ENVIRONMENTAL IMPACT ASSESSMENT

FOR PROPOSED EXPLORATION ACTIVITIES ON MINING CLAIMS, 70996, 70997, 70994, 70995, 68753, 68755, 70310, 70754, 70755, 70756, 70757, 70758, 70759, 70992, 70993 NEAR OTWANI AREA, OPUWO CONSTITUENCY, KUNENE REGION

Prepared By

ECO-WISE ENVIRONMENTAL CONSULTING CC
P.O Box 40168 Windhoek
Cell: +264 813 826460
Email:ecowise@protonmail.com

Prepared For

KAOKO MINING NAMIBIA PTY LTD
P.O. Box 1121
Tsumeb
Cell: +264 67 220504
Fax: +264 67 220509

DOCUMENT AUTHENTICATION

This Environmental Impact Assessment project report has been prepared by Eco-Wise Environmental Consulting cc in accordance with the Environmental Management Act No 7 of 2007 (EMA) and its regulations of 2012, which requires that every mining related project must have an EIA report prepared for submission to the Ministry of Environment and Tourism-Division of Environmental Affairs. We the undersigned, certify that the particulars in this report are correct and righteous to the best of our knowledge.

EIA FIRM OF EXPERTS:

ECO-WISE ENVIRONMENTAL CONSULTING CC

P.O Box 40168 Windhoek

Cell: +264 813 826460

Email: ecowise@protonmail.com

ENVIRONMENTAL AUTHORIZATION INFORMATION

Please note that the environmental clearance certificate should be issued out to the client. All comments and enquiries during the evaluation of this document must be addressed to the Environmental Consultants. Please forward the clearance certificate to the consultant.

TABLE OF CONTENTS

LIST OF SITE IMAGES

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

Appendix A –Public Participation Process (Adverts, Background Information Document (BID), Register Meeting Minutes, Questionnaires & Letters from Traditional Authorities

Appendix B - Consent letters, Agreements

Appendix C - Environmental Management Plan (EMP)

Appendix D - CV's of Consultants

ACRONYM

ACRONYM	MEANING
BID	Background Information Document
EIA	Environmental Impact Assessment
EAP	Environmental Assessment Practitioner
EMP	Environmental Management Plan
EPL	Exclusive Prospecting License
I&APs	Interested and Affected Parties
LTD	Limited Company
PPP	Public Participation Process
PTY	Proprietary
ToR	Terms of Reference

EXECUTIVE SUMMARY

Ecowise Environmental Consulting cc conducted an Environmental Impact Assessment on behalf of Kaoko Mining Namibia Pty Ltd. The proponent (Kaoko Mining Namibia Pty Ltd) proposes to conduct exploration activities on the following mining claims 70996, 70997, 70994, 70995, 68753, 68755, 70310, 70754, 70755, 70756, 70757, 70758, 70759, 70992, 70993 in Opuwo constituency, Kunene Region. It is essential to note that all these mining claims are found in EPL 7082. Past researches have shown that the area of study might have commodities such as base and rare metals, precious metals and semi-precious stones. The proponent, is mainly interested in copper, given that medium to large deposits of copper are discovered, the proponent plans to sell the copper to Tsumeb Smelter and also export. Kaoko Mining Namibia Pty Ltd is carrying out exploration activities on various EPLs and mining claims on the northwestern side of Kunene Region so as to be able to determine the viability of establishing mining operations.

NB. The mining claims are not located on environmental sensitive areas or withdrawn areas thus according to the Ministry of Mines and Energy portal.

Impact identification was noticed through desktop studies, secondary data collection, site visits conducted on 31/10/2019, professional expertise and public participation meeting held on 02/11/2019 at the following places; Otwani Rural District Council at 10:00am, Sesfontein Conservancy at 14:00 and Otjapitjapi at 17:00. Interested and Affected Parties were notified of the project through newspaper adverts and site notices.

The proposed project is expected to have some positive impacts especially in future when medium to large minable deposits are discovered. The lives of the locals and the nation at large can be improved through employment creation. The community can also benefit through community development projects. It is essential to note that, the proposed project is already benefiting the locals given that the shareholders of the company are Namibian citizens hence promoting local empowerment. However, negative impacts which might be anticipated include impact on landscape, soil, fauna, vegetation loss although it is expected to be of low environmental significance.

The draft scoping report was made available to the public for commenting. The draft report included all comments raised during the public meetings. All impacts identified through the site visit, professional expertise and comments from the public were incorporated in the report. In a bid to ensure that the proposed mitigation measures will be implemented, an Environmental

Management Plan was developed to guide all activities of the project. The study was carried out according to the requirements of the Environmental Management Act (Act No.7 of 2007) and its regulations of 2012.

The final report was sent to the proponent, Kunene Regional Council, Ministry of Mines and Energy and Ministry of Environment and Tourism: DEA.

It is concluded that, the impacts identified during this Environmental Assessment are manageable if the mitigation measures proposed in the EMP are implemented. If the proponent abides to the legislatives related to this project and the proposed mitigation measures, the consultant recommends the approval of the Environmental Clearance.

CHAPTER ONE: BACKGROUND

1.1 INTRODUCTION

Kaoko Mining Namibia (Pty) Ltd is a Namibian registered company proposing to conduct exploration activities on the following mining claims 70996, 70997, 70994, 70995, 68753, 68755, 70310, 70754, 70755, 70756, 70757, 70758, 70759, 70992, 70993 which are all located in EPL 7082. The mining claims are located around Otwani area, Opuwo constituency, Kunene Region. It is essential to note that, the mining claims belong to different local individuals who came together and formed a company and then transferred their mining claims into that company which is Kaoko Mining Namibia (Pty) Ltd. **See Appendix B**, Agreement for transfer of the mining claims from the shareholders to Kaoko Mining Namibia (Pty) Ltd.

NB. All the mining claims listed were checked on the Ministry of Mines and Energy portal and were found not to be falling under environmental sensitive areas or withdrawn areas.

Eco-Wise Environmental Consulting being an independent consultant was therefore hired to conduct an EIA for the proposed exploration activity. Eco-Wise Environmental Consulting cc conducted a site visit on 31/10/2019. The consultant was mainly guided by the Environmental Management Act (No. 7 of 2007) and Environmental Impact Assessment Regulations (2012) during the process of the EIA. The EIA regulations (2012) states all the activities, which require an EIA and among the listed activities is annexure 3, mining and quarrying activities where this project is classified under. Annexure 3.2 states that other forms of mining or extraction of any natural resources whether regulated by law or not and 3.3 Resource extraction, manipulation, conservation and related activities require and EIA. The competent authority will be, Ministry of Environment and Tourism.

1.2 NEED FOR THE PROJECT

- **Boosting Namibia's copper supplies and mineral export** - previous geological researches show possibilities of copper deposits and also minerals like semi-precious stones and precious metals. If minable deposits of copper are found, Kaoko Mining Namibia Pty Ltd intends to supply to Tsumeb Smelter and maybe export the remaining hence boosting Namibia's copper supplies and at the same time it will help Namibia' economy through foreign currency earned from exports.
- **Empowerment of locals**- Kaoko Mining Namibia Pty Ltd has thirty-three local shareholders, hence if the project is successful it will result in empowering these local shareholders. The company has created a collective agreement amongst all stakeholders to govern this opportunity with the ultimate goal to create value and empower Namibians.
- **Economic development**- if medium to large minable copper deposits are explored, this will boost Namibia's economy through exports. The proponent will also generate revenue for the

government through taxes and revenue generated is channelled to the country's development.

- **Employment creation** - during the exploration phase, mainly professionals with the expertise will be hired to explore the area. Casual labour might however be sourced from locals when the need arises.
- **Community development**- generally, the area of Opuwo rural is remote hence this project will have a potential to boost the development of the area. If a mine is established in future, this might likely lead to upgrading of roads, establishment of infrastructure, increase of people which will have a consequence of increasing demand hence promoting local sells and products.

1.4 SCOPE OF THE PROJECT

The scope of the study includes carrying out environmental investigations in line with current provisions on environmental legislations. The Environmental Management Act (No 7 of 2007) and its regulations of 2012 were used as guidelines for the EIA study. The report is aimed at identifying and evaluating environmental and socio-economic impacts associated with the project.

1.5 TERMS OF REFERENCE

The approach to undertake the work was guided by the following ToR, which were provided by the proponent;

- Conduct environmental scoping.
- Determine all the possible environmental and socio-economic impacts of the project.
- Conduct public participation process to gather the views of Interested and Affected Parties.
- Design an Environmental Management Plan with sound and relevant mitigation measures for monitoring purposes.
- Compile a full EIA report for submission to Ministry of Environment and Tourism and Ministry of Mines and Energy.
- Coordinate the whole application process of the Environmental Clearance Certificate until the issuance of the certificate.

1.6 OBJECTIVES

The objectives of the study were derived from the ToR and they are as follows:

1.6.1 General objective

- To determine the potential environmental and socio-economic impacts derived from the exploration activities

1.6.2 Specific Objectives

- To establish baseline environmental conditions so that relevant impacts could be projected and sufficient mitigation measures could be designed
- To identify direct or indirect environmental impacts that may result from the proposed activity.
- To consult with key, interested and affected stakeholders so that their concerns are considered in the formulation and implementation of the Environment Management Plan.
- Comply with Namibia's Environmental Impact Assessment Regulations (2012), Environmental Management Act (No. 7 of 2007) and other relevant laws and regulations.
- To propose alternative measures where it is noticed that adverse effects may occur.
- To set up an Environmental Management Plan that will govern all activities of the project for the better protection of the environment.

1.7 METHODOLOGY USED FOR THE STUDY

a) **Desktop Study**- this involved review of documents and relevant legislatives. Documents containing geological, vegetation, climatic, demographic and hydrological data for Namibia were also reviewed.
b) **Site Visits –**the EIA team visited the sites on 31 /10/2019. The field visit was meant for physical inspections of the sites in order to gather information on the state of the environment.
c) **Public Participation**-the study also sought public opinion/views through distribution of questionnaires and public meetings. The meetings were held on 02/11 2019 at Otwani Rural District Council at 10:00am, Sesfontein Conservancy at 14:00 and Otjapitjapi village at 17:00.
d) **Mapping-**more data was obtained from the maps which were produced by the consultant GIS personal. The maps included vegetation, hydrogeology and location.
e) **Reporting**- all data gathered was used to compile an EIA and EMP report which was submitted to Ministry of Environment and Tourism and Ministry of Mines and Energy.

