

---

**ENVIRONMENTAL MANAGEMENT PLAN (EMP)  
FOR THE PROPOSED EXPLORATION AND SMALL  
SCALE MINING ACTIVITIES MINING CLAIMS NO.  
70459 AND 70460 LOCATED AT UIS DISTRICT  
ERONGO REGION**

**Prepared by**

**GWAYELA ENVIRONMENTAL SOLUTION**

**FOR**

**Submitted on: May 2023**

<b>DOCUMENT INFORMATION</b>	
<b>Title</b>	Environmental Management Plan for the base and rare metals and other industrial minerals found at Mining Claims No. 70459 and 70460 located in district, Erongo region.
<b>Report reference number</b>	KME001/2023
<b>Activity</b>	Activity 3: Mining and Quarrying Activity 8: Water Resource Developments
<b>Location</b>	Mining Claims No. 70459 and 70460 located on state land 20km west side of Uis, along the C35 road in Erongo Region
<b>Proponent</b>	<b>KARLOWA MINING ENTERPRISES PTY LTD</b>  <u>For Official Correspondence:</u> Mr. Timoteus Mashuna Office: Studio 42, Kock & Schmidt, Garden Street- Windhoek Namibia E-mail: <a href="mailto:tmashuna@gmail.com">tmashuna@gmail.com</a> Tel: +264 81 335 0253
<b>Revision</b>	Draft
<b>Issue Date</b>	May 10, 2023
<p><b>Author:</b> Eva Shitaatala, Environmental Assessment Practitioners (EAP)  <b>Reviewer:</b> Laudika Halueendo, Environmental Assessment Practitioner (EAP)  <b>On behalf of</b>  Gwayela Environmental Solutions cc  PO Box 668  Windhoek  Namibia  Email: <a href="mailto:evene38@gmail.com">evene38@gmail.com</a>  Tel:+264 81 283 1983</p>	
<p><b>Copyright</b>  <i>"This document is the intellectual property of Gwayela Environmental Solutions and may only be used for the intended purpose. Unauthorized use, duplication, copying or reproduction without referencing or obtaining written consent from Gwayela is illegal"</i></p>	

## **Executive Summary**

An Environmental Management Plan (EMP) is a binding document describing how the impacts identified during the assessment process will be mitigated.

The aim of the EMP is to ensure legal compliance to relevant frameworks while ensuring that probable environmental flaws emanating during project construction and operations as identified during the assessment process. This EMP further recommends mitigation measures to manage the project and ensure that the proposed processing is conducted in an environmentally friendly manner, and in accordance with the provisions of the Environmental Management Act and its regulations.

Thus, this EMP serves to guide the operation of mining establishment at Karlowa Mining Claims No. 70459 and 70460 and outlines specific mitigation measures to be followed during the Uis in the extraction of tin, tantalum and lithium minerals. The extraction of mineral deposits at Karlowa area presents realistic social and economic opportunities as well as negative environmental, cultural and occupational health and safety issues.

The small scale mining operation and flotation mining processing will explore the presence base and rare metals and other industrial minerals found at Mining Claims No. 70459 and 70460 which will be sold on the global market and contribute to the national GDP. The greater area of Karlowa is a historical mining area, with the mining of tin having started as early as 1922, although the sector hit a dip in the early 1990s with a closure of the then largest Uis Tin mine. Although the surrounding environment is already altered, the proposed activity will trigger an interruption in the current ecosystem if unmanaged.

Therefore, the provisions made under this EMP will ensure that the proposed project activities do not cause severe damage to the environment and will barely impact the immediate environment if properly managed. Consenting for proponent to mine in Karlowa will also not harm the environment but contribute to socio-economic development, employment creation, poverty reduction of the mining town of Uis improved household income and national development at large.

The main potential environmental risks that may arise from the proposed mining activities are landscape alteration; water pollution (oil from mining machinery); air pollution (dust from machinery), noise pollution (affecting peace and tranquillity of nearby tourism facilities), occupational health and safety and human wildlife conflicts and crime. However, for each risk appropriate mitigation measures have been identified and if the EMP is adhered to, no significant impacts are expected.

# Table of Contents

## EXECUTIVE SUMMARY

1. INTRODUCTION .....	1
1.1. Mining .....	1
1.2. Water Demand .....	1
1.3. Electricity Demand .....	1
1.4. Project Rationale.....	2
1.5. Environmental Management Plan (EMP) Context.....	2
1.6. What is an EMP? .....	3
1.7. EMP Scope .....	3
1.8. Possible adjustments to the EMP .....	4
1.9. Implementation Framework and Accountability to the EMP .....	5
2. PROJECT INFORMATION.....	6
2.1 Project Location .....	6
2.2 Existing Activities / Current Status .....	9
2.3 Socio-economic (employment).....	10
3. COMPLIANCE AND LEGAL FRAMEWORK .....	11
3.1 Environmental Management Act (No.7 of 2007) .....	11
3.2 Listed Activities .....	11
3.3 Water Resources Management Act, (Act No. 11 of 2013) .....	13
4. ROLES AND RESPONSIBILITIES .....	16
4.1 Roles and Responsibilities.....	16
4.1.1 The Environmental Compliance Officer (ECO):.....	16
4.1.2 The Proponent:.....	17
4.1.3 The Site Manager:.....	17
4.2 Instructions.....	18
4.3 EMP Implementation Context .....	18
5. POTENTIAL IMPACTS AND MITIGATION MEASURES .....	19
5.1 Impact Themes and Recommended Mitigation Measures .....	19
6. RECOMMENDATIONS .....	30
7. CONCLUSION.....	32
8. References .....	33

## FIGURES

Figure 1: Project Location .....	6
Figure 2: Project area with coordinates – Mining Claims No. 70459 and 70460 .....	7
Figure 3: Current biophysical environment – Mining Claims No. 70459 and 70460 ...	9

## TABLES

<i>Table 1: Role players, institutional framework.....</i>	<i>5</i>
<i>Table 2: Listed Activities triggered by the proposed project .....</i>	<i>11</i>
<i>Table 3: Relevant policies, plans and strategy .....</i>	<i>12</i>
<i>Table 4: Other relevant legal instrument/national statues .....</i>	<i>13</i>
<i>Table 5: Summary of potential impacts arising from the project.....</i>	<i>19</i>

## **1. INTRODUCTION**

---

### **1.1. Mining**

Karlowa Mining Enterprise (PTY) Limited) is 100% Namibian owned company that mainly focuses on exploration and mining activities. The company specializes in other areas such as commodity trading, investments, import and export and export of mineral resources.

