


Project Name:	<p><b>ENVIRONMENTAL MANAGEMENT PLAN TO UNDERTAKE EXPLORATION AND SMALL-SCALE TEST MINING ACTIVITIES FOR PRECIOUS STONES, PRECIOUS METALS AND BASE AND RARE METALS ON EXCLUSIVE PROSPECTING LICENSE (EPL) 6952, KATIMA MULILO, ZAMBEZI REGION</b></p>
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# 1. INTRODUCTION

According to the Environmental Management Act (2007), the proposed exploration and mining activities on EPL 6952 located in the Zambezi Region ±100km south of the town of Katima Mulilo are part of the listed activities for which an Environmental Impact Assessment (EIA) has to be conducted and which needs an Environmental Clearance (EC) from the Ministry of Environment and Tourism (MET) before implementation of the project. The MET indicated that they will consider the Environmental Clearance upon the submission of an Environmental Management Plan (EMP).

The proponent (Clarina Zita Dias) appointed *Green Earth Environmental Consultants* to prepare an Environmental Management Plan (EMP) to guide the operations of the proposed exploration and mining activities. The EMP was prepared from information gathered from the proponent (Clarina Zita Dias) and knowledge of the site (based upon several site visits) as well as from experience with EIA's and EMP's conducted for other similar operations. The assessment concluded that the exploration and mining activities will not pose any long term or irreversible threats to the receiving or surrounding environment if the operations are conducted along the guidelines of this EMP.

The EMP included in this document contains practical measures that should be taken and maintained by the Developer and Manager of the proposed exploration and mining activities in order to prevent potentially negative impacts on the environment, both from the ecological and social perspective. The EMP assigns rules, regulations and responsibilities and can be used by the MET and other relevant authorities as checklist to monitor compliance at the site. The idea is to minimize any negative impacts or to completely avoid it if possible.

The actions stated in this document (EMP) should be diligently followed in order to maintain a safe and healthy sustainable environment for future generations residing on the land and immediate environment. The proponent is responsible to oversee that the EMP is implemented and adhered to at all time. MET is kindly requested to consider and approve the EMP below and to issue a Clearance Certificate.

# 2. BACKGROUND AND SITE INFORMATION

The EMP included in this document is based on the principle that the relevant authorities with the MET as responsible Ministry, through their Environmental Control Officer's (ECO) with the proponent of the project as responsible person, should ensure that:

- The necessary environmental authorizations and permits have been obtained and are in use;

- Open and direct communication between the proponent and Interested and Affected Parties (I&APs) with regards to environmental and ecological matters are maintained;
- Regular site inspections of the exploration and mining operations is conducted to ensure compliance with the EMP of the site;
- By complying with the guidelines of the EMP, the impact on the receiving environment is kept to a minimum or avoided;
- Immediate action is taken if EMP specifications are not followed or adhered to;
- The proponent/manager of the exploration and mining operations need to find environmentally responsible solutions;
- All personnel/workers should be informed on the stipulations of the EMP and that environmental awareness is regarded as a high priority;
- Level of implementation and adherence to the EMP is audited on a regular basis;

There should be a clear message to the management and staff/workforce of the project that non-adherence to or non-compliance with the EMP can lead to the withdrawal of the Environmental Clearance Certificate and might lead to the closure of the exploration and mining operations. It is against this background that the EMP has been drafted.

### 3. RECOMMENDATION

The following measures are recommended:

- That Clarina Zita Dias be granted an Environmental Clearance to proceed with the exploration and mining operations by the Environmental Commissioner of the Ministry of Environment and Tourism.
- The continuous monitoring of the identified impacts on the environment to be able to take preventative remedial action.
- The implementation of the Environmental Management Plan (EMP) to mitigate identified impacts which are associated with the exploration and mining operations.
- The consideration of green building/environmentally sustainable designs in the phases for example making use of solar panels, rainwater tanks, recycling depots, etc where applicable.
- Testing of the water quality is also recommended in order to determine a baseline of the current water quality which can be used to monitor contamination which might occur from the proposed exploration and mining activities and to determine if the water is suitable for use in the process. It is proposed that the water quality is monitored through annual testing and comparison with the baseline analysis.
- An Environmental Audit to be conducted on the exploration and mining activities a year from the date of the Environmental Clearance Certificate by an inspector (from the DEA) or an independent Environmental Practitioner to

ensure that the Environmental Management Plan has been implemented and is adhered to on a continuous basis.

