



Excel Dynamic Solutions (Pty) Ltd

Environmental Scoping Assessment (ESA) for Base & Rare Metals, Industrial Minerals, Non-Nuclear Fuel Minerals, Nuclear fuel Minerals, and Precious Metals on Exclusive Prospecting Licenses (EPLs) No. 8273, 8274, 8275, 8276, 8277, 8278, 8279, 8280 near Mariental in the Hardap region and Keetmanshoop in the //Karas Region, Namibia

Environmental Assessment Report: FINAL

ECC Application Reference: App- 00886

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EXECUTIVE SUMMARY

Zoya Minerals CC (The Proponent), has applied to the Ministry of Mines and Energy (MME) for eight (8) Exclusive Prospecting Licenses (EPLs) 8273, 8274, 8275, 8276, 8277, 8278, 8279, and 82780 on the 23rd of July 2020. However, the approval and granting of the EPL is subjected to an Environmental Clearance Certificate, before any proposed prospecting and exploration works can be carried out. The 704 033.5077 ha (hectares) EPLs are located about 15 km West of Mariental in the Hardap Region and about 6 km North-West of Keetmanshoop in the Karas Region. The EPLs covers overlying Farms. The EPLs aims to prospect and explore for commodities such **Base & Rare Metals, Industrial Minerals, Non-Nuclear Fuel Minerals, Nuclear fuel Minerals, and Precious Metals.**

Prospecting and exploration related activities are among the listed activities that may not be undertaken without an Environmental Clearance Certificate (ECC) under the Environmental Management Act (EMA) (2007) and its 2012 Environmental Impact Assessment (EIA) Regulations. Subsequently, to ensure that the proposed activity is compliant with the national environmental legislation, the project Proponent, appointed an independent environmental consultant, Excel Dynamic Solutions (Pty) Ltd to undertake the required Environmental Assessment (EA) process and apply for the ECC on their behalf.

The application for the ECC was compiled and submitted to the competent authority (Ministry of Environment, Forestry and Tourism (MEFT)) as the environmental custodian for project registration purposes. Upon submission of an Environmental Scoping Assessment (ESA) Report and Draft Environmental Management Plan (EMP), an ECC for the proposed project will be considered by the Environmental Commissioner at the MEFT's Department of Environmental Affairs and Forestry (DEAF).

Brief Project Description

Planned Activities: Proposed Exploration Methods

The Proponent intends to adopt a systematic prospecting and exploration approach of the following:

- 1. Desktop Study: Geological mapping (Non-invasive Technique):** This mainly entails a desktop review of geological area maps and ground observations. This includes the review of geological maps of the area and on-site ground traverses and observations and an update where relevant of the information obtained during previous geological studies of the area.
- 2. Lithology geochemical surveys:** Rock samples shall be collected and taken for trace element analysis to be conducted by analytical chemistry laboratories to determine if enough Base & Rare Metals, Dimension Stones, Industrial Minerals, Precious Metals and Semi-Precious Stones are present. Also, trenches or pits may be dug depending on the commodity (in a controlled environment e.g., fencing off and labelling activity sites) adopting manual or excavator to further investigate the mineral potential. These consists of small pits ($\pm 20\text{cm} \times 20\text{cm} \times 30\text{cm}$) will be dug where 1kg samples can be extracted and sieved to collect 50g of material. As necessary, and to ensure adequate risks mitigation, all excavations will either be opened and closed immediately after obtaining the needed samples or the sites fenced off until the trenches or pits are closed. At all times, the landowner and relevant stakeholder will be engaged to obtain authorisation where necessary.
- 3. Geophysical surveys:** This will entail data collection of the substrata (in most cases service of an aero-geophysical contractor will be sourced), by air or ground, through sensors such as radar, magnetic and electromagnetic to detect any mineralization in the area and are conducted to ascertain the mineralisation. Ground geophysical surveys shall be conducted, where necessary using vehicle-mounted sensors or handheld by staff members, while in the case of air surveys the sensors will be mounted to an aircraft, which then flies over the target area.

- 4. Detailed Exploration Drilling (Invasive Technique):** Should analyses by an analytical laboratory be positive, holes are drilled, and drill samples collected for further analysis. This will determine the depth of the potential mineralization. If necessary new access tracks to the drill sites will be created and drill pads will be cleared in which to set the rig. Two widely used drilling options may be adopted, these are the Reverse Circulation (RC) drilling and/or diamond-core drilling. RC drilling uses a pneumatic hammer, which drives a rotating tungsten-steel bit. The technique produces an uncontaminated large volume sample, which is comprised of rock chips. It is relatively quicker and cheaper when compared to other techniques like Diamond Drilling. However, diamond drilling may also be considered for this exploration programme, during advanced stages of exploration if large amounts of sample material may be required for analysis and to perform processing trials. A typical drilling site will consist of a drill-rig, drill core and geological samples store and a drill equipment parking and maintenance yard (including a fuel and lubricants storage facility).

Public Consultation

Regulation 21 of the EIA Regulations details steps to be taken during a public consultation process and these have been used in guiding this process. The public consultation process assisted the Environmental Consultant in identifying all potential impacts and aided in the process of identifying possible mitigation measures and alternatives to certain project activities. The communication with I&APs about the proposed prospecting and exploration activities was done through the following means and in this order to ensure that the public is notified and afforded an opportunity to comment on the proposed project:

- A Background Information Document (BID) containing brief information about the proposed project was compiled, and delivered upon request to all new registered Interested and Affected parties (I&APs).
- Project Environmental Assessment notices were published in The Namibian Newspaper (29 August 2022 and 05 September 2022) and New Era Newspaper (29 August 2022 and 05 September 2022), briefly explaining the activity and its locality, inviting members of the public to register as I&APs and submit their comments/concerns.
- Consultation meetings were scheduled and held with the affected farmers (landowners) on 05 and 06 October, 2022 at Schutzenhaus Keetmanshoops at 09h00, Tses Community Hall Tses 14h00, Koes Community Hall Koes 09h00, and Stoney Hotel Gochas 14h00.
- The issues and concerns raised were noted and used to form the basis for the ESA report and EMP.

Potential Impacts identified

The following potential negative impacts are anticipated:

- **Positive impacts:** Socio-economic development through employment creation (primary, secondary, and tertiary employment) and skills transfer; Opens up other investment opportunities and infrastructure-related development benefits; Produces a trained workforce and small businesses that can serve communities and may initiate related businesses; Boosts the local economic growth and regional economic development and; Increased support for local businesses through the procurement of consumable items such as Personal Protective Equipment (PPE), machinery spare parts, lubricants, etc.

- **Negative impacts:** Potential disturbance of existing pastoral systems; Physical land/soil disturbance; Impact on local biodiversity (fauna and flora); Habitat disturbance and potential illegal wildlife in the area; Potential impact on water resources and soils particularly due to pollution; Air quality issue: potential dust generated from the project; Potential occupational health and safety risks, Vehicular traffic safety and impact on services infrastructures such as local roads, Vibrations, and noise associated with drilling activities may be a nuisance to locals; Environmental pollution (solid waste and wastewater), Archaeological and heritage impact and Potential social nuisance and conflicts (theft, damage to properties, etc.).

The potential negative impacts were assessed, and mitigation measures were provided accordingly.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

The potential impacts that are anticipated from the proposed project activities were identified, described, and assessed. For the significant adverse (negative) impacts with medium rating, appropriate management and mitigation measures were recommended for implementation by the Proponent, their contractors and project related employees.

The public was consulted as required by the EMA and its 2012 EIA Regulations (Section 21 to 24). This was done via the two newspapers (New Era and The Namibian) used for this environmental assessment. A face-to-face consultation meeting was held with the directly affected farmers (landowners) at Schutzenhaus (Keetmanshoop), Tses Community Hall in Tses, Koes Community Hall (Koes), and Stoney Hotel (Gochas), whereby they raised comments and concerns on the proposed project activities.

The issues and concerns raised by the registered I&APs formed the basis for this report and the Draft EMP. The issues were addressed and incorporated into this report whereby mitigation measures have been provided thereof to avoid and/or minimize their significance on the environmental and social components. Most of the potential impacts were found to be of medium rating significance. The effective implementation of the recommended management and mitigation measures, will particularly see a reduction in the significance of adverse impacts that cannot be avoided completely (from high/medium rating to low). To maintain the desirable rating, the implementation of management and mitigation measures should be monitored by the

Proponent directly, or their Environmental Control Officer (ECO) is highly recommended. The monitoring of this implementation will not only be done to maintain the impacts' rating or maintain low rating but to also ensure that all potential impacts identified in this study and other impacts that might arise during implementation are properly identified in time and addressed right away too.

It is crucial for the Proponent and their contractors as well as to effectively implementation of the recommended management and mitigation measures to protect both the biophysical and social environment throughout the project duration. All these would be done with the aim of promoting environmental sustainability while ensuring a smooth and harmonious existence and purpose of the project activities in the community and environment at large.

Recommendations

The Environmental Consultant is confident that the potential negative impacts associated with the proposed project activities can be managed and mitigated by the effective implementation of the recommended management and mitigation measures and with more effort and commitment put on monitoring the implementation of these measures.

It is, therefore, recommended that the proposed prospecting and exploration activities be granted an Environmental Clearance Certificate, provided that:

- All the management and mitigation measures provided herein are effectively and progressively implemented.
- All required permits, licenses and approvals for the proposed activities should be obtained as required. These include permits and licenses for land use access agreements to explore and ensuring compliance with these specific legal requirements.
- The Proponent and all their project workers or contractors comply with the legal requirements governing their project and its associated activities and ensure that project permits and or approvals required undertaking specific site activities are obtained and renewed as stipulated by the issuing authorities.
- Site areas where exploration activities have ceased are rehabilitated, as far as practicable, to their pre-exploration state.
- Environmental Compliance monitoring reports should be compiled and submitted to the MEFT/DEAF's.

Disclaimer

EDS warrants that the findings and conclusion contained herein were accomplished in accordance with the methodologies set forth in the Scope of Work and Environmental Management Act (EMA) of 2007. These methodologies are described as representing good customary practice for conducting an Environmental Impact Assessment of a property for the purpose of identifying recognized environmental conditions. There is a possibility that even with the proper application of these methodologies there may exist on the subject property conditions that could not be identified within the scope of the assessment, or which were not reasonably identifiable from the available information. The Consultant believes that the information obtained from the record review and during the public consultation processes concerning the proposed exploration work is reliable. However, the Consultant cannot and does not warrant or guarantee that the information provided by the other sources is accurate or complete. The conclusions and findings set forth in this report are strictly limited in time and scope to the date of the evaluations. No other warranties are implied or expressed.

Some of the information provided in this report is based upon personal interviews, and research of available documents, records, and maps held by the appropriate government and private agencies. This report is subject to the limitations of historical documentation, availability, and accuracy of pertinent records and the personal recollections of those persons contacted.

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Appendix C: Curricula Vitae (CV) for the Environmental Assessment Practitioner (EAP)

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Appendix E: Farmers’ Consultation Meeting Minutes

Appendix F: The Comments and Responses

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LIST OF ABBREVIATIONS

Abbreviation	Meaning
AMSL	Above Mean Sea Level
BID	Background Information Document
CV	Curriculum Vitae
DEA	Department of Environmental Affairs
EA	Environmental Assessment

EAP	Environmental Assessment Practitioner
ECC	Environmental Clearance Certificate
EDS	Excel Dynamic Solutions
ESA	Environmental Scoping Assessment
EMA	Environmental Management Act
EMP	Environmental Management Plan
EPL	Exclusive Prospecting Licence
GG	Government Gazette
GN	Government Notice
I&APs	Interested and Affected Parties
MEFT	Ministry of Environment, Forestry and Tourism
MME	Ministry of Mines and Energy
PPE	Personal Protective Equipment
Reg	Regulation
S	Section
TOR	Terms of Reference

DEFINITION OF TERMS

Alternative	A possible course of action, in place of another that would meet the same purpose and need of the proposal.
Baseline	Work done to collect and interpret information on the condition/trends of the existing environment.
Biophysical	That part of the environment that does not originate with human activities (e.g. biological, physical and chemical processes).

Cumulative Impacts/Effects Assessment	In relation to an activity, means the impact of an activity that in it may not be significant but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area.
Decision-maker	The person(s) entrusted with the responsibility for allocating resources or granting approval to a proposal.
Ecological Processes	Processes which play an essential part in maintaining ecosystem integrity. Four fundamental ecological processes are the cycling of water, the cycling of nutrients, the flow of energy and biological diversity (as an expression of evolution).
Environment	As defined in Environmental Management Act - the complex of natural and anthropogenic factors and elements that are mutually interrelated and affect the ecological equilibrium and the quality of life, including – (a) the natural environment that is land, water and air; all organic and inorganic matter and living organisms and (b) the human environment that is the landscape and natural, cultural, historical, aesthetic, economic and social heritage and values.
Environmental Management Plan	As defined in the EIA Regulations (Section 8(j)), a plan that describes how activities that may have significant environments effects are to be mitigated, controlled and monitored.
Exclusive Prospecting Licence	Is a license that confers exclusive mineral prospecting rights over land of up to 1000 km ² in size for an initial period of three years, renewable twice for a maximum of two years at a time

Interested and Affected Party (I&AP)	In relation to the assessment of a listed activity includes - (a) any person, group of persons or organization interested in or affected by activity; and (b) any organ of state that may have jurisdiction over any aspect of the activity. Mitigate - practical measures to reduce adverse impacts. Proponent – as defined in the Environmental Management Act, a person who proposes to undertake a listed activity. Significant impact - means an impact that by its magnitude, duration, intensity or probability of occurrence may have a notable effect on one or more aspects of the environment.
Fauna	All of the animals that are found in a given area.
Flora	All of the plants found in a given area.
Mitigation	The purposeful implementation of decisions or activities that are designed to reduce the undesirable impacts of a proposed action on the affected environment.

Monitoring	Activity involving repeated observation, according to a pre-determined schedule, of one or more elements of the environment to detect their characteristics (status and trends).
Nomadic Pastoralism	Nomadic pastoralists live in societies in which the husbandry of grazing animals is viewed as an ideal way of making a living and the regular movement of all or part of the society is considered a normal and natural part of life. Pastoral nomadism is commonly found where climatic conditions produce seasonal pastures but cannot support sustained agriculture.
Proponent	Organization (private or public sector) or individual intending to implement a development proposal.

