

**ENVIRONMENTAL IMPACT ASSESSMENT (EIA) FOR THE
PROPOSED MINING ACTIVITIES ON MINING CLAIMS (72915,
72916, 72917, 72918, 72919, 72920) IN THE OTJOZONDU AREA,
OTJOZONDJUPA REGION**

ENVIRONMENTAL SCOPING REPORT

AUGUST 2022

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DOCUMENT DESCRIPTION

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LIST OF ACRONYMS

BID:	Background Information Document
EAP:	Environmental Assessment Practitioner
ECC:	Environmental Clearance Certificate
EIA:	Environmental Impact Assessment
EMA:	Environmental Management Act
EMP:	Environmental Management Plan
EPL:	Exclusive Prospective Licence
GDP:	Gross Domestic Product
HWC:	Human-Wildlife Conflicts
I&APs:	Interested and Affected Parties
IUCN:	International Union for Conservation of Nature
IWRM:	Integrated Water Resources Management
MAWLR:	Ministry of Agriculture, Water and Land Reform
MC:	Mining Claim
MEFT:	Ministry of Environment, Forestry and Tourism
MME:	Ministry of Mines and Energy
MoHSS:	Ministry of Health and Social Services
NBRI:	National Botanical Research Institute
NEPL:	Non-Exclusive Prospective Licence
NGO:	Non-Governmental Organizations
PPP:	Public Participation Process
QDS:	Quarter Degree Square
ToR:	Terms of Reference

EXECUTIVE SUMMARY

Mrs. Lizzie Caroline Armstrong, hereinafter referred to as the proponent, intends to commence with mining activities on six mining claims 72915-72920 which are located in the Otjozondou area, Otjozondjupa region. All six MCs are located with the private farms; Ebenezer 377 and Otjozondou 274REM respectively. The MCs are registered for base and rare earth metals and are located within the EPL 3539 which belongs to the Otjozondou Mining (Pty) Ltd.

Mining activities in the Otjozondou area has taken place intermittently since the 1950s and continues today. This has led to the establishment of the existing Manganese Mine Project consisting of a manganese pit, processing plant, and supporting infrastructure. Otjozondou Mine is currently in possession of an Environmental Clearance Certificate for the existing operations. All minerals to be mined from the new mining claims will undergo the processing, beneficiation at the existing Otjozondou Mine. The processed minerals will be transported to Walvis Bay for export market.

In terms of the Environmental Management Act No. 7 of 2007 and Environmental Impact Assessment Regulations of February 2012, all mining and quarrying activities cannot be undertaken without an Environmental Clearance Certificate, hence this study. The objective of the EIA is to identify the potential impacts associated with the proposed mining activities and to provide mitigation measures and ensure that potential impacts to the environment are managed effectively and that positive impacts are enhanced.

The EIA was conducted in a multidisciplinary approach and followed Namibia's Environmental Assessment process. Relevant environmental data have been sourced from personal observations during site visits as well as from input from the proponent, relevant stakeholders, and interested and affected parties (I&APs) as well as a review of relevant literature and legal instruments. This report constitutes an Environmental Scoping report which details a description of the proposed mining activities. It also provides a description of the receiving or affected environment in terms of the biophysical aspects of climate, water, vegetation, geography, topography, and the socio-economic environments. The report is to be read in conjunction with the Environmental Management Plan (EMP) appended to this report.

1. INTRODUCTION

1.1 Background

The proponent (Mrs. Lizzie Caroline Armstrong) legally own six mining claims 72915, 72916, 72917, 72918, 72919 & 72920 located in the Otjozonde area, Otjozondjupa region. All MCs are located with the two adjacent private farms; Farm Ebenezer No.377 and Farm Otjozonde 274REM. The proponent has already entered into an agreement with the respective farm owners. The MCs are registered for base and rare earth metals and are located within the EPL 3539 which belongs to the Otjozonde Mining (Pty) Ltd. The proponent has an agreement with the Otjozonde Mining (Pty) Ltd to utilize the existing mine infrastructure for the processing and beneficiation of the ore before transported to the port of Walvis Bay for the export market. The Otjozonde Mining (Pty) Ltd already got Environmental Clearance Certificates for the existing mines. All new MCs were pegged in line with the Minerals (Prospecting and Mining) Act 33 of 1992.and all pre-registered with the Ministry of Mines and Energy (MME).

In order to comply with the statutory requirements of the Environmental Management Act of 2007, the proponent appointed Green Gain Consultants cc to undertake the required EIA study and apply for the ECC for the proposed mining activities on the six new MCs.

1.2 Terms of Reference

The Terms of Reference (ToR) are aligned with the requirements of the Environmental Management Act 7 of 2007 and its 2012 Regulations. The consultant is therefore required to.

- i. Identify, investigate and evaluate all potential impacts of the proposed mining activities on the physical environment, social, cultural and economic environment.
- ii. Review relevant and applicable legislations
- iii. Consult relevant stakeholders and potential Interested and Affected Parties (I&APs)
- iv. Prepare an Environmental Assessment report.
- v. Compile an Environmental Management Plan.
- vi. Submit the Environmental Scoping Report and Environmental Management Plan (EMP) to MEFT as per EMA Regulations of 2012.

1.3 Environmental Assessment Practitioner (EAP)

Green Gain Consultants cc has designated a team of consultant who are qualified EAP in terms of Section VII of the EIA Regulations of February 2012.

Lead EAP	Mr. Joseph Kondja Amushila
Qualifications	<ul style="list-style-type: none">• Master of Science in Environmental Management (University of the Free State, South Africa)• Bachelor Honours Degree in Agriculture (Polytechnic of Namibia)• Bachelor's Degree in Agriculture (Polytechnic of Namibia)• National Diploma in Agriculture (University of Namibia)
Experience	Up to ten years' experience in Environmental consulting industry, most of which includes Strategic Environmental Assessment (SEA), Environmental Impact Assessment, Environmental Management Plans (EMPs) and Specialist studies.
Other team members	Ms. Lovisa Hailaula

2. METHODOLOGY

The study was conducted in a multidisciplinary approach as outlined in the EIA Regulations (Government Notice No. 30 of 2012). The methods used in the collection of information and assessment are explained below.

2.1 Field inspection and baseline data collection

The consultant conducted a field inspection at the proposed mining site. During the field inspection, the consultant conducted a walk-through-survey across the site to record various plants and animal species observed. Information from previous studies and surveys were reviewed.

The data collected during the site visit and from secondary sources can be summarized as follows:

- A list of all plant species observed at the site. This was verified with Quarter Degree Square (QDS) of vegetation from the National Botanical Research Institute (NBRI).
- Description and composition of the diverse habitats and plant communities observed on site.
- A list of all mammals, reptiles and amphibians directly or indirectly observed at the site.
- Maps of sensitive areas identified in the field and delineated on satellite imagery of the site.
- GPS coordinates of significant point-location biodiversity features.
- Photographs of various habitats, environments and biodiversity features present.

2.2 Review of existing information

Information on the ecological setting of the area was collected from sources such as Tree Atlas of Namibia and Vegetation Survey of Namibia and the Namibia Botanical Research Institute (NBRI). The list of plants species of the area was derived from the NBRI data portal using a Quarter Degree Square (QDS) method. The conservation status of the species in the list was extracted from the database of the Ministry of Agriculture, Water and Land Reform (MAWLR) and the Red Data Book Namibian Plants. Information on fauna were obtained from direct observation and counter checked with important sources such as the Birds in Namibia, the red list of threatened species of Namibia, and other relevant reports. Additional information of the flora and fauna were also sourced from previous specialist studies conducted in the same area.

2.3 Legal and policy review

Relevant legislations were reviewed, and their applicability are outlined in Section 5 of this document.

2.4 Public and stakeholder consultation

The study was subjected to a public participation process as defined in the Environmental Management Act 7 of 2007 and EIA Regulations of February 2012. The process that was followed is summarized below.

2.4.1 Consultations of stakeholders

The project was formally introduced to key stakeholders such as Government Ministries, Regional and Local Government and Farmers. The aim of these consultations was to ensure that all relevant stakeholders are aware of the development and to obtain consent and input.

2.4.2 Consultations of I&APs

Potential I&APs were invited to register through newspaper advertisements that were published in two (2) local newspapers: New Era (19 & 23 September 2022), and Confidante (16 and 23 September 2022). Several public notices were placed at public places e.g., government offices, MEFT office, Service station in Aus. Relevant authorities were informed through notification letters sent to them.

The image shows a public notice from a newspaper. At the top left, it says 'Lifting the lid' and at the top right, '23 September - 29 September 2022'. Below this, contact information for Mandy is provided: 'Contact: Mandy', 'T: 061 24 6136', 'C: 081 895 8296', and 'E: mandy@confidentenamibia.com'. The main notice is enclosed in a green border and has a green header: 'PUBLIC PARTICIPATION NOTICE ENVIRONMENTAL IMPACT ASSESSMENT (EIA) FOR THE PROPOSED MINING ACTIVITIES ON MINING CLAIMS 72915, 72916, 72917, 72918, 72919 & 72920 IN OTJOZONDJU AREA, OTJOZONDJUPA REGION'. The text of the notice states that an application for an Environmental Clearance Certificate will be submitted to the Competent Authority and the Ministry of Environment, Forestry and Tourism (MEFT) for proposed mining activities on six mining claims (72915, 72916, 72917, 72918, 72919, and 72920) located in the Otjozondju area. The proponent is Lizzie Caroline Armstrong, and the EAP is Green Gain Consultants cc. A description explains that mining activities on these claims are located within private farms and require an EIA study and an Environmental Clearance Certificate. All I&APs are invited to register, request for the Background Information Document (BID), and submit comments/inputs to eia@greengain.com.na by 10 October 2022. The need for a public meeting will be communicated to all registered I&APs. For more information, contact details for Green Gain Consultants are provided: Cell: +264 811422927 or +26481 3380114, and <http://www.greengain.com.na>. The Green Gain Consultants logo is visible at the bottom left of the notice.

Figure 1: Public Notices

See appendix B for Proof of consultations

2.4.3 Site screening

The proponent and EAP conducted a site screening around the new MC sites as well as the existing Otjozonde mine and associated infrastructure. The aim of the visit was for EAP to familiarize himself with proposed mining site and to collect baseline information.



Figure 2: officials during a site visit

2.4.4 Public and stakeholder meetings

Given the fact that all proposed mining claims are located within the private farms, the respective farm owners as well adjacent farm owners were consulted face to face during the consultation period. The names and contact details of all the affected and adjacent farmers is provided in the proof of consultation. I&APs were requested to register and indicate the need for a public meeting through the public notices, however, such need was not identified. As such, a focus group discussion with the affected farmers was conducted and deemed sufficient. Lastly, relevant stakeholders were notified about the proposed new mining activities and were requested to provide inputs that were incorporated in this report.

3. DESCRIPTION OF THE PROPOSED ACTIVITIES

3.1 Locality

The six new MCs are located within the Otjozondu manganese field located in the Otjozondu village in Otjozondjupa region (Figure 3). Four MCs are located within farm Ebenezer 377 and two MC are located with farm Otjozondu 274REM.

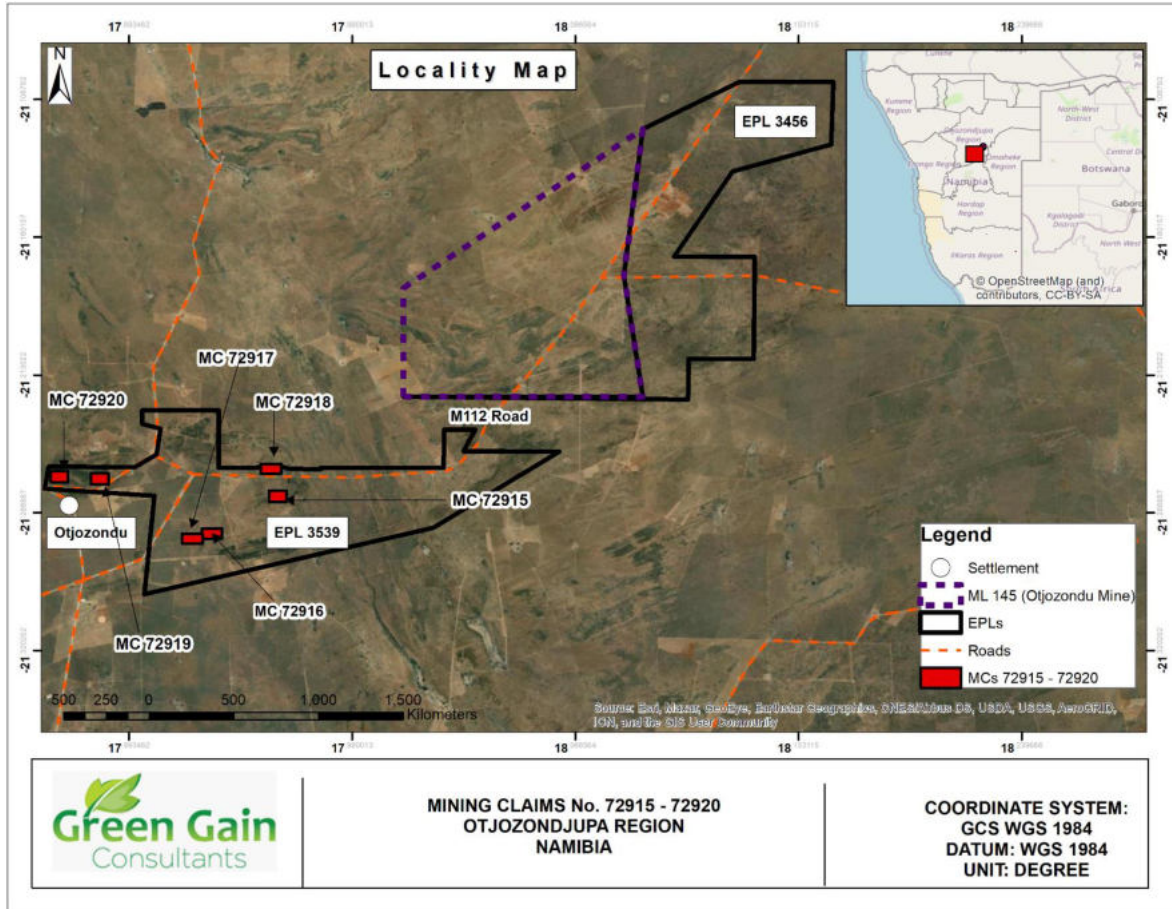


Figure 3: Locality map

MC number	Beacon	Lat	Long	MC number	Beacon	Lat	Long
72915	1	-21.25960°	17.94875°	72917	1	-21.27428°	17.92239°
	2	-21.25955°	17.95416°		2	-21.27346°	17.92794°
	3	-21.26212°	17.95407°		3	-21.27612°	17.92818°
	4	-21.26218°	17.94845°		4	-21.27690°	17.92277°
72916	1	-21.24965°	17.94624°	72918	1	-21.27589°	17.91747°
	2	-21.24946°	17.95198°		2	-21.27516°	17.92277°
	3	-21.25206°	17.95190°		3	-21.27796°	17.92311°
	4	-21.25205°	17.94619°		4	-21.27861°	17.91764°

3.2 Proposed mining activities

3.2.1 Types of minerals

EPL 6691 is registered for the following commodities *base and rare metals, dimension stones, industrial minerals, precious metals, precious stones, and semi-precious stones.*

3.2.2 Existing infrastructure

The proposed mining activities on the new MCs will be part of the existing Otjozondu Mine project. Hence, mineral processing and beneficiation will be done at the mining and will make use the following exiting the mine infrastructure.

