

ENVIRONMENTAL MANAGEMENT PLAN

For the proposed development of small-scale mining activities for dimension stone, industrial minerals and semi-precious stones within Mining Claims 73039, 73040, 73041 and 73042

Near Orupembe,

KUNENE REGION

JANUARY 2024

APP: 001218



TABLE OF CONTENTS

1.	INTRODUCTION	1
	1.1. PROJECT ACTIVITIES	3
	1.2. PURPOSE OF THE DOCUMENT	12
2.	ENVIRONMENTAL MANAGEMENT PRINCIPLES	13
3.	ROLES AND RESPONSIBILITIES FOR ENVIRONMENTAL MANAGEMENT	15
	3.1. COMMUNICATION BETWEEN PARTIES	15
	3.2. THE MINING/QUARRYING OPERATING COMPANY	15
	3.3. SITE MANAGERS.....	16
	3.4. ENVIRONMENTAL CONTROL OFFICER (ECO)	16
	3.5. CONTRACTORS	16
4.	ENVIRONMENTAL SPECIFICATIONS	17
	4.1. COMPLIANCE WITH THE ENVIRONMENTAL SPECIFICATIONS	17
	4.2. TRAINING AND AWARENESS	17
	4.3. STAKEHOLDER RELATIONS.....	17
	4.4. PERMITS	17
	4.5. ROAD SAFETY.....	17
	4.6. ACCESS TRACKS.....	18
	4.7. CONSERVATION OF BIODIVERSITY	18
	4.8. WILDLIFE POACHING	18
	4.9. SOIL MANAGEMENT AND EROSION CONTROL.....	18
	4.10. POLLUTION CONTROL.....	19
	4.11. WASTE MANAGEMENT	20
	4.12. HAZARDOUS SUBSTANCES	20
	4.13. FIRE PREVENTION	20
	4.14. ARCHAEOLOGICAL SITES	20
	4.15. HEALTH AND SAFETY	20
	4.16. WORK STOPPAGE.....	21
	4.17. COMPLIANCE MONITORING.....	21
5.	MITIGATION MEASURES	22
6.	MONITORING PLAN	32
7.	CONCLUSION	36

LIST OF FIGURES

FIGURE 1 – REGIONAL LOCATION OF THE MINING CLAIMS AND SURROUNDING INFRASTRUCTURE. 2
FIGURE 2 - HEAVY MACHINERY USED TO MOVE OVERLYING MATERIAL 7
FIGURE 3 - WHITE MARBLE QUARRY CUTTING OPERATIONS..... 8
FIGURE 4 -BLOCK HANDLING FROM QUARRY 9
FIGURE 5 – TYPICAL ON-SITE BLOCK SORTING AND STOCK PILING 10
FIGURE 6 - ACCESS ROUTES TO THE SITE 11

LIST OF TABLES

TABLE 1 - CORNER COORDINATES FOR THE MINING CLAIMS..... 1
TABLE 2 – EMP MITIGATION MEASURES..... 23

1. INTRODUCTION

Alliance Environmental Consultancy CC (AEC) has been appointed by Ms. Saima K Magano Nuuyoma to act on their behalf in obtaining an Environmental Clearance Certificate (ECC) for the proposed small scale mining activities within Mining Claims (MCs) 73039, 73040, 73041 and 73042. The potential environmental impacts associated with the proposed mining activities will be assessed in this report and an Environmental Management Plan will be provided (This document).

The project area is located near Orupembe and Onjuva settlements, Epupa Constituency in the Kunene Region. This site is accessible via tracks from the D3704 district road approximately 20km North of Orupembe settlement. The site is 200 km directly west of the town of Opuwo. The Mining Claims covers a total combined area of approximately 58 Hectares. FIGURE 1 & 2 shows the locality of the area.

The mining claims lie within the Orupembe Communal Conservancies which fall under the Opuwo Urban constituency, and in the vicinity of the historical marble stone quarry. The people living in the general area are led by headmen who in turn grant stewardship and authority to junior headmen.

The mining claims are under the ownership of Ms. Saima K Magano Nuuyoma who pegged the area through the Ministry of Mines and Energy (MME) on 31st March 2022. The mining claims are still at the application stage (pending approval) as it is subject to an environmental clearance certificate (ECC) by the Ministry of Environment, Forestry and Tourism (MEFT) which is the reason for conducting this environmental scoping and impact assessment.

The corner coordinates of the claims are provided in the TABLE 1 below.

TABLE 1 - CORNER COORDINATES FOR THE MINING CLAIMS

ID	LATITUDE	LONGITUDE		LATITUDE	LONGITUDE
73039	-18.00160	12.58490	73041	-17.927523	12.575701
	-17.99690	12.58514		-17.920884	12.573173
	-17.99710	12.58800		-17.922836	12.575992
	-18.00150	12.58767		-17.927449	12.578195
73040	-17.936306	12.57861	73042	-17.921737	12.575671
	-17.931615	12.57679		-17.920379	12.573200
	-17.930898	12.57947		-17.914460	12.571963
	-17.935617	12.58119		-17.917471	12.575231