The company is driven by young dynamic Namibians who exert their efforts into improve the lives of the Namibian people. Their primary objective is to ensure that value is added to local resources and economic benefits is realized by the people on the grassroots. Thus the exploration activities aims to contribute to the discovery of minerals such as copper, tin, tantalum, and lithium which can be sold on the global market and bring value to the Namibian economy.

The proposed exploration activities at MC No. 70459 and 70460 trigger activities that are listed under the EMA. Meaning an EIA should be conducted to comply with the national legal framework as well as prevent any eventuality that will jeopardize the company's continental reputation. Karlowa Mining envisioned this undertaking to show its commitment towards national compliance and contribution to growth at home in Namibia.

### **1.2. Water Demand**

The proposed small scale mine will require water for commercial/industrial, which is to be, supplied from the existing desalination water plants. This is due to the fact that, the local proposed site's local aquifer (Nei-Neis) of this hyper-arid area is of alluvial nature. Being alluvial aquifer and given that there is barely river flow in the Ugab catchment and hence slow aquifer recharge, this aquifer has a history of running dry and hence will not be able to supply the proposed mining operations.

### **1.3. Electricity Demand**

Mining operation will be powered and operated with energy generated from diesel generation. The proponent will need to establish a solar based power plant to cater for the operation's energy needs and is obliged to acquire the necessary documentations from the relevant authorities. Approval and License to set up a solar park should be obtained from Ministry of Mines and energy as well as Electricity Control Board respectively.

#### **1.4. Project Rationale**

The discovery of mineral resources in Namibia has made mining a major contributor to the national economy. Mining is the 4<sup>th</sup> contributor, contributing up to 25% to the GDP. The industry also contributes significantly to job creation, economic development and building relations with international trading partners.

Mining is also considered a blessing in disguise. If unmanaged properly, the industry is also a potential downfall for Namibia. Over the years, there has been a major overlap in the locality of rare species, critical biodiversity areas and the presence of minerals in Namibia. Mismanagement of natural resources caused by exploration and mining activities can lead to ecological degradation, destruction of natural habitat and heritage resources, occupational related damages.

Uis is a settlement in Erongo Region. Previously known as Damaraland, Uis is blessed with large mineral deposits. Established in 1958 to exploit tin deposit, to date Uis is playing a significant role in the exploitation of tin, tantalum and lithium. The growing demand in these deposits and the need of electrical cars is causing an explosion of mining related activities in the town.

Uis is also popular for its Brandberg – the highest mountain in Namibia. The Brandberg Mountain is home to the world's famous "White Lady" rock painting which is said to be over 20,000 years old, factors which among others attracts a sizeable number of tourists to this settlement.

Together with the tourism activities, the envisaged project at Karlowa area will contribute to the national economy through job creation and infrastructural development, which will contribute to livelihoods improvement of the beneficiaries. The project will specifically contribute towards:

The project will employ 15 employees who will directly be employed by the proponent or indirectly by the contractors and this will enhance households' income, food security and improved livelihoods overall.

#### **1.5. Environmental Management Plan (EMP) Context**

The EIA Regulations defines a 'Management Plan' as:

*"a plan that describes how activities that may have significant impacts on the environment are to be mitigated controlled and monitored."*

The EMP is binding to the proponent, and all contractors/sub-contractors to be engaged in mining of tin, tantalum and lithium at Karlowa Mining EPL No. 7248. Stakeholders engaged in the mining establishment should comply with the EMP throughout the project lifespan. Non-compliance may have serious consequences

such as withdrawal of license by Ministry of Environment, Forestry and Tourism.

This EMP has been developed in accordance with the provisions of the Environmental Management Act (Act No.7 of 2007), EIA Regulations of 2012, while taking into consideration the issues highlighted in other national regulations such as the Labour Act (Act No. 11 of 2007).

## **1.6. What is an EMP?**

An EMP is defined as tool used to mitigate potential environmental risks associated with the proposed project / activity by providing a risk management strategy and logical framework during construction and operation and decommissioning of the proposed project. It covers the mitigation of potential environmental, occupational health & safety, heritage and socio-economic impacts.

The EMP outlines mitigation measures against specific activities, steps, stages or processes of the proposed development. Thus, the EMP can be defined as the tool to prevent and or minimize the impacts identified during the EIA process. Furthermore, the EMP outlines specific roles and responsibilities for role-players against which they can be evaluated and non-compliance is punishable.

The objective of the EMP is to eliminate, prevent / minimize (where possible) the anticipated unacceptable and adverse environmental, heritage & cultural, occupational health & safety, social or economic impacts that may arise from the proposed development. Overall, the EMP aims to prevent any negative impact/s (real, potential or perceived) that may result from the proposed development.

## **1.7. EMP Scope**

The purpose of the EMP is to identify potential environmental and social impacts associated with the mining of base metal – tin, tantalum and lithium at Karlowa area. This is to ensure compliance to the EMA and other relevant legal framework. It further aims to protect the environment for the entire project life span.

