

ENVIRONMENTAL MANAGEEMNT PLAN (EMP)
FOR THE ESTABLISHMENT OF MINING ACTIVITIES OF INDUSTRIAL MINERALS
(CRUDE GYPSUM) ON MINING LICENCE (ML) 256 AT UUNDUNDU
WANANDJILA VILLAGE NEAR OMAKANGE, OMUSATI REGION



ABBREVIATION

CC	Close Corporation
DEA	Directorate of Environmental Affairs
DESR	Draft Environmental Scoping Report
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
EMP	Environmental Management Plan
EPL	Exclusive Prospecting Licence
GPS	Global Positioning System
Ha	Hectare
I&APs	Interested and Affected Parties
IT	Information Technology
KM	Kilometres
KW	Kilowatts
MEFT	Ministry of Environment, Forestry and Tourism
MM	Millimetres
MIME	Ministry of Industries, Mine and Energy
NHC	National Heritage Council
PPEs	Personal Protective Equipment's
SME	Small Medium Enterprise

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1. INTRODUCTION

Chrono Resources CC, hereafter referred to as the proponent, is of the intention to carry out mining activities for industrial minerals (crude gypsum) on the Mining Licence (ML) 256. The company had lodged an application for the Mining Licence 256 on 20 October 2023 with the Ministry of Industries, Mines and Energy (MIME), and currently, an Environmental Clearance Certificate (ECC) is pending. The proponent has both financial and technical capacities to carry out the proposed mining activities. The company undertook a comprehensive exploration program in the area after acquiring an environmental clearance certificate for exploration on EPL 8437 from the relevant authority. The proponent intends to extract industrial mineral resources from the area for commercial purposes. The proposed mine will implement an open-cast mining method, which is one of the common methods used to extract minerals. The excavators will be used to access and remove the overburden to access the underlying ore bodies. The mined ore in the form of gypsum will be sorted and loaded onto trucks for delivery as per customer requirements. The main off-takers for the proposed mining project will be the Cheetah Cement Factory outside Otjiwarongo in Otjozondjupa region, as well as supplying the proposed factory in Oshakati, that will manufacture ceiling boards.

The proponent undertook a comprehensive exploration program in the area after acquiring an environmental clearance certificate for exploration on EPL 8437 from the relevant authority. The exploration commenced in 2022, and a commercial reserve was identified after completing a substantial number of drillings holes with a depth of 500 meters that were drilled at different targeted drilling sites within the EPL to collect core samples from the subsurface gypsum layers. The samples were carefully documented in terms of depth and location and ultimately taken for analysis at credible laboratories and cement factories in the country and abroad. The resource estimate for the available commercial reserve is projected to be around 50 million metric tonnes, that translates into a lifespan of approximately 30 years with prospect for expansion. The validity of the intended mining license is 25 years with the potential for extension based on the results of continuous exploration in the area. If the proposed project will have a huge economic impact to the settlement of Omakange, neighbouring settlements and towns in the region. The project will employ approximately 80 people during the mining phase and is estimated to cost around 30 million Namibian dollars.

In the interim the proponent has secured an offtake agreement with Whale Rock Cement (Pty) Ltd, which own Cheetah Cement Factory. The demand for crude gypsum continues to demonstrate a positive outlook in both local and international markets due to its wide utilisation in the manufacturing sector for instance as a fluxing agent, fertiliser, filler in paper and textile and as indispensable component in cement because it's a retarding agent. The demand for ceiling boards is escalating due to high number of property development in the country which prompted the establishment of the proposed development. Moreover, credible SMEs from the area of Omakange and surrounding villages will be contracted to render support services to the project. The Uukwaluudhi Traditional Authority has granted a consent for the project to commence and a corporate social responsibility plan has been formulated and agreed upon between the two parties.

The proposed activity is a listed activity as per Environmental Management Act 2007 (Act No. 7 of 2007) (EMA) and an Environmental Clearance Certificate (ECC) is therefore required to commission the proposed development. EnvironClim Consulting Services (ECS) was therefore appointed by Chrono Resources CC to conduct an Environmental Impact Assessment (EIA) and formulate an Environmental Management Plan for the envisaged mine development.

Chrono Resources CC, hereinafter referred to as the proponent intends to carry out the following activity:

- **Environmental Impact Assessment (EIA) of mining activities for industrial mineral (crude gypsum) on Mining Licence (ML) 256 at Uundundu waNandjila village near Omakange, Omusati region.**

The Environmental Assessment is imperative in evaluating the likely social and environmental impacts associated with the proposed mining activities of crude gypsum, on Mining Licence (ML) 256 at Uundundu waNandjila village as well as formulating the most appropriate and feasible rehabilitation procedure of the open pits once the operation ceased.

The proposed mining project 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).

