indicators	Responsibility
<p>Safety</p>	<p>Adhere to the Health and Safety Regulations, Government Notice 156/1997 (GG 1617).</p>	<ul style="list-style-type: none"> • All light vehicle should have a 2-meter-high red flag mounted on the vehicle • All mining vehicle should be branded. • The proponent must develop a health and safety plan; • A compulsory safety induction course must be given to all employees. • Each employee must be provided with personal protective equipment (PPE) and must be worn at all time 	<p>2-meter red flags on vehicles</p> <p>Vehicles branded</p> <p>Health and safety included and reflected in the induction minutes</p>	<p>Visual inspections</p> <p>Certification of completion by approved personnel</p>	<p>Management or Site Manager</p>

Environmental / Social Aspects	Objective	Mining Phase Mitigation Measures	Monitoring Indicators	Monitoring Indicators	Responsibility
		<p>during working and when on site.</p> <ul style="list-style-type: none"> • Ensure all workers are inducted on the dangers of risks of explosions, chemicals and the emergency response; • There must be clear health and safety signs at designated sites such as, ASSEMBLY AREA, NO SMOKING “DANGER”, “ENTRANCE PROHIBITED” etc. • Employees must NOT be exposed to noise levels above the required -85dB (A) limit over a period of 8 hours. Should the noise 	<p>Visual Inspection</p> <p>Visual Signs available</p>	<p>Visual Inspection</p> <p>Availability of fire extinguishers and evidence on training (e.g. minutes, training pictures etc.).</p> <p>Visible signs</p>	

Environmental / Social Aspects	Objective	Mining Phase Mitigation Measures	Monitoring Indicators	Monitoring Indicators	Responsibility
Health		<p>level be higher than 85dB (A), the employer must implement a hearing conservation program such as noise monitoring;</p> <ul style="list-style-type: none"> • Worker must be provided with appropriate PPE such as industrial earmuffs; • Supply safe drinking water. • Ensure adequate, hygienic and user-friendly ablution facilities for all staff; • Separate male and female toilets with a ration of 1:30 and 1:15 for male and females respectively. • Appoint cleaners from the local community and rotate cleaning responsibilities. 	Record of hearing loss	Report of health check ups	

Environmental / Social Aspects	Objective	Mining Phase Mitigation Measures	Monitoring Indicators	Monitoring Indicators	Responsibility
		<ul style="list-style-type: none"> • Inspect ablution facilities regularly. • Supervisors must undergo an occupational health and first aid course. • Maintain levels of contaminant dusts, vapours and gases in the work environment at concentrations below the recommended ACGIH TWA-TLV (8 hrs/day, 40 hrs/week, week-after-week). Specific limits for Daure Mine will include: <ul style="list-style-type: none"> o PM10 < 10 mg/m³ (Namibian); o SO2 < 5.64 mg/m³(Namibian). 	<p>Clean tap water</p> <p>Clean toilets at all time</p> <p>Proof of Certification</p>	<p>Laboratory analysis report</p> <p>Clean toilets at all time</p>	

Environmental / Social Aspects	Objective	Mining Phase Mitigation Measures	Monitoring Indicators	Monitoring Indicators	Responsibility
		<ul style="list-style-type: none"> • Develop and implement work practices to minimize the release of contaminants into the work environment: <ul style="list-style-type: none"> o Provide appropriate PPE to mine personnel in conjunction with training, use, and maintenance of the PPE; o Enclose operations which may result in direct release of dust into areas where people work such as the crusher; o Ensure all areas in the processing plant are well ventilated; and o Ensure enclosed climate-controlled cabins for mine 			

Environmental / Social Aspects	Objective	Mining Phase Mitigation Measures	Monitoring Indicators	Monitoring Indicators	Responsibility
		vehicles and equipment (i.e. haul trucks, excavators, drill rigs, etc.)			
Noise	To reduce noise in the surrounding environment	<ul style="list-style-type: none"> • All mining vehicle and machinery engines must be off when not in use; • Adhere to minimum speed limit of 40km • Purchase/hire mining equipment with low noise emission; • Where possible, fit silencers on vehicle exhaust; • Operation must be limited to daytime only (08h00-17h00); • Blasting should not be carried out under very overcast this increase the noise and 	Record of public complaints	Record of public complaints	Management / Site Manager

