

# **ENVIRONMENTAL IMPACT ASSESSMENT**

## **SCOPING REPORT**

**FOR THE ESTABLISHMENT AND MINING OF BASE AND RARE METALS ON**

**MINING CLAIMS 72530, 72531 AND 72532 AT**

**OUNDOMBO VILLAGE, OPUWO RURAL CONSTITUENCY, KUNENE REGION**





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CONSULTANTS CC**

<b>Title</b>	ENVIRONMENTAL IMPACT ASSESSMENT (EIA) FOR THE ESTABLISHMENT AND MINING OF BASE AND RARE METALS ON MINING CLAIM; 72530, 72531 AND 72532 AT OUNDOMBO VILLAGE, OPUWO RURAL CONSTITUENCY, KUNENE REGION.		
<b>Application Number</b>	APP- 221121000386		
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<b>Report date</b>	June 2022 Resubmitted 02/02/2023		
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## **EXECUTIVE SUMMARY**

Ms. Karimunika Wendy Matundu has an intention to establish and mine base and rare metals on mining claims; 72530, 72531 and 72532 at Oundombo Village, Opuwo Rural Constituency, Kunene Region. The planned mining program is considered to be low risk mining operation because it is a small-scale project. The proposed mine will implement an open cast mining method which is a common mining method used to extract minerals from the earth. The excavators will be used to remove the overburden and access the underneath ore bodies. The mined copper ore in form of boulders and chips will be sorted and packaged into one-ton bags for export purposes. The targeted mineral resource is mainly copper; other minerals that could be found in the area includes cobalt, silver and lead deposits.

The general area of the proposed mining has limited disturbance and limited economic activities. The main negative impacts associated with the project from mining have been rated as medium to low significance and can significantly reduce to negligibly low with appropriate application of the recommended mitigations outlined in the Environmental Management Plan.

## ABBREVIATIONS

<b>AIDS</b>	Acquired Immune Deficiency Syndrome
<b>CC</b>	Close Corporation
<b>Covid19</b>	Coronavirus disease
<b>DEA</b>	Directorate of Environmental Affairs
<b>DESR</b>	Draft Environmental Scoping Report
<b>EA</b>	Environmental Assessment
<b>EAP</b>	Environmental Assessment Practitioner
<b>ECC</b>	Environmental Clearance Certificate
<b>ECO</b>	Environmental Compliance Officer
<b>EIA</b>	Environmental Impact Assessment
<b>EMA</b>	Environmental Management Act
<b>EMP</b>	Environmental Management Plan
<b>EPL</b>	Exclusive Prospecting Licence
<b>GPS</b>	Global Positioning System
<b>Ha</b>	Hectare
<b>HIV</b>	Human Immune Virus
<b>I&amp;APs</b>	Interested and Affected Parties
<b>IT</b>	Information Technology
<b>KM</b>	Kilometres
<b>MAWLR</b>	Ministry of Agriculture, Water and Land Reform
<b>MEFT</b>	Ministry of Environment, Forestry and Tourism
<b>MM</b>	Millimetres
<b>MME</b>	Ministry of Mine and Energy
<b>NHC</b>	National Heritage Council
<b>PPEs</b>	Personal Protective Equipment's
<b>SME</b>	Small Medium Enterprise

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## 1. PROJECT BACKGROUND

### 1.1 INTRODUCTION

**Ms. Karimunika Wendy Matundu**, hereafter referred to as the proponent intend to undertake mining activities for base and rare metals on mining claims; 72530, 72531 and 72532. The proponent is a holder of an application for the mining claims; 72530, 72531 and 72532 which was lodged on the 02/09/2021 with the Ministry of Mine and Energy (MME) after following all the necessary procedures to satisfy the relevant Authorities enabling her to mine base and rare metals from the allocated portions. The proponent has secured both financial and technical partners to carry out the proposed small-scale, base and rare metals mining activities. The proposed project is a listed activity as per the Environmental Management Act 2007 (Act No. 7 of 2007) (EMA) and an Environmental Clearance Certificate (ECC) is therefore required to commission such a project. Healthy Earth Environmental Consultants (HEEC) has been appointed by **Ms. Karimunika Wendy Matundu** to carry out an Environmental Impact Assessment (EIA) and develop an Environmental Management Plan (EMP) for the proposed mining project at Oundombo Village within the Opuwo rural constituency in Kunene Region.

### 1.2 PROJECT LOCATION

The mining claims 72530, 72531 and 72532 are situated at Oundombo Village approximately 60 Km South of Opuwo when using the D3705 which branch out from the C43 road from Opuwo to Sesfontein as shown in **Figure 1**. The mining claim 72530 covers an area of 17.5061 Ha while mining claim 72531 covers an area of 16.7075 Ha and mining claim 72532 covers an area 18.0569 Ha. The total area covered by the 3 mining claims is 52.2705 hectares.



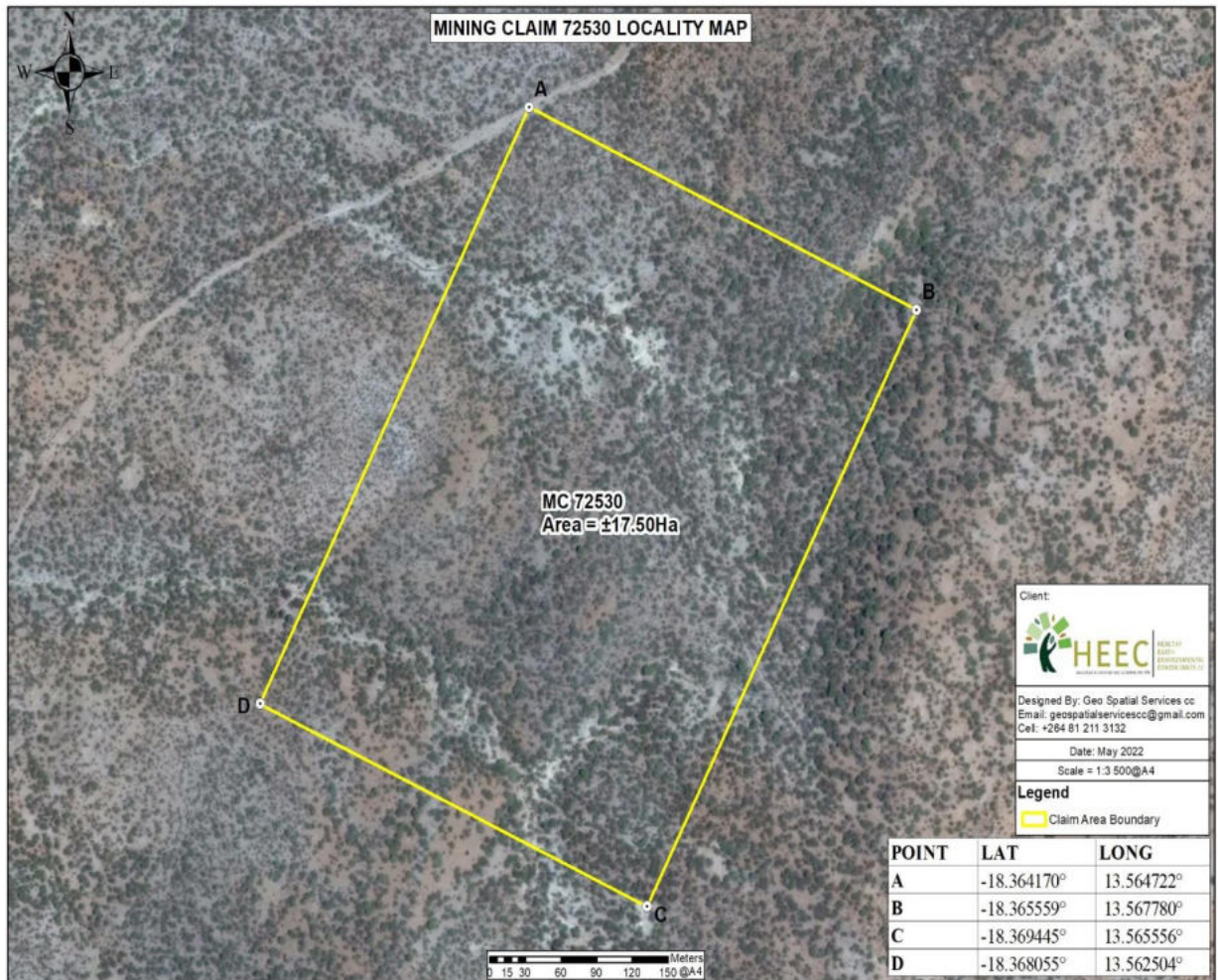


Figure 2: The geo-physical location of mining claim; 72530 at Oundombo Village, Opuwo Rural Constituency, Kunene Region (Shown by the yellow quadrant) covering a total area of 17.5061 Ha (HEEC, 2022).

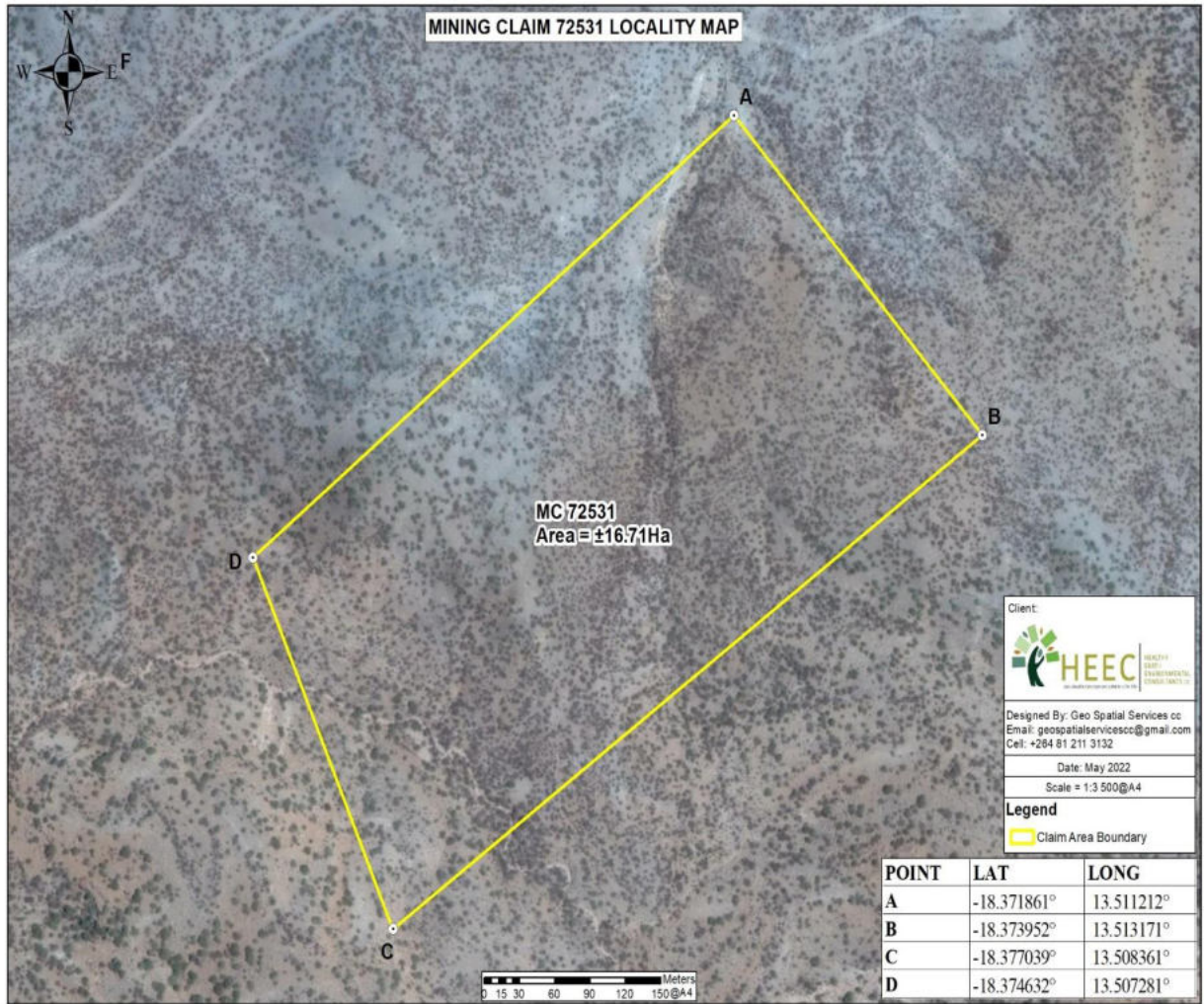


Figure 3: The geo-physical location of mining claim; 72531 at Oundombo Village, Opuwo Rural Constituency, Kunene Region (Shown by the yellow quadrant) covering a total area of 16.7075 Ha (HEEC, 2022).