- Training and induction courses should be given to the managers, workforce and employees.
- The proponent is responsible for ensuring that environmental awareness education of all employees and contractors is done satisfactorily.
- The proponent should ensure that employees and contractors are made aware of the environmental requirements of the project.
- The contractors, sub-contractors and staff should familiarize themselves with the full content of the Environmental Management Plan.
- Periodic environmental monitoring must be taken on a regular basis. This should be done to ensure compliance with all aspects of the Environmental Management Plan.
- A copy of the Environmental Management Plan and Environmental Clearance Certificate should be kept at the site office and should be distributed to the manager, contractors and sub-contractors.
- Non-compliance to the measures stated in the Environmental Management Plan: Implement suitable corrective action and prevent recurrence of the incident.
- An independent environmental control officer should be appointed to monitor and review the on-site environmental management and implementation of the Environmental Management Plan.
- The environmental control officer should ensure that the impacts are kept to a minimum.
- He/she should be inspecting the site and surrounding areas regularly and should monitor an ongoing program to promote environmental awareness.
- He/she should request the removal of people or equipment not complying with the specifications of the Environmental Management Plan.
- Audit reports should be made available for viewing by the public.
- Any areas outside the designated working/exploration/mining zone should be considered “no go” areas.

# Environmental Management Plan

## Exploration Non-Invasive Phase

- Aesthetic and Visual Issues
- Water consumption efficiency
- Energy consumption efficiency
- Solid Waste
- Health and Safety
- Social Aspects

## Operational invasive Phase

- Mining of Sand
- Human Waste
- Toxic Materials
- Site Preparation
- Facilities for Workers
- Waste Management
- Water Use
- Wildlife
- Fuel, Transport and Storage
- Vehicles, Trucks, Roads and Tracks
- Vegetation
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- Noise
- Dust
- Visual Impacts
- Historical, Archeological and Cultural
- Accommodation and Sanitation
- Health and Sickness/Disease
- Waste Water
- Energy
- Nature Conservation
- Sense of Place
- Community Relations
- Health and Safety Issues

## Decommissioning Phase

- Equipment
- Rehabilitation of Site
- Stormwater and Wastewater
- Waste
- Spillage
- Remediation
- Health and Safety

Submission of DEA for Environmental clearance

## 4. ENVIRONMENTAL MANAGEMENT PLAN (EMP)

The proposed EMP has been drawn to give guidance to:

- Planning of the exploration and mining area, replacing equipment and services **(Planning Exploration: Non-Invasive Phase)**;
- Operations concerning the daily management and running of the exploration and mining operations and associated activities **(Operational Exploration: Invasive phase)**;
- Decommissioning of the exploration and mining sites **(Decommissioning Phase)**.

### 4.1. PLANNING EXPLORATION (NON-INVASIVE PHASE)

The location of the exploration activities must fit into the surroundings and the natural environment. The proponent and manager of the activities must ensure that the sense of place be kept in accordance with the surrounding areas.

The proposed exploration activities are based on the assumption that it is feasible and viable. The proposed exploration is important because of the work opportunities and socio-economic aspects involved. It is advised that the exploration and mining activities be audited by an independent auditor to verify if it is feasible. Specific actions are required to ensure the negative effects or impacts are minimized on the site. The following measures should be followed:



#### 4.1.1. Addressing of Aesthetic and Visual Issues

Responsible Person	Measures
The Proponent, Manager and Workers	<ul style="list-style-type: none"><li>a. The exploration activities and equipment must be as visually pleasing as possible. Equipment should not be positioned where it can obstruct natural views or wildlife migration.</li><li>b. Should there be any development regarding solar panels, water tanks and other prominent features, it must be placed or constructed at spots that prohibits visual destruction or minimize visual impact.</li><li>c. Tourists or any person driving past the exploration operations should not be able to notice visually unpleasing objects on the site.</li><li>d. The visual character of the exploration activities should not compromise the integrity of landmarks and places of cultural and heritage significance such as special scenic areas and tourist sites of interest.</li></ul>

#### 4.1.2. Ensuring water consumption efficiency

Responsible Person	Measures
The Proponent, Manager and Workers	<ul style="list-style-type: none"><li>a. Any addition of lawns or cultivated gardens on the site must be limited since it makes use of sparse clean water. The cultivation or enhancements of locally adapted natural grasses which can survive the natural conditions are preferred.</li><li>b. Rivers and drainage systems bordering the site must be maintained and channels must be kept open to conserve the environment and flow of water.</li></ul>

#### 4.1.3. Ensuring energy consumption efficiency

Responsible Person	Measures
The Proponent, Manager and Workers	<ul style="list-style-type: none"><li>a. Preference must be given to the implementation of energy conserving and efficient systems. Renewable energy sources for instance solar power should be considered to replace a generator if possible.</li><li>b. Devices or equipment which conserves energy must be introduced and used in the operations of the project.</li></ul>

<b>4.1.4. Limiting creation of solid waste</b>	
<b>Responsible Person</b>	<b>Measures</b>
The Proponent, Manager and Workers	<ul style="list-style-type: none"> <li>a. Consumables and containers which can be recycled or which are biodegradable must be introduced in order to limit the creation of solid waste on site which has to be taken out of the area to be managed and handled at another site.</li> <li>b. All potential hazardous waste should be transported to Windhoek (Kupferberg landfill site).</li> <li>c. Concepts like pollution control, material substitution and maximization on recycling content in order to reduce waste generation and disposal should be introduced.</li> </ul>

