Environmental and Social Management Plan (ESMP) for small-scale mining on three (3) Mining Claims; 69263, 6926 & 69265, Sand Mining activities in Otjongava River and Bricks making project at Otjongava village in Opuwo, Kunene region.

Prepared for

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LIST OF ACRONYMS

EMA	Environmental Management Act
EAP	Environmental Assessment Practitioner
ESMP	Environmental and Social Management Plan
I&AP	Interested and Affected Parties
MAWF	Ministry of Agriculture, Water and Forestry
MET	Ministry of Environment and Tourism
MME	Ministry of Mines and Energy
MOL	Ministry of Labour
MWTC	Ministry of Works, Transport and Communication
NACOBTA	Namibia Community-based Tourism Association
NBSAP	National biodiversity Strategy and Action Plan
NDP	National Development Plan
PPE	Personal Protective Equipment
SHE	Safety, Health and Environment
ToR	Terms of Reference

1. INTRODUCTION AND BACKGROUND

1.1 Introduction

Mr. Jasper Uys is legal owner of three mining claims (69263, 69264 & 69265) in Otjongava village in the outskirt of Opuwo in Kunene region. The initial EIA was conducted in between 2014 and 2015 for small-scale mining activities only and an Environmental Clearance Certificate (ECC) was obtained in 2015. In 2017, Mr. Jasper Uys decided to commence with sand mining activities in Otjongava River and Bricks making project to add to the mining activities. The initial ECC has since been amended to include the sand mining activities in the Otjongava River and Bricks making project. The ECC was issued on the 14 of June 2017 and had expired on the 14 of June 2020, hence the application for renewal.

Due to slow economic situation experienced over the years, all activities have been dormant since the issuance of the ECC in 2017. Hence, the environmental settings of the affected environment remain pretty much the same both in terms of biophysical and socio-economic factors. This has been verified by the Environmental Assessment Practitioner, prior to the updating of this ECC. This ESMP was prepared and updated in line with Section 8 (j) of the EIA Regulations (GN 30 of February 2012).

1.2 Objectives of this EMP

The purpose of the Environmental and Social Management Plan (ESMP) is to provide measures for the mitigation and management of potential negative impacts and the optimization of potential positive impacts that may be associated with the proposed project during the construction, operational and potential decommissioning phases. The need for compliance and the need for monitoring compliance by inspection are explained as well as various role players and their responsibilities and reporting procedures are contained within this ESMP.

The EMP is therefore important in ensuring that the management actions arising from EIA processes are clearly defined and implemented through all phases of the project life cycle. It is not a standalone document; however, it must be read in conjunction with the Scoping report. All personnel taking part in the planning, construction, operation, and maintenance of the proposed Outapi WTP should be made aware of the contents of this EMP.