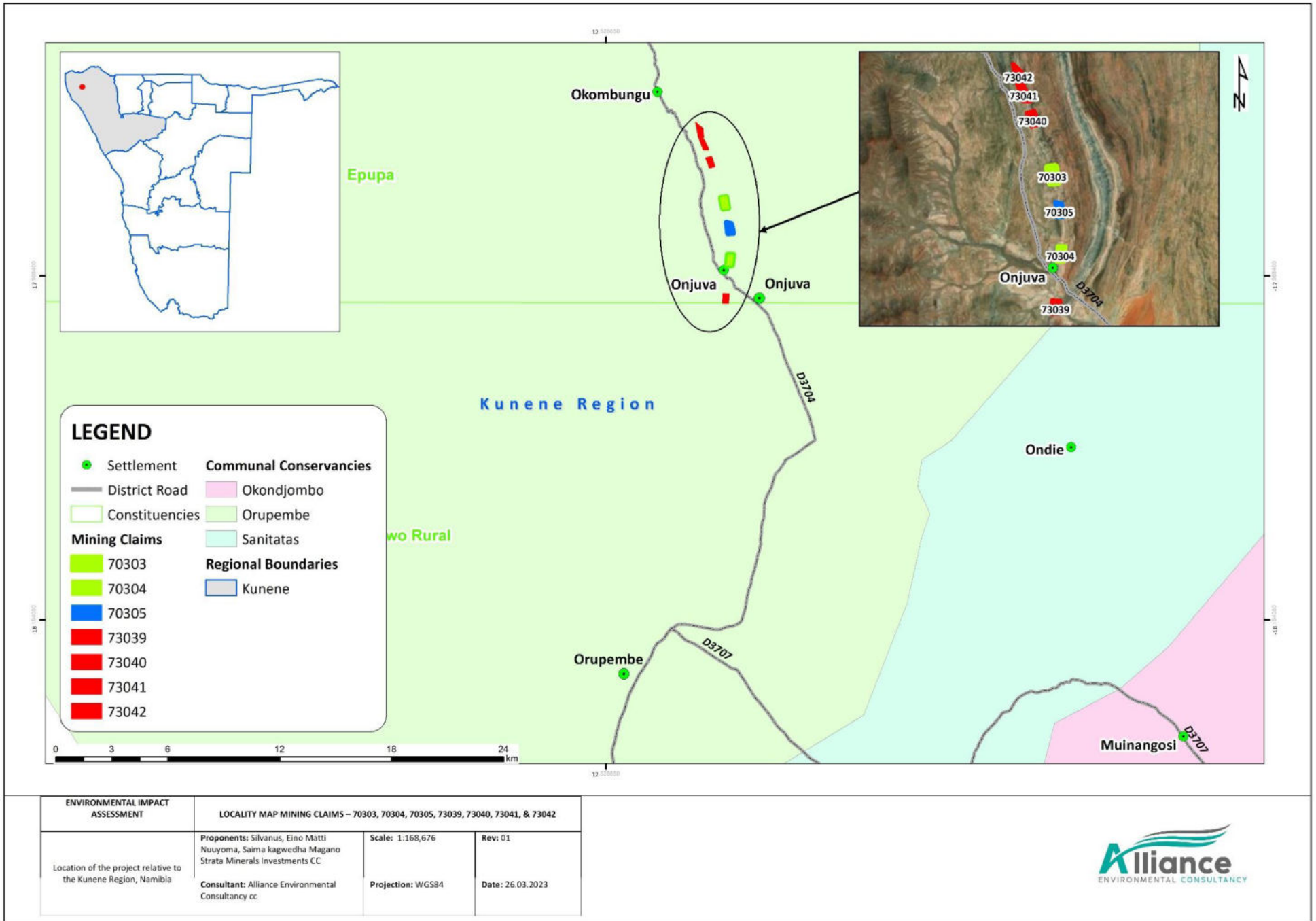


FIGURE 1 – REGIONAL LOCATION OF THE MINING CLAIMS AND SURROUNDING INFRASTRUCTURE.

1.1. PROJECT ACTIVITIES

Operations are currently in the Planning Phase for the quarry and associated operations. This phase will aim at finalizing designs, agreements and permissions which are all related to the development of the quarry and related infrastructure. The quarry and accessory works area are planned to be developed and operated simultaneously with the Construction Phase commencing upon receipt of the ECC should it be granted and secure funding. During this phase, all infrastructure required for operations will be established on site. All construction activities are planned to be completed within 12 months from initiation.

Once operational, the life of mine of the quarry is dependent on the demand requirements and capability of meeting such demands. However, in terms of feasibility some timeframe may be estimated based on expected demand requirements. The current estimate for the life of mine of the quarry is 10 - 17 years. Rehabilitation during the Decommissioning Phase is crucial for all proposed operations. It will mainly focus on making excavated areas safe by re-shaping the pit walls. Quarry operations will include carefully monitored blasting, diamond wire saw cutting and blade cutting technique together with the subsequent stockpiling for haulage.

PLANNING PHASE ACTIVITIES

This will incorporate the procurement of all required permits and of the mining/operational plans for the quarry and processing of the product. Contractual agreements such as the appointment of sub-contractors especially mine engineers and surveyors are dealt with in the latter part of the planning phase. Various state and parastatal agencies will be engaged regarding the various project component and permitting. These discussions will result in various agreements. Agencies that will be/are being consulted include the following:

- Ministry of Mines and Energy (MME)
- Ministry of Environment Forestry & Tourism (MEFT, this application)
- Kunene Regional Council
- Ministry of Agriculture, Water & Land Reform (MAWLR)
- Ministry of Lands Resettlement and Rehabilitation (MLRR)

OPERATIONAL PHASE

i. Site preparation

- The preparation will commence with clearing the proposed quarry areas and setting up the campsite where the workforce will be accommodated throughout the project life, provided that the layout is not amended during the life of the project.

- Establishing the waste rock area, access roads, topsoil storage stockpile bays, temporary sorting and loading bays for blocks, and general operational support infrastructure areas (such as onsite office, maintenance workshop area, power supply genset pads, diesel and water tank pads, temporary fenced off yard for solid and liquid waste).
- Widening and upgrading existing access tracks and creating new access routes to the quarries, including installing culverts at river and drainage channel crossings.
- Removing of topsoil where the surface is not already exposed thereafter safely storing topsoil at a designated area.
- Removing overburden and utilizing it in cut and fill operations.

ii. *Resource definition and quarry operations preparations*

- Conducting geotechnical core drilling to inform the layout and design of the quarry/quarries.
- Rehabilitating and possibly deepening existing water supply boreholes to support quarrying operations.

iii. *Erection of supporting infrastructure*

An accessory works area will provide the ground and Licence for the establishment of a works yard. This area will be demarcated so as to limit the movement of equipment and personnel beyond the footprint of the quarry and accessory works area, and also to limit the movement of animals onto the site from the surrounding. When lateral expansion is required the removal of trees will be done in association with the Directorate of Forestry that issues such permits.

- Erecting a corrugated sheet and concrete floor lined structure, covering an area of 700 to 1000 square meters, for use as a maintenance workshop and storage space for spare parts and supplies. The concrete floors of the structure will extend at least 1.5 meters beyond the boundary of the corrugated sheets to effectively contain any oil and lubricant spillages.
- Setting up a 6-meter-long office block container and setting up a partitioned 6-meter-long container for ablution facilities (toilets and showers). Excavating a 2-meter-deep hole about 20 meters from each ablution facility container for installing a sewage septic tank. The hole will be lined with a HDPE liner anchored in a 1-meter-deep trench. The septic tanks will be pump-emptied as needed.
- Installing an above-ground 10,000L diesel tank for onsite diesel storage near the quarries. The tanks will be placed on a concrete bund for spillage control.
- Installing a heavy-duty diesel engine powered generator near the quarries. Each generator will be placed on a concrete bund and have a shade structure for heat control.
- Spreading crushed aggregates with a size range of 19 to 37.5 mm across the accommodation and designated parking bay areas for dust suppression. The aggregates can be obtained from

nearby sources or generated by crushing overburden waste rock from historical quarrying operations.

- Installing solar panels on the roofs of accommodation containers for domestic power supply, such as lighting and cooking.
- Diverting small tributaries away from the maintenance workshop, accommodation, temporary waste storage, and oil storage areas.

iv. *Stakeholder communications*

- Maintaining ongoing engagement with the Orupembe community for local human resource planning and development.

OPERATIONAL SUPPORT SERVICES

i. *Water Supply*

Water supply sources being considered are either.

- Ground water abstraction; and
- NamWater

The proponent does not expect to use much water, as the only main activities are for camp use and for drilling (approximately 2000L – 2500L or less a month). It is suggested that amounts of water can be sourced from the nearest NamWater supply scheme or from one of the surrounding neighbors or community boreholes and then be trucked to the site and camp, this is the preferred option.