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 1** were triggered by the proposed project:

Table 7: List of triggered activities identified in the EA process which apply to the proposed mining 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
Activity 3.1 (Mining and Quarrying activities)	The construction of facilities for any process or activities which require a licence, right or other form of authorisation and renewal of licence, right or other form of authorisation, in terms of mineral (Prospecting and Mining Act) 1992.	The proposed project includes mining activities of industrial minerals (crude gypsum) for commercial purposes.
Activity 3.2 (Mining and Quarrying activities)	Other forms of mining or extraction of any natural resources whether regulated by law or not.	The proposed project entails mining activities of industrial minerals (crude gypsum) for commercial purposes.
Activity 3.3 (Mining and Quarrying activities)	Resource extraction, manipulation, conservation and related activities.	The proposed project entails mining activities of industrial minerals (crude gypsum) for commercial purposes.

An Environmental Management Plan (EMP) is the most imperious outputs of the EA process because it details all the proposed mitigation and monitoring provisions, provide schedule including specific responsibilities to individuals in order to ensure accountability. This EMP elucidate the mitigation and monitoring procedures that should be applied during the following stages of these developments:

- Crude gypsum mining phase – the period during which the proponent, having dealt with the necessary legislative and administrative arrangements, appoints a contractor to carry out mining activities of crude gypsum.

- Transportation phase - the period during which the proponent transports the crude gypsum and transport it to Cheetah Cement Factory under Whale Rock Cement (Pty) Ltd in Otjiwarongo, and possible the remnant in a form of powder will be transported to the proposed bricks manufacturing factory in Oshakati.
- Dressing phase - the period during which the proponent processes the mined crude gypsum by crushing the ore at the site.

The rehabilitation of the pit is sturdily suggested as soon as mining activities ceases in order to ensure that the pit assumed alternative usage that is cost-effective and does not cause any threat to both human and animals as well as the general area. The recommendation for the alternative utilisation of the pit once the mining operation have stopped are provided in this EMP.

2. PROJECT LOCATION

The ML 256 is situated approximately 10 Km north-east of Omakange, when using the C41 main road from Omakange to litananga village. The ML covers an area of 6776.3839 Ha and is accessible via a track that branch out from the C41 road at a turn-off to the left at an erected signboard for Oshana Crusher (Pty) Ltd and for approximately 7 km.

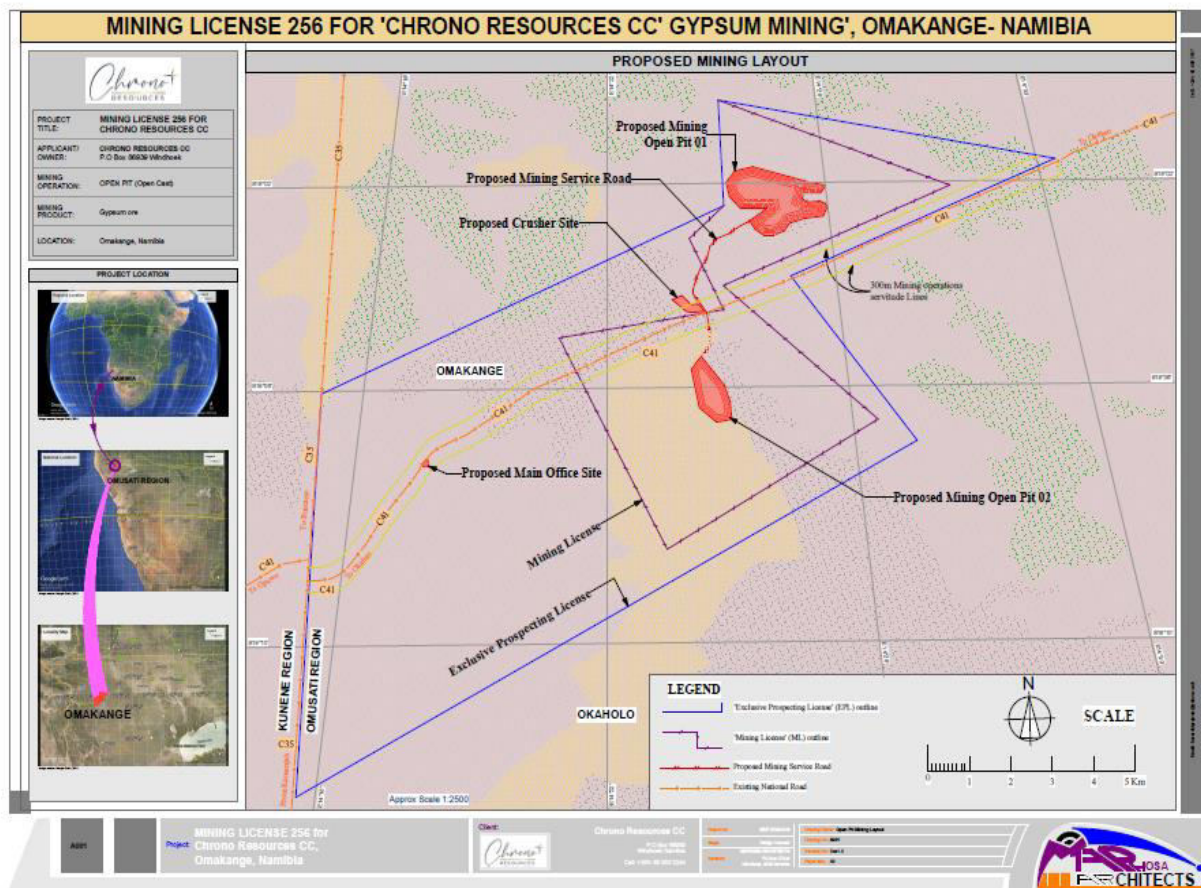


Figure 3: Location of ML 256 at Uundundu waNandjila near Omakange, Omusati Region (Polygon) (GPS coordinates - 18.095000 S, 14.393056 E).