Environmental / Social Aspects	Objective	Mining Phase Mitigation Measures	Monitoring Indicators	Monitoring Indicators	Responsibility
		<p>vibration transmission through such mediums.</p> <ul style="list-style-type: none"> • Drilling and blasting contractors must monitor the blast noise, shock and vibration felt at the boundary of the mine to ascertain impact levels. 			
Dust / Air Pollution	The reduce fugitive dust from project operation	<ul style="list-style-type: none"> • Movement of heavy mining vehicles must be restricted to the mining site; • Only use a one-way lane to access the site; • Adhere to the minimum speed limit of 30 or 40km/hour; 		Record of public complain	Management / Site Manager

Environmental / Social Aspects	Objective	Mining Phase Mitigation Measures	Monitoring Indicators	Monitoring Indicators	Responsibility
		<ul style="list-style-type: none"> • Do not excavate or make excavation during heavy winds; • Sand and/or gravel heaps must be covered or regularly water sprayed; • On site where soil is loosened by vehicle movement, apply dust suppression method such as water spraying; • Workers must not be exposed to excess dust and should be provided with appropriate PPE such as dust mask and earmuffs; • Adhere to the Labour act, non-toxic human dust exposure levels may not 			

Environmental / Social Aspects	Objective	Mining Phase Mitigation Measures	Monitoring Indicators	Monitoring Indicators	Responsibility
		<p>exceed 5mg/m³ for respiratory dust and 15mg/m³ for total dust;</p> <ul style="list-style-type: none"> • Water sprays and/or chemical suppressants (agglomeration additives) should be used on: <ul style="list-style-type: none"> - the roads - the crusher and screen, and - materials handling points. • Partial vegetation cover should be established on the TSF as soon as practically possible. • Exposed soils and other erodible materials should be re-vegetated or covered promptly. 			

Environmental / Social Aspects	Objective	Mining Phase Mitigation Measures	Monitoring Indicators	Monitoring Indicators	Responsibility
		<ul style="list-style-type: none"> • Vegetation of dormant TSF surface to be continuously re-vegetated in areas where vegetation has died/ exposed areas. • A dust deposition monitoring network is to be established to monitor the dust deposition due to routine operations, as well as the dust deposition during high-wind periods. • Dust monitoring should be established before operations commence to measure baseline conditions. It should remain active throughout the life of the mine as well as for a few years post closure to determine the 			

Environmental / Social Aspects	Objective	Mining Phase Mitigation Measures	Monitoring Indicators	Monitoring Indicators	Responsibility
		effectiveness of tailing storage facility mitigation measures.			

SECTION C: POLLUTION CONTROL AND WASTE MANAGEMENT

Table 5. Waste Management Mitigation Measures

Environmental / Social Aspect	Objectives	Mining Phase Mitigation Measures	Monitoring Indicator	Monitoring Indicator	Responsibility
Vehicle Emissions	Reduce greenhouse gas (GHG) emissions from vehicles / machinery	<ul style="list-style-type: none"> • All vehicles and equipment must be kept in good working condition and serviced frequently to prevent leakage and emission of noxious smoke etc. • Switch off engines when vehicle is not operations • Vehicle fleet should be carefully selected to include the latest technology that would ensure low tailpipe emissions. • Preventative controls for vehicle tailpipe PM10 emissions: 	<p>Vehicle servicing records books</p> <p>Reports of smoke emissions from machinery</p> <p>Visible signs</p>		Management / Site Manager

Environmental / Social Aspect	Objectives	Mining Phase Mitigation Measures	Monitoring Indicator	Monitoring Indicator	Responsibility
		<ul style="list-style-type: none"> - minimization of vehicle idling times, <li style="padding-left: 20px;">- regular maintenance of vehicles according to manufacturer's guidance <li style="padding-left: 20px;">- use of best available technologies such as the installation of selective catalytic reducers, oxidation catalysts and diesel particulate filters to reduce PM10 emissions. • Uses of low sulphur content fuels are recommended to minimise SO2 emissions from both vehicle tailpipe emissions as well as generator emissions 			
Waste Generation	To prevent littering	<ul style="list-style-type: none"> • The mining site must have sufficient wheelie bins and skip 	Waste bins and skip containers	Waste bins and skip containers	Management / Site Manager