If for any reason more water is required then the proponent suggests abstraction of ground water, which can be done at minimal extraction cost, a borehole can be sunk to augment supply volumes or an existing borehole can be utilized with the owner's permission. However, for this option groundwater exploration would need to be undertaken followed by the required permit application process with the Directorate of Water Affairs (DWA).

ii. *Power Supply*

No infrastructure development to get electricity from the national grid has been planned. All mobile equipment is diesel driven and self-propelled. Static equipment will use electricity generated by diesel generators. A small field of photovoltaic panels is also envisaged for power generation in the medium term.

iii. *Fuel Storage and supply*

Approximately 2000 – 4000 litres of diesel will be stored in a bunded fuel tank system, conveniently placed and accessible for deliveries. This facility will be of modern construction, either double-skinned or 110% bunded to ensure spills are prevented.

Delivery systems will use sealed fittings to prevent spillage. The fuel facility is to be actively manned. Standardized spill kits and reporting systems will be in place to deal with any hydrocarbon spills. Contaminated soil will be transferred to a remediation site, which is specifically designed for such treatment.

iv. *Vehicle, machinery, and associated equipment*

Main equipment types to be used will include 4x4 mining support vehicles X3, Portable down-the-hole drill rig for block splitting, Excavators / front-end loaders for overburden stripping, removal, and initial splitting of blocks, and for block handling, tipper trucks for waste rock haulage to designated stockpiling bays, diesel truck (bowser) for transporting diesel to site, water tankers to cart water to the quarry sites, explosives transport and magazine unit and diamond wire saw cutters for block extraction.

Mining is scheduled to operate 12 hours a day, Monday to Saturday. The mine work force will operate using conventional workplace arrangements that are expected of industry operations in the region and will be transported to and from the quarry site by company transport.

v. *Waste Management*

Due to the inevitable production of waste, a designated area will be established near the accommodation and office spaces for the temporary storage of waste. Waste will be collected and deposited to the nearest municipal dumpsite.

Hydrocarbon tanks will be appropriately stored and banded to hold 110% of the capacity of the tanks and all relevant permits should be applied for by the proponent as required (MME).

For ablution facilities, septic tanks will be installed in a lined pit, and sewage will be periodically disinfected before being pumped out for disposal at one of the nearest municipal sewage disposal sites, as required. It is important to note that discharging untreated wastewater into the environment, such as dry ephemeral rivers, is strictly prohibited according to the Water Act of 1906.

vi. *Personnel*

The team will either be commuting from nearby settlements or will establish camp sites within the license area and with the permission of the community. The team is envisioned to consist of twenty-five (25) skilled and non-skilled workers.

vii. *Safety*

Security will be supplied on a 24-hour basis with temporary accommodation for the staff. A fence surrounding the mine site will be constructed to ensure people and domestic animals are not put at risk. The support services and facilities constructed during this phase will either be

removed at the end of the construction phase or incorporated into the further phases of the project.

Once quarry development and associated activities are completed, mining commences soon after as per the following section.

OPERATIONAL PHASE

Below is a summary of the projected activities that will occur within the Mining Claims.

Overburden removal

- Heavy machinery designed for moving earth is commonly employed to eliminate overlying material. In specific cases, the weathered section is extracted through the process of creating holes using jackhammers and slender drilling machines. These holes are filled with mild explosives and subsequently, with meticulous supervision of blasting techniques, the surplus material is expelled.
- Clearing of vegetation at the planned drill sites will be necessary. Larger trees where necessary should be retained so that the bush can restore itself. Permits from the forestry directorate will be required for this purpose.
- The removed overburden will be hauled and dumped on stockpiles for later use during rehabilitation.



FIGURE 2 - HEAVY MACHINERY USED TO MOVE OVERLYING MATERIAL

Rock cutting and blocks extraction

- The extraction process in this project involves utilizing diamond wire saws and stone cutting machines to separate rectangular blocks. Quarrying dimension stone involves cutting large blocks of stone from the natural rock mass or employing alternative methods. Initially,
- the quarry will employ diamond wire saw cutting technique to extract high-quality marbles until reaching a depth of approximately 5 to 7 meters from the surface. Subsequently, a combination of diamond wire saw cutting and blade cutting techniques will be utilized to extract substantial quantities of rock, typically ranging in the thousands of cubic meters
- As block extraction begins at the ridge's highest point, a vertical cut of 4 to 6 meters per year will be made through the rock mass. If certain areas of the ridge do not meet market demands or have poor rock quality, they may be left undeveloped. However, this will only become apparent once the test quarrying program is concluded.
- Various factors influence the size of individual blocks produced, including the rock's homogeneity, the quarry owner's capacity to handle raw stone, and the intended use for the stone once it is shaped. Each quarry can have its own unique operational methods, and the geological composition of the rock mass significantly impacts the mining process in a dimension stone quarry. FIGURE 3 below illustrate typical cutting operations in a dimension stone quarry.



FIGURE 3 - WHITE MARBLE QUARRY CUTTING OPERATIONS

Block handling and removal from the quarry and storage

Based on the ultimate shape of the quarry, it is expected that blocks will be handled using front-end loaders. The dimension stone blocks, obtained by cutting with diamond wire saws or blades, will be taken out of the quarry using front-end loaders and transported to a storage area for sorting as shown in FIGURE 4.



FIGURE 4 -BLOCK HANDLING FROM QUARRY

Quarrying output

The output of the mining process or the result of cutting and splitting are rectangular blocks measuring 5 to 7 cubic meters, which are commercially viable. The exact annual production of the dimension stones from the planned quarries is currently unknown, but considering the thickness of the deposits, the quarries are expected to operate for a minimum of 10 to 15 years. Once extracted from the ground, the blocks are transported to a designated area for sorting and stacking based on their size and quality, including factors like color, patterns, fracture frequency, staining, and more. The blocks will subsequently be transported from site by means of flat deck trucks to processing facility for further beneficiation, or directly to the port of Walvis Bay for shipping to overseas markets. This approach ensures that no processing of dimension stone blocks occurs at the quarry site, resulting in a significant reduction in solid waste generated on-site.



FIGURE 5 – TYPICAL ON-SITE BLOCK SORTING AND STOCK PILING

DECOMMISSIONING AND FINAL REHABILITATION

To minimize the environmental impact during a quarry's operational phase, it is beneficial to plan with future closure in mind. According to Ashmole and Motloung (2008) one effective approach is to strategically mine in a way that allows for the utilization of waste from active quarries to fill the voids of depleted quarries. By careful planning, it is possible to fill many voids in quarries and borrow areas at minimal additional cost during the operational phase.

As mining activities approach their conclusion on active sites within the mining license, the Proponent will undertake progressive and ongoing rehabilitation measures. This will involve the shading of rocks and partial backfilling using both waste rock and topsoil. Once quarrying is finished, after the exhaustion of the high-quality dimension stone deposits, the activities will be decommissioned, and efforts will be made to rehabilitate the sites as extensively as possible.

In summary, the quarry closure and decommissioning phase will include the following actions, dismantling of all infrastructures such as support infrastructure and access roads, Cessation of all quarrying activities, Landscaping of all disturbed areas including the grubbing and levelling of access roads and stockpile bays, Distribution of weathered rock and potentially fertile topsoil over rehabilitated areas, Workforce retrenchment, potential relocation, and provision of funding for alternative economic activities and social disengagement from communities, which involves discontinuing support for community initiatives.

