

**ENIRONMENTAL MANAGENT PLAN FOR PROPOSED DEVELOPMENT OF A
MARBLE AND GRANITE MINE ON MINING LICENCE (ML 236), KARIBIB,
ERONGO REGION**



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Contents

Cover page	i
Document data sheet	ii
Table of contents	iii
List of tables	vi
Abbreviations and acronyms	vii
Definitions	vii
1. Environmental management Plan	1
1.1. Project Background.....	1
1.2. Project Description.....	1
1.3. Purpose of this Environmental Management Plan (EMP)	2
1.4. Summary of the proposed activities.....	3
1.5. Project Phases Covered in the EMP.....	3
1.6. Legal Implications and obligations under the EMP	4
2. Environmental Management Principles.....	4
3. Anticipated Environmental Impacts	6
3.1. Positive Impacts	6
3.1.1. Job Creation	6
3.1.1.1. Enhancement measures for job creation	7
3.1.2. Support to local retailers shop.....	7
3.1.3. Export taxes and VAT payments	7
3.1.4. Supply of raw materials	8
3.2. Identified impacts, monitoring and proposed mitigation measures	8
3.2.1. Liquid waste: oil spillage and waste water	8
3.2.2. Impacts on surface water.....	8
3.2.3. Solid waste	9
3.2.4. Land and soil disturbance	10
3.2.5. Biodiversity (fauna and flora)	10
3.2.6. Impacts of Alien invasive Plants.....	12
3.2.7. Air quality	13

3.2.8. Impacts on Archaeological Sites	14
3.2.9. Noise	15
3.2.10. Storm water and erosion Control	16
3.2.11. Topsoil disturbance	17
3.2.12. Visual negative impacts	18
3.2.13. Fire and Explosion Hazard.....	19
3.2.14. Impacts on Socio-Economic	19
3.2.15. Health, safety and security	20
4. Environmental Management Plan, Organization and Implementation	20
5. Monitoring, reporting and corrective action	28
5.1. Monitoring of EMP.....	28
5.1.1. Inspections and Audits	28
5.1.1.1. Internal Inspections/Audits	28
5.1.1.2 External Audits	29
5.2. Documentation.....	29
5.3. Reporting.....	29
5.4. Environmental management system framework.....	29
5.4.1. Policy and Performance Standards	30
5.4.2. Enviro-Legal Documentation.....	30
5.5. Impact aspect register.....	30
5.5.1. Procedures and Method Statements	30
5.5.2. Register of roles and responsibilities	31
5.5.3. Site Map.....	31
5.5.4. Environmental management schedule.....	31
5.5.5. Change Management.....	32
6. Environmental code of conduct	32
7. Site closure and rehabilitation.....	33
7.1. Introduction.....	33
7.2. Alternatives Considered	34
7.3. Preferred Alternative: Rehabilitation/ Backfill of boreholes	34
7.4. Closure Assumptions	35
7.5. Closure and Rehabilitation Activities	36

7.5.1. Infrastructure.....	36
7.5.2. Roads.....	36
7.5.3. Remediation of Contaminated Areas	37
7.5.4. Vegetation	37
7.5.5. Waste Management.....	37
8. Conclusion and recommendations	39
9. References.....	41

List of tables

Table1: Implementing of the Negative Impacts. All the mentioned impacts in the below table are scheduled for all the phases of the proposed project	21
Table2: Summary of Environmental Management Plan during construction, operation and decommissioning phases.....	22

ABBREVIATIONS AND ACRONYMS

EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EC	Environmental Commissioner
ECC	Environmental Clearance Certificate
ECO	Environmental Control Officer
EMA	Environmental Management Act
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EPL	Exclusive Prospecting Licence
I&Aps	Interested and Affected Parties
MEFT	Ministry of Environment, Forestry and Tourism
MME	Ministry of Mines and Energy
ML	Mining Licence
SM	Site Manager
DEA	Department of Environmental affairs

DEFINITION OF TERMS

The ‘**Consultant**’ – this refers to the team that is conducting the Environmental Clearance Certificate (ECC) renewal process and the preparation of the updated EMP report for the project.

The ‘**Proponent**’ – this refers to the organization that is directly involved in the implementation of the project, i.e. SLS Crushers.

The ‘**Stakeholders**’ – this refers to the people, organisations, NGOs that are directly or indirectly affected and interested by the project.

The ‘**Environment**’ – this refers to the ecology, economy, society and politics.

1. Environmental Management Plan (EMP)

1.1. Project Background

Tipton Investments (Pty) Ltd is the holder of exclusive prospecting license (EPL 7728) located in Karibib District, Erongo Region. The EPL has been valid since 16/10/2020 and will expire on the 15/10/2023. The project is situated approximately 45 km southwest of the Town of Karibib on farm Etusis 75 and, farm Kubas 77 in Karibib Constituency, Erongo Region. Tipton Investments (Pty) Ltd is a Namibian Registered company. After the completion of the initial exploration programme aimed at delineating potential for marble and granite economic resources within the EPL area, the company has applied to the Ministry of Mines and Energy (MME) for mining license (ML 236). Once the ML has been granted and the Environmental Clearance Certificate as well as all other relevant permits have been issued by METF, mine development and the subsequent production phase and processing will follow.

1.2 Project Description

The exclusive prospecting license area (EPL 7728) is 424, 3 Ha and the proposed mining license area (ML236) covers 314, 7 Ha. The mining licence area has been found to host marble and granite of economic value of over 12 million tons and 35 million tons of marble and granite respectively. Lithology envisaged for dimension stone quarrying are the marble of the Karibib Formation and the non-foliated biotite granite Cambrian age. The proponent intends to implement a surface quarry for marble and granite on three quarries at the proposed project site. The main marble unit designated quarry 1 is envisaged to be the initial focal point mining or be mined concurrently with other two quarries designated quarry 2 and 3, depending on the market demand. Mining will proceed by means of a series of work faces, benches and vertical slopes. The mining stage of dimension stone extraction conforms to one of two general strategies. In the first of these, large volumes of rocks are loosened by means of primary cuts, and then divided stepwise into smaller pieces until commercial blocks are obtained. These will be transported to The Port of Walvis Bay is situated 255 km from the proposed mining area by public road.

1.3 Purpose of this Environmental Management Plan (EMP)

Environmental management plan (EMP) serves as a tool that can ensure sustainable mining and mineral exploration, as it contains measures aimed at protecting, rehabilitating and restoring of the environment to its productive state before, during and after mining. It serves as a risk strategy that contains logical framework, monitoring programs, mitigation measures and management control. The aim of an Environmental Management plan (EMP) is to develop procedures to implement project's mitigation measures and monitoring requirements. It is deemed as a risk strategy that contains logical framework and management control strategies to minimize potential environmental impacts to significant level. The EMP ensures the community that the environmental management of the project is acceptable. As well as stipulating the roles and responsibilities of persons involved in the project. An EMP ensures that legal and policy requirements are well known and understood by the proponent, its employees and contractors and will be strictly enforced by its management team. Issues and concerns identified in the EIA will form a set of environmental specifications that will be implemented on site.