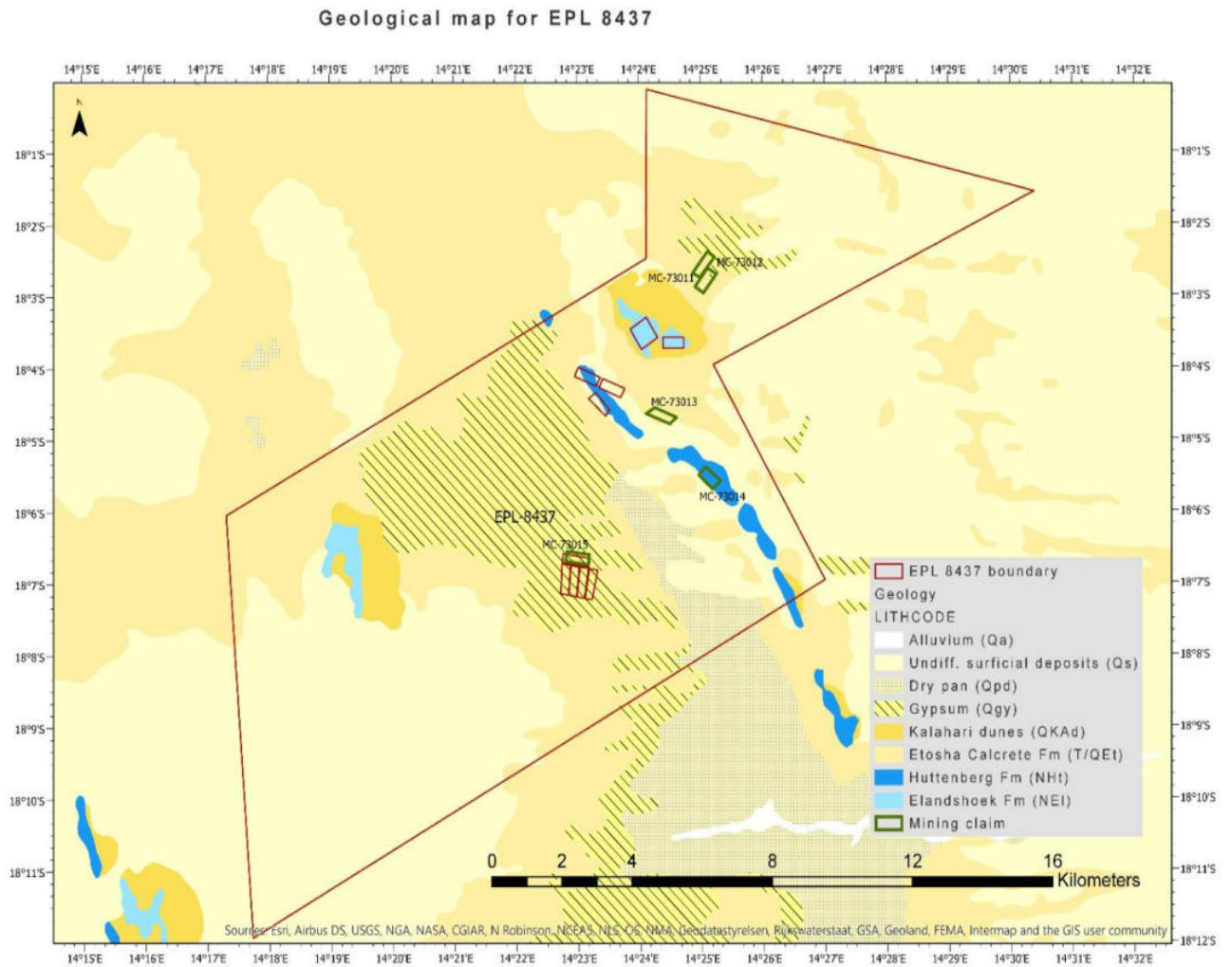


Figure 4: The geological map for ML 256 (EPL 8437) at Uundundu waNandjila village near Omakange, Omusati Region.

3. PURPOSE OF THE EMP

This Environmental Management Plan (EMP) provide detailed information including practical actions that can be applied to reduce impacts and implement monitoring actions as well as management control procedure to reduce possible impact to insignificant. The roles and responsibility of the persons involved in the proposed development are evidently explained. This EMP incorporates the mitigation measures for the proposed mining of crude gypsum at ML 256.

4. COMPLIANCE TO THE EMP

This EMP is a legally permissible binding document as given under the provisions of the Environmental Management Act, 2007 (Act No. 7 of 2007). Thus, **Chrono Resources cc** as well as its contractors must adhere to the mitigation measures detailed in this document. This EMP is a living document and is subjected to modification to align with changes in the environment and new information that may be developing in the future. Consequently, the EMP must be modified accordingly with the provision of the EMA.