- Crusher plant
- Stockpile and temporary storage facility
- Tailing facility
- Employees accommodation at Okondjatu (rented)
- Beneficiation plant
- Waste dump (temporary usage)
- Laboratory
- Site office and maintenance workshop
- Boreholes, power supply (on-grid) and telecommunication network
- Refuelling site



3.2.3 Proposed mine infrastructure

The only infrastructure to be established for the mining activities on the new six MCs are as follows.

- Access roads (existing farm roads to be used as far as possible)
- Mine open pits (to be rehabilitated afterwards)
- Potable ablution facilities on mining site
- All mine waste to be generated from the new pits will be transported to the existing waste handling facilities (dumpsite and tailing dams).
- All new employees will be accommodated in the existing facilities at Okondjatu

3.2.4 Mine plant and Equipment

The following mine plant and equipment will be used on the new MCs.

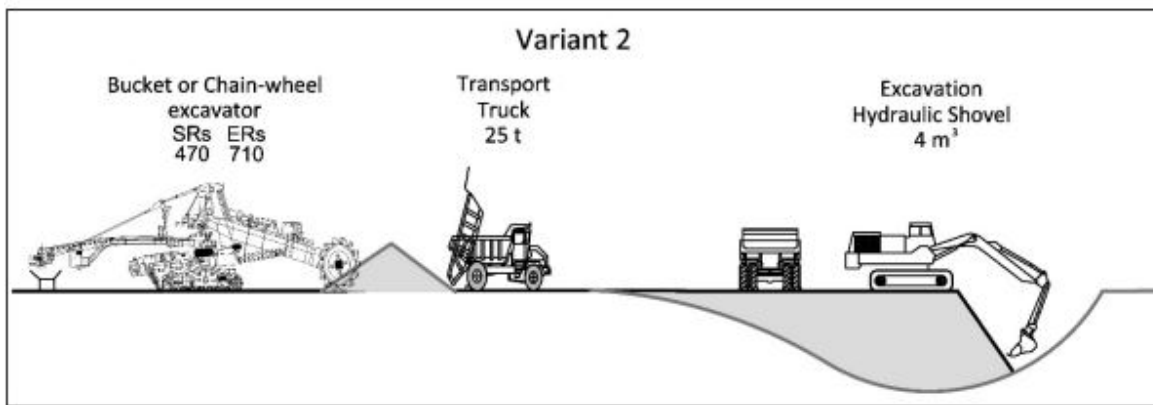
- Excavator (chain-wheel or bucket)
- Dump truck
- Jaw-crusher
- Hydraulic driller

3.2.5 Methods of mining

The method to be used in mining include mainly drilling and blasting to test the composition of the individual structural components, leading to the final establishment of the open pit boundaries, and start-up benches for ore extraction.

a) Drilling and trenching

The intended mining activities will include diamond drilling and trenching to test the depth and continuity of the individual structural components followed by geophysical techniques to test potential extensions of the ore body and removal of overburden (sand and calcite) where necessary.



The manganese mineralisation is associated with banded iron formation deposits approximately 50m thick. The visual impression of homogeneity of the deposit masks variations of mineralogy and variation of Manganese grade. The primary ore is located on several layers with paleogeographic and sedimentologic controls implying lateral variation of facies. The ore will be extracted using an open cast from several open-pits in an owner-miner environment.



Figure 4: Typical example of trenching method

b) *Blasting in mining*

Blasting will be conducted by a registered blasting company or individual. The blasting technique normally follows six main steps as depicted in Figure 6 below.

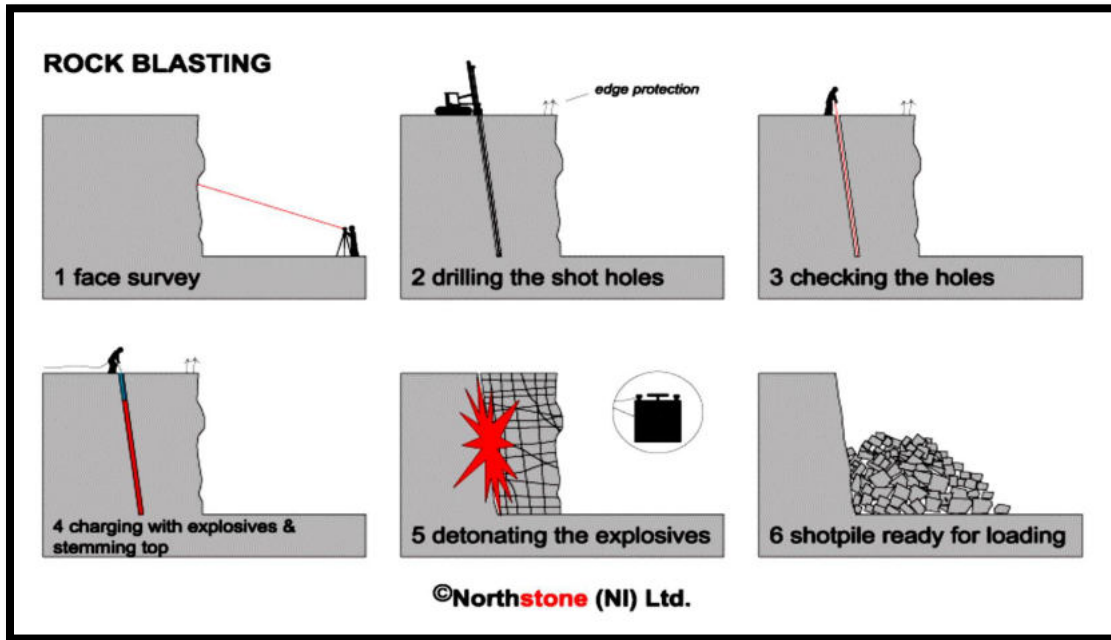


Figure 5: Typical example of the blasting process

Step 1: The first step is a three-dimensional survey of the mining area to allow the explosives engineer to design the blast and to plot where the shot holes should be drilled so that the blast can be carried out safely and efficiently. The survey will also indicate the presence of bulges or hollows in the face and determine the number of explosives required.

Step 2: After the profiling survey, shot holes are drilled using an air or hydro operated driller at the marked spots corresponding to the hole positions on the blast design and at the angles and depths required (9 meter). The number of shot holes will depend on the size of the area to be blasted. This usually range from 10 to 30 shot holes per occasion.

Step 3: The area is then prepared for blasting and humans and animals are removed from the site. The placement of explosives is professionally planned to ensure that the required fragmentation of the rock is achieved with the minimum environmental impact. Detonator cord is placed in each hole and loaded with explosives within a few metres of the top.

Step 4, 5 & 6: After blasting, the area is inspected to check that all the shot holes have fired correctly.

- *Blasting explosives*

Table 1: Most common mining blasting explosive used in mining.

Explosive	Compositions	Classifications	Possible Risks
Emulsion Blasting in opencast mines	Oil emulsion	Hazardous substance, Class 5.1 oxidizing substances.	Oxidizing and toxic substances
Cartridge Suitable for underground mining applications, blasting in opencast mines, and civil blasting operations	Water and oil emulsion	Classified as hazardous substances and dangerous goods	Shock, Fire
Ammonium Nitrate-Fuel Oil (ANFO) Used in dry blast holes for surface and underground operations	Ammonium Nitrate and Fuel Oil	Hazardous substances	Emit hazardous gases (nitrogen oxides and carbon oxide)

3.2.6 Ore processing and beneficiation

Processing is carried out through a crush screen and jig plant. The plant and equipment are owned by Otjozundu Mine. The mine’s processing plant already produces large tonnes of the product per year since commencement and would be able to accommodate additional volumes.



Figure 6: Manganese processing plant at Otjozundu mine

After processing, the final product is transported to the siding and material handling facility from where it is transported to Walvis Bay Harbour.

3.3 Auxiliary infrastructures ‘

3.3.1 Water supply

The Otjozundu Mine currently owns two boreholes which are diesel” and “electric” driven. The “electric” borehole has never been used and water from the borehole is not potable. The “diesel” borehole currently supplies water at 5m³/h. The water travels via pipeline directly to concrete settling tanks. One vertical exploration borehole at Bosrand could be accessed and the groundwater was measured at 40 mbgl. An old Manganese mining pit (50-60 years) on site has water permanently standing in the pit at approximately 5-6 mbgl (estimated by eye).

3.3.2 Workforce and accommodation

About 30 new employees will be recruited as part of the new mining activities. Majority of the employees will be sourced from the local community. Mine employees are currently housed in their own or rented accommodation at Okondjatu. The mine provides daily transport from the village to the mine.

3.3.3 Waste management and rehabilitation

Mining activities produce two types of waste, namely: mining waste e.g., waste rocks and general waste e.g., litter etc. General waste will be collected and disposed of at the Okahandja disposal site. Hazardous waste will be collected separately and transported to Windhoek landfill site. There will also be a radiation monitoring of waste and hydrogeological drilling to monitor the composition of groundwater and aquifer levels.

Progressive rehabilitation will include contouring of waste dumps to flatten and stabilize dumps and monitoring of dump oxidation processes. Other rehabilitation activities that will be undertaken concurrent with the mining activities will include.

- Refilling and levelling of trenches
- Removal waste, scraps and contaminated soil from spills and leaks
- Flattening of abandoned roads
- Re-vegetation of the disturbed area with local adapting species under the supervision of the MEFT where possible.
- Dust and Erosion control measures

3.3.4 Occupational health and safety

Employees in the mining activities are exposed to several occupational health hazards which could result into serious health risks such as injuries, diseases, or death. The exposure to these hazards could be aggravated by risk factors such as the lack of experience & limited knowledge, nature of work and non-compliance to health safety standards. The common hazards include physical, chemical, biological, radiological, agronomical, and behavioural hazards.

Table 2: Baseline Hazard Assessment of mining activities

Occupational Hazard	Hazard type	Potential Risks	Likelihood (1-4)
Dust	Ergonomic	Lung diseases, skin irritation and eye damage	4
Noise	Physical	Insomnia	4
Vibration	Ergonomic	Insomnia	4
Noxious gases	Chemical	Lung diseases, cancer, respiratory diseases etc.	3
Falling rocks	Physical	Injuries, death	4
Flying rocks	Physical	Injuries	1
Heights	Ergonomic	Falling, injuries, death	4
Toxic and hazardous substances	Radiological	Poisoning	4
Explosions	Physical	Fire, damage, injuries, death	4
Heavy loads	Ergonomic	Fatigue	2
Long distances	Physical	Physical fatigue	1
Long working hours	Ergonomic	Physical fatigue, insomnia	4
Poisonous plants	Biological	Poisoning	2
Predators	Biological	Injuries, death	1
Snake bites	Biological	Injuries, death	4
Harsh weather	Physical	Fatigue	4
Conflicts	Behavioural	Injuries	4

Likelihood scale: 1-unlikely/improbable, 2 –likely, 3 –most likely, 4 – definite/certainly

For detailed information of the above identified occupational health hazards, please refer to Section 4.2.6 of the EMP.

4. DESCRIPTION OF THE AFFECTED ENVIRONMENT

Below is the baseline of the affected environment which entails a description of various environmental receptors that are likely to be affected by the proposed mining activities. This includes both the socio-cultural-economic and biophysical aspects. The impacts on socio-cultural-economic aspects will affect a greater geographical area e.g., constituency, regional and national. Hence, the description of the socio-cultural-economic baseline provided for the study area corresponds to the extent of the community in which the activities are taking place. Alternatively, the baseline study area chosen for physical and ecological data collection is mainly the area which is in the direct zone of influence of the mining activities, its process facilities and supporting infrastructures.

4.1 Socio-economic environment

4.1.1 About the area

The Otjozondu area is located approximately 220 km north-east of Windhoek, Namibia, near the villages of Otjozondu and Hochfeld, midway between Otjozondu and Okondjatu on the M112 secondary road. According to the National Household Income and Expenditure Survey (NHIES) (2003/2004) the total population in Namibia was estimated to be 1,991,747 (Third National Development Plan (NDP3)). The population of the Otjozondjupa Region was 124,283 which constitutes ~ 7 % of the total population of Namibia. The number of households for the region was estimated to be 28,707, with an average size of 4.3 persons per household. This is lower than the average household size in Namibia of 4.9 persons per household. The main languages spoken in homes in the region are Otjiherero languages (28%), Nama/Damara (22%) and Oshiwambo languages (20%). The unemployment rate in 2001 was 32% (2001 Population and Housing Census of the National Planning Commission (NPC)) and in 2008, 44% (2008 Namibia Labour Force Survey).

4.1.2 Land use

The main settlements in the area are Otjozondju, Uitkoms, Okondjatu and Hochfeld. The settlement of Otjozondju is located ~ 15 km south-west of the Otjozondju mine and Farm Ebenezer were the new mining claims are located. The area essentially consists of a primary school that accommodates about 530 pupils, of whom ~ 460 are boarders, and employs 17 teachers and 40 support staff. The largest settlement in the area is Okondjatu which is located about 40 km north-east of the Otjozondju mine site in the communal area. The estimated population of Okondjatu is 6,000. The employment opportunities in both Okondjatu and Uitkoms are limited and are largely linked to the agricultural sector.