<b>4.1.5. Health and Safety of the Workforce</b>	
<b>Responsible Person</b>	<b>Measures</b>
The Proponent, Manager and Workers	<ul style="list-style-type: none"> <li>a. The safety, security and health of the labour force, employees and neighbours are of great importance, workers should be orientated with the maintenance of safety and health procedures and they should be provided with PPE (Proper Protective Equipment).</li> <li>b. A health and safety officer should be employed to manage, coordinate and monitor risk and hazard and report all health and safety related issues in the work place.</li> <li>c. The introduction of external workers into the area is sometimes accompanied with criminal activities posing security risks for neighbouring land/farms therefore security measures should be introduced to prevent such activities for example a supervisor can be appointed to monitor the workers.</li> <li>d. The welfare and quality of life of the neighbouring land/farms and workforce needs to be considered in order for the project to be a success on its environmental performance.</li> </ul>

	e. Conversely, the process should not affect the overall health of persons related to the project including the neighbours.
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<b>4.1.6. Social Aspects</b>	
<b>Responsible Person</b>	<b>Measures</b>
The Proponent, Manager and Workers	<ul style="list-style-type: none"> <li>a. It is beneficial if workers/employees wear identification tags and uniforms when residing and working on the project site.</li> <li>b. A list of all the workers with their identification and contact details should be kept on site and with the manager/supervisor.</li> <li>c. Working hours should be adhered to namely mining operations may only take place from 7h00 to 18h00 from Monday to Saturdays. No work should be carried out on Sundays and public holidays in order to avoid noise pollution.</li> </ul>

#### 4.1.7. Exploration (Non-Invasive Phase)

Responsible Person	Measures
The Proponent, Manager and Workers	<ul style="list-style-type: none"><li>a. The non-invasive exploration phase will be conducted through airborne geophysical surveying and data analysis. This will have to be conducted without causing a nuisance to the communities therefore it should be done in normal working hours (8h00 to 17h00) and not after hours or on weekends.</li><li>b. Conductivity, magnetic susceptibility, rock density, radioactive element concentration, and reflectance spectra are measured. Once the information gathered through these processes have been evaluated and confirmed, target areas will be identified which may be drilled or undergo test-mining. Drilling and test-mining should also be conducted in normal working hours (8h00 to 17h00) and not after hours or on weekends.</li><li>c. The mining areas should be fenced in to protect the community and animals.</li></ul>

## 4.2. OPERATIONAL EXPLORATION (INVASIVE PHASE)

Steps to be taken in the daily management and running of the invasive exploration and mining activities are stated in the following section. To ensure that the invasive exploration and mining activities are operated on an environmentally sustainable manner the following **general guidelines** are included in the EMP:

- a. The exploration and mining activities must be managed with minimal disturbance to the surrounding natural environment.
- b. It must be ensured that guests/visitors to the site behave in an appropriate manner that does not impact negatively on the environment, wildlife and local communities.
- c. The conservation of the natural and human environment must be regarded as high priority.
- d. An “environmental friendly behavior” must be cultivated and maintained amongst all people involved in the operation of the exploration and mining activities.
- e. The entire operation on the site must ideally conform to the standards usually ascribed to “eco-tourism”.
- f. The job description for the manager must include his/her responsibilities and duties towards the implementation and adherence to the EMP.
- g. Mining on river banks should not be allowed. Systematic strip mining with buffer zones should be carried out.

The following specific environmental management issues which require daily operational attention from management and workers are included in the EMP:

<b>4.2.1. Invasive Exploration and Mining</b>	
<b>Responsible Person</b>	<b>Measures</b>
The Proponent, Manager and Workers	<ul style="list-style-type: none"> <li>d. The water table may not be exposed by the exploration and mining activities or any other operational activities.</li> <li>e. Excavation should be at least 10 meters away from the river banks.</li> <li>f. No form of groundwater pollution may take place by any activities. Groundwater levels should be taken into account when exploration and mining operations are in process.</li> </ul>

<b>4.2.2. Human Waste Management (Sewage)</b>	
<b>Responsible Person</b>	<b>Measures</b>
The Proponent, Manager and Workers	<ul style="list-style-type: none"> <li>a. The sewage will be accommodated in a removable septic tank to be installed on the site. These tanks will be constructed outside of river areas. Tanks should be maintained and leaks should be fixed to prevent any seepage</li> <li>b. Notices must be placed in the toilets indicating that workers should not flush foreign objects down the toilet to ensure a healthy environment and the sustained functioning of the sewer system.</li> </ul>