The control measures described in this EMP have been developed following consideration of the findings of the Environmental Impact Study (EIS), which concluded that a number of environmental values would be impacted by the proposed dimension stone (marble and granite) mining project. The intent of the proposed control measures is to ensure that project related activities will not negatively affect the environment or the health, welfare and amenity of people and land uses by meeting or exceeding statutory requirements.

Furthermore, overall objectives of this EMP are:

- To develop measures that will mitigate the adverse impacts of the proposed project
- Ensuring compliance with regulatory authority stipulations and guidelines;

- To formulate measures to enhance the value of environmental components where possible.
- To formulate measures to protect environmental resources as well enhance the value of environmental components where possible.
- Responding to unforeseen events and providing feedback for continual improvement in environmental performance

1.4. Summary of the proposed activities

The proponent has a mining Licence application (ML236) over the Project site. Quarrying operations, processes and associated activities have potential impacts on the following:

- Potential land or soil disturbances;
- Soil and water resources contamination;
- Biodiversity (fauna and flora);
- Air quality/dust;
- Noise;
- Health and safety;
- Vehicular traffic safety; and
- Visual (aesthetic) and
- Archaeological impact.

1.5. Project Phases Covered in the EMP

The following phases are addressed in this EMP:

- **Construction phase:** The initial phase which entails construction of main and supporting mining infrastructures (Mine Development).
- **Operation and maintenance phase:** the phase during which the quarrying activities are carried out and maintenance of the site, related infrastructure, equipment and machinery is done.

- **The decommissioning phase** is the time during which the targeted dimension is depleted or of no longer economic value, leading to the cessation of the mining activities. During the operational phase and before decommissioning, the Proponent will need to put site rehabilitation measures in place. The decommissioning phase is followed by mine closure and aftercare

1.6. Legal Implications and obligations under the EMP

The EMP will be sent to the Directorate of Environmental Affairs (DEA) of the Ministry of Environment, Forestry and Tourism (MEFT) for approval. Once the DEA is satisfied with the contents of the EMP, they will issue an Environmental Clearance Certificate (ECC) to the Proponent to commence with the establishment of the quarry for marble and granite in the proposed area. The ECC is linked with the recommendations of the Environmental Management Plan. Once the ECC is issued, the EMP becomes a legally binding document and each role-player including contractors and sub-contractors are made responsible to implement the relevant sections of the EMP and is required to abide by the conditions stipulated in this document

2. Environmental Management Principles

The proponent will ensure that all parties involved in the project uphold the following broad aims:

1. All persons will be required to conduct all their activities in a manner that is environmentally and socially responsible. This includes all consultants, contractors, and sub-contractors, transport drivers, guests and anyone entering the quarrying areas in connection with the quarrying project.

2. Health, Safety and Social Well Being

- ❖ 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 natural dangers on site, and radiation hazards; and,
- ❖ Promote good relationships with the local authorities and their staff.

3. Biophysical Environment

- ❖ Wise use and conservation of environmental resources, giving due consideration to the use of resources by present and future generations;
- ❖ Prevent or minimize environmental impacts;
- ❖ Prevent air, water, and soil pollution, Biodiversity conservation and Due respect for the purpose and sanctity of the area.

To achieve these aims, the following principles need to be upheld.

Commitment and Accountability:

The proponent's senior executives and line managers will be held responsible and accountable for: Health and safety of site personnel while on duty, including while travelling to and from site in company vehicles and environmental impacts caused by quarrying activities or by personnel engaged in the quarrying activities, including any recreational activities carried out by personnel in the area

Competence

The proponent will ensure a competent work force through appropriate selection, training, and awareness in all safety, health and environmental matters.

Risk Assessment, Prevention and Control

Identify, assess and prioritize potential environmental risks. Prevent or minimize priority risks 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 the environmental specifications. Implement regular monitoring and reporting of compliance with these requirements.

Stakeholder Consultation

Create and maintain opportunities for constructive consultations with employees, authorities, other interested or affected parties. Seek to achieve open exchange of information and mutual understanding in matters of common concern.

Continual Improvement

Through continual evaluation, feedbacks, and innovation, seek to improve performance regarding social health and well-being and environmental management throughout the lifespan of the quarrying project.

Financial Provisions for Quarrying

In line with Namibia's environmental rehabilitation policy, the proponent will make the necessary financial provision for compliance with the EMP.

3. Anticipated Environmental Impacts

3.1. Positive Impacts

3.1.1. Job Creation

Local recruitment will be encouraged by the proponent with a target of at least 65% locals. This operation thus contributes to the alleviation of unemployment which is severe in the country. The establishment and operation of the quarry will create both direct and indirect jobs for at least minimum 50 people. Employment on the new project will be attractive to the local workforce by virtue of the comparatively high wages offered, this will result in the local growth in the economy of Karibib constituency and surrounding areas.

3.1.1.1. Enhancement measures for job creation

- The proponent will introduce training programs (bursary schemes, on the job training etc) in order to boost the supply of local skills
- It is proposed that local people community members from Karibib Constituency should be considered first for employed. Especially where no specific skills are required.
- The Karibib Town Councilor could be requested to assist with the recruitment of workers.
- Gender equality considerations during recruitment process.
- Employment preference will be afforded to previously disadvantaged Namibians.

3.1.2. Support to local retailers shop

Mining is the highest foreign currency earner and GDP contributor to the Namibian economy, therefore the presence of mining activities near local authorities stand to benefit the local economies from project-related purchases, for example, the retail, accommodation and recreation sectors. The proponent and his employees are encouraged to purchase or support local retailers in Karibib town unless the intended material/product to purchase is not available.

3.1.3. Export taxes and VAT payments

Export taxes and VAT payments contribute significantly to the national economic contribution. Thus, without these payments our government will not be able to roll out the project on infrastructure, being it water, road or electricity and also sanitation facilities nationwide. The proponent and his employees are encouraged to make these payments when applicable to support the economic growth of the country.

3.1.4 Supply of raw materials

Supply of raw materials and processed materials to downstream industry for economic growth. In addition to construction, dimension stone is also needed for monumental, as the raw material for sculpture and tombstones. This industry will also add local value addition for the processing of blocks (waste) that cannot be sold as complete blocks.

3.2. Identified impacts, monitoring and proposed mitigation measures

3.2.1. Liquid waste: oil spillage and wastewater

Mitigation Measures to be enforced:

- Ensure adequate storage and handling of liquid waste, fuel, waste water as well as regular maintenance of plant equipment.
- Avail a spill response action plan in case of accident.
- Accessibility to spill prevention and response equipment, such equipment should be visible and accessible to all employees at any given time.
- Spills will be cleaned up immediately to the satisfaction of the Regional Manager by removing the spillage together with the polluted soil and by disposing of them at a recognized facility.
- Designated waste collection tanks should be available on-site and away from waterways, and such isolation should be maintained at all times.
- Storage of the hazardous substances in a bounded area,
- Refuel vehicles at a designated area that has a protective surface covering/geo-membrane lining and utilise drip trays for stationary plant.

3.2.2 Impacts on surface water

Mitigation Measures to be enforced:

- No dumping of waste products of any kind in or in close proximity to surface water bodies.
- Heavy mining vehicles should be kept out of any surface water bodies and the movement of vehicles should be limited where possible to the existing roads and tracks.
- Ensure that oil/ fuel spillages from vehicles transporting the stones and machinery are minimised and that where these occur, that they are appropriately dealt with.
- Drip trays must be placed underneath vehicles when not in use to contain all oil that might be leaking from these vehicles.

