

**UPDATED ENVIRONMENTAL MANAGEMENT PLAN FOR MARBLE  
EXPLORATION AND MINING ON MINING CLAIMS NUMBER: 67286  
– 67289 (4) IN THE KARIBIB AREA, ERONGO REGION.**

**FOR**

**MARK HOFFMANN**



*PREPARED BY*



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**PROJECT DETAILS**

**TITLE** UPDATED ENVIRONMENTAL MANAGEMENT  
PLAN FOR MARBLE EXPLORATION AND  
MINING ON MINING CLAIMS NUMBER: 67286  
– 67289 IN KARIBIB AREA, ERONGO REGION.

**TERMS OF REFERENCE**

**AND SCOPE OF THE PROJECT** MARK HOFFMANN

**AUTHORS** OUTRUN CONSULTANTS CC

**CLIENT** MARK HOFFMANN

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**AUTHORISED SIGNATURE:**



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**LEAD CONSULTANT – EA PRACTITIONER**

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<b>STAGE OF REPORT</b>	<b>FINAL UPDATED ENVIRONMENTAL MANAGEMENT REPORT</b>
<b>CLIENT</b>	<b>MARK HOFFMANN</b>
<b>LEAD CONSULTANT</b>	<b>OTRUN CONSULTANTS CC</b>
<b>CONTRIBUTOR(S)</b>	<b>JOSIAH T. MUKUTIRI</b>

## DECLARATION

I hereby declare that I:

- have knowledge of and experience in conducting assessments, including knowledge of the Environmental Management Act (7 of 2007), its regulations and guidelines that have relevance to the proposed activity;
- have performed the work relating to the application in an objective manner, regardless of whether or not the views and findings were favourable to the applicant;
- Have complied with the Act, and its regulations, guidelines and other applicable laws.

I also declare that there is, to my knowledge, no information in my possession that reasonably has or may have the potential of influencing –

- Any decision to be taken with respect to the application in terms of the Act and its regulations; or
- The objectivity of this report, plan or document prepared in terms of the Act and its regulations.

## Executive Summary

### 1. INTRODUCTION

This document constitutes an updated Environmental Management Plan (EMP) for the environmental management of the proposed marble exploration and mining on mining claims number: 67286 – 67289 in Karibib area, Erongo Region. The contents of the updated EMP will be binding to Mark Hoffmann and all parties who have a role to play in the implementation phases, confirmatory exploration activities, mining or operation and decommissioning thereof, as relevant to the active roles played by the various responsible parties or actors involved.

This document was prepared according to the Namibian Environmental Management Act (No. 7 of 2007) and its supporting Environmental Impact Assessment Regulations of (2012) whereby various aspects of the planned activities are considered under the listed activities which may have an impact on the environment. Therefore, given that this activity requires authorization and an Environmental Clearance Certificate (ECC) from the Environmental Commissioner (Ministry of Environment and Tourism) the Proponent did as required and obtained ECC number 00588 valid for three (3) years until the 31<sup>st</sup> of March 2023.

Mark Hoffmann (referred to as the applicant) appointed Outrun Consultants CC, an independent Environmental Assessment Practitioner to the project as required by the Environmental Management Act, 2012 to renew the expired ECC.

The commitments described here form part of the Environmental Clearance Certificate (ECC) between Mark Hoffmann and the state, as represented by the Ministry of Environment, Forestry and Tourism (MEFT). Non-compliance is considered illegal and may have legal consequences. The amendment, transfer or renewal of the ECC should be communicated to the Environmental Commissioner as stipulated in the Environmental Management Act (EMA) of 2007 (S 39-42) and its EIA Regulations (S 19-20). Any changes to the planned activities considered herein will require an amendment to this updated EMP and the ECC.

This document constitutes an updated EMP, amended to accompany the application for renewal of the ECC that was issued for mining claims number: 67286 – 67289. The nature of the proposed activities and the operational sites recorded in the EMP have remained unchanged and the EMP is therefore adopted in its existing form, with the addition of two important sets of documents:

Appendix A: Permission to Erect Accessory Works, Including Site Maps

Appendix B: Landowners Agreement (Single most important interested and affected party



## 1.1 SITE LOCALITY

The proposed exploration and mining area is illustrated in the figure 1 below. This area lies to the south-west of Karibib in Erongo Region of Namibia. This region of the country is known to its presence of marble and gemstones.

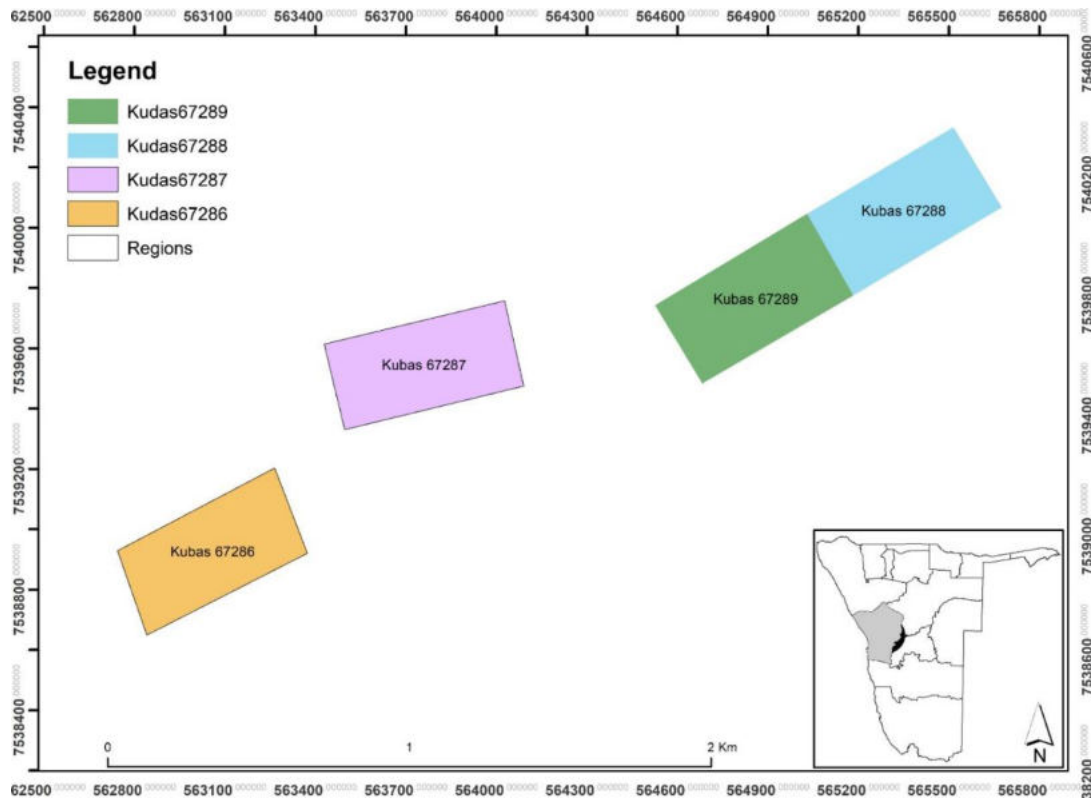


Figure 1: The location of Mining Claims 67286 to 67289 in Karibib District in Erongo Region. Source: Own map.