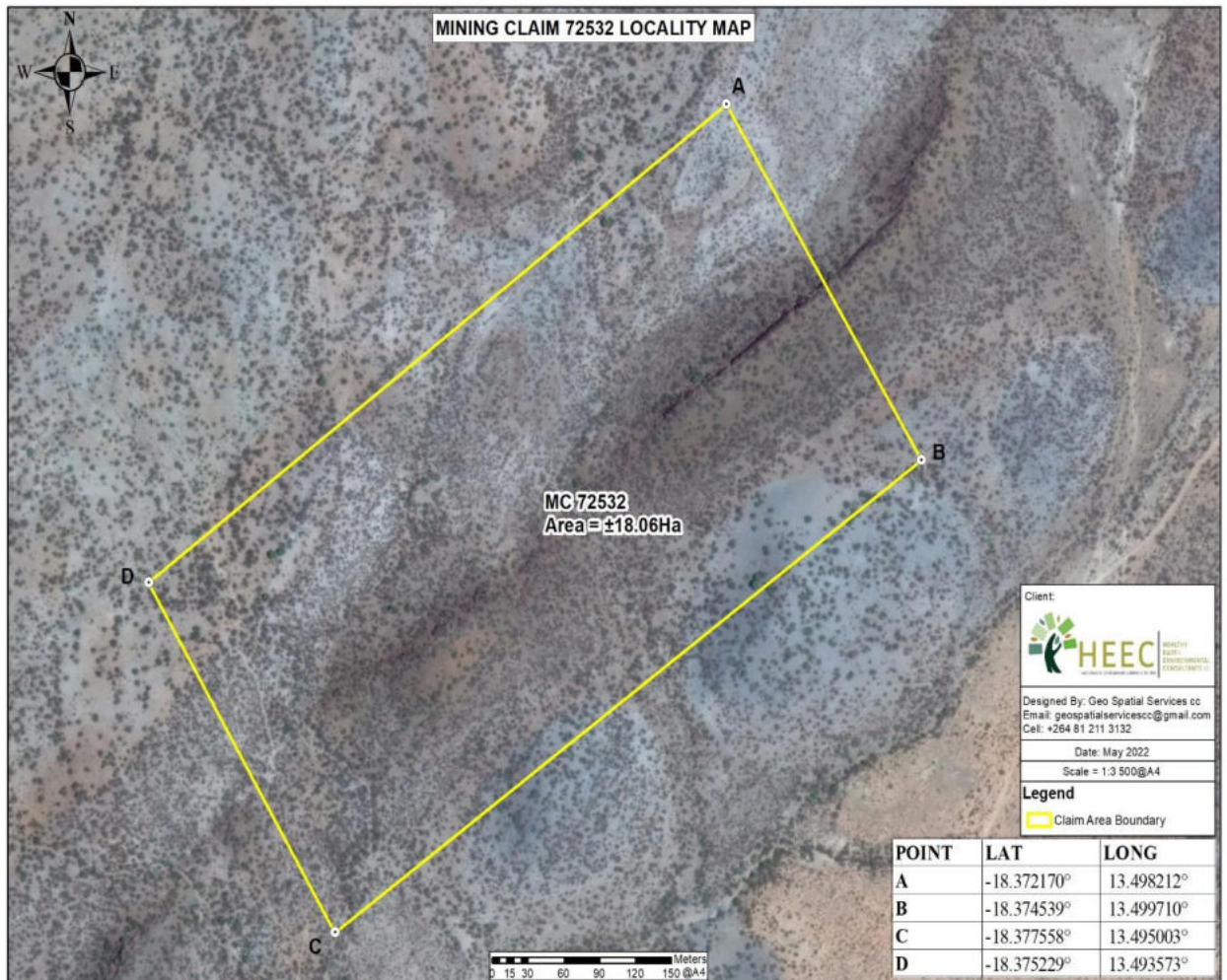


Figure 4: The geo-physical location of mining claim; 72532 at Oundombo Village, Opuwo Rural Constituency, Kunene Region (Shown by the yellow quadrant) covering a total area of 18.0569 Ha (HEEC, 2022).

### 1.3 TERMS OF REFERENCES

The Environmental Impact Assessment (EIA) was undertaken in conformity with Namibia Environmental Management Legislations (Environmental Management Act, No 7 of 2007) and its Regulation (Government Notice No. 30 of 2012). The essence of the EIA is to afford substantial information to the Office of the Environmental Commissioner to ensure that an informed decision on whether or not an Environmental Clearance Certificate (ECC) should be issued. The process as stipulated in the Environmental Regulation (2012) includes the following stages, which are defined in this document as follows;

- ✓ Provide a detail description of the proposed activity;
- ✓ Identifying all legislation and guidelines that have reference to the proposed activity;

- ✓ Identify existing environmental (physical, biological and social) conditions of the area in order to determine their environmental sensitivity;
- ✓ Inform Interested and Affected Parties (I&APs) and relevant authorities of the details of the proposed activity and provide them with a reasonable opportunity to participate during the process;
- ✓ Consider the potential environmental and social impacts of the proposed activity and assess the significance of the identified impacts and;
- ✓ Outline management and mitigation measures in an Environmental Management Plan (EMP) to minimise and/or mitigate potentially negative impacts and assist in formulating a decommissioning plan for the proposed mining activity.

#### **1.4 ENVIRONMENTAL IMPACT ASSESSMENT REQUIREMENT**

The Environmental Impact Assessment Regulations (Government Notice No. 30 of 2012) stipulate that no mining or exploration activities should be undertaken without a valid Environmental Clearance Certificate (ECC). Consequently, an ECC shall be applied for in accordance with regulation 6 of the 2012 environmental regulations. It is imperative that the proponent must conduct a public consultation process in accord with regulation 21 of the 2012 environmental procedure and prepare and submit an environmental scoping report and an environmental management plan for the planned mining of base rare metals.

#### **1.5 THE PURPOSE OF THE SCOPING REPORT**

The report is prepared for the purposes of the Environmental Impact Assessment for the propose mining activities of base and rare metals on mining claims 72530, 72531 and 72532. The scoping process identifies the potential impacts associated with the planned mining project throughout the EIA and disdain matters which are of miniscule apprehension. The purpose of this report is thus to;

- Identify any negative environmental impacts to be considered prior to the commencement of the proposed mining project.
- Identify information required for decision making purpose.
- Inform the public about the proposed mining activities.
- Identify the key stakeholders, their comments, and concerns.

- Define reasonable and practical alternative to the proposed project.
- Establish the terms of references for the envisioned EIA.

In terms of the Environmental Management Act (No. 7 of 2007) and Environmental Impact Assessment Regulations (Government Notice No. 30 of 2012), the intended development is a listed activity, therefore, an Environmental Impact Assessment should be conducted.

Table 1: List of triggered activities identified in the EIA Regulations which apply to the proposed project

<b>Activity description and No(s):</b>	<b>Description of relevant Activity</b>	<b>The portion of the development as per the project description that relates to the applicable listed activity</b>
<b>Activity 3.1</b> (Mining and Quarrying Activities)	The construction of facilities for any process or activities which requires a licence, right or other form of authorisation, and the renewal of a licence, right or other form of authorisation, in terms of the Minerals (Prospecting and Mining Act), 1992.	The proposed project includes the mining of base and rare metals for commercial purposes.
<b>Activity 3.2</b> (Mining and Quarrying Activities)	Other forms of mining or extraction of any natural resources whether regulated by law or not.	The proposed project includes mining of base and rare metals for commercial purposes.
<b>Activity 3.3</b> (Mining and Quarrying Activities)	Resource extraction, manipulation, conservation, and related activities.	The proposed project includes mining of base and rare metals for commercial purposes.

## 2. PROJECT ALTERNATIVES

### 2.1 Alternatives

Several areas have been explored with the aims of pegging mining claims and ultimately lodging an application by following all the correct procedures. However, this area were considered by the proponent because the area is rich in mineralization than any other potential area in the

vicinity. Therefore, this prompted the proponent to opt for the intended area based on the available resources for mining, accessible, feasible and economic viable.

## **2.2 No - Go Alternatives**

The no-go alternative is primarily the baseline against which all alternatives are explained. The no-go alternative would chiefly include preserving the existing status quo, whereby the mining of base and rare metals will not take place at all. Furthermore, if the mining of base and rare metals will not take place this means the economic and social impacts of the community of Oundombo Village will be negatively impacted. Because the local communities will definitely lose out on potential economic opportunities associated with this project. The project will make a positive significant economic impact on the livelihoods of the communities. Furthermore, the country will also benefit from the intended project through royalties, taxes and foreign currency exchange.



### 3. SUMMARY OF LEGAL AND POLICY FRAMEWORK APPLICABLE TO THE PROJECT

All mineral rights related to mining activities are regulated by the Ministry of Mines and Energy (MME), whereas the environmental regulations are regulated by the Ministry of Environment, Forestry and Tourism (MEFT). The proposed mining project shall be established and function in accordance with the provision of the prevailing and relevant statutory frameworks of Namibian and international laws of which Namibia is signatory.

Table 2. Legal requirements relevant for the proposed project

Legislation	Summary	Applicability
<b>The Namibian Constitution</b>	The Namibian constitution is the supreme law of the country which is committed to sustainable development. Article 95(1) of the Constitution of Namibia states that: - “The State shall actively promote and maintain the welfare of the people by adopting policies aimed at ... The maintenance of ecosystems, essential ecological processes and biological diversity of Namibia and utilization of living natural resources on a sustainable basis for the benefit of all Namibians, both present and future”.	To undertake the EIA in order to maintain the ecological process and diversity of ecosystem.
<b>The Environmental Management Act</b>	The Environmental Management Act No 7 of 2007 aims to promote the sustainable management of the environment and the use of natural resources and to provides for a process of assessment and control of activities which may have significant effects on the environment; and to provide for incidental matters. The acts provide a list of activities that may not be undertake without an environmental clearance certificate.	Legal requirement to undertake an EIA

Legislation	Summary	Applicability
	<p>Further, the Act ensures that;</p> <ul style="list-style-type: none"> <li>(a) Potential threats are considered timeously.</li> <li>(b) A comprehensive stakeholder’s consultation is conducted, and all Interested and affected parties are given an opportunity to comment on the project.</li> <li>(c) Decision are robust by considering the above-mentioned activities</li> </ul>	
<p><b>Atmospheric Pollution Prevention Ordinance Act No.11 of 1976)</b></p>	<p>This Ordinance serves to control air pollution from point sources, but it does not consider ambient air quality. This ordinance is being repealed by the proposed Pollution Control and Waste Management Bill. Any person carrying out a ‘scheduled process’ which are processes resulting in noxious or offensive gases typically pertaining to point source emissions have to obtain a registration certificate from the Department of Health.</p>	<p>Generation of Greenhouse Gases by the fuel</p>
<p><b>Draft Pollution Control and Waste Management Bill</b></p>	<p>This Bill serves to regulate and prevent the discharge of pollutants to air and water as well as providing for general waste management. The Bill will repeal the Atmospheric Pollution Prevention Ordinance (11 of 1976) when it comes into force. The Bill also provides for noise, dust or odour control that may be considered a nuisance. Further, the Bill advocates for duty of care with respect to waste management affecting humans and the environment and calls for a</p>	<p>Possible fuel spill and leakages may pollute underground and surface water.</p>

Legislation	Summary	Applicability
	waste management licence for any activity relating to waste or hazardous waste management.	
<b>Environmental Policy framework (1995)</b>	This policy subjects all developments and project to environmental assessment and provides guideline for the Environmental Assessment. Its provision mandate that Environmental Assessment take due consideration of all possible impacts and incorporate them in the development or planning stages.	Provision of the EIA and guidelines
<b>The Occupational Safety and Health Act No. 11 of 2007;</b>	<p>Safety: A safety risk is a statistical concept representing the potential of an accident occurring, owing to unsafe operation and/or environment. In the working context “SAFETY” is regarded as “free from danger” to the health injury and to properties.</p> <p>Health: Occupational Health is aimed at the promotion and maintenance of the highest degree of physical, mental and social wellbeing of workers in all occupations. This is done by ensuring that all work-related hazards are prevented and where they occur, managed.</p>	<p>Operating mining equipment has the potential risk of injuries.</p> <p>Provision of clean ablution facility, routine health check-ups for employees, Covid, HIV/AIDS awareness etc.</p>
<b>Public Health Act No. 36 of 1919</b>	The Act serves to protect the public from nuisance and states that no person shall cause a nuisance or shall suffer to exist on any land or premises owned	Ensure public safety from noise, dusts, and air pollution.

Legislation	Summary	Applicability
	or occupied by him/her or of which he/she is in charge of any nuisance or other condition liable to be injurious or dangerous to health.	
<b>Water Resources Management Act (2004)</b>	This Act provides a framework for managing water resources based on the principles of integrated water resources management. It provides for the management, development, protection, conservation, and use of water resources. Furthermore, any watercourse on/or in close proximity to the site and associated ecosystems should be protected in alignment with the listed principles.	Ensure that the underground water and ephemeral river systems are not polluted and implement pollution control mechanism to avoid water pollution
<b>Water Act No, 54 of 1956</b>	<p>This act states that, all water resources belong to the State. It prevents pollution and promotes the sustainable utilization of the resource. To protect these resources, this act requires that permits are obtained when activities involve the following;</p> <ul style="list-style-type: none"> <li>• Discharge of contaminated into water sources such as pipe, sewer, canal, sea outfall and</li> <li>• Disposal of water in a manner that may cause detrimental impact on the water resources</li> </ul>	Contaminated water, such as sewage sludge must not be seep into the ephemeral river and water sources.