2. PROJECT DESCRIPTION

2.1 Locality

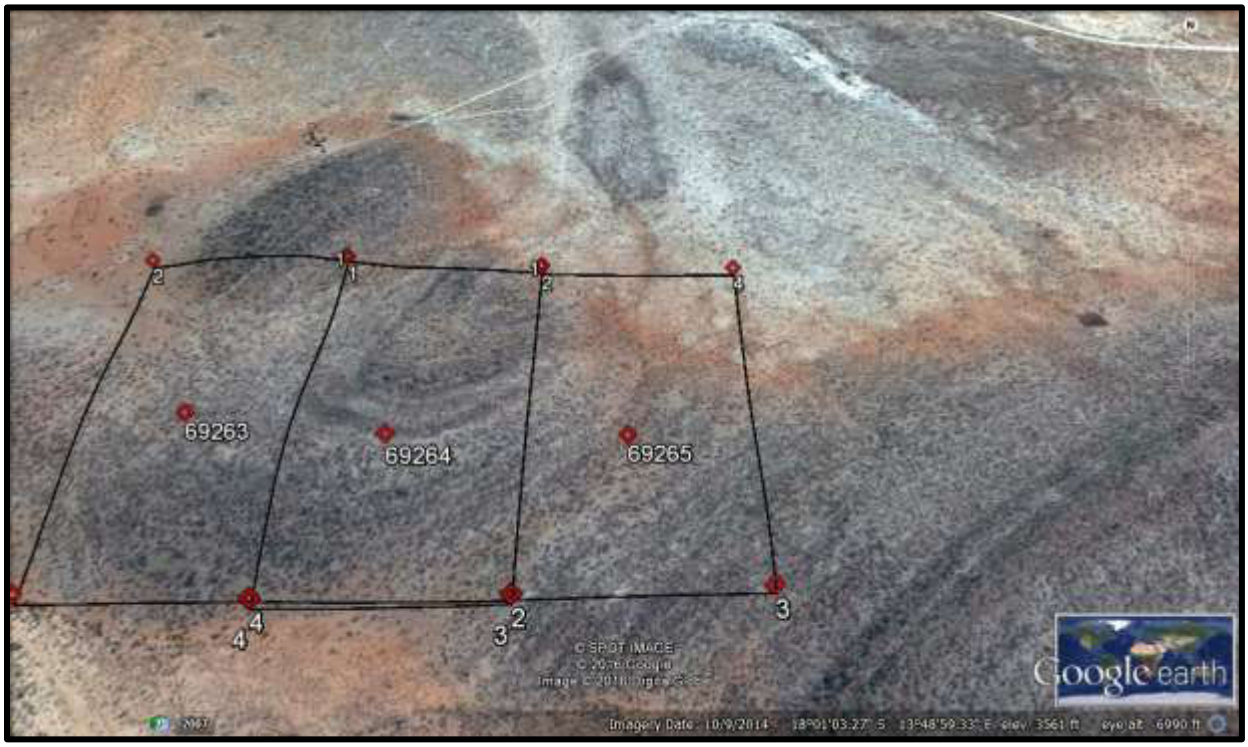
The small-scale mining, sand mining and bricks project are all located within the same vicinity in the Otjongava village, about 7km north-east of Opuwo town in Kunene region. The site is accessible through a district road (D3703) which connects to Opuwo town and other parts of the region.

Figure 1; Site locality

2.2 Description of activities

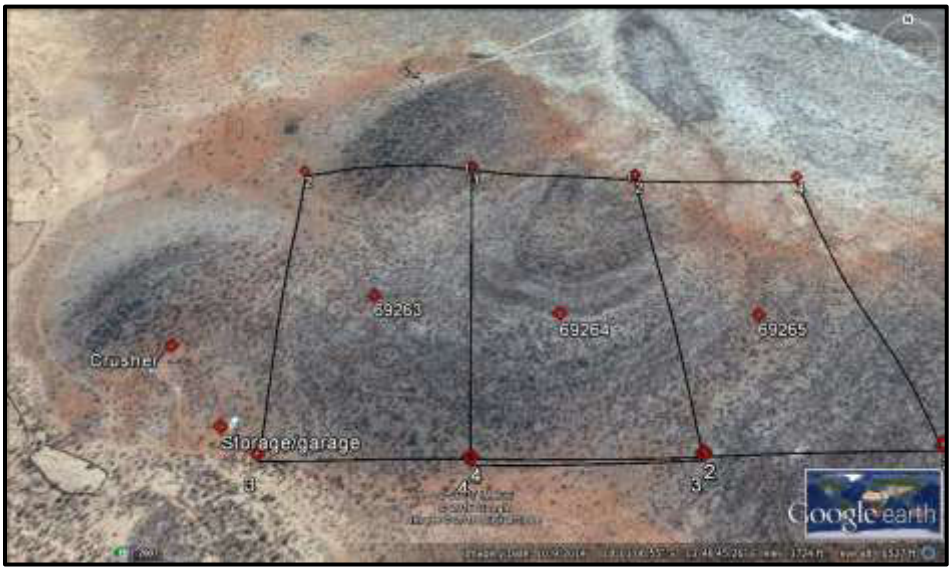
a). Small-scale mining activities

The area covered by the three mining claims measures approximately 54ha (18ha each). They are located adjacent to each other as depicted in the figure below. The small-scale mining activity involve the extraction of industrial minerals in the form of quartzite rock. The extracted material is then supplied to the crusher plant. The crusher plant is located at the base of mining Claim 69263.