5. LEGAL AND POLICY FRAMEWORK

The planned gypsum mining project shall be operated under the provision of the relevant statutory legal framework of Namibia and international laws of which Namibia is signatory.

5.1 Applicable and relevant statutory framework of Namibia

Table 2. Legal requirements for the planned mining operation of crude gypsum 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	Legal requirement to undertake an EIA

Legislation	Summary	Applicability
	<p>matters. The acts provide a list of activities that may not be undertake without an environmental clearance certificate.</p> <p>Further, the Act ensures that;</p> <ul style="list-style-type: none"> (a) Potential threats are considered timeously (b) A comprehensive stakeholder's consultation is conducted, and all Interested and affected parties are given an opportunity to comment on the project (c) Decision are robust by considering the above-mentioned activities 	
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>	Generation of greenhouse gases by the fuel
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</p>	Possible fuel spillage and leakages may pollute underground and surface water.

Legislation	Summary	Applicability
	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.	
Environmental Policy framework (1995)	This policy subjects all developments and project to environmental assessment and provides guideline for the Environmental Assessment. Its provision mandate that Environmental Assessment take due consideration of all possible impacts and incorporate them in the development or planning stages.	Provision of the EIA and guidelines
The Occupational Safety and Health Act No. 11 of 2007;	<p>Safety:</p> <p>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:</p> <p>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, diseases awareness etc.</p>

Legislation	Summary	Applicability
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/her or of which he/she is in charge of 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 (2004)	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 watercourse on/or in close proximity to the site and associated ecosystems should be protected in alignment with the listed principles.	Ensure that the underground water is not polluted and implement pollution control mechanism to avoid water pollution
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"> • Discharge of contaminated into water sources such as pipe, sewer, canal, sea outfall and <p>Disposal of water in a manner that may cause detrimental impact on the water resources</p>	Contaminated water, such as sewage sludge must not seep into the surface water sources.

Legislation	Summary	Applicability
Petroleum Product and Energy Act No, 13 of 1990	<ul style="list-style-type: none"> 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. The main objective of this Act is to initiate, supervise, manage and evaluate development at regional level.	Observe the regional by laws.
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 and 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

Legislation	Summary	Applicability
National Heritage Act No. 27 of 2004	<p>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.</p>	<p>Mining activities such as stripping of the overburden, excavation and, trenching may unearth archaeological material.</p>
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> <p><i>Polluter Pays Principle</i></p> <p>This principle ensures that proponents takes responsibility of their actions. Hence in cases of pollution, the proponent bears the full responsibility to clean up the environment.</p>	<p>Mining particularly in the area with potential surface water and underground water can be detrimental to the water quality. Therefore, precaution must be taken to avoid the contamination of both surface and underground water.</p> <p>In the event of any soil contamination pollution, the proponent must be responsible to clean up the environment.</p>

6. ROLES & RESPONSIBILITIES

6.1 Environmental Compliance Officer (ECO)

The Ministry of Environment, Forestry and Tourism (MEFT) is the custodian of environmental protection. The Environmental Compliance Officer shall be an appointed Environmental Officer from the Directorate of Environmental Affairs assigned to ensure the implementation of all environmental compliance as per the provision of the EMA. The ECO may undertake inspection at any given time to enforce compliance. Based on his/her work schedule, the ECO shall visit the site his/her convenience for environmental inspection and monitoring.

6.2 The Proponent

Chrono Resources CC shall have the complete accountability of environmental management by effectively implementing the environmental management plan. Moreover, it shall be a comprehensive obligation of the **proponent** to perform the following activities.

- Appoint an Environmental Manager;
- Ensures that all workers and contractors are acquainted with the Environmental Management Plan (EMP) and induction on safety measures relating to mining of crude gypsum are initiated;
- 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 environmental performance and compliance;
- Contract an environmental consultants or specialist to carry out environmental audits.

6.3 Environmental Manager

The Environmental Manager shall represent the proponent and should ensure that the daily operations of the mine are monitored and employees and contractors are complying with the EMP. The copy of the EMP shall be accessible at the site at all time and all the employees must be familiar with the EMP.

6.4 Employees and Contractors

All stakeholders, particularly employees and contractors must;

- Comply and adhere to the EMP;
- Ensuring that all employees have personal protective gears at all time when working;
- Report damaged PPE and request for replacement;
- Adhere to the company rules and policies.

7. DISCIPLINARY ACTION

The EMP is considered as a live and a legally binding document. Therefore, any nonconformity on non-compliance to the EMP must result in serious disciplinary legal action against the proponent such as;

- Deferment of work;
- Pecuniary consequences.

The punitive deed shall be determined as per the provision of EMA and relevant statutory legal 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. CRUDE GYPSUM MINING AND PITS REHABILITATION

The occurrence of the pits at ML 256 as results of mining activities for crude gypsum is unavoidable. Consequently, the proponent should be accountable for the realisations of all the provisions detailed within the relevant sections of this EMP. The proponent shall be liable for the implementation of this EMP and any relevant work subcontracted. This shall also be applicable to all contractors appointed during the mining phase and those appointed during the continuous rehabilitation phase of the pits. To ensure that there is an effective environmental management, the sections focusing on the preservation of the environment should be incorporated in the contracts for any outsourced work involving the proposed mining activities.