Environmental / Social Aspect	Objectives	Mining Phase Mitigation Measures	Monitoring Indicator	Monitoring Indicator	Responsibility
		<p>containers for onsite waste disposal;</p> <ul style="list-style-type: none"> • The waste must be segregated and be disposed of at an approved disposal site in Uis/Khorixas; • No waste should be buried on site or anywhere in the surrounding; • Provide temporarily toilets to workers in a ration a 1:15 and 1:30 for male and female respectively. • Effluent from these toilets must be disposed of at the nearest and approved waste treatment plant of oxidation ponds at Uis/Khorixas. 	<p>Visible temporarily ablution facility</p> <p>Record of effluent disposal</p>		

Environmental / Social Aspect	Objectives	Mining Phase Mitigation Measures	Monitoring Indicator	Monitoring Indicator	Responsibility
		<ul style="list-style-type: none"> • Acts of secretion in the open must never be allowed. • No waste may be buried, burned or disposed to land on site, outside of the approved waste disposal facility. <ul style="list-style-type: none"> • Waste containers (bins) should be emptied regularly and • removed from site to a recognized (municipal) waste disposal site at Uis or Khorixas. • Enough separate waste containers (bins) for hazardous and domestic/general waste must be provided on site. 			

Environmental / Social Aspect	Objectives	Mining Phase Mitigation Measures	Monitoring Indicator	Monitoring Indicator	Responsibility
		<p>These should be clearly marked as such.</p> <ul style="list-style-type: none"> • Mining workers and contractors should be sensitized to dispose of waste in a responsible manner and not to litter. • No waste may remain on site after the completion of the project. 			
Surface and ground water contamination / pollution	To prevent soil and water pollution	<ul style="list-style-type: none"> • Vehicle and machinery to be used for mining and transportation purposes must be in good condition and well serviced to avoid leakages of oils and lubricants; • All stationary vehicles and machinery must have drip trays 	Service records		Management / Site Manager
			Visible drip trays		

Environmental / Social Aspect	Objectives	Mining Phase Mitigation Measures	Monitoring Indicator	Monitoring Indicator	Responsibility
		<p>to collect leakages of oils and lubricant;</p> <ul style="list-style-type: none"> • Oils, lubricants and hydrocarbons must be stored in a proper storage facility with concrete bunds or impermeable lined materials. • Although not expected to be significant, i.e oil drops of less than 500ML, if it occurs, and happened to contaminate soils must be collected and treated with bioremediation waste. • Performance of the seepage control measures are to be evaluated with monitoring of water levels and water balance of the operations. The indication of higher seepage 	<p>Proper storage with concrete bund surface</p> <p>Bioremediation chamber</p>		

Environmental / Social Aspect	Objectives	Mining Phase Mitigation Measures	Monitoring Indicator	Monitoring Indicator	Responsibility
		<p>rates than expected would require the following:</p> <ul style="list-style-type: none"> • Measures to contain and recovery of water from the TSF cells during the start-up stages. • Installation of recovery boreholes for retrieval of the effluent without affecting downstream groundwater. • Wastewater is to be disposed of in the natural environment unless the effluent quality guidelines are met. 			
Oil Spillages	To prevent oil spill from tanks and during re-fuelling	<ul style="list-style-type: none"> • Refuel vehicles at designated areas that has protected surface covering /geomembrane lining and use drip trays for stationary equipment and vehicle. 	Place warning signs	Site inspection and record keeping	Management / Site Manager

Environmental / Social Aspect	Objectives	Mining Phase Mitigation Measures	Monitoring Indicator	Monitoring Indicator	Responsibility
		<ul style="list-style-type: none"> Engage the suppliers of consumable such as grease and lubricants upon used to collect and dispose of such waste in an environmentally friendly manner. 			

<p>Oil leakage</p>	<p>To prevent fuel leakages</p>	<ul style="list-style-type: none"> • All stationary vehicles and machinery must have drip trays to collect leakages of oils and lubricant; • The workshop area should be lined with concrete. • The workshop should have an oil-water separator for collection of run-offs from washing. • Oil filters should be stored in marked containers that allow oil to drain but not escape from storage. • Any spills should immediately be contained and cleaned up and the contaminated soil appropriately disposed of. The receiving environment should then be remedied where necessary to prevent the spill 		<p>Visible monitoring</p>	<p>Management and Site Manager</p>
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Environmental / Social Aspect	Objectives	Mining Phase Mitigation Measures	Monitoring Indicator	Monitoring Indicator	Responsibility
		from entering the storm water drainage system.			