<b>4.2.3. Spillages of potentially toxic materials</b>	
<b>Responsible Person</b>	<b>Measures</b>
The Proponent, Manager and Workers	Damage to the environment during excavation and mining operations have a few origins that differ to large degree: accidental, negligent, spillage, vehicles, earthmoving equipment, generators and plant

areas, excessive noise or heat and workers exposed to physical hazards. There are mitigation measures that must be followed in order to minimize or avoid damage and pollution. The following measures are based on the Ministry of Environment and Tourism (MET) regulations and must strongly be adhered to:

- a. Any spillages of potentially toxic materials, whether by accident or through negligence, must be reported and the corrective action must be undertaken to 'clean' and to remove the evidence of the spillage.
- d. Make use of design structures and transfer equipment so as to avoid spillage as far as possible.
- e. Train the workers on how to make use of diesel/fuel transfer and to avoid spillage. Fuel storage should be bunded.
- f. Any spill must be cleaned up immediately by removing the spill together with the polluted soil and disposing of it at a recognized dumping site or facility.
- g. Install oil traps in all appropriate places to collect potentially toxic materials.
- h. When there is made use of diesel generators on site it must be placed on concrete slabs.
- i. Any runoff from the work areas either arising from wash downs or rainfall must be channeled into a pollution control pond.
- j. There must be a weekly monitoring of all equipment namely a visual check; there must also be a weekly monitoring of work areas.

#### 4.2.4. Site Preparation

Responsible Person	Measures
The Proponent,	a. Before any workers, equipment or trucks are brought in; the manager/supervisor must set out the



<p>Manager and Workers</p>	<p>entire project area. The corners of every walkway, driveway, parking area, power generator and the exploration and mining area, etc must clearly be marked.</p> <ul style="list-style-type: none"> <li>b. The marked out area must be inspected and approved before any exploration and mining is started.</li> <li>c. The manager/supervisor must demarcate the areas with metal droppers and hazard tape so that there will be no confusion about which area may be disturbed for exploration and mining and related operations and which areas will strictly be off-limits.</li> <li>d. Disturbance and risks related to the exploration and mining operations should be minimized at all time. Mining activities and the site location should comply with national environment protection legislations and best practice environmental management guidelines.</li> <li>e. Exploration and mining should be carried out in a safe and effective manner.</li> </ul>
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<p style="text-align: center;"><b>4.2.5. Facilities for Workers</b></p>	
<p><b>Responsible Person</b></p>	<p><b>Measures</b></p>
<p>The Proponent, Manager and Workers</p>	<ul style="list-style-type: none"> <li>a. All workers that need to reside on the site while exploration and mining is in progress will have to be housed in temporary structures like tents or caravans to limit the impact on the environment.</li> <li>b. The workforce residing on the site must be provided with water, proper toilets and washing facilities.</li> <li>c. Cooking on the site must be done on gas or open fires. When the workers make use of open fires, these must be made in a designated spot so that there will be no possibility for a veldt fire occurring.</li> <li>d. Exploration and mining workers on site should not be allowed to collect wood for cooking purposes. The manager must provide them with wood/charcoal preferably from intruder bush from outside sources.</li> </ul>

#### 4.2.6. Waste Management

Responsible Person	Measures
The Proponent, Manager and Workers	<ul style="list-style-type: none"> <li>a. All waste that is stored temporarily on the site must be secured in refuse bags stored in a fenced-in area to avoid it being blown into the veldt.</li> <li>b. A temporary waste storage site or cage structure may not be set up close to any river, dam or water course.</li> <li>c. Measures must be taken to prevent waste that attracts scavengers for example jackal or vultures.</li> <li>d. No paint, solvents, thinners, diesel, oil or any other harmful substances may be poured onto the ground. The substances must be collected in containers and be removed from the site for proper disposal.</li> </ul>

#### 4.2.7. Water Use

Responsible Person	Measures
The Proponent, Manager and Workers	<ul style="list-style-type: none"> <li>a. Water for domestic purposes, human consumption and exploration and mining operations must at all times be used sparingly.</li> <li>b. All pipes and tanks must be maintained and managed so that they do not leak.</li> <li>c. Water pipelines laid to the site shall be done in such a manner that the surface and natural vegetation are not unduly disturbed.</li> <li>d. Weekly visual checks on possible spillages must be conducted.</li> <li>e. Effluent water from washing must be disposed of in a properly constructed storage/septic tank that must be located as far as possible, but not less than 50 meters from a stream, river, pan, dam or borehole.</li> <li>f. There must be weekly inspections of the tanks.</li> </ul>

	g. Water consumption must be checked on a three monthly basis.
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<b>4.2.8. Wildlife</b>	
<b>Responsible Person</b>	<b>Measures</b>
The Proponent, Manager and Workers	a. No wild animals in the area or around the mining sites may be trapped or killed for any reason whatsoever by the workers, managers, supervisor or any person related to the exploration or mining activities.