1.8 LAND OWNERSHIP

The land is under communal land, see Appendix A consent letters from the traditional authorities. The owners of the mining claims were however allocated the mining claims by Ministry of Mine and Energy.

1.9 OVERVIEW OF EIA REPORT

The remaining part of this report has been designated for the following aspects;

- Project Description.
- Legal and Policy Analysis.

- Environmental Baseline.
- Public Consultation.
- Impact Identification and Analysis.
- Environment Management, Monitoring and Evaluation Plan.
- Conclusions and Recommendations.

CHAPTER TWO: PROJECT DESCRIPTION

The following issues will be clarified under project description;

- Project location.
- Project activities.
- Project cost.

2.1 PROJECT LOCATION

Kaoko Mining Namibia (Pty) Ltd proposes to conduct exploration activities on the following mining claims around the area of Otwani, Opuwo constituency, Kunene Region. All the mining claims are located in EPL 7082. The mining claims also fall under the Otjambangu and Ombujokanguindi Conservancy, **see figure 1 below, location map**. The coordinates for the location of the mining claims are as follows:

Table 2. 1:coordinates for the mining claims

Mining claim	AREA (HECTARES)	Corner 1	Corner 2	Corner 3	Corner 4
70996	16.1341	18° 37' 16" S 13° 39' 35" E	18° 37' 16" S 13° 39' 45" E	18° 37' 33" S 13° 39' 47" E	18° 37' 32" S 13° 39' 36" E
70997	15.847	18° 37' 16" S 13° **39**' 46" E	18° 37' 15" S 13° 39' 56" E	18° 37' 32" S 13° 39' 57" E	18° 37' 33" S 13° 39' 47" E
70994	17.876	18° 37' 43" S 13° 39' 57" E	18° 37' 43" S 13° 40' 07" E	18° 38' 01" S 13° 40' 07" E	18° 38' 02" S 13° 39' 57" E
70995	15.6477	18° 37' 43" S 13° 40' 08" E	18° 37' 43" S 13° 40' 17" E	18° 38' 01" S 13° 40' 17" E	18° 38' 01" S 13° 40' 07" E
68753		18° 35' 44" S 13° 42' 42" E	18° 35' 42" S 13° 42' 51" E	18° 36' 00" S 13° 42' 57" E	18° 36' 03" S 13° 42' 48" E
68755		18° 33' 01" S 13° 38' 01" E	18° 32' 59" S 13° 38' 10" E	18° 33' 17" S 13° 38' 16" E	18° 33' 20" S 13° 38' 06" E

70310	15.8464	18° 38' 01" S 13° 40' 09" E	18° 38' 07" S 13° 40' 18" E	18° 38' 17" S 13° 40' 03" E	18° 38' 11" S 13° 39' 56" E
70754	18.2795	18° 36' 56" S 13° 39' 35" E	18° 36' 56" S 13° 39' 46" E	18° 37' 16" S 13° 39' 46" E	18° 37' 16" S 13° 39' 35" E
70755	18.4547	18° 36' 56" S 13° 39' 46" E	18° 36' 56" S 13° 39' 56" E	18° 37' 15" S 13° 43' 56" E	18° 37' 15" S 13° 39' 46" E
70756	17.9984	18° 36' 56" S 13° 39' 56" E	18° 36' 56" S 13° 40' 06" E	18° 37' 15" S 18° 40' 06" E	18° 37' 15" S 13° 39' 56" E
70757	16.2277	18° 38' 12" S 13° 39' 50" E	18° 38' 11" S 13° 39' 56" E	18° 38' 29" S 13° 40' 03" E	18° 38' 31" S 13° 39' 53" E
70758	11.2467	18° 38' 15" S 13° 40' 01" E	18° 38' 12" S 13° 40' 10" E	18° 38' 26" S 13° 40' 12" E	18° 38' 29" S 13° 40' 03" E
70759	14.9191	18° 38' 12" S 13° 40' 10" E	18° 36' 06" S 13° 40' 19" E	18° 38' 24" S 13° 40' 22" E	18° 38' 26" S 13° 40' 12" E
70992	17.053	18° 37' 15" S 13° 39' 56" E	18° 37' 16" S 13° 40' 16" E	18° 37' 19" S 13° 40' 05" E	18° 37' 25" S 13° 40' 17" E
70993	17.3566	18° 36' 56" S 13° 40' 06" E	18° 36' 56" S 13° 40' 16" E	18° 37' 16" S 13° 40' 16" E	18° 37' 16" S 13° 40' 06" E

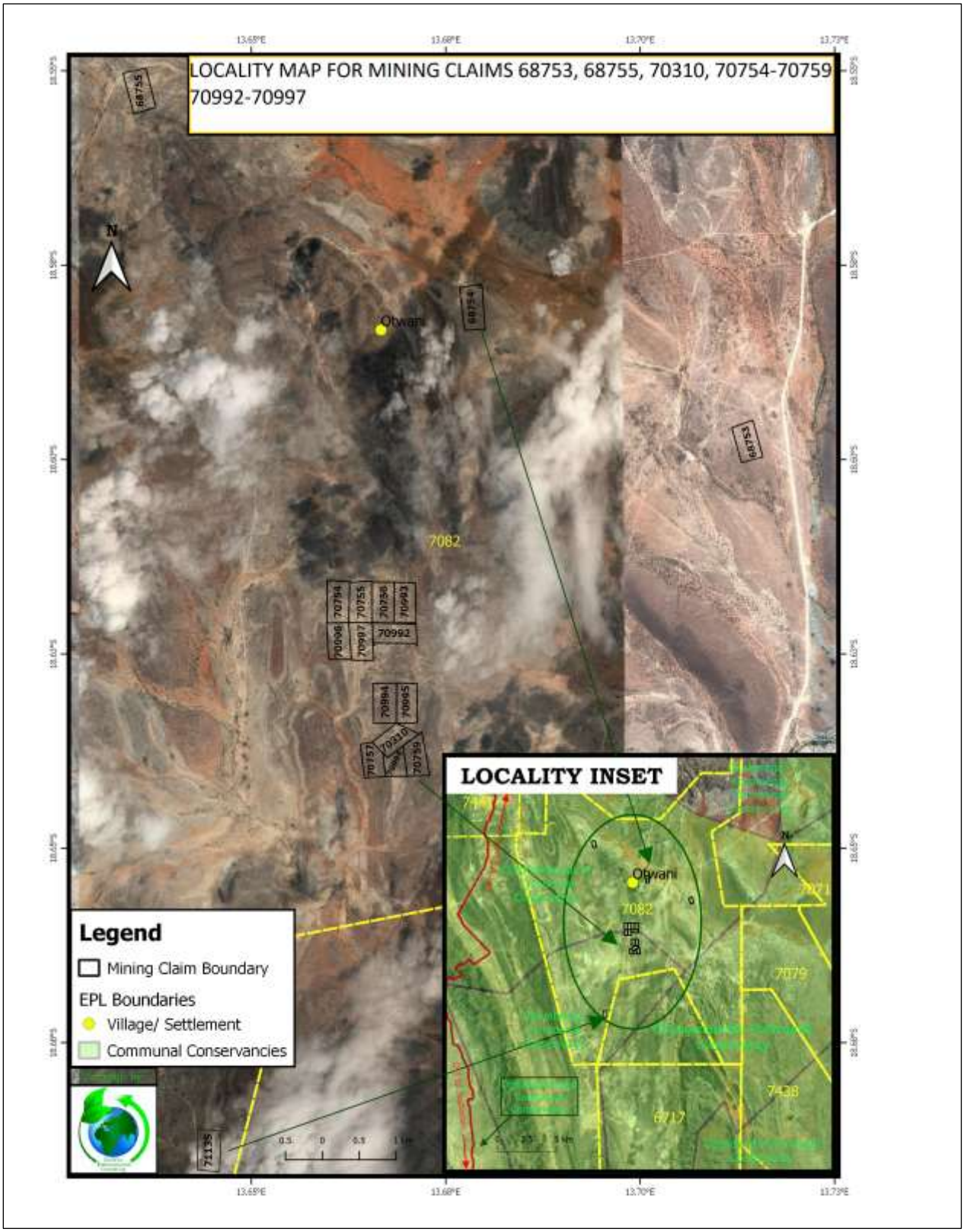


Figure 1: Location Map

2.2 SURROUNDING LAND USES

The mining claims are mainly surrounded by mountains and open areas. Generally, the area can be described as remote, without any electrical and sewage connection. Telecommunication network is also very poor.

2.3 PROJECT ACTIVITIES

Exploration is a stage of investigating or examining about the geological condition of an area. The main aim at this stage is to find high quality ore. It is vital to note that, no construction will take place during the phase of exploration. In addition, existing roads will be used hence reducing the impact of clearing vegetation. Roads in bad conditions will be upgraded and where mining claims are inaccessible, cut lines will be created for accessibility of vehicles. The prospectors will be accommodated at nearby villages. Other employees for manual labor will be sourced from nearby villages hence commuting to work from their homes. The following activities will be conducted during the process of exploration:

Research and reconnaissance- research shall firstly be done whereby survey of existing literature, examination of aerial photographs and satellite imagery alongside acquisition of geophysical data and geological maps of the prospective region will be reviewed. The desktop information is used to generate a geological model on which all the future exploration activities will be based.

Reconnaissance will be done whereby Mr David an employee of Kaoko Mining Namibia Pty Ltd will walk around the mining claims so as to try and identify areas with ore deposits. In a case that Mr David identifies a potential area, Mr Alno (geologist) will further verify. During this stage, prospectors will only look in the rocks thus for useful minerals and other clues to where a deposit may be hidden. The main purpose of carrying a reconnaissance is to reduce the areas of study by identifying select ones for further studies.

Trenching and Drilling –Kaoko Mining Namibia Pty Ltd intends to use limited trenching and drilling. Trenching will be used to expose the ore body near the surface and shovels and picks will only be used. This is a cost-effective method compared to drilling. Drilling will be used to have a better understanding of the subsurface geology. In a case that the ore deposits extend underneath, drilling will be used. Exploratory openings or boreholes will be drilled at closer intervals along the strike and also depth wise, to accurately determine the shape, size, disposition of ore and grade of ore body. Drilling will require water, which will be obtained from nearby villages.

Geochemical sampling and analysis- samples will be collected during trenching and drilling and sent for chemical analysis/testing.

Mapping- a map will be produced showing areas with potential deposits. Such maps will be of great importance during the mining phase.