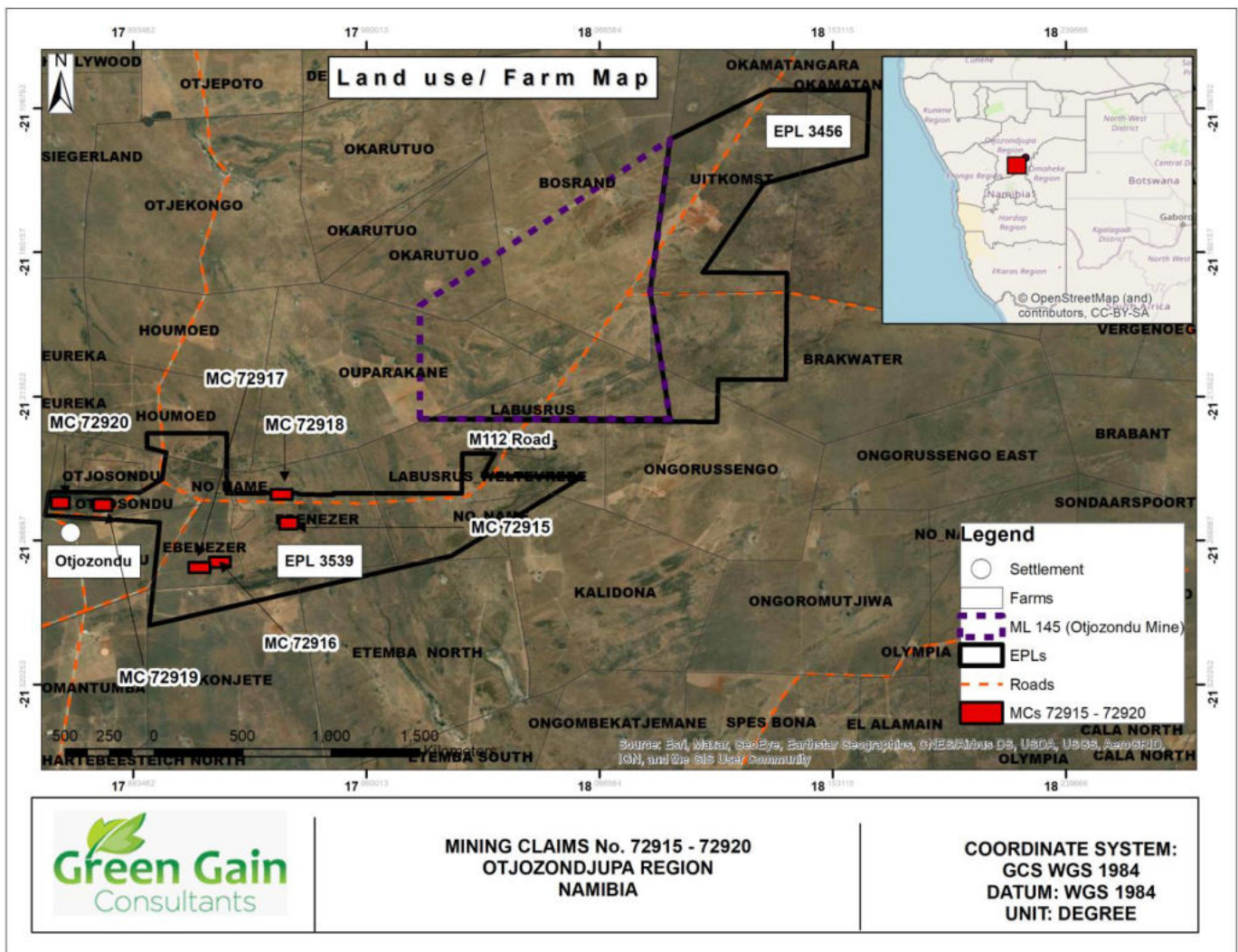


Figure 7: Surrounding land uses

4.1.3 Archaeology and Palaeontology

There are also no significant archaeological and heritage sites or materials that are known to be located within the proposed mining area.

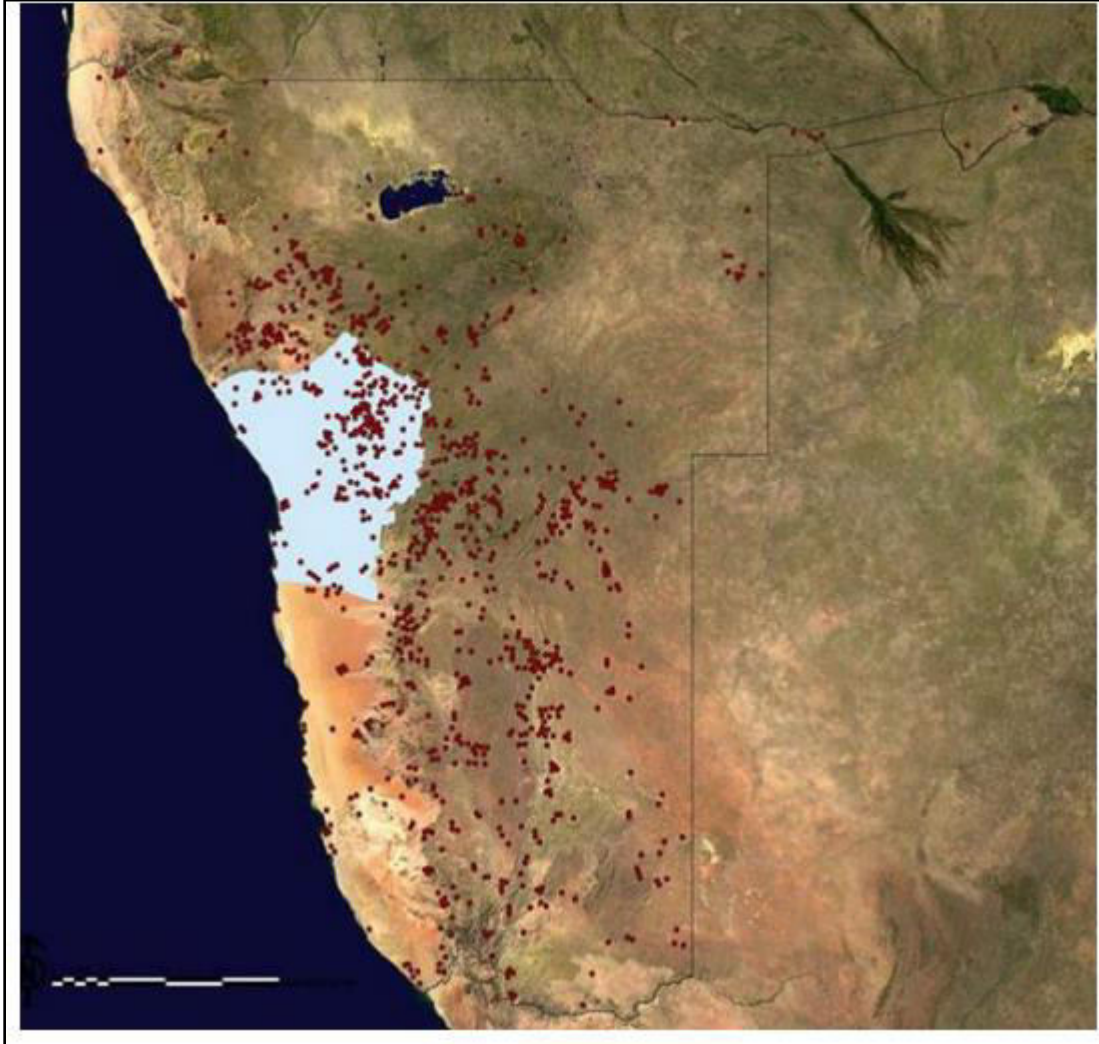


Figure 8: Known archaeological sites in Erongo Region (blue area) in relation to the general

4.2 Biophysical environment

4.2.1 Climate and meteorology

❖ Climate and rainfall

Otjozondjupa region has a semi-arid climate and lies between the 400 mm and 450 mm annual rainfall isohyets. The annual rainfall is highly variable, with the majority of rain falling between November and April. Rainfall data recorded over the last decade indicate that a worsening drought has been in effect for the last nine years. The average daily maximum temperature for the hottest month is 33 °C - 34 °C, and the average daily minimum temperature for the coldest month is 4 °C - 5 °C (Van der Merwe, 1983). The dominant wind directions throughout the year are from the north, north-east and east. However, strong westerly winds occur for two pre-summer months August, of September and October (Mendelsohn, J. *et al*, 2002).

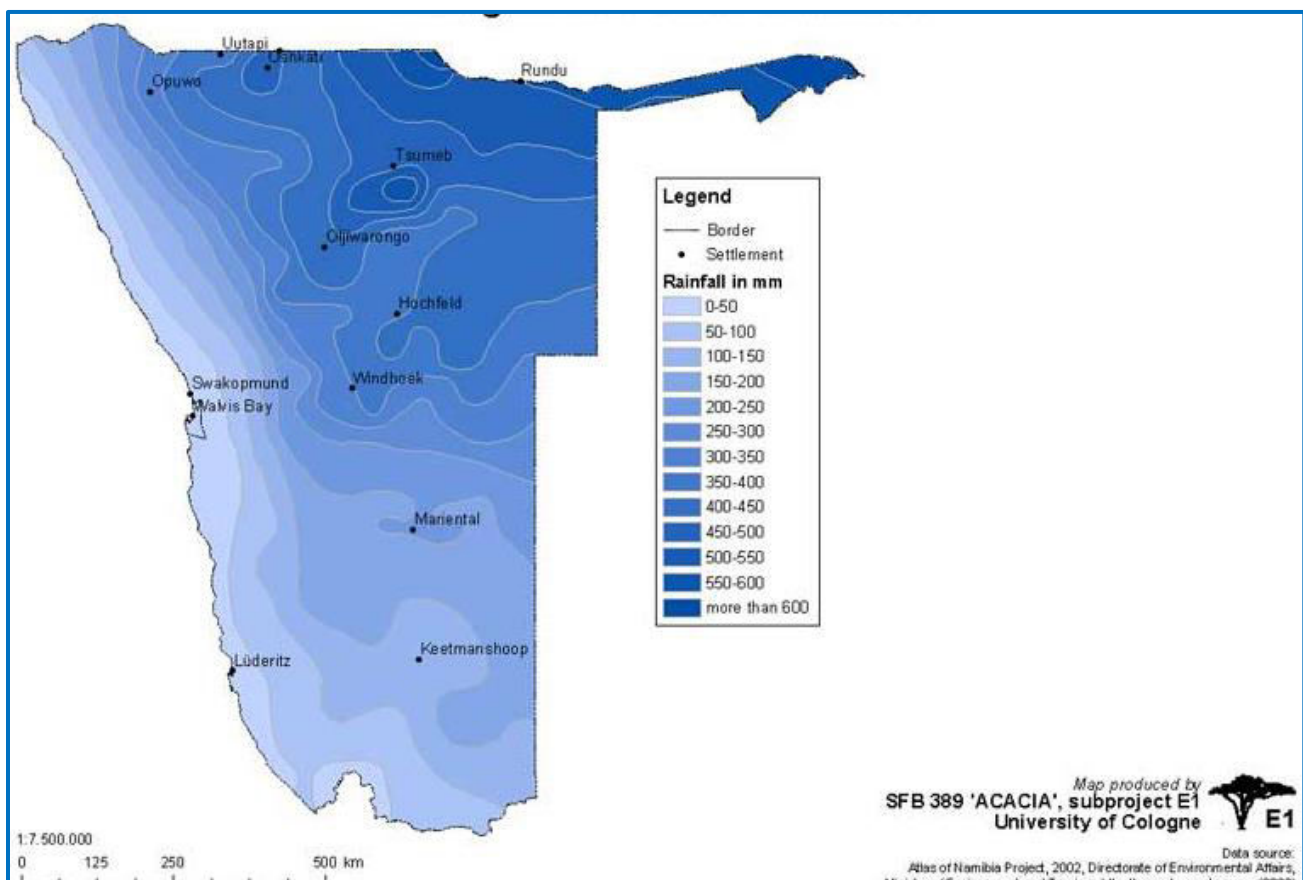


Figure 9: Climatic map of Namibia

❖ Wind

The prevailing wind field in the area is from the north-east to the south-east with the most frequent winds from the east (12% of the time). During daytime north-easterly airflow prevails whereas a shift to easterly and east-south-easterly winds occur during the night. Day-time reflects higher wind speeds on average than night-time. The strongest winds are associated with east winds occurring during the day with 18% exceeding 5 m/s. Overall, wind speeds exceed 5 m/s for 11.3% of the time with a total of 10.2% calms. The average wind speed is 3.2 m/s with a maximum for the year 2011 of 12 m/s.

❖ Temperature and evaporation

Air temperature is an important parameter for the development of the mixing and inversion layers. It also determines the effect of plume buoyancy as the larger the temperature difference between ambient air and the plume, the higher the plume will rise. This in turn will affect the rate of dissipation of pollutants before it reaches ground level. Incoming solar radiation also determines the rate of development and dissipation of the mixing layer. Relative humidity is an inverse function of ambient air temperature, increasing as ambient air temperature decreases.

4.2.3 Local flora

The Otjozundu area is located in thornbush shrubland biome of the Central Namibia which consist of about 50% grass cover and another 50% bush/trees cover.

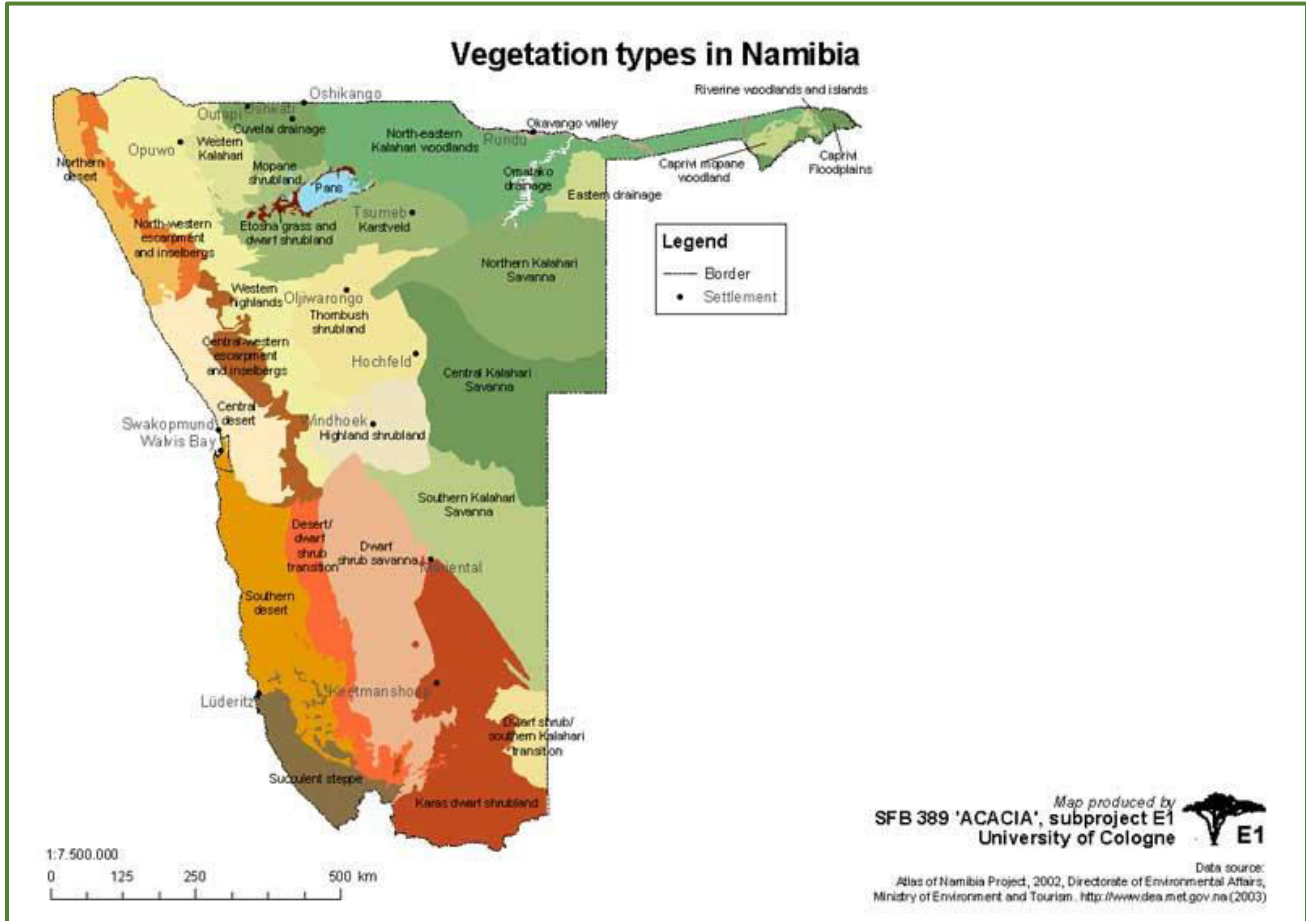


Figure 11: Vegetation map of Namibia

As depicted in Figure 12, the proposed mining area falls under the shrubland dominated by the *Acacia Merifera* species.