Legislation	Summary	Applicability
<b>Petroleum Product and Energy Act No, 13 of 1990</b>	This Act provides a framework for handling and distribution of petroleum products which may include purchase, sale, supply, acquisition, possession, disposal, storage or transportation thereof.	Safe handling of the petroleum products such as fuel and lubricants.
<b>Labour Act No. 11 of 2007</b>	This Act aims to regulate labour in general and includes the protection of the health, safety and welfare of employees. The 1997 regulations relating to the Health and Safety of employees at work sets out the duties of the employer, welfare and facilities at the workplace, safety of machinery, hazardous substances, physical hazards, medical provisions, construction safety and electrical safety.	Follow legal labour requirements such as safety, remuneration etc
<b>Regional Council Act, 1992 (Act No. 22 of 1992)</b>	The Regional Councils Act legislates the establishment of Regional Councils that are responsible for the planning and coordination of regional policies and development. The main objective of this Act is to initiate, supervise, manage and evaluate development at regional level.	Observe the regional by laws
<b>Soil Conservation Act No. 76 of 1969</b>	This act promotes the conservation of soil, prevention of soil erosion.	Coordinate movement of mining equipment to prevent soil erosion. Ensure conservation of topsoil.
<b>Hazardous Substances Ordinance No. 14 of 1974</b>	This ordinance gives provision to control the handling of hazardous substance in all circumstances, such as manufacturing, imports and exporting of these to ensure human and environmental safety.	Handling of fuel, fire and explosion risks

Legislation	Summary	Applicability
<p><b>National Heritage Act No. 27 of 2004</b></p>	<p>The Act makes provision for the protection and conservation of places and objects of heritage significance and the registration of such places and objects. Part V Section 46 of the Act prohibits removal, damage, alteration or excavation of heritage sites or remains, while Section 48 sets out the procedure for application and granting of permits such as</p>	<p>Mining activities such as excavation and, trenching may unearth archaeological material.</p>
<p><b>Word's Best Practises</b></p>	<p><b><i>Precautionary Approach Principle</i></b></p> <p>This principle is worldwide accepted when there is a lack of sufficient knowledge and information about the possible threats to the environment. Hence if the anticipated impacts are greater, then precautionary approach is applied. In this project, there are no eminent uncertainty however in cases when they arise, this approach should be applied.</p> <p><b><i>Polluter Pays Principle</i></b></p> <p>This principle ensures that proponents takes responsibility of their actions. Hence in cases of pollution, the proponent bears the full responsibility to clean up the environment.</p>	<p>Mining of base and rare metals particularly in the area with washes and ephemeral rivers can be detrimental to the underground water. Therefore, precaution must be taken to avoid the contamination of underground water.</p> <p>In the event of any soil contamination pollution, the proponent must be responsible to clean up the environment.</p>

## 4. DESCRIPTION OF THE PROPOSED MINING ACTIVITY

### 4.1 Introduction

Namibia is endowed with numerous minerals resources such as gold, uranium, diamond, tin, lithium, zinc, vanadium, lead, cadmium, and salt. The mining sector is the major contributor to the Namibian economy. The mining industry contribute about 25% to the domestic economy through income and royalties. The demand for copper is anticipated to outpace the supply in the near future. The global steep rise in the demand for copper is forecasted to escalate because copper is a metal of electrification. Copper has been used for many decades in electric wiring for domestic and industrial purposes in electric circuits, power generation, transmission, and electrical equipment. The fact that copper is conductive, thermal resistant, strong and fairly cheap to produce has made it the most preferred choice for most if not all electrical wirings. The global approach of shifting away from fossil fuel to renewable energy is contributing enormously to the demand for copper because mostly copper is widely used in solar energy and power grids which transmit power. The significant increase in the Electric Vehicle (EV) market has also exacerbated the demand for copper in the global market. The conductivity of copper has made suitable and essential in the healthcare sector particularly its use in the medical equipment. The demand for copper in the global market and its wide utilization in key sectors of the economy has prompted **Ms. Karimunika Wendy Matundu** to explore for areas with high copper mineralisation and ultimately venturing into mining of this essential commodity. Therefore, it is against this background that the proponent has appointed Healthy Earth Environmental Consultants (HEEC) to undertake an Environmental Impact Assessment (EIA) and formulate an Environmental Management Plan (EMP) for the envisaged project in order to assess the potential social and environmental impacts associated with the establishment and mining of base and rare metals and also to provide methods of rehabilitation once the available mineral resources are depleted to an uneconomically viable levels which will result in the operation of the mine to cease.

## **4.2 Mining Methods**

The mineral resource targeted for this project is base and rare metals mainly copper, which is the most available mineral found in the area. The proposed mine will implement an open cast mining method which is a common mining method used to extract minerals from the earth. The excavators will be used to remove the overburden and access the underneath ore bodies. The mined copper ore in form of boulders and chips will be sorted and packaged into one-ton bags for export purposes. Other by product minerals that could be found in the area includes cobalt, silver and lead deposits. The copper ore will be packaged in one-ton bags and transported via the existing national roads to the port of Walvis Bay for shipping and further processing in China. The proponent has in the interim secured both financial and technical partners who will bankroll the operation of the project. The proponent is in the process of engaging a local company with an existing copper processing plant such as Dundee Precious Metals in Tsumeb to handle the processing of copper ore into copper concentrate before exporting to the international market. The processing of copper ore locally is highly encouraged because it will add value addition to the product and more revenue will be assimilated into the local economy. The proposed project is envisaged to cost round about 40 million Namibian dollars.

## **4.3 Labour Requirements**

The proposed project will contribute enormously to the local economy of Oundombo Village and the surrounding town such as Opuwo. The availability of the resource is estimated to be sufficient to provide this mine with a lifespan of approximately 15 years. The proposed mine will provide permanent employment for 30 local people and additional jobs will be created during the sorting and loading of the mined copper ore. Some of the tasks will be outsourced to the local Small and Medium Enterprises (SMEs) in the area on contract basis and this will further create more employment opportunity. The proponent will ensure that the operation of the mine will comply with the Labour Act of 2007. To ensure that all employees are acquainted with safety and all employees will undergo an extensive safety induction and first aid training courses.



## **5. SERVICES**

### **5.1 Energy requirements**

Due to the remoteness of the area, access to the main power grid is not possible, therefore a diesel generator will be used to generate electricity for the operation of the mine. Diesel generators are instrumental in providing electricity in areas with limited access to electricity and this is due to their reliability, durability, and versatility. This will ensure constant power supply at the site. There is possibility of establishing a solar power plant to ensure uninterrupted power supply and scaling down on carbon footprint as an effort to reduce climate change impacts, build resilience and conversion towards sustainable green economy.

### **5.2 Water supply**

Water for the intended mining activities including domestic and human consumption will be sourced from the borehole which is yet to be drilled. A water abstraction permit will be applied for at the Ministry of Agriculture, Water and Land Reform (MAWLR). Water will mostly be required for domestic utilisation and cleaning of equipment. Since Namibia is an arid country and the project will take place in the area with very limited water source and mainly relies on underground water and fountains found in the vicinity. Therefore, emphasise will be put on recycling and where possible water will be used sparingly.

### **5.3 Waste management**

The project will be taking place in area with no formal waste management system in place. All domestic waste materials that will be generated during mining operation will be disposed of at Opuwo landfill. The sewage will be removed from the site mobile toilets by means of sewer removal truck of the Opuwo Town Council at regular intervals and disposed at Opuwo sewerage ponds. The proponent will ensure that there is enough supply of temporary sanitary containerize facilities which will be maintained and kept in a hygienic condition.

## **6. INFRASTRUCTURE SERVICES**

### **6.1 Housing and Offices**

A customised modern eco-friendly base camp made from prefabricated modular will be establishment to provide safer and comfortable accommodation to the employees. The base camp will be split into two sleeping quarters: the men quarter and ladies' quarter. There will be sufficient ablution facility and showers for both male and female. The field office will be constructed at the site to ensure a smooth operation of the project. Male and female ablution facilities will be constructed for use during office hours and by visitors to the site. All facilities will comply with the Public and Environmental Health Act 1 of 2015 and Water Supply and Sanitation policy.

### **6.2 Security**

An area at the entrance of the site will be identified to erect the guard's house. A reputable local company will be outsourced to provide security services on a daily basis at the site. There will be strict access control to the site. Access to the site will require authorisation and all vehicles entering and leaving the site will be registered.

### **6.3 Storage of fuel, lubricants, and consumables**

Due to the remoteness of the area a customised 1000-gallon fuel trailer with an easy to fuel pipe will be filled up diesel at the available filling stations in Opuwo and transported to site in order to use the fuel to operate different equipment required for mining activities at the site. All lubricants and consumable materials will be stored in containers at a designated area at the site. These substances will only be used for mechanical purposes, and it is presumed that they are non- hazardous.

### **6.4 Telecommunication and IT System**

The proposed area has poor network coverage for all telecommunications service providers, therefore, there will be limited access to telecommunication networks. A two-way radio

communication will be optimised as the most feasible and reliable alternative for communication.

## **6.5 Roads**

Access to the mining claim area will be gained from the D3705 road which branch out from the C43 road from Opuwo. A track which branches out from the D3705 road leading to Oundombo Village will be used to access the site. However, a new track which will branch out from the road heading to the village will be created to access the mine site. The areas which are less ecologically sensitive will be considered for the establishment of the access road.

## **7. DESCRIPTION OF THE BIO-PHYSICAL ENVIRONMENT**

### **7.1 Climate**

The climate of Oundombo Village where the mining of copper ore at **Mining Claims**; 72530, 72531 and 72532 will take place is located within the semi-arid to arid savannah. The climatic condition of Oundombo Village may resemble that of Opuwo due to its proximity. Rainfall pattern in Namibia is quite mutable with a smooth gradient from the wettest and typically most tropic in the north-east to the extremely arid environment in the west. The area proposed for these mining projects have an average annual rainfall of 100 mm – 150 mm. The highest average maximum temperature in the area is about 32°C to 34°C, while the average minimum temperatures are 6°C - 8°C (Mendelsohn, 2003). The following graphs depicts the mutable climatic patterns for the area.

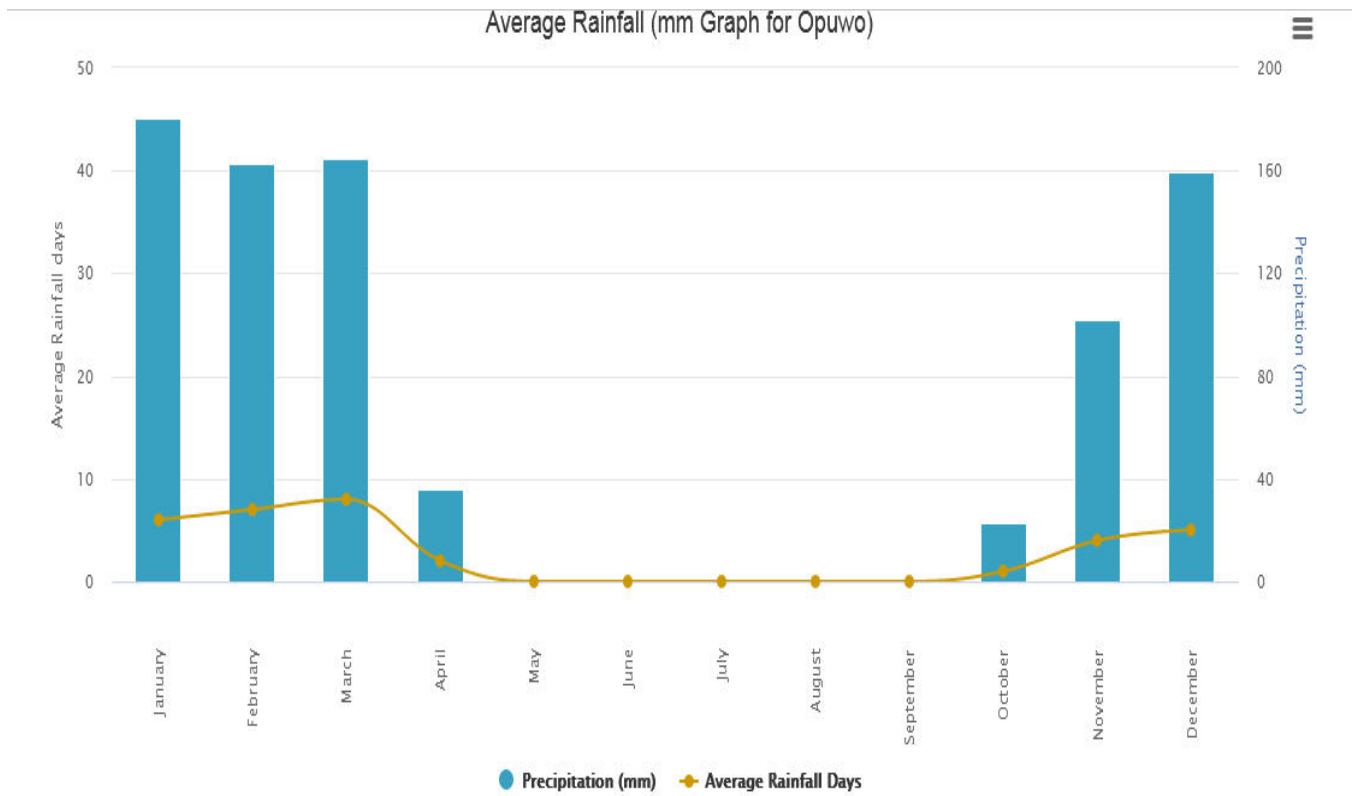


Figure 5: Average rainfall graph for Opuwo, Kunene region (Worldweatheronline, 2022).