Public Consultation/Involvement	A range of techniques that can be used to inform, consult or interact with stakeholders affected by the proposed activities.
Protected Area	Refers to a protected area that is proclaimed in the Government Gazette according to the Nature Conservation Ordinance number 4 of 1975, as amended
Scoping	An early and open activity to identify the impacts that are most likely to be significant and require specialized investigation during the EIA work. Can, also be used to identify alternative project designs/sites to be assessed, obtain local knowledge of site and surroundings and prepare a plan for public involvement. The results of scoping are frequently used to prepare a Terms of Reference for the specialized input into full EIA.
Terms of Reference (ToR)	Written requirements governing full EIA input and implementation, consultations to be held, data to be produced and form/contents of the EIA report. Often produced as an output from scoping.

1 INTRODUCTION

1.1 Project Background

Zoya Minerals CC (The Proponent), has applied to the Ministry of Mines and Energy (MME) for eight Exclusive Prospecting Licenses (EPLs) No. 8273, 8274, 8275, 8276, 8277, 8278, 8279 and 8280. An application for EPLs has been lodged on the 23rd of July 2020. However, the approval and granting of the EPLs requires an Environmental Clearance Certificate (ECC), before any proposed prospecting and exploration works can be undertaken.

The EPLs 8273, 8274, 8275, 8276, 8277, 8278, 8279, and 8280 are located about 15 km West of Mariental in the Hardap Region and about 6 km North-West of Keetmanshoop in the Karas Region as shown Figure 1-1.

The target commodities for prospecting and exploration are Base & Rare Metals, Industrial Minerals, Non-Nuclear Fuel Minerals, Nuclear fuel Minerals, and Precious Metals.

Section 27 (1) of the Environmental Management Act (EMA) (No. 7 of 2007) and its 2012 Environmental Impact Assessment (EIA) Regulations, provides a list of activities that may not be carried out without an Environmental Impact Assessment (EIA) undertaken and an Environmental Clearance Certificate (ECC) issued. Exploration activities are listed among the activities that may not occur without an ECC. Therefore, individuals or organizations may not carry out exploration activities among those listed, without an EIA undertaken and an ECC awarded.

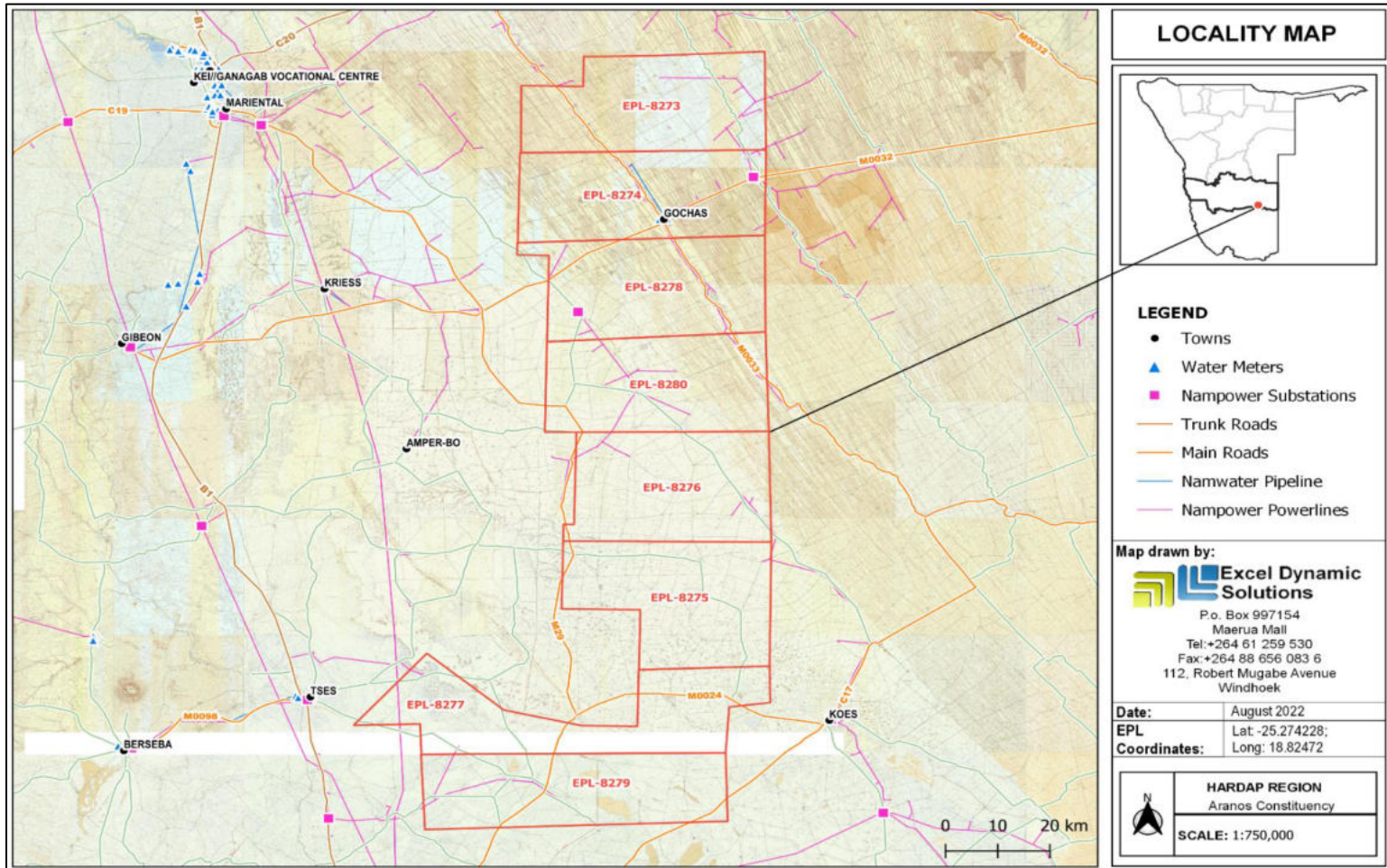


Figure 1-1: Locality map for EPLs No. 8273, 8274, 8275, 8276, 8277, 8278, 8279, and 8280.

1.2 Terms of Reference, Scope of Works and Appointed EA Environmental Assessment Practitioner

Excel Dynamic Solutions (Pty) (EDS) has been appointed by the Proponent to undertake an environmental assessment (EA), and thereafter, apply for an ECC for exploration works on the EPL. There were no formal Terms of Reference (ToR) provided to EDS by the Proponent. The consultant, instead, relied on the requirements of the Environmental Management Act (No. 7 of 2007) (EMA) and its Environmental Impact Assessment (EIA) Regulations (GN. No. 30 of 2012) to conduct the study.

The application for the ECC is compiled and submitted to the Ministry of Environment, Forestry and Tourism (MEFT) (Appendix A), as the environmental custodian for project registration purposes. Upon submission of an Environmental Scoping Assessment (ESA) Report and Draft Environmental Management Plan (EMP) (Appendix B), an ECC for the proposed project may be considered by the Environmental Commissioner at the MEFT's Department of Environmental Affairs and Forestry (DEAF).

The EIA project is headed by Mr. Nerson Tjelos, a qualified and experienced Geoscientist and experienced EAP. Consultation and reporting were done by Mr. Mandume Leonard and reviewed by Ms. Fredrika Shagama. The CV's of Mr. Leonard and Mr. Tjelos are presented in Appendix C.

1.3 Motivation for the Proposed Project

The mining industry is one of the largest contributors to the Namibian economy. It contributes to the improvement of livelihoods. In Namibia, exploration for minerals is carried out mainly by the private sector. Exploration activities have a great potential to enhance and contribute to the development of other sectors and its activities do provide temporary employment, and taxes that fund social infrastructural development. The minerals sector yields foreign exchange and accounts for a significant portion of gross domestic product (GDP). Additionally, the industry produces a trained workforce and small businesses that can serve communities and may initiate related businesses. Exploration activity fosters several associated activities such as manufacturing of exploration and mining equipment, and provision of engineering and environmental services. The mining sector forms a vital aspect of some of Namibia's development

plans, namely: Vision 2030, National Development Plan 5 (NDP5), and Harambee Prosperity Plans (HPPs) I and II. Thus, mining is essential to the development goals of Namibia in contributing to meeting the ever-increasing global demand for minerals, and for national prosperity. Successful exploration on EPL No. 8273, 8274, 8275, 8276, 8277, 8278, 8279, and 8280 would lead to the mining of targeted commodities, which could contribute towards achieving the goals of the national development plans.

2 PROJECT DESCRIPTION: PROPOSED PROSPECTING, EXPLORATION ACTIVITIES

Prospecting and exploration of minerals are the first components of any potential mining project. These are done to acquire the necessary data required for further decision making and investment options. These activities are anticipated to last for about three years. The exploration process includes three phases, namely: prospecting, exploration, and the decommissioning of works.

2.1 Prospecting Phase

During the prospecting and exploration phase, reviewing existing reports and composite stratigraphic, lithological-geochemical maps of the targeted areas to identify prospective lithostratigraphic packages will be vital. In addition to the literature review, fieldwork (lithological (soil/rock) mapping and sampling) will be conducted to verify desktop work. Up to this point, no physical disturbance is required. Prospecting during the advanced exploration phase will require the Proponent to assess the EPLs area through detailed geological mapping, geophysical and geochemical surveys, supported where necessary by geophysical surveys, to define targets for test pitting, trenching, and drilling.

2.1.1 Desktop Study: Geological mapping

This mainly entails a desktop review of geological area maps and ground observations. This includes the review of geological maps of the area, on-site ground traverses and observations and an update, where relevant, of the information obtained during previous geological studies of the area.

2.1.2 Geophysical surveys

Geophysical surveys entail data collection of the substrate by air or ground, through sensors such as radar, magnetic and/or electromagnetic sensors, to detect and ascertain any mineralization in the area. Ground geophysical surveys shall be conducted, where necessary, using vehicle-mounted sensors or handheld by staff members, while in the case of air surveys, the sensors are mounted to an aircraft, which navigates over the target area.

2.1.3 Lithology geochemical surveys

Rock and soil samples shall be collected and taken for trace element analysis to be conducted by analytical chemistry laboratories, to determine if enough target commodities are present. Additionally, trenches or pits may be dug depending on the commodity (in a controlled environment e.g., fencing off and labelling activity sites) adopting a manual or excavator to further investigate the mineral potential.

Soil sampling involves small pits being dug where 1kg samples can be extracted and sieved to collect about 50g of material. As necessary, and to ensure adequate risk mitigation, all major excavations will be opened and closed immediately after obtaining the needed samples, or the sites will be secured until the trenches or pits are closed. The landowner and other relevant stakeholders will be engaged to obtain authorization where necessary.

2.2 Exploration (Drilling, Sampling and Analysis) Phase

The selection of the potential mineralization model and exploration targets will be based on the local geology, trenching, drilling, and assay results of the samples collected. The planned exploration activities are aimed at delineating the mineral deposits and determine whether the deposits are economically feasible mining resources.

No explosives will be used during the exploration phase.

2.2.1 Detailed Exploration Drilling (Invasive Technique)

Should analyses by an analytical laboratory yield positive results, holes are drilled, and drill samples collected for further analysis. This will determine the depth of the potential mineralization. If necessary new access tracks to the drill sites will be created and drill pads will be cleared in which to set the rig. Two widely used drilling options may be adopted, these are the Reverse Circulation (RC) drilling and/or diamond-core drilling. RC drilling uses a pneumatic hammer, which drives a rotating tungsten-steel bit. The technique produces an uncontaminated large volume sample, which is comprised of rock chips. It is relatively quicker and cheaper when compared to other techniques like Diamond Drilling. However, diamond drilling may also be considered for this exploration programme, during advanced stages of exploration if large amounts of sample material may be required for analysis and to perform processing trials.

A typical drilling site will consist of a drill-rig and support vehicles as well as a drill core and geological samples store. A drill equipment parking and maintenance yard may be set up (including a fuel and lubricants storage facility).

2.3 Project Resources

Other aspects of the exploration operations include:

2.3.1 Accessibility to Site

The EPLs are accessible via the main B1 road that is connected to the M29, M0029, M0032 and M0033 roads from Keetmanshoop and Mariental. Project-related vehicles will use existing roads to access the EPLs. The Proponent may need to do some upgrades on the site access roads to ensure that it is fit to accommodate project related vehicles, such as heavy trucks.

2.3.2 Material and Equipment

The input required for the exploration program in terms of vehicles and equipment includes, 4X4 vehicles, a truck, water tanks, drill rigs and drilling machines, and a power generator. Equipment and vehicles will be stored at a designated area near the accommodation site or a storage site established within the EPLs.

2.3.3 Services and Infrastructure

The services to be used for the exploration activities will include the following

- **Water:** Water for the exploration operations on the EPLs will be obtained from the nearest existing boreholes, or the proponent will drill boreholes on the farms, upon obtaining necessary permits and signed agreements with the farmers (landowners). Estimated monthly water consumptions are at 7000 liters, but will not exceed 80 000 liters, which includes water for drinking, sanitation, cooking, dust control (if necessary), drilling, as well as washing of equipment.
- **Power supply:** Power required during the operation phase will be provided from diesel-generators. About 2000 litres of diesel will be used per day, a bunded diesel bowser, which will be on site, will be filled 2 – 3 times a week.
- **Fuel (diesel for generators and other equipment):** The fuel (diesel) required for exploration equipment will be stored in a tank mounted on a mobile trailer, and drip trays will be readily available on this trailer and monitored to ensure that accidental fuel spills are cleaned up as soon as they have been detected/observed. Fuel may also be stored in jerry cans placed on plastic sheeting to avoid unnecessary contamination of the ground.

- **Waste Management:** The site will be equipped with secured waste bins for each type of waste (i.e., domestic, hazardous, and recyclable). Depending on the amount generated, waste will be sorted and collected weekly or monthly and taken to the nearest certified landfill site. An agreement will need to be reached with different waste management facility operators/owners and authorization or permits will be obtained prior to utilizing these facilities, in the case of production of any hazardous waste.
- **Sanitation and human waste:** Portable ablution facilities will be used and the sewage will be disposed of as according to the approved disposal or treatment methods of the waste products.
- **Hazardous waste:** Drip trays and spill control kits will be available on site to ensure that oil/fuel spills and leaks from vehicles and equipment are captured on time and contained correctly before polluting the site.
- **Health and safety:** Adequate and appropriate Personal Protective Equipment (PPE) will be provided to every project personnel while working at the site. A minimum of two first aid kits will be readily available on-site to attend to potential minor injuries.
- **Storage Site:** Temporary storage areas for exploration material, equipment, and machinery will be required at the campsite and/or exploration sites. Security will be supplied on a 24-hour basis at the delegated sites for storage. A temporary support fence surrounding the storage site will be constructed to ensure people and domestic animals are not put at risk.
- **Fire management:** A minimum of basic firefighting equipment, i.e., two fire extinguisher will be readily available in vehicles, at the working sites and camps.
- **On-site Workers' Safety:** Adequate and appropriate Personal Protective Equipment (PPE) will be provided to every project personnel while on and working at site. A first aid kit will be readily available on site to attend to potential minor injuries.
- **Accommodation:** For the EPLs parts that are within or close to a settlement /village and or town, the exploration crew will be accommodated there, for areas such as Gochas. And for areas far from settlements or villages and towns, a campsite will be set up for the exploration crew near the exploration sites. If the accommodation camp is to be set up on a farm, necessary arrangements will be made with the farm owner(s) or land custodians. Exploration activities will take place during daytime only and staff will commute to exploration site (s) from their place of accommodation.