## 1.2 MARBLE EXPLORATION AND MINING: ISSUES AND KEY MEASURES TO BE UNDERTAKEN

The exploration and mining activities will cover portions of the Mining Claims Number: 67286 – 67289.

1.2.1 The block yard, waste deposit and accessory works at each site will cover a combined area of +- 1 hectare. The block yard is planned on the existing one that is completely void of vegetation.

1.2.2 The waste material is planned to be recovered through market testing and for value addition through future processing.

## 1.3 EXPLORATION AND MINING METHOD

The exploration and mining methods to be used for this specific marble mining operation is the opencast quarry method.

- Maximum bench heights +- 8 metres.

- Minimum bench sizes cut +/- 100m<sup>3</sup> (larger benches cut will result in less stress-fractures and therefore higher block recovery).
- Marble cut with diamond wire, percussion drilling and plugs and feathers.

- Water to be recycled.
- Blocks to be moved and loaded with front-end-loader.

#### 1.4 BLOCKS HANDLING METHOD

- Marble blocks to be sold ex quarry as rough blocks.
- Dressing of blocks done by means of diamond wire cutting.
- Quality checks: Fractures, veins, inclusions.
- Minimum block dimensions: +- 2.00 x 1.00 x 1.00 metres preferred block dimensions: +- 3.00 x 1.80 x 1.30 metres.
- A processing plant will be appointed for value addition once the economic position of the project has become stable and sustainable.

#### 1.5 PURPOSE OF THIS REPORT

An EMP is one of the most critical products of an Environmental Assessment (EA) process. An EMP synthesizes all recommended mitigation and monitoring measures, laid out according to the various stages of a project life cycle, with clearly defined follow-up actions and responsibility assigned to specific actors. This updated EMP is a legally binding document and has been drafted in accordance with the Namibian Environmental Management Act (No. 7 of 2007) and its Environmental Impact Assessment Regulations (2012) (MET, 2008). This plan describes the mitigation and monitoring measures to be implemented during the following phases of these developments.

This report does not include the decommissioning phase which should be dealt with on its own at the end of the exploration and / or mining activities. This warrants an EIA process to be conducted prior to the site being decommissioned. However, this EMP makes recommendations that should be considered prior to decommissioning.

The components of the EMP should meet the requirements of Section 8 (j) of the EIA Regulations. The EMP must address the potential environmental impacts of the proposed activity on the environment throughout the project life-cycle. Furthermore, it should have an inclusion of systems for assessment of monitoring and management arrangements after the project implementation. It is therefore the responsibility of MET and the proponent to ensure that the proposed activity as well as the EMP process conforms to the principles of the EMA and should ensure that any contractors appointed comply thereto. Outrun Consultants therefore, carried out the EMP process according to the EMA.

## 2. PROJECT OVERVIEW

The applicant, Mark Hoffmann is the holder of Mining Claims Number: 67286 – 67288, with mining claim 67289 pending, which he applied for at the Ministry of Mines and Energy in terms of the Minerals Act and on the basis of its capacity and competence to carry out exploration. The proposed exploration activities are within the Karibib magisterial district in the Erongo region which is located about 40 kilometers east of the town of Karibib.

The planned marble exploration and mining operation will target only solid dimension stone outcrops with limited fracturing and no soil / vegetation cover. Areas that appear to fit these criteria were initially selected with the help of satellite imagery and aerial photographs and later developed according to economic potential. Targets of economic potential and targets that are of no economic interest will be distinguished accurately before testing market response with test blocks from selected sites.

### 2.1 PHASES OF THE PROJECT

The process which was followed in compiling this EMP is in compliance with the Environmental Management Act of (2007) and Environmental Impact Assessment Regulations 2012, and applies the principles of sustainable development, Vision 2030, National Development Plan 5 and the Harambee Prosperity Plan. The purpose of this EMP is to formulate mitigation measures that are made binding on all contractors during the exploration phase as well as during the mining / operational phase. The point of departure for this EMP is to take a proactive route by addressing potential problems before they occur. This should limit corrective measures needed during the mining and operational phases of the development. Additional mitigation will be included throughout the project's various phases, as required and if necessary. This EMP deals with the following phases presented in the following sections: 2.2 – 2.5.

### 2.2 PLANNING AND DESIGN PHASE

This updated EMP offers an ideal opportunity to incorporate proactive environmental management measures with the goal of attaining sustainable and socio-economic development. While there is still the chance of accidental impacts taking place; however, through the incorporation of contingency plans (e.g. this EMP) during the planning phase, the necessary corrective action can be taken to further limit potential impacts.

### 2.3 EXPLORATION AND MINING PHASE

The bulk of the impacts during this phase will have immediate effects (e.g. noise and dust / air pollution). If the site is monitored on a continual basis during the exploration phase, it is possible to identify these impacts as they occur. These impacts can then be mitigated through the contingency plans identified in the planning phase, together with a commitment to sound environmental management from MET.

## 2.4 OPERATION AND MAINTENANCE

By taking proactive measures during the planning and exploration phases of the marble exploration operations, potential environmental impacts emanating during the operational phase will be minimized. This, in turn, will minimize the risk and reduce the monitoring effort, but it does not make monitoring obsolete. It is therefore a goal of this report to reduce the impact on the immediate and surrounding environment by minimizing environmental harm and preventing environmental incidents:

- Systematically manage environmental risk
- Where practicable eliminate environmental risk, or if not practicable adequately control via application of a hierarchy of risk control measures.
- Legislation prescribed by the relevant Regulatory Authorities MEFT and Ministry of Mines and Energy (MME)

## 2.5 RESPONSIBILITIES

The responsibility for the implementation of the updated EMP ultimately lies with the Proponent, Mr. Mark Hoffmann, who is also responsible for the eventual exploration and mining activities. The implementation of this EMP requires the involvement of several key parties, each fulfilling a different but vital role to ensure sound environmental management during each phase of the proposed project.

