


PROJECT DETAILS

Title	ENVIRONMENTAL MANAGEMENT PLAN FOR THE ESTABLISHMENT OF MINING ACTIVITIES FOR DIMENSION STONES ON MINING CLAIM 72121; KARIBIB, ERONGO REGION.		
HEEC Reference	HEEC032022		
Proponent	Ms. Laina Silvanus Erf 176, Okaramba Street, Wanaheda, Windhoek P. O Box 62933, Wanaheda Windhoek		
Report date	March 2022		
Author	Name	Signature	Date
	Tanaka D. Nyatoro		30/03/2022

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ABBREVIATION

AIDS	Acquired Immunodeficiency Syndrome
COVID19	Coronavirus
DEA	Department of Environmental Affairs
EA	Environmental Assessment
EAP	Environmental Assessment Practitioner
ECC	Environmental Clearance Certificate
ECO	Environmental Compliance Officer
EIA	Environmental Impact Assessment
EMA	Environmental Management Act
EMP	Environmental Management Plan
EPL	Exclusive Prospecting Licence
HIV	Human Immunodeficiency Virus
MAWLR	Ministry of Agriculture, Water and Land Reform
MEFT	Ministry of Environment, Forestry and Tourism
MME	Ministry of Mines and Energy
NHC	National Heritage Council
PPE	Personal Protective Equipment

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1. INTRODUCTION

Ms. Laina Silvanus, hereafter referred to as the proponent intends to undertake mining activities for dimension stones on the mining claim 72121. The proponent is a holder of an application for the mining claim 72121 which was lodged on the 11/09/2020 with the Ministry of Mine and Energy (MME) after following all the necessary procedures to satisfy the relevant authorities enabling her to mine the dimension stones from the allocated portion. The proponent has secured both financial and technical partners to carry out the proposed small-scale dimension stones mining activities. The mining claim overlays EPL 3275, which belongs to QKR Namibia Navachab Gold Mine and proponent has been granted a consent to prospect and mine dimension stones in the area. The proposed project is a listed activity as per the Environmental Management Act 2007 (Act No. 7 of 2007) (EMA) and an Environmental Clearance Certificate (ECC) is therefore required to commission such a project. Healthy Earth Environmental Consultants (HEEC) has been appointed by **Ms. Laina Silvanus** to carry out an Environmental Impact Assessment (EIA) and develop an Environmental Management Plan (EMP) for the proposed project.

Ms. Laina Silvanus has utilised the available historical data, surface investigation and existing dimension stones mining operations in the vicinity to confirm and verify the presence of descent resources for mining on the applied mining claim at Karibib. The planned mining program will consider using a substantial budget and a technically low risk mining operation. The mining of dimension stones will employ the standard dimension stones mining approach currently used at the existing quarries within the vicinity of Karibib. The operation will include cutting of dimension stones using jack hammers and automated diamond wire cutting machines. The dimension stones will be cut as per the size that has been pre-loaded in the machine and thereafter these stones will be loaded on a flatbed truck with a heavy-duty front-end forklift for transportation to Walvis Bay port for shipping to the international markets for further processing. As a response to the call by the government for mining operation of dimension stones in Karibib and elsewhere around the country to add value to mined resources and scale-down the exportation of jobs outside the country. The proponent with her financial and technical partners are exploring opportunities of acquiring land in Karibib townlands to set up a processing facility where the dimension stones will be cut into bulk

slabs/cubes and ultimately finished products such as; tiles, kitchen tops and other stoneware products targeting both the local and international market.

Ms. Laina Silvanus, hereinafter referred to as the proponent intends to carry out the following activity:

- **Environmental Impact Assessment (EIA) for the establishment and mining of dimension stones on mining claim; 72121, Karibib, Erongo Region, Namibia.**

The objective of the Environmental Assessment was to assess the potential social and environmental impacts associated with the establishment and mining of dimension stones on mining claim; 72121 at Karibib, Erongo Region and also to formulate methods of rehabilitation of the open quarry pits at the claim.