Additionally, an integral part of the rehabilitation process should involve the re-vegetation of disturbed sites using plant species found in the surrounding areas. The rehabilitation program will be implemented in phases, aligning with the development of quarrying activities around specific sites, as determined by the targeted and selected quarrying technique to be employed.

ACCESS AND TRANSPORT

The location will be accessible through existing tracks from the D3707 road as far as practically possible. If the need to create new tracks arises, this will be assessed for any environmental sensitivity.

It is the Proponents responsibility to negotiate access agreements with landowner's interests are always observed and as may be agreed upon with the landowners individually. Permission from landowners and appropriate authorities is required for any new tracks.

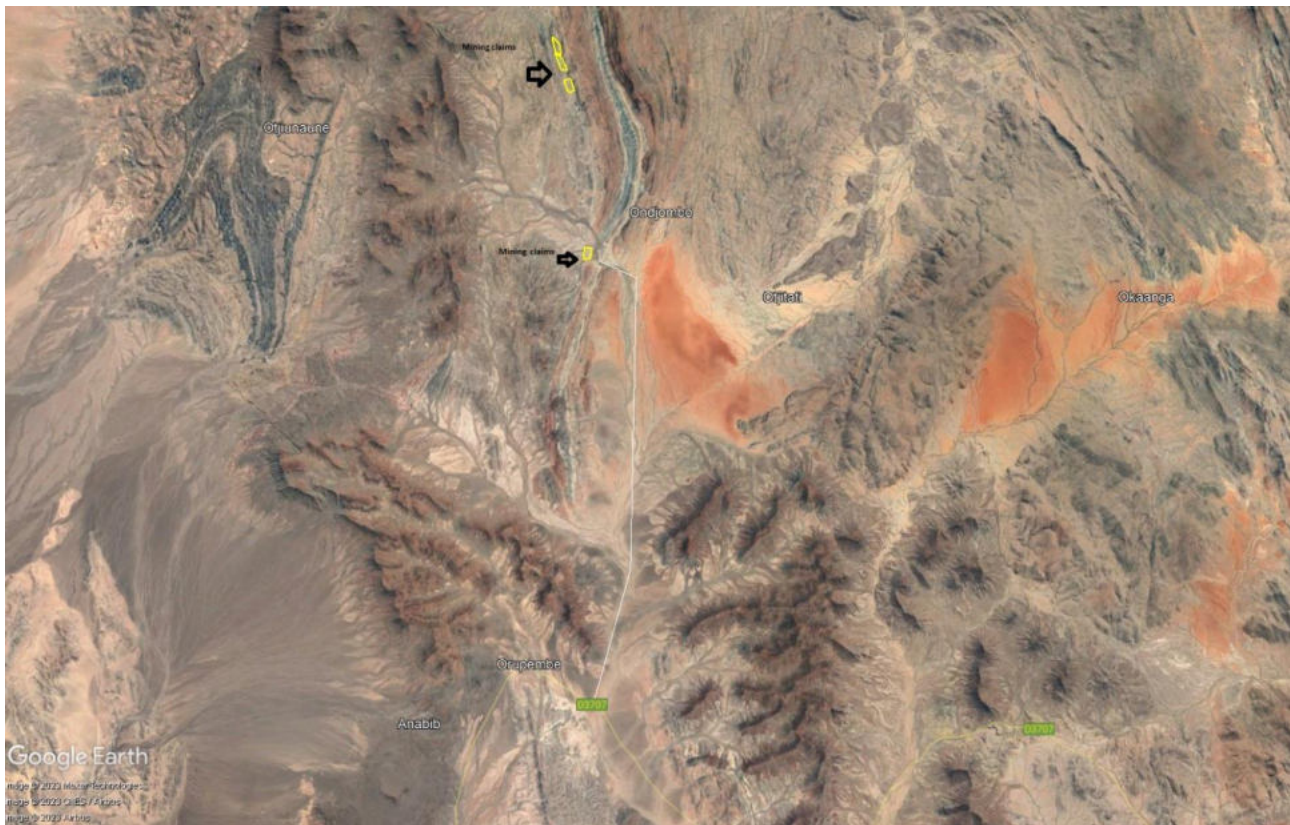


FIGURE 6 - ACCESS ROUTES TO THE SITE

1.2. PURPOSE OF THE DOCUMENT

Alliance Environmental Consultancy CC (AEC) has prepared this document as part of the Environmental Scoping and Impact Assessment for proposed prospecting and quarrying which was conducted in terms of the Environmental Management Act, 2007 (Act No 7 of 2007). This Environmental Management Plan is a live document that has been prepared based on the environmental effects identified in Environmental Scoping and Impact Assessment and should be read in conjunction with the Environmental Scoping and Impact Assessment Report.

The aim of this document is to provide management measures to address the environmental effects that have been identified in the Environmental Scoping and Impact Assessment report and to give possible mitigation measures/recommendations to address these effects. It is essential for personnel involved to fully be aware of the possible environmental issues and the means to avoid or minimize the potential impacts of activities on site.

Furthermore, the proponent fully understands the legal and policy requirements as a holder of the Mining Claims. Impacts identified in the EIA form the basis of a set of environmental specifications that will be implemented on-site. These environmental specifications act as an agreement between the proponent and the Ministry of Environment, Forestry, and Tourism (MEFT).

2. ENVIRONMENTAL MANAGEMENT PRINCIPLES

The Proponent will ensure that all project participants adhere to the following company goals:

- i. All employees will be obliged to undertake activities in an ecologically and socially responsible way. This applies to all consultants, workers, contractors, and subcontractors, as well as transporters, visitors, and anyone else who enters the premises.
- ii. Safeguard the health and safety of project personnel and the public against potential impacts of the project. This includes issues of road safety, precautions against dangers on site, potential hazards; and,
- iii. Promote good relationships with the surrounding settlements and other stakeholders.
- iv. Biophysical Environment
- v. Wise use and conservation of environmental resources, giving due consideration to the use of resources by present and future generations;
 - a. Prevent or minimize environmental impacts;
 - b. Minimize air, water, and soil pollution; and
 - c. Conserve Biodiversity.

In order to achieve the project's goal, the following principles must be followed:

TERM	DESCRIPTION
Accountability and Commitment	The Company Senior Executives and Line managers will be held responsible and accountable for: <ul style="list-style-type: none"> a. Health and safety of site personnel while on duty, b. Environmental impacts caused by exploration and quarrying activities or by personnel engaged in the daily operations of the site.
Competence	The company will ensure a competent workforce through appropriate selection, training, and awareness of all safety, health, and environmental matters.
Risk Assessment, Prevention, and Control	Identify, assess and prioritize potential environmental risks. Prevent or minimize risks

TERM	DESCRIPTION
	through careful planning and design, allocation of financial resources, management, and workplace procedures. Intervene promptly in the event of adverse impacts arising.
Performance and Evaluation	Set appropriate objectives and performance indicators. Comply with all laws, regulations, policies, and environmental specifications. Implement regular monitoring and reporting of compliance with these requirements.
Stakeholder Consultation	Create and maintain opportunities for constructive consultations with employees, authorities, and other interested or affected parties. Seek to achieve an open exchange of information and mutual understanding in matters of common concern.
Continual Improvement	Through continual evaluation, reports, and innovation, seek to improve performance with regard to social health and well-being as well as environmental management throughout the lifespan of the project.
Financial Provisions for retail activities	In line with the internationally recognised "polluter pays principle" the company will make the necessary financial provision for compliance with the EMP.