The Proponent should appoint his Representative i.e. Employer's Representative (ER) to oversee all aspects of the exploration phases (including all contracts for work outsourced). Furthermore, the Proponent may decide to assign this role to one person for the full duration of the mine's lifespan, or may assign an ER to each of the exploration phases i.e. one for the Planning and Design Phase, one for the Exploration Phase and one for the Mining Phase. The ER will in turn appoint an Environmental Control Officer (ECO) to oversee the implementation of the whole EMP during the exploration mining operation and rehabilitation phases. Again, the ER (and/or the Proponent) may decide to assign this role to one person for both phases, or may assign a different ECO for each phase – i.e. one for the Exploration Phase and another for the Mining Phase. The following positions and their respective responsibilities are outlined below:

- Employer's Representative;
- Environmental Control Officer; and
- Contractor (Exploration, Operations & Maintenance and Rehabilitation).

### 2.5.1 EMPLOYERS REPRESENTATIVE

The ER is appointed by the Proponent to manage all contracts for work/services that are outsourced during all the project phases. Any official communication regarding work agreements is delivered through this person. The ER should with the commencement of the project appoint a competent ECO who will represent the Proponent on-site.

During the Planning & Design, Mining and Rehabilitation Phases, the ER will have the following responsibilities regarding the implementation of this EMP:

- Ensuring that the necessary legal authorisations have been obtained (Table 1: Relevant guidelines and legislated permit requirements.);
- Developing, managing implementation of and maintaining all Development, and
- Guidelines (Table 2: General Specifications.);

#### 2.5.2 ENVIRONMENTAL CONTROL OFFICER (ECO)

The ECO should be a competent person appointed by the ER. The ECO is the Proponent's on-site representative primarily responsible for the monitoring and review of on-site environmental management and implementation of the EMP by the exploration Contractor or exploration management. If no ECO is appointed the duties of the ECO fall upon the ER. During the mine exploration Phase, Operation & Maintenance and the Rehabilitation Phases, the ECO's duties include the following:

- Assisting the ER in ensuring that the necessary legal authorizations have been obtained;
- Maintaining open and direct lines of communication between the ER, Proponent, the exploration and/or exploration Operations and Maintenance Contractor, and Interested and Affected Parties (I&APs) with regard to this EMP and matters incidental thereto;
- Monthly site inspection of all mining and/or infrastructure maintenance areas with regard to compliance with this EMP;
- Monitor and verify adherence to the EMP (audit the implementation of the EMP) and verify that environmental impacts are minimized at all times;
- Be fully conversant with the Environmental Management Plan, and
- Be fully conversant with all relevant environmental legislation and the Namibian Energy Policy environmental policies and procedures, and

ensure compliance with them.

### 2.5.3 SAFETY HEALTH AND ENVIRONMENTAL (SHE) OFFICER

The SHE Officer will:

- Be fully conversant with the Environmental Management Programme.
- Be fully conversant with all relevant environmental legislation applicable to the project, and ensure compliance with them.
- Compilation of Method Statements together with Management and / or the Contractor (if any) that will specify how potential environmental impacts in line with the requirements of the EMP will be managed, and, where relevant environmental best practice and how they will practically ensure that the objectives of the EMP are achieved.
- Convey the contents of this EMP to the exploration site staff and discuss the contents in detail with the all Parties.
- Undertake regular and comprehensive inspection of the site and surrounding areas in order to monitor compliance with the EMP.
- Take appropriate action if the specifications contained in the EMP are not followed (Non-Compliance / Findings).
- Monitor and verify that environmental impacts are kept to a minimum, as far as possible.

- Order the removal from the exploration site of any person(s) and/or equipment in contravention of the specifications of the EMP.
- Report any non-compliance or remedial measures that need to be applied to the appropriate environmental authorities, in line with the requirements of the EMP.
- Submitting a report at each site meeting which will document all incidents that have occurred during the period before the site meeting.
- Ensuring that the list of transgressions issued by the ECO is available on request.
- Maintain an environmental register which keeps a record of all incidents which occur on the site during exploration. These incidents include:
  - Public involvement / complaints.
  - Health and safety incidents.
  - Incidents involving hazardous materials stored on site.
  - Non-compliance incidents.

## 2.6 MONITORING

A monitoring programme should be put in place not only to ensure compliance with the EMP through the exploration plan, but also to monitor any environmental issues and impacts which may not have been accounted for in the EMP, or could result in significant environmental impacts for which corrective action would be required. A monitoring programme will be implemented for the duration of the exploration phase of the project. This programme will include:

- Monthly audits will be conducted by the ECO/s for the duration of the exploration and mining phase – the ECO shall undertake this environmental monitoring with the audits considering compliance with the EMP, the EA conditions, as well as the conditions of any permits and/or licences.
- On-going monitoring of Contractors – this will include notification to the ECO and proponent EO should an incident take place.
- External auditing may take place at unspecified times by the authorities and/or other relevant authorities.
- An independent, suitably qualified, Environmental Auditor will need to be contracted to conduct an audit once the exploration and mining phase commences according to the provisions of the EMP.



- The Environmental Control Officer must undertake regular site inspections to ensure all legislative requirements are adhered to. Proof of such inspections shall be kept on file for ease of reference or for audit purposes.

## 2.7 CONTRACTOR

The exploration and mining contractor is responsible for the implementation of the EMP, on-site monitoring and evaluation of the EMP. It is envisaged that this project will assign the role of exploration and mining contractor and Environmental Control Officer to the Exploration Manager. It might be required to appoint at various periods for various tasks throughout the life cycle (exploration and mining through to decommissioning phase) additional contractors, if the operation grows beyond the planned scale. These can be broadly grouped into mine contractors and Operations and Maintenance Contractors. In order to ensure sound environmental management, the relevant sections of this EMP should be included in all contracts of work outsourced thus legally binding all appointed contractors and sub-contractors. All contractors shall ensure that adequate environmental awareness training (Table 2: General Specifications.) of senior site personnel takes place and that all exploration workers and newcomers receive an induction presentation on the importance and implications of the EMP. The presentation shall be conducted, as far as is possible, in the employees' language of choice. The Contractor should keep records of all environmental training sessions, including names, dates and the information presented.

## 2.8 ENVIRONMENTAL SPECIFICATIONS: AWARENESS, TRAINING AND COMPETENCE

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 minimisation 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 EMP. Environmental training may typically include the following:

- A basic understanding of the key environmental features of the exploration site and the surrounding environment;
- The requirements of the EMP and the environmental specifications as they apply to the exploration and mining of marble;
- The identification of archaeological artefacts if encountered on the site;
- Awareness of any other environmental matters, which are deemed to be necessary by the ECO;

- Record keeping including those that would have completed the relevant training.