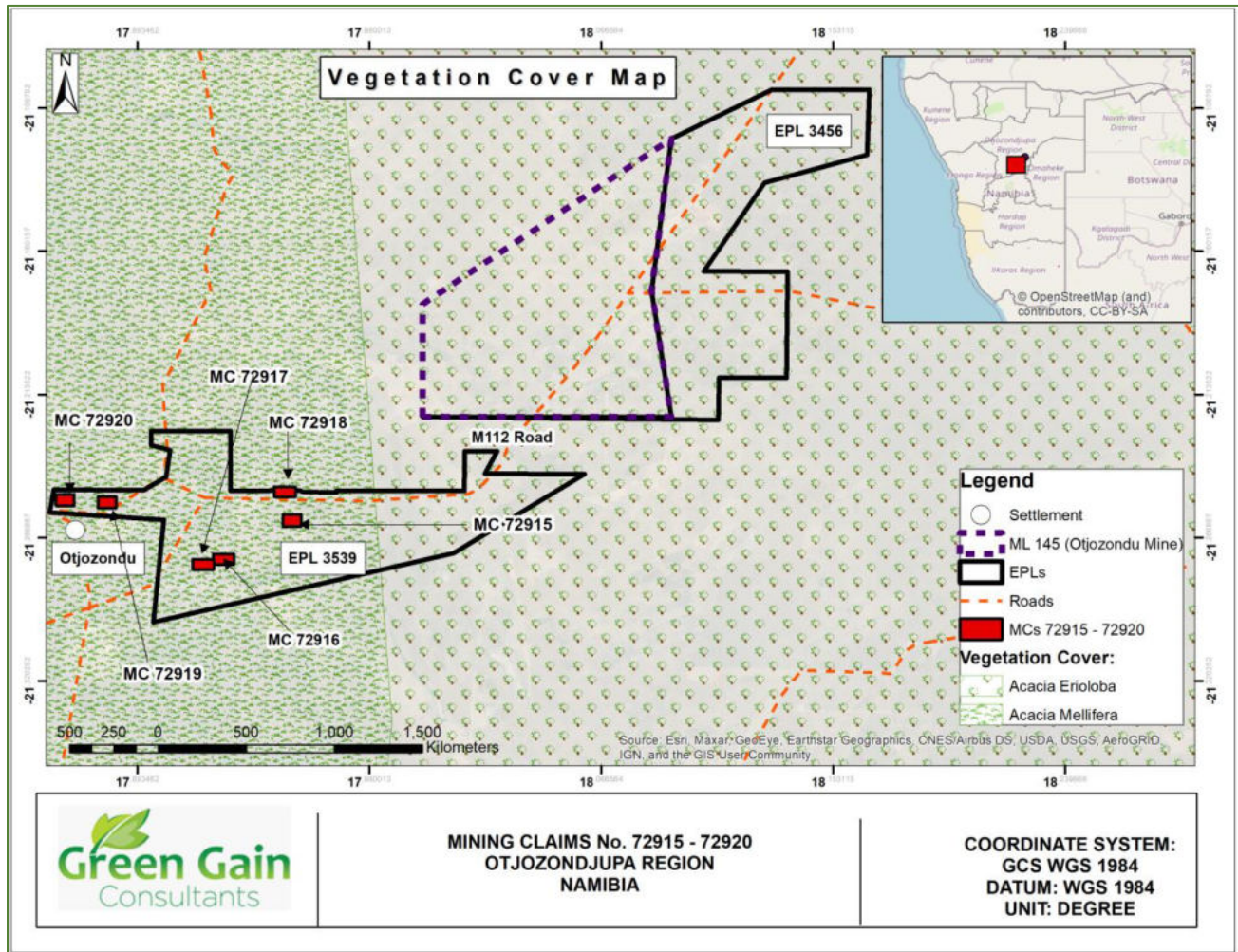


Figure 12: Vegetation map of the area

❖ Dominant plant species

The Otjozundu area is located in an area of high species richness (estimated 300-400 species at a regional scale), but a low level of endemism. As depicted in Figure 13 below, the proposed mining area is dominated mainly by thorn bush of acacia species and other dwarfshrub species, dotted with a mixture of herbaceous and climax and sub-climax grass species.



Figure 13: Local occurring vegetation

There are few large trees, found mainly in the watercourses and natural drainage lines. The area contains about 48 different species of trees and shrubs, and 62 species of grasses.

❖ Flora conservation status

There are species of conservation concern which are protected under the Nature Conservation Ordinance 19 of 1974 and the National Forestry Act 12 of 2001 as listed below.

Table 3: Flora species of conservation concern

Species Name	Conservation Concern
1. Grasses	
<i>Eragostis rigidior</i>	
<i>Stipagrostis uniplumis</i>	
<i>Schizachyrium spp</i>	
<i>Enneapogon cenchroides</i>	
<i>Brachiaria nigropedata</i>	
2. Shrubs/brush bush	
<i>D. cinerea</i> (sickle bush).	
<i>A. reficiens</i>	
<i>Albizia anthelmintica</i> (<i>Albizia aru</i>)	Protected
<i>Barleria lanceolata</i>	Endemic
<i>Boscia albitrunca</i> (<i>shepherd's tree</i>)	Protected
<i>Convolvulus argilicola</i>	Endemic
<i>Hibiscus fleckii</i>	Endemic
<i>Impomoea hochstetteri</i>	Endemic
<i>Kahautia azurea</i>	Endemic
<i>Leucas pechuelii</i>	Near endemic
<i>Philenoptera nelsii</i>	Protected
<i>Solanum damarense</i>	Endemic
Trees	
<i>Acacia erioloba</i> (Camelthorn), omumbonde, kameeldoring	Protected
<i>Digitaria eriantha</i>	Near endemic
<i>Harpogophytum procumbens</i> (<i>Devils claw</i>)	Protected

4.2.4 Local fauna

The fauna of the Otjozonde area is made up of a mixture of domestic farm animals mainly livestock, an abundance of wildlife and several species of mammals, avifauna, reptiles etc.

Animal species	Species diversity
Birds	171-200 species
Frogs	12-19 species
Mammals	61-75 species
Large herbivores	5-8 species
Reptiles	61-70 species
Termites	7-9 genera
Scorpions	10-11 species

Reptiles includes different species of snakes, chameleons, geckos, lizards. About 108 species of birds are recorded to occur in the area. The most commonly that were observed or known to occur in the area are such as Secretary bird, *Helmeted Guineafowl*, Laughing Dove, *Hornbill*, *Prinia flavicans* as well as endangered *Cape griffon vulture (SABAP)*. There are 70 species of mammals, 8 antelopes and 18 carnivore species. There are also 12 species of bats, 21 species of rodents

None of the local fauna are endemic to the area. However, there are species of potential conservation concern and listed under the Nature Conservation Ordinance, Schedule 4, Protected Game. CITES IUCN Red list (Table 4).

Table 4: Fauna of conservation concern (Source: Loots S, 2005)

Species name	Conservation concern
<i>Taurotragus oryx</i> (Eland,)	Least-concern
<i>Felis lybica</i> (Wild cat)	Vulnerable
<i>Felis nigripes</i> (rare
<i>Acinonyx jubatus</i> (Cheetah)	Endangered
<i>Vulpes chama</i> (Cape fox)	Near Threatened
<i>Otocyon megalotis</i> (Bat-eared fox)	Near Threatened
<i>Panthera leo</i> (Lions)	Near Threatened
<i>Hyaena brunnea</i> (Brown hyaena)	Near Threatened
<i>Proteles cristata</i> (Aardwolf)	Near Threatened
<i>Manis Termminckii</i> (Pangolin)	Vulnerable

Other species that are commonly found in the area are such as black-backed jackal (*Canis mesomelas*), Kudu (*Tragelaphus strepsiceros*), Oryx (*Oryx gazella*), Warthog (*Phacochoerus aethiopicus*), and common duiker (*Sylvicapra grimmia*).

❖ Groundwater vulnerability

The groundwater in the area depth and static water levels are estimated at approximately 35 metres below ground level (mbgl). The groundwater vulnerability in the area is rated as moderate.

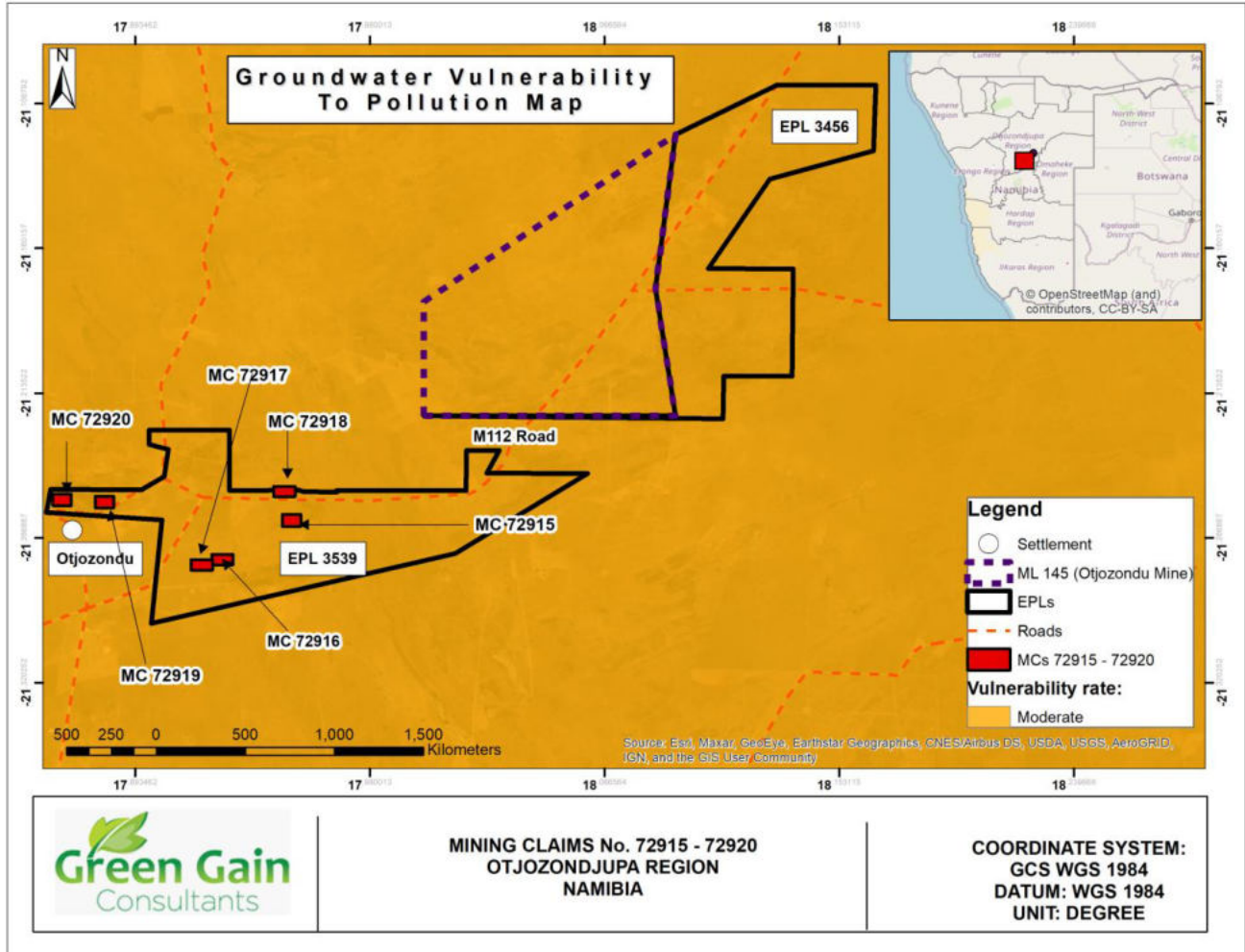
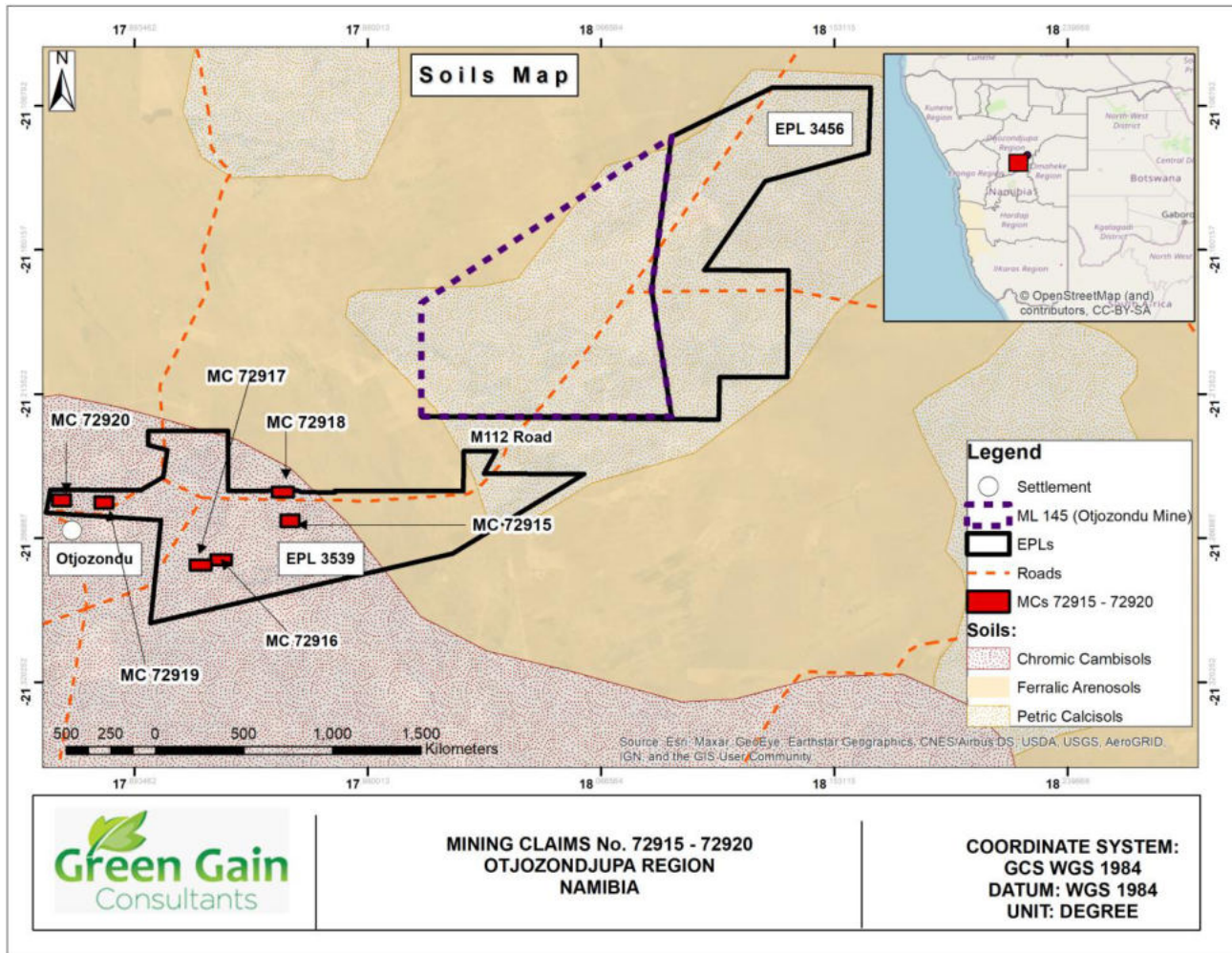


Figure 15: Hydro-geological map of Namibia (Source: IWRM, 2010)

4.2.6 Soil

The soil comprises predominantly *Ferallitic Arenosols* (high contents of iron and aluminium oxides, wind transported), which is rather infertile, but well drained due to the sandy texture.