2.4 Decommissioning and Rehabilitation Phase

Once the exploration activities on the EPLs come to an end, the Proponent will need to put site rehabilitation measures in place. Decommissioning and rehabilitation are primarily reinforced through a decommissioning and rehabilitation plan, which consists of safety, health, environmental, and contingency aspects. An unfavorable economic situation or unconvincing exploration results might force the Proponent to cease the exploration program before predicted closure.

3 PROJECT ALTERNATIVES

Alternatives are defined as the “different means of meeting the general purpose and requirements of the activity” (EMA, 2007). This section highlights the different ways in which the project can be undertaken, and identifies alternatives that may be the most practical, but least damaging to the environment.

Once the alternatives have been established, these are examined by asking the following three questions:

- What alternatives are technically and economically feasible?
- What are the environmental effects associated with the feasible alternatives?
- What is the rationale for selecting the preferred alternative?

The alternatives considered for the proposed development are discussed in the following subsections.

3.1 Types of Alternatives Considered

3.1.1 The "No-go" Alternative

The “no action” alternative implies that the status quo remains, and nothing happens. Should the proposal of exploration activities on the EPLs, be discontinued, none of the potential impacts (positive and negative) identified would occur. If the proposed project is to be discontinued, the current land use for the proposed site will remain unchanged.

This option was considered and a comparative assessment of the environmental and socio-economic impacts of the “no action” alternative, is undertaken to establish what benefits might be lost if the project is not implemented. The key losses that may never be realized if the proposed project does not go ahead include:

- Loss of foreign direct investment.
- About ten (10) temporary job opportunities for community members will not be realized.
- No realization of local business supports through the procurement of consumable items such as Personal Protective Equipment (PPE), machinery spare parts, lubricants, etc.
- Loss of potential income to the local and national government through land lease fees, license lease fees, and various tax structures.

- Improved geological understanding of the site area regarding the targeted commodities.
- Socio-economic benefits such as skills acquisition to local community members would be not realized.

Considering the above losses, the “no-action/go” alternative was not considered a viable option for this project.

3.1.2 Exploration Location

The prospecting/exploration location is dependent on the geological setting (regional and local), the economic geology, and the exploration and mining history of the EPLs area. Therefore, finding an alternative location for the planned exploration activities is not possible. This means that the mineralization of the target commodities is area-specific, which means exploration targets are primarily determined by the geology (host rocks) and the tectonic environment of the site (an ore-forming mechanism). The tenement has sufficient surface area for future related facilities should an economic mineral deposit be defined.

Furthermore, the national mineral resources’ potential locations are also mapped and categorized by the Ministry of Mines and Energy in exclusive prospecting licenses, mining licenses and claims, mineral deposit retention licenses, reconnaissance licenses, and exclusive reconnaissance licenses. Available information on EPLs 8273, 8274, 8275, 8276, 8277, 8279, and 8280 (Figure 3-1) and other licenses are available on the Namibia Mining Cadastral Map here <https://portals.landfolio.com/namibia/>

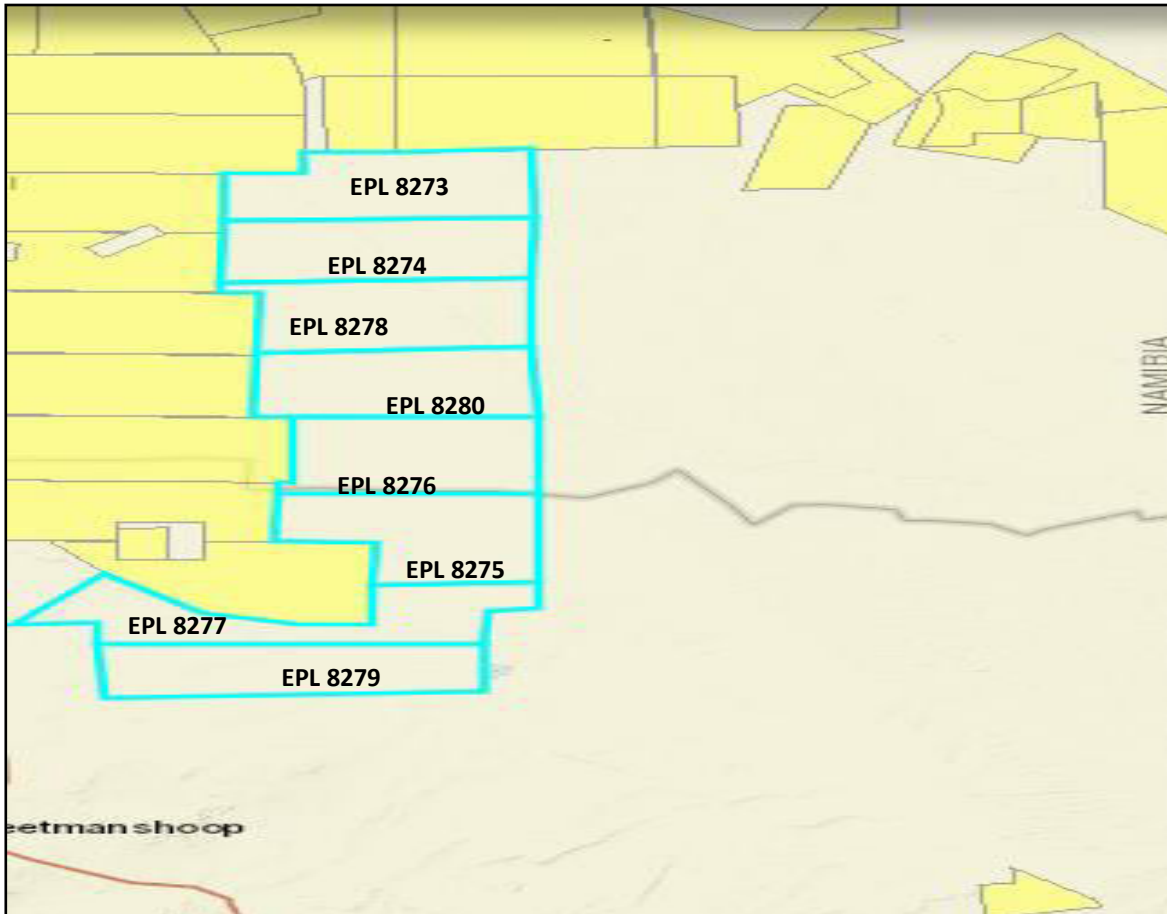


Figure 3-1: The location of the EPLs on the National Mining Cadastre

3.1.3 Exploration Methods

Both invasive and non-invasive exploration activities as indicated under the project description chapter are expected to take place. If an economically viable discovery is made, the project will proceed to the mining phase upon approval of a mining EIA and issuance of a mining license. If any other alternative viable exploration methods are found to achieve the purpose more effectively and/or efficiently without aggravating any environmental measures put in place.

4 LEGAL FRAMEWORK: LEGISLATION, POLICIES, AND GUIDELINES

Prospecting and exploration activities have legal implications associated with certain applicable legal standards. A summary of applicable and relevant international Namibian legislation, policies, and guidelines for the proposed exploration activities is given in this section (Table 4-1). This summary serves to inform the project Proponent, Interested and Affected Parties, and the decision-makers at the DEAF, of the requirements and expectations, as laid out in terms of these instruments, to be fulfilled to establish the proposed prospecting and exploration activities.

4.1 National: The Environmental Management Act (No. 7 of 2007)

This EIA was carried out according to the Environmental Management Act (EMA) and its Environmental Impact Assessment (EIA) Regulations (GG No. 4878 GN No. 30).

The EMA has stipulated requirements to complete the required documentation to obtain an ECC for permission to undertake certain listed activities. These activities are listed under the following Regulations:

- 3.1 The construction of facilities for any process or activities which requires a license, right of other forms of authorization, and the renewal of a license, right, or other forms 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.

The Environmental Impact Assessment (EIA) Regulations GN 28-30 (GG 4878) detail requirements for public consultation within a given environmental assessment process (GN 30 S21). The EIA regulations also outline the required details of a Scoping Report (GN 30 S8) and an Assessment Report (GN 30 S15).

Other legal obligations that are relevant to the proposed activities of EPLs No. 8273, 8274, 8275, 8276, 8277, 8278, 8279, and 8280 and related activities are presented in Table 4-1.

Table 4-1: Applicable local (institutional), and national standards, policies and guidelines governing the proposed development

Legislation/Policy/ Guideline	Relevant Provisions	Implications for this project
<p>The Constitution of the Republic of Namibia, 1990 as amended</p>	<p>The Constitution of the Republic of Namibia (1990 as amended) addresses matters relating to environmental protection and sustainable development. Article 91(c) defines the functions of the Ombudsman to include:</p> <p>“...the duty to investigate complaints concerning the over-utilization of living natural resources, the irrational exploitation of non-renewable resources, the degradation and destruction of ecosystems and failure to protect the beauty and character of Namibia...”</p> <p>Article 95(l) commits the state to actively promoting and maintaining the welfare of the people by adopting policies aimed at the:</p> <p>“...Natural resources situated in the soil and on the subsoil, the internal waters, in the sea, in the continental shelf, and in the exclusive economic zone are property of the State.”</p>	<p>By implementing the environmental management plan, the establishment will be in conformant to the constitution in terms of environmental management and sustainability.</p> <p>Ecological sustainability will be main priority for the proposed development.</p>

Legislation/Policy/ Guideline	Relevant Provisions	Implications for this project
Nature Conservation Amendment Act, No. 3 of 2017	National Parks are established and gazetted in accordance with the Nature Conservation Ordinance, 1975 (4 of 1975), as amended. The Ordinance provides a legal framework with regards to the permission of entering a state-protected area, as well as requirements for individuals damaging objects (geological, ethnological, archaeological, and historical) within a protected area. Though the Ordinance does not specifically refer to mining as an activity within a protected area (PA) or recreational area (RA), it does restrict access to PA's and prohibits certain acts therein as well as the purposes for which permission to enter game parks and nature reserves may be granted.	The Proponent will be required to enhance the conservation of biodiversity and the maintenance of the ecological integrity of protected areas and other State lands
The Parks and Wildlife Management Bill of 2008	Aims to provide a regulatory framework for the protection, conservation, and rehabilitation of species and ecosystems, the sustainable use and sustainable management of indigenous biological resources, and the management of protected areas, in order to conserve biodiversity and in order to contribute to national development.	
Minerals (Prospecting and Mining) Act (No. 33 of 1992)	Section 52 requires mineral license holders to enter into a written agreement with affected landowners before exercising rights conferred upon the license holder.	The Proponent should enter into a written agreement with landowners before carrying out exploration on their land. The Proponent should carry out an assessment of the impact on the receiving environment.

Legislation/Policy/ Guideline	Relevant Provisions	Implications for this project
	<p>Section 52(1) mineral license holder may not exercise his/her rights in any town or village, on or in a proclaimed road, land utilized for cultivation, within 100m of any water resource (borehole, dam, spring, drinking trough, etc.) and boreholes, or no operations in municipal areas, etc.), which should individually be checked to ensure compliance.</p> <p>Section 54 requires written notice to be submitted to the Mining Commissioner in the event that the holder of a mineral license (which includes the EPLs) intends to abandon the mineral license area.</p> <p>Section 68 stipulates that an application for an EPLs shall contain the particulars of the condition of, and any existing damage to, the environment in the area to which the application relates and an estimate of the effect which the proposed prospecting operations may have on the environment and the proposed steps to be taken in order to prevent or minimize any such effect.</p> <p>Section 91 requires that rehabilitation measures should be included in an application for a mineral license.</p>	<p>The Proponent should include as part of their application for the EPLs, measures by which they will rehabilitate the areas where they intend to carry out mineral exploration activities.</p> <p>The Proponent may not carry out exploration activities within the areas limited by Section 52 (1) of this Act.</p>

Legislation/Policy/ Guideline	Relevant Provisions	Implications for this project
Mine Health & Safety Regulations, 10th Draft	Makes provision for the health and safety of persons employed or otherwise present in mineral licenses area. These deal with among other matters; clothing and devices; design, use, operation, supervision and control of machinery; fencing and guards; and safety measures during repairs and maintenance.	The Proponent should comply with all these regulations with respect to their employees.
Petroleum Products and Energy Act (No. 13 of 1990) Regulations (2001)	Regulation 3(2)(b) states that “No person shall possess [sic] or store any fuel except under authority of a license or a certificate, excluding a person who possesses or stores such fuel in a quantity of 600 litres or less in any container kept at a place outside a local authority area”	The Proponent should obtain the necessary authorization from the MME for the storage of fuel on-site.
The Regional Councils Act (No. 22 of 1992)	. This Act sets out the conditions under which Regional Councils must be elected and administer each delineated region. From a land use and project planning point of view, their duties include, as described in section 28 “to undertake the planning of the development of the region for which it has been established with a view to physical, social and economic characteristics, urbanisation patterns, natural resources, economic development potential, infrastructure, land utilisation pattern and sensitivity of the natural environment.	The relevant Regional Councils are considered to be I&APs and must be consulted during the Environmental Assessment (EA) process. The project site falls under the //Karas and Hardap Regional Councils therefore, they should be consulted.