Training can be done using an appropriate language that participants are comfortable and can understand easily. A register of all training programmes, participants names and what was covered during training should be maintained for future reference and institutional memory.

### 3. EXPLORATION AND MINING DEVELOPMENT REQUIREMENTS

The table below forms the core of this EMP for the exploration design and operational phases of the proposed project. Table one (1) can be used as a checklist on site, especially during the exploration phase. Compliance with this EMP must be monitored on a timely basis during both the design and exploration phases of this project.

THEME	LEGISLATION INSTRUMENT	MANAGEMENT REQUIREMENTS	STATUS
<b>Archaeology</b>	National Heritage Act 27 of 2004	All protected heritage resources (e.g. human remains etc.) discovered need to be reported immediately to the National Heritage Council (NHC) and require a permit from the NHC before they may be relocated.	To be applied from the NHC as and when required.
<b>Forestry</b>	Forest Act 12 of 2001 (guideline) Nature Conservation Ordinance 4 of 1975 (Guideline only). Permit for removal of protected and unique species.	Protected tree species as listed in relevant legislation and any vegetation within a 100 m from a water course may not be removed without permission from the MAWF.	To be applied from the Ministry of Agriculture, Water & Forestry if needed.
<b>Environment</b>	Environmental Management Act (EMA) 7 of 2007 EIA Regulations (EIAR) (GR) No. 28/2007 (GG No. 4878)	The amendment, transfer or renewal of the Environmental Clearance Certificate (ECC) (EMA S39-42; EIAR S19 & 20). Amendments to this EMP will require an amendment of the ECC for new developments.	ECC from the MEFT:DEA

	Pollution and Waste Management Bill (draft).	This bill defines pollution and the different types of pollution. It also points out how the Government intends to regulate the different types of pollution to maintain a clean and safe environment.	
	List of activities that may not be carried out without an ECC GG No. 4878 GN No. 29	Any activities listed in this listing notice require an ECC and therefore an Environmental Assessment. The proposed marble exploration is a listed activity and this report is a response to meet this requirement.	
	Soil Conservation Act 76 of 1969	This Act makes provision for combating and for the prevention of soil erosion, it promotes the conservation, protection and improvement of the soil resources of the Republic of Namibia.	The Proponent should prevent soil erosion and contamination during establishment and operation of the mine.
<b>Labour</b>	Labour Act 11 of 2007 Health and Safety Regulations (HSR) GN 156/1997 (GG 1617). Local recruitment and procurement policy; training and skills development, and awareness programmes.	Adhere to all applicable provisions of the Labour Act and the Health and Safety Regulations.	To be compiled by the project proponent during the planning phase and implemented by the Contractor during exploration and operational and phases.

	Public Health and Environmental Act, 2015	<p>Any person who intends to conduct activities which generate special, industrial, hazardous or infectious waste must be obtain a permit to work in triplicate</p> <p>(3) The waste generated on the site concerned is kept and stored before final disposal at the designated site:</p> <p>(a) under conditions that causes no harm to human health or damage to the environment; and  (b) In accordance with applicable laws.</p> <p>(4) All waste contemplated in this section must be stored in approved containers and for the maximum period determined in consultation with the relevant departments.</p>	The proponent should maintain a hygienically sound environment on the site including the campsite accommodating workers.
<b>Roads</b>	Obtain permission from Roads Authority to construct access route and to upgrade existing roads.	Obtain permission from Roads Authority (RA) to construct access route and to upgrade existing road.	To be applied for from Roads Authority by the Proponent as and when necessary.
<b>Water</b>	Water Act 54 of 1956 Licence to drill a borehole and to abstract groundwater.	Section 21 details provisions relating to the effluent discharge permits.	Permit for water abstraction to be applied for from Ministry of Agriculture, Water and Forestry (MAWF) by the Proponent before drilling a borehole should the need arise. No effluent discharge is anticipated since Dixy toilets will be used.

#### 4. PLANNING AND DESIGN

This section outlines how environmental considerations should be informed and incorporated into the planning and design phases of the exploration and mining activities at Mining Claims Number: 67286 – 67289 near the town of Karibib. The following design related mitigation measures have been recommended in order to minimize predicted environmental impacts. This EMP has been structured so as to provide its various intended recipients (Proponent, ER, Consultants and Contractors) with mitigation measures immediately applicable to their respective scopes of work. The management requirements for the various recipients carrying out work for this project are divided according to the main project phases.

##### 4.1 BIODIVERSITY

The following mitigation measures are recommended for the planning and design phase to reduce the impact on the biological environment:

- Locate access routes and other infrastructure to avoid the removal of bigger trees as far as possible.
- Ensure landscaping designs prohibits the planting of potentially alien invasive plant species (e.g. *Tecoma stans*, *Pennisetum setaceum*, etc.) for decorative purposes (e.g. around offices, etc.) and incorporates indigenous vegetation (especially the protected species i.e. *A. erioloba*, *Albizia anthelmintica*, *B. albitrunca*, *B. foetida*, *Faidherbia albida*, *Parkinsonia africana*, *Ziziphus mucronata*) into the development as far as possible (e.g. around offices, etc.).

##### 4.2 SOCIO-ECONOMIC

The following mitigation measures are recommended for the planning and design phase to reduce the impact on the socio-economic aspects:

- The Proponent should prioritize employing local labour (i.e. from Karibib and Otjimbingwe area) where possible. The requirements for employing local people should be formalised within other Contractors' contracts.
- A provision stating that all unskilled labour should be sourced from local communities should be included in procurement documents concerning the exploration and/or maintenance of services infrastructure where possible.
- Provisions promoting gender equality pertaining to recruitment should be included in procurement documents.

- Women should be encouraged to participate and apply for jobs.
- It is crucial that the project procurement criteria include requirements for training and skills development of the work force. Such training should be able to capacitate the employees to apply for permanent positions during the operations of the exploration and mining activities.

#### 4.3 HERITAGE

The following mitigation measures has been recommended for the planning and the design phase with reference to national heritage:

- In the event of any artefacts findings, the Proponent should formally apply to the National Heritage Council (NHC) for removal.

#### 4.4 ROADS

The following mitigation measure is recommended in line with the planning and design phase to reduce the impacts on roads and traffic flow:

- The intersection of any new access roads to the exploration and mining site must be designed by a professional engineer and submitted to the Roads Authority (RA) for approval. Existing farm entry gates should be used where possible.
- Furthermore, the proponent is required to notify RA well in advance as to when the actual exploration and site preparation phase will begin.