3.2.3. Solid waste

Solid waste is a challenge during the ongoing exploration and operational phases. It can be generated from contractors, staff members and other visitors to the area. Proper solid waste management will involve full commitment by all the employees and contractors of the site. Solid waste which will be generated from this project if not managed will have an effect on the environment.

Mitigation Measures to be enforced:

- Sufficient waste disposal sites should be established on-site where generated waste should be kept during ongoing exploration and operation period.
- The collected solid waste should be disposed of at Karibib Town Council solid waste disposal sites.
- For human waste, during the construction phase, the mobile toilet should be made available on-site for workers and once these facilities are full, the collected human waste should be disposed at the Town Council human waste disposal site.
- It is recommended that waste from the temporary toilets be pumped out and disposed of at the designated waste treatment site in Karibib.
- Mandatory waste segregated right at the source of waste generation. The collection of segregated waste would be made from the quarrying site and amenity areas.

- Reusable and recyclable waste will be disposed of by selling to scrap dealers and private contractors for resale.
- Non-degradable waste will be transferred to the municipal solid waste management system.

3.2.4. Land and soil disturbance

Dimensions stone mining process involve cutting out prismatic blocks from in situ granite and marble outcrops and therefore disturbing the landform and the soil cover in the immediate surroundings of the mining site. This undertaking has the potential of disturbing the structural composition and biological productivity of topsoil and If not taken care of this can lead to land degradation.

Mitigation Measures to be enforced:

- The access road to the mining site must be established in consultation with the landowner and usage of existing roads shall be enforced.
- The design, construction, and location of access to main roads will be in accordance with the requirements laid down by the controlling authority.
- Land markings, vehicle tracks, trenches and excavations shall be restored to the original landform and, visual state as much as possible.
- In the case of dual or multiple uses of access roads by other users, arrangements for multiple responsibilities must be made with the other users. If not, the maintenance of access roads will be the responsibility of the holder of the mining licence (ML).

3.2.5. Biodiversity (fauna and flora)

Mining can be destructive process, changing abiotic and biotic conditions and in some cases singlehandedly causing local decline in rare and threatened species and ecosystems. Some of the activities of the proposed project i.e. vehicles, human movements, excavating pose a risk to the integrity of baseline biodiversity as well as the biological productivity of the site and the immediate proximity. Movement of vehicles in and out of the site and noise produced by moving earth-moving equipment are the major threats to fauna .The following mitigations are to be undertaken

to minimize further impact on the existing biodiversity:

Mitigation Measures to be enforced: **flora**

- Disturbed areas must be kept to a minimum.
- Remove unique fauna and sensitive faunabefore commencing with the development activities and relocate to a less sensitive/disturbed site if possible.
- Recommend the planting of local indigenous species of flora as part of the landscaping as these species would require less maintenance than exotic species and have important ecological functions in terms of carbon sequestration from decomposing materials at the site.
- Disturbance of marginal vegetation in the mountains should be limited.
- Where it is clear that certain large species will be destroyed consideration should be given to offering to rescue the individuals involved and relocate them to nearby gardens.
- Transplant removed trees where possible, or plant new trees in lieu of those that have been removed.
- Prevent the destruction of protected tree species.

Mitigation Measures to be enforced: **fauna**

- Barriers/barricades confining driving trucks must be erected to avoid stray driving and trampling on habitat. Proper demarcation of the mining and exploration area.
- Avoid disturbance on invertebrate on-site and along the gravel road stretch.
- Avoid the creation of multiples roads strips, which could result in the disturbance of breeding sites for various mammals.
- No workers will be allowed to collect any plant or snare, hunt or otherwise capture any wild animal.
- No domestic animals will be permitted on the quarry sites by means of erecting a perimeter fence, small stock should graze at designated areas.

- A fauna survey will be conducted to determine the effect of fragmented habitat on game species should the need arise.
- No foodstuff will be left lying around as these will attract animals which might result in human-animal conflict.
- Care will be taken to ensure that no litter is lying around as these may end up being ingested by wild animals

Methods for monitoring:

- Regular monitoring of any unusual signs of animal habitat.
- There should be limited movement of heavy duty machinery and mining equipment in the area to avoid interference.
- Birds or Nest sites will not be disturbed by any employee, visitor or contractor.
- If possible encountered bird kills and nest removal should be registered in a biodiversity data-base and information should be made available to the general public

3.2.6. Impacts of Alien invasive Plants

Alien invasive plants are prevalent in areas affected by land transformation and anthropogenic disturbance. It is a well-known fact that disturbance to the natural environment often encourages the establishment of alien invasive weed species. Surface mines are a major disturbance, and thus may promote the establishment and expansion of invasive plant communities. Seed or plant material may be imported to site from building materials if the source is contaminated. It is also possible that, plant or seed material may adhere to car tyres or animals. In some cases seeds of alien invasive plants may blow from debris removed at sites.

Mitigation Measures to be enforced:

- The site manager will ensure that debris is properly disposed of.
- Vehicle tyres inspections can be carried out although this may not be a practical mitigation measure.

- The proponent should implement an alien plants awareness campaign to educate and sensitize the employees and the local community on the menace of planting alien vegetation in the area.
- Eradicating alien plants by using an Area Management Plan

Methods for monitoring:

- Regular monitoring of any unusual signs of alien species.
- The proponent and local community should establish an alien plant task force to ensure that there is no planting of alien plants species in the area.
- The proponent should adopt and support the implementation of an annual alien plants clearing campaign.

3.2.7. Air quality

The proposed quarrying activities are the potential of fugitive sources for the dust particles as they are easily dispersed and carried away by the winds. During the operation phase dust will be generated onsite by earth moving equipment and also on the gravel road by trucks and vehicles. Continuous movements of people, vehicles and earth moving vehicles on site can thus loosen and re-suspend the deposited material again into the air

Mitigation Measures to be enforced

- Dust suppressants shall be applied to all the mining activities as well as all the unpaved/gravel roads.
- The speed of haul trucks and other vehicles must be strictly controlled to excessive dust or excessive deterioration of the road being used.
- All gravel roads in the project area should have a speed limit of 60km/h for light vehicles and 30km/h for heavy vehicles in order to minimize the amount of dust generated by vehicles.
- Transportation of raw materials required for construction will be carried out during non-peak hours.

- Covering scaffolding and cleaning of vehicles that can reduce dust and vapor emissions will be used.
- Cover any stockpiles with plastic to minimise windblown dust.
- During high wind conditions the proponent must make the decision to cease works until the wind has calmed down.
- Use of personal protective equipment for proper dust control for respiratory protection and other necessary PPE (gloves, work suits, sun hats etc.).

Monitoring

- Daily inspection by the ENC of the gravel roads and quarry site on possible dust creation that requires attention.
- Daily inspection on site by the ENC to ensure that all workers are wearing their protective clothes at all time during the mining process and the dry skin contact with gloves is prevented.