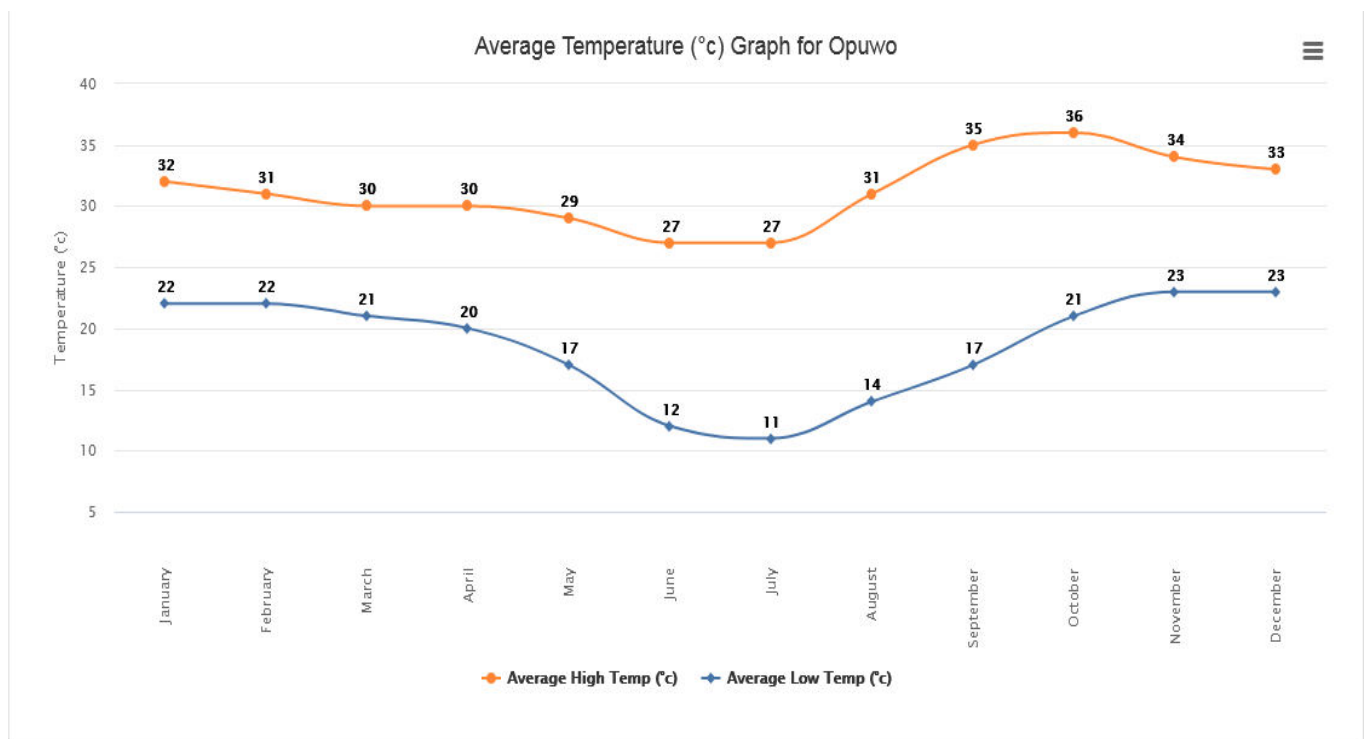


Figure 6: Average monthly temperature graph for Opuwo, Kunene region (Worldweatheronline, 2022).

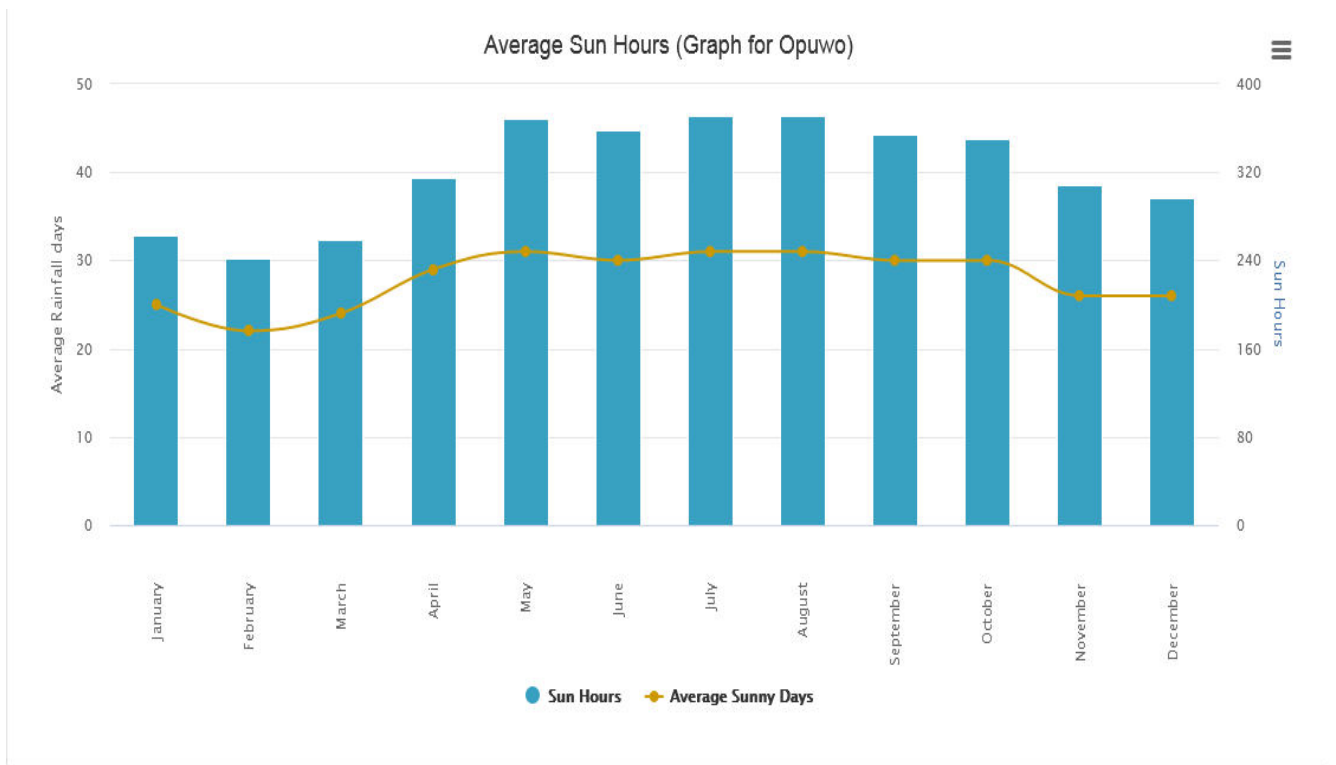


Figure 7: The average sun hours graph for Opuwo, Kunene region (Worldweatheronline, 2022).

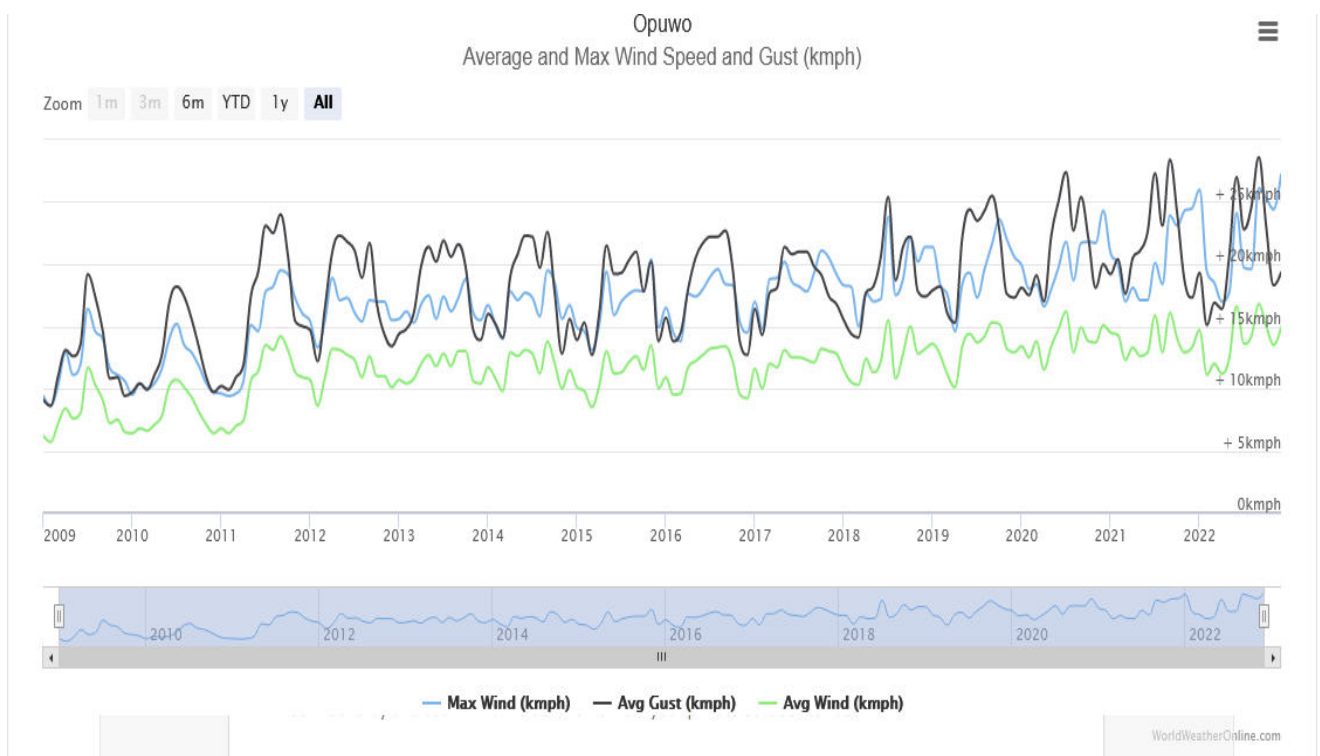


Figure 8: Average and maximum wind speed graph for Opuwo, Kunene region (Worldweatheronline, 2022).

A better understanding of the climatic pattern of the area is imperative in the establishment and operation of a mine because it may present some stimulating risks which may influence the mining operation. Different climatic variables may pose some serious impact on the operation of the mine. Heavy rainfall and potential flooding for instance may pose danger to the operation of the mine because it may compromise the structure of the mine and the surrounding environment. When undulating surfaces are inundated by water, they become susceptible to landslide. This will highly likely cause mining operation to be temporarily suspended until the situation returns to normalcy or it becomes fit for mining operation to continue. Beside rainfall other climatic variables such as wind and temperature are critical and a better understanding such climatic conditions will be useful in the effective planning and daily operations of the mine. Therefore, a thorough perspective of the climatic patterns of the area is important to ensure that the operation of the mine is not disrupted and risks associated with the project in relation to climatic conditions is mitigated at a rational level. The rainfall in the area is high during the initial three months of the year from January to March and start descending in April and no rainfall recorded between May until September. The rainfall only starts again towards the end of the year from October and increases exponentially in November and December as illustrated in **Figure 5**. The average monthly high temperature and low temperature are high in January to April and decrease towards winter. However, the average monthly high and low temperature are extremely high in August to December as depicted in **Figure 6**. The average sun hours are short in January to March and starts fluctuating in April until October and decreases in November and December as indicated in **Figure 7**. The average and maximum wind speed recorded for the area for the past fourteen years from the year 2009 to 2022 keeps rippling as depicted in **Figure 8**.