<b>4.2.9. Fuel, Transport and Storage</b>	
<b>Responsible Person</b>	<b>Measures</b>
The Vehicle Drivers, Proponent, Manager and Workers	<ul style="list-style-type: none"> <li>a. Vehicles that transport materials to and from the site must be road worthy. Road safety and road conditions should be taken into consideration by all the drivers transporting materials.</li> <li>b. Overloading of trucks/transport vehicles should be monitored and prevented.</li> <li>c. All drivers that transport materials must have a valid driver's license and must at all times adhere to traffic rules and regulations.</li> <li>d. Vehicles carrying loads must be properly secured in order to completely avoid items falling off the vehicle at any time.</li> <li>e. Fuels namely diesel/oil/petrol must be stored in watertight containers that will ensure it cannot react with each other or be spilled onto the ground.</li> </ul>

<b>4.2.10. Vehicles, Trucks, Roads and Tracks</b>	
<b>Responsible Person</b>	<b>Measures</b>
The Vehicle Drivers, Proponent, Manager and Workers	<ul style="list-style-type: none"> <li>a. Any haphazard driving of any vehicles where there are no existing routes must be avoided.</li> <li>b. Vehicles or trucks with headlights must switch their headlights on at all times.</li> <li>c. No vehicles or trucks that move in the area may exceed 40km/h with warning, and speed signs must be positioned at relevant locations.</li> <li>d. No littering is allowed along the road and all drivers must be made aware of this.</li> <li>e. Daily or weekly visual checks are required and all drivers must be supervised.</li> <li>f. The safety of surrounding residents and land users, other motorists and animals should not be compromised by the vehicles associated with the exploration and mining operations.</li> </ul>

	g. Traffic control measures should be taken during exploration and mining that are in accordance with the traffic control regulations.
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4.2.11. Vegetation	
Responsible Person	Measures
The Proponent, Manager and Workers	<ul style="list-style-type: none"> <li>e. There must be an overall preservation of vegetation communities to ensure minimal disruption of important vegetation communities and valuable plant specimens.</li> <li>f. At all times, clearance of vegetation for firewood must be avoided. No trees or shrubs must be damaged for the purpose of obtaining firewood.</li> <li>g. The manager and proponent must ensure the maximum use of local plant material for rehabilitation processes.</li> <li>h. Before exploration and mining processes begins, the upper level of the soil must be stripped and stockpiled separately so that this layer can be utilized in the rehabilitation process.</li> <li>i. There must also be a visual check on the wind erosion on a monthly basis.</li> <li>j. Disturbance of flora and fauna should be minimized during exploration and mining and vegetation should be replaced to the satisfaction of the responsible authority at the conclusion of work.</li> </ul>

4.2.12. Fauna	
Responsible Person	Measures
The Proponent,	a. No hunting and trapping of resident animals will be allowed on the site.

Manager and Workers	<ul style="list-style-type: none"> <li>b. The proponent and manager must fence off waste storage areas to prevent animals from falling in or getting entangled in waste.</li> <li>c. The fences must be sufficient to control the access of large and small animals.</li> <li>d. There must be weekly visual checks of the fences and staff must report to the managers.</li> </ul>
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<b>4.2.13. Noise</b>	
<b>Responsible Person</b>	<b>Measures</b>
The Proponent, Manager and Workers	<ul style="list-style-type: none"> <li>a. Any diesel driven generator must be positioned away from neighbours and must have boarding to help suppress noise.</li> <li>b. There must be limited impacts on adjacent settlements and on the workforce.</li> <li>c. There must be a weekly noise check of the generator and other equipment namely of trucks and mining machinery.</li> </ul>

<b>4.2.14. Dust</b>	
<b>Responsible Person</b>	<b>Measures</b>
The Proponent, Manager and Workers	<ul style="list-style-type: none"> <li>a. The impact of dust on the air quality in general and on the fauna and flora must be limited.</li> <li>b. The general speed limit on the site must be kept below 40km/h to limit dust generated by traffic.</li> <li>c. There must be daily visual monitoring of transport activities and dust generation in the area.</li> </ul>

<b>4.2.15. Visual Impacts</b>	
<b>Responsible Person</b>	<b>Measures</b>
The Proponent, Manager and Workers	<ul style="list-style-type: none"> <li>a. The machinery must be as aesthetically pleasing as possible.</li> <li>b. Waste and stockpile dumps must not be visible from the road or neighbouring communities.</li> </ul>

<b>4.2.16. Historical, archaeological and cultural heritage</b>	
<b>Responsible Person</b>	<b>Measures</b>
The Proponent, Manager and Workers	<ul style="list-style-type: none"> <li>a. The proponent and manager must carefully examine on the area before any exploration and mining is undertaken.</li> <li>b. If any archaeological or cultural heritage sites are found on the site, the manager must immediately advise the National Monuments Council to ensure that steps are taken for the preservation of the site or artefacts.</li> </ul>