#### 4.5 VISUAL

The following mitigation measures are recommended for the planning and design phase to reduce the impact on visual resources:

- Limit offices and structures to single storey and site carefully to reduce visual intrusion.
- Select colours for buildings to reflect hues of the surrounding vegetation and/or the ground (grey green). Door and window frame colour must reference either the roof or wall colours.
- Retain as much of the natural vegetation as possible where accessory works are erected.

- Limit the size of signage and use colour tones that are visible but not dominating, so that size and colour contrast do not dominate the attention of the casual observer.
- Ensure that fencing is grey in colour and located as close as possible around the exploration site.
- Keep facility lighting to a minimum, within the requirements of safety and efficiency. Where lighting is required, use energy savers and design low-level lighting shielded to reduce light spillage and pollution. Use down-lighters for external lighting (including security and perimeter lighting) so that no light falls outside the area needing to be lit and ensure that no naked light sources are directly visible from a distance.

#### 4.6 NOISE

The following mitigation measures are recommended for the planning and design phase to reduce the impact from a noise perspective:

- Ensure that the exploration and mining site is designed to take into account the maximum allowable equivalent continuous day and night rating levels of the potentially impacted sites outside the project boundary. Where the noise levels at such external sites are presently lower than the maximum allowed, the maximum must not be exceeded.
- Insulate particularly noisy plant areas and equipment and keep all plant, equipment and vehicles in good repair.
- Where possible, ensure very noisy activities do not take place at night.



#### 4.7 THE EXPLORATION PHASE AND MITIGATION DETAILS

All activities involved in the marble exploration phase of the project have been considered and potential impacts identified in order to craft mitigation measures. The EMP for the exploration phase aims to address environmental and social risk pertaining to this phase and is presented in the table below:

Table 1: General Specifications.

Section	Aspect	Impact	Mitigation	Indicator	Suggested Responsibility
A	<b>Waste Management Plan</b>	There is potential for environmental contamination and degradation from waste generated on site.	The Proponent should compile a Waste Management Plan which should address as a minimum the mitigation measures included below		Proponent
	<b>Hazardous waste such as oil lubricants.</b>	Impact on soil and water.	<ul style="list-style-type: none"> <li>All heavy exploration and mining vehicles and equipment on site should be provided with a drip tray.</li> <li>Drip trays are to be placed under heavy vehicles after each work cycle.</li> <li>Drip trays should be cleaned after spillage and waste handled, stored and disposed of as hazardous waste.</li> <li>All equipment should be maintained regularly to prevent oil leakages.</li> </ul>	Correct handling, use and storage of materials, including hazardous materials.	Proponent

			<ul style="list-style-type: none"> <li>• Maintenance and washing of equipment should be take place only at a designated workshop area.</li> <li>• The workshop area should be lined with concrete and sloped so as to collect and detain all run-off.</li> <li>• The workshop should have an oil-water separator for collected run-off from washing.</li> <li>• Spilled cement and/or concrete (wet or dry) should be treated as hazardous waste and disposed of by the end of each day in the appropriate hazardous waste containers.</li> <li>• All hazardous substances (e.g. fuel etc.) or chemicals should be stored in a specific location on an impermeable surface that is bunded.</li> </ul>		
	<b>General waste</b>	The incorrect management of solid waste can result in the pollution of soil, groundwater and the general environment. Windblown litter can also contribute to a negative visual impact.	<ul style="list-style-type: none"> <li>• The exploration site should be kept tidy at all times. All domestic and general exploration waste produced on a daily basis should be cleaned and contained daily.</li> <li>• No waste may be buried or burned.</li> <li>• Waste containers (bins) should be emptied regularly and removed from site to a recognised (municipal) waste disposal site according to Karibib or Usakos Town Council regulation. All</li> </ul>	No complaints from the neighbours and surrounding road users.	Proponent

			<p>recyclable waste needs to be taken to the nearest recycling depot.</p> <ul style="list-style-type: none"> <li>• A sufficient number of separate bins for hazardous and domestic/general waste must be provided on site. These should be clearly marked as such.</li> <li>• Workers should be sensitised to dispose of waste in a responsible manner and not to litter.</li> <li>• No waste may remain on site after the completion of the exploration and mining project.</li> </ul>	<p>No windblown waste. No contamination of the ground and water resources</p>	
	<b>Sewage and grey water.</b>	<p>Incorrect management of sewage and grey waste may contaminate the soil, vegetation and groundwater resources.</p>	<ul style="list-style-type: none"> <li>• Sewage should not be discharged directly onto open soil.</li> <li>• All sewage must be collected in sewage tanks, from which solids are to be removed regularly and disposed of at a recognised (municipal) sewage treatment facility.</li> <li>• Grey water should be recycled where possible.</li> </ul>	<p>No sewage spills on site. No sewage and grey water pools on site.</p>	<p>Proponent &amp; ECO</p>
			<ul style="list-style-type: none"> <li>• Separate toilets should be available for men and women if applicable.</li> </ul>		

			<ul style="list-style-type: none"> <li>• Portable Dixy toilets (i.e. easily transportable) should be available at the exploration site.</li> <li>• Sewage needs to be removed on a regular basis to an approved municipal) sewage disposal site. Alternatively, sewage may be collected or pumped into sealable containers and stored until it can be removed.</li> <li>• Workers responsible for cleaning the toilets should be provided with latex</li> </ul>		
	<b>Open Fires</b>	Potential for fire outbreak on commercial lands.	<ul style="list-style-type: none"> <li>• No open fires may be made anywhere on site, if the relevant permissions have been obtained and safe provisions have been made, a single fire point may be installed within the canteen area for cooking.</li> </ul>	No sign of burnt material on site. No sign of smoke on site at all times.	Proponent and ECO
<b>B</b>	<b>Environmental Training of workers</b>	Without proper training the health and safety of workers will be at risk and preventable environmental impacts could occur.	<p>All exploration workers are to undergo environmental induction (training) which should include as a minimum the following:</p> <ul style="list-style-type: none"> <li>• Explanation of the importance of complying with the EMP.</li> </ul>	All employees adhere to the mitigation	MET and proponent