3.2.8. Impacts on Archaeological Sites

Potential damage to archaeological sites may be impacted through unintentional destruction or damage as a result of vehicle tracks, footprints and actions of contractors, employees and visitors of the quarrying site. Currently, there is no information provided about known heritage or site of cultural values within the project site. Therefore, this impact can be rated medium to low, if there are no mitigation measures in place. At the sites, there are no known heritage areas or artifacts deemed to be impacted by the ongoing exploration and quarrying activities. However, there might be unknown archaeological remains within the Mining Licence area hence the Proponent is required to follow the chance find procedures and consult the Heritage Council immediately. The Proponent should consider having a qualified and experience archaeologist on standby during entire operational phase. This action will be to assist on the possibility of uncovering sub-surface graves or other cultural/heritage objects and advice the Proponent accordingly. Identified graves

or any archaeological significant objects on the site should not be disturbed, but are to be reported to the project Environmental officer or National Heritage Council offices

Mitigation Measures to be enforced

- Buffer zones will be created around the operation site.
- Adhere to practical guidelines provided by an archaeologist to reduce the archaeological impact of quarrying activities.
- All archaeological sites to be identified and protected before construction commences.
- Notices/information boards will be placed on sites.
- Training employees regarding the protection of these sites.
- Obtain appropriate clearance or approval from the competent authority.

In the event of such finds, mining must stop and the project management or contractors should notify the National Heritage Council of Namibia immediately

Monitoring

- An archaeologist will inspect any identified archaeological sites before commencing with the quarrying activities.

3.2.9. Noise

Noise emissions on site are mainly generated by earthmoving equipments, drilling rigs, wire saw, people and vehicles. The main noise sources are associated with drilling, breaking, crushing and transport of equipment or materials to or from the quarry site. Exposure to loud noises at work can cause irreversible hearing damage, workplace accidents and be a contributing factor to other health problems.

Mitigation Measures to be enforced

Continuous monitoring of noise levels should be conducted to make sure the noise levels at the mining site does not exceed acceptable limits.

- Reduction of noise from drilling rigs by using downhole drilling or hydraulic drilling;

- Installation of proper sound barriers and (or) noise containments, with enclosures and curtains at or near the source equipment.
- Use of rubber-lined or soundproof surfaces on processing equipment (e.g. screens, chutes, transfer points, and buckets);
- Use of rubber-belt transport and conveyors;
- Installation of natural barriers at facility boundaries (e.g. Vegetation curtains or soil berms).
- Optimization of internal-traffic routing, particularly to minimize vehicle-reversing needs (reducing noise from reversing alarms) and to maximize distances to the closest sensitive receptors.
- No activity having a potential noise impact should be allowed after 18:00 hours if possible.
- In the event that activities continue outside the stipulated hours the contractor will communicate such occurrences to potentially affected communities prior to commencing such activities.
- Workers working near high noise mining machinery will be provided with ear muffs/ earplugs.

3.2.10 Storm water and erosion Control

Mitigation Measures to be enforced

- Regular preventative maintenance should be carried out on the quarry infrastructure.
- Earth embankments to prevent erosion will be established where appropriate.
- The surface water accumulated in the open trenches must be channelled along the natural tributaries of area.

- It is recommended that granite mining takes place outside of the rainy season in order to limit flooding on site and surface water pollution.
- Storm water Management Plans should be developed for each quarry/claim site and should include the management of storm water during excavation, as well as the installation of storm water and erosion control infrastructure and management thereof after completion of mining.
- Storm water management systems will be installed to prevent storm water from entering or exiting the quarry, which could result in silt laden surface water from draining into any ephemeral river systems that may be in proximity to the mining claim site.
- Quarry slopes should be profiled to ensure that they are not subjected to excessive erosion but capable of drainage run-off with minimum risk of scour (maximum 1:3 gradient).
- If necessary, diversion channels should be constructed ahead of the open cuts as well as above emplacement areas and stockpiles to intercept clean run-off and divert it around disturbed areas into the natural drainage system downstream of the quarry.
- All mined areas (where works will take place) will be rehabilitated to control erosion and sedimentation.
- Existing vegetation must be retained as far as possible to minimise erosion problems.
- Rehabilitation of quarries shall be planned and completed on a continuous basis in such a way that the run-off water (if any) will not cause erosion.
- Visual inspections shall be done on a regular basis with regard to the stability of water control structures, erosion and siltation (if required).

3.2.11. Topsoil disturbance

Topsoil shall be removed from all areas where physical disturbance of the surface will occur, prior to the disturbance occurring. Topsoil refers to that layer of soil covering the earth and which provides a suitable environment for the germination of seeds, allows the penetration of water, and is a source of micro-organisms, plant nutrients and in some cases seed.

Mitigation Measures to be enforced

- Topsoil shall be stored so that it can be placed on the exposed subsoil as soon as the mining of the excavation or the relevant section of it has been completed and its slopes have been finished off to the acceptable gradient as part of the rehabilitation process.
- Topsoil shall be stockpiled only in the areas dedicated for only that purpose, even if the topsoil is only partially cleared.
- The topsoil removed, shall be stored in a bund wall on the high ground side of the quarry and in such a way that it will not cause damming up of water or washaways, or wash / blow away itself. Stockpiles will not exceed a height of **two** meters.
- Stockpiles shall be managed so as to maintain the re-growth potential of the topsoil. Should the stockpiles stand for too long (greater than 12 months) it can be considered barren from a seed bank point of view. In this case reseedling may be required. Stockpiles should ideally be stored for no longer than six months.
- The overburden, i.e., that layer of soil immediately beneath the topsoil, will be removed and stored separately from the topsoil.
- No chemical pollution shall be allowed to contaminate the soils; any plant equipment found to be attributing to this shall be removed from the site and repaired.

3.2.12. Visual negative impacts

Mitigation Measures to be enforced

- Negative visual effects can further be prevented through mitigations (i.e. keep existing trees, introduce tall indigenous trees).
- Quarries should be levelled mining activities cease so as to restore the visual sense of place of the area to its natural state.
- The remains of all structures that may have been erected at the quarry shall be demolished and removed on completion of the project.

- Care must be taken to ensure that all rehabilitated areas are similar to the immediate environment in terms of visual character, vegetation cover and topography and any negative visual impacts will be rectified to the satisfaction of the environmental consultant.
- Overburden will be placed back into excavation as part of the rehabilitation programme

3.2.13 Fire and Explosion Hazard

Mitigation Measures to be enforced

- Sufficient fire extinguishers will be installed at selected locations such as mine office, garage. Sufficient water hydrants with sufficient length of hosepipes will be made available on the surface for fire protection.
- Mine personnel will be trained on how to use fire extinguishers.

3.2.14 Impacts on Socio-Economic

The **nature of impact** is outlined below:

- Impact from loss of grazing for domestic livestock in “exclusive use zone”
- Impacts on cultural and spiritual values.
- Demographic factors: Attraction of additional population that cannot benefit from the project.
- Perception of Health and Safety risks associated with quarrying.

Mitigation Measures to be enforced:

- The population change can be mitigated by employing people from the local community and encouraging the contractors to employ local individuals.
- The perception of risks will be mitigated by putting up safety signs wherever possible and ensuring that all employees and visitors to the site undergo a safety induction course.

Methods for monitoring:

- Public meetings will be held by the proponent whenever necessary.