Legislation/Policy/ Guideline	Relevant Provisions	Implications for this project
Local Authorities Act No. 23 of 1992	To provide for the determination, for purposes of traditional government, of traditional authority councils; the establishment of such traditional authority councils; to define the powers, duties and, functions of traditional authority councils; and to provide for incidental matters.	The Mariental Municipality, Keetmanshoops Municipality, Gochas Village council and Koes Village Council are the responsible local Authority of the area therefore they should be consulted.
Water Act 54 of 1956	<p>The Water Resources Management Act 11 of 2013 is presently without regulations; therefore, the Water Act No 54 of 1956 is still in force:</p> <p>Prohibits the pollution of water and implements the principle that a person disposing of effluent or waste has a duty of care to prevent pollution (S3 (k)).</p> <p>Provides for control and protection of groundwater (S66 (1), (d (ii)).</p> <p>Liability of clean-up costs after closure/abandonment of an activity (S3 (l)). (l)).</p>	The protection (both quality and quantity/abstraction) of water resources should be a priority.
Water Resources Management Act (No 11 of 2013)	The Act provides for the management, protection, development, use and conservation of water resources; and provides for the regulation and monitoring of water services and to provide for incidental matters. The objects of this Act are to:	

Legislation/Policy/ Guideline	Relevant Provisions	Implications for this project
	<p>Ensure that the water resources of Namibia are managed, developed, used, conserved and protected in a manner consistent with, or conducive to, the fundamental principles set out in Section 66 - protection of aquifers, Subsection 1 (d) (iii) provide for preventing the contamination of the aquifer and water pollution control (Section 68).</p>	
<p>National Heritage Act No. 27 of 2004</p>	<p>To provide for the protection and conservation of places and objects of heritage significance and the registration of such places and objects; to establish a National Heritage Council; to establish a National Heritage Register; and to provide for incidental matters.</p>	<p>The Proponent should ensure compliance with these Acts requirements. The necessary management measures and related permitting requirements must be taken. This done by the consulting with the National Heritage Council of Namibia.</p>
<p>The National Monuments Act (No. 28 of 1969)</p>	<p>The Act enables the proclamation of national monuments and protects archaeological sites.</p>	
<p>Soil Conservation Act (No 76 of 1969)</p>	<p>The Act makes provision for the prevention and control of soil erosion and the protection, improvement and conservation of soil, vegetation and water supply sources and resources, through directives declared by the Minister.</p>	<p>Duty of care must be applied to soil conservation and management measures must be included in the EMP.</p>
<p>Public Health Act (No. 36 of 1919)</p>	<p>Section 119 states that “no person shall cause a nuisance or shall suffer to exist on any land or premises owned or occupied by him or of which he is in charge any nuisance or other condition liable to be injurious or dangerous to health.”</p>	<p>The Proponent and all its employees should ensure compliance with the provisions of these legal instruments.</p>
<p>Health and Safety Regulations GN 156/1997 (GG 1617)</p>	<p>Details various requirements regarding health and safety of labors.</p>	

Legislation/Policy/ Guideline	Relevant Provisions	Implications for this project
Road Traffic and Transport Act, No. 22 of 1999	The Act provides for the establishment of the Transportation Commission of Namibia; for the control of traffic on public roads, the licensing of drivers, the registration and licensing of vehicles, the control and regulation of road transport across Namibia's borders; and for matters incidental thereto. Should the Proponent wish to undertake activities involving road transportation or access onto existing roads, the relevant permits will be required.	Mitigation measures should be provided for, if the roads and traffic impact cannot be avoided, the relevant permits must be applied for.
Labor Act (No. 6 of 1992)	The Ministry of Labor (MOL) is aimed at ensuring harmonious labor relations through promoting social justice, occupational health and safety and enhanced labor market services for the benefit of all Namibians. This ministry ensures effective implementation of the Labor Act no. 6 of 1992.	The Proponent should ensure that the prospecting and exploration activities do not compromise the safety and welfare of workers.

4.2 International Policies, Principles, Standards, Treaties and Conventions

The international policies, principles, standards, treaties, and conventions applicable to the project are as listed in Table 4-2 below.

Table 4-2: International Policies, Principles, Standards, Treaties and Convention applicable to the project

Statute	Provisions	Project Implications
Equator Principles	A financial industry benchmark for determining, assessing, and managing environmental and social risk in projects (August 2013). The Equator Principles have been developed in conjunction with the International Finance Corporation (IFC), to establish an International Standard with	These principles are an attempt to: ‘...encourage the development of socially responsible projects, which subscribe to appropriately responsible environmental management practices with

Statute	Provisions	Project Implications
	<p>which companies must comply with to apply for approved funding by Equator Principles Financial Institutions (EPFIs). The Principles apply to all new project financings globally across all sectors.</p> <p>Principle 1: Review and Categorization</p> <p>Principle 2: Environmental and Social Assessment</p> <p>Principle 3: Applicable Environmental and Social Standards</p> <p>Principle 4: Environmental and Social Management System and Equator Principles Action Plan</p> <p>Principle 5: Stakeholder Engagement</p> <p>Principle 6: Grievance Mechanism</p> <p>Principle 7: Independent Review</p> <p>Principle 8: Covenants</p> <p>Principle 9: Independent Monitoring and Reporting</p> <p>Principle 10: Reporting and Transparency</p>	<p>a minimum negative impact on project-affected ecosystems and community-based upliftment and empowering interactions.'</p>
<p>The International Finance Corporation (IFC) Performance Standards</p>	<p>The International Finance Corporation's (IFC) Sustainability Framework articulates the Corporation's strategic commitment to sustainable development and is an integral part of IFC's approach to risk management. The Sustainability Framework comprises IFC's Policy and Performance Standards on Environmental and Social Sustainability, and IFC's Access to Information Policy. The Policy on Environmental and Social Sustainability describes IFC's commitments,</p>	<p>The Performance Standards are directed towards clients, providing guidance on how to identify risks and impacts, and are designed to help avoid, mitigate, and manage risks and impacts as a way of doing business in a sustainable way, including stakeholder engagement and disclosure obligations of</p>

Statute	Provisions	Project Implications
	<p>roles, and responsibilities related to environmental and social sustainability.</p> <p>As of 28 October 2018, there are ten (10) Performance Standards (Performance Standards on Environmental and Social Sustainability) that the IFC requires a project Proponents to meet throughout the life of an investment. These standard requirements are briefly described below.</p> <p>Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts</p> <p>Performance Standard 2: Labour and Working Conditions</p> <p>Performance Standard 3: Resource Efficient and Pollution Prevention and Management</p> <p>Performance Standard 4: Community Health and Safety</p> <p>Performance Standard 5: Land Acquisition, Restrictions on Land Use, and Involuntary Resettlement</p> <p>Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources</p> <p>Performance Standard 7: Indigenous Peoples/Sub-Saharan African Historically Undeserved Traditional Local Communities</p> <p>Performance Standard 8: Cultural Heritage</p> <p>Performance Standard 9: Financial Intermediaries (FIs)</p>	<p>the Client (Borrower) in relation to project-level activities. In the case of its direct investments (including project and corporate finance provided through financial intermediaries), IFC requires its clients to apply the Performance Standards to manage environmental and social risks and impacts so that development opportunities are enhanced. IFC uses the Sustainability Framework along with other strategies, policies, and initiatives to direct the business activities of the Corporation to achieve its overall development objectives.</p>

Statute	Provisions	Project Implications
	<p>Performance Standard 10: Stakeholder Engagement and Information</p> <p>A full description of the IFC Standards can be obtained from</p> <p>http://www.worldbank.org/en/projects-operations/environmental-and-social-framework/brief/environmental-and-social-standards?cq_ck=1522164538151#ess1</p>	
The United Nations Convention to Combat Desertification (UNCCD) 1992	<p>Addresses land degradation in arid regions with the purpose to contribute to the conservation and sustainable use of biodiversity and the mitigation of climate change.</p> <p>The convention objective is to forge a global partnership to reverse and prevent desertification/land degradation and to mitigate the effects of drought in affected areas to support poverty reduction and environmental sustainability United Nation Convention.</p>	The project activities should not be such that they contribute to desertification.
Convention on Biological Diversity 1992	<p>Regulate or manage biological resources important for the conservation of biological diversity whether within or outside protected areas, with a view to ensuring their conservation and sustainable use.</p> <p>Promote the protection of ecosystems, natural habitats, and the maintenance of viable populations of species in natural surroundings.</p>	Removal of vegetation cover and destruction of natural habitats should be avoided and where not possible minimised.
Stockholm Declaration on the Human	It recognizes the need for: “a common outlook and common principles to inspire and guide	Protection of natural resources and prevention of any form of pollution.

Statute	Provisions	Project Implications
Environment, Stockholm (1972)	the people of the world in the preservation and enhancement of the human environment.	

Relevant international Treaties and Protocols ratified by the Namibian Government

- Convention on International Trade and Endangered Species of Wild Fauna and Flora (CITES), 1973.
- Convention on Biological Diversity, 1992.
- World Heritage Convention, 1972.

5 ENVIRONMENTAL BASELINE

The proposed exploration programme will be undertaken in specific environmental and social conditions. Understanding the pre-project conditions of the environment will aid in providing background "information" of the status quo and future projections of environmental conditions after proposed works on the EPLs. This also helps the EAP in identifying the sensitive environmental features that may need to be protected through the recommendations and effective implementation of mitigation measures provided.

The baseline information presented below is sourced from a variety of sources including reports of studies conducted in the Hardap and Karas Region. Further information was obtained by the Consultant during the site visit.

5.1 Biophysical Environment

5.1.1 Climate

Climate has a major influence on the exploration activities proposed on the EPLs. Understanding of climatic conditions helps to determine the appropriate and/or inappropriate times to conduct exploration activities.

High temperatures around Mariental and Keetmanshoop area are mainly experienced in December, at an average of 35⁰ C - 36.41⁰ C; and the lowest temperatures are experienced at an average of 7⁰ C - 14.21⁰ C

in July. The highest average rainfall between 56.4mm - 58mm experienced in February, and the lowest average rainfall 0.78mm – 1mm experienced in August. Moreover, April month experience the highest humidity of 36% - 36.38% and low humidity in October at 20% - 20.14%. Figure 5-1 shows the climatic condition in Mariental, while Figure 5-2 shows the climatic condition in Keetmanshoop.

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Nov	Oct	Dec	Year
Record high °C (°F)	40.8 (105.44)	40.8 (105.44)	40.8 (105.44)	36.5 (97.7)	34.36 (93.85)	30.06 (86.11)	31.13 (88.03)	34.36 (93.85)	39.72 (103.5)	41.87 (107.37)	40.8 (105.44)	41.87 (107.37)	41.87 (107.37)
Average high °C (°F)	36.22 (97.2)	35.55 (95.99)	33.88 (92.98)	30.39 (86.7)	27.54 (81.57)	23.44 (74.19)	23.38 (74.08)	26.96 (80.53)	31.23 (88.21)	34.01 (93.22)	35.49 (95.88)	36.41 (97.54)	31.21 (88.18)
Daily mean °C (°F)	31.19 (88.14)	30.32 (86.58)	28.76 (83.77)	24.91 (76.84)	21.5 (70.7)	16.53 (61.75)	15.98 (60.76)	18.63 (65.53)	23.33 (73.99)	26.96 (80.53)	28.99 (84.18)	30.73 (87.31)	24.82 (76.68)
Average low °C (°F)	25.82 (78.48)	24.77 (76.59)	23.13 (73.63)	19.03 (66.25)	15.0 (59.0)	9.24 (48.63)	8.15 (46.67)	9.83 (49.69)	14.13 (57.43)	18.2 (64.76)	21.06 (69.91)	24.12 (75.42)	17.7 (63.86)
Record low °C (°F)	15.03 (59.05)	16.1 (60.98)	11.81 (53.26)	9.66 (49.39)	3.22 (37.8)	0.0 (0)	-1.07 (30.07)	-1.07 (30.07)	2.15 (35.87)	4.29 (39.72)	7.52 (45.54)	11.81 (53.26)	-1.07 (30.07)
Average precipitation mm (inches)	51.08 (2.01)	56.24 (2.21)	41.49 (1.63)	17.25 (0.68)	7.93 (0.31)	2.25 (0.09)	1.57 (0.06)	0.78 (0.03)	4.15 (0.16)	6.85 (0.27)	11.05 (0.44)	21.65 (0.85)	18.53 (0.73)
Average precipitation days (≥ 1.0 mm)	7.9	8.59	6.34	3.22	1.07	0.19	0.19	0.29	1.17	1.56	1.95	4.1	3.05
Average relative humidity (%)	30.29	34.46	35.01	36.38	31.68	33.67	33.86	25.49	21.1	18.92	20.14	23.82	28.74
Mean monthly sunshine hours	12.35	12.31	12.25	12.05	11.73	11.56	11.61	11.97	12.3	12.36	14.44	14.44	12.44

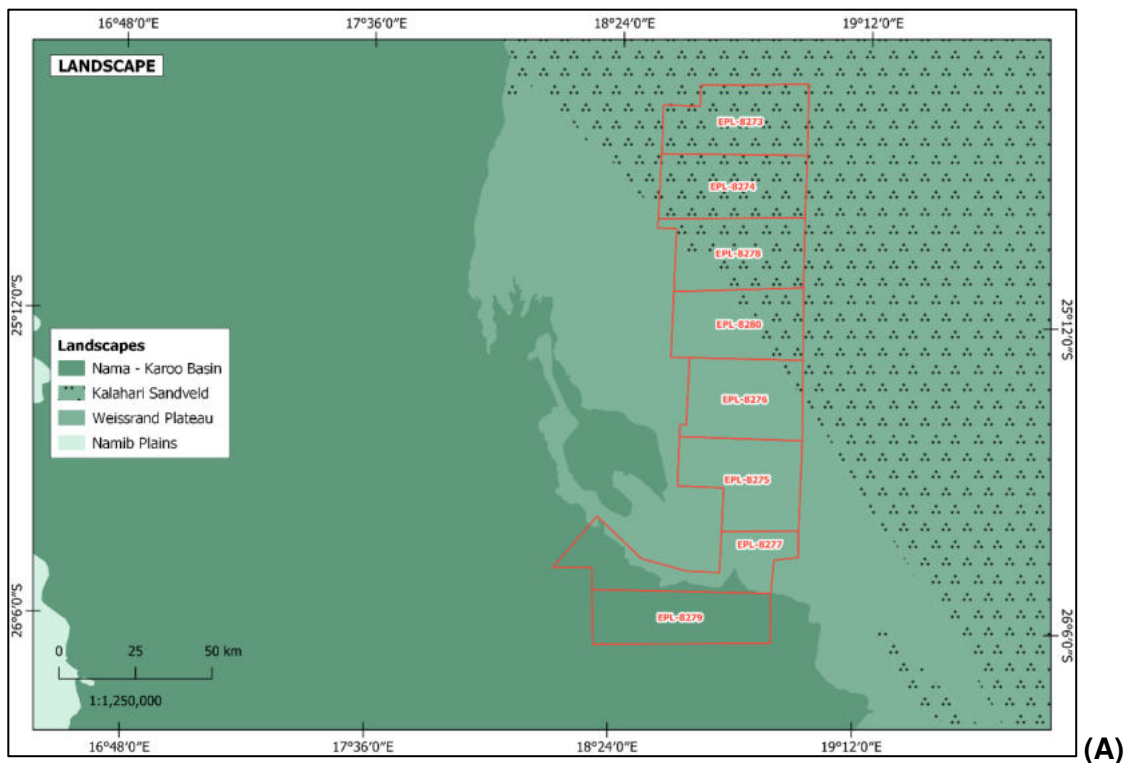
Figure 5-1: The climate condition around the project area, Mariental (source: [Mariental climate: Climate-Data.org](#))