3. ROLES AND RESPONSIBILITIES FOR ENVIRONMENTAL MANAGEMENT

3.1. COMMUNICATION BETWEEN PARTIES

Emphasis will be put towards open communication between all parties, in order to reach a proactive approach towards potential environmental issues deriving from the project. This approach should guarantee that environmental impacts are anticipated and prevented, or minimized, rather than adopting a negative “policing” approach after negative impacts have already occurred.

The importance of a proactive approach cannot be over-emphasized, particularly in relation to preventing unnecessary tracks, and damage to vegetation (i.e., protected and endemic species) as these impacts cannot easily be remedied.

3.2. THE MINING/QUARRYING OPERATING COMPANY

The company is ultimately responsible for all stages of the project and the impacts resulting from those activities. The responsible persons will be the company's Environmental Control Officer (ECO) and Managing Director to ensure that:

- The EMP and its environmental specifications are included in contractual documents and it is required that contractors, and subcontractors, consultants etc. do meet the EMP requirements;
- The company and all its subcontractors, consultants etc. comply with all Namibian legislation and policies and any relevant International Conventions;
- Compliance with the environmental specifications is enforced on a day-to-day basis;
- Environmental audits are conducted periodically by a suitably qualified ECO to confirm that the environmental requirements are properly understood and effectively implemented;
- Sufficient budget is provided to implement those measures that have cost implications;
- The Site Manager must commission tree surveys well in advance of planned road construction so that the necessary site visits by forestry personnel and forestry permits are acquired; and,
- Open and effective communication is maintained between all parties concerning environmental management on the project.

3.3. SITE MANAGERS

Day-to-day responsibility for environmental management will be assigned to the (Environmental Control Officer (ECO) and Manager Field Operations (MFO) for the duration of the project to:

- Be familiar with the contents of the EMP and applicable sections of the EIA and the measures recommended therein;
- Monitor compliance with the environmental specifications on a daily basis and enforce the environmental compliance on-site by communicating the ECO's directions to all personnel involved; In the event of any infringements leading to environmental damage, personnel need to consult with the ECO and seek advice on any remedial measures to limit or rectify the damage;
- Maintain a record (photographic and written) of "before-and-after" conditions on site;
- Facilitate communication between all role players in the interests of effective environmental management; and,

3.4. ENVIRONMENTAL CONTROL OFFICER (ECO)

The proponent must appoint a suitably qualified ECO who is responsible to:

- Undertake environmental audits of overall compliance with the environmental specifications. This should be done at least bi-annually for the project area,
- Submit a site inspection report to the Managing Director and MFO;
- Advise the MFO on interpretation and implementation of the environmental specifications as required; and,
- Make recommendations for remedial action in cases of non-compliance with the environmental specifications.
- The report should be submitted to the MEFT periodically at the time interval stipulated by law.

3.5. CONTRACTORS

The contractors will have the responsibility to:

- Familiarize themselves with the requirements of the EMP and comply with the environmental specifications within;
- Notify the ECO through the MFO timeously in advance of any actions that might have significant negative impacts. Mitigatory measures should be discussed and implemented before negative impacts arise; Conduct or arrange for environmental training for employees and sub-contractors;
- Undertake rehabilitation measures where required as far as possible, rehabilitation measures should be carried out progressively and not left till the end of the project.

4. ENVIRONMENTAL SPECIFICATIONS

4.1. COMPLIANCE WITH THE ENVIRONMENTAL SPECIFICATIONS

The activities will be conducted in an environmentally and socially responsible manner. The contractor and all personnel on-site will comply with the environmental specifications contained in this section.

4.2. TRAINING AND AWARENESS

All site personnel and site contractors will receive the training to equip them with the necessary knowledge to comply with the environmental specifications. The MFO will ensure that an appropriate level of training is provided at all levels of site personnel.

4.3. STAKEHOLDER RELATIONS

All site personnel will maintain good relations with the landowners and members of the public. Any complaints received by the ECO should be recorded and will be addressed.

4.4. PERMITS

All relevant permits shall be obtained from relevant authorities.

The removal or relocation of rare and endangered plants will be conserved and should it be removed or relocated it shall be done with the required permits from the Directorate of Forestry.

4.5. ROAD SAFETY

The access roads can be dangerous at times due to dust from passing vehicles, poor camber, patches of loose sand, careless drivers and other external factors. All drivers must be aware of these hazards and take precautions to avoid them. Such precautions will include, but not be limited to:

- Complying with speed limits;
- Reducing speed considerably when visibility is poor;
- Being wary of other vehicles
- Travelling with lights on even in daylight;
- Slowing down for animals and birds on the road; and,
- Being cautious of other road users– taking into account reduced visibility due to dust.

4.6. ACCESS TRACKS

- No new tracks will be made unless there are no pre-existing tracks, any new tracks or extensions should be established with the permission of the Municipality and other landowners.
- The selected access and site roads will be clearly marked. A single road only will be used to and from each destination. Turning points for vehicles will also be pre-selected and marked. Particular care will be taken to avoid damage to plants.
- Any elevated sites, or sites away from existing tracks, will be accessed on foot rather than by a vehicle.

4.7. CONSERVATION OF BIODIVERSITY

- Damage to protected species will be avoided at all costs.

4.8. WILDLIFE POACHING

NB: It is an offence to poach wildlife.

No animal or bird is to be captured, killed or harmed in any way. Anyone caught violating this law will face suspension from the project and could be liable for prosecution. In a likewise manner, domestic livestock on farms may also not be harmed.

4.9. SOIL MANAGEMENT AND EROSION CONTROL

- During any excavating and clearing the Contractor shall take care to remove as little topsoil as possible. All soil within 100mm of the cleared surface level shall be regarded as topsoil.
- Remove and separately stockpile any subsoil material that can be used for site backfilling.
- Topsoil shall be stockpiled (and seeded) in areas within the site boundary and approved by the Project Engineer in conjunction with the Environmental Consultant, for reuse and restoration.
- Avoid handling soil when wet as this may result in the loss of soil structure and compaction. Soils should not be handled during windy conditions, which may lead to the loss of soil through wind erosion.
- Soil erosion must be prevented at all times. Where evidence of soil erosion can and/or is taking place, this should be reported by the Contractor to the Project Engineer or Environmental Consultant.
- Unnecessary compaction of construction areas must be prevented, to reduce runoff velocity.

- Suitable erosion measures should be implemented in areas sensitive to erosion such as near water supply points, edges of slopes, etc. These measures could include the use of sandbags, hessian sheets, retention or replacement of vegetation.
- All the necessary precautions in terms of design and construction of earthworks, cuts, and fills must be taken.