3.2.15. Health, safety and security

There are number of hazards associated with the movement of equipments and impact on dangerous parts of the equipment. The risk of an accident will be high if the dangerous parts are exposed and operators are poorly trained or supervised. This increases the possibility of injuries and the responsible manager must ensure that all staff members are briefed about the potential risks of injuries on site.

Mitigation Measures to be enforced:

- All vehicular equipment operators must have valid licences for that particular vehicle class.
- Personnel should not overnight at the mining site, except the security personnel.
- Ensure that all mining personnel are properly trained depending on the nature of their work.
- Provide for a first aid kit and a properly trained person to apply first aid when necessary.
- A wellness program should be initiated to raise awareness on health issues, especially the impact of sexually transmitted diseases as described above.
- Encourage HIV counselling and testing and facilitate access to Antiretroviral (ARV) medication
- Restrict unauthorised access to the mining claim site and implement access control measures.
- Clearly demarcate the mining claim site boundaries along with signage of “no unauthorised access”.
- Clearly demarcate dangerous areas and no go areas on site.
- Staff and visitors to the mining claim site must be fully aware of all health and safety measures and emergency procedures.
- The contractor must comply with all applicable occupational health and safety requirements.
- The workforce should be provided with all necessary Personal Protective Equipment where appropriate.
- Emergency medical treatment should be available on site.

4. Environmental Management Plan, Organization and Implementation

The environmental aspects which may be affected by the proposed project have been categorized into negative and positive impacts. As an extension of the preceding sections, this

section summarizes the objectives, indicators to be observed, schedules to adhere to, and the roles and responsibilities of various stakeholders to the EMP. The following tables give the mitigation measure to be undertaken during construction, operation and decommissioning phases with the agency responsible for implementation. The following abbreviations are used to indicate who is responsible for what impact mitigation objective:

- Site Foreman SF
- Site/mine Manager SM/MM
- Project manager PM
- Project Proponent PP
- Project Geologist PG
- Environmental Coordinator ENC
- Contractor C
- Geological Technician GT
- Project staff PS

Table1: Implementing of the Negative Impacts. All the mentioned impacts in the below table are scheduled for all the phases of the proposed project.

Objectives	Indicators	Responsibility
To avoid any form of hydrocarbon spills on and around the mining site	No hydrocarbon spillage or/and remnants of hydrocarbon spillage shall be visible around the project site	SF,PS, ENC
To avoid any form of litter be it paper, metal, plastic and human waste on and around the mining site	No litter or/and remnants of litter shall be visible around the project site	SF,PS , ENC
To minimize land and soil disturbance	Driving tracks and excavation shall be restricted and only be visible within the project site.	SM, SF , ENC
To protect and conserve fauna and flora within the project area	Minimum levels of habitat disturbance	SM,SF, ENC
To minimize dust generation on site and atmospheric pollution	Emissions/generation particulate content of the dust around the site and gravel roads shall not exceed	SM,SF, ENC

	maximum allowable concentration that may affect human being and animals	
To ensure compliance with statutory requirements	Assurance measures shall be put in place and Periodic inspections aimed at corrective action undertaken, recorded and documented	EC, PP , ENC

Table 2: Summary of Environmental Management Plan during construction, operation and decommissioning phases.

Construction Phase			
Environmenta l Impact	Proposed mitigation measures	Respon sibility	Monitoring plan
Air pollution	<ul style="list-style-type: none"> Control speed and operation of construction vehicles. Regular maintenance of vehicles and equipment. Sensitize quarrying workers and contractors. Provide dust masks to everyone on site. 	C SM PM ENC	<ul style="list-style-type: none"> Amount of dust produced. Level of Landscaping executed.
Noise pollution	<ul style="list-style-type: none"> All noise sources should be removed from site or kept within reasonable level. Work should only be carried out only during daytime. Regular maintenance of vehicles, equipment. Regular maintenance of and heavy machinery, vehicles and equipment. Workers should be provided with personal hearing protection if working in noisy environment. 	C GT SM ENC	<ul style="list-style-type: none"> Amount of noise produced
Solid waste	<ul style="list-style-type: none"> Littering should be discouraged. Any debris/litter should be collected by a waste collection company The site should have waste receptacles with bulk storage facilities at convenient points to prevent littering during quarrying. 	PM SM ENC	<ul style="list-style-type: none"> Presence of dust bins, waste collection point.
Oil leaks and spills	<ul style="list-style-type: none"> Vehicles and equipment should be well maintained to prevent oil leaks. Contractor should have a designated area where maintenance is carried out and that is well sealed to prevent percolation into the ground. All oil products should be handled carefully. 	C ENC SM	<ul style="list-style-type: none"> Absence of oil spills and leaks onsite

First aid	<ul style="list-style-type: none"> • A well-stocked first aid kit shall be maintained by qualified personnel 	PM	<ul style="list-style-type: none"> • Contents of the first aid kit.
Visual	<ul style="list-style-type: none"> • Environmental considerations will always be adhered to before clearing roads, trenching and excavating. 	PM GT	<ul style="list-style-type: none"> • Employees to be trained on how to minimize visual impacts.
Archaeological Sites	<ul style="list-style-type: none"> • Buffer zones will be created around the sites. • Adheretopracticalguidelinesprovidedbyanarchaeologistoreducethearchaeologicalimpactofquarryingactivities. • Allarchaeologicalsitetobeidentifiedandprotectedbeforefurtherquarryingcommences. 	PM ENC PP SM	<ul style="list-style-type: none"> • Register of all archaeological sites identified.
Occupational Health and Safety	<ul style="list-style-type: none"> • Provide Personal Protective Equipment • Train workers on personal safety and how to handle equipments and machines. • A well-stocked first aid kit shall be maintained by qualified personnel. • Report any accidents / incidences and treat and Compensate affected workers. • Provide sufficient and suitable sanitary conveniences which should be kept clean. 	C PM PP	<ul style="list-style-type: none"> • Workers using Protective Equipment. • Presence of Well stocked First Aid Box. • Clean sanitary facilities.
Fauna	<ul style="list-style-type: none"> • Some habitat areas such as trees of the river bed and tunnels outcrops will be avoided wherever possible. • A fauna survey will be conducted to determine the effect of fragmented habitat on game species should the need arise. • No animals shall be killed, captured or harmed in any way. • No foodstuff will be left lying around as these will attract animals which might result in human-animal conflict. 	PM ENC PP SM	<ul style="list-style-type: none"> • Regular monitoring of any unusual signs of animal habitat.
Alien invasive plants	<ul style="list-style-type: none"> • Eradicating alien plants by using an Area Management Plan. • Ensure vehicles and equipment are clean of invasive plants and seeds. • Contain neighboring infestations and restrict movement of invasive plants from adjacent lands • Educating everyone on site on types of invasive plants. 	PM ENC PP SM	<ul style="list-style-type: none"> • Regular monitoring of any signs of alien plants.