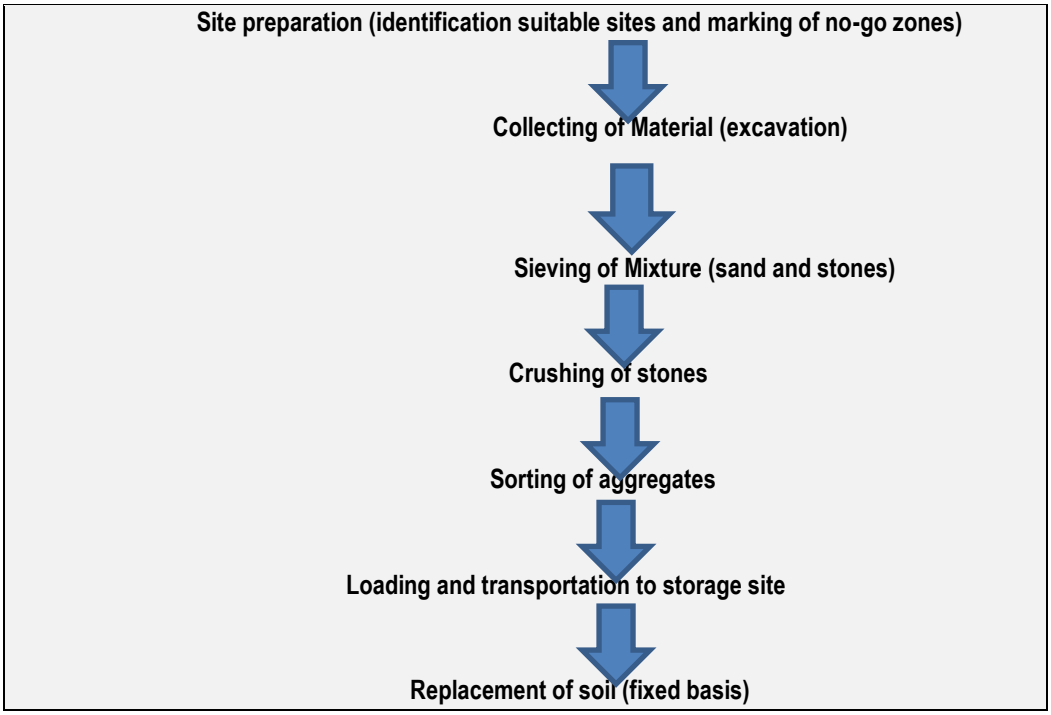


b). Crusher plant and auxiliary facilities

There is also a mining camp consisting of a maintenance workshop, storage room and temporary accommodation for few staff members. The developer (Kunene Crush Stone cc) intends to establish a small brick making project at the mining camp. Bricks (super bricks) will be made from a mixture of crusher dust and river sand. The mining camp is enclosed in a fence with lockable gates to prevent animal movement and trespassing.



The crushing of aggregates is taking place in a simple process explained in the diagram below.



The sand mining activities will be taking place in the Otjongava River, an ephemeral river which is about 500m from the crusher plant. The sand mining process involve extraction of river sand by means of Front-End-Loader and load it into trucks. No sieving is taking place onsite and sand is extracted as per the need, hence no stock piling is done within the river bed.

3. IMPLEMENTING THE ESMP

3.1 Role Players and Responsibility

The overall implementation of this ESMP, through the appointed contractor, remains the responsibility of the project proponent, KUNENE CRUSH STONE CC However different stakeholders will also have roles to play in order to ensures proper project management.

a. (Proponent)

- Ensure that the employees and the contractor (if necessary) are aware of all specifications, legal constraints as well as procedures pertaining to the project specifically with regards to the environment.
- Ensure that all stipulations within the ESMP are communicated and adhered to by employees, contractor(s) and sub-contractors.
- Monitor the implementation of the ESMP throughout the project by means of site inspections and meetings. This will be documented as part of the site meeting minutes.
- Be fully conversant with the Environmental Impact Assessment for the project, and all relevant environmental legislation
- Above all, appoint a responsible official to oversee the implementation of the ESMP, conduct environmental monitoring and prepare and submit environmental report to the MET

b. Contractor and sub-contractors (When necessary)