9. THE ENVIRONMENTAL MANAGEMENT PLAN

This EMP form part of the EIA as well as complementing the scoping environmental assessment report of the proposed establishment of mining activities of crude gypsum on ML 256, at Uundundu waNandjila village near Omakange, therefore they must be read together. Provisions has also been made for the decommissioning phase of the proposed project and it has been explained in this EMP. The following tables details the management actions recommended as measures to reduce potential impacts associated with the intended mineral development project. The arrangement of the management actions includes the followings; Social, Environmental, Safety and Occupational Health aspects.

SECTION A: STAFF INDUCTION

Table 8. Staff Induction Mitigation Measures

Environmental or Social Aspects	Objective	Proposed Mitigation Measures	Monitoring Indicators	Responsibility
Staff Induction	To ensure that all employees are acquainted with the requirements of the EMP including environmental policy and procedures.	<p>All employees and contractors must go through an intensive induction course on all the provisions of the EMP including environmental policy and procedures.</p> <ul style="list-style-type: none"> • There must be a yearly induction course for all the workers. • New employees must not commence work without going through the induction program. 	<p>Induction minutes and attendance register signed by each staff member.</p> <p>Induction report</p>	Proponent representative or Environmental Manager
	Disciplinary	<ul style="list-style-type: none"> • The proponent must adopt a disciplinary system to correct staff for non-compliance, such as not wearing PPE while working onsite etc. 	Disciplinary meetings and actions	Proponent representative or Environmental Manager

Environmental or Social Aspects	Objective	Proposed Mitigation Measures	Monitoring Indicators	Responsibility
		<ul style="list-style-type: none"> Rigorous measures must be put in place for any employee found disregarding provisions of the EMP, and warning letter must be must be granted. 	Disciplinary / Warnings letters.	
	Availability of the EMP and Environmental Policy Statement at the site for ease of reference.	<ul style="list-style-type: none"> Ensure that a copy of the EMP and Environmental Policy Statement are kept at the site at all time and it should be readily accessible. 	EMP and Environmental Policy Statement available onsite.	Proponent representative or Environmental Manager
Communication	To ensure effective communication and improve environmental management and awareness.	<ul style="list-style-type: none"> The proponent must develop a communication strategy. Correspondences must be in writing. The contact numbers for the Environmental Manager must be available, and always displayed at key areas at the mine in case of emergencies. 	<p>Communication Strategy.</p> <p>Letters, e-mail, notices, minutes.</p> <p>Display of Environmental manager and emergency numbers at key areas on the mine.</p>	Proponent representative or Environmental Manager

Environmental or Social Aspects	Objective	Proposed Mitigation Measures	Monitoring Indicators	Responsibility
		<ul style="list-style-type: none"> • There must be an assembly point for emergency communication. • All employees who are in a position to make or take actions that will influence the conservation and management of the environment must be vested with a good knowledge of their respective responsibilities in order to ensure correct implementation of the EMP, Environmental Policy Statement including Environmental Management System. 		

SECTION B: HEALTH AND SAFETY

Table 9. Health and Safety Measures to be implemented

Environmental / Social Aspects	Objective	Mining Phase Mitigation Measures	Monitoring Indicators	Management Indicators	Responsibility
Health & Safety	Adhere to the Health and Safety Regulations, Government Notice 156/1997 (GG 1617).	<ul style="list-style-type: none"> 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 during working hours and when onsite. Ensure all employees are inducted on the dangers of the risks associated with working at the mine 	<p>Health and safety included and reflected in the induction minutes</p> <p>Visual Inspection</p> <p>Visual Signs available</p>	<p>Approved certification of completion.</p> <p>Visual Inspection</p> <p>Availability of fire extinguishers at the mine and evidence of</p>	Proponent representative or Environmental Manager

Environmental / Social Aspects	Objective	Mining Phase Mitigation Measures	Monitoring Indicators	Management Indicators	Responsibility
		<p>and the available emergency response;</p> <ul style="list-style-type: none"> • There must be clear health and safety signs at designated area 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 level be higher than 85dB, the proponent must implement a hearing conservation 	Record of hearing loss	<p>training (e.g. minutes, training pictures etc). Visible signages</p> <p>Report of health check ups</p>	

Environmental / Social Aspects	Objective	Mining Phase Mitigation Measures	Monitoring Indicators	Management Indicators	Responsibility
		<p>program such as noise monitoring;</p> <ul style="list-style-type: none"> • Employees must be provided with appropriate PPE such as industrial earmuffs; • Supply safe drinking water. • Ensure adequate, hygienic and user-friendly ablution facilities for all employees at the site; • Inspect ablution facilities at the site regularly. • Supervisors must undertake an 	<p>Clean 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	Management Indicators	Responsibility
		occupational health and first aid course.			
Open fires	To prevent veld fire	<ul style="list-style-type: none"> No open fires may be made anywhere on the mining licence area. 	Visual Inspection	Visual Inspection	Proponent representative or Environmental Manager
Blasting	To reduce noise and vibration impacts on the environment.	<ul style="list-style-type: none"> Before any blasting take place, the traditional authority, surrounding community and nearest police stations at Omakange must be notified well in advance. Only environmentally friendly blasting agents should be used. An accredited blaster should be contracted to 	<p>Proof of communication</p> <p>Proof of eco-friendly registration.</p> <p>Proof of registration</p>	<p>Proof of communication.</p> <p>Records of registration.</p>	Proponent representative or Environmental Manager