The above is a listed activity in terms of the Environmental Management Act (No. 7 of 2007) and Environmental Impact Assessment Regulations (Government Notice No. 30 of 2012).

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 EIA Regulations which apply to the proposed project

Activity description and No(s):	Description of relevant Activity	The portion of the development as per the project description that relates to the applicable listed activity
Activity 3.1 (Mining and Quarrying Activities)	The construction of facilities for any process or activities which requires a licence, right or other form of authorisation, and the renewal of a licence, right or other form of authorisation, in terms of the Minerals (Prospecting and Mining Act), 1992.	The proposed project includes the mining of dimension stones for export 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 the extraction of dimension stones for export purposes.
Activity 3.3 (Mining and Quarrying Activities)	Resource extraction, manipulation, conservation and related activities.	The proposed project entails the extraction of dimension stones for export purposes.

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

- Dimension stone mining Phase – the period during which the proponent, having dealt with the necessary legislative and administrative arrangements, appoints a contractor to engage in the extraction of dimension stones from the project site to be transported to the Walvis Bay Port for export purposes;
- Transportation Phase - the period during which the proponent transports the dimension stones from the quarry to Walvis Bay port for export.

- Dressing Phase - the period during which the proponent processes the excavated dimension stones, further processing will be done in China and therefore is not in the scope of this EMP.

The rehabilitation of the quarries at the dimension stone mining claim site once activities have ceased is highly recommended so as to ensure that the subject area assumes economically viable alternative land uses and not pose a drowning threat/injury to the livestock and local people making use of this land parcel; when the event occurs some recommendations have been outlined in **Section G**.

2. PROJECT LOCATION

The mining claim 72121 is situated approximately 8 Km South of Karibib townland when using the D1953 which branches out from the C32 road South of Karibib in Erongo Region as shown in **Figure 1**. The mining claim covers an area of 10.032 Ha and there are active existing dimension stones mining operations taking place in the adjacent area.