The Contractor(s) Managers will be contractually required to comply with the various commitments in this ESMP. In the event of nonconformance, the contractor will be required to take corrective action according to the requirements of the ESMP. Clean up may be done on their behalf, and if so, the contractor will be back-charged accordingly.

c. Environmental Consultant

The service of an independent Environmental Consultant/specialist will be required for the monitoring, reviewing and verifying of compliance with the ESMP and conditions of the environmental authorization by the Contractor.

d. Ministry of Agriculture Water and Forestry

MAWF will play a supervisory role to ensure that the project adhere to the conditions of the Forest Permit (To be obtained) as well as to monitor water utilizations at the site in accordance with the contractual agreement. This can be done by means of regular site inspections and assessments.

e. Ministry of Environment and Tourism

MET, through the office of Environmental Commission are the regulating authority and thus responsible for the approval/disapproval of this ESMP. Moreover, MET are responsible to issue the Environmental Clearance Certificate and impose conditions that need to be complied with. Finally, MET may conduct monthly inspections as well as review project environmental and incidental report?

3.2 Awareness and Training

It is important to ensure that all personnel have the appropriate level of environmental awareness and competence to ensure continued environmental due diligence and ongoing minimization of environmental harm.

To achieve effective environmental management, it is important that employees, Contractors and Subcontractors are aware of the responsibilities in terms of the relevant environmental legislation and the contents of this ESMP. This can be achieved through training. The environmental training should typically include the following:

- Employees must have a basic understanding of the key environmental features of the site and the surrounding environment
- The significant environmental impacts, actual or potential, as a result of their work activities
- The environmental benefits of improved personal performance.
- Their roles and responsibilities as well as importance in achieving conformance with the environmental policy and procedures, and with the requirement of the Agency's environmental management systems, including emergency preparedness and response requirements.
- The potential consequences of departure from specified operating procedures.
- The mitigation measures required to be implemented when carrying out their work activities.
- The importance of not littering and the need to use water sparingly.
- Details of, and encouragement to, minimize the production of waste and re-use, recover and recycle waste where possible.
- Details regarding archaeological and/or historical sites which may be unearthed during construction and the procedures to be followed should these be encountered?
- Details regarding fauna and flora of special concern

4. LEGAL REQUIREMENTS

The following are some of applicable laws and regulations that needs to be complied with. More information on this section can be obtained from the main report (EIA Report).

Regulatory Instrument	Legislative Requirements
a) Forestry Act No 27 of 2004.	The act affords protection to certain indigenous plant species and any intention to remove such species would have to be legalised through a permit from the same ministry. The following protected species were identified at the project site; • *Sterculia africana* • *Boscia foetida* • *Commiphora species* • *Sarcocaulon mossamedense*
b) Water Resources Management Act 2004	This act provides provision for the control, conservation and use of water for domestic, agricultural, urban and industrial purposes.
c) Nature Conservation Ordinance (Ordinance 4 of 1975).	Conservation of indigenous Species
d) United Nation Convention on Biological Diversity (UNCBD) (1992).	Conservation of biological diversity
e). National Heritage Act 27 of 2004	Any material of cultural, archaeological importance found must be reported to the National Heritage Council
f). Public Health and Environmental Act, 2015	Prohibition of nuisance in terms of dust, noise, pollution etc.
g). National Labour Act	Working hours, condition and remuneration of employees
h). Affirmative Action (Employment Act, No.29 of 1998)	Implementation of Affirmative action policy i.e. right of women and disabled people
i). Regulations relating to the Health and Safety of Employees at Work, 1996	Employee's working environment and the use of protective measures
j). Minerals (Prospecting and Mining) Act of 1992	Rights in relation to the minerals as well as transportation or exportation of such resources
k). Atmospheric Pollution Prevention Ordinance no. 11 of 1976	Prevention of atmospheric pollution
I). Communal Land Act, of 2015	Obtain Leasehold from the Ministry of Land Reform (MLR)