Required Resources -The list of anticipated equipment to be used during exploration include:

- Drilling rig equipment, including support truck(s);
- 4x4 vehicle(s);
- Compressor and generator(s); and
- Fuel to power the drill rigs.
- Picks and shovels during trenching

2.4 PROJECT COST

The total funding required to set up the project is not yet established.

CHAPTER THREE: ANALYSIS OF ALTERNATIVES

The following chapter will focus on the alternatives to the project. Alternatives to the project are different options, other possibilities or other course of action, which can be adopted. The alternatives to the proposed project are:

Option 1 – Alternative locations

Option 2 – No project alternative

Option 3 – Continue with the project

3.1 ALTERNATIVE LOCATIONS

Option 1, which is alternative locations, implies that a different location to carry out the development must be acquired somewhere else other than the chosen site. Nevertheless, the fact that there are possibilities of copper deposit basing on past researches justify the use of the proposed sites for further studies.

3.2 THE "NO PROJECT" ALTERNATIVE

Option 2, which is "no project alternative", implies that the project must not be undertaken on the proposed land rather the land should remain undisturbed. However, the "no project alternative" will be less favorable from the socio-economic perspective due to the following factors:

- **Local Empowerment-** the shareholders of the company are local people hence the project will help to reduce poverty rate thus improving their social wellbeing.
- **Transfer of skills**- in future (mining phase) the project will probably enable locals to obtain skills and knowledge through trainings.
- **Growth and development**- the project has the potential to benefit the locals mainly in future. If medium to large copper deposit are discovered during exploration phase, plans to start mining will be done which will result in growth and development of the area in terms of human capital and infrastructure.
- **Employment creation**-more jobs will mainly be created in future thus during the mining phase. Currently, two people will be employed permanently and locals will be hired in cases when manual labor is required.
- **Land utilization**- if the project continues, land allocated to the locals to conduct mining activities will be utilized for the benefit of the people.

3.3 OTHER ALTERNATIVES

Initially, it was proposed that limited trenching shall be used and drilling when necessary. However, both methods will be used depending on the condition of the ground and the required depth. Table 3.1 below indicate the proposed methods.

Table 3.1: exploration methods

Method	Pros	Cons
Limited Trenching	- Ideal for understanding surface geology.	-Difficult in areas with limited access
Drilling	-Easier installation in areas with limited access (under buildings, roads, railway tracks, hills, rivers, ponds, heavily-wooded areas) -Ideal when one requires to understand subsurface geology -Less impact on job site and public -Reduced restoration costs due to minimal impact on land -Maintains a cleaner job site -Environmentally-friendly process	-Drilling is also not an option for shallow trenches less than 2 ft. deep.

3.4 ALTERNATIVES ASSESSMENT OUTCOMES

Option 3, which promotes the continuation of the project, has been reckoned as the preferred alternative. Option 3, was viewed as beneficial given the benefits that come with the project.

CHAPTER FOUR: RELEVENT LEGISLATION

An important part of the EIA is identifying and reviewing the policy and legislative situation concerning the proposed activity, to inform the proponent about the requirements to be fulfilled in undertaking the proposed mineral exploration activities.

This section looks at the legislative framework within which the proposed development will operate under. The focus is on the compliance with the legislation during the exploration process. Table 4.1 below shows relevant legislation to the project.

Table 4.1: Relevant legislations related to the project

Aspect	Legislation	Relevant Provisions	Relevance to the Project
The Constitution	Namibian Constitution First Amendment Act 34 of 1998	− According to article 91(c) it provides for duty to guard against ''the degradation and destruction of ecosystems and failure to protect the beauty and character of Namibia'' − Article 95 (l) deals with the ''maintenance of ecosystems, essential ecological processes and biological diversity'' and sustainable use of the country's natural resources.	− During exploration activities, sustainable practices should be performed.
Environmental	Environmental Management Act 7 of 2007	− States that, projects with significant environmental impacts are subject to an environmental assessment process (Section 27). − Requires for adequate public participation during the environmental assessment process for interested and affected parties to voice their opinions on a project (Section 2).	− The EMA should guide the management of this project. − Adverts should be published in two local newspapers twice. − The public and relevant authorities should be consulted during the process of public participation as per the requirement of the act − The EMP which will guide on the management of the environment should be drafted as per the requirement of the act
	EIA Regulations (2012)	− Lists all activities, which cannot be undertaken without an EIA.	− This project is listed under mining and quarrying activities.

			– Activity 3.3 states that resource extraction, manipulation, conservation and related activities require an EIA.
	Convention on Biological Diversity (1992)	- Article 1 lists the conservation of biological diversity amongst the objectives of the convention.	- The proponent should consider the impact of the project on the biodiversity of the area.
	Nature Conservation Ordinance No. 4 of 1975	Chapter 6 provides for legislation regarding the protection of indigenous plants	- Indigenous and protected plants should be protected within the areas of works.
	Environmental Assessment Policy of Namibia (1995)	The Policy seeks to ensure that the environmental consequences of development projects and policies are considered, understood and incorporated into the planning process, and that the term ''environment'' is broadly interpreted to include biophysical, social, economic, cultural, historical and political components.	- The EIA considers this term of ''environment''.
	Minerals (Prospecting and Mining) Act,1992 (Act 33 1 of 1992)	To provide for the reconnaissance, prospecting and mining for, and disposal of, and the exercise of control over, minerals in Namibia; and to provide for matters incidental thereto. ''mineral'' means any substance, whether in solid, liquid or gaseous form, occurring naturally in, on or under any land and having been formed by,	- The intended activity involves exploration of minerals mainly copper ore.

		or subjected to, a geological process, excluding-(c) subject to the provision of subsection (2) , soil, sand, clay, gravel or stone (other than rock material specified in Part 2 of schedule 1) .	
Soil	Soil Conservation Act 6 of 1969	This act covers the prevention and combating of soil erosion; the conservation, improvement and manner of use of the soil and vegetation; and the protection of water sources	- Limited trenching will leave earthed soils hence it should not be left un-rehabilitated.
Water	Water Act 54 of 1956	− Prohibits the pollution of underground and surface water bodies.	− If drilling activities go below the level of the water table, they might be possibilities of pollution. Hence the pollution of water resources should be avoided during the exploration process.
Health and Safety	Labour Act (No 11 of 2007)	− This act emphasizes and regulates basic terms and conditions of employment, it guarantees prospective health, safety and welfare of employees and protects employees from unfair labour practices.	− The proponent will be obliged to create a safe working environment for the employees.
	Public Health and Environmental Act, 2015	− The act mainly emphasis on proper management of the environment, to prevent negative health impacts. − The act promotes proper waste management.	− Proper waste management should be promoted to prevent nuisance, which can consequently affect public health. − Recycling, reuse and reduce must be practised at all times thus if any waste is generated.

	Heritage Act	– The Heritage Act of 2004 makes provision for the developer to identify and assess any archaeological and historical sites of significance. The existence of any such sites should be reported to the Monuments Council as soon as possible. The Council may serve notice that prohibits any activities as prescribed within a specified distance of an identified heritage/archaeology site.	– In an event that the proponent comes across any archaeological or historical sites of significance, they should report immediately to the Monuments Council

N.B: The proponent shall be required to comply with the legislations. Where there is need to engage private consultants to facilitate compliance, the proponent is encouraged to consult qualified and certified personnel. The Environmental consultant is supposed to conduct legal compliance audits and produce bi-annual reports, which will be required during renewal of environmental clearance certificate.

CHAPTER FIVE: DESCRIPTION OF THE AFFECTED ENVIRONMENT

This chapter describes the environmental setting of the project, which includes the biophysical environment and the socio-economic environment. The baseline information will assist in the monitoring of the environmental impacts during the exploration phase.

5.1 BIO-PHYSICAL ENVIRONMENT

5.1.1 Climate

The area under study generally receives little rainfall, average annual rainfall received in the area is around 300-350 mm per annum. Summer months are hot, such that they can reach maximum temperatures of 34°C-36°C. It is essential to not that, drought has affected the area for the past years which has resulted in death of small livestock which the locals rely on. Table 5.1 below briefly describe the general climatic conditions experienced within the area of study, as deduced from the Atlas of Namibia, by Mendelsohn et al 2003.

Table 5.1: General Climate Data

Average Annual rainfall:	Average rainfall in the area is between 300-350mm per year
Variation in rainfall:	Variation in annual rainfall is averaged to be 40-50 % per year
Average evaporation:	Average evaporation in the area is between 2240-2380mm per year.
Precipitation:	January-March receives high rainfall, with January being the wettest. June and July being the driest month
Water Deficit:	Average water deficit in the area is between 1700-1900mm per year.
Temperatures	Annual temperatures are 20-22 °C per year Average maximum temperature 34°C-36°C Hottest month February Average minimum temperatures 6°C-8°C Coldest month July
Wind direction	Wind directions in the area are predominantly from the south.
Humidity	Most humid month is March with 80%-90% and September being the least with 10%-20%

(Source: Atlas of Namibia, 2003)

5.1.2 Topography, Geology & Hydrogeology

The topography of the region is mainly mountainous. The elevation of the region is 868m above sea level.

Hydrology shape files were used to identify water sources located on or near the mining claims. This was done to observe the current conditions in the area and to identify potential hydrologic risks associated with establishment of the proposed project. No major rivers pass through or are near the mining claims except small ephemeral rivers which rarely flow. **See figure 2**, Hydrogeological Map.

Geology of Kunene Region is classified mainly under the Otavi Group (Ls). Mendelsohn (2000) pointed that Kunene Region has the oldest rocks and the Damara supergroup and gariep complex. Mendelsohn (2000) further point that besides diamond, all valuable minerals are found in the western side of the country. The geology of all the mining claims is dolomite, limestone, shale, quatzite (Na). See table 5.2 below, which shows geology of the mining claims and possible types of mineral deposits.