			<ul style="list-style-type: none"> <li>• Discussion of the potential environmental impacts of exploration activities.</li> <li>• Employees' roles and responsibilities, including emergency preparedness.</li> <li>• Explanation of the mitigation measures that must be implemented when particular work groups carry out their respective activities.</li> <li>• Explanation of the specific mitigation measures within this EMP especially unfamiliar provisions.</li> </ul>	<p>measures provided in this document .</p> <p>All operators of Mechanical equipment are trained properly by the contractor.</p>	
<b>C</b>	<b>Communication</b>	Inability to communicate the Environmental obligations effectively to responsible parties can result in	To ensure that the exploration activities do not result in avoidable impacts on the environment by anticipating and managing the impacts.	The ECO is aware of decisions taken by	Proponent and ECO

		unnecessary environmental degradation. It can also compromise the health and safety of employees as well as disruption to existing infrastructure.	<ul style="list-style-type: none"> <li>• The contact details of the key exploration team must be available to all relevant parties.</li> <li>• All site instructions pertaining to environmental matters issued by the Contractor are to be copied to the ECO.</li> <li>• All sub-contractors, employees, suppliers or agents etc. must be fully aware of the environmental management requirements detailed in this EMP.</li> <li>• Have a copy of the EMP and ECC available on site at all times for reference purposes.</li> </ul>	the engineer and contractors. All relevant stakeholders are kept in the loop of all activity taking place on site.	
<b>D</b>	<b>Socio-economic impact</b>	The activity could benefit local Communities through job creation, however negative impacts are also possible and must be controlled.	Adhere to the legal provisions in the Labour Act (see Table 1) for the recruitment of labour (target percentages for gender balance, optimal use of local labour and SME's, etc.) in the Contract. The Contractor should compile a	Contribute to employment and capacity	Proponent and ECO

			<p>formal recruitment process including the following provisions as a minimum:</p> <ul style="list-style-type: none"> <li>• Ensure that all sub-contractors are aware of recommended recruitment procedures and discourage any recruitment of labour outside the agreed upon process.</li> <li>• Contractors should give preference in terms of recruitment of sub-contractors and individual labourers to those who are qualified and from the project area and only then look to surrounding towns.</li> <li>• Clearly explain to all job-seekers the terms and conditions of their respective employment contracts (e.g. period of employment etc.) – make use of interpreters where necessary.</li> </ul>	<p>building in the local community. Creating awareness amongst employees and the public.</p>	
<b>E</b>	<b>Heritage Resources</b>	Heritage resources can be impacted on during the site clearance, earthworks and the exploration operations on the mining claims.	<p>➤ Should a heritage site or archaeological site be uncovered or discovered during the exploration phase of the project, a “chance find” procedure should be applied in the order they appear below:</p> <ul style="list-style-type: none"> <li>• If operating machinery or equipment stop work;</li> <li>• Demarcate the site with danger tape;</li> <li>• Determine GPS position if possible;</li> </ul>	No heritage artefacts are disturbed or destroyed	Proponent and ECO

			<ul style="list-style-type: none"> <li>• Report findings to the exploration foreman;</li> <li>• Report findings, site location and actions taken to superintendent;</li> <li>• Cease any works in immediate vicinity;</li> <li>• Visit site and determine whether work can proceed without damage to findings;</li> <li>• Determine and demarcate exclusion boundary;</li> <li>• Site location and details to be added to the project's Geographic Information System (GIS) for field confirmation by archaeologist;</li> <li>• Inspect site and confirm addition to project GIS;</li> <li>• Advise the National Heritage Council (NHC) and request written permission to remove findings from work area; and</li> <li>• Recovery, packaging and labelling of findings for transfer to National Museum.</li> </ul> <p>➤ Should human remains be found, the following actions will be required:</p> <ul style="list-style-type: none"> <li>• Apply the chance find procedure as described above;</li> <li>• Schedule a field inspection with an archaeologist to confirm that remains are human;</li> </ul>	<p>on site and the NHC is informed should any heritage artefacts be discovered on site.</p>	
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			<ul style="list-style-type: none"> <li>• Advise and liaise with the NHC and Police; and</li> <li>• Remains will be recovered and removed either to the National Museum or the National Forensic Laboratory.</li> </ul>		
<b>F</b>	<b>Ecological conservation</b>	Constructing the facility may have impacts on the fauna and flora.	<p>To prevent unnecessary disturbance to natural flora and fauna.</p> <ul style="list-style-type: none"> <li>• Adequately educate the ECO to ensure the appropriate management of the wildlife and ecological processes specific to the exploration site.</li> <li>• Implement and maintain speed control with maximum speed limits (e.g. 40km/h). Temporary speed humps could also be used to limit the speed at which people travel but care must be taken to ensure these do not cause erosion.</li> <li>• Avoid off-road driving and unnecessary nocturnal driving in the area.</li> <li>• Prevent and discourage the setting of snares (poaching), illegal collecting of veld foods (e.g. tortoises, etc.), indiscriminate killing of perceived dangerous species (e.g. snakes, etc.) and the</li> </ul>	<p>No animals are injured.</p> <p>No setting of snares</p> <p>No employees enter the no-go areas.</p> <p>No alien vegetation</p>	Proponent and ECO

			<p>collection of wood in and surrounding the project area.</p> <ul style="list-style-type: none"> <li>• Initiate a policy of capture, removal and relocation of fauna (e.g. slow-moving species such as tortoises and chameleon) encountered</li> <li>• Prevent planting of potentially alien invasive plant species (e.g. Pennisetum setaceum) for decoration purposes.</li> <li>• Any alien plants within the control zone of the company must be immediately controlled to avoid establishment of a soil seed bank. Control measures must follow established norms and legal limitations in terms of the method to be used and the chemical substances used. Disposal of cleared alien vegetation must be to a licenced landfill site.</li> <li>• Rehabilitation should commence immediately upon completion of exploration and mining activities.</li> </ul>	<p>establishment.</p> <p>Implement speed limits and temporary speed humps.</p> <p>No off-road driving</p> <p>No setting of fires</p> <p>Establish an appropriate refuse removal policy.</p>	
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				No domestic pets on site	
<b>G</b>	<b>Visual impacts</b>	Although the visual resources of the area were already degraded, the additional mining activities could contribute to negative visual impacts that could result in a reduction in tourism and detract from the sense of place.	<p>Limit dust caused by materials haulage to and from the site,</p> <ul style="list-style-type: none"> <li>• Develop the target mining sites so that visibility from the main road is kept at a minimum.</li> <li>• Keep access roads clear and implement measures to minimize dust from exploration traffic on gravel roads.</li> <li>• Remove all litter and no contaminants shall be allowed to enter the environment by any means.</li> <li>• Rehabilitation of impact areas of the Proponent must commence during the mining phase and continue until the state of the vegetation meets the requirements of the ecological assessment and is satisfactory to the ECO.</li> </ul>	No complaints from the public	Proponent and ECO
<b>H</b>	<b>Traffic</b>	During the exploration and mining phase, it is expected that there will be regular movement of vehicle to and	<p>To ensure that increased traffic volume is managed efficiently to minimise associated impacts.</p> <ul style="list-style-type: none"> <li>• Demarcate roads clearly.</li> <li>• Off-road driving should not be allowed.</li> </ul>	Traffic is orderly, free flowing	Proponent and ECO