## **8. DESCRIPTION OF THE GEOLOGY AND GEOHYDROLOGY**

### **8.1 Geology**

The mining claims: 72530, 72531 and 72532 lie in the highly prospective geological terrain which is the Kaoko Belt. The Kaoko, Damaran and Gariep Belts are part of the Damaran Orogen. The Kaoko Belt is stratigraphically correlated with rich copper deposit which is visible in the area due to the presence of malachite and chrysocolla on the surface of rocks as well as magnetic-high anomalies in the vicinity. The presence of magnetic high anomalies signifies the



## **9. DESCRIPTION OF THE ARCHAEOLOGICAL AND HERITAGE RESOURCES**

### **9.1 Archaeology and Heritage**

There are no declared heritage sites by the National Heritage Council of Namibia (NHC) in the area. Even though there are no heritage resources in the area, an accidental chance find procedure at the subject area may be required.

## **10. DESCRIPTION OF THE BIODIVERSITY**

### **10.1 Flora Diversity**

The area proposed for the establishment and mining of copper ore is located within the semi-arid to arid savannah. However, the area is well vegetated and vegetation type in the area is typically characterized by tree and shrub savanna. The area is dominated by a variety of trees and shrub species such as *Colophospermum mopane*, *Terminalia prunioides*, *Commiphora* sp, *Catophractes alexandri*, *Combretum apiculatum* while species such as *Boscia albitrunca*, *Acacia (Vachellia) hebeclada* subsp. *hebeclada*, *Acacia (Senegalia) senegal*, *Dichrostachys cinerea* and *Pechuel-loeschea leubnitziae* are conspicuous in the area.





Figure 10: The general area of the mining claims; 72530, 72531 and 72532 at Oundombo Village, Kunene region.

The average plant production in the general area is considered to be “low” and there is limited growth of vegetation in terms of green vegetation biomass (Mendelsohn *et al.* 2002). The overall plant diversity in the area is estimated to be 100 - 149 species and plant endemism is likely to be 5-6 species (Mendelsohn *et al.* 2002).

Table 3: Plant species recorded and expected to occur in the vicinity of the Mining Claims; 72530, 72531 and 72532.

Species	Occurrences	Protection Status	Conservation Categories
<b>Trees and Shrubs</b>			
<i>Acacia erubescens</i>	√	LC	-
<i>Acacia karroo</i>	√	LC	-
<i>Acacia mellifera subsp. detinens</i>	√	LC	-
<i>Acacia reficiens</i>	√	-	-

<i>Acacia senegal</i>	√	LC	-
<i>Acacia tortilis</i>	√	LC	-
<i>Acacia hebeclada</i>	√	LC	-
<i>Adenolobus garipesis</i>	√	-	-
<i>Adenia pechuelii</i>	√	LC	E
<i>Brownanthus kuntzei</i>	√	-	-
<i>Blepharis grossa</i>	√	-	NE
<i>Boscia albitrunca</i>	√	-	-
<i>Boscia foetida</i>	√	LC	-
<i>Cadaba aphylla</i>	√	LC	-
<i>Cadaba schroepelli</i>	√	LC	-
<i>Calostephane marlothiana</i>	√	-	E
<i>Catophractes alexandri</i>	√	LC	-
<i>Cleome foliosa var. foliosa</i>	√	-	-
<i>Cordia sinensis</i>	√	LC	-
<i>Crotalaria kurtii</i>	√	DD	E
<i>Croton gratissimus</i>	√	-	-
<i>Colophospermum mopane</i>	√	-	-
<i>Combretum apiculatum</i>	√	-	-
<i>Combretum imberbe</i>	√	-	-
<i>Commiphora dinteri</i>	√	-	E
<i>Commiphora glandulosa</i>	√	LC	-
<i>Commiphora glaucescens</i>	√	LC	NE
<i>Commiphora kraeuseliana</i>	√	LC	E
<i>Commiphora pyracanthoides</i>	√	-	-
<i>Commiphora saxicola</i>	√	LC	E
<i>Commiphora tenuipetiolata</i>	√	LC	-
<i>Commiphora virgata</i>	√	LC	-

<i>Commiphora wildii</i>	√	LC	-
<i>Cyphostemma currorii</i>	√	LC	P
<i>Cyphostemma uter</i>	√	-	NE, P
<i>Dombeya rotundifolia</i>	√	-	E
<i>Ectadium rotundifolium</i>	√	LC	E
<i>Ehretia alba</i>	√	-	-
<i>Engleria africana</i>	√	-	-
<i>Euclea pseudebenus</i>	√	-	-
<i>Euclea undulata</i>	√	-	-
<i>Euphorbia damarana</i>	√	LC	NE
<i>Euphorbia guerichiana</i>	√	LC	-
<i>Euphorbia virosa</i>	√	LC	-
<i>Euphorbia phylloclada</i>	√	LC	-
<i>Elephantorrhiza suffruticosa</i>	√	-	-
<i>Euphorbia phylloclada</i>	√	LC	-
<i>Faidherbia albida</i>	√	LC	-
<i>Felicia clavipilosa subsp. clavipilosa</i>	√	-	-
<i>Ficus cordata</i>	√	-	-
<i>Ficus illicina</i>	√	-	-
<i>Ficus sycomorus</i>	√	LC	-
<i>Forsskaolea viridis</i>	√	LC	-
<i>Frankenia pulverulenta</i>	√	-	-
<i>Gisekia africana var. africana</i>	√	-	-
<i>Grewia bicolor</i>	√	-	-
<i>Grewia flava</i>	√	-	-
<i>Grewia flavescens</i>	√	-	-
<i>Grewia tenax</i>	√	-	-
<i>Grewia villosa</i>	√	-	-

<i>Gymnosporia senegalensis</i>	√	-	-
<i>Gossypium anomalum</i>	√	-	-
<i>Gossypium triphyllum</i>	√	-	-
<i>Hermbstaedtia spathulifolia</i>	√	-	E
<i>Helichrysum roseo-niveum</i>	√	-	-
<i>Heliotropium tubulosum</i>	√	-	-
<i>Hermannia amabilis</i>	√	LC	E
<i>Hoodia pedicellata</i>	√	-	-
<i>Hypertelis caespitosa</i>	√	-	-
<i>Indigastrum argyroide</i>	√	-	-
<i>Lotononis schreiberi</i>	√	LC	E
<i>Lycium bosciifolium</i>	√	-	DD
<i>Lycium tetrandrum</i>	√	-	-
<i>Manuleopsis dinteri</i>	√	-	E
<i>Maerua gilgii</i>	√	LC	NE
<i>Maerua parvifolia</i>	√	LC	-
<i>Melianthus comosus</i>	√	-	-
<i>Moringa ovalifolia</i>	√	LC	NE, P
<i>Montinia caryophyllacea</i>	√	-	-
<i>Monsonia umbellata</i>	√	-	NE
<i>Mundulea sericea</i>	√	-	-
<i>Myxopappus hereroensis</i>	√	LC	E
<i>Ornithogalum stapffii</i>	√	-	E
<i>Orthanthera albida</i>	√	LC	-
<i>Ozoroa crassinervia</i>	√	-	-
<i>Parkinsonia africana</i>	√	-	-
<i>Phaeoptilum spinosum</i>	√	-	-
<i>Rotheca myricoides</i>	√	-	-

<i>Senecio engleranus</i>	√	-	E
<i>Salvadora persica</i>	√	-	-
<i>Sesamum marlothi</i>	√	-	E
<i>Sesamum triphyllum</i> var. <i>grandiflorum</i>	√	-	-
<i>Steganotaenia araliacea</i>	√	-	-
<i>Salsola</i> spp.	√	-	-
<i>Sterculia africana</i>	√	-	-
<i>Tamarix usneoides</i>	√	-	-
<i>Terminalia prunioides</i>	√	-	-
<i>Tinnea rhodesiana</i>	√	-	-
<i>Tripteris microcarpa</i> subsp. <i>microcarpa</i>	√	-	-
<i>Ximenia americana</i>	√	LC	-
<i>Ziziphus mucronata</i>	√	-	-
<b>Grass species</b>			
<i>Enneapogon desvauxi</i>	√	-	-
<i>Stipagrostis dinteri</i>	√	-	-
<i>Stipagrostis hochstetteriana</i> var. <i>hochstetteriana</i>	√	-	-
<i>Stipagrostis subcaulis</i>	√	-	-
<i>Stipagrostis uniplumis</i> var. <i>uniplumis</i>	√	-	-

**KEY:** LC – Least Concern; E- Endemic; NE- Near - Endemic; P-Protected, F – Forestry protected under Forestry Act (Act 12 of 2001).

The north-west of Kunene region is diverse and rich in flora; with numerous plant species endemic to Namibia. A total of 16 plant species occurring in the general area of the mining claims; 72530, 72531 and 72532 are endemic, while 7 species are near-endemic and three species namely; *Cyphostemma currorii*, *Cyphostemma uter* and *Moringa ovalifolia* are protected species.

Proper consideration should be bestowed to the species protected under the Forestry Act (Act 12 of 2001). It's out most important to ensure that endemic and near-endemic species found in the area are avoided by all means, because they have restricted geographical distributions. The overall impacts on the plant species is considered to be minimal and localised. However, any removal of protected plant species will require a permit from the Ministry of Environment, Forestry and Tourism (MEFT).



Figure 11: *Commiphora* species among the common species in the area (HEEC, 2022).

## 10.2 Alien Plant Assessment

An assessment on alien plants was conducted during the botanical assessment. It was found that there are no alien plants in the project area.

## 10.3 Fauna Diversity

The north-west of Kunene in which mining claims 72530, 72531 and 72532 are located is associated with large mammals such as elephant, leopards, lion, cheetah, Jackals, hyena, zebra, kudu, oryx, giraffe, springbok, steenbok, giraffe, duiker, and ostriches. The presences of the mammals in the area had been necessitated by the availability of integral wildlife habitats. It is highly likely that human-wildlife conflict may potentially occur due to the occurrence of wild-animals such as elephant and lion, therefore appropriate mitigation measures should put in places. Relevant human-wildlife policy and other policies and legislation relating to the promotion of conservation as a land-use in wildlife precinct, should be considered. According to Cumming & Jones (2005) Namibia, the population of elephant population was forecasted to be above 15 000 and the population is distributed through the north of the country from the arid Skeleton Coast to the Tropical Savannah woodland in the north-east. The elephant population in Namibia is occurring at lower densities due to hunting and increasing pressure emanating from anthropogenic development which attributes to the decline of elephant. Illegal hunting of elephants and high valued animals for the purposes of accessing wildlife product such as trophies is another conservation point of concern.

## 10.4 Reptiles Diversity

According to Griffin (1998a) approximately 261 species of reptiles are known to occur in Namibia. The general area of the mining claims has a relative species diversity of reptiles. This is due to the convenience of different habitats such as crevices found within the project area. The following table denotes different species of reptiles known and/or likely to occur in the general area.

Table 4: Reptile known to occur in the vicinity of the proposed area.

Scientific name	Common name	Occurrence (√)	Conservation Status
Snakes			

<i>Leptotyphlops occidentalis</i>	Namaqua Worm Snake	√	-
<i>Dasypeltis scabra</i>	Common egg-eater	√	-
<i>Lycophidion namibianum</i>	Namibian Wolf Snake	√	-
<i>Lycophidion capense</i>	Common Wolf Snake	√	-
<i>Philothamnus semivariatus</i>	Spotted bush Snake	√	-
<i>Prosymna frontalis</i>	South-western Shovel-snout	√	-
<i>Pseudaspis cana</i>	Mole Snake	√	-
<i>Lamprophis capensis</i>	Brown House Snake	√	-
<i>Python natalensis</i>	Southern African Python	√	-
<i>Xenocalamus bicolor</i>	Binocoloured Quill-snouted Snake	√	-
<i>Telescopus semiannulatus</i>	Damara Tiger Snake	√	-
<i>Pythonodipsas carinata</i>	Western keeled Snake	√	Endemic
<i>Psammophis notostictus</i>	Karoo Whip Snake	√	-
<i>Psammophis leopardinus</i>	Leopard Whip Snake	√	Endemic
<i>Psammophis trigrammus</i>	Western Whip Snake	√	Endemic
<i>Dipsina multimaculata</i>	Dwarf beaked Snake	√	-
<i>Aspidelaps scutatus</i>	Shield-nose Snake	√	-
<i>Naja nigri collis nigricincta</i>	Zebra Cobra	√	Endemic
<i>Bitis caudalis</i>	Horned Adder	√	-
<i>Bitis arietans</i>	Puff Adder	√	-
<b>Tortoises (Geochelone)</b>			
<i>Geochelone pardalis</i>	Leopard Tortoise	√	-
<b>Terrapins (Pelomedusidae)</b>			
<i>Pelomedusa subrufa</i>	Marsh or Helmented Terrapin	√	-
<b>Lizards</b>			
<i>Zygaspis violacea</i>	Kalahari Round Worm Lizard	√	
<i>Heliobolus lugubris</i>	Bushveld Lizard	√	-
<i>Pedioplanis namaquensis</i>	Namaqua Sand Lizards	√	-
<i>Pedioplanis undata</i>	Western Sand Lizard	√	-
<i>Cordylusaurus subtessellatus</i>	Dwarf Plated Lizard	√	-