	January	February	March	April	May	June	July	August	September	October	November	December
Avg. Temperature °C (°F)	27.4 °C (81.3) °F	27 °C (80.7) °F	26 °C (78.7) °F	22.1 °C (71.8) °F	18.6 °C (65.5) °F	14.5 °C (58.2) °F	14.2 °C (57.6) °F	16 °C (60.8) °F	19.9 °C (67.7) °F	23.3 °C (74) °F	26.1 °C (77.2) °F	26.8 °C (80.2) °F
Min. Temperature °C (°F)	19.5 °C (67.1) °F	19.8 °C (67.6) °F	18.7 °C (65.7) °F	15.2 °C (59.4) °F	11.5 °C (52.8) °F	7.5 °C (45.5) °F	7 °C (44.8) °F	7.9 °C (46.2) °F	11.1 °C (51.9) °F	14.5 °C (58) °F	16.2 °C (61.2) °F	18.1 °C (64.5) °F
Max. Temperature °C (°F)	34.9 °C (94.9) °F	34.1 °C (93.3) °F	32.8 °C (91.1) °F	28.9 °C (84.1) °F	25.9 °C (78.6) °F	22 °C (71.6) °F	21.8 °C (71.2) °F	24.2 °C (75.5) °F	26.3 °C (82.9) °F	31.6 °C (88.9) °F	33.3 °C (92) °F	35 °C (95) °F
Precipitation / Rainfall mm (in)	48 (1)	58 (2)	47 (1)	23 (0)	5 (0)	1 (0)	3 (0)	1 (0)	4 (0)	6 (0)	12 (0)	23 (0)
Humidity(%)	30%	34%	33%	36%	32%	34%	31%	26%	21%	20%	21%	24%
Rainy days (d)	5	6	5	3	1	0	0	0	0	1	2	3
avg. Sun hours (hours)	12.0	11.4	10.7	10.1	9.6	9.2	9.4	9.8	10.6	11.4	12.0	12.3

Figure 5-2: The climate condition around the project area, Keetmanshoop (source: [Keetmanshoop climate: Climate-Data.org](#))

5.1.2 Landscape and Topography

The EPLs area is dominated by the Nama-Karoo Basin landscapes. This large flat lying plateau dominates much of Southern Namibia. Sedimentary rocks deposited first in the Nama Basin and later in the same area in the Karoo Basin, form the foundations of the landscape. The basin slopes from the north, where elevations are about 1400m above the sea level, to the south, where altitudes are approximately 900m above sea level. The Fish Lowen and Konkiep rivers drain the landscape, all flowing south to the Orange River. Furthermore part of the EPLs is covered by the Weissrand Plateau, the plateau lies sandwiched between the Nama-Karoo basin and the Kalahari sandveld. Previously it was probably covered by Kalahari sand that has now been stripped away, leaving a surface of calcrete that extends eastwards under present sands (Mendelsohn, 2003). The Kalahari sandveld tht is covering the northern part of the project area, is particularly flat although the sands have been moulded into dunes in some areas. Altitudes are highest in the centre and west from where the whole landscape slopes gently down to lower ground in the east and south. Several rivers cut through the sandveld (Mendelsohn, 2003) Figure 5-3 (A) and (B) show the landscape map and the topographic map, respectively.



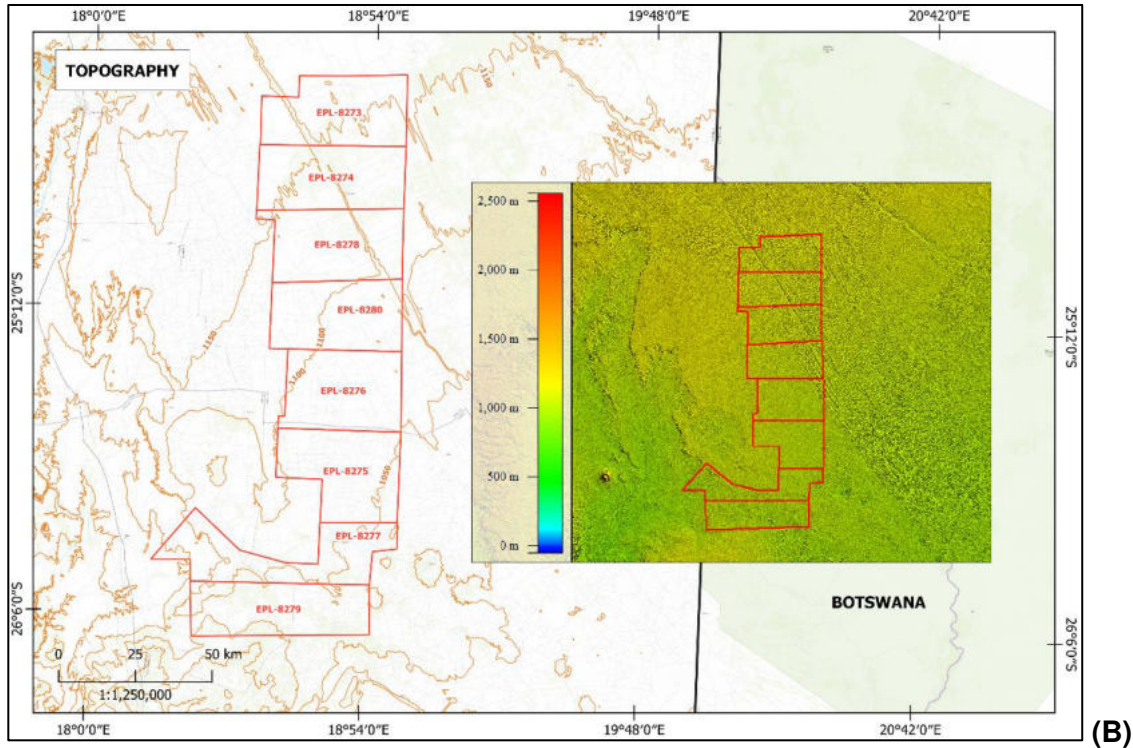


Figure 5-3: 6a, Landscape of project area; 6b, Topographic map of project area

5.1.3 Geology

The project area is underlain by three types of geological formations, Kalahari and Namib Sands, Dykes and Sills, and Main Karoo Basin. The Kalahari and Namib Sands extend from Northern Cape through Namibia, Botswana, and Zambia. It is filled with sand and water-borne deposits. The main Karoo Basin is covered by extensive sheets of moving ice on the southern side, while the smaller ice sheets and glaciers formed in the north and north-west. These sheets of ice flattened the landscape while glaciers cut through the land surface to gouge out new valleys. Furthermore when the great masses of molten rocks were forced up into, and through the earth crust as volcanoes or as relatively subdue intrusions of igneous rock, hundreds of dykes and sills were formed, as were many kimberlite pipes that intruded into the crust. Many of these pipes are in the area of Gibeon and in the southern part of the Khaudum Game Park (Mendelsohn 2003). The lithology of the EPLs is dominated by the Aeolian sand, Conglomerate, Sand, Gravel, Scree, Calcrete, Shale (Carbonaceous), Sand Stone, Shale/Siltstone. Figure 5-4 below shows the general geology map for the project.

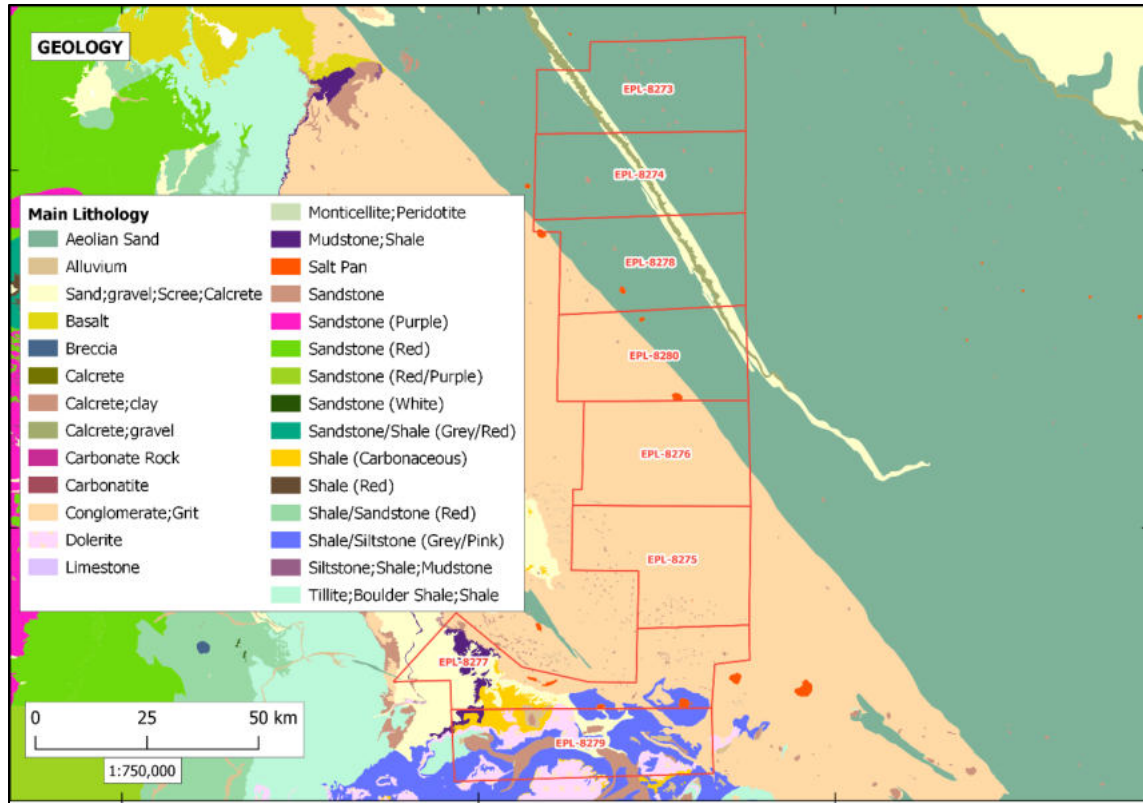


Figure 5-4: The general geology of the project area

5.1.4 Soil

The EPLs are dominated by three (3) types of soil, Eutric Leptosols, Ferralic Arenosols and Petric Calcisols with Eutric fluvisols at the northern part of the project area as shown on the map in Figure 5-5. Petric Calcisols are mostly found in depressions or other low-laying areas of the landscape, and typically contain accumulations on Calcium Carbonate, often in cemented form called calcrete. These soils are potentially fertile but iron and zinc may not be available to plant because of high concentration of calcium (Mendelsohn, 2003).

Furthermore the Eutric Leptosols which, is one of the dominant soil in the project area is typically formed in actively eroding landscape, especially in the hilly or undulating areas that covers much of southern and north-western Namibia. These coarse-textured soils are characterized by their limited depth caused by the presence of a continuous hard-rock highly calcareous or cemented layer within 30 cm of the surface. They are shallowest soil found in Namibia, with low water-holding capacity, with high erosion (Mendelsohn, 2003). The other soil dominating is the Ferralic Arenosols, with high contents of combined Oxides of Iron and Aluminium (Sesquioxides). Arenosols are formed from wind-blown sand and usually extended to a depth of at least one

metre, with sand generally making up more than 70% of the soil. The rest of the soil usually consist of particles of clay and silt. The sandy texture allows water to drain through the soil rapidly. Few nutrients are retained in this porous sand (Mandelsohn, 2003).

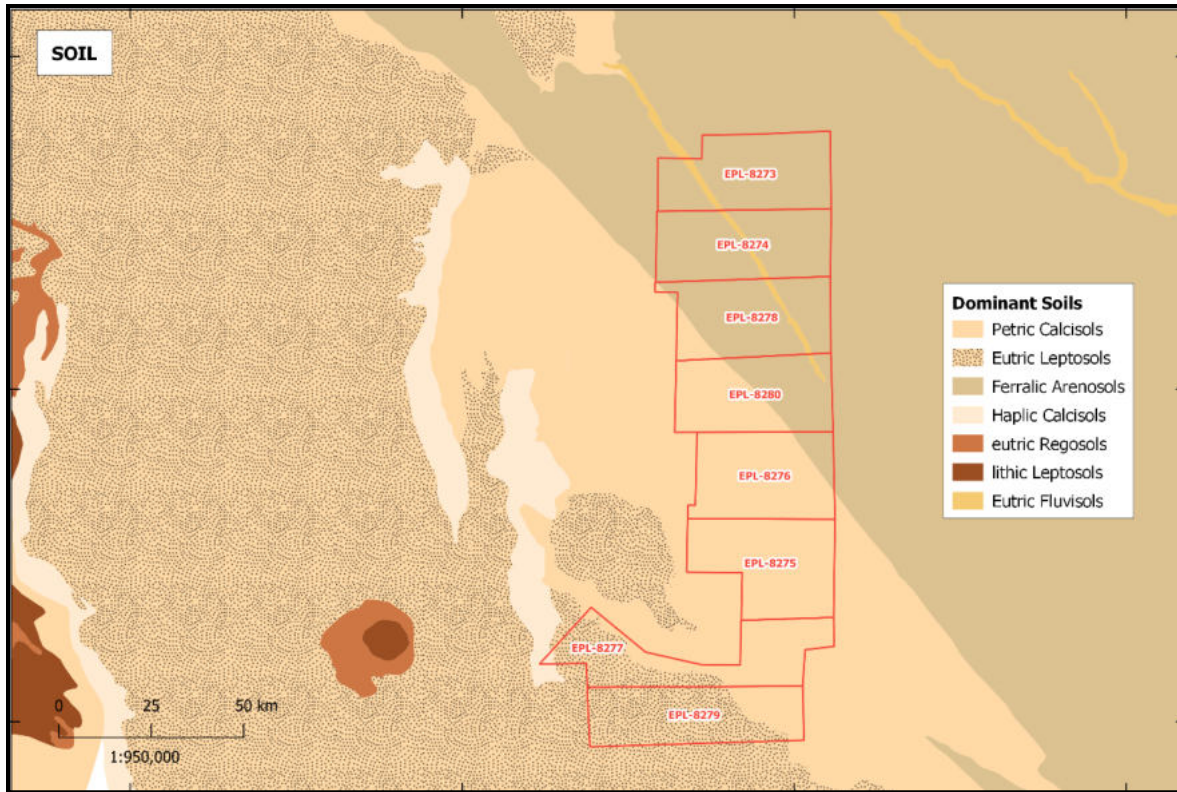


Figure 5-5: The dominant soil types found within the EPLs

It is notable that during the operational phase of the project, soil sampling will be conducted. Therefore, the Soil Conservation Act (No 76 of 1969) should be taken into account to ensure that soils are conserved in a way that does not promote soil erosion.