5. MANAGEMENT AND MITIGATION MEASURES: OPERATION PHASE

Significant impacts	Source of impacts	Mitigation measures	Monitoring actions and methods	Responsibility
a) No-compliance				
• **Lack of implementation of this EMP result into various environmental risks arising from project activities**	Non-compliance to this EMP could cause various negative impacts as identified. Lack of commitments toward the environment. Lack of knowledge or limited capacity to implement	The Proponent must appoint a responsible person who should spearhead the implementation of the EMP and conduct regular monitoring The proponent should establish a SHE policy in order to determine their commitments toward environmental sustainability All employees must be trained on the SHE aspects and what is expected of them.	Annual Reports	Proponent
b) Impact on biodiversity				
• **Loss of habitants**	Vegetation clearance, removal of top soil, habitants destruction	-Minimize vegetation clearance and avoid damage to sensitive areas -Land re-vegetation plan should be implemented simultaneously within project activity	Monitor growth of new plants, provide favorable environment for regrowth of indigenous species, and remove any alien invasion or weeds to reduce competition.	Proponent
• **Loss of indigenous vegetation**	Vegetation Clearance	-All large indigenous trees should be marked and left out -Obtain Tree removal permit from MAWF	Regular inspection at project site	Proponent MAWF; Forestry Department
• **Loss of fauna and sensitive habitants**	Mining operations in sensitive site could cause large habitant fragmentation and loss of fauna	Rocky outcrop area should be avoided for disturbance and maintained in its natural state. -Awareness to all	Not necessary	Proponent

c)	**Water availability and quality**				
	Over abstraction	Water usage may lead to over abstraction and degradation of the water sources	Water should only use for domestic purpose. Recycle water for bricks project	Regular check the presence of erosion gullies, especially after rain.	Proponent
	Pollution	Pollution of fresh water sources (river) from mining activities	-Limit water usage and avoid pollution of water sources, -Encourage water recycling -No additional activities that use more water should be allowed at sites i.e. gardening, car wash etc. No discharge into river beds	Monitor borehole water yield on regular basis	Proponent
d)	**Impacts on Groundwater**				
•	**Depletion of Water table**	Sand mining transforms the riverbeds into large and deep pits which deplete the water table	Limit the sand mining to the depth of 1.5m	Regular inspections	Proponent
e)	**Impacts on Topography and drainage**				
•	**Slope stability and Erosion**	Mining on sensitive sites and drainage lines may affect the slope stability and site drainage	Avoid mining on slope areas i.e. hilltops Mining should be confined to flat areas. Avoid major drainage lines and no drainage maybe diverted for any reason	Regular inspections	Proponent
f)	**Impacts on local ecology**				
•	**Loss of topsoil during mining**	Mining on sensitive areas may cause soil erosion. Exposure of soil to wind may also cause erosion	Top soil must be replaced after mining Provide protective mechanism to prevent soil erosion by wind	Regular inspection	
•	**Impact on riparian zone**	Sand mining may cause sedimentation of riparian zone	Soil conservation measures such as berms, gabions should be used on-site to help reduce erosion.	Regular inspection	

g) Impact on local Geology				
	Disturbance of geotechnical of the soil during mining.	Mining plan should be prepared to avoid sensitive sites and ensure site slope stability.		Proponent
h) Impact on land use				
• **Decrease in scenic quality or "sense of place".**	Removal of Trees/Desertification of the area	-Develop a site re-vegetation plan and should be implemented simultaneously within project lifespan		Proponent
• **Degradation**	Land degradation would be one of the most significant impacts arising from mining activities.	It is expected that the area will return to its close natural states, thus its natural function has nit total deteriorate as it can still be used for other purposes.	Monthly report	Proponent
i) Impacts on Human Health and Safety				
• **Noise and vibrations**	Running generator, crushing units and Moving heavy vehicles may raise noise level and cause earth vibration	-keep noise level within permissible limits 75dB -Avoid operating too many machineries at once -Apply soundproof to running machineries/equipment -Minimum driving speed -Protective gears for all employees (ear plugs) and reduce exposure time of workers to the higher noise level by shift management	Regular monitoring of ambient noise level at the project site -Ensure that all Employees/drivers are informed	Proponent
• **Air quality**	-Crushing of stones may result create dust -Heavy vehicles may increase concentration of CO_2 in the air	-Regular water spraying on access roads and crushing sites -Crusher must be fitted with a bag filter to arrest dust emission -Soil and Stones mixture must be sieved before crushing to reduce dust generation -Protective gear (dust masks) for all employees working at site	Regular monitoring of dust level at site -Regular check-ups of workers	