<b>Skinks (Scincidae)</b>			
<i>Mabuya acutilabris</i>	Wedge-snouted Skink	√	Endemic
<i>Mabuya capensis</i>	Cape Skink	√	-
<i>Mabuya hoeschi</i>	Hoesch's Skink	√	-
<i>Mabuya occidentalis</i>	Western Three-Striped Skink	√	-
<i>Mabuya spilogaster</i>	Kalahari Tree skink	√	-
<i>Mabuya walbergii</i>	Striped Skink	√	-
<i>Mabuya sulcata</i>	Western Rock Skink	√	-
<i>Mabuya variegata</i>	Variiegated Skink	√	-
<b>Agamas (Agamidae)</b>			
<i>Agama anchietae</i>	Anchietae Agama	√	-
<i>Agama planiceps</i>	Namibian Rock Agama	√	Endemic
<b>Chameleons (Chamaeleonidae)</b>			
<i>Chamaeleo namaquensis</i>	Namaqua Chameleon	√	-
<i>Chondrodactylus namibensis</i>	Giant Ground Gecko	√	Endemic
<i>Lygodactylus bradfieldi</i>	Bradfield's Dwarf Gecko	√	Near - Endemic
<i>Pachydactylus bicolor</i>	Velvety Thick-toed Gecko	√	Endemic
<i>Pachydactylus capensis</i>	Cape Thick-toed Gecko	√	-
<i>Pachydactylus turneri</i>	Turner's Thick-toed Gecko	√	-
<i>Pachydactylus punctatus</i>	Speckled Thick-toed Gecko	√	-
<i>Pachydactylus scherzi</i>	Schertz's Thick-toed Gecko	√	Endemic
<i>Pachydactylus weberi</i>	Weber's Thick-toed Gecko	√	Near -Endemic
<i>Palmatogecko rangei</i>	Web-footed Gecko	√	Near -Endemic
<i>Ptenopus carpi</i>	Carp's Barking Gecko	√	Endemic
<i>Ptenopus maculatus</i>	Common Barking Gecko	√	Near -Endemic
<i>Rhoptropus afer</i>	Common Namib Day Gecko	√	Endemic
<i>Rhoptropus boulltoni</i>	Boullton's Namib Day Gecko	√	Endemic

The north-west of Kunene is known to have a high species diversity of reptiles. Some of the species known or likely to occur in the area are endemic to Namibia. Amid the species occurring in the general area of the mining claims; 12 species are endemic to Namibia while 4 species

are Near-endemic. The rest of species of reptiles known to occur in the area are of no conservation concern.

### 10.5 Avian-Fauna Diversity

Birdlife is relatively high in the vicinity due to various micro habitats occurring in the area.

Table 5: Birds known and/or likely to occur in the vicinity of mining claims; 72530, 72531 and 72532 Oundombo Village, Kunene region.

Scientific name	Common name	Namibia Status
<i>Cypsiurus parvus</i>	African Palm Swift	-
<i>Streptopelia senegalensis</i>	Laughing Dove	-
<i>Oena capensis</i>	Namaqua Dove	-
<i>Ardeotis kori</i>	Kori Bustard	Near Threaten
<i>Pterocles namaqua</i>	Namaqua Sandgrouse	-
<i>Falco rupicolus</i>	Rock Kestrel	-
<i>Falco chicquera</i>	Red-necked Falcon	-
<i>Corvus albus</i>	Pied Crow	-
<i>Hirundo albigularis</i>	White-throated Swallow	-
<i>Hirundo dimidiata</i>	Pearl-breasted Swallow	-
<i>Hirundo cucullata</i>	Greater Stiped Swallow	-
<i>Hirundo semirufa</i>	Red-breasted Swallow	-
<i>Pycnonotus nigricans</i>	African Red-eyed Bulbul	-
<i>Eremomela icteropygialis</i>	Yellow-bellied Eremomela	-
<i>Prinia flavicans</i>	Black-chested Prinia	-
<i>Mirafrapa passerina</i>	Monotonous Lark	-
<i>Mirafrapa africana</i>	Rufous-naped Lark	-
<i>Mirafrapa fasciolata</i>	Eastern Clapper Lark	-
<i>Mirafrapa sabota</i>	Sabota Lark	-
<i>Chersomanes albofasciata</i>	Spike-heeled Lark	-
<i>Certhilauda benguelensis</i>	Benguela Long-billed Lark	-
<i>Eremopterix leucotis</i>	Chestnut-backed Sparrowlark	-
<i>Eremopterix verticalis</i>	Grey-backed Sparrowlark	-
<i>Calandrella cinerea</i>	Red-capped Lark	-
<i>Alauda starki</i>	Stark's Lark	-

<i>Bradornis infuscatus</i>	Chat Flycatcher	-
<i>Namibornis herero</i>	Herero Chat	-
<i>Nectarinia fusca</i>	Dusky Sunbird	-
<i>Bualornis niger</i>	Red-billed Buffalo- Weaver	-
<i>Philetairus socius</i>	Sociable Weaver	-
<i>Ploceus rubiginosus</i>	Chestnut Weaver	-
<i>Quelea quelea</i>	Red-billed Quelea	-
<i>Estrilda astrild</i>	Common Waxbill	-
<i>Vidua paradisaea</i>	Long-tailed Paradise - Whydah	-
<i>Vidua regia</i>	Shaft-tailed Whydah	-
<i>Passer domesticus</i>	House Sparrow	-
<i>Passer motitensis</i>	Great Sparrow	-
<i>Passer melanurus</i>	Cape Sparrow	-
<i>Passer griseus</i>	Southern Grey-headed Sparrow	-
<i>Anthus similes</i>	Long-billed Pipit	-
<i>Serinus alario</i>	Black-headed Canary	-
<i>Crithagra atrogulariis</i>	Black-throated Canary	-
<i>Serinus flaviventris</i>	Yellow Canary	-
<i>Serinus albogularis</i>	White-throated Canary	-
<i>Emberiza capensis</i>	Cape Bunting	-
<i>Emberiza flaviventris</i>	Golden-breasted Bunting	-

Most of the bird species recorded and/or known to occur in the area have no conservation concerns. However, there are some species such as *Ardeotis kori* which is likely to occur in the area and is near-endemic. The likely impact expected towards the avian fauna may include; the destruction of nests and different habitats during active mining. The breeding and nesting sites are most likely vulnerable to destruction particularly during the clearing of vegetation in the area to pave way for mining operations. The clearing of vegetation to allow mining to take place will undesirably impact the breeding potentials of birds in the area. It is assumed that mining equipment will emit noise during operation and as a result it will impacts on the daily activities of birds.

## 11. DESCRIPTION OF THE SOCIO-ECONOMIC

Oundombo Village is situated approximately 60 Km South-west of Opuwo within the Opuwo Rural constituency in the Kunene region. The administrative centre for Opuwo Rural

constituency is the settlement of Otuari. The settlement is situated south-east of Oundombo Village. Otuari is prominent for its copper deposit and a small to medium scale copper mining project situated on the west of the settlement. According to the (Namibia 2011 Population and Housing Census Report) Kunene region has the population size of 86 856 while Opuwo which is the closest main town to Otuari has a population size of 7 657. The population size of both Kunene region and that of Opuwo is anticipated to have increase over the years. Beside the copper mine project at Otuari. The main core economic activities at the settlement and its surrounding villages are predominately livestock farming. The settlement features a school namely Musaso Combined school. The town also has a healthcare facility; Otuari clinic. The Opuwo Rural Constituency councillor office is also found at the settlement.

## **11. DESCRIPTION OF THE PUBLIC PARTICIPATION**

### **11.1 Public Participation Requirement**

In term of Section 21 of the EIA Regulations a call for open consultation with all I&APs at well-defined phase of the EIA process is required. This involves participatory consultation with members of the public by providing them with an opportunity to comment on the envisaged project. For the purpose of this project the public was given sufficient time to comments and make suggestions on the envisaged copper mining project at Oundombo Village in Kunene region and a public participation meeting was also scheduled for the 19<sup>th</sup> March 2022 at Senior Councillor homestead, Oundombo village to obtain all the comments and suggestions from the public but there was no turn out. Please see **Table 6** below for activity undertaken as part of the public participation process. The public was given time to comment on the project until **08<sup>th</sup> April 2022**. The commenting period was further extended until **08<sup>th</sup> May 2022** (see **Annexure B**). Nevertheless, no comment or suggestions were received from the public.

Table 6. Public Participation Activities

Activity	Remarks
<b>Placement of Advertisements in the Newspapers</b>	
<b>Confidante Newspaper</b>	<b>See Annexure B</b>
<b>Windhoek Observer</b>	<b>See Annexure B</b>

## 12. ASSESSMENT METHODOLOGY

The core of this segment is to provide a framework on assessment approach applied in shaping the significance, management, location, and operational impacts on the mining of copper ore at Oundombo Village and where practicable the conceivable alternatives are provided on the bio-physical and socio-economic environment.

Assessment of the predicted significance of impact of the mining activities that is not operational at this stage by its nature, fundamentally unspecified environmental assessment is subsequently an inaccurate discipline. Therefore, to handle the situation of ambiguity a standardised and internationally recognised approach has been formulated. Thus, this assessment uses such an approach in order to determine the significance of the prospective ecological impacts of the planned copper mining project at Oundombo Village as outlined in **Table 7** below;

Table 7: standardised and internationally recognised methodology determine to the significance of the likely ecological impacts.

CRITERIA	CATEGORY
<b>Impact</b>	<b>Description of the potential impact</b>
<b>Nature</b> Describe type of effect	<p><b>Positive:</b> The activity will have a social / economical / environmental benefit.</p> <p><b>Neutral:</b> The activity will have a no effect.</p> <p><b>Negative:</b> The activity will have a social / economical / environmental harmful effect.</p>
<b>Extent</b> Describe the scale of the impact	<p><b>Site Specific:</b> Expanding only as far as the activity itself (onsite).</p> <p><b>Small:</b> Restricted to the site's immediate environment within 1km of the site (limited).</p> <p><b>Medium:</b> Within 5 km of the site (local).</p> <p><b>Large:</b> Beyond 5 km of the site (regional).</p>
<b>Duration</b> Predicts the lifetime of the impact	<p><b>Temporary:</b> &lt;1 year (not included in the construction).</p> <p><b>Short-term:</b> 1-5 years.</p> <p><b>Medium:</b> 5-15 years.</p> <p><b>Long-term:</b> &gt; 15 years (Impact will stop after the exploration or running life of the of the project, either due to natural course or by human interferences).</p> <p><b>Permanent:</b> Impact will be where mitigation or moderation by natural course or by human interference will not occur in a particular time period that the impact can be considered temporary.</p>

CRITERIA	CATEGORY
<p><b>Intensity</b></p> <p>Describe the magnitude (scale/size) of the impact</p>	<p><b>Zero:</b> Social and/ or natural function and/ or process remain unaltered.</p> <p><b>Very low:</b> Affect the environment in such a way that natural and/ or social functions/ processes are not affected.</p> <p><b>Low:</b> Natural and/ or social functions/ processes are slightly altered.</p> <p><b>Medium:</b> Natural and/ or social functions/ processes are notably altered in a modified way.</p> <p><b>High:</b> Natural and/ or social functions/ processes are severely altered and may temporarily or permanently cease.</p>
<p><b>Probability of occurrence</b></p> <p>Describe the probability of the impact <u>actually</u> occurring</p>	<p><b>Improbable:</b> Not at all likely.</p> <p><b>Probable:</b> Distinctive possibility.</p> <p><b>Highly probable:</b> Most likely to happen</p> <p><b>Definite:</b> Impact will occur regardless of any prevention measures.</p>
<p><b>Degree of Confidence in predictions</b></p> <p>State the degrees of confidence in predictions based on availability of information and specialist knowledge.</p>	<p><b>Unsure/Low:</b> Little confidence regarding information available (&lt;40%).</p> <p><b>Probable/Med:</b> Moderate confidence regarding available (40% - 80%).</p> <p><b>Definite/High:</b> Great confidence regarding available (&gt;80%).</p>
<p><b>Significance Rating</b></p> <p>The impact on each component is determined by a combination of the above criteria.</p>	<p><b>Neutral:</b> A potential concern which was found to have no impact when evaluated.</p> <p><b>Very low:</b> Impacts will be site specific and temporary with no mitigation necessary.</p> <p><b>Low:</b> The impact will have a minor influence on the proposed project and/ or environment. These impacts require some though to adjustment of the project design where achievable or alternative mitigation measures.</p> <p><b>Medium:</b> Impacts will be experienced in the local and surrounding areas for the life span of the project and may result in long term changes. The impact can be reduced or improved by amendment</p>

CRITERIA	CATEGORY
	<p>in the project design or implementation of effective mitigation measures.</p> <p><b>High:</b> Impacts have high magnitude and will be experienced regionally for at least the life span of the project or will be irreversible. The impacts could have the no -go proposition on portions of the project in spite of any mitigation measures that could be implemented.</p>

It is imperative to be cognisant that the magnitude of the impact must be interrelated to the relevant standard (threshold value specified and source reference). The scale of impact relies on the specialist knowledge of the specific field.