The aim of the EMP is to ensure that the activities undertaken during mining of base metal – tin, tantalum and lithium at Mining Claims No. 70459 and 70460 are conducted in accordance with the following:

- i. Environmental Management Act (No. 7 of 2007),
- ii. EIA regulations of 2012 (GN: 30), and
- iii. National Policy on Prospecting and Mining in Protected Areas
- iv. Best environmental practices (benchmarks)
- v. Any other applicable legislation (*as presented in Table 3.1 to 3.3*)



The EMP provides environmental guidelines to be followed throughout the lifespan of the mining activity. The guideline comprises of the following:

- a) Environmental Aspects,
- b) Management Objective,
- c) Mitigation Measures / Actions Required,
- d) Monitoring Indicators, and
- e) Party Responsible

The EMP is not limited to the boundaries of the proposed project and activities related to the Mining Claims No. 70459 and 70460 zone, but it includes the bigger picture, and serves as a guiding tool to protecting the natural, bio-physical and socio-economic environment both in the surrounding area and beyond the scope of construction, operation and rehabilitation of the mine. This is crucially so, due to the fact that, most of the probable impacts (e.g pollution of the river, dust and noise pollution, cannot be localised to the mining area).

### **1.8. Possible adjustments to the EMP**

The EMP is an open-ended document and may be considered inconclusive. In other words, the EMP should allow room for adjustments if new information becomes available at a later stage, in which new / additional mitigation measures may become necessary.

The necessity of possible adjustments to the EMP at a later stage may be attributed to:

- a) Lack of information at the time of drafting the initial EMP,
- b) Evolution or addition of new activities, or
- c) Unintended omission of potential impacts during the initial project design and development of the initial EMP.
- d) Development of industry best practice.

This implies that, in-addition to the information contained herein, any other relevant information that may surface during the construction and operations through internal monitoring or auditing by the Environmental Compliance Officers (ECOs), can be added to the EMP (evolution of activities), and such changes or inclusions will be binding to the proponent and all contractors / sub-contractors.

### **1.9. Implementation Framework and Accountability to the EMP**

For effective implementation of the EMP, the Institutional roles are presented below. However, the specific roles and responsibilities are defined and broken down as presented in Sections 5 and 6, respectively.

*Table 1: Role players, Institutional Framework*

<b>Role-player</b>	<b>Company / Institution</b>	<b>Role</b>
Proponent	Karlowa Mining Enterprise (Pty) Ltd	Compliance to the EMP
Environmental Consultant	Gwayela Environmental Solutions	Development of the EMP
Environmental Compliance Officer/s (ECO)	Ministry of Environment & Tourism (MET) – Department of Environmental Affairs (DEA), Departments of Park Management	Monitoring Compliance to EMP: <ul style="list-style-type: none"> <li>➤ Un-announced spot checks,</li> <li>➤ Warning, penalties / fines, license suspension, etc</li> </ul>
Public	Interested and affected parties (I&APs)	Report to the ECOs, any activity of environmental concern (e.g Pollution, safety risks, etc)

## 2. PROJECT INFORMATION

---

### 2.1. Project Location

The proposed exploration activities will take place on a two claims namely MC 70459 and 70460, located within the Karlowa area in Erongo region. The site is located 20 km south-west side of Uis, along the C35 road between Uis and Hentis Bay referred to in Figures 2-1. The site covers 31.1309 hectares and is coordinated at the points as summarized in *Table 2-1 and 2 below*.



Figure 1: Project Location



Table 2-1: MC No. 70459 Coordinates

<b>Corner</b>	<b>Latitude</b>	<b>Longitude</b>
1	21 <sup>0</sup> 27' 05.85" S.	14 <sup>0</sup> 41' 06.55" E.
2	21 <sup>0</sup> 27' 06.48" S.	14 <sup>0</sup> 41' 16.28" E.
3	21 <sup>0</sup> 27' 21.33" S.	14 <sup>0</sup> 41' 09.70" E.
4	21 <sup>0</sup> 27' 20.08" S.	14 <sup>0</sup> 40' 59.87"E .

Table 2-2: MC No. 70460 Coordinates

<b>Corner</b>	<b>Latitude</b>	<b>Longitude</b>
1	21 <sup>0</sup> 26' 05.85" S.	14 <sup>0</sup> 41' 06.55" E.
2	21 <sup>0</sup> 26' 06.48" S.	14 <sup>0</sup> 41' 16.28" E.
3	21 <sup>0</sup> 26' 21.33" S.	14 <sup>0</sup> 41' 09.70" E.
4	21 <sup>0</sup> 26' 20.08" S.	14 <sup>0</sup> 40' 59.87"E .

## **2.2. Existing Activities / Current Status**

The exploration activities will take place at mining claims No.70459 and 70460. A small scale mine will be established in exploration of base and rare metals and other industrial minerals.

Overall, the area near Karlowa mining is disturbed, there are many mining activities taking place. Around the proposed project there are 10 mining claims currently being explored for sampling and small-scale mining activities. On site there has not been an old quarry, this means that the area is virgin.

Based on the assessment, the central desert area is characterised by the "Succulent Karoo" biome and is considered to have less endemic fauna and flora. The proposed project falls in a state land within Tsesib conservancy.

The typical fauna found in Tsesib conservancy include Elephant, black rhino, leopard, cheetah, mountain zebra, kudu, gemsbok, ostrich, springbok, steenbok, black-backed jackal, and klipspringer.

According to the assessment, there are no significant heritage and cultural resources on site. Discovery after commencement of the project will be dealt in accordance to the EMP. The proponent will be responsible for informing the Heritage Council of Namibia.

Considering the description above, the proposed site falls out of the mining exclusion zone and co-exists with tourist activities in the area. The existing environment is disturbed particularly the area adjacent to the Uis river which is impacted by several activities. South of the site (about 3 km) is an abandoned mine and approximately 1km north of the proposed site is a prospecting mine, (see figure 2 below).

The existing biophysical environmental is further characterized by sparsely vegetated land dominated by small shrubs and grassland as shown in figure 2-2. The figure below further describes the landscape at Karlowa's mining claims.