j) Waste Management				
• **Sewage waste**	Accommodation at site, sanitation for employees while at work	-Proper sanitation, avoid discharge in river streams by using proper latrine or septic system - Awareness among workers	Regular check for any leakages or accidentals	Proponent
• **Solid waste**	Generation of general waste i.e. plastic, food items, supplies etc	-All waste should be contained and properly dumped at nearby municipal dumping sites -Provide proper recycle bins at site -Develop waste collection program -Create awareness among employees	Regular update of the waste collection program	
• **HIV and AIDs**	-Higher risks of HIV transmission as migrant construction workers are more likely to ignore the consequences of casual sexual relationships.	Recruit people from local community to avoid migrant workers	-Regular health check ups	
• **Access road**	Plying of trucks and tractor trolleys from public road to the site may cause damage to environment and also inconveniences to the public	-Limit speed limit (40KM) -Avoid creating too many roads -Access road crossing over the river bank should be placed at site of least steepness of river bank	Develop a Site Access plan	Proponent
k) Positive impacts				
• **Local employment**	Direct project employment	-Local people should be given preferences	Train local to build capacity	
• **Business prosperity**	Sourcing of supplies i.e.	-The project should buy from local stores/shops in order to contribute to the local economy	Make research of local supplies and capacity	Proponent

6. ENVIRONMENTAL COMPLIANCE AND MONITORING: OPERATIONAL PHASE

In order to ensure adherence to this ESMP, it is advisable to keep monitoring of certain aspects. This monitoring is ultimate responsibility of the appointed official. Monitoring activities should be done at different interval/frequencies as indicated in the table below and should be done throughout the project life span. Any negative impact found should be reported to the Environmental Commissioner and correct mitigation measure should be established by the project team in consultation with different specialists. It would be advisable that the ESMP be revisited at intervals of 3 years or less to ensure that changes in site conditions or operation are addressed, as well as to incorporate any new or amended legislation that may be applicable.

Issue to be monitored	What need to be monitored	Monitoring frequency	By Who?
Water sustainability	Since the project will make use of borehole, it is very important to monitor Water levels and Abstraction rate.	Every three months	The in collaboration with MAWF: Water Affairs
Soil Erosion	The project activities will require removal of top soil, leaving the topsoil vulnerable to wind or water erosion	After rain season	Proponent
Indigenous trees	Damages to big indigenous trees	Regularly	Proponent, MAWF; Forestry Department
Alien invasion	Monitor the presence of any new plant species and removal of any alien species	Regularly	Proponent, MAWF: Forestry Department
Air quality	Monitor the quality of air by monitoring CO_2 and Dust level	Every month	Proponent
Noise level	Monitor ambient noise level at project site (must be kept within the standard 75dB)	Every month	Proponent
Implementation of Mitigation measures	Ensure total compliance to this EMP and adherence to the regulative measures	Throughout	Proponent

7. SITE ENVIRONMENTAL CHECKLIST

The following checklist should be used during the monitoring program. The checklist will enable the project to cope with new circumstances and/or requirements of community or other Authorities as they arise.

	KEPT AT STANDARD LEVEL?		
	YES	***NO***	***Comments***
Air quality			
Soils and hydrogeology			
Noise level			
Condition of access roads			
Borehole water yield			
Waste materials			

This information is true and correct to the best of my knowledge

Name of person inspecting site: _____

Signature: _____

Date of site inspection: _____

8. MITIGATION MEASURES: DE-COMMISSIONING PHASE

One of the major concerns of open mining activities such stone crushing is land degradation resulting from deforestations and topsoil disturbances. It is a requirement of EMA, No.07 of 2007 to ensure simultaneous reclamation of land along with other mining operations. This can be achieved through a rehabilitation program, which should be year-wise to reduce the time gap between land exaction and reclamation.