Table 5. 2: Geology for the mining claims

Mining claim	**Geology**	**Commodities**
70996	(Na)	Base and Rare Metals, Precious Metals
70997	(Na)	Base and Rare Metals, Precious Metals
70994	(Na)	Base and Rare Metals, Precious Metals
70995	(Na)	Base and Rare Metals, Precious Metals
68753	(Na)	Base and Rare Metals (applied for), Semi-Precious Stones
68755	(Na)	Base and Rare Metals (applied for), Semi-Precious Stones
70310	(Na)	Base and Rare Metals (applied for), Semi-Precious Stones
70754	(Na)	Semi-Precious Stones
70755	(Na)	Semi-Precious Stones
70756	(Na)	Semi-Precious Stones
70757	(Na)	Semi-Precious Stones
70758	(Na)	Semi-Precious Stones
70759	(Na)	Semi-Precious Stones
70992	(Na)	Base and Rare Metals, Precious Metals
70993	(Na)	Base and Rare Metals, Precious Metals

Lithology: dolomite, limestone, shale, quatzite (Na)

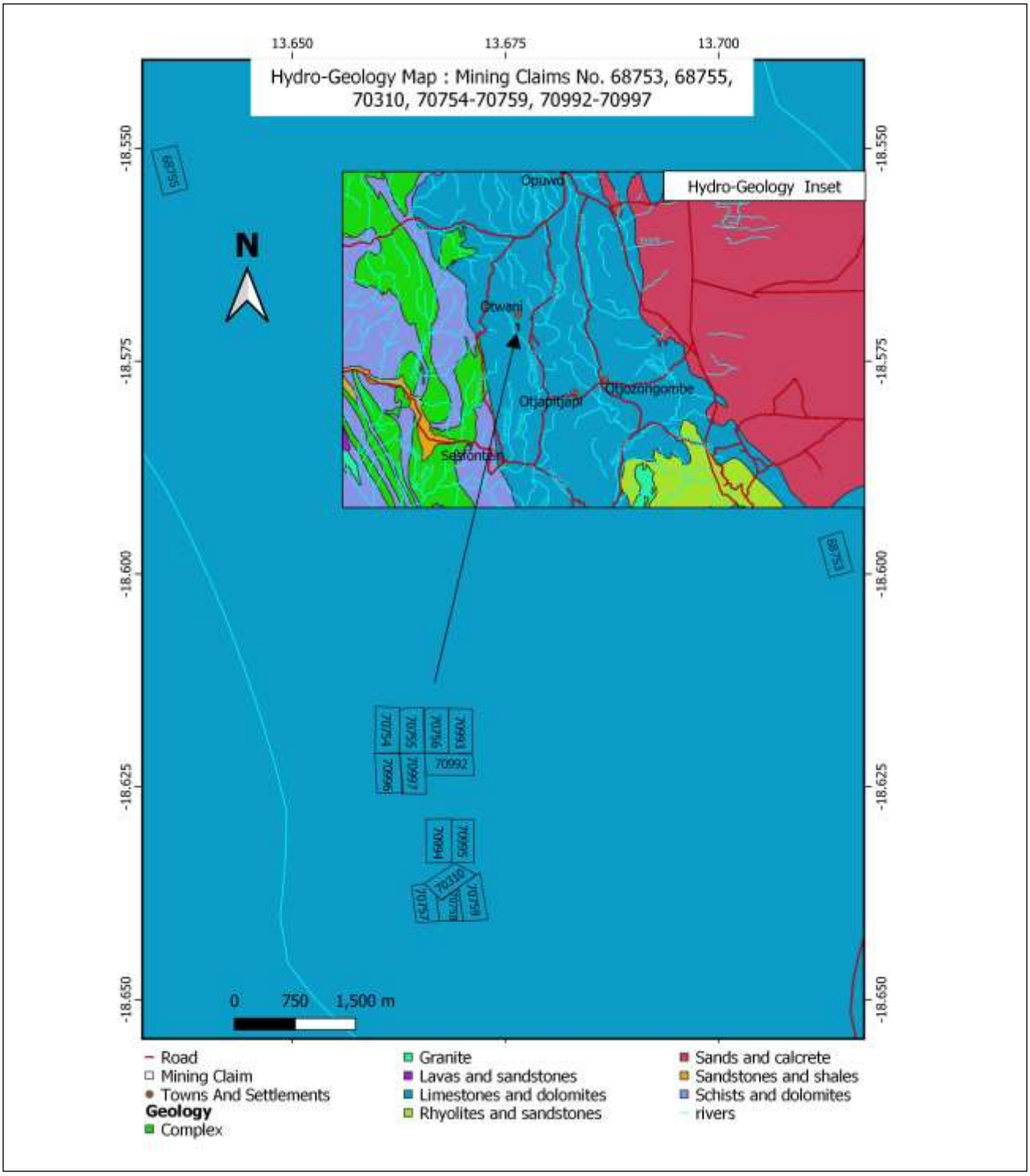


Figure 2: Hydrogeology Map

5.1.3 Soils

The area of study is mainly covered by lithic leptosols soil which are very thin and shallow. Leptosols are coarse-textured soils which are characterized by their limited depth caused by the presence of a continuous hard rock, highly calcareous or cemented layer within 80cm of the surface. Water holding capacity of leptosols is low and vegetation in areas in which they occur is often subject to drought (Mendelsohn 2000). Leptosols can only support low densities of livestock and wildlife.

5.1.4 Vegetation of the study area

Kunene Region is classified under the Acacia Tree and Shrub Savanna. All the mining claims falls under the western highlands' vegetation type, **see figure 3 below,** Vegetation Map. For protected plant species obtained around the mining claims, see table 5.3 below. It is essential to note that, the proponent shall not be allowed to cut down protected plant species. To note, generally the area under study receives low rainfall and due to climate change issues, the amount of rainfall received in the area has decreased over the years hence affecting the density and growth of vegetation as shown on site images below.

Table 5. 3: Protected plant species

Species Name	**Tree Name**	**Mining Claims**	**Occurrence**
Adsonia Digitata	Baobab	68755, 70755, 70757, 70758, 70310, 68753	Common to abundant
			Occasional occurrence
Albizia Anthelmintica	Worm-cure albizia/ Oumaboom		Common to abundant
		70754, 70310, 70755, 70756, 70757, 70758, 70759, 70992,70993, 70994, 70995, 70996, 70997,68753, 68755	Uncommon to rare occurrence
Berchemia Discolour	Bird Plum	70754, 70310, 70755, 70756, 70757, 70758, 70759, 70992, 70993, 70994, 70995, 70996, 70997, 68753, 68755	Uncommon to rare occurrence
Boscia Albitrunca	Shepherd's tree/ Witgat	70310, 70754, 70755, 70756, 70757, 70758, 70759, 70992,70993, 70994, 70995, 70996, 70997, 68753, 68755	Uncommon to rare occurrence
Sclerocarya birrea	Marula	70754, 70755, 70756, 70757, 70758, 70759, 70992, 70993, 70994, 70995, 70996, 70997, 68753, 68755	Uncommon to rare occurrence

Ziziphus mucronata	Buffalo thorn / Wag-'n-bietjie	70310, 70754, 70755, 70756, 70757, 70758, 70759, 70992, 70993, 70994, 70995, 70996, 70997, 68753, 68755	Uncommon to rare occurrence

Site image 1: vegetation around the study area

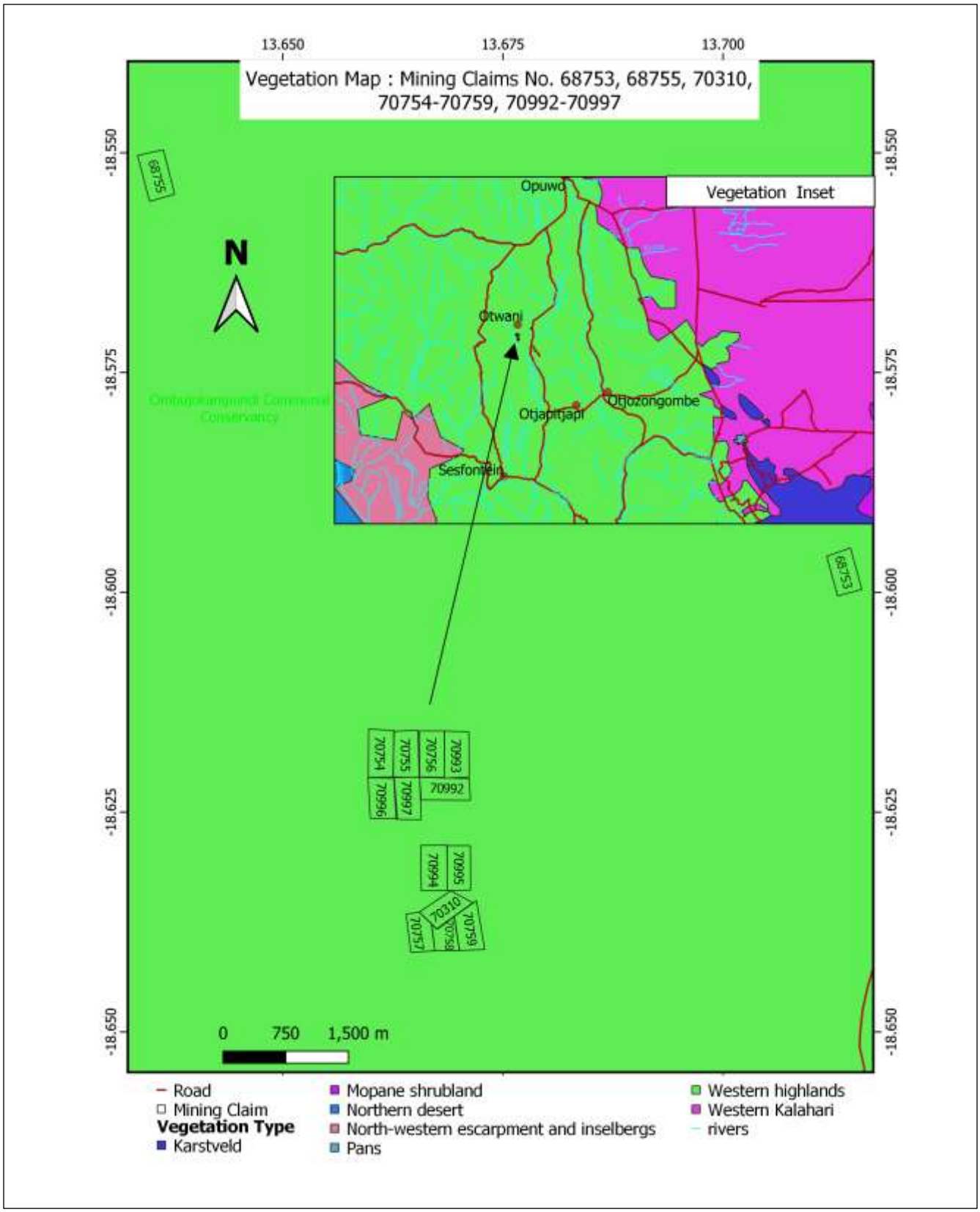


Figure 3: Vegetation Map

5.1.5 Fauna

The area under study generally receives low rainfall which makes it difficult for animals to survive in such areas with little water for drinking. Generally small animals like goats are mainly domesticated which can feed on tree leaves and survive in arid like conditions. The area has been seriously affected by drought in recent years which resulted in death of livestock. However, table 5.4 below indicate the general fauna data for small creatures.