		from the site for transportation of workers and materials.	<ul style="list-style-type: none"> <li>• All vehicles that transport materials to and from the site must be roadworthy.</li> <li>• Drivers that transport materials should have a valid driver's license and should adhere to all traffic rules.</li> <li>• Loads upon vehicles should be properly secured to avoid goods falling off the vehicle.</li> <li>• Access road entrances must be demarcated, both at their exit point from existing roads and the entry point to the site.</li> <li>• Erect signage to warn motorists about mining activities and heavy vehicle movement where appropriate.</li> </ul>	and controlled	
I	<b>HIV/AIDS and TB training</b>	Possible discrimination of infected people and medical emergencies may occur.	The Proponent should collaborate with MOHSS to facilitate HIV/AIDS and TB education programmes periodically on site during the exploration phase.	No discrimination in the workplace. Employees are appointed	Proponent and ECO

				fairly without being discriminated.	
<b>J</b>	<b>Dust</b>	Dust generated from materials handling, roads and stockpiles can become a nuisance to neighbouring landowners.	<p>To avoid nuisance impacts caused by dust as far as possible.</p> <ul style="list-style-type: none"> <li>• A watering truck should be used on gravel roads with the most heavy vehicle movement especially during dry and windy conditions.</li> <li>• However, due consideration should be given to water restrictions during times of drought.</li> </ul>	No complaints received from public and site staff.	Proponent
<b>K</b>	<b>Noise</b>	The increase in traffic and operation of equipment such as welding and fixing of the racks may result in noise becoming a nuisance.	<p>To ensure that noise from the mining activities do not exceed unacceptable levels</p> <ul style="list-style-type: none"> <li>• Work hours should be restricted to between 08h00 and 17h00.</li> <li>• Workers will be required to wear ear protecting devices whenever exposed to excessive noise.</li> </ul>	No noise complaints received.	Contractor and ECO

Table 2: Establishment of the working area.

Section	Aspect	Impact	Mitigation	Indicator	Suggested Responsibility
1	<b>Demarcate the exploration and mining site</b>	Without properly demarcating the site, the public would be able to access the site and would be at risk.	It is of outmost importance to prevent the encroachment of exploration and mining areas into the surrounding environments.	Proper signage in place to demarcate the mining site.	Proponent
2	<b>Stockpiling of equipment and materials</b>	Incorrect storing of materials can result in water and soil contamination, dust and or erosion. Incorrect storage and handling of materials also pose a risk of environmental contamination and could jeopardise the safety of public / site staff.	Ensure that all materials and equipment handled and stored in a manner that environmental contamination and safety hazards are limited. <ul style="list-style-type: none"> <li>The Proponent should maintain good housekeeping throughout all sections of mine.</li> </ul>	No public complaints. Correct handling, use and storage of materials, including hazardous materials. No incidents of environmental contamination. No accidents or incidents related to the handling of materials. No public complaints	Proponent

3	<b>Ablution facility</b>	The lack of adequate ablution facilities and recess areas can compromise the health of site staff and result in environmental degradation.	To minimise the potential environmental impacts associated with workers on the site. <ul style="list-style-type: none"> <li>• Make use of Dix Toi toilets.</li> <li>• Make use of tank mounted flush toilets</li> </ul>	Adequate ablution facilities are in place.	Proponent
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Section	Aspect	Impact	Mitigation	Indicator	Suggested Responsibility
1	<b>Demarcating the site area for mining</b>	There may have unnecessary environmental liabilities outside the site footprint if the area is not demarcated.	To keep the site area to a minimum to avoid unnecessary impacts to the surrounding environment. <ul style="list-style-type: none"> <li>• The site must be clearly demarcated with fencing or orange mining barrier to keep</li> </ul>	The site area is clearly demarcated.	Proponent

			<p>activities on the target area(s).</p> <ul style="list-style-type: none"> <li>• No site staff must be allowed in the area outside of the demarcated area to prevent negative interactions with the environment.</li> </ul>		
2	<p><b>Removal of equipment, materials and any temporary structures</b></p>	<p>If the exploration and mining site is not decommissioned it can result in environmental degradation</p>	<p>It is imperative to leave the impacted area in an acceptable state.</p> <ul style="list-style-type: none"> <li>• Implement General Specifications.</li> </ul>	<p>The area impacted by the exploration activities pose no threat to the environment</p>	<p>Proponent</p>



#### 4.8 THE OPERATION AND MAINTENANCE PHASE

The following mitigation measures should be complied with and carried out during any maintenance works associated with the services infrastructure within the planned exploration and mining areas.

Table 3: Mitigation measures during exploration phase.

Aspect	Mitigation Measure
<b>EMP Implementation</b>	If any construction is to be conducted as part of maintenance works for the services infrastructure within the project area please refer to the mitigation measures of this EMP (Table 1: General Specifications.).
<b>Environmental management Documentation and procedures</b>	<p>To ensure that the operation of the exploration and mining sites does not result in avoidable impacts on the environment, and that any impacts that do occur are anticipated and managed.</p> <ul style="list-style-type: none"> <li>• Appoint a suitably qualified, independent ECO to monitor compliance and compile an environmental audit report.</li> <li>• Audit the compliance with the requirements of the environmental specification contained within the EMP</li> </ul>
<b>Socio-economic impact</b>	<p>To ensure that the operation of the facility maximizes positive impacts on the socioeconomic environment.</p> <ol style="list-style-type: none"> <li>1) Procurement of materials, goods and services must be from local suppliers, where possible.</li> <li>2) Employ local labour for the operational phase, where possible, and particularly for day to day operations and maintenance.</li> <li>3) Where possible encourage the use of local suppliers for procurement of goods, materials and services.</li> <li>4) Implement training and capacity building programmes to enhance the ability of local community members to take advantage of available employment opportunities.</li> </ol>
<b>Protection of ecology</b>	<p>To prevent unnecessary disturbance to natural vegetation and fauna.</p> <ul style="list-style-type: none"> <li>• Maintain track discipline with maximum speed limits (e.g. 40km/h). Temporary speed humps could also be used to limit the speed at which people travel but care must be taken to ensure these do not cause erosion.</li> </ul>