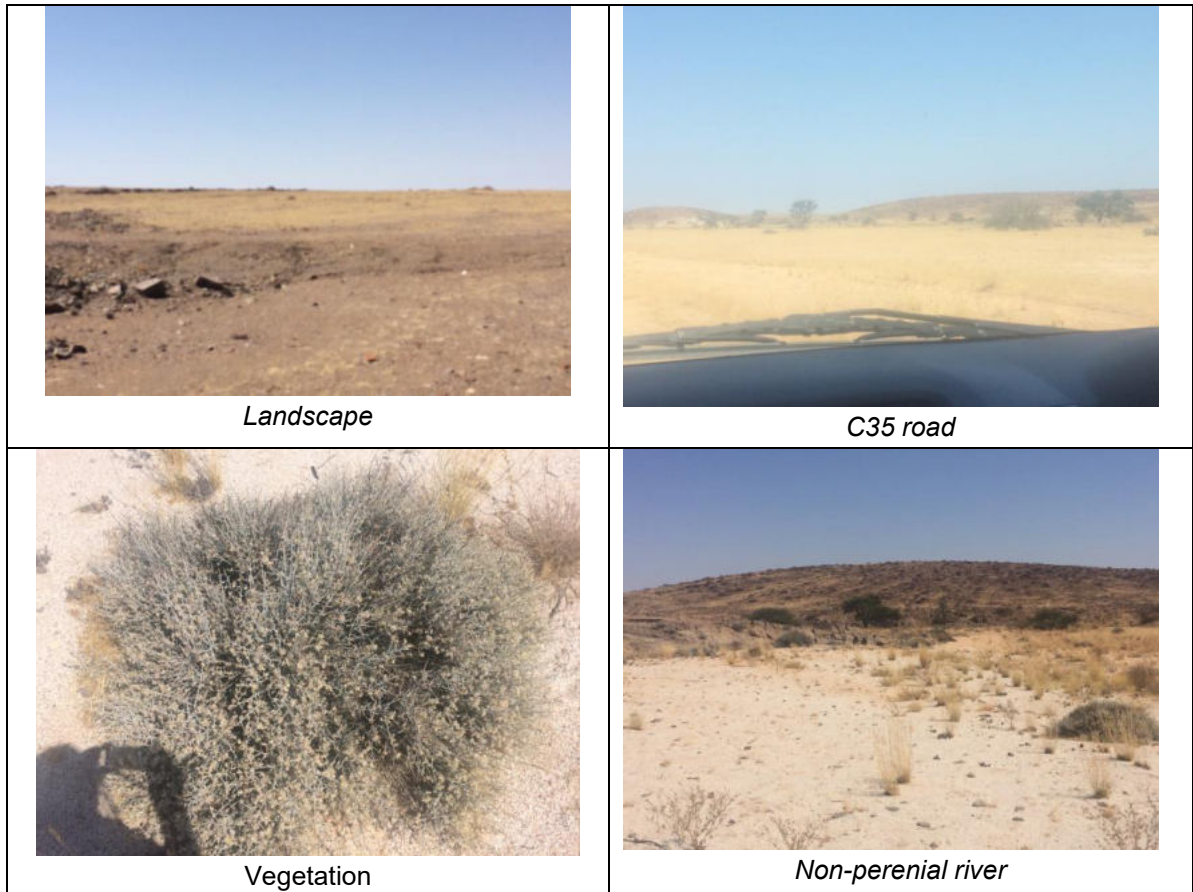


Figure 3: Current Biophysical Environment – MC No. 70459 and 70460

### 2.3. Socio-economic (employment)

The proposed project will provide direct and indirect employment to more than 15 individuals who will be employed either by the proponent or contractors during construction or operation of the mine. Employees will be mainly involved in mining ore extraction, sorting of the stones or operative machinery and mining equipment. All employees will be hosted and accommodated onsite for the entire period of the project lifespan. The proponent will also be responsible for ensuring the safety and health of employees at work.

### **3. COMPLIANCE AND LEGAL FRAMEWORK**

---

This chapter outlines the regulatory framework applicable to the proposed project. Table 3.2 provides an overview of applicable policies, plans and strategies and Table 3.1 provides a list of applicable national legislation.

#### **3.1. Environmental Management Act (No.7 of 2007)**

Section 27 of the Environmental Management Act 2007 (Act No. 7 of 2007) provides a list of activities that may not be undertaken without an Environmental Clearance Certificate (ECC) (herein referred to as: listed activities).

#### **3.2. Listed Activities**

Listed Activities may not be undertaken without an Environmental Clearance Certificate (ECC), and hence an Environmental Impact Assessment (EIA) is required.

The proposed project triggers a number of Listed Activities as set out in the Environmental Management Act, 2007 (Act No. 7 of 2007) (herein referred to as the EMA) and the Environmental Impact Assessment Regulation, 2007 (No. 30 of 2011) (herein referred to as the EIA Regulations). Prior to commencement of the project, the proponent shall apply for the ECC. The application shall entail the following documents: written application, assessment report and EMP.



*Table 2: Listed Activities triggered by the proposed project*

<b>Activity</b>	<b>Specific Activity</b>	<b>Proposed Activity</b>
Activity 3 Mining & Quarrying Activities	3.1 The construction of facilities for any process or activities which requires a license, right or other form of authorization, and the renewal of a license, right or other form of authorization, in terms of the Minerals (Prospecting and Mining Act), 1992.	Karlowa proposes to establish a small scale mine to explore for base and rare metals and other industrial minerals at Mining Claims No. 70459 and 70460.
Activity 9 Hazardous Substance Treatment, Handling and Storage	9.4 The storage and handling of dangerous goods, including petrol, diesel, liquid petroleum gas or paraffin, in containers with a combined capacity of more than 30 cubic meters at any one location.	Storage and usage of diesel fuel for energy and powering the plant.