4.10. POLLUTION CONTROL

Should any incidence occur in terms of spilling, the shall report it immediately to the Developer and the Contractor shall be responsible for containing and cleaning up the spillage. The Contractor (Developer) shall ensure that correct mitigation of the pollution is undertaken.

4.10.1. Air pollution / Dust emission

- Excavations and other clearing activities should only be done during permissible weather conditions to avoid drifting of sand and dust into neighboring areas.
- Soil and sand stockpiles shall be located in sheltered areas not exposed to the wind.
- Retention of vegetation where possible will reduce dust travel.
- Exposed surfaces must be re-vegetated as soon as possible.
- The movement of vehicles and other vehicles should be strictly controlled in order to reduce the impact of increased air pollution.
- Adherence to speed limits shall be enforced.
- Sensible and responsible use of equipment which generates dust.
- It is recommended to practice dust monitoring per month in order to take note of the dust emitted at different distances and directions around the project area during operations.

4.10.2. Noise pollution

- Noise levels shall be kept within acceptable limits. All noise and sounds generated shall adhere to SABS 0103 specifications for maximum allowable noise levels for industrial areas.
- Noisy activities must be limited to between 06h00 to 18h00 to avoid disturbance of adjacent landowners.
- Noisy activities should not be allowed on weekends and public holidays unless specific arrangements have been made with the proponent and provided that neighbors have been timeously notified
- Vehicles and operating equipment must be regularly serviced.

4.11. WASTE MANAGEMENT

- The area needs to be kept clean, neat, and tidy to the satisfaction of the proponent and ECO. The proponent will provide bins at the worksites and will be responsible for the collection and containment of daily refuse and waste generated by his staff. Bins will be secured in such a way that wind cannot remove papers and plastics. Bins will also be secured against animals around the vicinity.
- No waste will be buried on site. All waste will regularly be removed to an approved waste disposal facility.

4.12. HAZARDOUS SUBSTANCES

- All containers of fuel, oil, and any other hazardous substances will be kept sealed, and clearly labeled for identification.
- Tanks for fuels, oils, and any other hazardous substances need to be bunded to hold 110% of the capacity of the tank to contain any possible spills.
- If any spills occur, clean-up shall occur immediately and disposed of appropriately.

4.13. FIRE PREVENTION

- Ensure an Emergency Response Plan
- No fires are to be left unattended
- Charcoal sourced from the surrounding should be 100% cured to avoid combustion

4.14. ARCHAEOLOGICAL SITES

- All archaeological remains are protected under the National Heritage Act (2004) and are not to be destroyed, disturbed, or removed. The Act also requires that any archaeological finds, be reported to the Heritage Council Windhoek (**Tel. 061-244375**). The same applies to rock art sites.
- The ECO will be notified without delay of any archaeological finds.

4.15. HEALTH AND SAFETY

All company personnel will receive a detailed induction upon joining the project and on a regular basis thereafter.

- **Dust:** All staff will receive dust masks and proper PPE to prevent inhalation of potentially dust while carrying out any dust-producing activities associated with the project

- Eating, drinking, and **smoking** while working with any materials that may contain radioactive or hazardous substances is forbidden. Good personal hygiene is encouraged (e.g., washing hands before eating) to prevent ingestion of potentially hazardous or radioactive materials.
- **Bees:** Bee stings are potentially dangerous to persons who are allergic to them. Bees are attracted to water, so water / liquid should not be left standing.
- **Snakes & Scorpions:** A number of poisonous snake and scorpion species may occur in the area. Therefore, precautions are required which include: -
 - Exercising caution when picking up rocks or equipment from the ground;
 - Looking at the ground when walking; and,
 - Wearing closed shoes and not walking barefoot.

In case of emergency Aspivenin (suction syringe) is permanently available at all workstations for the first aid treatment of snake bites, scorpion stings and bee stings. Antihistamine tablets should also be available for the first aid treatment of allergic reactions to bee stings.

4.16. WORK STOPPAGE

The MFO will have the right to order work to stop in the event of environmental specification infringements that could result in damage to plants, wildlife, or personnel. Work will continue once the situation is rectified and brought to a state of compliance.

In the event of such work stoppage, the Contractor will not be entitled to claim for delays or standing time.

4.17. COMPLIANCE MONITORING

During exploration and quarrying activities, the company ECO will conduct site compliance inspections at least once a month. After each inspection the ECO will compile an EMP compliance report for regular submission to the MFO and biannually to the MEFT or as required.

5. MITIGATION MEASURES

The purpose of the Environmental Management Plan is to provide a detailed plan to mitigate the negative and positive impacts identified in the environmental scoping and assessment report. Furthermore, it aims to provide actions with roles and responsibilities to implement the environmental specifications provided for to the proponent, contractors, subcontractors who will undertake exploration and mining activities.

The following table provides a large-scale summary overview of all the major environmental management aspects. The scoping study submitted with this EMP also provide mitigation measures for impacts identified therein under chapter 9

TABLE 2 – EMP MITIGATION MEASURES

Aspect	MANAGEMENT DETAILS	RESPONSIBLE PERSONS	FREQUENCY
Access Control	<ul style="list-style-type: none"> • Make use of existing tracks/roads as much as possible throughout the area. • Only drive along the existing tracks and avoid unnecessary drives around the area as it may harm vertebrate fauna and unique flora and may also cause erosion related problems, etc.). • Avoid off-road driving at night as this increases mortality of nocturnal species. • Implement and maintain off-road track discipline with maximum speed limits (30km/h) • Where tracks must be made to potential quarrying sites off the main routes, the routes should be selected along already disturbed areas or where there is minimal biodiversity expected to occur. • Avoid placing tracks within drainage lines. Avoid collateral damage (i.e. select routes that do not require the unnecessary removal of trees/shrubs, especially protected species). • Rehabilitate all new tracks created. 	Contractor, Project Manager	On-going
Establishing Storage Areas	<ul style="list-style-type: none"> • Establishment of the supporting project infrastructure should be done on an area with the least disturbance to the environment and within the non-sensitive areas. • Choice of location for storage areas must take into consideration prevailing winds, distance to water bodies and general on-site topography. • Storage areas must be designated, demarcated, and fenced if necessary. • Storage areas should be secure to minimize the risk of crime. • They should be safe from access by children and animals etc. 	Contractor, Project Manager	On-going