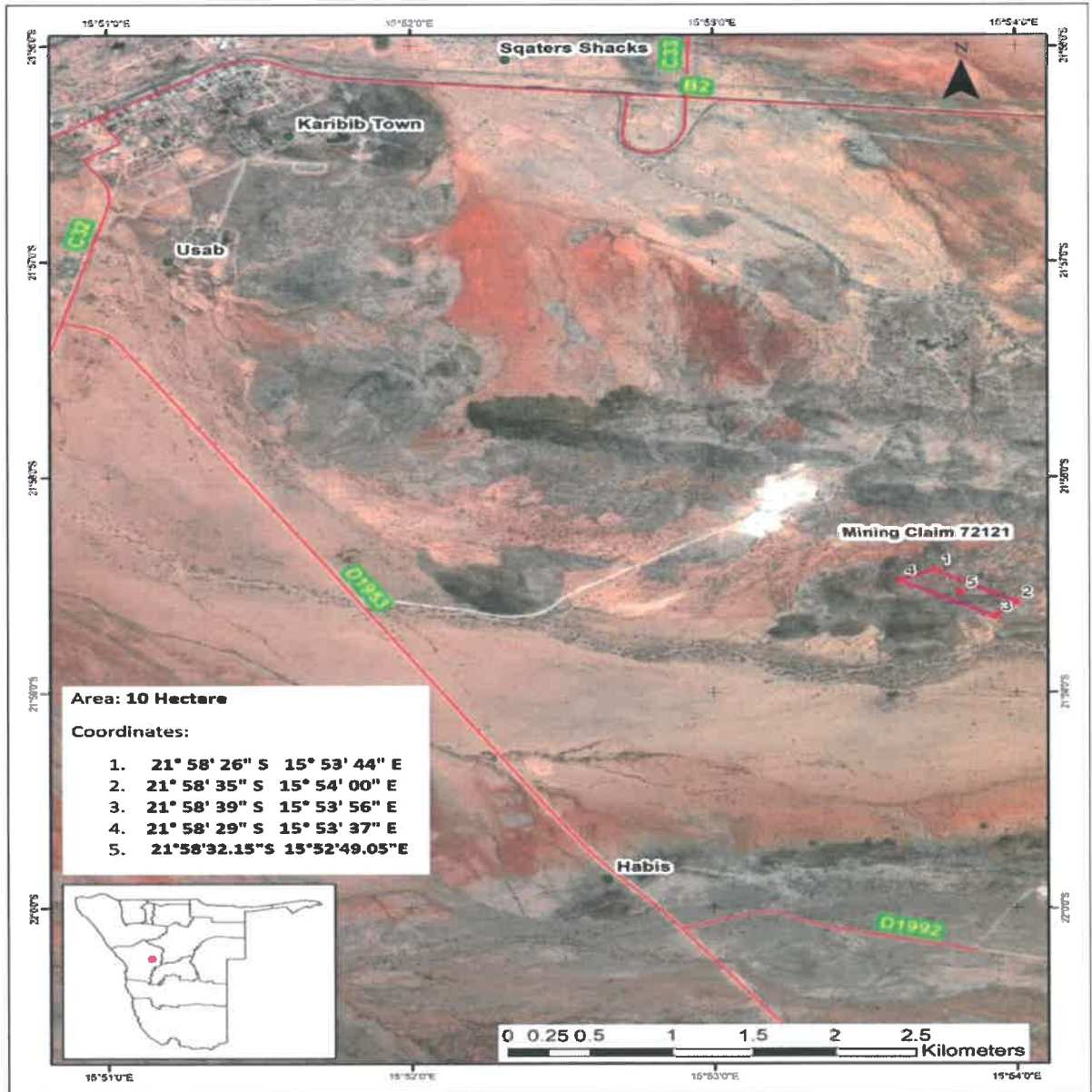


Figure 1: Location of the mining claim proposed for dimension stones mining activities (Shown above by the purple quadrant Mining Claim 72121). (HEEC, 2022).