Some photos of the soils observed in the EPL area during the site visit are shown in Figure 5-6. The soils color ranges from light orange and brown loamy sandy to grey sandy gravel.



Figure 5-6: The soil types dominating the EPL area observed on site

5.1.5 Water Resources and Groundwater Vulnerability to Pollution

The Stampriet Transboundary Aquifer System (STAS) is the only permanent and dependable water resource for the local population living in an area that covers 87,000 sq. km (km²) from Central Namibia into Western Botswana and South Africa's Northern Cape Province (UNESCO, 2013).

The EPLs' area has no long-term or permanent surface water, except in times of rains with some minor ephemeral rivers such as Auob and Olifants River noted, which are tributary of Fish River. Moreover, In terms of groundwater, the EPLs are covered by thin soils underlain by unfractured rock bodies with little groundwater potential and porous aquifers. The EPLs are dominated by the rocks that are good (porous) aquifers, with some parts of the EPLs covered by the Rocks that are poor (Rock bodies with little groundwater potential) aquifers. Due to the nature and mixture of different type's pf aquifers around the EPLs they fall within a zone of moderate (vulnerability) sensitivity to high (Vulnerability) sensitivity to groundwater pollution. Figure 5-7 shows the water resources (surface water and groundwater/aquifer) map of the EPLs area.

With regards to water abstraction, it is recommended for the Proponent to obtain a permit, if necessary, as required under the Water Act No. 54 of 1956 (enforced), and the Water Resources Management Act, No. 11 of 2013.

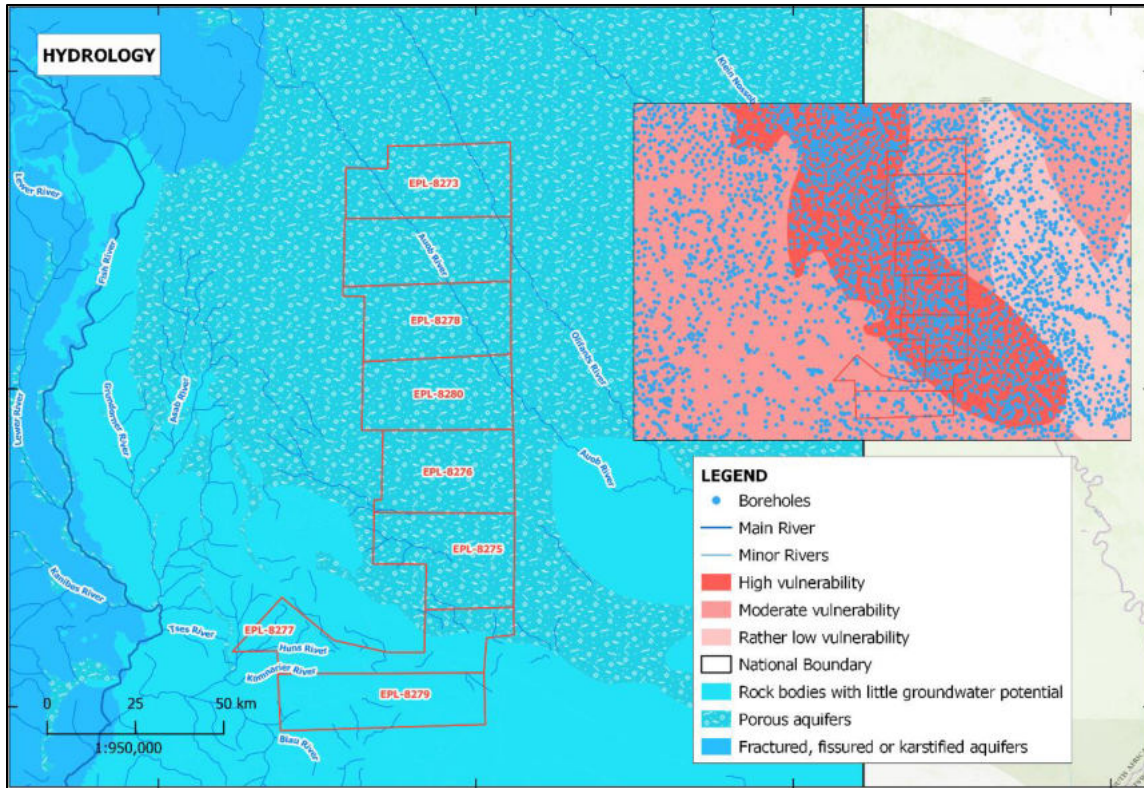


Figure 5-7: The water resources conditions of the project area

5.1.6 Flora and Fauna

5.1.6.1 Flora

The project area is dominated by the Southern linear duneveld at the far north with the middle part of the project area being dominated by the Weissrand and southern part of the EPLs covered by the Koes panveld and plains with dolerite outcrops. Figure 5-8 shows the vegetation map of the EPLs area, while Figure 5-9 shows the plants that were observed during the site visit around the project area on the 06th of October 2022.

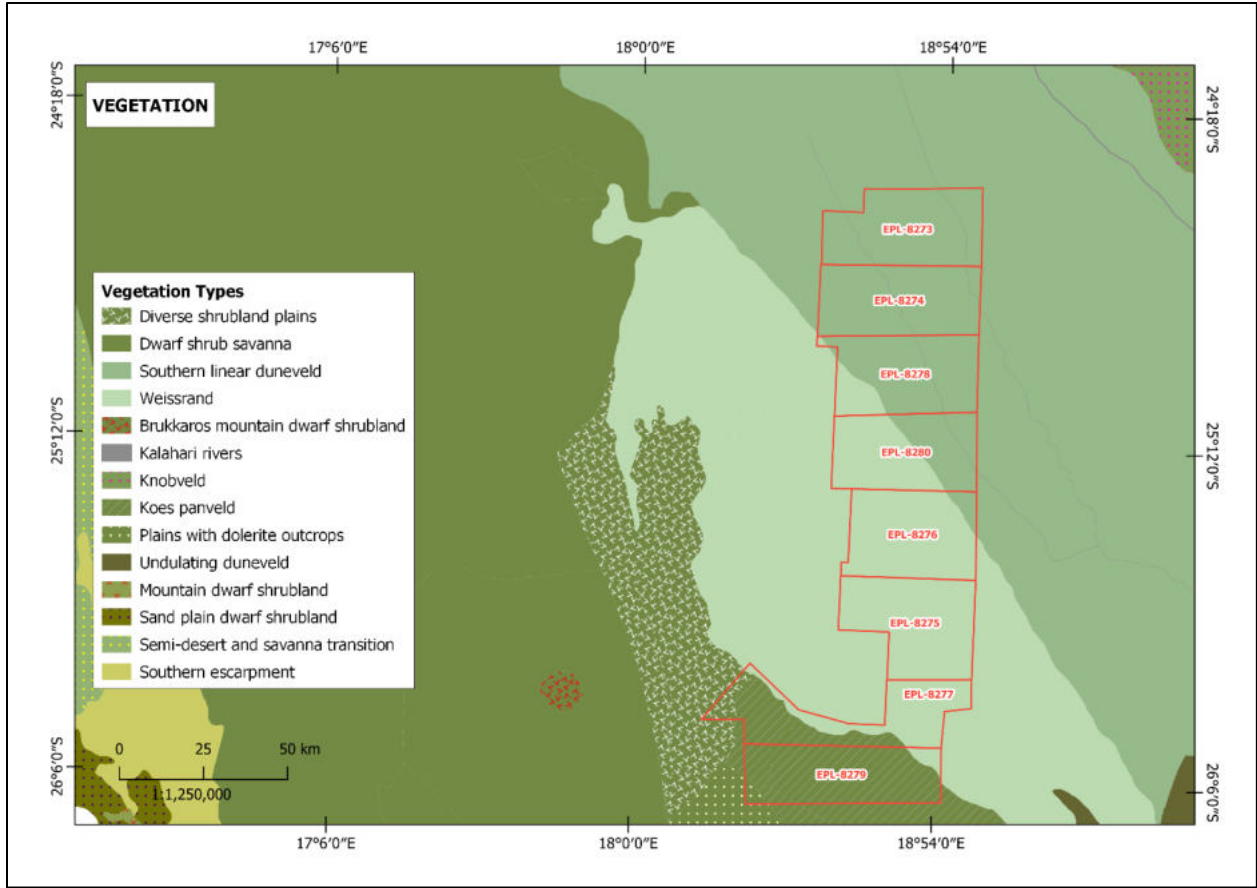


Figure 5-8: Site Vegetation Map



Figure 5-9: Some plant species observed during site visit within the project area

5.1.6.2 Fauna

During site visit conducted on 06th October 2022, the presence of domestic and wild animals was observed as per evidence in Figure 5-10. According to the locals, the EPLs area has wildlife such as zebras, hyenas, springboks, ostriches, kudus and leopards, as well as livestock such as cows, goats, donkeys and sheep.

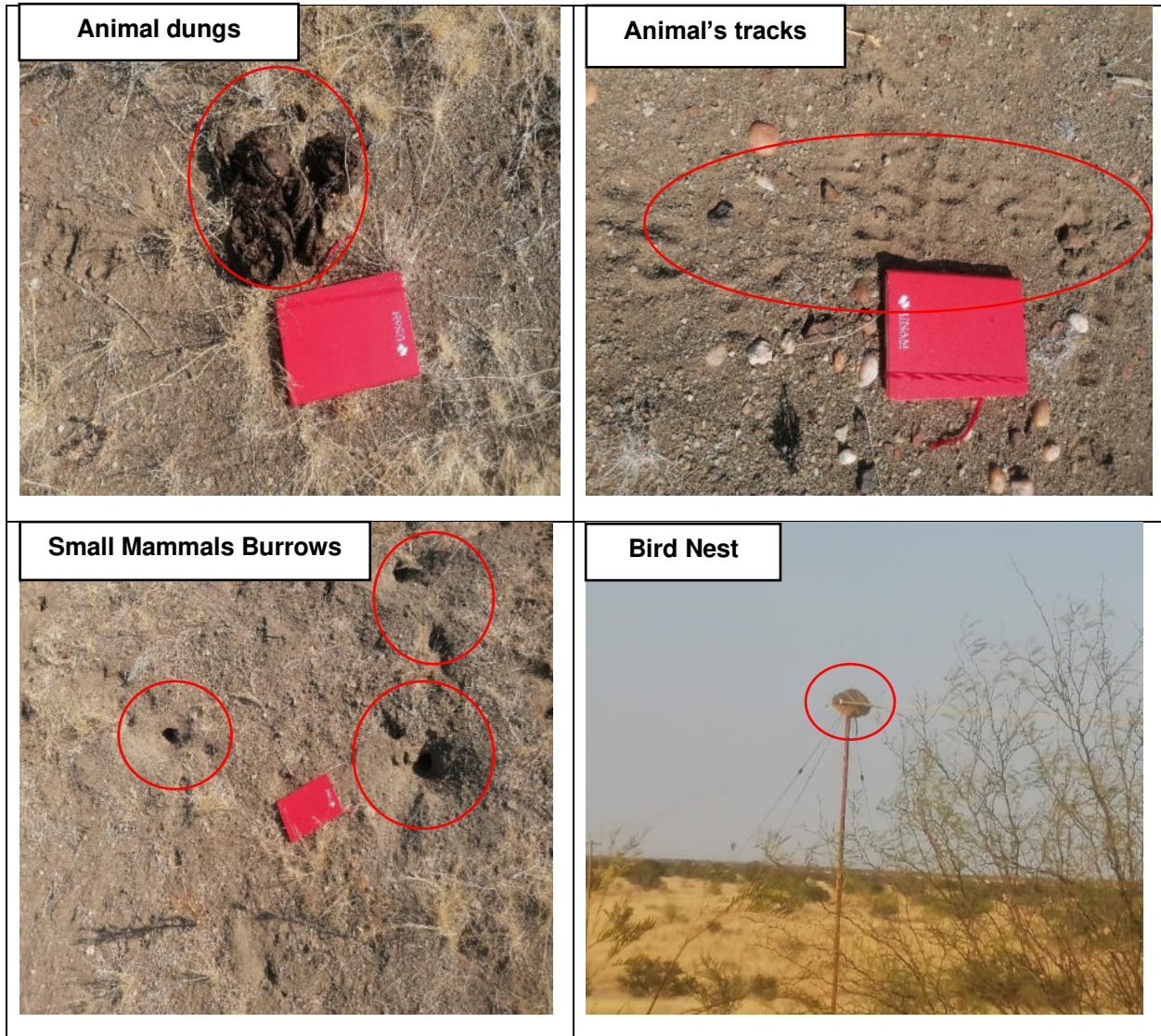


Figure 5-10: Evidence of faunal presence

5.2 Heritage and Archaeology

5.2.1 Local Level and Archaeological Findings

Archaeological sites in Namibia are protected under the National Heritage Act of 2004 (No. 27 of 2004). Evidence shows that, the emergence of modern humans and their ancestors have lived in Namibia for more than one million years, and there are fossil remains of lineal hominin ancestors as early as the Miocene Epoch (Kinahan, 2017). Namibia has a relatively complete sequence covering the mid-Pleistocene to Recent Holocene period, represented by thousands of archaeological sites mainly concentrated in the central highlands, escarpment, and Namib Desert. Abundant evidence has been found of human occupation since at least the mid-Pleistocene (Shackley, 1985). The Hardap and Karas region is among the archaeologically sensitive landscapes in Namibia, the Karas region is home to 37 declared national monuments, while the Hardap region is home to 3 declared national monuments in the country and other non-designated archaeological sites, and thus make it archaeologically and historically sensitive.

During the site assessment, archaeological sites were observed. Historical graves were observed around the EPLs area. This suggests the possibility of the discovery of more archaeologically significant resources during the exploration works. Figure 5-11 shows archaeologically significant sites observed on the EPLs.



Figure 5-11: Archaeological sites observed during site visit within the EPLs

5.3 Surrounding Land Uses

Parts of three of the EPLs (EPL-8277 and 8279) fall within the !Khub !Naub Conservancy, and the rest on commercial, and communal land as shown in Figure 5-12. The Proponent is required to secure a signed agreement from the affected landowners, farmers and traditional authorities to gain access to the areas of interest for prospecting and exploration investigations as per the Section 52 of the Minerals (Prospecting and Mining) Act No. 33 of 1992 and Section 2.2.3 of the Minerals Policy of Namibia.

Section 52 (1) the holder of mineral licence shall not exercise any rights conferred upon such holder by this Act or under any terms and conditions of such mineral license –

In, on or under any and until such time as such holder has entered into an agreement in writing with the owner of such land containing terms and conditions relating to the payment of compensation, or the owner of such land has in writing waved any right to such compensation and has submitted a copy of such agreement or waiver to the Commissioner.