Aspect	MANAGEMENT DETAILS	RESPONSIBLE PERSONS	FREQUENCY
	<ul style="list-style-type: none"> • Fire prevention facilities must be present at all storage facilities. 		
<p>Establishing Storage Areas</p>	<p><u>Hazardous Material Storage</u></p> <ul style="list-style-type: none"> • Hazardous substances are those that are potentially poisonous, flammable, carcinogenic, or toxic. Some examples are diesel, petroleum, oil, bitumen, cement, solvent-based paints, lubricants, explosives, drilling fluids. • Material safety Data Sheets (MSDSs) shall be readily available on site for all chemicals and hazardous substances to be used on site. Where possible and available, MSDSs should additionally include information on ecological impacts and measures to minimize negative environmental impacts during accidental releases or escapes. • Hazardous storage areas must be 110% bunded with an impermeable liner to protect groundwater and soil from contamination. The Contractor shall submit a method statement to the Project Manager for approval. • Storage areas containing hazardous substance materials must be clearly signposted. 	<p>Environmental Control Officer (ECO), Proponent</p>	
<p>Education Of Site Staff on General Environmental Conduct</p>	<p><u>Environmental Education and Awareness</u></p> <ul style="list-style-type: none"> • Ensure that all site personnel have a basic level of environmental awareness training. The proponent must submit a proposal for this training to the ECO for approval. Topics to be covered should include: <ul style="list-style-type: none"> ○ What is meant by “environment”; 	<p>Environmental Control Officer (ECO), Proponent</p>	<p>During staff induction and ongoing</p>

Aspect	MANAGEMENT DETAILS	RESPONSIBLE PERSONS	FREQUENCY
	<ul style="list-style-type: none"> ○ Why the environment needs to be protected and conserved ○ How construction activities can impact on the environment; ○ What can be done to mitigate against such impacts; ○ Awareness of emergency and spills response provisions; ○ Social responsibility during operations, e.g., being considerate to local residents. <ul style="list-style-type: none"> ● It is the proponent's responsibility to provide the site with no less than 1 hour's environmental training and to ensure that there is sufficient understanding to pass this information onto the anyone operating at the site. ● The need for a 'clean site' policy also needs to be explained to all workers. 		
<p>Education Of Site Staff on General Environmental Conduct</p>	<p><u>Workers Conduct on site</u></p> <ul style="list-style-type: none"> ● A general regard for the social and ecological wellbeing of the site and adjacent areas is expected of the site staff. Workers need to be made aware of the following general rules: ● No alcohol / drugs to be present on site. ● No firearms allowed on site or in vehicles transporting staff to / from site (unless used by security personnel). ● Prevent excessive noise. ● Prevent unsocial behaviour. ● Bringing pets onto the site is forbidden. 	<p>Proponent, Employees, Environmental Control Officer (ECO)</p>	<p>During staff induction and ongoing</p>

Aspect	MANAGEMENT DETAILS	RESPONSIBLE PERSONS	FREQUENCY
	<ul style="list-style-type: none"> • No harvesting of firewood from the site or from the adjacent areas. • Staff are to make use of the facilities provided for them, as opposed to ad-hoc alternatives, (e.g., fires for cooking, the use of surrounding areas / bush as a toilet is forbidden). • Trespassing on private / commercial properties adjoining the site is forbidden. • Driving under the influence of alcohol is prohibited. • Other than the pre-approved security staff, no workers shall be permitted to live on site. 		
Social Impacts	<ul style="list-style-type: none"> • Avoid exacerbating the influx of unemployed people to the area and address the unrealistic expectations about large numbers of jobs would be created. • Develop a standardized recruitment method for sub-contractor and field workers • The employment of local residents and local companies should be a priority. • Camp if required should be established in close consultation with the landowners. • Accommodation camp should consider provision of basic services. • Contract companies could submit a code of conduct, stipulating disciplinary actions where employees are guilty of criminal activities in and around the vicinity of the claims. Disciplinary actions should be in accordance with Namibian legislation. • Contract companies could implement a no-tolerance policy regarding the 	Contractor, Project Manager	During staff induction and ongoing

Aspect	MANAGEMENT DETAILS	RESPONSIBLE PERSONS	FREQUENCY
	<p>use of alcohol and workers should submit to a breathalyzer test upon reporting for duty daily.</p> <ul style="list-style-type: none"> • Request that the Roads Authority erect warning signs of heavy operation vehicles on affected public roads. • Ensure that drivers adhere to speed limits and that speed limits are strictly enforced. • Ensure that vehicles are road worthy, and drivers are qualified. • Train drivers in potential safety issues. 		
Fauna And Flora	<p><u>Fauna and Flora</u></p> <ul style="list-style-type: none"> • No protected vegetation may be cleared without prior permission from the forestry department. • Care must be taken to avoid the introduction of alien plant species to the site and surrounding areas. • Disturbance to birds, animals and reptiles and their habitats should be minimized Wherever possible. • Avoid unnecessary affecting areas viewed as important habitat • Avoid off-road driving at night as this increases mortality of nocturnal species. • Implement and maintain off-road track discipline with maximum speed limits (e.g.30km/h). 	Contractor, Project Manager	Ongoing
Visual	<ul style="list-style-type: none"> • Consider the landscape character and the visual impacts of the area including camp site from all relevant viewing angles, particularly from 	Contractor, Project Manager	Ongoing

Aspect	MANAGEMENT DETAILS	RESPONSIBLE PERSONS	FREQUENCY
	<p>public roads.</p> <ul style="list-style-type: none"> • Use vegetation screening where applicable. Do not cut down vegetation unnecessary around the site and use it for site screening. • Avoid the use of very high fencing. • Minimise access roads and no off-road that could result in land scarring is allowed. • Minimise the presence of secondary structures: remove inoperative support structures. • Remove all infrastructure and reclaim or rehabilitate the project site after project activities are completed. 		
Air Quality	<ul style="list-style-type: none"> • Dust suppression techniques should be employed if the specific operation activity is likely to create dusty atmospheric conditions in excess of the periodic extremes. • Avoid activities that create excessive dust on extremely windy days. • Personnel are required to wear personal protection equipment if excessive dust is created for prolonged working periods. 	Contractor, Project Manager	Ongoing
Noise	<ul style="list-style-type: none"> • A grievance procedure will be established whereby noise complaints can be received, recorded, and responded to appropriately. • Machineries and vehicles (moving and stationed) should be serviced regularly. • A noise management standard operating procedure (SOP) for the activities happening on-site should be developed 	Contractor, Project Manager	Ongoing

Aspect	MANAGEMENT DETAILS	RESPONSIBLE PERSONS	FREQUENCY
	<ul style="list-style-type: none"> • Avoid creating unnecessary noise by making sure that equipment that are not in used are always turned off and by avoiding operations during odd hours. • Fit sound mufflers on all machinery where applicable. • Equip employees with proper PPE (noise reduction earmuffs) • Employees should work in shifts to avoid prolonged working hours and consequently prolonged exposure to noise. 		
Soil And Groundwater Contamination	<ul style="list-style-type: none"> • Accidental spills that occur outside of the bund area must be contained and prevented from entering the stormwater system. • Spills must be treated with the appropriate spill absorbent. • Any significant spills or leak incidents must be reported in terms of the National Environmental Management Act and the Water Act. 	Contractor, Project Manager	Ongoing
Health and Safety	<ul style="list-style-type: none"> • Prevention of the above impacts can be enhanced through the implementation of the following measures: • Having user-friendly Operational procedure manuals • Offering adequate Health and safety training to new personnel and visitors • Continuous enforcement of stringent housekeeping rules • Colour coding areas, pipes, equipment and substances • Training and enforcement of the use of safe working procedures and permits to work • Having an emergency response plan for all occupational and working sites 	All personnel	Ongoing