### 3.3. Water Resources Management Act, (Act No. 11 of 2013)

The application to abstract water from the reservoir will be launched with the department of water affairs to obtain the permit just as in accordance with the provisions of the Water Resources Management Act, 2013 (No. 11 of 2013).

*Table 3: Relevant Policies, Plans and Strategies*

Policy / Plan	Relevance	Applicability to the Proposed Project
5th National Development Plan (NDP) and Vision 2030	Outlines the country's National Development Plans (NDPs), in line with the Harambee Prosperity Plan (HPP) and vision 2030	The proposed project is a development that forms part of the bigger picture of achieving economic progression, social transformation and environmental sustainability.  Mining as a pillar for social well-being and economic development through household income and improved livelihoods

*Table 4: Other Relevant Legal Instruments / National Statutes*

National Statutes	Relevance	Applicability to the Proposed Project
Environmental Assessment Policy (1995)	Promotes Sustainable development and Environmental Conservation emphasize the importance of environmental assessments as a key tool towards environmental sustainability.	Environmental Protection
Water Resources	Provides a framework for managing water resources	Laying of water pipeline network from

National Statutes	Relevance	Applicability to the Proposed Project
Management Act, 2013 (No. 11 of 2013)	based on the principles of integrated water resource management. It provides for the management, protection, development, use and conservation of water resource.	the desalination main pipeline to the mining site.  Section 68 makes provisions for prevention of water pollution.
Forest Act 12 of 2001  Forest Act Regulations 2015	To provide for the protection of the environment and the control and management of forest. Relevant sections:  - Approval required for the clearance of endemic plants Tree species and any vegetation within 100m from a water source may not be removed without a permit (Section 22, subsection 1 (b))	Forestry permits maybe required for vegetation clearing
Public and Environmental Health Act (Act No. 1 of 2015)	- Advocates for Public Health and safety.	Protective clothing provision, exposure limits and occupational injuries and disease prevention
National Heritage Act, No. 27 of 2004.	The Act provides provision of the protection and conservation of places and objects with heritage significance.	Refer to handling procedures presented in the Assessment Report.
Precautionary Approach Principle	The precautionary principle is a global accepted approach, which states that, when there is a insufficient information about the potential threats / impacts that may arise from the proposed development, precaution	Prevention is better the cure. Implementation of hazard management hierarchy.

National Statutes	Relevance	Applicability to the Proposed Project
	(safety) should be applied	
Polluters Pays Principle	This principle ensures that proponent takes responsibility of their actions. Hence in cases of pollution, the proponent bears the full responsibility and cost to clean up the environment	Accountability: The day that the government and authorities start holding people accountable, a new Namibia will be born and socio-economic development will blossom.

## 4. ROLES AND RESPONSIBILITIES

---

This section outlines the roles and responsibilities of the key personnel that will be responsible for the day to day management of activities to ensure effective implementation of the EMP.

### 4.1. Roles and Responsibilities

To ensure accountability, it is necessary to assign responsibilities. The key role-players for project implementation are;

- a) The **Environmental Compliance Officer (ECO)** representing the Ministry of Environment and Tourism (MET), or an appointed independent environmental officer, who is responsible for monitoring and auditing.
- b) **The Proponent**: Owner / Project Manager **Karlowa Mining Pty Ltd**
- c) **The Site Manager** the person responsible for the day-to-day management of the project.

#### 4.1.1. The Environmental Compliance Officer (ECO):

The ECO refers to the party responsible for the environmental monitoring and auditing to ensure that the provisions of the EMP are complied with. The ECO shall have adequate environmental knowledge to understand and interpret the EMP and pertaining environmental aspects associated with the project. The specific tasks of the ECO are as follows:

- To undertake all monitoring and auditing activities in-order to ensure compliance with the EMP.
- Conduct site inspection prior to the commencement of activities; and at reasonable intervals (e.g. every month, quarterly or annually), throughout the duration of the project. Depending on the risks, some projects may be inspected more frequently (e.g. every month).
- Conduct regular inspections (unannounced spot checks) and shall submit compliance or non-compliance reports to the respective authorities (MET or any other relevant authority).
- Compile Progress Reports immediately after site inspections, Compliance Reports, pertaining to any non-compliance incident/s, and a Rehabilitation Report following the conclusion a specific activity.
- The ECO shall liaise closely with all key stakeholders i.e. the Site Manager and the Environmental Commissioner.

- Shall provide guidance on any environmental management issues, incidents or emergencies that may arise throughout the project lifespan.
- Shall assist in providing recommendations for remedial action in the event of non-compliance.
- Auditing or monitoring activities may involve investigation, as well as structured observation, measurement, and evaluation of environmental data over a period of time.

#### 4.1.2. The Proponent:

The specific responsibilities of The Proponent are as follows:

- Appoint a Site Manager (SM) to oversee the daily onsite activities.
- Liaise closely with the SM and ECO on any environmental management issues, incidents or emergencies.
- Ensure that all activities on and around the site are conducted in accordance with the requirements of the EMP at all times.
- Ensure that all sub-contractors and visitors to the site are conversant with the requirement of the EMP, relevant to their roles on site.
- Shall develop a **communication strategy** between The Proponent, Site Manager, workers, the ECO and any other relevant stakeholder.
- Shall develop an **organisational structure** to ensure that:
  - There are clear channels of communication;
  - There is an organisational hierarchy for effective implementation of the EMP; and
  - Conflicting or contradictory instructions are eliminated;
  - Ensure that all instructions and official communications regarding environmental matters shall follow the organisational structure as determined
  - Ensure that those EMP requirements are assigned to specific people /positions with the capacity and experience required for implementation.