Table 5.4: Summary of General Fauna Data

Type of fauna	**Number of different species/genera**	**Total around Namibia**
Mammal Diversity	61-75 Species	217
Bird Diversity	111- 140 Species	658
Reptile Diversity	51-60 Species	258
Frog Diversity	1-3 Species	50
Termite Diversity	7-9 Genera	19
Scorpion Diversity	12-13 Species	21

Source: Atlas of Namibia (2003)

5.1.6 Archaeology

The project area falls within Kaokoland in Kunene Region, northeast of Namibia. This section will therefore describe how the Proponent will handle any unknown heritage sites that might fall within the Proponent's mining claims. It is also worthwhile to note that currently there are no registered or declared heritage sites that fall within Kaoko Mining Namibia (Pty) Ltd.'s mining claims. In addition, previous archaeological work done around Kaokoland will also be discussed in brief.

According to the Heritage Act (27 of 2004), "heritage" is restricted to places and objects, including those of archaeological, cultural, historical, scientific and social significance. The act also defines "archaeological" as any remains of human habitation or occupation that are more than 50 years old found on or beneath the surface on land or in the sea, and especially notes rock art, being any form of painting, engraving or other representation on affixed rock surface or loose rock or stone which is 50 or more years old. It is essential to understand that the legal protection can extend beyond the archaeological object or site, to include the natural or existing condition or topography of land, as well as the trees, vegetation or topsoil. Kaoko Mining Namibia (Pty) Ltd shall therefore be responsible in persevering any archeological or heritage sites within their project area, in a case that they come across any. The Proponent shall bear in mind that, all archaeological objects are the property of the State and the ownership extends to all archaeological remains, known or unknown. It shall also be the responsibility of the Proponent to inform the exploration personnel and contractors about the legal status of archaeological

remains and the obligation to report the discovery of any new archaeological remains to the National Heritage Council.

Apart from that, during the exploration phase, the exploration personnel should be observant given that they might come across archaeological evidence.

The following should be observed as they might be clues to archaeological evidence; stone artefacts and stone features sites (settlements and graves).

In addition, the exploration team should be aware that archaeological sites commonly occur in these locations; rock outcrops and inselbergs, saddles, drainage lines, pans and dune fields and gravel plains.

a) Brief History of Archaeological work around Kaokoland

Archaeological work has been conducted around the Kaokoland area and significant archaeological evidence has been obtained. The most significant results in the Kaokoland were provided by excavations in a rock shelter, named Oruwanje 95/1 (Frank, in prep). Ovizorombuku 96/1 being another rock shelter was also excavated in 1998 (Vogelsang 1998). The stone artifact accumulation from the basal layers of this site were attributed to date back to an Early Holocene to Late Pleistocene **Age** (around 10,000 **B.P). The** second trench at the site Ovizorombuku 96/1 after excavation produced a sheep bone, coming from one of the final spits. A charcoal sample from this spit was dated about 2500 B.P.

Another site discovered was Omungunda 99/1 which is situated near Opuwo town. With an extension of approximately 23 x 4 m, Omungunda 99/1 is the largest rock-shelter in the region and it was the first site with rock paintings in the Kaokoland (Vogelsang 1998). In addition, around 1999 other sites Hartmann's (N99/3) and Marienfluss valleys (N99/5) located on top of hills, were discovered and they had stone circles, potsherds, glass-beads and an iron arrowhead. According to Vogelsang (1998), a first radiocarbon date from a fireplace inside one of the hut-circles had an age of 230 years hence corresponding with the suspected date of the immigration of the cattle keeping Himba people from Angola. Apart from that, several clusters of stone circles were also discovered at a granite hill close to the border of the Skeleton-Coast Park.

b) Declared Heritage Sites in the vicinity of the proposed development

According to the data sourced from the website of National Heritage Council, there are six declared heritage sites in Kunene Region where Kaoko Mining Namibia (Pty) Ltd mining claims are located. Of the known heritage sites, none overlays the claims for Kaoko Mining Namibia (Pty) Ltd.

c) Unknown Heritage Sites

It is essential to note that, within the mining claims, there might be unknown heritage sites. The Proponent will consult with the headman of the area before conducting any work as their knowledge will be of great importance in identifying some sites of significance such as their holy

grounds and graves. In addition, given that the Proponent comes across unknown heritage sites within the mining claims, the Proponent will follow the following procedures:

Action by person identifying archaeological or heritage material

- If operating machinery or equipment, stop work
- Identify the site with flag tape
- Determine GPS position if possible
- Report findings to foreman

Action by Foreman

- Report findings, site locations and actions taken to superintendent
- Cease any work in immediate vicinity

Action by superintendent

- Visit site and determine whether work can procced without damage to findings
- Determine and mark exclusion boundary
- Record coordinates for the site for confirmation by archaeologist

Action by Archaeologist

- Inspect site and confirm recorded coordinates
- Advise National Heritage Council (NHC) and request written permission to remove findings from work area
- Recover, package and label findings for transfer to National Museum

In the event of discovering human remains:

Action as above

- Field inspection by Archaeologist to confirm that remains are human
- Advise and liaise with NHC and Police
- Recover remains and remove to National Museum or National forensic Laboratory, as directed

d) Management of "no-go areas"

Currently there are no declared or registered heritage sites that overlap or coincide with our proposed project area, hence this section at the moment does not apply to this project.

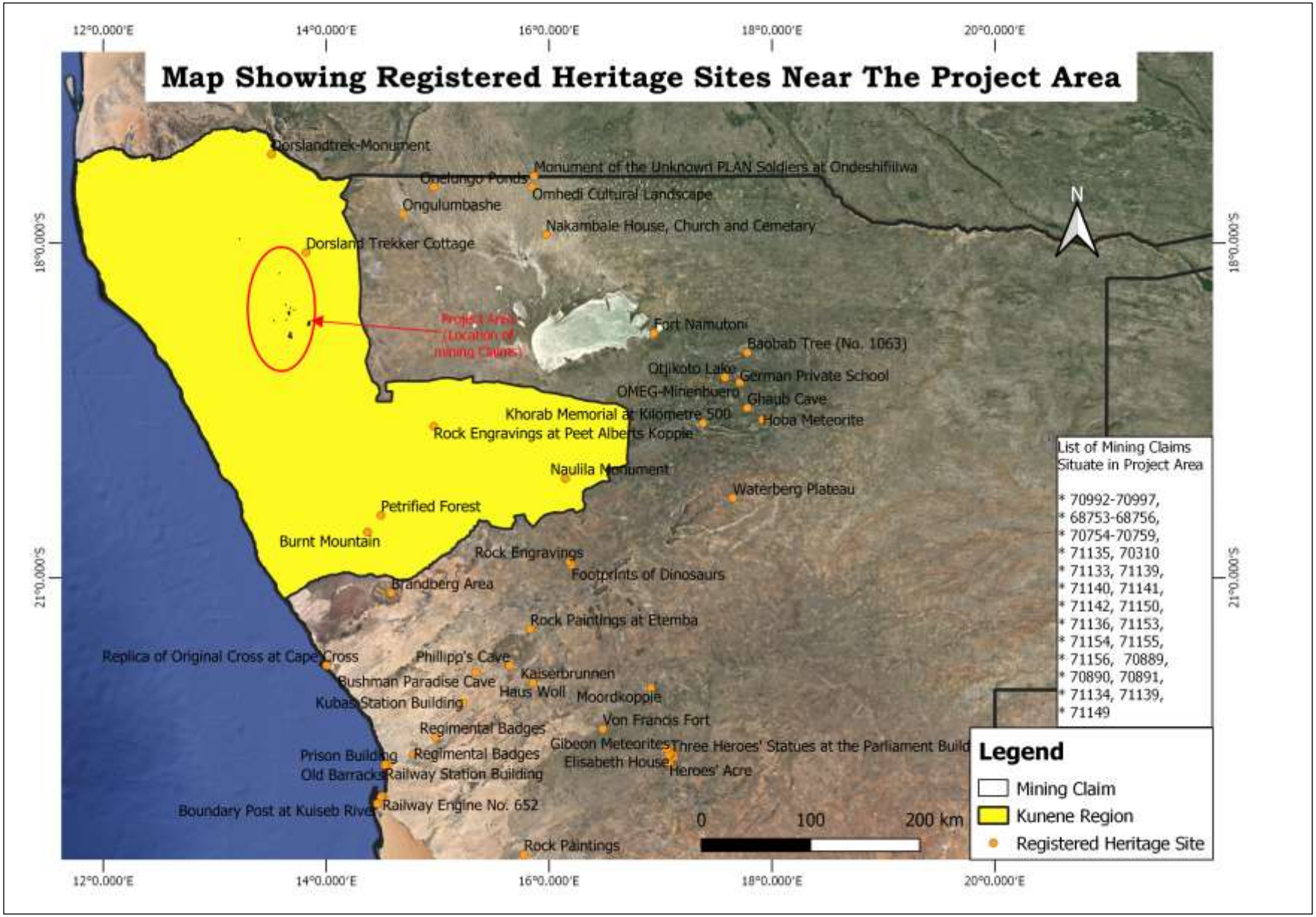


Figure 4: Heritage sites around the study area

5.2 SOCIO-ECONOMIC ENVIRONMENT

Kunene Region is located on the northwest of Namibia and the Skeleton Coast Park forms its entire west coast on the Atlantic Ocean. The following six political constituencies comprises Kunene Region, Opuwo, Sesfontein, Epupa, Khorixas, Kamanjab and Outjo. Outjo is classified under municipality, Khorixas and Opuwo as towns, Kamanjab as a village. Sesfontein, Fransfontein and Okangwati have been proclaimed and targeted for urban development. Opuwo Rural is an electoral constituency in the Kunene Region and its' administrative centre is the settlement of Otwani.

The population of Kunene Region was 86 856 of which 43 253 are female and 43 603 are males (NPC 2011). According to NPC (2011), there was an increase in population from 2001 (68 735) to 2011 (86 856). The population is mainly dominated by young people less than 15 years of age. This implies that there is need to bring more projects so as to create employment for the youths. Apart from that, by region, Kunene Region among the other regions has the lowest percentage of people living with HIV. By region it has 9.7% people living with HIV/AIDS (MHSS 2015).