Loss of vegetation	<ul style="list-style-type: none"> • Environmental considerations will be adhered to at all times before clearing roads, trenching and excavating. • The movement of vehicles in riverbeds, rocky outcrops and vegetation sensitive areas will be avoided. • The movement of vehicles will be restricted to certain tracks only. 	PM ENC PP SM	<ul style="list-style-type: none"> • Warning signs onsite • Restored vegetation
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Operational Phase

Environmental /Social Impact	Proposed mitigation measures	Responsibility	Monitoring plan
Noise pollution	<ul style="list-style-type: none"> • Maintain vehicles and drilling equipment. • All noise sources should be removed from site or kept within reasonable level. • Work should only be carried out only during day time. • Regular maintenance of vehicles, equipment. • Regular maintenance of and heavy machinery, vehicles and equipment. • Workers should be provided with personal hearing protection if working in noisy environment. 	PM ENC PP SM MM C	<ul style="list-style-type: none"> • Amount of noise produced
Visual	<ul style="list-style-type: none"> • Environmental considerations will be adhered to at all times before clearing roads and excavating. 	PM, ENC GT	<ul style="list-style-type: none"> • Employees to be trained on how to minimize visual impacts
Fauna	<ul style="list-style-type: none"> • Some habitat areas such as trees of the river beds and tunnels outcrops will be avoided wherever possible. • A fauna survey will be conducted to determine the effect of fragmented habitat on game species should the need arise. • No animals shall be killed, captured or harmed in any way. • No foodstuff will be left lying around as these will attract animals which might result in human-animal conflict. 	PM ENC PP MM C	<ul style="list-style-type: none"> • Regular monitoring of any unusual signs of animal habitat.

Alien invasive plants	<ul style="list-style-type: none"> • The explorer will ensure that debris is properly disposed of. • Ensure vehicles and equipment are clean of invasive plants and seeds. • Contain neighboring infestations and restrict movement of invasive plants from adjacent lands • Educating everyone on site on types of invasive plants • Eradicating alien plants by using an Area Management Plan 	PM ENC PP MM C	<ul style="list-style-type: none"> • Regular monitoring of any signs of alien species.
Loss of vegetation	<ul style="list-style-type: none"> • Environmental considerations will be adhered to at all times before clearing roads, trenching and excavating. • Paths and roads will be aligned to avoid root zones. Permeable materials will be used wherever possible. • The movement of vehicles in riverbeds, rocky outcrops and vegetation sensitive areas will be avoided. • The movement of vehicles will be restricted to certain tracks only. 	PM ENC PP MM C	Warning signs onsite Restored vegetation
Solid waste	<ul style="list-style-type: none"> • Minimize solid waste generated onsite. • Recycle waste especially waste from trenching. • Debris should be collected by waste collection company. • Excavation waste should be re-used or backfilled. 	PM C	Amount of waste on Site. Presence of dust bins, waste collection point
Oil leaks and spills	<ul style="list-style-type: none"> • Machinery should be well maintained to prevent oil leaks. • Contractor should have a designated area where maintenance is carried out and that is protected from rainwater. 	PM ENC PP MM C	No observed oil spills and leaks on site.

Archaeological Sites	<ul style="list-style-type: none"> • Buffer zones will be created around the sites. • Adheretopracticalguidelinesprovidedbyanarchaeologisttoreducethearchaeologicalimpactofquarryingactivities. • All archaeological sites to be identified and protected before further quarrying commences. 	PM	Up to date Register of all archaeological sites identified.
First aid	<ul style="list-style-type: none"> • A well stocked first aid kit shall be maintained by qualified personnel 	PM	Contents of the first aid kit.
Fire preparedness	<ul style="list-style-type: none"> • Firefighting emergency response plan. • Ensure all firefighting equipment are always available, regularly maintained, serviced and inspected. • Fire hazard signs and directions to emergency exit, route to follow and assembly point in case of any fire incidence. 	PM	Fire Signs put up in strategic places. Availability of well maintained firefighting equipments.
Environment Health and Safety	<ul style="list-style-type: none"> • Train workers on personal safety and disaster preparedness. • A well-stocked first aid kit shall be maintained by qualified personnel. • Report any accidents/ incidences and treat and compensate affected workers. • Provide sufficient and suitable sanitary conveniences which should be kept clean. • Conduct Annual Health and Safety Audits. 	PM	Provide sanitary facilities. Copies of Annual Audit
	Decommissioning Phase		
Environmental/Social Impact	Proposed mitigation n measures	Responsibility	Monitoring plan/indicator
Noise and air pollution	<ul style="list-style-type: none"> • Maintain plant equipment. • Decommissioning works to be carried out only during daytime. • personal hearing protection must be worn by workers in noisy section • Workers should be provided with dust masks. 	C PM	Amount of noise and dust generated

Disturbed Physical environment	<ul style="list-style-type: none"> Undertake a complete environmental restoration programme and introducing appropriate vegetation 	PM	
Solid waste	<ul style="list-style-type: none"> Solid waste should be collected by contracted waste collection company. Excavation waste should be used or backfilled 	C PM	<p>Amount of waste on site.</p> <p>Presence of well-maintained receptacles and central collection point.</p>

Occupational Health and Safety	<ul style="list-style-type: none"> Provide Personal Protective Equipment. Train workers on personal safety and how to handle equipments and machines. A well stocked first aid kits shall be maintained by qualified personnel. Demarcate area under decommissioning. 	C PM	<p>Workers using Protective Equipment.</p> <p>Presence of a First Aid Box.</p>
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5. Monitoring, reporting and corrective action

5.1 Monitoring of EMP

Monitoring of the EMP performance for the proposed project by the Contractor emphasizes early detection, reporting, and corrective action. It is divided into three parts, namely:

- Monitoring of project activities and actions to be undertaken by the Environmental Coordinator (ENC) appointed by the Contractor.
- The Environmental Coordinator (ENC) shall report all incidents and situations which have the potential of jeopardizing compliance of statutory provisions as well as provisions of this EMP to the Project Proponent.
- The Environmental Coordinator (ENC) shall take corrective prompt measures, adequate and long-lasting in addressing non-compliance activities or behavior.

To ensure compliance of the Contractor ENC to the implementation of the EMP, it is highly recommended that an External Environmental Expert is appointed by the proponent to ensure the implementation of the EMP.

5.1.1 Inspections and Audits

During the life of the project, performance against the EMP commitments will need to be monitored, and corrective action taken where necessary, in order to ensure compliance with the EMP and relevant enviro-legal requirements

5.1.1.1 Internal Inspections/Audits

The following internal compliance monitoring programme will be implemented:

1. Project kick-off and close-out audits will be conducted on all contractors. This applies to all phases, including drilling contract work during operations:
 - Before a contractor begin any work, an audit will be conducted by the applicable phase site manager to ensure that the EMP commitments are included in Contractors' standard operating procedures (SOPs) and method statements.

- Following completion of a Contractor's work, a final close-out audit of the contractor's performance against the EMP commitments will be conducted by the applicable phase site manager.
2. Monthly internal EMP performance audits will be conducted during the construction/initial and decommissioning phases.
 3. Ad hoc internal inspections can be implemented by the applicable manager at his/her discretion, or in follow-up to recommendations from previous inspection/audit findings.

5.1.1.2 External Audits

- At the end of each project phase, and annually during the operational phase, an independently conducted audit of EMP performance will be conducted.
- Specialist monitoring/auditing may be required where specialist expertise are required or in order to respond to grievances or authorities directives.
- Officials from the DEA may at any time conduct a compliance and/or performance inspection of quarrying operations. The proponent will be provided with a written report of the findings of the inspection. These audits assist with the continual improvement of the quarrying project and the proponent will use such feedback to help improve its overall operations.