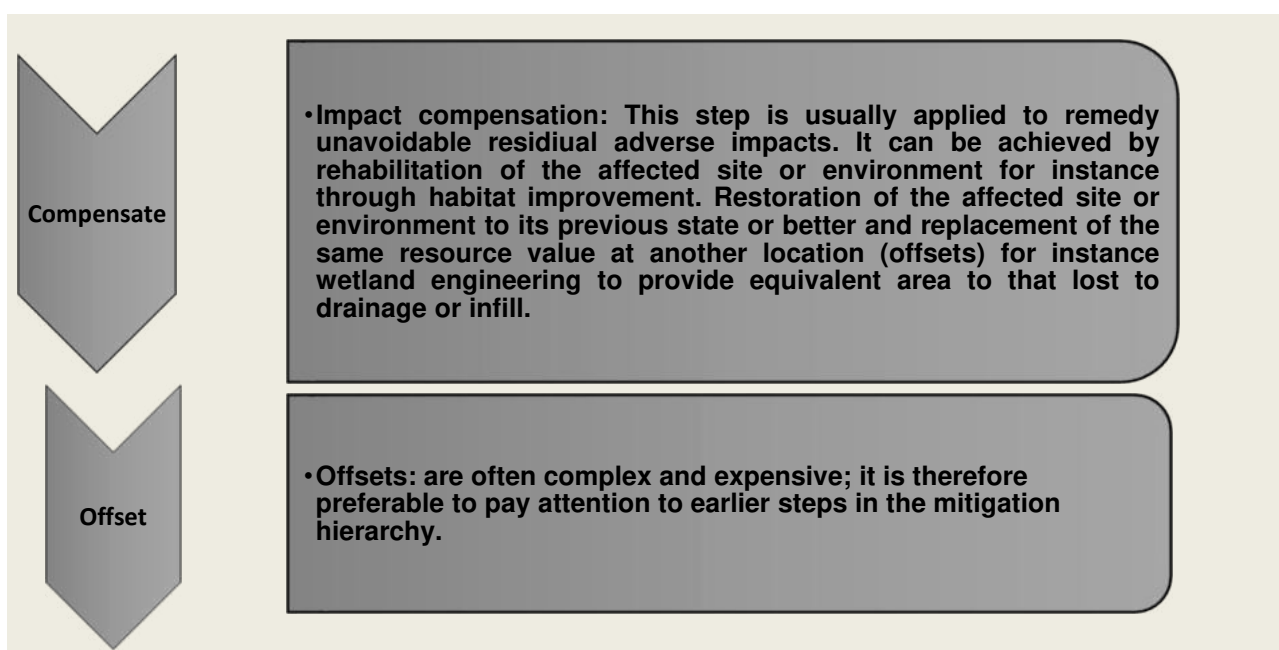
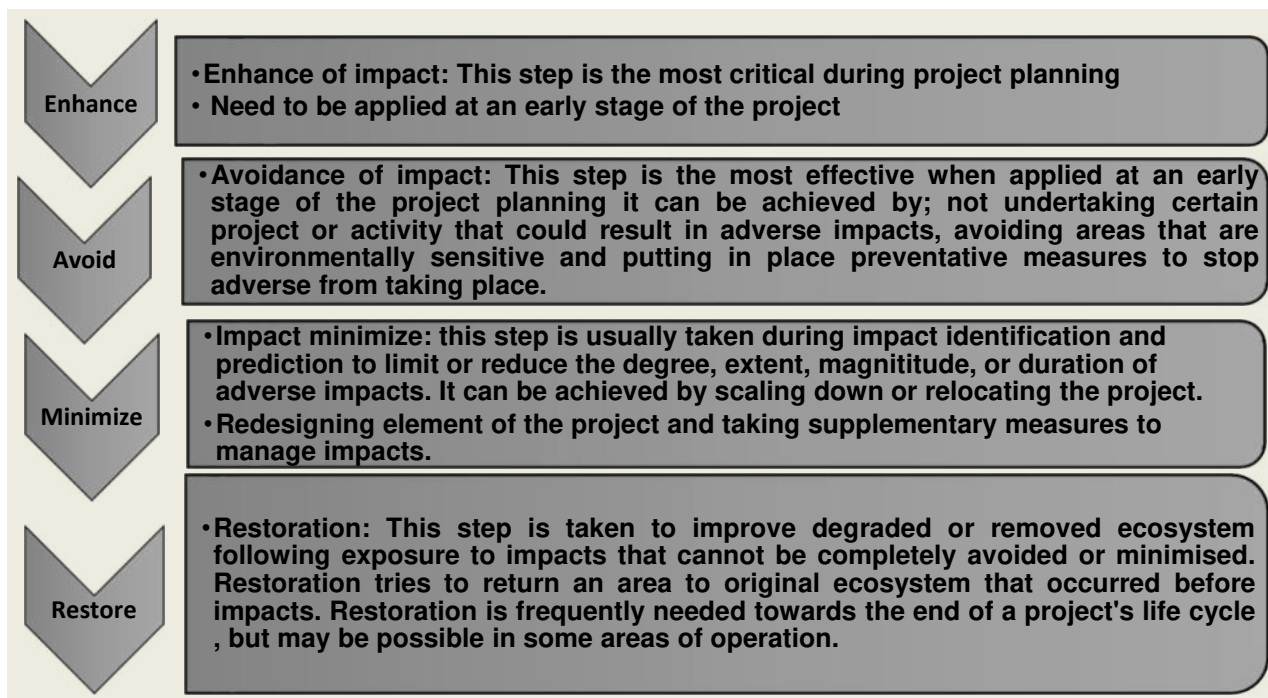
For each impact, the EXTENT (spatial scale), MAGNITUDE (size or degree scale) and DURATION (time scale) are defined. These criteria are basically used to establish the significance of the impact, beginning with the event where there is no mitigation needed and then with the most effective mitigation measures in place. The clarification as to which mitigation measure can be integral is entirely the prerogative of the proponent; **Ms. Karimunika Wendy Matundu** and acceptance and eventually endorsed by the relevant environmental authority.

The SIGNIFICANCE of the impact has been attained by taking into consideration the temporal and spatial scales and magnitude.

### 13. MITIGATION MEASURES

There is a mitigation protocol that can be optimised to retort to any planned project or activity. The mitigation protocol entails: enhancing impact, avoidance, minimization, restoration and compensation as depicted below. It is essential and imperative to highlight constructive benefits which emanate from the planned mining project or activity which are impairment to the environment and if negative impacts occur the protocol is formulated to reduces the severity of negative impacts.





## 14. ASSESSMENT OF POTENTIAL IMPACTS AND MITIGATION

This section explains the bio-physical and socio-economic impacts, which may potentially take place as result of the planned copper ore mining activities which have been elucidated in Section 3. The impacts entail the probable long-term impact associated with the planned mining activity as where else short terms impacts such as construction of a new road in order to access the mine without any difficulties. The assessment of the likely impacts associated with the project will be instrumental to guide and provide a better understanding to the MEFT: DEA regarding

the management of the environmental issues which have been acknowledged in the environmental assessment process. The MEFT: DEA's decision on the approval of environmental clearance certificate for the proposed mining activity of dimension stones within the mining claims 72530, 72531 and 72532 and setting of conditions (should the mining of copper ore happened to be authorised) will heavily relies on this section complemented by additional information provided in this environmental assessment report.

The baseline and potential impacts that can occur as a results of mining copper ore on mining claims 72530, 72531 and 72532 are defined and evaluated with latent mitigation measures suggested. The recommendation has also been highlighted on the potential cumulative impacts which may occur from the proposed mining activity.

#### **14.1 Impacts During Mining Phase**

A significant topographical change will occur because of mining of copper ore on the parcels of land designated for mining by the relevant authority. There is a need to prepare for waste rock heaps, dispatching areas for copper ore and potential logistic centred around the transportation of the copper ore from the site.

##### **14.1.1 Surface and underground water Impacts**

There are potential risks of polluting water resources such as the washes and underground aquifer may be possible. Therefore, mining equipment that will be optimised during mining operation may inadvertently have leakages and as a result pollute the washes and eventually contaminate the underground water. In order to avoid such potential risks heavy mining equipment should be cautiously checked for any leakage and fitted with drip tanks when stationary and if refuelling is taking place on site it must either be a tank mounted on stilts or housed with a concrete/cement floor to prevent any leakage.

##### **14.1.2 Noise Impacts**

The mining equipment and machinery in general emits excessive noise that more than the recommended 85 dB exposure to employees for an extended period and this will be inevitable predominantly throughout working hours. It is subsequently suggested that employees should be provided with ear-muffs and afforded sufficient breaks to avoid potential impacts such as

hearing loss. Furthermore, potential excessive noise will be experienced during the testing of mining equipment to ensure that they are operating, and this may emanate in the generation of short-term noise.

#### **14.1.3 Dust and Emission Impacts**

The air quality in the area is generally considered to be fairly good, however, dust may result during the operational phases as a result of mining activity. In addition, dust and emissions associated with mining may be generated by the movement of vehicles and trucks that will transport the mined copper ore. Henceforth, the proposed mining operation should comply with the Public Health Act of 2015 and the Atmospheric Pollution Prevention Ordinance (**No. 11 of 1976**).

#### **14.1.4 Impacts on biodiversity**

The mining claims are situated in an area with limited disturbance besides human settlement and livestock farming. In essence a large section of the area is still intact. Therefore, impact on biodiversity is anticipated particularly on the fauna and flora. Some of the vegetation found in the targeted area with significant mineral resource deposit will be removed in order to access the ore body. This will result in habitat destruction and ultimately loss of biodiversity in the area. Nevertheless, the impact on biodiversity will be localised and limited to the ear-marked area because the proposed project is a small-scale mining project.

#### **14.1.5 Visual and Sense of Place Impacts**

The pits/quarries that will be created during mining operations will create an unpleasant visual intrusion in the area. The aesthetic values of the area will be compromised and the area may potentially be visually unpleasant to some local people due to the transformation of the landscape. The level of this impact will primarily be based on the aesthetic values devoted to the initial aesthetic importance of the area by the interested and affected parties.

#### **14.1.6 Archaeological and Heritage Resource Impacts**

There are no heritage resources in the area. However, an accidental chance find procedure may be required.

### **14.1.7 Social Impacts**

The rate of job redundancy in the country in general has become a serious problem particularly post Covid 19 pandemic. The most affected category is the youth and Oundombo Village where the proposed mining project will take place is excepted from the high level of unemployment. The proposed mining project will employ a significant number of people from the village on permanent and casual basis. In addition, cumulative jobs will be created and local entrepreneurs will be encouraged and afforded the first priority in securing contracts and participate in outsourced job. The proposed copper mining project will contribute immeasurably to the local economy and extend further to the national economy through royalties, taxes, and foreign currency exchanges.

### **14.1.8 Traffic Impacts**

The traffic volume is not anticipated to increase significantly during the operation of the mining project. Although, there will be few trucks that will be transporting the mined copper ore from the site to Opuwo, then to Walvis Bay for export purposes. There will be light vehicles that will be used at the mine and to access the site. If mining operations will be carried out as per schedule and drivers of the vehicles use only the delineated right of ways, the impact is likely to be of very low. However, soil erosion and compaction impacts may potentially take place as a result of trucks and light vehicle that will be using the roads.

### **14.1.9 Existing Service Infrastructure Impacts**

The proposed project will be situated in a very remote area with limited access to services. Water for the intended mining operation and human consumption will be sourced from the borehole which is yet to be drilled once all the necessary permits have been obtained from the relevant authorities. A water abstraction permit for the borehole will be applied for at the Ministry of Agriculture, Water and Land Reform (MAWLR). Electricity which will be used to supply the base based camp will be supplied using a diesel-powered generator, while the option of constructing a 5 MW solar power plant in the area is being explored.

#### **14.1.10 Waste Management Service Impacts**

The envisaged copper mining project will act as an incentive for a number of people from the village to migrate to the active mining site. Such people will require sufficient ablution facilities and provision of solid waste management services. The proponent will source adequate temporary sanitary facilities which will be upheld and kept in a hygienic condition. The proponent will be responsible for emptying the ablution facility on weekly basis and dispose of at the nearest sewerage disposal ponds which is only found in Opuwo. There is a possibility for a local company with a decent track record to be outsourced to handle the waste management services. All domestic waste materials that will be generated during the proposed mining activity will be disposed of at Opuwo landfill. Moreover, assorted wheelie bins and a skip container will be provided at the site and recycling will be encouraged.