Keeping the above in view, the land reclamation shall be carried out with emphasis on plantation. Moreover, the area under disturbance must be kept at minimum. This shall be achieved by ensuring the reclamation of excavated area is concurrently with mining activities to reduce gap between the first damage and first reclamation activity thus the area should be reclaimed within minimum time after completion of mining**. The rehabilitation plan** (next section) is prepared and is to be updated periodically to reflect current changes in operational aspects that may affect reclamation of project components.

9. ABANDONING OF SITE

During post mining period, all disturbed areas in the mining site must be reclaimed before decommissioning/abandoning the mine, excluding the permanent infrastructures such as office buildings, fences etc. which should donated to the community for social use i.e. school, health etc. Other infrastructures, such as crushing plants, Vehicles, equipment, stockpiles and material handling systems should be dismantled and reclaimed and no such items should be abandoned at the site. In case of abandoning of sites and projects, the mineral rights shall be ceased by the relevant authority (MME) as per the Mineral Act and the leasehold (land rights) shall be returned to the community. Any items left or abandoned the site can be reclaimed by the relevant local authority with or without the proponent's consent.

ANNEXUE: A

PROVISIONAL REHABILITATION PLAN FOR THE MINING ACTIVITIES

Prepared by: **Green Gain Consultant cc, 2015**

Mr. J.K. Amushila (*M.Sc. Environmental Management*)

This section describes the Company's reclamation objectives, principles and planning for areas that would be disturbed by the Project as well as the steps it intends to take to rehabilitate disturbed areas during the first 3years period of operation.

1. Introduction

Land rehabilitation is the process of returning the land in a given area to some degree of its former state, after some process has resulted in its damage. Many projects and developments will result in the land becoming degraded, and mining is one of the best examples.

It is the objective of the project proponent that the operation of this mining is within the context of sustainable development. Although there will be no blasting or drilling at the mining site, the mining activities will result in several disturbances such as destruction of the natural vegetation and creation some open trenches leaving the area prone to soil erosion and may result to further degradation if left un-rehabilitated. This reclamation and closure/decommissioning plans would be periodically updated to reflect current changes in operational aspects that may affect reclamation of Project components.

1.2 Reclamation objectives

The Company has established general planning and development objectives that would meet or exceed international environmental guidelines and best management practices for reclamation and mine closure including:

- Adhere to all statutory requirements,
- Provide long-term stable site configuration to attain beneficial post-mining land use,
- Rehabilitate mine related disturbances to obtain post-mining land use compatible with prevailing conditions in the area,
- Eliminate public safety hazards,
- Perform reclamation activities concurrent with mining and
- Allocate sufficient funds to implement these objectives.

1.3 Reclamation principles

The Company would follow basic principles of reclamation including:

- Progressively rehabilitate sites where possible,
- Reshape areas disturbed by mining operations to the extent possible to attain:
  - *Site stability,*
  - *Adequate drainage to minimize erosion,*
  - *Compatibility with desired long-term land use, and*
  - *Surface conducive to vegetation.*
- Salvage and stockpile topsoil (growth medium) in accordance with suitability for reclamation
- Incorporate use of local or native species in vegetation plan,
- Remove all facilities and equipment not required for restoration in a timely manner,
- Properly dispose of residual hazardous materials,
- Identify overburden and exposed strata that may be deleterious to water quality or re-vegetation efforts and
- Monitor and manage rehabilitated areas until vegetation is self-sustaining and all reclamation objectives have been met.