#### 4.1.3. The Site Manager:

The **Site Manager (SM)** should:

- Ensure that each team recruited to work at the sites, adheres to the EMP;
- Ensure that a **copy of the EMP is kept on site at all times and as it may be requested by authorities conducting spot checks at any time.**

- Ensure that all staff attend an induction session before commencement of any work on site and that they are adequately informed of the requirements of the EMP;
- Shall take special care to prevent irreversible damage to the environment;
- Ensure that activities are within the boundaries of the proposed zones as specified Site Map and boundary markings (visible pegs, tape etc).

#### **4.2. Instructions**

All instructions and official communications regarding environmental matters shall follow the organisational structure as determined by the Proponent. Based on the adopted structure, it is essential that responsibilities outlined are assigned to specific parties with adequate capacity and experience required to implement the EMP.

#### **4.3. EMP Implementation Context**

Environmental management is not only concerned with the final results of The Proponent's operations, but also with how such operations are carried out. Tolerance with respect to environmental matters applies not only to the finished product but also to the standards of the day-to-day operations required to complete the Works.

The EMP is an important tool and necessary to mitigate / counter negative environmental or social impacts that may arise from the project. However, in the absence of audits and monitoring, it will become ineffective.

## 5. POTENTIAL IMPACTS AND MITIGATION MEASURES

### 5.1. Impact Themes and Recommended Mitigation Measures

The EMP has been categorised into different themes, which serve as a quick guide to the recommended EMP remedial actions during the construction, Operation and rehabilitation stages (*Section A to E*). The recommended mitigation measures were suggested based on the risk management theory as well as hazard management hierarchy.

*Table 5: Summary of potential impacts arising from the project*

EMP Phase	Specific Aspects
A. Socio economic	Employment opportunities for Locals
	Alcohol and Drug abuse
	HIV / AIDS
	Security
B. Pollution and Waste Management	General waste categorised into: Material waste (off cuts) and domestic waste
	Oil and Lubricant Spills
	Industrial waste such as tailings
	Air Emissions and dust
C. Environment	Water (surface & underground
	Ecology
	Visual Environmental
	Rehabilitation
	human wildlife conflict
Cultural Heritage	Heritage resources / artefacts
Occupational Health and Safety	General safety at work place
	Risk management & Hazards
	Ablution facilities
	Visitor Safety



## SECTION A: SOCIO ECONOMIC

Environmental / Social Impact	Objectives	Proposed Mitigation Measures	Monitoring Indicator	Responsibility
<b>Employment opportunities from the mining activity</b>	Promote benefits to the local community.	<ol style="list-style-type: none"> <li>1. Recruit locals for unskilled labour as well as give preference for qualified locals for skilled labour.</li> <li>2. Where possible, procure materials from local suppliers.</li> <li>3. Consult relevant stakeholder in local</li> </ol>	<p>Employee structure and proportion of local employment.</p> <p>Compliance to Affirmative Action.</p>	Proponent
<b>Alcohol and Drug use</b>	Prevent alcohol and drug use at the mining site.	<ol style="list-style-type: none"> <li>1. Provide awareness on the dangers and health impacts of alcohol and drug use</li> <li>2. All employees must be screen with the breathalyser to avoid intoxicated personnel on site.</li> <li>3. Prohibit use of alcohol and drugs on site.</li> </ol>	<p>Breathalyser report</p> <p>Monitor presence of alcohol at work place.</p>	Proponent through the site manager
<b>Working hours</b>	Adhere to the Labour Act No. 11 of 2007.	<ol style="list-style-type: none"> <li>1. Operate within the prescribed working days and hours as per the Namibian Labour laws and regulations.</li> </ol>	Verification of working hours against the labour Act.	Proponent
<b>HIV / AIDS</b>	Provide HIV / AIDS awareness to employees.	<ol style="list-style-type: none"> <li>1. Provide HIV / AIDS awareness at induction</li> <li>2. Avail condoms at on site</li> </ol>	Availability of condoms at Mining site.	Proponent

Environmental / Social Impact	Objectives	Proposed Mitigation Measures	Monitoring Indicator	Responsibility
<b>Security</b>	Provide a secured environment and prevent unauthorized entry.	<ol style="list-style-type: none"> <li>1. Have available security officer on site 247.</li> <li>2. Demarcate and shield all the dug holes to prevent people and animals from falling into the holes.</li> <li>3. No unauthorized individuals should be allowed onsite and every employee will be given a permit as required by the park</li> </ol>	<p>Presence of security service onsite.</p> <p>Barricade ropes around the site and holes.</p> <p>Provision of access cards with cards/permits for the employees.</p> <p>Implement proper signage.</p>	Proponent

## SECTION B: POLLUTION CONTROL AND WASTE MANAGEMENT

Environmental / Social Impact	Objective	Proposed Mitigation Measures	Monitoring Indicator	Party Responsible
<b>Oil and sewage Spills</b>	Manage oil spills and leak from vehicles and Machinery. Prevent waste water from seeping in the ground.	<ol style="list-style-type: none"> <li>1. There must be an immediate spill response kit on site</li> <li>2. Ensure all vehicle and machinery must be well serviced and leak inspections are done.</li> <li>3. Provide drip trays to stationary vehicle and machinery</li> <li>4. The onsite re-fuelling area must be on concrete bund</li> <li>5. Storage of fuel, oil and lubricants must be kept on banded structure</li> <li>6. If an oil spill occurs, collect the contaminated soil, store in drums and dispose at appropriate waste disposal site (e.g. Municipal disposal site).</li> <li>7. The septic tanks must be properly lined according to the Act to prevent it from pollution the ground and waste water should be pumped out</li> </ol>	Physical verification and routine monitoring, documentation of incident investigations and corrective actions reports.	Proponent