5.2 Documentation

Records of all inspections/audits and monitoring reports will be kept in line with legislation. Actions will be issued on inspection/audit findings. These will be tracked and closed out.

5.3 Reporting

Environmental compliance reports will be submitted to the Ministry of Environment, Forestry and Tourism on a bi-annual basis.

5.4 Environmental management system framework

Environmental Management System (EMS) will be established and implemented by

the proponent and their Contractors. This subchapter establishes the framework for the compilation of a project EMS. The applicable manager will maintain a paper based and/or electronic system of all environmental management documentation. These will be divided into policy and performance standards & Enviro legal documentation.

5.4.1 Policy and Performance Standards

A draft environmental policy and associated objective, goals and commitments has been included in the EMP. The project proponent may adapt these as necessary.

5.4.2 Enviro-Legal Documentation

A copy of the approved environmental assessment and EMP documentation will always be available by the proponent. Copies of the Environment Clearance Certificate and all other associated authorizations and permits will also be kept with the quarrying team. In addition, a register of the legislation and regulations applicable to the project will be maintained and updated as necessary.

5.5 Impact aspect register

A register of all project aspects that could impact the environment, including an assessment of these impacts and relevant management measures, is to be maintained. This Draft EMP identifies the foreseeable project aspects and related potential impacts of the proposed project, and as such forms the basis for the Aspect Impact Register; with the Project Activity. It should however be noted that during the life of the project additional project aspects and related impacts may arise which would need to be captured in the Aspect-Impact Register.

5.5.1 Procedures and Method Statements

In order to affect the commitments contained in this EMP, procedures and method statements will be drafted by the relevant responsible quarrying staff and Contractors. These include, but may not be limited:

- Standard operating procedures for environmental action plan and management programme execution.
- Incident and emergency response procedures.

- Auditing, monitoring and reporting procedures, and
- Method statements for EMP compliance for ad hoc activities not directly addressed in the EMP action plans.

All procedures are to be version controlled and signed off by the applicable manager. In addition, knowledge of procedures by relevant staff responsible for the execution thereof must be demonstrable and training records maintained.

5.5.2 Register of roles and responsibilities

During project planning and risk assessments, relevant roles and responsibilities will be determined. These must be documented in a register of all environmental commitment roles and responsibilities. The register is to include relevant contact details and must be updated as required.

5.5.3 Site Map

An up to date map of the quarrying site indicating all project activities is to be maintained. In addition to the project layout, the following detail must be depicted:

- Materials handling and storage;
- Waste management areas (collection, storage, transfer, etc.);
- Sensitive areas;
- Incident and emergency equipment locations; and Location of responsible parties.

5.5.4 Environmental management schedule

A schedule of environmental management actions is to be maintained by the applicable phase site managers and/or relevant Contractors. A master schedule of all such activities is to be kept up to date by the manager. Scheduled environmental actions can include, but are not limited to:

- Environmental risk assessment;
- Environmental management meetings;
- Soil handling, management and rehabilitation;

- Waste collection;
- Incident and emergency response equipment evaluations and maintenance
- Environmental training;
- Stakeholder engagement;
- Environmental inspections and
- Auditing , monitoring and reporting

5.5.5 Change Management

The environmental management schedule must have a procedure in place for change management. In this regard, updating and revision of environmental documentation, of procedures and method statements, actions plants etc. will be conducted as necessary in order to account for the following scenarios:

- Changes to standard operating procedures (SOPs);
- Changes in scope;
- Ad hoc actions;
- Changes in project phase; and
- Changes in responsibilities or roles

All documentation will be version controlled and require sign off by the applicable phase site managers.

6. Environmental code of conduct

The Code of Conduct outlined in this section of the EMP applies to, subcontractors, visitors, permanent and temporal workers. Therefore, anybody within the boundaries of the project site must adhere to the Environmental Code of Conduct as outlined in this section of the EMP.

The Environmental Coordinator ENC will implement on-site environmental guidelines and has the authority to issue warnings as well as discipline any person who transgresses environmental rules and procedures. Persistent transgression of environmental rules will result in a disciplinary hearing and thereafter continued noncompliance behavior will result in permanent removal from the construction sites.

7. Site closure and rehabilitation

7.1 Introduction

The closure period will commence once the last planned blocks of dimension stone has been extracted from the quarry, at the end of the active mining period. The scope of the proponent site rehabilitation emphasizes the backfilling of excavated quarries and sampling holes with previously removed top soil and overburden rocks. Mine rehabilitation is the process of repairing the damage done by mining activities. Rehabilitation plan has been developed with a main aim of returning disturbed environment close to its pre mining state. It is also planned to cater for the access road, vehicle tracks around the site, removal, and restoration of areas covered by stockpile and rock piles. The closure vision for the proposed project is to establish a safe, stable and non-polluting post-prospecting landscape that can facilitate integrated, self-sustaining and value generating opportunities, thereby leave a lasting positive legacy.

Site closure and rehabilitation

All waste (such as hazardous and domestic) waste will be transported offsite for disposal in licensed landfills in Karibib town. Disturbed or/and contaminated areas will be cleaned up, treated where necessary and restored to its pristine state.

- No roads are anticipated to be constructed to access the site; existing roads will be used as far as possible. Where access tracks have been developed in cases where there are no roads, these will be rehabilitated and closed as part of normal closure actions.
- Rehabilitated area will be re-vegetated with the objective of creating a sustainable ecosystem. Vegetation establishment will be in line with a project area's indigenous vegetation.
- The recovered topsoil and subsoil should be utilized to reconstruct the original soil profile.
- All rehabilitated areas shall be considered no go areas and the environmental coordinator shall ensure that none of the staff members enters the area after rehabilitation.

- A site inspection will be held after completion of the mining process to determine the nature and scope of the rehabilitation work to be undertaken. The rehabilitation will be done to the satisfaction of both the proponent and METF.

7.2. Alternatives Considered

Considering that this is a uniform mining project with no chemical processing involved, the proposed project is not complex, and the risks associated with prospecting are understood and can be mitigated at closure. Alternative options for closure are limited. There are only two options that have been considered as activity alternatives for the closure plan:

- **Preferred Alternative:** Closure or backfill of quarries and trenches with overburden removed during mining.
- **Alternative 2:** To leave trenches, quarries open, in-order to allow for groundwater recharge by surface run-off.

7.3. Preferred Alternative: Rehabilitation/ Backfill of boreholes

Rehabilitation is the restoration of a disturbed area that has been degraded as a result of activities such as mining, road construction or waste disposal, to a land use in conformity with the original land use before the activity started. This also includes aesthetical considerations, so that a disturbed area will not be visibly different to the natural environment. This also involves maintaining physical, chemical and biological ecosystem processes in degraded environments, hence the preferred option of backfilling the boreholes with the overburden removed during development and cover with growth medium to establish vegetation. This option has several advantages as discussed below:

Advantages:

- The site will be aesthetically acceptable;
- The site will blend in with the environment;
- The site will be a suitable habitat for fauna and flora again.
- The site will be safe and pollution free;
- Re-vegetating the site will ensure that the site is non-erodible.