On the education sector, the region has very few schools with poor educational facilities. According to (EMIS, 2012) there are 41 Primary schools, 12 Combined school and 6 Secondary schools, in total there are 120 schools which is too low as compared to other regions. In addition, of the population aged 6 years and above in Kunene Region, 35.9 % never attended school, 50% left school and 9% are currently at school (NPC 2011). The major problem in the region is shortage of schools such that learners travel long distances to school which might be a factor to high dropouts in the region.

Furthermore, many people in the region rely on wages and salaries. According to NPC (2011), 64 % of the economically active population aged 15 years and above are employed and 36% unemployed in Kunene Region.

The area of study is also surrounded by conservancies such as the Otjambangu and Ombujokanguindi Conservancy. Locals depend on the natural resources offered by the conservancies such as wild animals and plants. The Himba culture is also a source of tourism.

CHAPTER SIX: PUBLIC PARTICIPATION

The public consultation process forms an important component of the Environmental Assessment process. It is defined in the EIA Regulations (2012), as a "*process in which potential interested and affected parties are given an opportunity to comment on, or raise issues relevant to, specific matters*" (S1). Section 21 of the Regulations details steps to be taken during a given public consultation process and these have been used in guiding our process.

The objectives of the public participation were:

- ✓ To inform I&AP about the proposed activity and to give them the opportunity to express their views, concerns or opinions.
- ✓ To reduce conflict through early identification of contentious issues
- ✓ To gather potential negative and positive environmental impacts associated with the proposed project from the stakeholders' perspectives.
- ✓ To engage stakeholders for the effective mitigation of negative impacts and enhancement of positive impacts arising from the proposed project respectively.

The following principles governed the public consultation

Inclusivity - The public participation was open for everyone; invitation to make comments and attend the meetings was announced in the local newspapers, The Namibian and New Era. To ensure that all stakeholders were involved, the consultant compiled a list. Both locals, traditional authorities and Kunene Regional Council were conducted; **see Appendix A, letters sent to stakeholders.** The list included the following:

- Kunene Regional Council
- Traditional Authorities
- Locals

Transparency - The consultant took time to explain the background of the project and both positive and negative impacts associated with the project. All people who registered as Interested and Affected Parties were also given a BID and full document of the EIA was available upon request.

Relevancy- The consultant remained focused on subjects related to the project. Interested and Affected Parties were suppose to make comments relating to socio-economic and environmental impacts associated with the project. Political and other non-related comments were considered not relevant.

6.1 NOTIFICATION OF INTERESTED AND AFFECTED PARTIES

The consultation was facilitated through the following means:

6.1.1 Background Information Document (BID)

The consultant prepared a BID, which was circulated to Interested and Affected Parties. A BID is a short document, which briefly gives the background of the project. The main aim of distributing

the BID to Interested and Affected Parties is to bring awareness and clarity about the proposed project. **A copy of the BID is provided in Appendix A.**

6.1.2 Advertisement

Adverts were placed in two local newspapers namely, The Namibian and New Era as shown in table 6.1 below.

Table 6.1: Details of public notification for the EIA study

Newspaper	Area of Distribution	Language	Date Placed
The Namibian	Country Wide	English	28 October2019
The Namibian	Country Wide	English	4 November 2019
New Era	Country Wide	English	28 October 2019
New Era	Country Wide	English	4 November 2019
Site notices	Kunene Regional Council, Otwani Clinic	English	1 November 2019

(See Appendix A)

6.1.3 Public Meeting

The public meetings were announced in The Namibian and New Era. The meetings were held on 2 November 2019 at Otwani Rural District Council (Otwani), Sesfontein Conservancy (Sesfontein) and Otjapitjapi village as shown on site images below. For more information on issues raised during the meetings, **see Appendix A, Meeting Minutes**

Site image 2: Stakeholder meeting at Otwani Rural District Council

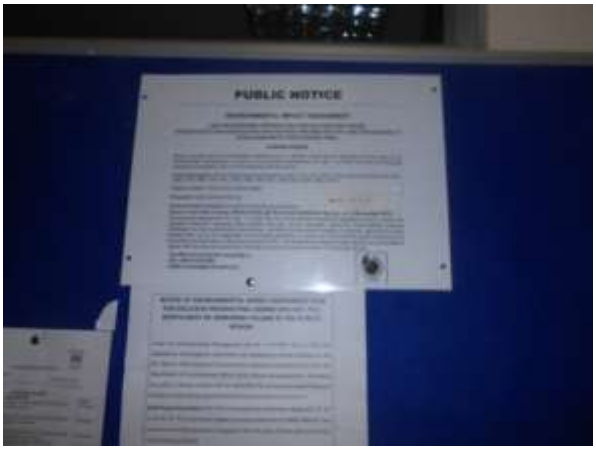
Site image 3: Stakeholder meeting at Sesfontein Conservancy




Site image 4: Stakeholder meeting at Otjapitjapi village

6.1.4 Public Notices

Notices with project information were placed at Kunene Regional Council, Otwani Clinic and around the villages as shown in site images below.

Site image 5: Public notices at Kunene Regional Council & Otwani Clinic respectively

6.1.5 Questionnaires

Questionnaires were also distributed amongst the participants so as to gather more information on their views towards the project. Distribution of questionnaires was also done to allow stakeholders to air their views privately. The questionnaires were open –ended whereby the respondent was free to express their views and ideas. **The questionnaires are attached in Appendix A.**

6.2 SUMMARY AND DISCUSSION OF STAKEHOLDERS CONSULTATION.

The following issues were mainly raised during the public consultation:

- ✓ Employment
- ✓ Communication and good relation between the proponent and the community
- ✓ Development
- ✓ Encroachment of boundaries
- ✓ Membership to the company/ how to join the company

(**See Appendix A** – meeting minutes and signed questionnaire sheets)

6.2.1 Response to stakeholder concerns

During the public participation process, all people viewed the project as beneficial to the community. For more issues raised during the public participation process, **see Appendix A, Meeting Minutes for both the three meetings**. In summary, the following major issues were brought forward:

a) Employment

Many participants recommended that locals be employed by the proponent. However, it is essential to note that during the exploration phase two people (geologist and assistant) will be employed permanently by Kaoko Mining Namibia Pty Ltd. During this phase, personnel with experience mainly in geology will be required hence the need to employ experienced staff. Locals will only be employed when there is need for manual labor. Employment will be mainly created in future thus during mining phase.

b) Relations with the community and communication

Mr. Elago Hamnjela (Administrative officer at Kunene Regional Council) also pointed out that, the company should remain friendly to the community and communication should always be maintained. Concerning this issue, the proponent promised to keep good relations with the community. The proponent also highlighted that if they get permission to start exploration activities, they will always notify the headman before working in their area. The proponent also noted that communication with the headman will always be vital given that they will always want to know if there are any holy grounds in the area before any works.

c) Joining the company

Participants in Otjapitjapi village were mainly concerned about joining the company and registering their EPLs and mining claims. In response, the proponent indicated that for now its too late as the EIA is already underway.

d) Community development

Traditional authorities were mainly concerned about community development. Chief Kaenda Herunga of Otjikukutu emphasized that, the proponent should develop schools, roads, waterpoints and kindergartens. Given that the proponent decides to conduct mining activities in future, social responsibilities should be fulfilled.

e) Encroachment of boundaries

Another issue which was raised during the public meeting was encroaching boundaries. It is essential to note that the proponent shall not be allowed to encroach on other mining claims which are not part of their sites. The proponent shall use maps and GPS to see the boundaries of their mining claims.

f) Project description

Mr. Wassenaar emailed requesting the kml file and it was sent to him. He further required clarification on the exploration activities to be done. See Appendix A, response. It is essential to note that, it was decided that both methods which are limited trenching and drilling will be used. Trenching will only be used to understand the surface geology and drilling will be used to understand the subsurface geology. Limited trenching will only be done after the geologist confirms that there is potential ore deposits basing on reconnaissance of the rocks. This implies that no unnecessary trenching shall be done.

6.2.2 Stakeholders' Recommendations

Conducted traditional authorities recommended the project to go ahead but the proponent was tasked to employ locals and bring development to the community.

CHAPTER SEVEN: ASSESSMENTOF ENVIRONMENTAL IMPACTS

Potential impacts both negative and positive will be identified in this section. Mitigation measures will also be proposed so that the proponent may carry out the process in an environmentally manner. The following methodology was used to assess impacts and alternatives:

- ✓ Public participation
- ✓ Site visit
- ✓ Professional experience

7.1 IDENTIFICATION OF POTENTIAL IMPACTS OF THE PROJECT

Positive Impacts

- Local empowerment
- Employment creation.
- Community development
- Land utilization for the benefit of people

Negative impacts

- **Air Environment**
- Dust
- Noise
- **Land Environment**
- Impact on landscape
- Vegetation loss
- Generation of waste
- Impact on fauna
- Impact on soil

Water Environment

- Impact on surface and groundwater sources
- **Socio -Economics**
- HIV/AIDS
- Occupational Health and Safety risks.
- Heritage impact
- Population influx
- **Indirect Impacts**
- Cumulative impacts

7.2 IMPACT ANALYSIS

In this section, the impacts of the proposed project on human and biophysical environment are evaluated and analyzed. Following the identification of the various potential environmental impacts, the impact analysis framework looked at the impacts under the following categories;

Table 7.1 : Ranking Matrix

	Temporal scale		Score
EFFECT	Short term	Less than 5 years	1
	Medium term	Between 5 and 20 years	2
	Long term	Between 20 and 40 years (a generation) and from a human perspective almost permanent.	3
	Permanent	Over 40 years and resulting in a permanent and lasting change that will always be there.	4
	Spatial Scale		
	Study area	The proposed site /within immediate area of the activity	1
	Beyond project boundary	Surrounding area outside the project boundary	2
	Regional	District and Provincial level	3
	National	Country	4
	International	Internationally	5