Section 2.2.3 of the Draft Minerals Policy of Namibia states that the Licence Holder and/or mineral explorers currently have to negotiate a contract with landowners to gain access for or mining purposes.

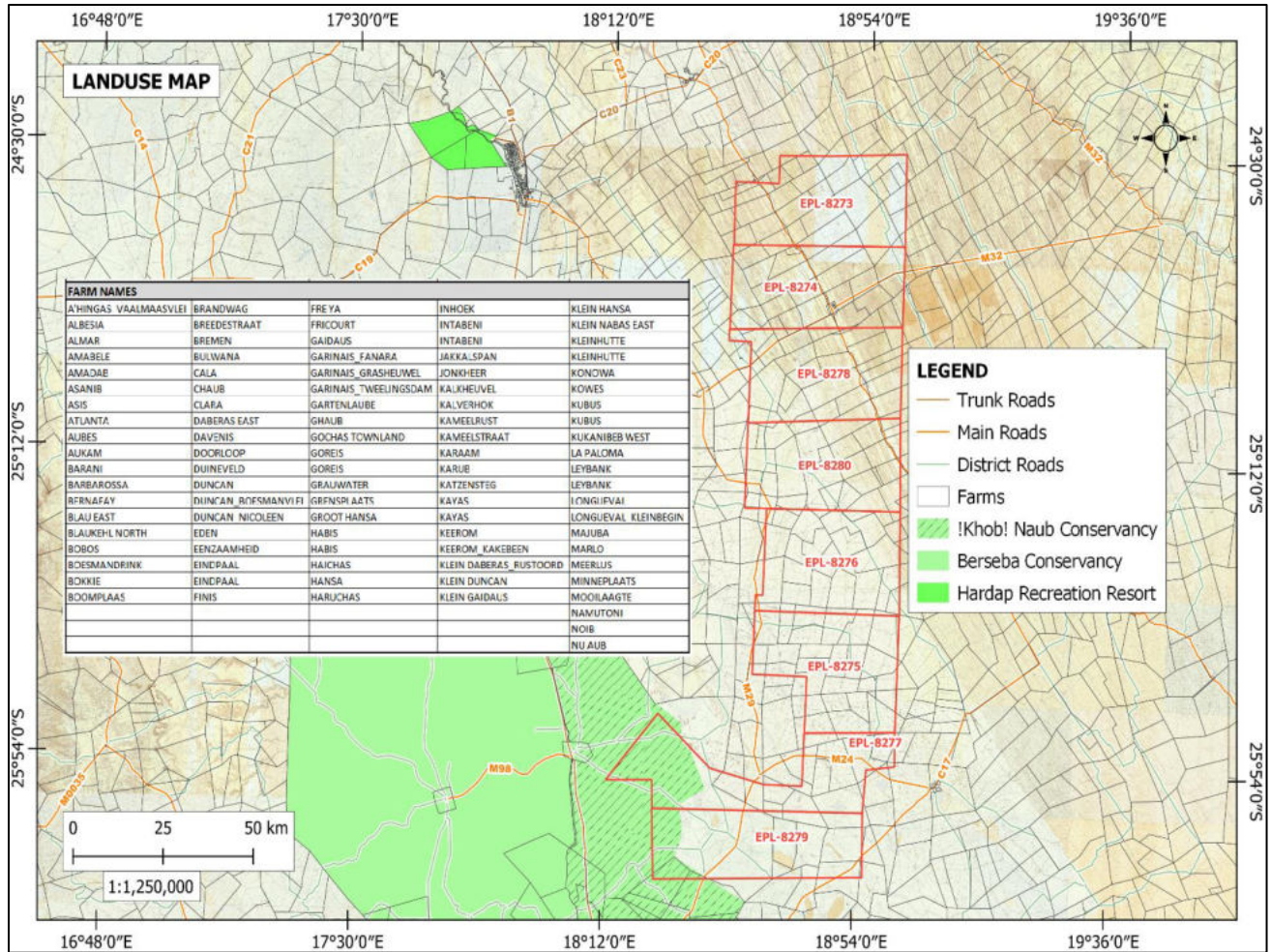


Figure 5-12: The land use within and surrounding the EPLs

5.4 Socio-Economic conditions of Keetmanshoop (Koes) and Mariental (Gochas)

5.4.1 Population

According to the Namibia Statistic Agency (NSA), 2011. The Hardap Region recorded a population of about 68,249 people, while the //Karas Region recorded a population of about 76,000 people. However, the vicinity towns of the project which are Mariental and Keetmanshoop recorded a population of approximately 10,000 (Mariental) people and 22,000 (Keetmanshoop) people.

5.4.2 Farming

Farming in //Karas and Hardap Regions relies on the rainfall. The Hardap regions, Gochas area Gochas is an important node for the agriculture community in the Mariental Rural Constituency of the Hardap Region. The settlement is a convenient resource centre for mainly the agricultural sector. The area is at the center of a set of Kalahari Desert dune farms on which cattle and sheep graze. On the Koes area, Koës is a village in the //Karas Region of south-eastern Namibia within the Keetmanshoop Rural electoral constituency. It is situated on the edge of the Kalahari Desert. Though small, Koës is an important town for local farmers. The vast majority of income in Koës is generated on ranches in the surrounding area and stem from sheep, goat and cattle ranching for meat production purposes. Meat hunting takes place widely and to a lesser extent trophy hunting is also available.

5.4.3 Tourism

The //Karas Region has several sceneries for tourism such as the Ai Ais Hot spring which is a popular stopover for tourists visiting both the Fish River Canyon and the Hot Springs. It is a popular hiking destination. During the winter months, many take a hiker on the challenging 85 km Fish River Canyon Hiking Trail. The Hardap Region has diverse sceneries for tourism. Most notably, the Hardap dam found 18 km north east of Mariental. Gross Nabas Mariental is also found at the South of Stampriet, 20 km along the C15 road. The other unique potentials of tourist attraction to the region is the Lapa Lange Lodge situated 35 km from Mariental in the Kalahari Desert. Additionally, the Batelle Kalahari game ranch is found 46 km north of Mariental.

This trail starts at the viewpoint of the Fish River Canyon.

5.4.4 Mining

!Karas is the second most dominant region in Namibia with mining activities after Erongo Region. There are no mining operations in the municipal jurisdiction of Keetmanshoop, this is in line with geological maps that shows low potential of mineral deposits in the town. However, there are mineral activities in !Karas Region in towns such as Rosh Pinah, Oranjemund and Lüderitz where some of the largest mines in the country are found namely Namdeb, De beers Marine and Rosh Pinah Zinc to mention a few.

Diamond mining is the most prominent in !Karas Region the biggest subsector in the mining sector followed by uranium in Namibia. Additionally, a small amount of industrial minerals deposits such

as limestone, clays, sand, gravel, diatomite, kaolin, bentonite, silica, barite, gypsum, and talc are found around the town.

There is low potential of mineral deposits in the Hardap Region. However, a small number of deposits such as Copper, Silver, Lead, Iron, Manganese and Kimberlite are found in the area. So far there is only 3 Shafts in the Hardap Region in the Klein Aub Region and small miners.

5.4.5 Services Infrastructure

//Karas and Hardap connected to the railway on the Trans-Namib Railway that links Windhoek to Upington South Africa. Furthermore, the two Regions hosts B1 road from South Africa through Namibia to Angola and other SADC regions.

5.4.6 Existing Local Services and infrastructures

There are local services and infrastructure exists within the EPLs' area and some of these are shown in the photos below ().

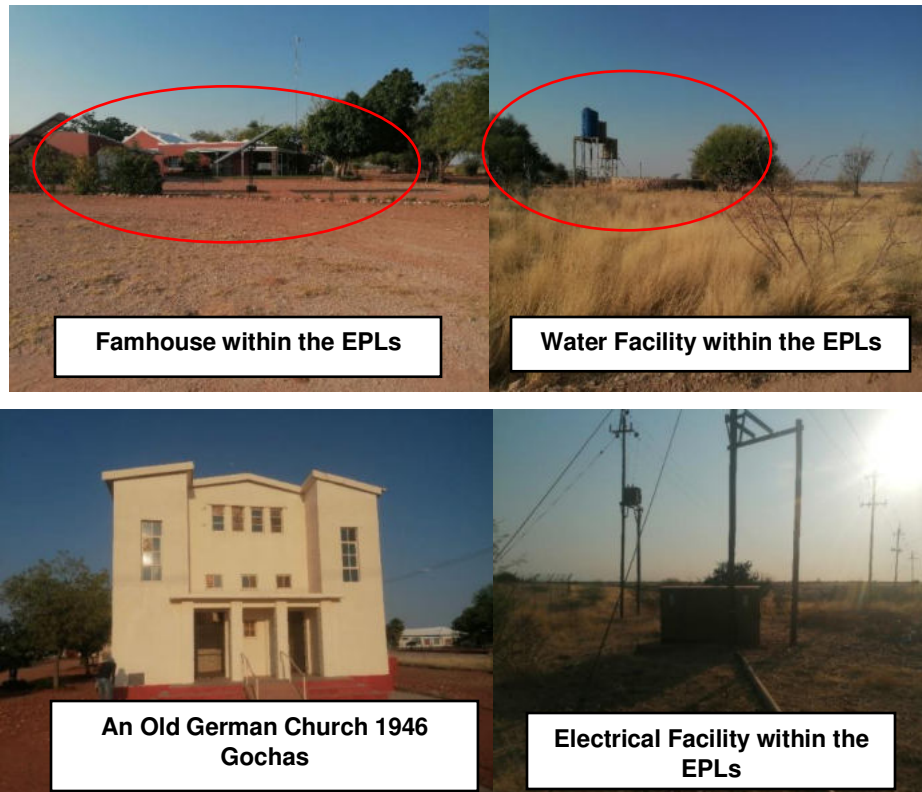


Figure 5-13: Some local infrastructure found within the EPLs area

6 PUBLIC CONSULTATION PROCESS

Public consultation forms an important component of an Environmental Assessment (EA) process. It provides potential Interested and Affected Parties (I&APs) with an opportunity to comment on and raise any issues relevant to the project for consideration as part of the assessment process, thus assisting the Environmental Assessment Practitioner (EAP) in identifying all potential impacts and to the extent to which further investigations are necessary. Public consultation can also aid in the process of identifying possible mitigation measures. Public consultation for this project has been done under the EMA and its EIA Regulations.

6.1 Pre-identified and Registered Interested and Affected Parties (I&APs)

Relevant and applicable national, regional, and local authorities, local leaders, and other interested members of the public were identified. Pre-identified I&APs were contacted directly, while other parties who contacted the Consultant after project advertisement notices in the newspapers, were registered as I&APs upon their request. Newspaper advertisements of the proposed exploration activities were placed in two widely-read national newspapers in the region (The Namibian Newspaper and New Era Newspaper). The project advertisement/announcement ran for two consecutive weeks inviting members of the public to register as I&APs and submit their comments. The summary of pre-identified and registered I&APs is listed in Table 6-1 below.

Table 6-1: Summary of Interested and Affected Parties (I&APs)

National (Ministries and State-Owned Enterprises)
Ministry of Environment, Forestry and Tourism
Ministry of Mines and Energy
Ministry of Health and Social Services
Ministry of Agriculture, Water and Land reform
Regional, Local and Traditional Authorities
Hardap Regional Council
//Karas Regional Council
Keetmashoop Municipality
Mariental Municipality

Koes Village Council
Gochas Village Council
Tses Village Council
General Public
Land owners /Interested members of the public
Namibia Community Based Tourism Association

6.2 Communication with I&APs

Regulation 21 of the EIA Regulations details the steps to be taken during a public consultation process and these have been used in guiding this process. Communication with I&APs with regards to the proposed development was facilitated through the following means and in this order:

- A Background Information Document (BID) containing brief information about the proposed exploration works was compiled and delivered to relevant Authoritative Ministries, and upon request to all new registered Interested and Affected Parties (I&APs);
- Project Environmental Assessment notices were published in The Namibian Newspaper (29 August 2022 and 05 September 2022) and New Era Newspaper (29 August 2022 and 05 September 2022) (Appendix D), briefly explaining the activity and its locality, inviting members of the public to register as I&APs and submit their comments/concerns;
- Public notices were placed at frequented public places at Keetmashoop Town, Tses Village, Koes Village and Gochas Village Figure 6-1, Figure 6-2, Figure 6-3 and Figure 6-4) to inform members of the public of the EIA process and register as I&APs, as well as submit comments.
- Public meetings were scheduled and held on 05 October 2022 and 06 October 2022, at Schutzenhaus Conference Hall in Keetmanshoop at 09h00 (05 October 2022), at Tses Community Hall in Tses 14h00 (05 October 2022), at Koes Community Hall 09h00 (06 October 2022) and at Stoney's Country Hotel in Gochas 14h30 (06 October 2022) (Figure 6-5). The meeting minutes were taken and attached hereto as Appendix E.



Figure 6-1: Public notices placed at the Schutzenhaus Hotel in Keetmanshoop Town, //Karas Region



Figure 6-2: Public notices placed at the Tses Community Hall in Tses Village, //Karas Region, Namibia

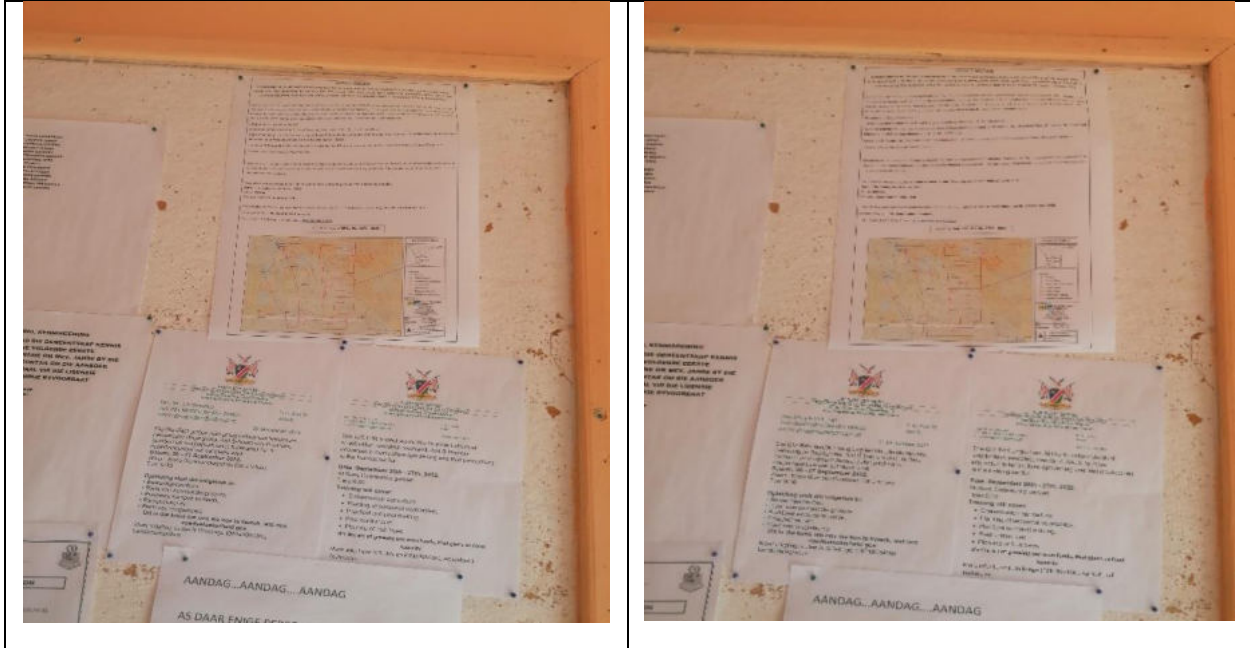


Figure 6-3: Public notices placed at the Koes Village Council in Koes Village, //Karas Region, Namibia



Figure 6-4: Public notices placed at the Stoney's Country Hotel in Gochas Village, Hardap Region, Namibia



Figure 6-5: Consultation meetings scheduled and held on the 05th and 06th of October 2022, Schutzenhaus Conference Hall Keetmanshoop //Karas Region, Tses Community Hall, Tses //Karas Region, Koes Community Hall, Koes //Karas Region, and Stoney's Country Hotel, Gochas Hardap Region.