#### **14.1.11 Storage and Utilisation of Hazardous Substance**

Hazardous substances are considered by the Hazardous Substance Ordinance (No: 14 of 1974) as such substance which may cause injury or ill-health or even death of a human being due to their toxic, corrosive, irritant, strongly sensitizing or flammable nature or the generation of pressure thereby in certain circumstances. It includes manufactures, sales, use, disposal, and dumping as well as import and export. During mining operation, the utilisation, storage and disposal of hazardous substance such as low-density dynamites which is explosive and is made from of nitro-glycerine, sorbents (powdered shells or clay) and stabiliser may take place because is widely used in mining. The use of dynamite highly discouraged because it has some negative impacts on the environment. If chemical from those explosives entered the surface water bodies particularly during the rainy season it will be disastrous to the environment and people. Therefore, the use of explosive should be discouraged, and any potential hazardous substance should be kept safe in a lockable storage container.

#### **14.1.12 Health, Safety and Security Impacts**

Projects of this nature in general may potentially attract people from different areas to search for attainable temporary job. Experience with similar project in the past, has been proven that migrant workers may have a chance to interact with the local community and a significant risk

may occur due to advancement of social conditions and sexual behaviours which may potentially lead to the spread of HIV and AIDS.

The proponent is therefore encouraged to ensure that workers have access to Personal Protective Equipment's (PPEs). A fully stocked first kit with accredited medicines must always be on site. Although Covid19 pandemic has dwindled and the situation has gradually come back to normal, still employees are encouraged to maintain a high levels of hygiene and adhere to all health conditions outline in the EMP complementary to this report.

## **15. AN ENVIRONMENTAL MANAGEMNT PLAN**

A tailored-made Environmental Management Plan (EMP) is contained into this report as **Annexure C**. The intentions of the EMP is to afford direction in order to measure and realize compliance with the protection of the environment and mitigation requirements of mining copper ore and ultimately decommissioning of the mining project to condense and circumvent the likely negative impacts associated with the planned project.

## **16. SUMMARY OF POTENTIAL IMPACTS**

An outline of the significance of the potential impacts associated with the proposed copper mining activity is detailed in the environmental impact assessment matrix (see **Table 8** below). The summary of the mitigation measures for the likely impacts have been recommended. Although some modification in the extent of the probable impacts may take place due to the anticipated alternatives which may include conversion of the area into an active economic place were not measured to be significant for any possible impacts, consequently the matrix table below is relevant to the planned mining project.

Table 8: Environmental impact assessment matrix for copper ore mining project at mining claims; 72530, 72531 and 72532

Description of potential impact	Project alternative	No mitigation / mitigation	Extent	Magnitude	Duration	SIGNIFICANCE	Probability	Confidence	Reversibility	Cumulative impact
<b>IMPACTS DURING EXPLORATION OF BASE &amp; RARE METALS</b>										
<b>Surface and Ground Water Impacts</b>	Mining of copper ore	No mitigation	Local	Medium-Low	Short term	Medium	Probable	Certain	Reversible	Medium-Low (-ve)
		Mitigation	Local	Low	Short term	Medium -Low	Probable	Certain	Reversible	Low (-ve)
	No go	No mitigation	Local	Neutral	Short term	Neutral	Probable	Certain	Reversible	Neutral
		Mitigation	Local	Neutral	Medium term	Neutral	Probable	Certain	Reversible	Neutral
<b>Noise Impacts</b>	Mining of copper ore	No mitigation	Local	Medium	Short term	Medium	Probable	Certain	Reversible	Medium (-ve)
		Mitigation	Local	Medium - Low	Medium term	Medium-Low	Probable	Certain	Reversible	Low (-ve)
	No go	No mitigation	Local	Neutral	Short term	Neutral	Probable	Certain	Reversible	Neutral
		Mitigation	Local	Neutral	Short term	Neutral	Probable	Certain	Reversible	Neutral
	Mining of copper ore	No mitigation	Local	Low	long term	Medium	Probable	Certain	Reversible	Low (-ve)
		Mitigation	Local	Very low	Medium term	Medium-Low	Probable	Certain	Reversible	Very low (-ve)

Description of potential impact	Project alternative	No mitigation / mitigation	Extent	Magnitude	Duration	SIGNIFICANCE	Probability	Confidence	Reversibility	Cumulative impact
<b>Dust and Emission Impacts</b>	No go	No mitigation	Local	Neutral	Short term	Neutral	Probable	Certain	Reversible	Neutral
		Mitigation	Local	Neutral	Short term	Neutral	Probable	Certain	Reversible	Neutral
<b>Impacts on biodiversity</b>	Mining of copper ore	No mitigation	Local	Medium	Short term	Medium	Probable	Certain	Reversible	Medium (-ve)
		Mitigation	Local	Low	Short term	Low	Probable	Certain	Reversible	Medium - Low (-ve)
	No go	No mitigation	Local	Neutral	Short term	Neutral	Probable	Certain	Reversible	Neutral
		Mitigation	Local	Neutral	Short term	Neutral	Probable	Certain	Reversible	Neutral
<b>Visual and Sense of Place Impacts</b>	Mining of copper ore	No mitigation	Local	Medium	Short term	Medium	Probable	Certain	Reversible	Medium – low (-ve)
		Mitigation	Local	Low	Short term	Medium-Low	Probable	Certain	Reversible	Low (-ve)
	No go	No mitigation	Local	Neutral	Short term	Neutral	Probable	Certain	Reversible	Neutral
		Mitigation	Local	Neutral	Short term	Neutral	Probable	Certain	Reversible	Neutral
	Mining of copper ore	No mitigation	Local	Very low	Short term	Low	Probable	Certain	Irreversible	Very low(-ve)



Description of potential impact	Project alternative	No mitigation / mitigation	Extent	Magnitude	Duration	SIGNIFICANCE	Probability	Confidence	Reversibility	Cumulative impact
Archaeological and Heritage Impacts		Mitigation	Local	Negligible	Short term	Very Low	Probable	Certain	Irreversible	Negligible (-ve)
	No go	No mitigation	Local	Neutral	Short term	Neutral	Probable	Certain	Reversible	Neutral
		Mitigation	Local	Neutral	Short term	Neutral	<b>Probable</b>	Certain	Reversible	Neutral
Social Impacts	Mining of copper ore	No mitigation	Local	Medium-Low	Short term	High++	Probable	Certain	Reversible	Medium-Low (-ve)
		Mitigation	Local	Low	Short term	High++	Probable	Certain	Reversible	Low (-ve)
	No go	No mitigation	Local	Neutral	Short term	Neutral	Probable	Certain	Reversible	Neutral
		Mitigation	Local	Neutral	Short term	Neutral	Probable	Certain	Reversible	Neutral
Traffic Impacts	Mining of copper ore	No mitigation	Local	Low	Short term	Medium-Low	Probable	Certain	Reversible	Low (-ve)
		Mitigation	Local	Very low	Short term	Low	Probable	Certain	Reversible	Very low
	No go	No mitigation	Local	Neutral	Short term	Neutral	Probable	Certain	Reversible	Neutral
		Mitigation	Local	Neutral	Short term	Neutral	Probable	Certain	Reversible	Neutral

Description of potential impact	Project alternative	No mitigation / mitigation	Extent	Magnitude	Duration	SIGNIFICANCE	Probability	Confidence	Reversibility	Cumulative impact
<b>Existing Service Infrastructure Impacts</b>	Mining of copper ore	No mitigation	Local	Medium	Short term	Medium - Low	Probable	Certain	Reversible	Medium - Low (-ve)
		Mitigation	Local	Low	Short term	Low	Probable	Certain	Reversible	Very low (-ve)
	No go	No mitigation	Local	Neutral	Short term	Neutral	Probable	Certain	Reversible	Neutral
		Mitigation	Local	Neutral	Short term	Neutral	Probable	Certain	Reversible	Neutral
<b>Waste Management Service Impacts</b>	Mining of copper ore	No mitigation	Local	Medium	Short term	Medium -Low	Probable	Certain	Reversible	Medium - Low (-ve)
		Mitigation	Local	Low	Short term	Low	Probable	Certain	Reversible	Low (-ve)
	No go	No mitigation	Local	Neutral	Short term	Neutral	Probable	Certain	Reversible	Neutral
		Mitigation	Local	Neutral	Short term	Neutral	Probable	Certain	Reversible	Neutral
		Mitigation	Local	Neutral	Medium term	Neutral	Probable	Certain	Reversible	Neutral
<b>Storage and Utilisation of Hazardous Substances</b>	Mining of copper ore	No mitigation	Local	Low	Short term	Medium	Probable	Certain	Reversible	Low (-ve)
		Mitigation	Local	Very low	Short term	Low	Probable	Certain	Reversible	Very low (-ve)

Description of potential impact	Project alternative	No mitigation / mitigation	Extent	Magnitude	Duration	SIGNIFICANCE	Probability	Confidence	Reversibility	Cumulative impact
	No go	No mitigation	Local	Neutral	Short term	Neutral	Probable	Certain	Reversible	Neutral
		Mitigation	Local	Neutral	Short term	Neutral	Probable	Certain	Reversible	Neutral
<b>Health, Safety and Security Impacts</b>	stones	No mitigation	Local	Neutral	Short term	Medium	Probable	Certain	Reversible	Medium-Low
		Mitigation	Local	Neutral	Short term	Low	Probable	Certain	Reversible	Low
	No go	No mitigation	Local	Neutral	Short term	Neutral	Probable	Certain	Reversible	Neutral
		Mitigation	Local	Neutral	Short term	Neutral	Probable	Certain	Reversible	Neutral

## 17. CONCLUSION AND RECOMMEDATIONS

The overall aim of this section is to provide a summary and complete the assessment report with reference to **Table 8** above and at the same time provided suitable and effective measures which are environmentally satisfactory. Most of the negative impacts from the associated with the planned copper ore mining activities are considered to have **medium to low** significance. Nevertheless, some of the negative impacts associated with this copper mining project have medium significance which can be mitigated to irrelevantly **low** provided that the proponent employs the recommended mitigation measures delineated in **Section 13** and which is part of the EMP in **Annexure C** which complement this report. The significance of the negative impacts associated with the intended mining project will be rated as **low**.

The area envisaged for mining of copper ore endowed a high biodiversity which includes flora and fauna and it has limited disturbances. Due to the fact that the mining of copper ore at Oundombo village is localised the impacts on biodiversity can be rated low-medium. The species recorded in the area are considered to be least concern and this was necessitated by the distribution range of such species in the vicinity and the country at large. The main concern with the fauna and flora in the area is the protected and endemic species. The protected species occurring within the project areas should be avoided at all costs. It is suggested that the proponent should implement a compensation policy to ensure that the lost vegetation is replenished. The planned mining project if executed appropriately, it will have minimal negative impacts on biodiversity. The presence of antelope in the vicinity may potentially lure some of the employees to involve in unlawful activities such as illegal hunting. It is therefore recommended that illegal hunting or any activity assumed to be associated with poaching should be reported to the police in Opuwo and anti-poaching unit within the line ministry. Stringent measures should be in place to distract people to engage in poaching and severe penalties should be imposed to any individual suspected to be involved in poaching.

In terms of social impact, the proposed project has a **high** significance which is **positive**. The positive significance outweighs the negative impacts, and this is due to the fact that the project will make a huge impact in the community. Both directly and indirectly jobs will be created, and this will improve the livelihood of the community enormously. The project will further contribute to the national economy through royalties, taxes, and foreign currency earnings.

The assessment and information gathered and presented in this report are sufficient and as result there is confidence in the environmental assessment undertaken. The assessment is adequate and acceptable for the decision making. Therefore, it is recommended that, this project must be approved and issued with an Environmental Clearance Certificate (ECC) by MEFT: DEA. Due to variations on the environment, consistent monitoring is extremely recommended and the proponent must appoint an Environmental Practitioner of her choice to carry out environmental audits for submission to the office of the Environmental Commissioner.

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**Annexure A: Consent letter from the Traditional Authority**

17 March 2022

To: Whom it May Concern

**REF: Consent letter for the application for an Environmental Clearance Certificate for establishment and mining of base and rare metals (copper ore) on mining claims 72530, 72531 & 72532 at Oundombo Village, Opuwo Rural Constituency, Kunene Region.**

The Vita Royal House Traditional Authority represented by Chief Kenangunja Kaombungu and their subject community have no objection for the application for an Environmental Clearance Certificate for establishment and mining of base and rare metals (copper ore) on mining claims 72530, 72531 & 72532 at Oundombo Village, Opuwo Rural Constituency, Kunene Region. within our jurisdiction.

The proponent, Ms. Karimunika Wendy Matundu must however adhere to all mandatory requirements as per the agreed social responsibility with the Traditional Authority and the community of Oundombo village and should continue to engage with our office so that the community benefits from these exploration and mining activities through the community trust fund to allow for our developmental priorities to be undertaken.

Yours truly,

Chief Kenangunja Kaombungu

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K. Kaombungu

63012 02004  
Secretary: 0810427343

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Name: H. Jiposa

73111600262  
0812745907





## Annexure B: Proof of Newspaper Advertisements

## Annexure C: Environmental Management Plan (EMP)

## Annexure D: Curriculum Vitae for the Environmental Assessment Practitioner