2. General Approach

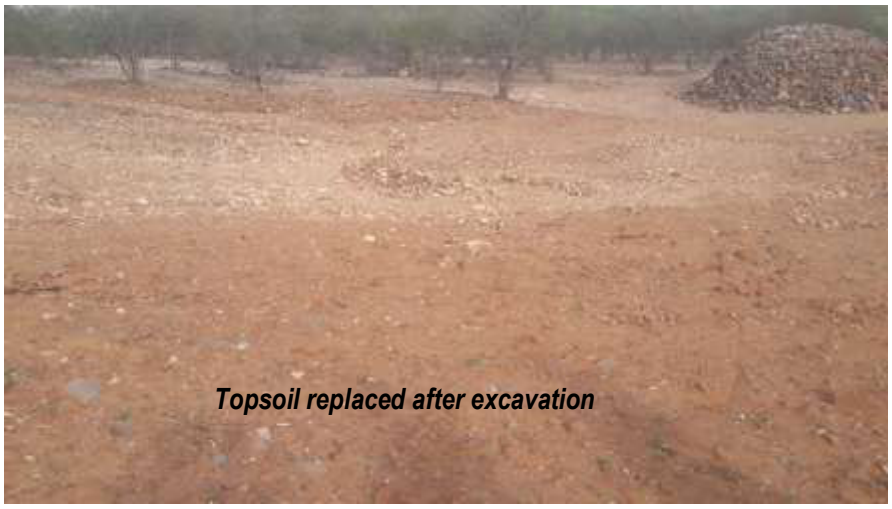
In order to comply with the above principles and ensure a successful reclamation of the mining area, the company will be take responsible of the following activities;

- Conservation of topsoil
- Prevention of soil erosion
- Afforestation and new plant community
- Maintaining a sustainable plant community

2.1 Conservation of top soil

Conservation of top soil is very important thus it helps to reduce erosion and stabilization of slopes. The top soil is also crucial to the re-establishment of plant community thus it contains nutrients to support plant growth. Top soil and subsoil will be is replaced back in the trenches and excavations soon after sieving. Sediment controls structures will be installed during the initial stages mining process to ensure that any increased sedimentation resulting from site disturbance is captured and managed. No mining activities is done on the hilltops or slope areas to avoid soil erosion.

Excavated area during mining



Topsoil replaced after excavation

2.2 Prevention of soil erosion

The following measures must be used to prevent soil erosion

- Replace and properly spread the soil over the pit holes
- Provide some protective garland drains around the mining site wherever required to arrest soil from carried away by running water
- Erosion gullies should be filled with local stones and soil
- Throw stones around the soil dumps to prevent soil from being carried away

2.3 Afforestation plan and new plant community

The afforestation plan entails the establishment of new plant community in order to avoid land degradations. The re-establishment of will help to stabilize the soil of the area by protecting it from erosion by means rain and wind. From the initial mining activities it has been observed that method used by Kunene Crush Stone will allow for re-establishment of plant communities. This is because re-growth of some local plant species (mopane and some grass species) can be observed in the post mined area (See figure 2 below).

New seedling of mopane in the mined out area

New grass plants in the mined out area

In order to accelerate the regeneration of plant community at the disturbed area, the proponent must consider other mechanisms such as re-seeding program. This can be done by spreading or broadcasting seeds of local indigenous plants over the area and ensure the re-establishment of new plant community. This can be done during the replacement of the topsoil. This could be done during the rainy season to enable fats growth.

2.4 Maintaining a sustainable plant community

The establishment of new plant community will be greatly affected by natural factors such as water availability and soil conditions. The proponent will ensure to limit movements (i.e. vehicles, animals etc.) and disturbances in the new plant communities. The proponent will also provide necessary support to the plant community such as watering, mulching erosion control in order to enable the establishment of a stabilized forest. The proponent's official responsible for monitoring will also conduct regular monitoring to inspect growth of invasive plant species. In case of any invasive plant observed it shall be reported to the Ministry of Agriculture, Water and Forestry for remedial actions. Furthermore, the MAWF (Forestry) shall conduct regular inspection to the mining area to observe the project activities as per the National Forestry Act.

To this end, this Rehabilitation Plan shall form part of the EMP and thus it's a legal obligation for the proponent to implement the outlined actions and ensure sustainable reclamation of the disturbed area. The Plan is to be reviewed annually to include new issues that may arise during the course of the mining operation or accommodate any climatic changes that may prevail at time.

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