	Severity		**Benefit**	
	Slight/Slightly Beneficial	Slight impacts on the affected system(s) or party(ies)	Slightly beneficial to the affected systems(s) or party(ies)	1
	Moderate/Moderately Beneficial	Moderate impacts on the affected system(s) or party(ies)	An impact of real benefit to the affected system(s) or party (ies)	2
	Severe/Beneficial	Severe impacts on the affected system(s) or party(ies)	A substantial benefit to the affected system(s) or party(ies)	4
	Very Severe/Very Beneficial	Very severe change to the affected system(s) or party(ies)	A very substantial benefit to the affected system(s) or party(ies)	8
	Likelihood			
LIKELIHOOD	Unlikely	The likelihood of these impacts occurring is slight		1
	May occur	The likelihood of these impacts occurring is possible		2
	Probable	The likelihood of these impacts occurring is probable		3
	Definite	The likelihood is that this impact will definitely occur		4

Table 7.2: Ranking matrix for Environmental Significance

Environmental Significance		**Positive**	**Negative**
LOW	An acceptable impact for which mitigation is desirable but not essential. The impact by itself is insufficient even in combination with other low impacts to prevent development.	4-7	4-7
MODERATE	An important impact, which requires mitigation. The impact is insufficient by itself to prevent the implementation of the project but which, in conjunction with other impacts may prevent its implementation.	8-11	8-11
HIGH	A serious impact, which, if not mitigated, may prevent the implementation of the project. These impacts would be considered by society as constituting a major and usually long-term change to the natural and/or social environment and result in severe negative or beneficial effects.	12-15	12-15

VERY HIGH	A very serious impact, which may be sufficient by itself to prevent the implementation of the project. The impact may result in permanent change. Very often, these impacts are unmitigable and usually result in very severe effects or very beneficial effects.	16-20	16-20

Table 7.3: Matrix to show environmental significance

	3	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	16
1	4	5	6	7	8	9	10	11	12	13	14	15	16	17
2	5	6	7	8	9	10	11	12	13	14	15	16	17	18
3	6	7	8	9	10	11	12	13	14	15	16	17	18	19
4	7	8	9	10	11	12	13	14	15	16	17	18	19	20

7.3 IMPACT EVALUATION

7.3.1 Negative impacts associated with exploration phase:

1. **Impact on fauna**

Identified Impact	Effect						Risk or Likelihood	Score	Overall Significance
	Temporal Scale	Score	Spatial Scale	Score	Severity of impact	Score			
Impact on fauna Unmitigated	Short term	1	Study area	1	Moderate impact	2	Definite	4	8
Mitigated	Short term	1	Study area	1	Slight impact	1	May occur	2	5

Fauna might be affected by the following activities, drilling, limited trenching, creating of cut lines and movement of vehicles and prospectors. Noise generated from these activities might scare away animals. These activities can lead to habitat loss for a diversity of fauna ranging from microorganisms to large animals. However, the impact is expected to be of low environmental significance if mitigation measures are implemented. If the proponent abides to the plan, that no new roads will be created and no massive vegetation clearing shall be done, the impact will be manageable.

Mitigations and recommendation

• Working hours should be limited to during the day, thus enabling the wildlife to roam freely at night.

2. Vegetation loss

Identified Impact	Effect						Risk or Likelihood	Score	Overall Significance
	Temporal Scale	Score	Spatial Scale	Score	Severity of impact	Score			
Vegetation Loss Unmitigated	Medium term	2	Study area	1	Slight impact	1	May occur	2	6
Mitigated	Medium term	2	Study area	1	Slight impact	1	Unlikely	1	5

It is essential to note that the areas do not have dense vegetation and they are devoid of grass. The areas are rocky and most of the places have poor soils which cannot sustain growth of dense vegetation. However, flora might be affected during the following activities, drilling, limited trenching and creation of cut lines for accessibility of vehicles. Protected plant species are most severely affected since the slightest disruption in their habitat can result in extinction. The proponent should therefore identify these protected species and cooperate them in the project. Massive vegetation clearing shall not be allowed.

Mitigations and recommendation

- Protected plant species should not be removed but preserved and the activities should fit into the environment without affecting the protected trees.
- Massive clearing shall not be allowed

3. Impact on landscape

Identified Impact	Effect						Risk or Likelihood	Score	Overall Significance
	Temporal Scale	Score	Spatial Scale	Score	Severity of impact	Score			
Impact on landscape Unmitigated	Short term	1	Study area	1	Moderate impact	2	Definite	4	8
Mitigated	Short term	1	Study area	1	Slight impact	1	May occur	2	5

Exploration activities ie drilling and limited trenching will leave scars on the landscape. Disturbance on the land can consequently affect animals in the area in terms of their habitancy and also the general aesthetic value of the land. Less harm is generally expected during the exploration phase given that trenching shall be limited and done at a small scale with the use of shovels and picks. If mitigation measures are implemented, the impact will reduce from medium to low environmental significance.

Mitigations and recommendation

- Limited trenching should be done to understand the surface geology but when need arise to understand the subsurface geology, drilling should be used.
- Removed rocks and soil should be replaced back and levelling of the area done so as to try to restore the area to its natural state

4. Dust

Identified Impact	Effect						Risk or Likelihood	Score	Overall Significance
	Temporal Scale	Score	Spatial Scale	Score	Severity of impact	Score			
Dust Unmitigated	Short term	1	Study area	1	Slight impact	1	Probable	3	6
Mitigated	Short term	1	Study area	1	Slight impact	1	May occur	2	5

Exploration activities which might generate dust are expected to be the following, movement of vehicles given that the roads are dust roads, drilling and limited trenching. The severity of the impact is expected to be slight such that it will not affect by-passers. Employees working in the area are the ones who might be at risk hence they are expected to cover themselves with dust masks to avoid contracting diseases like pneumoconiosis.

Mitigations and recommendation

- Soil watering when soil works are being executed and where dust is emitted
- People at site should be provided with respirators
- Regular monitoring and review to ensure safe operation

5. Noise impact

Identified Impact	Effect						Risk or Likelihood	Score	Overall Significance
	Temporal Scale	Score	Spatial Scale	Score	Severity of impact	Score			
Noise Unmitigated	Short term	1	Study area	1	Slight impact	1	May occur	2	5
Mitigated	Short term	1	Study area	1	Slight impact	1	Unlikely	1	4

During exploration, noise above the ambient levels of the area might be generated locally from exploration activities such as drilling and frequenting vehicles. Noise generated is not expected to affect outside the boundaries of the mining claims. Noise generated might affect employees working at the site hence posing a risk of ear damage. The normal levels of 55 decibels recommended by World Health Organization (WHO) might be surpassed during the exploration phase. Drilling machines can produce noise of about 95-100 decibels. However, the impact of noise will remain of low environmental significance if mitigation measures are implemented.

Mitigations and recommendation

- A drilling interval should be established, used and adhered to and working hours should be limited to minimum of 8 hours per day

• Noise should be addressed and mitigated at an early stage.
• Proper and timely maintenance of machineries and vehicles
• Employees should be equipped with ear protection equipment.

6. Impact on soil

Identified Impact	Effect						Risk or Likelihood	Score	Overall Significance
	Temporal Scale	Score	Spatial Scale	Score	Severity of impact	Score			
Soil Unmitigated	Short term	1	Study area	1	Moderate impacts	2	Definite	4	8
Mitigated	Short term	1	Study area	1	Slight impacts	1	Definite	4	7

Drilling and limited trenching will definitely disturb the soil on the sites. Soil might also be partly affected by oil or fuel leakages from vehicular and drilling machines. The impact is expected to affect only the study area and it will be definite that soil will be disturbed. The significance can be reduced from medium to low if mitigation measures are implemented.

Mitigations and recommendation

- After completion of exploration activities such as trenching, removed soil layers must be replaced and levelling must be done so that the original condition is restored.

• Proper care should be taken so that there is no spill that would cause soil contamination

• If any hazardous waste is produced it should be properly handled and sent for disposal to appropriate disposal areas

• Fuels shall not be kept/stored at the site

7. Impact on surface and groundwater sources

Identified Impact	Effect						Risk or Likelihood	Score	Overall Significance
	Temporal Scale	Score	Spatial Scale	Score	Severity of impact	Score			
Surface & groundwater Unmitigated	Short term	1	Study area	1	Slight impact	1	May occur	2	5
Mitigated	Short term	1	Study area	1	Slight impact	1	Unlikely	1	4

There will be no storage of oils and fuel on site, however there is risk of spillage of hydrocarbons from vehicles and drilling machine which may result in groundwater contamination. It is essential to note that, no rivers pass through or near the mining claims hence reducing the risk of surface water contamination.

Mitigations and recommendation

- Implement a maintenance programme to ensure all vehicles, machinery and equipment remain in proper working condition and maintenance should be conducted in designated areas only, preferably off-site.
- Waste oils and fuels from drip trays on stationery vehicles and machinery should be disposed of as hazardous waste at a licensed facility by a specialist hazardous waste handler.

8. Waste generation

Identified Impact	Effect						Risk or Likelihood	Score	Overall Significance
	Temporal Scale	Score	Spatial Scale	Score	Severity of impact	Score			
Waste generation Unmitigated	Short term	1	Study area	1	Moderate impact	2	Definite	4	8
Mitigated	Short term	1	Study area	1	Slight impact	1	Unlikely	1	4

Exploration activities such as trenching will definitely produce waste in the form of unearthed rocks and soils. Moreover, there will be possibilities of waste to be generated in the form of oils, fuel, food leftovers, papers and plastics. It is definite that waste will be generated from unearthed rocks and soil but if mitigation measures are implemented such as making sure that after completion of exploration activities such as trenching, removed soil layers are replaced and levelling are done so that the original condition is restored, the impact will be of low environmental significance.

Mitigations and recommendation

- Contaminated wastes in the form of soil, litter and other material must be disposed off at an appropriate disposal site.
- Strictly, no burning of waste on the site or at the disposal site is allowed as it possess environmental and public health impacts
- After completion of exploration activities such as trenching, removed soil layers and rocks must be replaced and levelling must be done so that the original condition is restored

7.3.2 Negative socio-economic impacts associated with exploration phase:

1. . Occupational Health and Safety Risks

Identified Impact	**Effect**						**Risk or Likelihood**	**Score**	**Overall Significance**
	Temporal Scale	**Score**	**Spatial Scale**	**Score**	**Severity of impact**	**Score**			
O.H.S Unmitigated	Short term	1	Study area	1	Moderate impacts	2	May occur	2	6
Mitigated	Short term	1	Study area	1	Slight impact	1	Unlikely	1	4

Noise, dust and occupational stress are hazards, which are likely to be encountered during the exploration phase. Dust emitted during trenching and drilling can cause pneumoconiosis to employees thus if they are exposed to it for prolonged periods. Moreover, work

pressure on employees can cause stress hence resulting into accidents. The proponent is therefore expected to, provide employees with appropriate personal protective clothing and allow employees to work on designated time according to the Labor Act.