4.2.7 Geology

The geological features of the proposed mining area consist of the Chuos Formation of the Swakop Group. The underlying rock types are mainly the marble, mica schist, quartzite, calc-silicate and graphitic schist. The manganese and iron units are associated with banded iron formation (BIF) which consists mainly of hematite intermixed with manganese and iron-rich gneisses. The manganese layers occur as two distinct ore zones separated by the banded iron formation with quartz arenites overlaying the sequence and quartzites forming the base contact. The manganese ore zone is characterised by the dominant minerals namely Braunite (Mn_6SiO_{12}), Jacobsite ($(Mn^{2+}, Fe^{2+}, Mg)(Fe^{3+}, Mn^{3+})_2O_4$) followed by hematite (Fe_2O_3) quartz (SiO_2) and Mn-oxide forming accessory minerals.

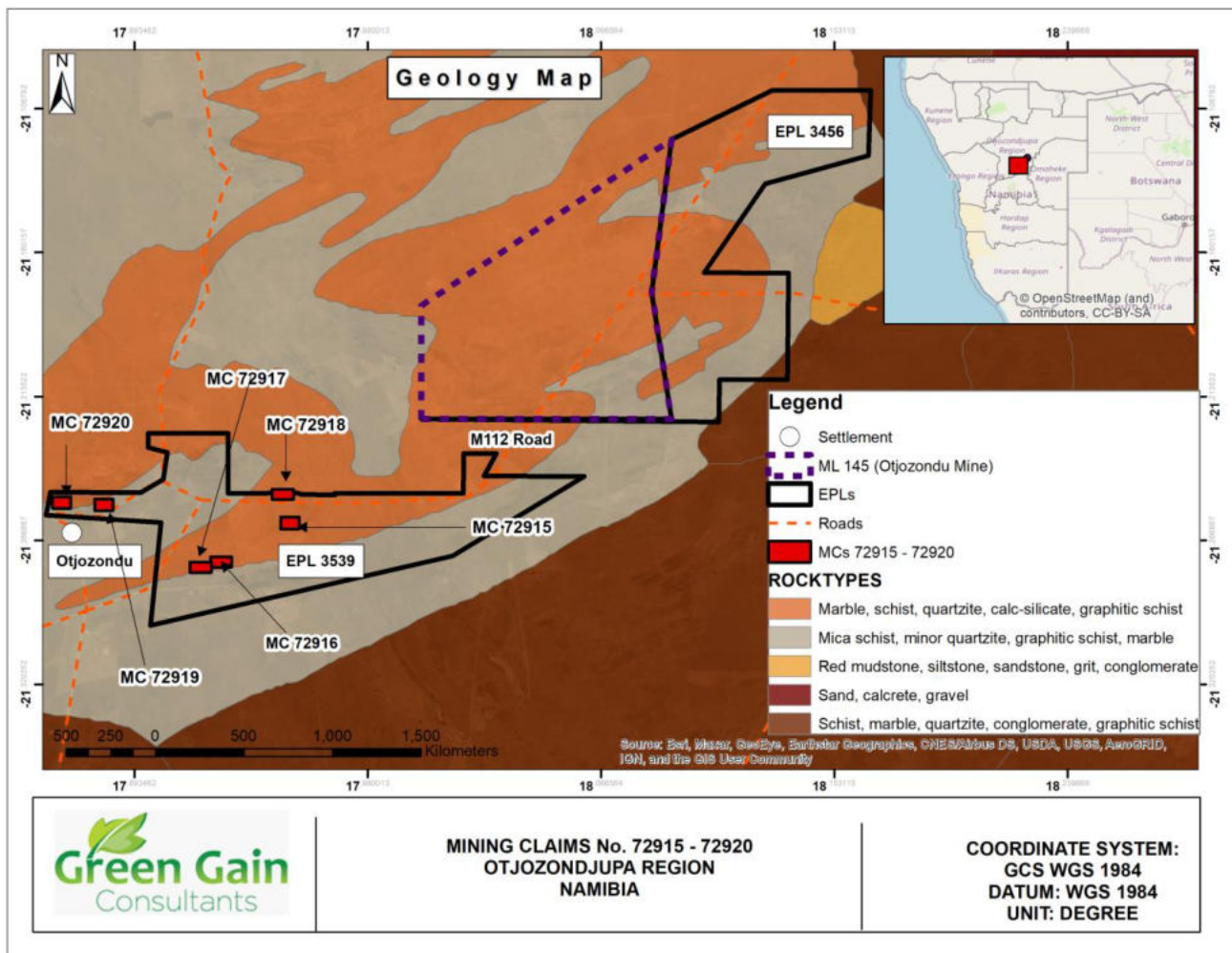


Figure 16: Geological map of the area

5. LEGISLATIVE FRAMEWORK

5.1 Environmental management requirements

The Environmental Management Act No.7 of 2007 and the Environmental Assessment Policy for Sustainable Development and Environmental Conservation (1995) set the guiding policy/legal framework for environmental management in Namibia. The proposed activities trigger activities listed under the EMA Regulations of 2012, thus cannot be undertaken without an EIA being conducted and an ECC being obtained. The proposed mining activities on EPL 6691 will triggered the following listed activities.

- **Section 2: Waste management, treatment, handling and disposal.**
 - 2.1 The construction of facilities for waste site treatment or waste and disposal of waste
 - 2.2 Any activity entailing a scheduled process referred to in the atmospheric pollution prevention Ordinance of 1976.
 - 2.3 The import, processing, use and recycling, temporary storage, transportation, or export of waste.

- **Section 3: Mining and quarrying activities**
 - 3.1 The construction of facilities for any process or activities which requires a license, right or other form of authorization, and the renewal of a license, right or other form of authorization, in terms of the Minerals (Prospecting and Mining act), 1992.

 - 3.2 Other forms of mining or extraction of any natural resources whether regulated by law or not.
 - 3.3 Resource extraction, manipulation, conservation, and related activities.

 - 3.5 The extraction of peat.

- **Water resource developments**
 - 8.1 The abstraction of ground or surface water for industrial or commercial purposes.

- **Hazardous substance treatment, handling, and storage**
 - 9.1 The manufacturing, storage, handling, or processing of a hazardous substance defined in the Hazardous Substances Ordinance, 1974.

 - 9.4 The storage and handling of dangerous goods, including petrol, diesel, liquid petroleum gas or paraffin, in containers with a combined capacity of more than 30 cubic meters at any one location.

5.2 Mineral rights in Namibia

The Minerals (Prospecting and Mining) Act 33 of 1992 provides the overarching legal control of rights related to reconnaissance, prospecting, mining sale/disposal in Namibia, the following mining rights are applicable (Source: MME, 2010).

- **Non-Exclusive Prospecting Licence (NEPL):** This is a gateway licence to pegging mining claims but does not permit the holder exclusive rights for any specific mineral group e.g., semi-precious stones or area of mining.
- **Exclusive Prospective Licence (EPL) (Section 67 -76)** An EPL is meant for detailed investigations such as geological mapping, ground geophysics, geochemical sampling, trenching, drilling, bulk sampling, trial mining, etc. It is the most common type of mineral license issued by the Ministry of Mines and Energy. In fact, more than 70% of the workload which the Mining Commissioner's office undertakes due to licensing related activities emanate from EPLs and EPL applications.
- **Mining Claim (MC):** gives rights to prospect and mine. It must be registered within 21 days from the date on which such claim is pegged. Procedures for the application of MCs are detailed on Section 16-45 of the Minerals (Prospecting and Mining) Act 33 of 1992.
- **Mining License (ML) (Section 90-101)** After a successful exploration program, an EPL holder may want to start mining activities. In this case, an EPL Holder may to apply for a mining license. Depending on the deposit size and the scale of production, a mining license may be issued for a period not longer than twenty-five (25) years. The annual fee depends on the projected annual turnover.
- **Reconnaissance Licence (RL) Section 58-66** A reconnaissance license is used to conduct regional investigations such as airborne geophysical surveys and analysis of satellite images. Usually, it covers a large area e.g. 1 million Ha. A RL issued for six (6) months after which, the holder of a RL should ideally be in a position to apply for an Exclusive Prospecting Licence within the area previously covered by the RL. The application fee for a RL depends on the size of the area (N\$500/quarter of a degree square).
- **Mineral Deposit Retention License (MDRL) (Section 77 -89)** After conducting exploration under an EPL, the EPL holder may find a deposit but there could be certain circumstances that prevent such EPL holder from taking the project to mining. These circumstances include: the commodity price, lack of infrastructure or poor extraction technologies at the time.

5.3 Applicable national legislations

One of the most important components of an environmental assessment process is the review of applicable and relevant legislations. Below is a review of relevant legislations and applicable provisions in respect of the proposed mining activities.

Table 5: Applicable National Legislation

LEGISLATION	PROVISIONS APPLICABLE TO SSMs ACTIVITIES	IMPLEMENTING AGENCY
Namibian Constitution	The legislative and regulatory foundation for protection and management of the environment and its natural resources is governed by the Namibian Constitution. Article 95(i) of the constitution clearly emphasizes the promotion of the welfare of the people, whereby <i>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.</i>	GRN of Namibia
Environmental Management Act of 07 of 2007	The purpose of this Act is to promote the sustainable management of the environment and the use of natural resources by establishing principles for decision-making on matters affecting the environment; to provide for a process of assessment and control of projects which may have significant effects on the environment; and to provide for incidental matters. The Act also provides procedures for adequate public participation during the environmental assessment process for the interested and affected parties to voice and register their opinions and concern about the proposed project.	Ministry of Environment, Forestry and Tourism
National Forestry Act of 2001	Provide for the establishment of a Forestry Council and the appointment of certain officials; to consolidate the laws relating to the management and use of forests and forest produce; to provide for the protection of the environment and the control and management of forest fires; to repeal the Preservation of Bees and Honey Proclamation, 1923 (Proclamation No.1 of 1923), Preservation of Trees and Forests Ordinance, 1952 (Ordinance No. 37 of 1952) and the Forest Act, 1968 (Act No. 72 of 1968) and to deal with incidental matters Deforestation of natural forests has important implications for soil erosion, biodiversity loss and global warming. <i>This Forest Act 12 of 2001 requires that tree species and any vegetation within 100m from a watercourse may not be</i>	Ministry of Environment, Forestry and Tourism

	<p><i>removed without a permit (S22 (1)).</i></p> <p>The Act also prohibits the removal of and transport of various protected plant species. The Act further requires any project activity that will result in clearance of certain forests to obtain a forest permit beforehand.</p>	
Public Health and Environmental Act of 2015	<p>Section 119 of this Act prohibits the existence of a nuisance on any land owned or occupied. The term nuisance is important for the purpose of this EIA, as it is specified, where relevant in Section 122 as follows:</p> <ul style="list-style-type: none"> a) any dwelling or premises which is or are of such construction as to be injurious or dangerous to health or which is or are liable to favour the spread of any infectious disease. b) any dung pit, slop tank, ash pit or manure heap so foul or in such a state or so constructed as to be offensive or to be injurious or dangerous to health. c) any area of land kept or permitted to remain in such a state as to be offensive, or liable to cause any infectious, communicable, or preventable disease or injury or danger to health; or d) Any other condition whatever which is offensive, injurious, or dangerous to health. <p>Furthermore, in terms of Section 8 of the Public Health Proclamation 16 of 1936, where a Regional authority is of the opinion that a nuisance is seriously offensive or a serious menace to health, it may serve a notice on the owner or occupant of the nuisance to immediately remove the nuisance. Failure to abide by this provision is an offence. Of relevance is the location of the mine, and the fact that mining activities will overlap with the activities of the community currently on the land.</p>	Ministry of Health and Social Services
Minerals (Prospecting and Mining) Act 33 of 1992	<p>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.</p> <p><i>Part 1: Rights in relation to the minerals</i></p> <p>Subject to any right conferred under any provision of this Act, any right in relation to the reconnaissance or prospecting for, and the mining and sale or</p>	Ministry of Mines and Energy

disposal of, and the exercise of control over, any mineral or group of minerals vests, notwithstanding any right of ownership of any person in relation to any land in, on or under which any such mineral or group of minerals is found, in the State.

Also deals with prohibition on carrying on certain operations without licence, and transfer of certain licences or grant, cession, or assignment of interests in such licences, and joinder of persons as joint holders of such licences or interests.

Part VI: Rights of holders of non-exclusive prospecting licences.

(a) to carry on prospecting operations on any land for any mineral or group of minerals.

(b) to remove any mineral or group of minerals other than a controlled mineral or sample of such mineral or group of minerals, for any purpose other than she or disposal, from any place where it was found or incidentally won in the course of prospecting operations referred to in paragraph (a) to any place within Namibia.

(c) with the permission of the Commissioner previously obtained generally or in every case in writing and subject to such conditions as may be determined by the Commissioner or subject to be conditions of an exemption granted under section 137 –

Section 109 (1): Minerals Ancillary Rights. The holder of NEPL or MC may obtain rights.

a). to enter upon land to carry on operations authorized by such licence or mining claim on such land.

(b) to erect or construct accessory works on any land for purposes of such operations.

(c) to obtain a supply of water or any other substance in connection with such operations.

(d) to dispose of water or any other substance obtained during such operations.