SECTION D: ENVIRONMENT

Table 6. Environmental Mitigation Measures to be implemented

Aspect	Objective	Mining Mitigation Measure	Monitoring Indicator	Responsibility
Biodiversity	To protect the flora and fauna	<ul style="list-style-type: none"> • The targeted mining site must be cordoned off to avoid safety risk to animals. • Prevent the destruction of protected species. • Prevent the employees from collecting firewood. • No workers should be permitted to collect plant materials, hunt or snare to capture wild animals. • Provide electricity or gas to staff for cooking and heating in order to discourage fire wood harvesting. • No poaching of wild animals including high valued species. • Any suspicious activities pertaining to illegal hunting should be reported to the nearest police in Uis. • No killing of animals including crawling animals unless it poses danger to human life. 		Management / Site Manager

Aspect	Objective	Mining Mitigation Measure	Monitoring Indicator	Responsibility
		<ul style="list-style-type: none"> No domestic animals are allowed at the site. 		
Soil Erosion	To prevent soil erosion	<ul style="list-style-type: none"> Mining should be limited to targeted sites only. It is highly recommended that mining must not take place during heavy winds; Excavated topsoil from mining trenches must be well compacted to avoid wind erosion; Movement of all vehicles must strictly be within the project site; Sand and gravel heaps from the excavated pit should be placed in designated areas. Rehabilitate all sites upon completion of the project. The top 200-300mm of topsoil should be saved for use in rehabilitation. The soil should be stripped and stockpiled not exceeding 1m in height. 		Management / Site Manager
Soil Compaction	To prevent flooding at the surrounding areas.	<ul style="list-style-type: none"> Vehicle and mobile mining equipment should be confined to existing roads and tracks. Implement a road and track management. 		Management / Site Manager

Aspect	Objective	Mining Mitigation Measure	Monitoring Indicator	Responsibility
Topsoil Stockpile	Avoid dispersion of the stockpile.	<ul style="list-style-type: none"> • If not used within 1 year, the stockpile should be levelled and contoured to allow natural grass to grow over the area. This will keep the soil biologically active. 	Trial sites	Management / Site Manager
Water Resource	Conservation of water resource	<ul style="list-style-type: none"> • A valid water abstraction permit should be obtained from the MAWLR and maintain its validity. • No pollution or contaminant should be allowed to enter the water ecosystem. • Recycle water and foster the re-use of water. • Monitor and control water usage and minimise if possible. • Monitoring points and parameters are recommended for providing an early warning system. • Monitoring of groundwater levels from the beginning of operations is recommended for an understanding of the expected seasonal fluctuations and recharge. • Although rainfall is rare in the area storm/rainwater harvesting methods should be considered for use on the mine site. 	Valid water abstraction permit.	Management / Site Manager

Aspect	Objective	Mining Mitigation Measure	Monitoring Indicator	Responsibility
Visual and Sense of Place	Maintain aesthetic value	<ul style="list-style-type: none"> • Pit and excavated area should be levelled upon completion. • Care must be taken to ensure that rehabilitated area blend in with the natural environment. • Overburdens must be placed in trenches and pits as part of rehabilitation. • Keep site visual clean. 		
Alien Invasive	Maintain natural ecosystem	<ul style="list-style-type: none"> • All alien invasive occurring in the area should be cleared. • Place measures in place to eradicate any alien infestation in the project area. • Adopt an alien clearing policy and awareness campaign. 		

SECTION E: HERITAGE AND ARCHEOLOGICAL SITES

Table 7. Archaeology and Heritage Mitigation Measures

Environment / Social Aspect	Objectives	Mining PHASE Mitigation Measure	Monitoring Indicator	Responsibility
Heritage Resources / Artefacts	Preserve Heritage and Archaeological materials	<ul style="list-style-type: none"> • The management should be made aware of the provision of the National Heritage Act regarding prompt reporting of any archaeological findings. • Workers must be trained on the possible find of archaeological material in the area; • Implement a chance find and steps to be taken when archaeological material finding (Heritage e.g. rock painting and drawings), human remains or artefacts) are unearthed • Stopping the activity immediately • Informing the site manager or supervisor • Cordoned of the area with a danger tape and the manager shall take appropriate pictures. • Site manager must report the finding to the nearest Namibian police or alternatively the National Forensic Laboratory (+264 61 240461). 	Sighting report/s of heritage resources / artefacts	Management / Site Manager