Mitigations and recommendation

- Conduct Hazard identification and risk assessments
- Comply with all Health and Safety standards specified in the Labor Act.
- Provide all staff on site with protective equipment (helmets, gloves, respirators, work suits, earplugs, goggles and safety shoes where applicable).
- Use of dust suppression measures
- Reduce noise exposure by isolating noisy equipment and rotate tasks
- Provision of the following, First Aid at the site, safety posters at conspicuous places and immediate accident/incident investigation reporting

2. Population Influx

Identified Impact	Effect						Risk or Likelihood	Score	Overall Significance
	Temporal Scale	Score	Spatial Scale	Score	Severity of impact	Score			
Population Influx Unmitigated	Short term	1	Beyond project boundary	2	Slight impact	1	Unlikely	1	5
Mitigated	Short term	1	Beyond project boundary	2	Slight impact	1	Unlikely	1	5

The proponent is expecting to hire a few people given that this stage of the project is not labor intensive as compared to mining. The proponent will hire two permanent employees (geologist and assistant to the geologist), contractors for drilling and locals for manual labor when the need arises. Therefore, the impact of population influx is expected to remain of low environmental significance.

Mitigations and recommendation

- Local employment should be a priority so as to reduce the number of outsiders entering Opuwo area

3. Heritage impact

Identified Impact	Effect						Risk or Likelihood	Score	Overall Significance
	Temporal Scale	Score	Spatial Scale	Score	Severity of impact	Score			
Heritage impact Unmitigated	Short term	1	Study area	1	Slight impact	1	May occur	2	5
Mitigated	Short term	1	Study area	1	Slight impact	1	Unlikely	1	4

The proposed exploration activities are not proposed to take place in an area that has significant archaeological or heritage resources. However, the proponent is required to consult with the headman of the area before any work is done so that if there are any areas which are holy or with graves, the proponent would be aware. In addition, if the proponent come across archaeological features or objects that possess cultural values (e.g. Pottery, bones, shells, ancient clothing or weapons, ancient cutlery, graves etc.), the area should be barricaded off and the relevant authorities should be contacted immediately.

Mitigations and recommendation

- The Proponent should consult the headman of the area before conducting any work.
- All works are to be immediately ceased should an archaeological or heritage resource be discovered.
- The National Heritage Council of Namibia (NHCN) should advise with regards to the removal, packaging and transfer of the potential resource.

4. Risk and spread of HIV/AIDS

Identified Impact	Effect						Risk or Likelihood	Score	Overall Significance
	Temporal Scale	Score	Spatial Scale	Score	Severity of impact	Score			
HIV/AIDS Unmitigated	Short term	1	Regional	3	Severe impact	4	May occur	2	10
Mitigated	Short term	1	Beyond project boundary	2	Slight impact	1	Unlikely	1	5

Even though a few employees will come to work in the area, but the virus can still spread. Anti-social behaviours like prostitution might be practised hence the probability of spreading HIV/AIDS. If mitigation measures are implemented, it will be unlikely that the virus will spread and the impact will be of low significance.

Mitigations and recommendation

- Employer should allocate time for employees to visit their families.
- Free distribution of condoms

5. Cumulative Impacts

Identified Impact	Effect						Risk or Likelihood	Score	Overall Significance
	Temporal Scale	Score	Spatial Scale	Score	Severity of impact	Score			
Cumulative impacts Unmitigated	Short term	1	Study area	1	Slight impact	1	Probably	3	6
Mitigated	Short term	1	Study area	1	Slight impact	1	May occur	2	5

Alternation of existing landscape caused by limited trenching and drilling might result is loss of habitancy for some animals which can further affect the food web.

Mitigations and recommendation

- Limited trenching should be done to understand the surface geology but when need arise to understand the subsurface geology, drilling should be used.
- Removed rocks and soil should be replaced back and levelling of the area done so as to try to restore the area to its natural state

7.3.3 Positive impacts associated with the project

1. **Employment creation**

Identified Impact	Effect						Risk or Likelihood	Score	Overall Significance
	Temporal Scale	Score	Spatial Scale	Score	Severity of impact	Score			
Employment creation Unmitigated	Short term	1	National	4	Very beneficial	8	Definite	4	17
Mitigated	Short term	1	National	4	Very beneficial	8	Definite	4	17

Employment will be created during the exploration phase. Job type will range from skilled, semi-skilled and unskilled. Geologist and the assistant will be considered as the permanent employees of the company. Contractors for drilling and locals for manual labour will work on a contract basis.

2. Local Empowerment

Identified Impact	Effect						Risk or Likelihood	Score	Overall Significance
	Temporal Scale	Score	Spatial Scale	Score	Severity of impact	Score			
Local Empowerment Unmitigated	Permanent	4	Regional	3	Very beneficial	8	Definite	4	19
Mitigated	Permanent	4	Regional	3	Very beneficial	8	Definite	4	19

It is definite that the project will promote local empowerment. The shareholders of Kaoko Mining Namibia Pty Ltd are all Namibian citizens who managed to group their licenses together in a bid to explore for the possible discovery of a medium to large minable copper deposit.

3. Land utilization for the benefit of people

Identified Impact	Effect						Risk or Likelihood	Score	Overall Significance
	Temporal Scale	Score	Spatial Scale	Score	Severity of impact	Score			
Land utilization for the benefit of people Unmitigated	Permanent	4	Regional	3	Very beneficial	8	Definite	4	19
Mitigated	Permanent	4	Regional	3	Very beneficial	8	Definite	4	19

The mining claims were granted to the locals but most of the shareholders did not have funds to start exploration activities. Therefore, the formation of the company helped most of the shareholders. Given that exploration activities are done and minable deposits are obtained, this can result in utilisation of the land hence benefiting the people.

4. Generation of Revenue

Identified Impact	Effect						Risk or Likelihood	Score	Overall Significance
	Temporal Scale	Score	Spatial Scale	Score	Severity of impact	Score			
Revenue Unmitigated	Permanent	4	National	4	Very beneficial	8	Definite	4	20
Mitigated	Permanent	4	National	4	Very beneficial	8	Definite	4	20

Revenue will be generated through taxes. Kaoko Mining Namibia Pty Ltd and contractors will pay tax hence generating revenue.

7.3.4 Post-Exploration Phase

Negative impacts related to post-exploration phase include impact on landscape/visual impact and loss of employment. However, the stage of exploration is expected to have minimum damage to the environment as compared to mining. However, pits created during limited trenching need to be rehabilitated. The following shall be done as a way to restore the environment:

- ✓ Rehabilitation of the site to acceptable standards should be commenced once exploration works cease.
- ✓ All pits shall be backfilled or contoured to a stable angle of repose.
- ✓ Stockpile disturbed bedrock on site in a safe and stable manner.
- ✓ Landowners shall be consulted to indicate acceptance of the rehabilitation.

Pertaining the impact of loss of employment, the proponent will have to implement the following measures:

- ✓ The Proponent should inform the employees on time, on the intentions to cease the exploration works and the expected date of such closure. This will provide the employees with enough time to search for work elsewhere.
- ✓ The Proponent should raise awareness of the possibilities for work in related industrial sectors.

7.4 SUMMARY & ANALYSIS OF IMPACTS

In conclusion, it is found that, the identified potential negative impacts will be of low environmental significant if mitigation measures are implemented. The following impacts will fall under moderate environmental impacts if no mitigation measures are put in place; impact on landscape, fauna, soil, waste and HIV/AIDS. In order to reduce the significance from medium to low, it is recommended that the Proponent effectively implement mitigation measures. Furthermore, in order to maintain low significance, the implementation of measures will need to be continuously monitored.

CHAPTER EIGHT: ENVIRONMENT MANAGEMENT AND MONITORING PLAN

Environmental planning and management as a concept seek to improve and protect environmental quality for both the project site and the neighborhood through segregation of activities that are environmentally incompatible. EMP is a vital output for an Environmental Impact Assessment as it provides a checklist for project monitoring and evaluation.

Environmental Management Plan (EMP) for the proposed project is aimed at providing a logical framework within which identified negative environmental impacts can be mitigated and monitored. **See Appendix C**, for the EMP.

CHAPTER NINE: CONCLUSIONS AND RECOMMENDATIONS

9.1 CONCLUSION

Environmental Impact Assessments on exploration activities have been done in the past but knowledge gap remains on this project given that no EIA has been done earlier before. It was therefore, important to have a profound research and a critical analysis on the Environmental Impact Assessment for exploration activities in relation to the proposed area of development.

Basing on the analysis done, if proposed mitigation measures are implemented, the project will not pose any serious negative environmental impacts. Should the proponent implement all the suggested mitigation measures and abide to the legislations, the consultant recommends the issuance of the Environmental Clearance Certificate.

9.2 RECOMMENDATIONS

The following recommendations have been brought forward:

- Unnecessary clearing of vegetation shall not be allowed unless when the need arise to create cut lines for accessibility of vehicles.
- After exploration activities, the proponent should rehabilitate the area by backfilling the pits or contour to a stable angle of repose
- Environmental audits by an independent environmental consultancy must be carried out during the exploration phase to monitor environmental compliance. The monitoring and audit reports should accompany the application for renewal of the environmental clearance certificate after 3 years.

REFERENCES

Constitution of the Republic of Namibia (1990)

Environmental Management Act (2007)

Environmental Management Regulations (2012)

Education Statistics. (2012). Education Management Information System. Namibia: Ministry of Education.

Ministry of Health and Social Services. (2015). The Namibia Aids Response Progress Report 2015, Namibia: MHSS.

Mining Minnesota. (2014). *Exploration drilling best management practices.* Duluth: Mining Minnesota.

Mendelsohn. J,Jarvis. A, Roberts.C, Robertson. T (2003). Atlas of Namibia. Cape town South Africa: David Philip publishers,

Miller, R. McG. (2008). The Geology of Namibia, Volume 2, Neoproterozoic to lower Paleozoic, Windhoek: Ministry of Mines and Energy, Geological Survey

Mendelsohn J., Jarvis A., Roberts C. and Roberts T. (2002). Atlas of Namibia: A portrait of the land and its people. Singapore: Tien Wah Press.

NSW Mining. (2013). Exploration Methods Explained: Fact Sheet. Castle Hill: Anchor Resources

Steinneman, (2000) Environmental Impact Assessment, a Guide for Reviewer