	(e) To do anything else in order to exercise any right conferred upon him or her by such licence or mining claim.	
Pollution Control and Waste Management Bill of 1999	<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 provide framework for a multitude administration on pollution control and waste management in the country. Each authority identified by the bill shall play its respective roles.</p> <p><u>In addition, the National Solid Waste Management Strategy</u></p> <p>The Ministry of Environment and Tourism (MET) has recognised the urgent need to improve solid waste management in Namibia. This National Solid Waste Management Strategy is important to ensure that the future directions, regulations, funding and action plans to improve solid waste management are properly co-ordinated and consistent with national policy, and to facilitate co-operation between stakeholders.</p>	Ministry of Environment, Forestry and Tourism
Atmospheric Pollution Prevention Ordinance No. 11 of 1976	<p>This Ordinance generally provides for the prevention of the pollution of the atmosphere and for matters incidental thereto. The Ordinance deals with administrative appointments and their functions; the control of noxious or offensive gases; atmospheric pollution by smoke, dust control, motor vehicle emissions; and general provisions.</p> <p>Part IV of this ordinance deals with dust control. The Ordinance is clear in requiring that any person carrying out an industrial process which is liable to cause a nuisance to persons residing in the vicinity or to cause dust pollution to the atmosphere, shall take the prescribed steps or, where no steps have been prescribed, to adopt the best practicable means for preventing such dust from becoming dispersed and causing a nuisance.</p> <p>Of applicability to the mining activities, is dust generated by vehicles or equipment as well as dust generated during mining. The risk of dust generation is high at the envisaged site. This deals with air pollution as it affects occupational health and safety, and no consideration is given to the natural environment.</p>	Ministry of Environment, Forestry and Tourism
Soil conservation Act 76 of 1969	The objectives of the Soil conservation Act 76, 1969 are to make provision for the combating and prevention of soil erosion, and for the conservation, protection and improvement of the soil, the vegetation and the sources and	Ministry of Agriculture, Water and Land Reform

	<p>resources of the water supplies.</p> <p>Part II, deals with soil conservation works and it further states that in section 4(1) The Minister may by means of a direction order the owner of land to construct the soil conservation works referred to in such direction either on land belonging to such owner or on land belonging to another person, in such manner and within such period as may be mentioned in such direction, if the Minister is of the opinion that the construction of such soil conservation works is necessary in order to achieve any object of this Act in respect of the land belonging to such owner.</p> <p>Of relevance is the fact that the area has very little disturbances. The proponent should ensure that when new areas will be mined, all the topsoil should be stored separately to ensure the seedbeds are conserved and can be used when rehabilitation of the area is conducted after mining has been completed.</p>	
Hazardous Substance Ordinance 14 of 1974	<p>This Ordinance provides for the control of toxic substance and thus also relevant for pollution control. It covers for the manufacturing, sale, use, disposal, dumping, importing, and exporting of hazardous waste.</p> <p>Of relevance to the proponent are the use of Blasting Abrasives and any other substance or mixture of substances classified under Group I Group II or Group III of hazardous substances.</p> <p>The sale of Group I, and use, operation, application, and installation of Group III hazardous substances are subjected to the provisions of subsection (2).</p>	Ministry of Environment, Forestry and Tourism
Water Resources Management Act 24 of 2004	<p>The Water Resources Management Act (Act 24 of 2004) governs the quality of both fresh- and seawater used for industrial purposes. Restrictions imposed on users are as follows: Any water used for industrial purposes must be purified to standards prescribed by the Minister. Purified or treated effluent must be returned to the source from which it was originally drawn. This may, however, be changed subject to ministerial intervention.</p> <p>Part 9-10 deals with the Water Supply and Licensing of Water Abstraction. The Ministry of Agriculture, Water and Land Reform has the overall responsibility to regulate, control, manage and regulate water resources and to supply water to rural areas through its Directorate of Water Supply and Sanitation Coordination (DWSSC). The Namibia Water Cooperation (NamWater) is responsible for bulk</p>	Ministry of Agriculture, Water and Land Reform

	<p>water supply from primary water sources (dams, aquifers, rivers etc.) to communities whereas private consumers (commercial farmers, mines, tourism operators etc.) have private boreholes for water abstraction.</p> <p>Abstraction of water for domestic use. Section 38 (1) Subject to subsection (3), a person who abstracts water from a water resource for own domestic use is exempted from the requirement for a licence to abstract and use water.</p> <p>Part 13 (70) of the WRA states that no person shall discharge or cause to discharge any substance industrial effluent or any other liquid or substance other than soil water or wastewater or unpolluted water for the purpose of testing the function of the drainage installation or any part thereof during or upon completion construction.</p> <p>Any occupier of a premise from which industrial effluent is discharge into a public sewer, shall: provide overflow detection devices, pre-treatment where necessary to comply with regulations and ensure that no prohibited discharges enter public sewer systems.</p> <p>Since connection to public sewer is not an option in this case, The proponent, shall before occupation make provision for a conservancy tank or a septic tank and absorption field on site. Sanitary systems must be constructed and located in such a way as to prevent a causation of any nuisance or unhygienic or offensive conditions.</p> <p>Sewage or other prohibited discharges should not enter storm water drains or roads. The occupier of any premises shall provide for facilities necessary to prevent any discharge, leakage or escape of such liquids onto any street or any premises or into any storm water drains or watercourse. No person shall cause or permit any storm water to enter any drainage installation on any premises. Inspections may be carried out at any time by the Department for Water Affairs (or a nominee). The Secretary has the power to suspend or restrict operations which may be causing water pollution and to impose certain conditions on the offender.</p>	
<p>Petroleum Products and Energy Act 13 of 1990</p>	<p>Regulations made under the Petroleum Products and Energy Act 13 of 1990 states that: A license or certificate is required for purposes of storing or</p>	<p>Ministry of Mines and Energy</p>

	<p>keeping fuel in a quantity of 200 liters or less in any container kept at a place within a local Authority area or fuel in a quantity of 600 liters or less in any container kept at a place outside a local authority area.</p> <p>These regulations apply, in the case of an above-ground tank, to a storage tank with a capacity of 2,200litres or more and in the case of all below-ground tank, to a capacity with a capacity of 4,560 liters or more. Every license-holder or certificate holder shall about any replacement or installation of a storage tank, or a remaining storage tank, which this regulation applies, and which is in the possession of such license-holder or certificate holder, annually not later than 28 February, duly complete Form PP/10 as set out in Annexure B and shall submit such form together with the information requested therein by the Ministry of Mines and Energy.</p>	
National Heritage Act 27 of 2004	<p>The National Heritage Act 27 of 2004 provide provisions for the protection and conservation of places and objects of national heritage significance, and to register places and objects under that framework. The proponent must ensure that should any archaeological objects defined in the Act be found while mining operations are ongoing, it will be communicated to the National Heritage Act.</p> <p>Cultural heritage is defined as “<i>monuments, [as] architectural works (...), cave dwellings and combinations of features, (...) [but also] sites, as works of man or the combined works of nature and man, and areas including archaeological sites which are of outstanding universal value from the historical, aesthetic, ethnological or anthropological point of view.</i>” Natural heritage is “<i>natural features (...), geological and physiographical (...) [and] natural sites or precisely delineated natural areas of outstanding universal value from the point of view of science, conservation and natural beauty.</i>”</p> <p>Heritage sites, whether included in UNESCO list (World Heritage Site, WHS), are composed of cultural and natural elements of aesthetic and scientific value.</p> <p>Natural and cultural capital are of great scientific, aesthetic and tourism value. Multiple groups of users compete for these assets and resources. They have different interests at stake, and this leads to conflicts over use of resources.</p>	National Heritage Council (NHC)

<p>Labour Act 11 of 2007</p>	<p>To establish a comprehensive labour law for all employers and employees; to entrench fundamental labour rights and protections. Regulate basic terms and conditions of employment; ensure the health, safety, and welfare of employees; to protect employees from unfair labour practices; to regulate the registration of trade unions and employers' organisations; to regulate collective labour relations; to provide or the systematic prevention and resolution of labour disputes.</p> <p>Some of the notable Sections under this Act are.</p> <p>Health and Safety Procedures Section 17 (1) The employer shall prepare any health and safety procedure referred to in sub regulation (1) in consultation with the work-place safety committee concerned.</p> <p>Section 21. (1) Any person who intends to commence any mining operation shall give 30 days' notice of such intention to the Minister.</p> <p>Section 22. (1) In the event of an accident or dangerous occurrence in or in connection with a workplace, including a mine, or if an employee dies, or suffers a serious injury because of such an accident or dangerous occurrence, the employer shall notify and report such accident to the Chief Inspector of Labour of the area.</p> <p>Notification of Occupational Diseases, Section 23. If a medical practitioner finds that any person is suffering from any occupational disease listed in Annexure A.2(1), or of any other disease that he or she believes was caused by that person's current or past employment, he or she shall immediately and in the form of Form OD. 1, report this fact to the Chief Medical Officer of Occupational Health and Safety.</p> <p>It shall be an unfair dismissal, or unfair disciplinary action, in terms of section 45 by an employer if such employer terminates the services of, or takes disciplinary action against, such employee, if such employee has contracted an occupational disease listed in Annexure A.2 (1), or any other disease, because of his or her past or present employment with such employer.</p>	<p>Ministry of Labour and Employment Creation</p>
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	Section 210, states that an employer shall ensure that an employee wears or uses, to the satisfaction of an inspector, suitable and adequate personal protective equipment. All employment issues should be handled in accordance with relevant Sections of the Labour Act.	
Human Wildlife Conflicts Policy	<p>The policy defines Human Wildlife Conflicts as Human “conflicts between wild animals and humans. This ranges from the destruction of crops and water installations to loss of livestock, homes and in some cases loss of human lives. Human Wildlife Conflict occurs throughout Namibia on communal as well as freehold land and involves a variety of species. The main problems occur on the land where the most elephants and predators are found outside protected areas and where people are least able economically to bear the costs of damage and losses.</p> <p>The Policy objectives is to manage human wildlife conflict in a way that recognizes the rights and development needs of local communities, recognizes the need to promote biodiversity conservation, promotes self-reliance and ensures that decision-making is quick, efficient, and based on the best available information.</p> <p>The Revised National Policy on Human Wildlife Conflict Management is based on several fundamental principles as stated under Section 5.1 to 5.13.</p>	Ministry of Environment Forestry and Tourism
Nature Conservation Act 5 of 1996	<p>The Act provides amendments to various Sections of the Nature Conservation Ordinance of 1975. One such amendments was the requirements to be complied with for the recognition of conservancy committees and the declaration of conservancies, and any restrictions and conditions to which a conservancy committee shall be subject.</p> <p>The Act provides for and promote the maintenance of ecosystems, essential ecological processes, and Namibia biodiversity and to promote the mutually beneficial co-existence of humans with wildlife as well as to give effect to Namibia’s international obligations to legal instruments such as the Convention on Biological Diversity.</p> <p>The Act also recognizes that biodiversity must be maintained, and where necessary, rehabilitated and that essential ecological processes and life support systems must be maintained.</p>	Ministry of Environment Forestry and Tourism
Arms and Ammunition Act 7 of 1996.	<p>To provide for control over the possession of arms and ammunition; to regulate the dealing in, importation, exportation, and manufacture of, arms and ammunition; and to provide for incidental matters.</p> <p><u>The relevant provisions under this Act are as follows.</u></p>	Ministry of Safety and Security

	<p>According to this Act an “ammunition” means any cartridge or percussion cap intended for use in the discharge of an arm.</p> <p>CHAPTER 5: Manufacture of Arms and Ammunition</p> <p>Prohibition of unauthorized manufacture of ammunition</p> <p>26. (1) Subject to subsection (2), no person shall manufacture ammunition or any explosive component of ammunition except -</p> <p>(a) in an explosives factory licensed under the Explosives Act, 1956 (Act 26 of 1956); and</p> <p>(b) under the authority of and in accordance with a permit issued under section 27.</p> <p>(2) Subsection (1) shall not apply to the loading or reloading of cartridges by the holder of a licence to possess an arm, for use in such arm.</p>	
<p>Explosives Act 1956 Act 26 of 1956</p>	<p>Provides for authorization of certain group of explosives, manufacture, storage, use and licensing of explosives.</p> <p><u>Authorized explosives in Namibia</u> <i>gunpowder, nitro-glycerine, dynamite, guncotton, blasting powders, fulminate of mercury or of other metals, coloured fires, and every other substance, whether like those herein mentioned or not, which is used or manufactured with a view to produce a practical effect by explosion or a pyrotechnic effect.</i></p> <p>Most of the products listed here are old fashioned and have been replaced with modern generation products such as emulsions, watergels and cartridge products.</p> <p><u>Prohibition of storage or possession of unauthorized explosives save in accordance with section three.</u> Section (1) states that No person shall keep, store or be in possession of any unauthorized explosive unless it has been manufactured as provided by subsection (1) of section three and is kept, stored or possessed in such manner and in such quantities as have been approved in writing by an inspector.</p> <p><u>Prohibition of storage of authorized explosives except in licensed premises</u> No person shall keep, store or be in possession of, any authorized explosive in or on any premises unless authorized thereto by a permit issued by an inspector and the explosive be kept in quantities not exceeding 500 kilograms in weight and be stored in an isolated place approved by an inspector and under conditions prescribed in writing by an inspector.</p>	<p>Ministry of Safety and Security</p>

	<p><u>Licence necessary to deal in explosives.</u> (1) No person, other than the manufacturer, shall sell or deal in any explosive unless he is in possession of a licence granted under the regulations, which shall be in addition to any other licence which may be required in terms of any other law.</p>	
<p>Controlled Wildlife Products and Trade Act 9 of 2008</p>	<p>Aim: To provide for the implementation of the Convention on International Trade in Endangered Species of Wild Fauna and Flora; and to provide for incidental matters. Of relevance to the proposed activities are.</p> <p>Section 4: Possession of and dealing with controlled wildlife products. (1) Any person who - (a) possesses any controlled wildlife product the possession of which is unlawful in terms of Schedule 1. (b) deals in any controlled wildlife product if the dealing therein is unlawful in terms of Schedule 1. (c) manufactures anything from a controlled wildlife product if such manufacture is unlawful in terms of Schedule 1., commits an offence unless he or she has been issued with a permit contemplated in subsection (3) authorising the act in question and unless he or she complies with the conditions specified in the permit.</p> <p>SCHEDULE 1: CONTROLLED WILDLIFE PRODUCTS (Section 1). Subject to paragraph 2 and 3 no person may possess, manufacture any object from, deal in, import into, or export from Namibia any tusk, horn, head, ear, trunk, skin, tail or foot or any part thereof, of any elephant or rhinoceros, or any part of any species or other specimen mentioned in Appendix I unless the action in question is authorised by a permit.</p>	<p>MEFT Directorate of Scientific Services (DSS)</p>

5.4 Legislation of international significance

a) Convention on wetlands and biological diversity

The Convention on Wetlands of International Importance, especially as Waterfowl Habitat of 1971 (Ramsar) aims primarily to prevent the loss of wetlands, to promote the wise use of these, and to give special protection to listed wetlands. The Convention stresses a habitat-type approach rather than a species-specific approach.

The primary goal of the Convention on Biological Diversity of 1992 is the conservation of biodiversity. The causes of threats to biodiversity should be anticipated and prevented, and the precautionary principle should be applied. Parties to the convention are obliged to:

- Establish a network of protected areas.
- Create buffer areas adjacent to these protected areas using environmentally sound and sustainable development practices; and
- Rehabilitate degraded habitats and populations of species.

b) Convention on Combat Desertification (CBD)

The convention recognized that the conservation of biological diversity is “a common concern of humankind” and is an integral part of the development process. The agreement covers all ecosystems, species, and genetic resources. It links traditional conservation efforts to the economic goal of using biological resources sustainably. It sets principles for the fair and equitable sharing of the benefits arising from the use of genetic resources, notably those destined for commercial use.