<b>4.2.17. Accommodation and Sanitation</b>	
<b>Responsible Person</b>	<b>Measures</b>
The Proponent, Manager and Workers	<ul style="list-style-type: none"> <li>a. There must be no camp or office site located closer than 50 meters from any spring, river, dam or pan.</li> <li>b. If space is required for a camp or office site, it must be kept to a minimum.</li> </ul>

<b>4.2.18. Health and Sickness/Disease</b>	
<b>Responsible Person</b>	<b>Measures</b>
The Proponent, Manager and Workforce	<ul style="list-style-type: none"> <li>a. Any project has the potential to increase the rate of HIV/AIDS infection. Education should be given to all personnel on the awareness and spreading of HIV/AIDS. The workers should be informed that prevention is better than cure. Condoms should be available at little or no cost.</li> <li>b. It can be expected that HIV/AIDS may have an impact on the project because labourers might be lost due to this disease. This may result in a loss of skills and training programmes will need to be ongoing.</li> <li>c. The Ministry of Health and Social Services can be consulted to inform the workers of the dangers regarding the disease.</li> <li>d. HIV/AIDS's negative impacts/aspects should be discussed and the workers should know the dangers regarding the disease for instance sickness, loss of energy and eventually death.</li> </ul>

<b>4.2.19. Management of Waste Water</b>	
<b>Responsible Person</b>	<b>Measures</b>
The Proponent, Manager and Workers	<ul style="list-style-type: none"> <li>a. The possibility of leakages at the site must be managed by ensuring that the condition of the pipelines is continuously visually monitored by the manager and workers.</li> <li>b. The manager and workers must monitor and limit water consumption as efficiently as possible.</li> <li>c. Workers residing on the site must not have lawns or gardens that need to be watered.</li> <li>d. All pipes must be well maintained and leaks must be repaired immediately.</li> <li>e. All taps must be turned off after it had been used.</li> </ul>



	<p>f. A water meter must be installed and it must be checked regularly to keep a register of water consumption and to monitor trends.</p> <p>g. Special care should be taken to prevent chemicals from washing/leaching into surface or groundwater systems.</p>
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<b>4.2.20. Energy Management</b>	
<b>Responsible Person</b>	<b>Measures</b>
The Proponent, Manager and Workers	<p>a. Gas must be used as alternative to power in kitchens due to its efficiency and low pollution factor.</p> <p>b. When fires are used on the site, the workforce must make use of alien-invasive wood that is readily available for example wood that comes from bush encroaching species for example <i>Acacia melifera</i>. The workers must avoid using Mopani, Leadwood or other species that might be harvested unsustainably.</p> <p>c. The workers may not buy wood from the local people since that might lead to increased deforestation by cutting down protected species or the natural forests.</p>

<b>4.2.21. Nature Conservation</b>	
<b>Responsible Person</b>	<b>Measures</b>
The Proponent, Manager and Workers	<p>a. To sustain the natural attributes on the site, it needs to be preserved and protected to the best of their abilities. The manager of the activities has a key responsibility in protecting the environmental aspects on the site.</p> <p>b. The workforce/manager/proponent must refrain from planting alien plants.</p> <p>c. A general environmental awareness must be established amongst the workers.</p>

**4.2.22. Maintaining Sense of Place**

<b>Responsible Person</b>	<b>Measures</b>
The Proponent, Manager and Workers	<ul style="list-style-type: none"> <li>a. Sense of place is seen as the style of the area, the atmosphere present when entering the site and the general “vibe” of the place. The “sense of place” normally differentiates one area from the other.</li> <li>b. The manager and workers may not make use of any inappropriate décor for example bright or clashing colors, unattractive murals or art, unnecessary statues, etc.</li> <li>c. No shabbiness may be experienced on the site; management must make sure that they abstain from untidiness, un-emptied ashtrays, rubbish bins etc.</li> <li>d. The manager and workers must repair and maintain all machines since un-repaired machinery creates a poor impression.</li> <li>e. Waste must be properly managed on the site; visitors and residents may not smell rubbish bins. The manager must keep drains clean in order to avoid unpleasant smells.</li> <li>f. The site may not have many signs or objects that distract tourists driving past the site from the natural beauty of the area.</li> <li>g. No scrap metal for example old vehicles or equipment may lie around in various states of disrepair, the site must be clean and neat.</li> <li>h. The manager may not allow overcrowding at the site since this will destroy sense of place in a way that it will take away the feeling of exclusivity.</li> <li>i. There may be no people loitering around at the site, whether visiting workers or looking for work.</li> </ul>