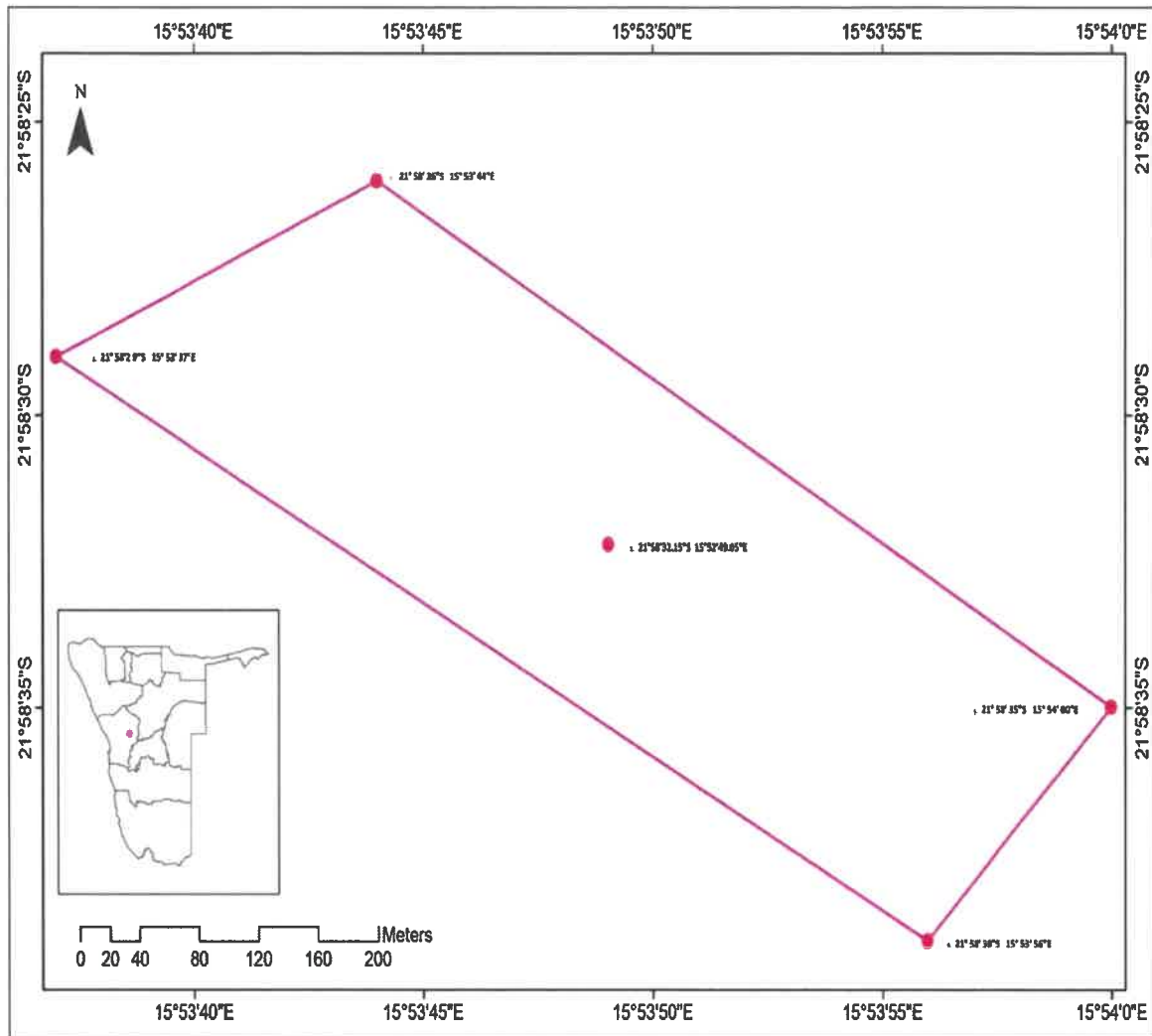


Figure 2: The orientation of mining claim 72121 (delineated in purple) with geo-reference points (HEEC, 2022).

3. PURPOSE OF THE EMP

This Environmental Management Plan (EMP) details the manner and practical framework which includes the mitigation approach, monitoring actions and management control programs to reduce probable environmental impacts to inconsequential levels. It further specifies the roles and responsibility of persons involved in the proposed dimension stone mining project. This EMP encompasses the mitigation measures for the likely impacts that may emanate as a results of the proposed dimension stone mining activities on mining claim; 72121 at Karibib, Erongo region.

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). Therefore, **Ms. Laina Silvanus** and her technical and financial partners including the contractors must consequently comply to the contents of this document. It should be noted further that the EMP is a living document and is subjected to modification depending on the changing environments and new information that may be available in the future, hence it must be amended 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 Namibia and international laws of which Namibia is signatory.

5.1 Applicable and relevant statutory framework of Namibia

Table 2. Legal requirements for the proposed dimension stone mining 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	Legal requirement to undertake an EIA

Legislation	Summary	Applicability
	<p>provide for incidental 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>	<p>Generation of Greenhouse Gases by the fuel</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</p>	<p>Possible fuel spillage and leakages may pollute underground and surface water.</p>

Legislation	Summary	Applicability
	<p>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>Environmental Policy framework (1995)</p>	<p>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.</p>	<p>Provision of the EIA and guidelines</p>
<p>The Occupational Safety and Health Act No. 11 of 2007;</p>	<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 ablation facilities, routine health check-ups for employees, Covid19, HIV/AIDS, TB 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 and ephemeral river systems are not polluted and implement pollution control mechanisms to avoid water pollution
Water Act No, 54 of 1956	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; <ul style="list-style-type: none"> • Discharge of contaminated into water sources such as pipe, sewer, canal, sea outfall and Disposal of water in a manner that may cause detrimental impact on the water resources	Contaminated water, such as sewage sludge must not seep into the ephemeral rivers and 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	<p>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.</p>	Follow legal labour requirements such as safety, remuneration etc
Regional Council Act, 1992 (Act No. 22 of 1992)	<p>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.</p>	Observe the regional by laws
Soil Conservation Act No. 76 of 1969	<p>This act promotes the conservation of soil, prevention of soil erosion.</p>	Coordinate movement of mining equipment to prevent soil erosion. Ensure conservation of topsoil.
Hazardous Substances Ordinance No. 14 of 1974	<p>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.</p>	Handling of fuel, fire and explosion risks