The objectives of the CBD are:

- The conservation of biological diversity,
- The sustainable use of its components and
- The fair and equitable sharing of the benefits arising out of the utilization of genetic resources, including by appropriate access to genetic resources and by appropriate transfer of relevant technologies, considering all rights over those resources and to technologies, and by appropriate funding.

Conservation of species and ecosystem to combat the increasing rate of loss of biological diversity is one of Namibia’s challenges due to a heavy reliance on natural resources and ecosystem goods and services. In the interest of the welfare of the people, the state has adopted policies aimed at maintaining ecosystems, ecological processes, and biodiversity for the benefit of present and future generations. Direct impact on biodiversity is minimal but a precautionary approach is necessary to ensure those disturbances are avoided.

6. ASSESSMENT OF ENVIRONMENTAL IMPACTS

6.1 Rating of environmental impacts

A summary of the potential impacts associated with the proposed mining activities are presented in this chapter, as well as the suggested mitigation measures required to ensure impacts are managed effectively. Within the accepted broad definition of the term “environment” that applies to Environmental Impact Assessments, it is required to assess potential impacts of both socio-economic and biophysical aspects.

Table 6: Assessment criteria

CRITERIA		DESCRIPTION			
EXTENT	National (4) The whole country	Regional (3) Otjozondjupa region and neighbouring regions	Local (2) Within a radius of 2 km of the mining site	Site (1) Within the mining site	
DURATION	Permanent (4) Mitigation either by man or natural process will not occur in such a way or in such a time span that the impact can be considered transient	Long-term (3) The impact will continue/last for the entire operational life of the development but will be mitigated by direct human action or by natural processes thereafter.	Medium-term (2) The impact will last for the period of the operation phase, where after it will be entirely negated	Short-term (1) The impact will either disappear with mitigation or will be mitigated through natural process in a span shorter than the operation phase	
INTENSITY	Very High (4) Natural, cultural, and social functions and processes are altered to extent that they permanently cease	High (3) Natural, cultural, and social functions and processes are altered to extent that they temporarily cease	Moderate (2) Affected environment is altered, but natural, cultural, and social functions and processes continue albeit in a modified way	Low (1) Impact affects the environment in such a way that natural, cultural, and social functions and processes are not affected	
PROBABILITY	Definite (4) Impact will certainly occur	Highly Probable (3) Most likely that the impact will occur	Possible (2) The impact may occur	Improbable (1) Likelihood of the impact materialising is very low	
SIGNIFICANCE	Is determined through a synthesis of impact characteristics. Significance is also an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. The total number of points scored for each impact indicates the level of significance of the impact.				

Table 7: Impacts significance rating

Low impact	A low impact has no permanent impact of significance. Mitigation measures are feasible and are readily instituted as part of a standing design, construction, or operating procedure.
Moderate impact	Mitigation is possible with additional design and construction inputs.
High impact	The design of the site may be affected. Mitigation and possible remediation are needed during the construction and/or operational phases. The effects of the impact may affect the broader environment.
Very high impact	Permanent and important impacts. The design of the site may be affected. Intensive remediation is needed during construction and/or operational phases. Any activity which results in a “very high impact” is likely to be a fatal flaw.
Type	Denotes the perceived effect of the impact on the affected area.
Positive (+)	Beneficial impact
Negative (-)	Deleterious or adverse impact.
Neutral (/)	Impact is neither beneficial nor adverse
It is important to note that the status of an impact is assigned based on the status quo should the project not proceed. Therefore, not all negative impacts are equally significant.	
<p>Significance Rating Scale</p> <p>Points 1-4 Insignificant/low impact</p> <p>Points 5-8 Significant /Moderate</p> <p>Points 9-12 Very significant/High impact</p> <p>Points 13-16 Highly significant /Very high impact</p>	

6.2 Anticipated biophysical impacts.

Below are possible negative impacts of the proposed mining activities on the biophysical environment. The significance of each impact has been rated before and after mitigations measures. The implementation of mitigations is expected to reduce the significance of impacts by means of at least two (2) scales.

➤ Vegetation losses and destruction

The proposed mining activities pose serious negative impacts to the local flora through vegetation clearance, trampling, dust generation, soil disturbance and veld fire. This is a main concern given the succulent diversity, endemism, and threatened plant species of the area.

Impact Type	Ratings (before mitigation/measures)				Significance	
	Extent	Duration	Intensity	Probability	Without measures	With measures
Negative	1	2	2	2	7	5

Mitigation measures

- Areas with abundance of species of concerns should be considered as No-go zones and must be avoided at all costs.
- Conduct a search rescue mission within the proposed mine footprint area. This should be done in collaboration with the NBRI prior to the commencement of mining activity
- Disturbances should be limited to the mine footprint area.
- Existing track roads should be used as far as possible.
- Fireplaces should be secured and must be under control
- Ensure progressive rehabilitation of the disturbed area as per the attached Mining Rehabilitation Plan, appended to the EMP.
- Appoint an Environmental Control Officer to conduct regular monitoring of mining activities

➤ Disturbance to the local fauna

The area is home to an abundance of wildlife of which about 10 species are of conservation concern. Potential impacts to the local fauna will be as a result of habitat fragmentation, trapping of small animals, risk of falling in the un-rehabilitated excavations as well as nuisance from excessive dust, noise and vibration. Other impact could be in the form of human-wildlife conflicts (HWC) that could also lead to poaching.

Impact Type	Ratings (before mitigation/measures)				Significance	
	Extent	Duration	Intensity	Probability	Without measures	With measures
Negative	2	2	1	2	7	5

Mitigation measures

Poaching of both small and large wildlife is prohibited and is a punishable act. Rehabilitation of the disturbed areas should be encouraged as far as possible. Vehicles should be driven at minimum driving speed of 40km/hr within the farm area and 60km/hr on gravel road. The possession of and dealing with controlled wildlife products is prohibited under the Controlled Wildlife Products and Trade Act 9 of 2008. All human-wildlife conflicts should be reported to MEFT and should be handled in accordance with the HWC policy.

➤ **Destruction of topography and landscapes**

The area is consisting of different landscapes and varying topographies. These landscapes serve as source of attractions and landmarks in the area. Mining activities have potential to cause surface disturbances of the natural landscapes, reduce the aesthetic view thus, degrading the sense of the place.

Impact Type	Ratings (before mitigation/measures)				Significance	
	Extent	Duration	Intensity	Probability	Without measures	With measures
Negative	2	2	1	2	7	5

Mitigation measures

Important local viewpoints and landscape features should be identified and spared from mining activities as far as possible. Blasting should be carried out by experienced and registered blasting companies only.

➤ **Ecological degradation**

Ecological settings refer to the processes and interconnectedness which support a variety of life and functioning of the natural ecosystem. Ecological settings are vital for sustaining life of trees, wild animals, livestock, and people. Habitats affected by the mining activities are open gravel plains, inselberg and rocky ridges. The mining activities are likely to cause fragmentations of the natural habitats, disturb soil profile, pollute the environment, and disrupt ecological processes and the entire ecosystem functioning.

Impact Type	Ratings (before mitigation/measures)				Significance	
	Extent	Duration	Intensity	Probability	Without measures	With measures
Negative	2	2	2	2	8	6

Mitigation measures

Disturbances should be limited to the mine footprint and areas with abundance of species of concerns should be considered as no-go areas. Ensure progressive rehabilitation of the disturbed areas and a search and rescue of species of concerns that are directly affected by the mining activities.

➤ **Soil erosion and contamination**

Soil disturbances occurs through the removal of topsoil and overburden during the mining process. De-vegetation of the area due to mining will increase soil erosion by wind or water and increase suspended sediment loads in nearby streams and rivers. Other impacts on soil are the possible contamination from spillage, leakages, and direct discharge of pollutant in the soil.

Impact Type	Ratings (before mitigation/measures)				Significance	
	Extent	Duration	Intensity	Probability	Without measures	With measures
Negative	1	2	2	2	7	5

Mitigation measures

The topsoil should be properly and securely stockpiled and not be mixed with overburdens and should be backfilled after mining. Avoid trampling of highly vegetated areas by making use of existing routes instead of creating new ones. Soil conservation measures such as berms, gabions should be used on-site to help reduce erosion and any erosion incidence should be contained as soon as possible.

Vehicles and Equipment with oil leaks should be properly maintained. Spillage or leakage should be contained, and contaminated soil should be carefully removed and disposed of at the nearest dumpsite.

➤ **Disturbance to local geology**

As such, mining activities are likely to cause unintended disturbances to the local geology and geomorphology.

Impact Type	Ratings (before mitigation/measures)				Significance	
	Extent	Duration	Intensity	Probability	Without measures	With measures
Negative	1	2	2	2	7	5

Mitigation measures

- ✓ The mining activities should be conducted inline the geological report
- ✓ A comprehensive Mining Plan should be developed and submitted to MME for approval prior to the mining operations
- ✓ Blasting should be carried out by experienced and registered companies

➤ **Increased water demand**

Due to the limited availability of freshwater in the area, the proposed activities will put immense pressure on the available water resources. The situation is likely to become untenable in case of a full-scale mining operation.

Impact Type	Ratings (before mitigation/measures)				Significance	
	Extent	Duration	Intensity	Probability	Without measures	With measures
Negative	2	2	2	2	8	6

Mitigation measures

- ✓ Water should also be used sparingly and when necessary recycled for other least essential activities such as dust suppression.
- ✓ Drill of borehole(s) in the area is subjected to an Abstraction Permit from the Directorate of Water Supply and Sanitation Coordination (DWSSC).
- ✓ Contamination of water sources both surface and groundwater should be avoided at all costs. Mining areas and camping sites should be provided with ventilated improved (VIP) latrines or portable toilets connected to a septic tank.
- ✓ Permits to install septic tanks should be obtained from the Ministry of Agriculture and Land Reform (Directorate of Sanitation). Spillage or leakage should be contained, and contaminated soil should be carefully removed and disposed of.

➤ **Contamination of surface and groundwater sources**

The impacts of excavations may influence the direct loss of stream reserve habitat, cause disturbances of species attached to streambed deposits, reduce light penetration, reduce primary production, and reduce groundwater recharge opportunities. Potential pollution of groundwater can also occur through acid mine drainage, poor sanitation, contamination of soil and uncontrolled discharge of mining waste and other pollutants in the ground.

Impact Type	Ratings (before mitigation/measures)				Significance	
	Extent	Duration	Intensity	Probability	Without measures	With measures
Negative	2	1	2	2	7	5

Mitigation measures

Care must be taken when selecting and locating the waste handling facilities. Avoid locating waste facilities in riverbeds or slope areas or area with heavy drainage. All mining areas must be rehabilitated upon mine closure and all discharge must be properly disposed as per the Minerals (Mining and Prospecting Act), of 1992 and the Environmental Management Act, of 2007.

➤ **Air pollution**

The major sources of air pollution are fugitive dust from excavations, loading, transportation, hauling of waste rocks, as well as wind erosion of open pits and silt heaps from the processing operation. Exposure to dust is a potential health risk because inhalation of fine dust particles can damage the lungs and lead to chronic obstructive pulmonary disease. Wind can disperse inhalable dust from the project site over settlements and farming areas that are nearby.

Another impact of dust deposition is on the environment. The most obvious effect will be observed on vegetation next to the roads or in the vicinity of the mining areas. Dust covers the surfaces of leaves, blocking stomata, reducing plant photosynthesis thus causing retard growth of local vegetation.

Impact Type	Ratings (before mitigation/measures)				Significance	
	Extent	Duration	Intensity	Probability	Without measures	With measures
Negative	2	2	2	2	8	6

Mitigations measures

The area is already prone to strong wind conditions which often carries the exposed dune sand of the local sand plains. However, the proponent should prevent further contribution to dust emission from the mining operations. The first step to control dust is to identify and monitor all dust emission sources. An inventory for all dust generation sources should be established and mitigation measure from each potential source should be proposed. Proper maintenance of equipment should also be ensured at contractual basis. Visual observations and dust monitoring should be used to identify additional problem areas and quantify dust emissions levels.

Another important part of air quality management is the collection of climate data on wind direction. This is because wind patterns determine the extent and direction of dust plumes. The prevailing wind directions in the area are southerly, south-westerly, and north-easterly. Controlling of dust emission is also a legal requirement in terms of certain legislations as outlined below.

Legal compliance aspects

The following compliance standards are applicable to dust emission:

- The Atmospheric Pollution Prevention Act (No 45 of 1965), which is still applicable in Namibia requires that *“any person carrying out an industrial process which is liable to cause a nuisance to persons residing in the vicinity or to cause dust pollution to the atmosphere, shall take the prescribed steps or, where no steps have been prescribed, to adopt the best practicable means for preventing such dust from becoming dispersed and causing a nuisance.”*
- The Namibian Labour Act’s Health & Safety Regulations set the following limits for personal exposure over 8 hours’ time-weighted average:
 - Total particulates of **10 mg/m³**.
- The Public Health and Environmental Act 1 of 2015, requires preventing the occurrence of a health nuisance, unhygienic condition, an offensive condition, or any condition which could be harmful or dangerous to the health of a person.

➤ **Land degradation**

Land degradation is one of the most significant impacts associated with any mining activities. This often occur as a result of destruction and disturbances of the vegetation during mining process. If no rehabilitation is done on the mined area, opportunistic and invader species could take over the area.

Impact Type	Ratings (before mitigation/measures)				Significance	
	Extent	Duration	Intensity	Probability	Without measures	With measures
<i>Negative</i>	2	2	2	2	8	6

Mitigation measures

- Areas with abundance of species of concerns should be considered as No-go zones and must be avoided at all costs.
- Conduct a search rescue mission within the proposed mine footprint area. This should be done in collaboration with the NBRI prior to the commencement of any activity
- Appoint a Botanist to conduct a Search and Rescuer mission in the mining area
- Disturbances should be limited to the mine footprint area.
- Existing track roads should be used as far as possible. Creation of new access roads (if need be) should be done in consultation with MEFT
- Fireplaces should be secured and must be under control
- Ensure progressive rehabilitation of the disturbed area

6.3 Anticipated socio-economic impacts.

The proposed mining activities are also associated with several negative impacts to the socio-economic environment. Unlike the biophysical impacts, the socio-economic impacts are likely to affect greater geographic area e.g., constituency, regional and national.

➤ **Public health and safety**

Public health hazards associated with the mining activities are such as Blasting, Excavation and Nuisance.

Blasting

Blasting in mining operations produces critical health hazards such as noise, dust, noxious gases, vibration etc. Other public health and safety concerns of blasting is explosions, from premature or delayed detonation of blasting explosives, damage to properties and danger of flying or falling rocks from poor handling of explosions.

Impact Type	Ratings (before mitigation/measures)				Significance	
	Extent	Duration	Intensity	Probability	Without measures	With measures
Negative	1	2	1	2	6	4

Mitigation measures

The area is isolated and no settlement in the close proximity. The movement of people in the area is also limited.

- Only use explosives listed under the Explosives Act of 1956.
- Use abrasives that can be delivered with water (slurry) to reduce dust.
- Blasting should ONLY be carried out by a registered company/person.
- No major blasting should take place for sites within 1000 m from residential areas.
- Do not keep explosions more than 500kg onsite
- Explosions must be kept and transported by licenced persons only.
- Explosions must be kept at cool, dry, and well-ventilated magazines.
- Keep people and animal away from the blasting area.