#### 4.2.23. Community Relations

Responsible Person	Measures
The Proponent, Manager and Workers	<ul style="list-style-type: none"><li>a. The manager must have sound relations with communities in the vicinity.</li><li>b. They may not damage any cultural or archaeological sites.</li><li>c. They must employ as many local people as possible for all levels of operation.</li><li>d. They must make use of dispute resolution methods and labour practices that are within the law and cultural norms.</li><li>e. All workers must be trained in order that they have the knowledge to do their work properly.</li><li>f. The manager must provide opportunities for career advancement and skills development.</li></ul>

#### 4.2.24. Occupational Health & Safety Issues & Hospital Services

Responsible Person	Measures
The Proponent, Manager and Workers	<ul style="list-style-type: none"><li>a. Potential accidents may require the use of emergency services and hospital facilities nearby.</li><li>b. Workers on site should be trained in handling emergencies such as response to fire, accidents etc.</li><li>c. There should be careful planning of emergency procedures namely training in first aid and emergency response to employees on site should be done.</li><li>d. The Labour Act (No 6 of 1992) makes certain provisions with regard to occupational health and safety, e.g. in relation to hazardous substances. Workers should be protected against dust and noise in the work place.</li></ul>

#### 4.2.25. Exploration (Invasive Phase)

Responsible Person	Measures
The Proponent, Manager and Workers	<ul style="list-style-type: none"><li>a. The invasive phase may involve small scale test mining where a specific area is mined. Exploration drilling is used to probe the contents of known ore deposits and potential sites. By withdrawing a small diameter core (150 – 200mm in diameter) of rock from the orebody, geologists can analyze the core by chemical assay and conduct petrologic, structural and mineralogical studies of the rock.</li><li>b. All drilling and test mining should be done within normal working hours (8h00 to 17h00) in week days to prevent noise and dust pollution.</li></ul>

### 4.3. DECOMMISSIONING, REHABILITATION AND CLOSURE PHASE

The decommissioning, rehabilitation and closure phase follows the exploration and mining operational phase. This is a plan developed to ensure that appropriate environmental management practices are followed during the decommissioning phase of this project and to detail remediation, site control, and monitoring activities that will continue once the project/mining is no longer required/needed.

The decommissioning phase:

- Provide effective and implementable procedures and mitigation measures to monitor and control environmental impacts throughout this phase of the project, such that the related activities do not adversely impact amenity, traffic, or the environment in the surrounding area.
- Establish long-term management of the project site for its next intended use, detailing plan for site assessment, remediation of contamination, and ecological restoration activities.
- Eliminate the long-term liability issues related to the site for the proponent or manager of the mining activities or project site.
- Rehabilitate the project sites from damage caused by the mining.

The following conditions are generally required.

<b>4.3.1. Equipment</b>	
<b>Responsible Person</b>	<b>Measures</b>
The Proponent, Manager, Workers and the Environmental Control Officer	<ul style="list-style-type: none"> <li>c. An investigation on the soil and groundwater contamination must be conducted to determine the presence, nature and extent of any contamination. This will provide information as to the current status of the site in terms of the level of contamination, which will influence the level or type of remediation that needs to be undertaken.</li> <li>d. All mining residue products must be carefully removed from the site for recycling or safe disposal.</li> <li>e. Only clean soil/sand should be used for filling purposes.</li> </ul>

<b>4.3.2. Rehabilitation of site after completion of mining</b>	
<b>Responsible Person</b>	<b>Measures</b>
The Proponent, Manager and Workers	<ul style="list-style-type: none"> <li>a. Before any rehabilitation is started on the site, the Ministry of Environment and Tourism must be advised to set certain terms and conditions.</li> <li>b. All rehabilitated areas must be monitored over a 4 year time period from the onset of the rehabilitation procedures. (The frequency of monitoring suggested is dependent on satisfactory performance. If however the requirements are not being met, the frequency of the monitoring must be increased).</li> <li>c. Unwanted materials and all waste namely domestic or mining must be collected. Remaining domestic and mining waste on site must be collected and transported to a recognised disposal facility.</li> <li>d. Waste material must be collected in drums and transported to a recognised disposal facility.</li> <li>e. Monitoring must be conducted when grasses are flowering.</li> </ul>

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|  | <ul style="list-style-type: none"><li>f. Upon the completion of all mining activities, remove all machinery, surrounding fencing, generators and any scrap materials in the vicinity of the mining area.</li><li>g. Seal all petrol, diesel, oil and grease containers and remove it from the site to a recognised storage facility.</li><li>h. Break up all unnecessary concrete slabs and structures on the site and transport the fragments to a suitable site for disposal.</li><li>i. There must be photographic evidence at different rehabilitated places with a camera providing dates on the prints. These photographs must be taken every year around the same period at the same places.</li><li>j. It should be ensured that all machinery, equipment, materials, waste, rubble, notice boards and temporary fences used during the operation of the mine and decommissioning be removed with minimum damage to the surrounding and receiving area or environment.</li><li>k. The site should be cleaned and cleared to the satisfaction of the ECO.</li><li>l. In the case of accidental spills of oil or chemicals in the operation of the mine, the affected soil should be dug out and removed from the site for disposal at a hazardous waste site and replace with fresh topsoil.</li></ul> |
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### 4.3.3. Stormwater and Wastewater Management