Opting for alternative 1, which is to leave trenches without backfilling poses a risk in that, these boreholes may fill in with water, which may become attractive to wildlife and communities leading to drowning and the risk of being trapped in the declines. To mitigate these risks, it is necessary to backfill. Treatment technologies should be used to prevent decanting.

7.4. Closure Assumptions

This closure plan has been developed based on limited available information including environmental data. Some of the information currently available may need to be supplemented during the operational period. Therefore, several assumptions were made about general conditions, and closure and rehabilitation of the facilities at the site to develop the proposed closure actions. As additional information is collected during operations, these assumptions will be reviewed and revised as appropriate.

The assumptions used to prepare this plan include the following:

- The closure period will commence once the last planned weight of minerals has been extracted from the site.
- The proposed mining sites will be adhered to minimise the potential impacts.
- Vegetation establishment will be in line with a project area's indigenous vegetation.
- Water management infrastructure developed for the operational phase will be retained for closure /end of the life of the project as necessary.
- There are limited opportunities for any infrastructure to be built on site and if any infrastructure is built, it will be of limited benefit to the community. Therefore, all buildings will be demolished.
- All hazardous and domestic waste will be transported offsite for disposal in licensed landfills.
- No roads are anticipated to be constructed to access the site; existing roads will be used as far as possible. Where access tracks have been developed in cases where there are no roads, these will be rehabilitated and closed as part of normal closure actions.

7.5. Closure and Rehabilitation Activities

The rehabilitation actions intended to be undertaken at the end of the life of the proposed mining activities are described below.

7.5.1 Infrastructure

All infrastructures will be decommissioned, and the footprints rehabilitated for the establishment of vegetation. Material inventories will be managed near the end of mining activities to minimize any surplus materials at closure. Where practicable, equipment and materials with value not needed for post-closure operations will be sold and or removed from the site. Equipment with scrap or salvage value will be removed from the site and sold to recyclers.

A soil contamination investigation will be conducted on completion of demolition activities. The purpose of this is to identify areas of possible contamination and design and implement appropriate remedial measures to ensure that the soil contaminants are removed. Closure actions will include:

- All power and water services to be disconnected and certified as safe prior to commencement of any decommissioning works;
- All remaining inert equipment and decommissioning waste will be disposed to the nearest licensed general waste disposal facility;
- Salvageable equipment will be removed and transported offsite prior and during decommissioning;
- All tanks, pipes and sumps containing hydrocarbons to be flushed or emptied prior to removal to ensure no hydrocarbon/chemical residue remains;

7.5.2 Roads

Existing roads will be used as far as possible. Closure actions concerning roads and parking areas will include:

- Removal of all signage, fencing, shade structures, traffic barriers, etc.
- All 'hard top' surfaces to be ripped along with any concrete structures.
- All potentially contaminated soils are to be identified and demarcated for later remediation; and

- All haul routes that have been treated with saline dust suppression water need to be treated, with the upper surface ripped and removed to designated contaminant disposal areas.

7.5.3 Remediation of Contaminated Areas

All soil, contaminated with hydrocarbons, will be identified, excavated, if possible, to at least 200 mm below the contaminated zone and then treated.

- All tanks, pipes and sumps containing hydrocarbons will be flushed or emptied.
- Removed soils will be managed as determined by the nature and extent of the contamination.
- Liquid storage tanks will be emptied, the structure removed/demolished and sub-surface holes filled; and
- All equipment in which chemicals have been stored or transported will be cleaned and disposed of in a suitable disposal facility.

7.5.4 Vegetation

Successful re-vegetation will help control erosion of soil resources, maintain soil productivity and reduce sediment loading in streams utilizing non-invasive plants that fit the criteria of the habitat (e.g. soils, water availability, slope and other appropriate environmental factors). Invasive species will be avoided, and the area will be managed to control the spread of these species. To counter the effects of erosion, naturally occurring grassland species will be planted on slopes. These species will provide soil holding capacity and reduce runoff velocity. The flatter areas will be re-vegetated with the objective of creating a sustainable ecosystem. The occurrence of protected plant species will need to be determined before vegetation is removed and the required permits will be obtained for either destruction or relocation.

7.5.5 Waste Management

Waste management activities will include:

- Hazardous waste will be managed handled, classified and disposed.
- Non hazardous substances will be disposed in the nearby landfill sites.
- Scrap and waste steel will be sold to recyclers

- It may be necessary to fence temporary salvage yards for security reasons, particularly where these are located close to public roads.

8. Conclusion and recommendations

The proposed dimension stone quarry project will bring a major contribution to the socio-economic development of Karibib constituency and the entire country. The significance of the social impact on the residents of Karibib constituency was deemed to be highly positive. As the activities will provide employment for the local people and contribute to local & national economic development. It should be acknowledged that disturbance to the environment will be incurred, but that will be minimal and within legally acceptable levels. The site of the proposed mining activities already hosts other authorized dimension stone mining activities, therefore the natural setting of the area is accustomed to similar operations.

The EMP Consultants are confident that the potential negative impacts associated with the mining activities on site can continue to be mitigated by effectively implementing the recommended management action measures and their monitoring. This report should be viewed as a framework for integrating mitigation measures and applicable legal tools to ensure both compliance and sustainability. It is therefore very important that the proponent provides adequate support for human and financial resources, for the implementation of the proposed mitigations and effective environmental management during the planned mining activities.

It is further extremely important to include an Environmental Control Officer (ECO) on site during the relevant phases of the intended activity to ensure that all the mitigation measures discussed in this report and the EMP are enforced. Rehabilitation back to the natural state is a key component and will be undertaken in a phased manner as the mining activities progress. It is advised that the proponent strictly engages the guidelines outlined within the EMP with regards to the rehabilitation of the quarries once mining activities has ceased so as to restore the area to its near natural state and to reduce the associated negative environmental impacts.

Since no objection was received during the consultation period, the project is well received by both I&AP's as well as by stakeholders. It is also concluded that there are no sensitive cultural or heritage materials on the proposed sites and in case of any such material found at site

during construction phase, this should be handled as per the National Heritage Act. However, the scope is limited to assessing the potential impacts associated with the proposed development; therefore the effect on the surrounding environment is based on the current land use.

The proponent is recommended to implement an internal and external monitoring of the actions and management strategies developed during the mining duration. It is also required that a final Environmental Monitoring report be prepared by the Environmental Coordinator / Consultant and to be submitted to the regulators towards the end of the proposed quarry project. Moreover, the proponent should develop and implement a monitoring program that will fit into the overall company's Environmental Management Systems (EMS) as well as for any future EIA for possible quarrying projects. Negative impacts identified in the report can be satisfactorily mitigated through the full implementation of the mitigation actions recommended in this report. It is hereby recommended that proponent take all the necessary steps to implement all the recommendations of the EMP for the successful implementation and completion of the proposed quarry project for ML236 situated in the Karibib District, Erongo Region, Namibia.

Therefore, it is recommended that the dimension stone mining and associated operations on the project site be granted an Environmental Clearance Certificate, provided that: All mitigations provided in this EMP should be implemented as stipulated and where required and emphasized, improvement should be effectively put in place. The Proponent and all their workers comply with the legal requirements governing this type of project and its associated activities.

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