Excavations

Uncovered excavations, pits and trenches from mining activities are safety hazards for animal and humans. People and animals are at risk of falling or being trapped into the un-rehabilitated pits and trenches.

Impact Type	Ratings (before mitigation/measures)				Significance	
	Extent	Duration	Intensity	Probability	Without measures	With measures
Negative	1	2	1	2	6	3

Mitigation measures

- Excavated areas must be backfilled and properly rehabilitated.
- If possible, avoid wildlife migration corridors.
- Sensitive areas should be avoided.

Nuisance

Nuisances are broadly defined as any condition which is offensive, injurious, or dangerous to health. This impact is subjective based on the public perceived views. It will also depend on the concerned person’s perception of what constitutes a nuisance. According to the National Labour Act 11 of 1992, a nuisance is described as noise, dust, vibration, and odour.

Mining activities that may contribute to nuisance include excavation, backfilling, blasting and the operation of heavy equipment.

Exposure to excessive noise levels can lead to:

- Prevention of sleep, insomnia, and fatigue.
- Decrease in speech reception, communication, distraction, and diminished concentration thus adversely affecting job performance efficiency.
- Chronic psychological disturbance including impaired hearing.
- Irreparable cardiovascular, respiratory, and neuralgic damages in certain extreme cases.

Impact Type	Ratings (before mitigation/measures)				Significance	
	Extent	Duration	Intensity	Probability	Without measures	With measures
Negative	1	1	1	1	4	2

Mitigation measures

- Large scale blasting should not be conducted at places closer to residential areas, otherwise residents should be informed prior to blasting.
- Noise level at semi-mechanized sites should not exceed 85db (Health and Safety Regulations No.156).
- Provide regular maintenance of all equipment/ machines to reduce noise generation.
- All affected community should be informed in advance.
- Activities should not be carried out during odd hours and should be limited to daylight.

➤ **Possibility of fire outbreaks**

One of the most critical issues is with regards to the use and storage of fuel for mining purposes. Fuel is regarded as a hazard and if not properly handled, could cause fire outbreaks and damage to properties, especially if stored in large quantity.

Impact Type	Ratings (before mitigation/measures)				Significance	
	Extent	Duration	Intensity	Probability	Without measures	With measures
Negative	1	1	1	1	4	2

Mitigation measures

Only fuel less than 200 L can be kept onsite in line with the Petroleum Products Regulations of 2000. Fuel should be kept on approved metal containers which are properly sealed. The refuelling of vehicles and machineries onsite should be done on a site with an impervious surface.

➤ **Visual appeal and aesthetics**

The proposed mining activities generate excessive dust which causes visual intrusion in the area. Structures, temporary housing, and excavated pits may also be visible from the road and not necessarily visually attractive to tourists or visitors to the area.

Impact Type	Ratings (before mitigation/measures)				Significance	
	Extent	Duration	Intensity	Probability	Without measures	With measures
Negative	1	2	2	2	7	5

Mitigation measures

Minimise dust emission activities and ensures dust control measures. Temporary structures should be made of locally available materials and should be comparable to the local landscapes. If lighting is to be used onsite, it should be installed in such a manner that it does not cause annoyance to the local wildlife, residents, and visitors.

➤ **Waste generation**

Mining activities will generate a variety of waste matrix such as waste rocks, litter, scrap metals, and sewage waste. Improper handling of these waste matrix is likely to cause a range of environmental impacts e.g., contamination of fresh water sources, soil contamination, sedimentation of river streams, pollution of the surrounding environment etc.

Impact Type	Ratings (before mitigation/measures)				Significance	
	Extent	Duration	Intensity	Probability	Without measures	With measures
Negative	1	2	2	2	7	5

Mitigation measures

- ✓ Waste rocks and overburdens should not be placed in riverbeds or on areas with high grazing potential. Topsoil should be kept separate to be used as backfilling material
- ✓ General waste generated on site should be gathered, collected regularly and properly dumped at the nearest Municipal or approved disposal site i.e. Okahandja
- ✓ Hazardous waste e.g., used oil, batteries generated should be collected and transported to specialized waste collectors or to Windhoek or Walvis Bay landfill site for proper dumping.
- ✓ Unwanted and old temporary structures not in use must be removed from the site and disposed of by the responsible person.
- ✓ The camping site must be equipped with Ventilation Improved (VIP) latrines or portable toilets connected to a septic tank. No spillage or discharge of sewage should be allowed in the environment and in case of accidents, corrective actions should be implemented to remedy such spillages.

➤ **Land use effects**

Some land use conflicts between the Proponent, farmers and residents if there is no adherence to the agreement or if there is any competition over limited resources.

Impact Type	Ratings (before mitigation/measures)				Significance	
	Extent	Duration	Intensity	Probability	Without measures	With measures
Negative	1	1	1	1	4	2

Mitigation measures

Activities have been taking place in this area and no land-use related conflicts have been experienced before. However, the proponent must

- ✓ Ensure adherence to the agreement with the farmers
- ✓ All human-wildlife conflicts (if occur) should be handled in terms of the Human-Wildlife Policy
- ✓ Maintain good communication with all parties involved through regular meetings

➤ **Impacts from temporal housing for employees.**

No permanent structures should be erected in the area. Temporary structures in the form of tents and other movable items that are comparable to the local landscapes are allowed. Employees residing at the mining site might be at risks of dangerous predators such leopards etc.

Impact Type	Ratings (before mitigation/measures)				Significance	
	Extent	Duration	Intensity	Probability	Without measures	With measures
Negative	1	2	2	2	7	5

Mitigation measures

Majority of the employees will be housed at the company house at Okondjatu

- ✓ Establishment of temporary housing on the farm area (if need be) should be agreed with the farm owner beforehand.
- ✓ No settlement should be allowed in wildlife corridors, habitats or near water points.
- ✓ Movement of people during night hours should be limited
- ✓ Fireplaces should be at secure sites and the fire should be put out after use.

➤ **Influx of people to the area**

The proposed mining activities is likely to attract an influx of people from different parts of the country in search for better opportunities. The influx of people could result into secondary impacts such as spread of HIV/AIDS, theft, poaching etc. Uncontrolled movement of people could also result in pressure on local available resources such as land, water, energy.

Impact Type	Ratings (before mitigation/measures)				Significance	
	Extent	Duration	Intensity	Probability	Without measures	With measures
Negative	1	1	1	1	4	2

Mitigation Measures

- ✓ Local people should be given first priority to minimise movement of people from other parts of the country
- ✓ The camp site and mining site should not be a place of abodes, hence only people who are actively involved in mining should be allowed to stay there.

➤ **Traffic related impacts**

The affected area is frequented by farmers and villagers. There will be an increase in the traffic flow, especially for the heavy vehicles from in and around the area during operating hours.

Impact Type	Ratings (before mitigation/measures)				Significance	
	Extent	Duration	Intensity	Probability	Without measures	With measures
Negative	1	2	1	2	6	4

Mitigation measures

There is already an access route which connects the site to the main trunk road (B4).

- ✓ Existing farm road should be used as far as possible
- ✓ All vehicles should be driven at the required speed limits
- ✓ All heavy vehicles should be tagged with reflective tags

➤ **Occupational safety and health impacts**

Like in other mining activities, employees are exposed various occupational health during operations. The most common hazards associated with mining activities are listed under item 3.7 of this document. The exposure to these hazards can be aggravated by certain risks factors such as lack of the experience & limited knowledge, nature of work and non-compliance to health and safety standards.

Impact Type	Ratings (before mitigation/measures)				Significance	
	Extent	Duration	Intensity	Probability	Without measures	With measures
Negative	1	2	1	2	6	4

Mitigations measures

The first step in preventing occupational health safety risks is to identify the potential hazards. To eliminate potential hazards and reduce the likelihood of potential risks the following measures should be implemented.

- All explosives must be transported, stored, and used by an experienced person in accordance with relevant regulations.
- All employees should also register themselves with the Social Security Commission (SSC).
- All employees should be subjected to regular health check-ups at the nearest health centre.
- Employees should be equipped with proper PPE suitable for each job.
- Consider the use of available technologies to reduce the workload.
- Regular inspections by the relevant inspectors such as Labour, Mines and NAMPOL.
- Ensure adherence to hazard exposure limits as listed under the National Labour Act 11 of 2007 as follows.

Potential hazard	Legal exposure limits/daily
Dust	0.1 mg/m ³
Noise	85dB
Vibration	5 m/s ²
Working time	8hrs.

➤ **Impacts on archaeology, culture, and heritage.**

There are no materials or area of archaeological or cultural importance within the area earmarked for mining.

Impact Type	Ratings (before mitigation/measures)				Significance	
	Extent	Duration	Intensity	Probability	Without measures	With measures
Negative	1	1	1	1	4	2

Mitigation measures

There are no archaeological sites within or in close proximity to the area of interest and the area earmarked for ox-wagon route will be identified by means of a concession to be operated under the auspicious of the MEFT. Hence,

- ✓ The proponent should ensure good communication with MEFT and the Concession operator
- ✓ Should there be sites or materials of archaeological importance uncovered during mining, such incidences should be reported to the National Heritage Council (NHC).

➤ **Impacts on local tourism.**

The operation could interfere with the tourism activities or destructions caused by the mining operations could reduce tourism potential of the area.

Impact Type	Ratings (before mitigation/measures)				Significance	
	Extent	Duration	Intensity	Probability	Without measures	With measures
Negative	2	2	2	1	7	5

Mitigations

The proponent must ensure progressive rehabilitation of the disturbed area, ensure proper and regular waste management as outlined in the EMP and ensure proper decommissioning when the mining activities deemed unproductive or when the operation cease.

➤ **Gender roles implications.**

The proposed mining activities are likely to contribute to the increase in female headed households because such infield activities are carried out mostly by men. Thus, most men leave their villages and homesteads for temporary settlements at mining sites.

Impact Type	Ratings (before mitigation/measures)				Significance	
	Extent	Duration	Intensity	Probability	Without measures	With measures
Negative	2	2	2	2	8	6

Mitigation measures

Females can equally benefit from these activities such as in office, administration or in similar roles as men where possible.

6.4 Potential positive impacts

Apart from the identified negative impacts, the proposed mining activities also provides an array of socio-economic benefits. However, certain enhancement measures should be implemented to fully realize these benefits.

6.4.1 Socio-economic benefits

✓ Employment opportunities

The proposed mining activities will create employment opportunities for local people

✓ Secondary opportunities

The proposed mining activities will also create indirect employment and business opportunities in areas such as logistic, supplies, consulting etc.

✓ Livelihood

The proposed activities will generate source of livelihood and economic wellbeing to many families through employment opportunities (both direct and indirect) and income generation.

✓ Foreign Exchange and GDP Contribution

The envisaged mining operations have potential to contribute to the mainstream economy through Gross Domestic Product (GDP) and earn foreign exchange through international markets. However, majority of Namibia's mineral resources are sold as raw products and only get processed abroad, the finished products are often not marketed as Namibian products.

6.5 Enhancement measures

The proponent should explore possibilities of mineral beneficiation and value addition within the country and discourage export of unprocessed minerals. This will create more opportunities and increase the sector's contribution to the country's GDP.

6.6 Summary of identified negative impacts.

Below is a summary of identified potentials impacts and their overall significance after mitigation measures.

Table 8: Significance of impacts

Potential Impacts on Environmental Receptors	Significance of impacts (After mitigations)
A. Impacts on Biophysical environment	
Vegetation losses and destruction	Moderate
Disturbance to Fauna	Moderate
Disturbance to topography and landscapes	Moderate
Ecological degradation and habitat fragmentation	Moderate
Soil erosion and contamination	Moderate
Disturbance to local Geology	Moderate
Increase water demand	Moderate
Contamination to surface and groundwater sources	Moderate
Air pollution	Moderate
Land Degradation	Moderate
B. Impacts on Socio-economic Environment	
Public health and safety	Moderate
Possibility of fire outbreaks	Low
Visual impacts	Moderate
Land use effects	Moderate
Waste Management	Moderate
Impacts of temporary infrastructures	Moderate
Influx of People	Moderate
Traffic impacts	Moderate
Occupational Health Impacts	Moderate
Impacts on Archaeological, Culture and Heritage	Low
Impacts on local tourism	Low
Impacts on Gender roles	Moderate

7. CONCLUSIONS, CONDITIONS AND RECOMMENDATIONS

7.1 Conclusion

The objective of this EIA study was to establish the baseline of the affected environment, solicit inputs from stakeholders and Interested and Affected Parties to define the range of the environmental impact assessments and determine any gap of information that require further studies. It is believed that this objective has been achieved and adequately documented in this report. All possible environment aspects associated with the proposed mining activities have been adequately assessed and necessary control measures have been formulated to meet statutory requirements. The following conclusions can be drawn from this EIA study.

- There are similar mining activities taking place within the area, hence, the proposed activities will not exacerbate the generic environmental impacts associated with mining activities provided that the identified measures are duly implemented.
- Considering the fact that the existing mine infrastructure will be used, it is expected that the proposed mining activities will have minimal ecological footprints.
- The current good relationship between the proponent, the private farmers and the entire community can be relied on.

7.2 Recommendations

To the proponent: Lizzie Caroline Armstrong and its partners (Otjozonde Mining (Pty) Ltd)

- ❖ Training should be provided to all employees (both old and new) and such proof be provided to the MEFT
- ❖ Adherence to the agreement between the proponent and the farmer
- ❖ No boreholes should be drilled at the area without prior approval from MEFT
- ❖ Ensure progressive rehabilitation of the disturbed area as per the attached Mining Rehabilitation Plan, appended to the EMP.
- ❖ Appoint an Environmental Control Officer to conduct regular monitoring of mining activities
- ❖ Acquire all necessary legal documents i.e., permits, required for the mining and conduct its activities in line with the Prospecting and Mining Act
- ❖ Comply with all other legislations as listed in Section of this report
- ❖ Ensure the implementation of the EMP during the life span of the proposed project/activities
- ❖ Notify the competent authority and regulatory authority of any changes or amendments to the initial proposed mining methods to be used and affect changes on the EMP
- ❖ Appoint an Environmental Control Officer to ensure the implementation of the EMP, conduct monitoring and provide biannual environmental reports to the regulatory authority.
- ❖ Appoint a Botanist/Horticulturist to implement the Search and Rescue management Plan
- ❖ Ensure effective communication with competent authority and/or regulatory authority to ensure a good working relationship at all times.

To the competent authority (MME) and regulatory Authority (MEFT)

- ❖ Approve the findings of the EIA study, ecological study and mitigation measures contained in the EMP.
- ❖ Conduct regular meetings or other form of communication with proponent to ensure a good working relationship at all times.
- ❖ When deemed necessary, attach any other condition/s to ensure environmental compliance and for the proposed project to meet statutory requirements.

8. REFERENCES

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9. APPENDICES

Appendix A: CV for the EAP

Appendix B: Proof of Consultations

Appendix C: Farmers agreement

Appendix D: Environmental Management Plan (EMP)