Responsible Person	Measures
The Proponent, Manager, Workers and the Environmental Control Officer	<ul style="list-style-type: none"> <li>a. Water used for flushing pipes and tanks must be disposed off safely. The relevant department must be contacted with regard to the discharge of water containing waste.</li> <li>b. The water containing waste must pass through a separator before discharge could be allowed.</li> <li>c. Any water containing waste should not contaminate clean storm water or groundwater.</li> </ul>

### 4.3.4. Waste Management

Responsible Person	Measures
The Proponent, Manager, Workers and the Environmental Control Officer	<ul style="list-style-type: none"> <li>a. Solid waste generated from the removal of pipes, tanks and machinery must be handled according to the precautionary principle meaning that waste (including soils, metals and other material) should be treated as hazardous unless proven otherwise.</li> <li>b. Contaminated soil and other waste material must be disposed of at an authorized/permitted landfill site.</li> <li>c. Waste must not be allowed to be stockpiled on the site for extensive periods but must be disposed off as generated/soon as possible.</li> <li>d. If waste material is stockpiled temporarily on site, it must be adequately protected from the environment to prevent leaching of potentially harmful contaminants.</li> </ul>



<b>4.3.5. Spillage</b>	
<b>Responsible Person</b>	<b>Measures</b>
The Proponent, Manager, Workers and the Environmental Control Officer	<ul style="list-style-type: none"> <li>a. Spillages during decommissioning must be reported to the relevant authorities.</li> <li>b. The contaminated area with the spill must be removed from the site to a recognized landfill site.</li> </ul>

<b>4.3.6. Remediation</b>	
<b>Responsible Person</b>	<b>Measures</b>
The Proponent, Manager, Workers and the Environmental Control Officer	<ul style="list-style-type: none"> <li>a. Clean-up or remediation of any contamination must be done.</li> <li>b. The manager of the project, the proponent, the owner of the land, the person in control of land or the person who occupies or uses the land on which pollution has occurred is not absolved from the responsibility of any further and/or associated pollution arising from this site.</li> <li>c. Should there be a risk to downstream users or the environment from this site in the future, it would be requested that further remedial measures be instituted at this site.</li> </ul>

### 4.3.7. Health and Safety of the Workers

Responsible Person	Measures
<p>The Proponent, Manager, Workers and Environmental Control Officer</p>	<ul style="list-style-type: none"> <li>a. The safety and security of labourers/workers in the decommissioning phase of the project are required and of high importance.</li> <li>b. The proponent, manager and workers shall comply with all standard and legally required health and safety regulations as promulgated under the Occupational Health and Safety Act and Labour Act and associated regulations.</li> <li>c. The proponent, manager and workers must provide and maintain personal protective equipment and facilities to workers working with hazardous substances.</li> <li>d. The proponent and manager shall provide a standard first aid kit at the site and/or at additional identified locations where needed.</li> <li>e. Disturbed soils, slopes and areas of open excavation must be minimised to avoid wind erosion.</li> <li>f. A health and safety officer should be employed to manage, coordinate and monitor risk and hazard and report all health and safety related issues in the work place.</li> <li>g. Conversely, it is anticipated that the process should not affect the overall health of persons related to the project including the neighbours.</li> </ul>

## 5. ENVIRONMENTAL STATEMENT/AGREEMENT

After all assessing was done and information available was reviewed, the conclusion was reached that **the proposed exploration and mining activities in EPL 6952 located in the Zambezi Region ±100km south of the town of Katima Mulilo will have a medium significance impact rating if the Environmental Management Plan is followed and adhered to.** Management actions prescribed and recommended in this EMP are especially designed to minimize or manage the impacts exerted by the exploration and mining operations.

It should however be noticed that the management activities should further be strengthened with continuous and well orchestrated monitoring of the implementation of the given EMP. The manager of the operations needs to understand the severity of the situation and all efforts should be made to ensure that the message is conveyed to the workforce and visitors.

It should further be noted the proposed EMP will have little or no value in managing the impacts of the exploration and mining operations on the environment if it is not implemented by the proponent/manager and not monitored by the responsible authorities. **It is thus suggested that the level of implementation of the EMP is audited at regular intervals by the Environmental Control Officer of the MET or Tourism Board in order to ensure that remedial actions are taken on time and on a continues basis.**

The Ministry of Environment and Tourism is herewith requested to accept and approve the EMP for the proposed exploration and mining activities on EPL 6952 located in the Zambezi Region ±100km south of the town of Katima Mulilo and to issue the site with an Environmental Clearance Certificate for the proposed operations.