SECTION F: SOCIO ECONOMIC

Table 8. Social Economic Mitigation Measures

Environmental / Social Aspects	Objectives	MINING PHASE Mitigation Measures	Monitoring Indicator	Responsibility
Employment	Promote benefits to the local resident	<ul style="list-style-type: none"> • Adopt a local first policy to ensure that all general work is reserved for local people unless in circumstances where specialised skills are required. • Employ local contractors • Fair compensation and labour practise as per Namibian Labour Laws must be followed. • The recruitment process must be formal and organised. • Preference should be given to recruit those who live closest to the project area. • Recruitment should not take place at mining site. • Ensure that all sub-contractors are aware of recommended recruitment procedures and discourage any recruitment of labour outside the agreed upon process. 	Employee structure and proportion of local employment	Management or Site Manager

Environmental / Social Aspects	Objectives	MINING PHASE Mitigation Measures	Monitoring Indicator	Responsibility
		<ul style="list-style-type: none"> • Contractors should give preference in terms of recruitment of sub-contractors and individual labourers to those from the local community. • Clearly explain to all job seekers the terms and conditions of their respective employment contract (e.g. period of employment etc.) – make use of interpreters when necessary. • Secure accreditation for in-house skills transfer which recognizes and certifies any training courses. 		
HIV/AIDS	To prevent the spread of HIV/AIDS	<ul style="list-style-type: none"> • Provide HIV / AIDS awareness at induction. • Avail condoms at site. 		
Alcohol and Drug use	Prevent alcohol and drug use	<ul style="list-style-type: none"> • Ban the use of alcohol and drugs at workplace • Teach employees about dangers alcohol and substance abuse • All employees must be screen with the breathalyser on daily basis to avoid intoxicated personnel on site. 	Drunk / Misbehaving employees Breathalyser report Monitor presence of alcohol at the construction site	Management or Site Manager

Environmental / Social Aspects	Objectives	MINING PHASE Mitigation Measures	Monitoring Indicator	Responsibility
Working hours	Adhere to the Labour Act No. 11 of 2007	<ul style="list-style-type: none"> Operate within the prescribed working days and hours as per the Namibian Labour laws and regulations 	Labour unrest / Demonstration	Management or Site Manager
Traffic	Adhere to Traffic Rules and ease traffic flow	<ul style="list-style-type: none"> A logbook should be kept at the gate of the access road indicating the time of entrance or exit, the type of vehicle, and its destination. By doing so, traffic to and from the town during peak hours can be monitored. It will also indicate whether traffic predictions were accurate or not, and whether traffic forecasts should be revisited. Should the product be transported via the main road C35, the traffic department in town should be informed of the intended road use from Uis to Henties Bay. Transport of shift workers should take place outside of peak traffic hours such as 07h00-08h30 and 16h00-17h30. 	Gate Log-sheet/Correspondence to Traffic Department	Management or Site Manager

9. DECOMMISSIONING PHASE

Decommissioning of the project is not envisaged at this stage of the project. However, in the event where the project has to be decommissioned, all the necessary applications required from the relevant authorities will be applied for. A qualified personnel must be appointed to study and develop a decommissioning plan. Therefore, the project owners must implement the following mitigation measures;

- The proponent must submit a decommissioning plan to the office of the Environmental Commissioner for approval;
- Install signs to inform the public about the decommissioning of the project;
- Access to the areas must be controlled;
- A qualified project geologist must be hired to oversee the project decommissioning
- Hire environmental specialist to monitor possible contamination during decommissioning;
- Ensure that all the pits and excavated areas are rehabilitated;
- Ensure that all topsoil is levelled;
- Provide workers with all necessary PPE;
- Generated waste must be disposed of at approved sites;
- When contamination is detected, the soil must be removed and treated before disposing it off to an approved site;
- The site must be rehabilitated and blend in with its natural state;

10. CONCLUSION AND RECOMMENDATIONS

Mining project in general poses a significant impact to the environment. The proposed mining project will have an impact to the receiving environment; therefore, mitigation measures should be applied to ensure that the preservation of the environment receive the highest priority. The impacts associated with mining of base and rare metals, industrial minerals and precious metals had been identified and appropriate mitigation measure were suggested. The information provided and environmental set up of the proposed mining project are sufficient. It is therefore recommended that due to the presence of critical endangered species believed to occur in the area a consensus between the Directorate of Environmental Affair and Directorate of Wildlife and National Parks should be made on whether an renewal of the Environmental Clearance Certificate shall be issued to necessitate the commencement of the intended mining project. If the renewal of the Environmental Clearance Certificate is issued continuous monitoring and adherence to the EMP should be strictly enforced.