Legislation	Summary	Applicability
<p>National Heritage Act No. 27 of 2004</p>	<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 such as</p>	<p>Mining activities such as stripping of the overburden, excavation and, trenching may unearth archaeological material.</p>
<p>Word's Best Practises</p>	<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>Dimension stone mining particularly in the area with washes and ephemeral rivers can be detrimental to the underground water. Therefore, precaution must be taken to avoid the contamination of 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 entrusted to enforce compliance as per the provision of the EMA. The ECO may carry out inspection at any given time to enforce compliance. Based on his/her work schedule, the ECO shall visit the site at any time for environmental inspection and monitoring.

6.2 The Proponent

Ms. Laina Silvanus shall hold the inclusive responsibility of environmental management by adequately implementing the environmental management plan (EMP). Moreover, it shall be a full responsibility of the **proponent** to execute 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 pertaining to mining of dimension stones 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 environment 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 day-to-day operations of the mine are monitored and employees and contractors are complying with the EMP. The copy of the EMP shall at all-time be available at the site at all time and all the employees must be acquainted 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 deviation 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. DIMENSION STONE MINING AND QUARRY REHABILITATION

The occurrence of the quarry at mining claim; 72121 as results of dimension stones mining activities is inevitably. Therefore, the proponent should be accountable for implementing all provisions provided for within the relevant sections of this EMP. The proponent shall be responsible for the implementation of this EMP and to any relevant work outsourced to subcontractors. This shall also be applicable to all contractors appointed during the dimension stone mining phase and to those appointed during the continuous quarry rehabilitation phase. To ensure that there is an effective environmental management, the sections focusing on ecological conservation should be factored in the contracts for any outsourced work relating to the planned mining activities.

9. THE ENVIRONMENTAL MANAGEMENT PLAN

This EMP should be read together with the EIA of the proposed dimension stones mining activities on the mining claim 72121 and decommissioning phase of the intended project. The following tables provide the management actions recommended to manage the potential impacts rated in the scoping-level EA conducted for these activities. These management actions have been organised temporally according to intended project activities which comprises of 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 a rigorous induction course on all the provisions of the EMP including environmental policy and procedures.</p> <ul style="list-style-type: none"> • 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>	Proponent representative or Environmental Manager
	Disciplinary	<ul style="list-style-type: none"> • The proponent must adopt a disciplinary system to discipline staff for non-compliance, such as 	Disciplinary meetings and actions	Proponent representative or Environmental Manager

Environmental or Social Aspects	Objective	Proposed Mitigation Measures	Monitoring Indicators	Responsibility
		<p>not wearing PPE while working onsite etc.</p> <ul style="list-style-type: none"> Stringent measures must be put in place for any employee found contravening provisions of the EMP, must be granted a warning letter. 	<p>Disciplinary letters / Warnings</p>	
	<p>Availability of the EMP and Environmental Policy Statement at the site for ease of reference.</p>	<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. 	<p>Empirical view of the EMP and Environmental Policy Statement.</p>	<p>Proponent representative or Environmental Manager</p>

Environmental or Social Aspects	Objective	Proposed Mitigation Measures	Monitoring Indicators	Responsibility
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, displayed at key areas at the mine in case of emergencies. 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 	<p>Communication Strategy</p> <p>Letters, e-mail, notices, minutes</p> <p>Display of Environmental manager and emergency numbers at key areas on the vessel.</p>	Proponent representative or Environmental Manager

Environmental or Social Aspects	Objective	Proposed Mitigation Measures	Monitoring Indicators	Responsibility
		of their respective responsibilities for the in order to ensure accurate implementation of the EMP, Environmental Policy Statement and 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 	Health and safety included and reflected in the induction minutes	Approved certification of completion.	Proponent representative or Environmental Manager