Environmental / Social Aspects	Objective	Mining Phase Mitigation Measures	Monitoring Indicators	Management Indicators	Responsibility
		carry out any required blasting activities.			
Road safety		<ul style="list-style-type: none"> • Demarcate roads clearly. • Off-road driving should not be allowed. • All vehicles that transport crude gypsum and all materials to and from the mine must be roadworthy. • Drivers operating mining equipment and those transporting materials should have valid driver's license and should adhere to all traffic rules. 	Road signs	Road signs	Proponent representative or Environmental Manager

Environmental / Social Aspects	Objective	Mining Phase Mitigation Measures	Monitoring Indicators	Management Indicators	Responsibility
		<ul style="list-style-type: none"> All loads should be properly secured to avoid items falling off the vehicles. Limit and control the number of access points to the mining sites. The road leading to the mine should be properly maintained in order to reduce dust emissions when being used by heavy duty vehicles. 			
Establish and Maintain an Occupational health and Safety	Improved occupational health and safety at work place	<ul style="list-style-type: none"> Maintain high safety standards at the site and arrange annual audits by credible institutions. 	Accident records	High standards of occupational health and safety ratings is maintained.	Proponent representative or Environmental Manager

Environmental / Social Aspects	Objective	Mining Phase Mitigation Measures	Monitoring Indicators	Management Indicators	Responsibility
Management System (SMS)					

SECTION C: POLLUTION CONTROL AND WASTE MANAGEMENT

Table 10. Pollution and Waste Management Mitigation Measures

Environmental / Social Aspect	Objectives	Mining Phase Mitigation Measures	Monitoring Indicator	Management Indicator	Responsibility
Vehicle Emissions	Reduce greenhouse gas (GHG) emissions from vehicles / machinery	<ul style="list-style-type: none"> All equipment and vehicles must be kept in good working condition and serviced regularly to prevent emission of noxious smoke etc. Switch off engines when vehicles are not operating. 	<p>Vehicle service records books</p> <p>Reports of smoke emissions from machinery</p>	Endorsement by the management	Proponent representative or Environmental Manager

Environmental / Social Aspect	Objectives	Mining Phase Mitigation Measures	Monitoring Indicator	Management Indicator	Responsibility
Surface and ground water contamination / pollution	To prevent soil and water pollution	<ul style="list-style-type: none"> Contaminated runoff from the various operational activities should be prevented from entering any surface water bodies. 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. 	<p>Visible drip trays</p> <p>Proper storage with concrete bund surface</p>		Proponent representative / Environmental Manager

Environmental / Social Aspect	Objectives	Mining Phase Mitigation Measures	Monitoring Indicator	Management Indicator	Responsibility
		<ul style="list-style-type: none"> Disposal of waste from the properties should be properly managed. 			
Oil Spillages	To prevent oil spill from tanks and during re-fuelling	<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. 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	Proponent representatives / Environmental Manager

Environmental / Social Aspect	Objectives	Mining Phase Mitigation Measures	Monitoring Indicator	Management 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. 			
Oil leakage	To prevent fuel leakages during crude gypsums mining	<ul style="list-style-type: none"> All stationary vehicles and machinery must have drip trays to collect leakages of oils and lubricant. Vehicle and machinery to be used must be in good condition and well service to avoid 	Visible monitoring		Proponent representatives / Environmental Manager

Environmental / Social Aspect	Objectives	Mining Phase Mitigation Measures	Monitoring Indicator	Management Indicator	Responsibility
		leakages of oils and lubricants; <ul style="list-style-type: none"> Although not anticipated to be significant, oil drops for instance of less than 500ml, if it happens to contaminate the soils must be collected and be treated with bioremediation waste. 			
Waste generation	To prevent littering	<ul style="list-style-type: none"> The site shall be kept clean and free of litter and no litter from the site shall be allowed to disperse to surrounding areas. 	Waste bins and skip containers	Waste bins and skip containers	Proponent representatives / Environmental Manager

Environmental / Social Aspect	Objectives	Mining Phase Mitigation Measures	Monitoring Indicator	Management Indicator	Responsibility
		<ul style="list-style-type: none"> • All personnel shall be instructed to dispose of all waste in the proper manner. • The mining site must have adequate wheelie bins and skip containers for onsite waste disposal. • Sufficient weather and scavenger-proof bins (with lids, to prevent the escape of litter) shall also be provided, and be easily accessible at all points where wastes are generated. 	Waste management plan	Waste management plan	

Environmental / Social Aspect	Objectives	Mining Phase Mitigation Measures	Monitoring Indicator	Management Indicator	Responsibility
		<ul style="list-style-type: none"> • The proponent 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. • No dumping of waste products of any kind in or in close proximity to any surface water bodies. • No waste may be burned on site. 			