<b>Environmental / Social Impact</b>	<b>Objective</b>	<b>Proposed Mitigation Measures</b>	<b>Monitoring Indicator</b>	<b>Party Responsible</b>
		and taken to the local waste water treatment facility.		
<b>Solid Waste Management</b>	To manage solid waste.  To prevent littering, pollution, contamination of water and general environmental health hazards.	<ol style="list-style-type: none"> <li>1. All waste produced on site should be contained and disposed as required.</li> <li>2. There must be sufficient temporally ablution facility at the site for designated for males and female.</li> <li>3. There must be provision of secure waste bins on site and should be disposed of at an approved dumpsite.</li> </ol>	Scattered waste, Littering and any other unsightly waste at the site (eyesore), clean environment status.	Proponent

## SECTION C: ENVIRONMENT

Aspect	Objective	Action Required	Monitoring Indicator	Party responsible
<b>Surface Water</b>	To avoid any potential water contamination or pollution of the river system.	<ol style="list-style-type: none"> <li>1. Refer to the adequate handling of oil and fuel above.</li> <li>2. Ensure no mining activities within 100 meters from the river.</li> <li>3. Once spillages occur, contaminated sand/grounds should be immediately remediated and treated to prevent run off into the river during rainy season.</li> </ol>	<p>Oil and grease trace in surface water.</p> <p>Incidents investigation records.</p>	<p>Proponent</p> <p>Site Manager</p>
<b>Water abstraction</b>	To conserve the river resources.	<ol style="list-style-type: none"> <li>1. Do not abstract more than the approved allocation as indicated in the permit</li> <li>2. Install automatic measuring gauge to monitor abstraction.</li> <li>3. Carry out periodic pumping yield to assess aquifer sustainability.</li> <li>4. Adhere to the conditions set in the reports.</li> </ol>	<p>Abstraction reports</p> <p>Water levels monitoring reports.</p>	Proponent
<b>Visual Environment</b>	To ensure that the infrastructure development is blending with the	<ol style="list-style-type: none"> <li>1. Use materials that are environmentally friendly and blend with the existing environment.</li> <li>2. Restore the environmental to its</li> </ol>	Visual and physical monitoring	Proponent

Aspect	Objective	Action Required	Monitoring Indicator	Party responsible
	current environment. To ensure minimal visual impacts on the existing environment.	original state where applicable by minimizing visual impact.		
<b>Ecology</b>	Rangeland Management	<ol style="list-style-type: none"> <li>1. Endemic vegetation should be taken to the Namibia Botanical Garden (NBG) to be preserved and replanted during rehabilitation.</li> <li>2. Create a tree database for monitoring</li> <li>3. Create a complain register from other land use.</li> <li>4. Clear the vegetation only where the ore deposit is.</li> </ol>	Inspection report Trees log at the NBG. Geo-physical monitoring	Proponent
<b>Human Wildlife</b>	To prevent human-Wildlife conflicts particularly between human and cheetah or elephant.	<ol style="list-style-type: none"> <li>5. Secure area around the site and put security light.</li> <li>6. Maintain quiet time in the evening.</li> <li>7. No fire permitted on the mining facility.</li> <li>8. All entertainment to be held need permission.</li> </ol>	Complaint cases, routine monitoring, cases of wildlife human conflict	Proponent

Aspect	Objective	Action Required	Monitoring Indicator	Party responsible
<b>Rehabilitation</b>	To ensure that all disturbed areas are rehabilitated.	<ol style="list-style-type: none"> <li>1. All areas disturbed as a result of the mining activities should be cleaned up and rehabilitated. Backfilling of all voids caused by excavation by placing of topsoil on backfill.</li> <li>2. Tailing waste and other waste materials should be removed from the sites and disposed of or used for backfilling.</li> <li>3. Re-vegetation of exposed soil surfaces to ensure no erosion in these areas with the endemic plants.</li> </ol>	Physical & visual verification	Proponent

## SECTION D. HERITAGE AND ARCHAEOLOGY

Aspect	Objective	Action Required	Monitoring Indicator	Party responsible
<b>Heritage Resources / artefacts</b>	Reduce the impacts associated earthworks, increase traffic on heritage resources / artefacts.	<ol style="list-style-type: none"> <li>1. Heritage remains or artefacts discovered on site must be reported to the National Museum (+264 61 276800) or the National Forensic Laboratory (+264 61 240461).</li> <li>2. No artefacts must be removed or be interfered with prior to authorisation from the Namibian National Heritage Council (NHC).</li> <li>3. Recovery of heritage remains or artefacts discovered and removal thereof should be directed by the National Museum.</li> <li>4. Return the area to its normal nature by having minimum impacts on the visual environment.</li> </ol>	Sighting report/s of heritage resources / artefacts	Site Manager



## SECTION E. OCCUPATIONAL HEALTH AND SAFETY HEALTH AND SAFETY

Aspect	Objective	Action Required	Monitoring Indicator	Party Responsible
<b>General Safety at Work Place</b>	Ensure that the safety of workers is not compromised and adhere to the Health and Safety Regulations, Government Notice 156/1997 (GG 1617)	<ol style="list-style-type: none"> <li>1. Develop a Health and safety Plan</li> <li>2. Train staff/employees on personnel safety and how to handle equipment and machinery.</li> <li>3. Provide protective gear (helmets, safety straps, first-aid kits etc.).</li> <li>4. Only qualified personnel must be allowed to operate special machine/instruments.</li> <li>5. No employee must be allowed to be onsite without PPE;</li> <li>6. Adequate safety signs must be displayed on site.</li> <li>7. No unauthorized people onsite.</li> </ol>	<p>Health and Safety included and reflected in the Induction Minutes</p> <p>adequate protective gear for all staff</p> <p>Availability of the first aid kit onsite</p> <p>Registry of personnel's onsite</p>	Site Manager
<b>Ablution</b>	Reduce health risks and environmental pollution.	<ol style="list-style-type: none"> <li>1. Ensure adequate, hygienic (clean) and user-friendly ablution facilities for all staff.</li> <li>2. Provision of separate Male and female toilets.</li> <li>3. Inspect ablution facilities regularly.</li> <li>4. Ensure that the septic tank is securely lined.</li> </ol>	<p>Availability of clean and hygienic ablution facilities for both genders.</p> <p>Incidents or complaints of waste discharge into the environment.</p>	Proponent and Site Manager
<b>Hazards</b>	Ensuring that all physical, chemical, biological,	<ol style="list-style-type: none"> <li>1. Ensure that employees and stakeholders entering the premises are trained, protected and aware of the hazards they are exposure to on the</li> </ol>	<p>Induction training registry</p> <p>Visible onsite hazards &amp; emergency plan signage</p>	