	<ul style="list-style-type: none"> <li>• Avoid off-road driving and unnecessary nocturnal driving in the area.</li> <li>• Remove all refuse on site.</li> <li>• If nesting on exploration structures becomes problematic, “dummy poles” could be erected for species such as sociable weaver to avoid this problem.</li> <li>• Prevent and discourage setting of fires as this could easily cause runaway veld fires.</li> <li>• Prevent and discourage the collection of firewood in and surrounding the exploration area.</li> </ul>
<b>Visual impact</b>	<p>To protect the sense of place.</p> <ul style="list-style-type: none"> <li>• Keep access roads clear</li> <li>• Keep all lighting minimal, within the requirements of safety and efficiency.</li> <li>• Where such lighting is deemed necessary, use shielded low-level lighting to reduce light spillage and pollution.</li> <li>• Avoid naked light sources that are directly visible from a distance. Only reflected light must be visible from outside the site.</li> <li>• Rehabilitation of all impacted areas must continue until the state of the vegetation meets the requirements of the ecological assessment and is satisfactory to the Environmental Control Officer.</li> </ul>
<b>Noise impact</b>	<p>To ensure that noise from the operational activities does not exceed unacceptable levels.</p> <ul style="list-style-type: none"> <li>• All plant, equipment and vehicles must be kept in good repair.</li> <li>• When ordering plant and machinery, manufacturers must be requested to provide details of the sound power level. Where possible, those with the lowest sound power level (most quiet) must be selected.</li> </ul>
<b>Monitoring</b>	<p>The ECO should monitor the implementation of the EMP:</p> <ul style="list-style-type: none"> <li>• The ECO should inspect the site before mining starts; and</li> <li>• The ECO should inspect the site at the end of the mining period.</li> </ul>

## 4.9 MONITORING PROGRAMES

Table 4: Monitoring programme.

Section	Aspect	Phase	What to monitor	Standards to be Achieved
1	<b>Access Roads</b>	Exploration and operation	<ul style="list-style-type: none"> <li>• Generation of mud on access roads after heavy rainfall event</li> </ul>	Roads in a well-maintained condition and causing no damage to vehicles
2	<b>Dust</b>	Exploration	<ul style="list-style-type: none"> <li>• Dust and ensuring its suppression during exploration of minerals</li> </ul>	Meet the standard for the South African Atmospheric Pollution Prevention Act 2
3	<b>Erosion</b>	Exploration Operation	<ul style="list-style-type: none"> <li>• Area (m<sup>2</sup>) affected by erosion</li> <li>• Effectiveness of erosion control measures (improvement over time)</li> </ul>	No incidences of erosion occurring Should erosion occur, successful remediation of erosion, so that areas are rehabilitated
4	<b>Pollution</b>	Exploration operation	<ul style="list-style-type: none"> <li>• No incidences of pollution Zero pollution incidences</li> </ul>	As incidents occur. Fortnightly and after every event logged
5	<b>Pollution Safety</b>	Exploration operation	<ul style="list-style-type: none"> <li>• Integrity of impervious floor layer of fuel storage and dispensing areas</li> <li>• Integrity of bund walls</li> <li>• The storage and dispensing areas are secure when not in use, e.g. over-night.</li> <li>• Clean up kits for accidental spills are available and 100% complete in terms of their contents</li> <li>• Any pollution or safety incidence</li> </ul>	Zero pollution incidences
6	<b>Erosion and water pollution</b>	Design and mining operation	<ul style="list-style-type: none"> <li>• Storm water system integrity</li> </ul>	Weekly or after each heavy rainfall event

7	<b>Waste</b>	Design and mining operation	<ul style="list-style-type: none"> <li>• Certificates of disposal at authorised waste facilities</li> <li>• Incidences of waste management contraventions</li> <li>• Distribution and integrity of waste disposal containers</li> <li>• Awareness training for staff related to waste matters (proof of workers trained)</li> </ul>	<p>Zero waste management infringements</p> <p>Application of responsible waste measures</p>
8	<b>Vegetation and fauna</b>	Design and mining operation	<ul style="list-style-type: none"> <li>• Incidents of unauthorised entry into no-go areas</li> <li>• Erosion (area in m2)</li> <li>• Rehabilitation of disturbed areas</li> <li>• Occurrence of alien species (type, location and area invested (m2))</li> </ul>	<p>Zero incidents, No incidences of erosion occurring Should erosion occur, successful remediation of erosion, so that areas are rehabilitated Measurable targets for this must be determined by the ECO at the commencement of the rehabilitation activities</p> <p>Zero alien species occurring in the footprint area and a 20m buffer area around footprint.</p>

#### 4.10 DECOMMISSIONING

In terms of EMA it is necessary to consider the environmental impacts of decommissioning of any development, however, the exploration and mining activities are expected to be operational in response to market demands.

It is the idea to consider decommissioning as a separate activity which should be dealt with on its own in order to formulate a plan that is responsive to the realities on the ground. The decommissioning of the exploration and mining sites would therefore be addressed in a new EIA process to be conducted prior to the site being decommissioned. This section makes recommendations that should be considered in the new EIA process prior to decommissioning.

The Project Proponent should develop a closure plan to be updated on an annual basis commencing prior to the envisaged decommissioning. The closure plan should identify the targets and objectives for closure, and will be important in allowing operations to work toward closure objectives. The Project Proponent should commission specialist inputs from time to time to provide direction on the closure plan to ensure the end result is as closely aligned with prevailing best practice as is possible, thereby minimising the risk and potential costs associated with decommissioning phase. The various stakeholders should also be engaged as early on in the closure planning process to ensure their interests are known and catered for from the point of origin. The exploration and mining phase EMP could be used as a guideline to facilitate the detailed decommissioning phase EMP.

Specific mitigation measures have been recommended for the decommissioning phase of the project and are listed below. It should however be noted that these conditions are subject to change.

#### 4.11 RECOMMENDED MITIGATION MEASURES FOR THE DECOMMISSIONING PHASE

##### 4.11.1 ECOLOGY

The following mitigation measures are recommended from an ecological point of view as part of the closure phase:

- Rehabilitate all areas impacted on by the infrastructure as close as possible to its previous state,
- Remove all exploration waste other than marble; rip temporary tracks, if feasible, and replace the topsoil where it had been retained on removal,
- Re-introduce indigenous vegetation (especially protected species) where it had been removed; should form part of the rehabilitation process.

#### 4.11.2 VISUAL

The following mitigation measures are recommended from a visual point of view as part of the closure phase:

- Exploration and mining structures, associated structures and fencing must be removed and recycled as far as possible.
- Where it is not possible to recycle material, the waste shall be disposed of at a registered landfill site.
- Rehabilitate internal roads that cannot be used by the landowner.

#### 4.11.3 SOCIO ECONOMIC

The following mitigation measures are recommended from a socio-economic point of view as part of the closure phase:

- Maximise the use of local labour on decommissioning activities;
- Provide adequate notification to staff and other stakeholders of the pending decommissioning;
- Provide staff with references so that they can pursue work with other companies;
- If feasible, assist staff in finding employment at other operations.