Environmental / Social Aspects	Objective	Mining Phase Mitigation Measures	Monitoring Indicators	Management Indicators	Responsibility
		<p>be given to all employees.</p> <ul style="list-style-type: none"> Each employee must be provided with personal protective equipment (PPE) and must be worn at all time during working and when onsite. Ensure all employees are inducted on the dangers of the risks associated with working at dimension stones quarry and the available emergency response; There must be clear health and safety signs 	<p>Visual Inspection</p>	<p>Visual Inspection</p> <p>Availability of fire extinguishers on the vessel and evidence of training (e.g. minutes, training pictures etc). Visible signage</p>	

Environmental / Social Aspects	Objective	Mining Phase Mitigation Measures	Monitoring Indicators	Management Indicators	Responsibility
		<p>at designated area such as, ASSEMBLY AREA, NO SMOKING "DANGER", "ENTRANCE PROHIBITED" etc.</p> <ul style="list-style-type: none"> 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 program such as noise monitoring; 	<p>Record of hearing loss</p>	<p>Report of health check ups</p>	

Environmental / Social Aspects	Objective	Mining Phase Mitigation Measures	Monitoring Indicators	Management Indicators	Responsibility
		<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 occupational health and first aid course. 	<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
Open fires	To prevent veld fire	<ul style="list-style-type: none"> No open fires may be made anywhere on the mining claim area. 	Visual Inspection	Visual Inspection	Proponent representative or Environmental Manager
Road safety		<ul style="list-style-type: none"> Demarcate roads clearly. Off-road driving should not be allowed. All vehicles that transport materials to and from the site must be roadworthy. Drivers that transport materials should have a 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"> • Loads upon vehicles should be properly secured to avoid items falling off the vehicle. • Limit and control the number of access points to the mining claim sites. • The road leading to the mining claims should be properly maintained so as to reduce dust emissions when they are being used by heavy vehicles. 			
Establish and Maintain 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 frequently to prevent emission of noxious smoke etc. 	<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
		<ul style="list-style-type: none"> Switch off engines when vehicle is not operations 			
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. 	Service records Visible drip trays		Proponent representative / Environmental Manager

Environmental / Social Aspect	Objectives	Mining Phase Mitigation Measures	Monitoring Indicator	Management Indicator	Responsibility
		<ul style="list-style-type: none"> 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. Disposal of waste from the properties should be properly managed. 	Proper storage with concrete bund surface		
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 		Site inspection and record keeping	Proponent representatives / Environmental Manager

Environmental / Social Aspect	Objectives	Mining Phase Mitigation Measures	Monitoring Indicator	Management Indicator	Responsibility
		<p>impermeable lined materials.</p> <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. • Engage the suppliers of consumable such as grease and lubricants upon used to collect and dispose of such waste in an environmentally friendly manner. 	Place warming signs		

Environmental / Social Aspect	Objectives	Mining Phase Mitigation Measures	Monitoring Indicator	Management Indicator	Responsibility
Oil leakage	To prevent fuel leakages during dimension stones 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 leakages of oils and lubricants; • Although not anticipated to be significant, oil drops for instance of less than 500ml, if it happen to contaminate the soils 	Visible monitoring		Proponent representatives / Environmental Manager

Environmental / Social Aspect	Objectives	Mining Phase Mitigation Measures	Monitoring Indicator	Management Indicator	Responsibility
Waste generation	To prevent littering	<p>must be collected and be treated with bioremediation waste.</p> <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. All personnel shall be instructed to dispose of all waste in the proper manner. The mining site must have adequate wheelie bins and skip 	Waste bins and skip containers	Waste bins and skip containers	Proponent representatives / Environmental Manager
			Waste management plan	Waste management plan	

Environmental / Social Aspect	Objectives	Mining Phase Mitigation Measures	Monitoring Indicator	Management Indicator	Responsibility
		<p>containers for onsite waste disposal.</p> <ul style="list-style-type: none"> • 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. 			