Environmental / Social Aspect	Objectives	Mining Phase Mitigation Measures	Monitoring Indicator	Management Indicator	Responsibility
		<ul style="list-style-type: none"> • General waste is to be collected either by the local Municipality or removed by the proponent or by the contractor. • The frequency of collections will be such that waste containment receptacles do not unduly accumulate at the site or overflow. • Ensure that Namibian National Solid Waste Management Strategy of 2017 is in place and enforce. 			

Environmental / Social Aspect	Objectives	Mining Phase Mitigation Measures	Monitoring Indicator	Management Indicator	Responsibility
Dust and air pollution		<ul style="list-style-type: none"> A watering truck should be used on gravel roads with the heaviest vehicle movement especially during dry and windy conditions. However, appropriate consideration should be given to water restrictions during times of drought. 	Dust monitoring	Dust monitoring	Proponent representatives / Environmental Manager

Environmental / Social Aspect	Objectives	Mining Phase Mitigation Measures	Monitoring Indicator	Management Indicator	Responsibility
		<ul style="list-style-type: none"> • The use of waterless dust suppression means (e.g. lignosulphonate products such as Dustex) should be considered. • Dust protection masks should be provided to workers if they complain about dust. • During high wind conditions the project manager must make the decision to cease works until the wind has calmed down. 			

SECTION D: ENVIRONMENT

Table 11. Environmental Mitigation Measures to be implemented

Aspect	Objective	Mining Phase Mitigation Measures	Monitoring Indicator	Responsibility
Biodiversity	Maintain the ecosystem services and protect the fauna and flora.	<ul style="list-style-type: none"> • No worker is allowed to hunt, disturb, remove, injure or feed any wild animals in the area. • No worker is permitted to intentionally remove, injure or kill any wild animals. • No workers should be permitted to disturb, remove or collect any plant or its materials. • Pick, uproot, fell or damage any plant materials growing in the area without a permit. • Prevent the destruction of protected tree species in the area. • Mining of crude gypsum should incorporate existing trees. 	<p>Disciplinary records</p> <p>Vegetation management plan</p>	Proponent representatives / Environmental Manager

Aspect	Objective	Mining Phase Mitigation Measures	Monitoring Indicator	Responsibility
		<ul style="list-style-type: none"> • Clear the vegetation within the project area in phases during mining in order to keep the soil more compacted as well as to limit overall disturbance to the area over time. • Encourage the regrowth and regeneration of trees with exposed roots at the site. • Ecological sensitive areas such as breeding sites and area with many crevices should be avoided during mining. • Disciplinary actions must be taken to any person not complying and strict penalties shall be imposed. 		
Illegal harvesting of any plant materials	To prevent illegal harvesting of plant materials and genetic resources.	<ul style="list-style-type: none"> • No worker and contractors are permitted to collect plant materials, wood and veld food, etc. during mining phase or to harvest any plant materials such as wood without a valid permit. 	Disciplinary records	Proponent representatives / Environmental Manager

Aspect	Objective	Mining Phase Mitigation Measures	Monitoring Indicator	Responsibility
		<ul style="list-style-type: none"> Any illegal harvesting of plant materials should be report to the relevant authority. 		
Water Resource	Conservation of water resource	<ul style="list-style-type: none"> No pollution or contaminant should be allowed to enter the water. A no-go buffer area of at least 30 m should be allocated to any water bodies in the area. There should be a continuous water quality monitoring taking place to ensure that there is no water contamination taking place within the mining licence area. Recycle water and foster re-use of water. Monitor and control water usage and minimise if possible. Keep record of water consumption, set target and put action plan when targets are exceeded. 	Valid water abstraction permit.	Proponent representatives / Environmental Manager

Aspect	Objective	Mining Phase Mitigation Measures	Monitoring Indicator	Responsibility
Soil Erosion		<ul style="list-style-type: none"> • Appropriate erosion control structures must be put in place where soil may be prone to erosion. • Checks must be carried out at regular intervals to identify areas within the mining licence site where erosion is occurring. Appropriate remedial actions are to be undertaken wherever erosion is evident. • It is recommended that most mining takes place outside of the rainy season in order to limit potential flooding and the run off of loose soil causing further erosion. 		
Alien Invasive	Maintain natural ecosystem	<ul style="list-style-type: none"> • No alien species may be plant is permitted to be planted at the site. • No pets are allowed to stay on the site. 	Alien invasive species record.	Proponent representatives / Environmental Manager

SECTION E: HERITAGE AND ARCHEOLOGICAL SITES

Table 12. 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. Immediately inform the Environmental Manager or management, who will inform the NHC. Retain all the artefacts recovered and where feasible; maintain a photographic record, take note of the date, time, location and type of artefacts found in the logbook; Contract an archaeologist in consultation with NHC to survey the area. Avoid mining within 500m from the centre once the area has been surveyed in order to 	Sighting report/s of heritage resources / artefacts	Proponent representatives / Environmental Manager

Environment / Social Aspect	Objectives	Mining Phase Mitigation Measure	Monitoring Indicator	Responsibility
		obtain the baseline data, a 2-3 baseline data is recommended.		