Aspect	MANAGEMENT DETAILS	RESPONSIBLE PERSONS	FREQUENCY
	<ul style="list-style-type: none"> • First aid treatment training to employees on site • Daily safety reminders, meetings and/or drills • Develop a risk register and conduct a comprehensive risk assessment prior to commencement of exploration and eventual quarrying activities • If test quarry walls are higher than 5 m the proponent must ensure they regularly consult a geotechnical professional to check the stability and integrity of such walls. 		
Waste	<ul style="list-style-type: none"> • The domestic waste, which is separated from all paper and organic materials, is taken to the nearest official dumpsite. • Oil from the servicing of the vehicles and machines is collected in drums and is taken together with all other industrial waste that is generated on site to the nearest hazardous waste site. • Storage areas that contain hazardous substances must be bunded with an approved impermeable liner. • Bins and / or skips shall be provided at convenient intervals for disposal of waste within the project site. • Bins should have liner bags for efficient control and safe disposal of waste. • Recycling and the provision of separate waste receptacles for different types of waste should be encouraged • Ensure good housekeeping 	All personnel	Ongoing

Aspect	MANAGEMENT DETAILS	RESPONSIBLE PERSONS	FREQUENCY
	<p><u>Ablutions</u></p> <ul style="list-style-type: none"> Waterless toilets are to be maintained in a clean state and should be moved to ensure that they adequately service the work areas. The Contractor is to ensure that open areas or the surrounding bush are not being used as a toilet facility. 		
<p>Heritage sites destruction during exploration and quarrying activities</p>	<ul style="list-style-type: none"> In addition, where possible, construction and operational activities are to be aligned along previously disturbed areas. Habitats surrounding the washes (rivers) host sensitive plant species which require permits for removal to avoid destruction. No wandering around the site, collecting of plant species or hunting should be allowed. A 'chance find' of any potential heritage site should be communicated to the police and the National Heritage Council of Namibia. If activities occur at the location where a 'chance find' has been made, then the activities should cease until the necessary authorities have visited the site and provided the go ahead to proceed with activities 	<p>Contractor, Project Manager</p>	<p>Ongoing</p>

6. DECOMMISSIONING AND REHABILITATION

The decommissioning phase refers to the conclusion of all exploration and mining activities, as well as the removal and/or rehabilitation of any sites that will not be utilized or developed during the ongoing quarrying phase. It is important to acknowledge that any intrusive exploration and subsequent mining (quarrying) activity will inevitably disturb the Earth's surface, resulting in the complete removal of existing vegetation and the disruption or alteration of habitats within the affected area. Typically, these impacts are significant but confined to the disturbed area, and the overall extent of the impact depends on the intensity of the exploration activity and the sensitivity and recovery rate of the surrounding environment. However, regardless of these factors, the environmental impacts can be mitigated by planning and executing these activities with closure in mind.

The objectives of decommissioning and closure for a prospecting and mining project like this are as follows:

- Ensure that sites where exploration indicates the absence of suitable rock for dimension stone are fully rehabilitated and restored to a safe state that closely resembles the surrounding area, to the extent feasible. In cases where restoring the original state is not practically achievable due to budget constraints or insufficient material for backfilling, these excavations can be modified into water dams for additional storage during periods of heavy rainfall and runoff.
- Ensure that sites designated for continuous quarrying remain safe throughout the quarrying phase.
- Comply with relevant regulatory requirements and obtain regulatory consensus on the successful closure and rehabilitation of the project area.
- Address the concerns and demands of affected communities regarding site restoration and rehabilitation, while maintaining a positive public perception.
- Continuously carry out restoration and rehabilitation work in a cost-effective manner during operations, while simultaneously achieving the primary socio-economic and developmental goals of the project.
- Create a final landform that is stable and visually blends into the surrounding landscape, while minimizing any hindrance to potential future land uses.
- Remove machinery, equipment, and containers that will not be needed during the quarrying phase.

- Relocate the accommodation camp closer to sites where exploration yielded positive results and continuous quarrying is likely to occur in the near future.

SITE REHABILITATION

Proponent should keep the disturbed areas to a minimum, plants should not be removed unless necessary; selective quarrying should be adopted so that the entire site is not cleared and affected at once; backfilling the topsoil should be done as soon as possible where soil was removed, therefore topsoil should not be piled up for a long time as it will lose its natural nutrient content.

PLANNING FOR REHABILITATION

The proposed post quarrying land-use will also influence the procedure and the plant species used for rehabilitation.

The following are the basic rehabilitation practices as summarized after the Minerals Council of Australia (2015), which with appropriate modifications, will apply to most disturbed areas.

- Making Safe: After planning for rehabilitation, the first step is to clean up and make the area to be rehabilitated, safe. This will involve the following:
 - Removal of infrastructure and unused or unwanted equipment. No facilities or equipment should remain on site unless with the written approval of the landowner or relevant authority.
 - Removal of liquid and liquid domestic and industrial waste for disposal at approved sites. Care is required with residual toxic or hazardous materials including contaminated packaging and containers.
- Erosion Control: Progressive rehabilitation will be undertaken to stabilize disturbed areas as quickly as practical and to limit erosion.
- Restrict clearing to areas essential for the works.
- Windrow vegetation debris along the contour
- Minimize length of time soil is exposed.
- Divert run-off from undisturbed areas away from the work areas in order to avoid contamination.
- Topsoil Management: The rehabilitation strategy may include the following measures which are designed to minimize the loss of topsoil material respread on rehabilitated areas and promote successful vegetation establishment.
- Minimize the length of time that topsoil material is to be stockpiled.

- Respread topsoil material in even layers at a thickness appropriate for the landform and land capability of the area to be rehabilitated.
- Topsoil stockpiles are located in areas away from drainage lines or windy areas in order to minimise the risk of soil and wind erosion.
- Rehabilitation areas of returned topsoil will be ripped, with care taken not to bring subsurface materials to the surface (e.g. large rocks). Ripping should only be sufficient to allow equipment to work efficiently. Ripping along slopes should be along contour.

7. MONITORING PLAN

The project monitoring is conducted under the EMP includes:

- (i) **Project readiness monitoring** - Monitoring to check progress on project readiness and close gaps through corrective actions.
- (ii) **Environmental quality monitoring** - To be conducted by a competent authority or person appointed by the proponent, involving the collection and analyses of air quality, noise and water quality data at designated monitoring locations for assessing compliance with applicable environmental quality and emission standards.
- (iii) **EMP compliance monitoring** - To be conducted by the Project Management Consultants to verify EMP compliance during project implementation.
- (iv) **Operational monitoring** - This is required as part of the operations of the subproject and will be undertaken by the relevant government department or a nominated private sector operator.

8. CONCLUSION

This Environmental Management Plan highlights the management measures that will be implemented to mitigate the environmental impacts of the proposed activities. Additionally, it highlights the need / requirements for the Environmental Emergency Preparedness and Response procedure.

The EMP is a legal document, which commits the applicant to comply with all management measures, monitoring programmes and other plans as presented herein. As part of the EMP, monitoring programmes have been provided to manage and control critical components of the environment. This is a live document which may be amended if project activities alter.