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		<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.• The excavation of the dimension stones should incorporate existing trees.	Disciplinary records Vegetation management plan	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 the dimension stone mining period 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 the dimension stone mining phase 	Disciplinary records	Proponent representatives / Environmental Manager

Aspect	Objective	Mining Phase Mitigation Measures	Monitoring Indicator	Responsibility
		<p>to harvest any plant materials such as wood without a valid permit.</p> <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"> A valid water abstraction permit should be obtained from the MAWLR in the event that a borehole will be drilled at the site. 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 claim area. 	Valid water abstraction permit.	Proponent representatives / Environmental Manager

Aspect	Objective	Mining Phase Mitigation Measures	Monitoring Indicator	Responsibility
		<ul style="list-style-type: none"> • Recycle water and foster the 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. 		
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 claim site where erosion is occurring. Appropriate remedial actions are to be undertaken wherever erosion is evident. 		

Aspect	Objective	Mining Phase Mitigation Measures	Monitoring Indicator	Responsibility
Alien Invasive	Maintain natural ecosystem	<ul style="list-style-type: none"> It is recommended that most dimension stone mining takes place outside of the rainy season in order to limit potential flooding and the run off of loose soil causing further erosion. 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.		

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 Karibib and surrounding settlement, 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 Karibib and Erongo 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.	
COVID 19	To prevent the spread of Covid 19.	<ul style="list-style-type: none"> Adhere to all Covid19 regulations and protocol. Maintain the wearing of face mask where necessary, social distance and sanitising. Ensure that employee's temperature is checked. Report any case of suspected employee with sign of Covid 19 and isolate the suspect from the 	Suspected employees and contacts	Proponent representatives / Environmental Manager

Environmental / Social Aspects	Objectives	Mining Phase Mitigation Measures	Monitoring Indicator	Responsibility
		colleagues to prevent contacts with the suspect.		
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
<p>Decommissioning/Closure Plan</p>	<p>To ensure and attain the decommission/closure targets.</p>	<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 quarries at the mining claim. • Stockpiled topsoil should be used to rehabilitate post-harvesting degraded areas and/or other nearby degraded areas within the Karibib townland in consultation with the Karibib Municipality office. • Collect all relevant information throughout the life cycle of the project to ensure that all 	<p>Updated decommissioning/closure plan.</p>	<p>Proponent representatives / Environmental Manager</p>

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. 		
<p>Financial provision for the decommissioning/closure of exploration activities and rehabilitation.</p>	<p>Enhance decommissioning/closure and rehabilitation</p>	<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 	<p>Protection and Indemnity (P&I) Insurance Cover.</p>	<p>Proponent representatives / Environmental Manager</p>

Aspect	Objective	Mining phase Mitigation Measure	Monitoring Indicator	Responsibility
		recovery process is taking longer than expected and resources for continuous monitoring will be requirement.		

10. CONCLUSION AND RECOMMENDATIONS

The intended dimension stones mining project had different aspects that were assessed for possible environmental, social and economic impacts. The potential environmental impacts for the proposed dimension stones mining project will be mainly localised to the mining claim area. Mining and quarrying are listed activity according to EMA and may not be undertaken without a valid ECC. Most of the latent negative impacts associated with this project can be reduced to insignificance levels if the mitigation measure outlined in this EMP are correctly implemented.

All potential impacts were identified, and mitigation measures proposed were provided with high confidence. The decommissioning of mining activities of dimension stones at the mining claim site is envisaged in the future. The closure plan must be done, in consultation with the community of Karibib and provides the opportunity to develop alternative land uses through rehabilitation, and to use the remaining infrastructure for other economic viable projects. The information provided and mitigation measures suggested for the proposed small-scale dimension stones mining project are suffice, hence it is recommended that the Environmental Clearance Certificate shall be issued to necessitate the commencement of the project. However, with continuous alteration of the environment, regular monitoring must be put in place, therefore, the proponent must appoint an Independent Environmental Consultant and relevant specialists to continuously undertake environmental audits and prepare specialist reports for submission to the office of Environmental Commissioner.