SECTION F: SOCIO ECONOMIC

Table 13. 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 from Omakange and surrounding villages, unless in circumstances where specialised skills are required. • Ensure that wellness program includes all the employees. • Employ local contractors e.g. SMEs • Where possible expand wellness programs to contracted SMEs. • Fair compensation and labour practise as per Namibian Labour Laws must be followed. 	Employee structure and proportion of local employment	Proponent representatives / Environmental Manager

Environmental / Social Aspects	Objectives	Mining Phase Mitigation Measures	Monitoring Indicator	Responsibility
Corporate Social Responsibility	Enhance the livelihood of the local communities	<ul style="list-style-type: none"> With the resources available support appropriate initiatives to improve the community welfare particularly in Omakange and Omusati region. 	Undertaking corporate social responsibility activities.	
HIV/AIDS	To prevent the spread of HIV/AIDS	<ul style="list-style-type: none"> Provide HIV/AIDS awareness at induction. 	HIV/AIDS awareness campaigns.	
Alcohol and Drug use	Prevent alcohol and drug use	<ul style="list-style-type: none"> Ban the use of alcohol and drugs onsite. Teach employees about dangers alcohol and substance abuse. All employees must be screen with the breathalyser to avoid intoxicated personnel to entering the mine. 	Drunk / Misbehaving employees Breathalyser report	Proponent representatives / Environmental Manager
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	Proponent representatives / Environmental Manager

SECTION G: DECOMMISSIONING/CLOSURE

Table 9. Decommissioning/closure Mitigation Measures to be implemented

Aspect	Objective	Mining phase Mitigation Measure	Monitoring Indicator	Responsibility
Decommissioning/Closure Plan	To ensure and attain the decommission/closure targets.	<ul style="list-style-type: none"> • Ensure decommissioning/closure plan is continuous throughout the life cycle of the project. • When stripping is carried out, the overburden should be stockpiled in a demarcated area and used in profiling and rehabilitating of the depleted, open pit at the mining licence. • Stockpiled topsoil should be used to rehabilitate post-harvesting degraded areas and/or other nearby degraded areas within the area in consultation with the traditional authority. • Collect all relevant information throughout the life cycle of the project to ensure that all 	Updated decommissioning/closure plan.	Proponent representatives / Environmental Manager

Aspect	Objective	Mining phase Mitigation Measure	Monitoring Indicator	Responsibility
		<p>environmental risks are quantified and managed properly.</p> <ul style="list-style-type: none"> • Submit the decommissioning/closure plan to the office of the Environmental Commissioner and Mining Commissioner for approval. 		
Financial provision for the decommissioning/closure of crude gypsum mining activities and rehabilitation.	Enhance decommissioning/closure and rehabilitation	<ul style="list-style-type: none"> • Allocate substantial operational cost in order to attain the EMP objectives by ensuring that potential impacts are managed or monitored. • Maintain sufficient Protection and Indemnity (P&I) Insurance Cover for the purpose of decommissioning/closure and rehabilitation liabilities. • Allot operational cost to monitor and ensuring natural recovery of the area through pre and post mining phases. • Reserve adequate funds for specialist assessments in the event that the natural recovery process is taking longer than expected 	Protection and Indemnity (P&I) Insurance Cover.	Proponent representatives / Environmental Manager

Aspect	Objective	Mining phase Mitigation Measure	Monitoring Indicator	Responsibility
		and resources for continuous monitoring will be requirement.		

10. CONCLUSION AND RECOMMENDATIONS

The proposed mining activities of crude gypsum, on Mining Licence (ML) 256 at Uundundu waNandjila village will have both negative and positive impacts on the environment, however, with the correct implementation of the suggested mitigation measures, the negative impacts will be condensed to insignificant levels. Due to a high number of unemployment in the area and limited economic activities the proposed project will have a huge positive economic impact to the area as well as the region at large. The proponent should respect the existing legal framework for traditional authority and must constantly involve them as well as the conservancy in their planning to ensure that their decisions do not affect the local community and intended conservation programs in the area. The proponent must honour the formulated and endorsed corporate social responsibility plan and support conservation initiatives in the area. Moreover, the identified potential negative environmental impacts of the proposed mining project will be mostly confined to the mining license only if the mitigation measure stipulated in this EMP are appropriately implemented. All potential impacts associated with the envisaged mining project were identified, and mitigation measures were provided with high confidence.

The decommissioning of mining activities of crude gypsums at ML 256 is not expected to occur in the nearest future because the demand for gypsum products is continuously increasing due to current demand for civil works particularly within the property development sector. Nevertheless, in the event that the operation of the proposed mine ceases the closure plan must be done, in consultation with the local community and opportunity must be afforded to the community to suggest appropriate alternative plan in relation to land uses through rehabilitation, and using the remaining infrastructure for other economic use. The information provided and mitigation measures detailed in this EMP are adequate to necessitate the approval of the proposed project. Consequently, it is suggested that the Environmental Clearance Certificate shall be issued to allow the mine development at Uundundu waNandjila village. However, with continuous modification of the environment, constant monitoring must be implemented. The proponent must appoint an Independent Environmental Consultant and relevant specialists to uninterruptedly conduct environmental audits and prepare specialist reports for submission to the office of Environmental Commissioner.