Aspect	Objective	Action Required	Monitoring Indicator	Party Responsible
	economical and psychological hazards are managed according to the related regulations.	<p>mine.</p> <ol style="list-style-type: none"> <li>2. Unauthorized individuals should not be allowed on the premise.</li> <li>3. Only trained/licensed individuals should operate heavy machinery, work at heights or concealed areas.</li> <li>4. Clear signs should be erected along the plan.</li> <li>5. Emergency plan should be developed and all employees should be acquainted with it.</li> </ol>	<p>erected.</p> <p>Job card issuance and log-out calls registry.</p>	
<b>Dust and Noise</b>	Mitigate dust and noise impacts to both employees and the public.	<ol style="list-style-type: none"> <li>1. Determine both entry and exit medical fitness of each employee.</li> <li>2. Provide dust masks and ear muffs to all employees operating in a dusty or noisy environment.</li> <li>3. Use dust suppression system to prevent accidents related to poor visibility.</li> <li>4. Monitoring of both environmental and occupational noise and dust.</li> </ol>	<p>Implemented noise and dust monitoring procedures</p> <p>Incident Report</p> <p>Public Complains</p> <p>Employee medical records</p>	Site Manager
	Dust Management	<ol style="list-style-type: none"> <li>5. See recommendations under Section 6.1.</li> </ol>		

## 6. RECOMMENDATIONS

---

- a) All the mining activities should be conducted at least 100 meters away from the road reserves;
- b) All structures to be erected as part of the mining activities at Karlowa's MC No. 70459 and 70460 should be done in an environmentally friendly manner and aesthetically in sync with the existing environment.
- c) All aspects related to social, heritage, environmental and occupational hazards should be monitored and mitigated accordingly.
- d) The proponent should appoint a specialist to assist with the implementation of a sound environmental and occupational health and safety management system.
- e) Procedures to execute critical jobs on site should be developed, filed and communicated to each employee.
- f) Water purposed for the mining operation should be sourced from desalination instead of the aquifer. The aquifer has previously run out from similar activities and the mining activities and Karlowa could possibly contribute to the depletion of the water level and drying out the aquifer.
- g) The proponent needs to acquire licence and permits related to activity 3,9 as referred in Table 2 from the relevant authorities.
- h) The proponent should consider Uis demographic outlook to create an impactful job creation and should further consult the relevant stakeholders such as, Uis traditional Authority, Daures constituency and Tsesib Conservancy in reaching out to the community for employment opportunities.

### 1.1. Dust Management

The site Manager shall ensure that:

- a) A compulsory speed limit of 30km/h is introduced within the boundary of the site and ensures that it is adhered to by both the public and employees.
- b) Introduce dust hazard warning (at least 1 km away from the site) for both on-going and coming traffic.
- c) Where applicable; close the road before blasting and until the dust cloud is cleared.
- d) Make use of non-portable water and ensure there is an adequate water supply at the site for effective dust suppression/mitigation particularly on windy and dry days.
- e) Use fine water sprays on conveyors, loading shovels, hoppers and wherever appropriate to minimize dust generation. Also ensure stockpiles of waste or materials are covered to reduce potential for fugitive dust emissions.

- f) Both employees and visitors are provided with dust masks while on site to prevent them from dust exposure.

## 7. CONCLUSION

---

The mining development at Karlowa MC No.70459 and 70460 trigger activities that require an environmental clearance certificate before it is implemented. In conjunction to the ECC, the proponent is prompt to acquire a licence to establish an energy generation power plant. The proponent is caution to use water sourced from desalination plant as the available underground water reservoir is often and currently depleted.

The mining establishment should be in accordance to the terms of the EMP in order to ensure that the activities are conducted in a manner that protects natural biodiversity along with its underlying ecological structure.

Thus, the EMP recommends mitigation measures in order to ensure that the recommended activity (mining in a protected area) is conducted in an environmentally friendly manner and in accordance with the provisions of the Environmental Management Act and EIA regulations.

Non-compliance against the EMP is punishable according to the law and specific responsibilities have been assigned to role players' in-order to ensure that the EMP is implemented. The key role-players (Proponent, Contractor, and Site Manager) as defined under section 4 should:

- **Read** the EMP (particularly the Site Manager) and ensure that they are fully conversant with provisions of the EMP,
- If need be, **Ask for clarity** from the Environmental Assessment Practitioner (EAP), Environmental Compliance Officer (ECO) or relevant authority,
- Ensure implementation of the recommended mitigation measures, and
- Communicate defaults / challenges to the ECO as soon as possible.

The ECO should monitor (conduct periodic and unannounced EMP audits) in-order to ensure compliance against the recommended mitigation measures.

In conclusion, changes related to the scope of work or mining operation will require an update in the EMP. The proponent needs to ensure that all relevant stakeholders are informed about such changes.

## 8. References

---

- Christelis G. and Struckmeier W. (2015). Groundwater in Namibia, an explanation to the Hydrogeological Map. Windhoek, Namibia
- NACOMA. (Undated). Namibia Coast Conservation and Management Project
- Tordif E. (2009). Notes on Hydrogeology Training for Ministry of Agriculture, Water and Forestry, Department of Water Affairs and Forestry. Windhoek, Namibia
- B. Matengu (2011) Hydrological Characteristics of the Omaruru Delta Aquifer System in Namibia. Hydrogeology Journal