Issues were raised by I&APs and these issues have been recorded and incorporated in the environmental report and EMP. The summarized issues raised during the public meeting are presented in Table 6-2 below. The issues raised and responses by EDS are attached under Appendix F.

Table 6-2: Summary of main issues raised and comments received during public meeting engagements

Issue	Concern
Groundwater Contamination	Exploration requires drilling, and drilling into the aquifer can cause ground water contamination. All the people and animals in the area depends on the ground water as a source of fresh water, for drinking and farming, therefore no chances should be taken with groundwater.
Sensitive area	The project area is sensitive because it covers an aquifer which is a water supply to human being.
Area Withdrawal	The project overlies the aquifer which is a transboundary aquifer, shared between Namibia, Botswana and South Africa therefore it must be withdrawn, so that no exploration must take place.
Farmers Invitation	All the interested and affected parties should be invited for public consultation meetings.
What is the Exploration all about	What commodities are to be explored and the depth level of exploration to be reached.
Headspring Green Mining	Is Excel Dynamic Solutions connected to Headspring Green Mining?
Drilling	If drilling is going to take place in the Stampriet Aquifer?
Drilling Guarantee	What is the guarantee that with this drilling the ground water is not going to be contaminated? All the farms here need a guarantee that water is not going to be contaminated.
Water Monitoring	Is there water monitoring gone take place? And who is going to do the monitoring to make sure all this is okay?
perforation	How is perforation going to be prevented for the three aquifers?

Issue	Concern
Water Table	What will happen to the water table if too much water is extracted? Will the water table not go down?
Water test	Where will be the water tests be done, and is it possible that, the interested and affected parties can also have that same water and test, will the results (test) be made public?
Communal areas (people)	If minerals are found in the communal areas, where will the people that lives, there be relocated to?

7 IMPACT IDENTIFICATION, ASSESSMENT AND MITIGATION MEASURES

7.1 Impact Identification

The proposed activities are usually associated with different potential positive and/or negative impacts. For an environmental assessment, the focus is placed mainly on the negative impacts. This is done to ensure that these impacts are addressed by providing adequate mitigation measures such that an impact's significance is brought under control, while maximizing the positive impacts of the development. The potential positive and negative impacts that have been identified from the prospecting activities are listed as follow:

Positive impacts:

- Creation of temporary job opportunities to the locals (primary, secondary and tertiary employment).
- Provision of opportunities to small businesses that can supply goods and services to the exploration works.
- Boosting of the local economic growth and development.

Negative impacts:

- Disturbance to the grazing area
- Land degradation and Biodiversity Loss.
- Generation of dust
- Water Resources Use
- Soil & Water Resources Pollution
- Waste Generation
- Occupational Health & Safety risks
- Vehicular Traffic Use & Safety
- Noise & Vibrations
- Disturbance to Archaeological & Heritage Resources
- Impacts on local Roads
- Social Nuisance: local property intrusion & disturbance
- Social Nuisance: Job seeking & differing Norms, Culture & values.

7.2 Impact Assessment Methodology

The Environmental Assessment process primarily ensures that potential impacts that may occur from project activity are identified, and addressed with environmentally cautious approaches and legal compliance. The impact assessment method used for this project is in accordance with Namibia's Environmental Management Act (No. 7 of 2007) and its Regulations of 2012, as well as the International Finance Corporation (IFC) Performance Standards.

The identified impacts were assessed in terms of scale/extent (spatial scale), duration (temporal scale), magnitude (severity) and probability (likelihood of occurring), as presented in Table 7-1.

In order to enable a scientific approach to the determination of the environmental significance, a numerical value is linked to each rating scale. This methodology ensures uniformity and that potential impacts can be addressed in a standard manner so that a wide range of impacts are comparable. It is assumed that an assessment of the significance of a potential impact is a good indicator of the risk associated with such an impact. The following process will be applied to each potential impact:

- Provision of a brief explanation of the impact,
- Assessment of the pre-mitigation significance of the impact, and
- Description of recommended mitigation measures.

The recommended mitigation measures prescribed for each of the potential impacts contribute towards the attainment of environmentally sustainable operational conditions of the project for various features of the biophysical and social environment. The following criteria were applied in this impact assessment.

Table 7-1: Criteria used for impact assessment (extent, duration, intensity and probability)

The Criteria used to assess the potential impacts				
Extent or (spatial scale) - extent is an indication of the physical and spatial scale of the impact.				
Low (1)	Low/Medium (2)	Medium (3)	Medium/High (4)	High (5)

The Criteria used to assess the potential impacts				
Impact is localised within the site boundary: Site only	Impact is beyond the site boundary: Local	Impacts felt within adjacent biophysical and social environments: Regional	Impact widespread far beyond site boundary: Regional	Impact extend National or over international boundaries
Duration- Duration refers to the timeframe over which the impact is expected to occur, measured in relation to the lifetime of the project				
Low (1)	Low/Medium (2)	Medium (3)	Medium/High (4)	High (5)
Immediate mitigating measures, immediate progress	Impact is quickly reversible, short-term impacts (0-5 years)	Reversible over time; medium term (5-15 years)	Impact is long-term	Long term; beyond closure; permanent; irreplaceable or irretrievable commitment of resources
Intensity, Magnitude / severity - Intensity refers to the degree or magnitude to which the impact alters the functioning of an element of the environment. This a qualitative type of criteria				
H-(10)	M/H-(8)	M-(6)	M/L-(4)	L-(2)
Very high deterioration, high quantity of deaths, injury of illness / total loss of habitat, total alteration of ecological processes, extinction of rare species	Substantial deterioration, death, illness or injury, loss of habitat / diversity or resource, severe alteration, or disturbance of important processes	Moderate deterioration, discomfort, partial loss of habitat / biodiversity or resource, moderate alteration	Low deterioration, slight noticeable alteration in habitat and biodiversity. Little loss in species numbers	Minor deterioration, nuisance or irritation, minor change in species / habitat / diversity or resource, no or very little quality deterioration.
Probability of occurrence - Probability describes the likelihood of the impacts occurring. This determination is based on previous experience with similar projects and/or based on professional judgment				
Low (1)	Medium/Low (2)	Medium (3)	Medium/High (4)	High (5)

The Criteria used to assess the potential impacts				
Improbable; low likelihood; seldom. No known risk or vulnerability to natural or induced hazards.	Likely to occur from time to time. Low risk or vulnerability to natural or induced hazards	Possible, distinct possibility, frequent. Low to medium risk or vulnerability to natural or induced hazards.	Probable if mitigating measures are not implemented. Medium risk of vulnerability to natural or induced hazards.	Definite (regardless of preventative measures), highly likely, continuous. High risk or vulnerability to natural or induced hazards.

7.2.1 Significance

Impact significance is determined through a synthesis of the above impact characteristics. The significance of the impact “without mitigation” is the main determinant of the nature and degree of mitigation required. As stated in the introduction to this section, for this assessment, the significance of the impact without prescribed mitigation actions is measured.

Once the above factors (Table 7-1) have been ranked for each potential impact, the impact significance of each is assessed using the following formula:

$$\text{SIGNIFICANCE POINTS (SP)} = (\text{MAGNITUDE} + \text{DURATION} + \text{SCALE}) \times \text{PROBABILITY}$$

The maximum value per potential impact is 100 significance points (SP). Potential impacts were rated as high, moderate or low significance, based on the following significance rating scale (Table 7-2).

Table 7-2: Significance rating scale

<i>Significance</i>	<i>Environmental Significance Points</i>	<i>Colour Code</i>
High (positive)	>60	H
Medium (positive)	30 to 60	M
Low (positive)	1 to 30	L

<i>Significance</i>	<i>Environmental Significance Points</i>	<i>Colour Code</i>
Neutral	0	N
Low (negative)	-1 to -30	L
Medium (negative)	-30 to -60	M
High (negative)	-60<	H

Positive (+) – Beneficial impact

Negative (-) – Deleterious/ adverse+ Impact

Neutral – Impacts are neither beneficial nor adverse

For an impact with a significance rating of high (-ve), mitigation measures are recommended to reduce the impact to a medium (-ve) or low (-ve) significance rating, provided that the impact with a medium significance rating can be sufficiently controlled with the recommended mitigation measures. To maintain a low or medium significance rating, monitoring is recommended for a period of time to enable the confirmation of the significance of the impact as low or medium and under control.

The assessment of the exploration phases is done for pre-mitigation and post-mitigation.

The risk/impact assessment is driven by three factors:

Source: The cause or source of the contamination.

Pathway: The route taken by the source to reach a given receptor

Receptor: A person, animal, plant, eco-system, property or a controlled water source. If contamination is to cause harm or impact, it must reach a receptor.

A pollutant linkage occurs when a source, pathway and receptor exist together. Mitigation measures aim firstly, avoid risk and if the risk cannot be avoided, mitigation measures to minimize the impact are recommended. Once mitigation measures have been applied, the identified risk would reduce to lower significance (Booth, 2011).

This assessment focuses on the three project phases namely; the prospecting, exploration (and possible analysis) and decommissioning. The potential negative impacts stemming from the

proposed activities on the EPLs are described, assessed and mitigation measures provided in the Draft Environmental Management Plan.

7.3 Assessment of Potential Negative Impacts

The key potential negative impacts associated with the project activities are identified and assessed below:

7.3.1 Disturbance to the grazing areas

The EPLs are overlying commercial farms and communal areas that practice livestock and game farming, the invasive exploration activities such as site clearing, trenching, and drilling can potentially lead to the disturbance of grazing land available to the livestock and wildlife. The land owners greatly depend farming for subsistence and commercial purposes; therefore, their livelihood may be impacted through any eventual losses.

The effect of exploration work on the land (when done over a wider spatial extent), if not mitigated, may hinder animal husbandry in the area and its surrounding. The project area might experience loss of its pastoral system over time, which minimizes the number of animals on the farms and overall farming activity in the area, and lead to loss of livelihoods. Under the status, the impact can be of a low significance rating. With the implementation of appropriate mitigation measures, the rating will be reduced to a lower significance. The impact is assessed in Table 7-3 below.

Table 7-3: Assessment of the impacts of exploration on grazing areas

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	M: -4	M: -3	M: -5	M/H: 5	M: -60
Post mitigation	L/M: -2	L/M: -2	L/M: -4	L/M: 3	L: -24

7.3.2 Land Degradation and Loss of Biodiversity

Fauna: The trenching, pitting and drilling activities carried out during exploration would result in land degradation, leading to habitat loss for a diversity of flora and fauna ranging from microorganisms to large animals and trees. Endemic species are most at risk, since even the slightest disruption in their habitat can result in extinction.

The presence and movement of the exploration workforce and operation of project equipment and heavy vehicles would disturb livestock and wildlife present farms. The proposed activities

may also carry the risk of potential illegal hunting of local wildlife. This could lead to reduction of specific faunal species, which may limit tourism (sightseeing and safari) activity in the area.

Additionally, if the exploration sites are not rehabilitated, they could pose a high risk of injuries to animals by falling into holes and pits.

Flora: The direct impacts of exploration work on flora will mainly occur through clearing for exploration access routes and associated infrastructure. The dust emissions from drilling may also affect surrounding vegetation through the fall of dust, if excessive. Some loss of vegetation is an inevitable consequence of the development. However, given the abundance of the shrubs and site-specific areas of exploration on the EPLs, the impact will be localized, therefore manageable.

Under the status, the impact can be of a medium significance rating. With the implementation of appropriate mitigation measures, the rating will be reduced to a low significance rating. The impact is assessed in Table 7-4 below.

Table 7-4: Assessment of the impacts of exploration on biodiversity

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	M: -4	M: -4	M: -6	M/H: 4	M: -56
Post mitigation	L/M: -3	L/M: -3	L/M: -4	L/M: 3	L: -30

7.3.3 Impact on Air Quality

Dust emanating from site access roads when transporting exploration equipment and supply to and from site may compromise the air quality in the area. Vehicular movements from heavy vehicles such as trucks would potentially create dust, even though it is anticipated to be low. The hot and dry environment, loose and sandy nature of the substrate and low vegetation cover causes ambient fugitive dust levels. Additionally, activities carried out as part of the exploration works such as drilling would contribute to the dust levels in the air. The medium significance of this impact can be reduced to a low significance rating by properly implementing mitigation measures. The impact is assessed in Table 7-5 below.

Table 7-5: Assessment of the impacts of exploration on air quality

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	M: -3	M: -3	M/L: -4	M/H: 4	M: -40

Post mitigation	L - 2	L - 2	L - 2	L - 1	L - 6
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7.3.4 Water Resources Use

Water resources is impacted by project developments/activities in two ways - through pollution (water quality) or over-abstraction (water quantity) or at times both.

The abstraction of more water than can be replenished from low groundwater potential areas would negatively affect the local communities (communal and commercial farmers and livestock) that depend on the same low potential groundwater resource (aquifer).

The impact of the project activities on the resources would be dependent on the water volumes required by each project activity. Exploration activities use a lot of water, mainly for drilling. However, this depends on the type of drilling methods employed (diamond drilling is more water-consuming compared to drilling methods such as reverse circulation for instance) and the type of mineral being explored for.

The drilling method to be employed for this project's exploration activities is Reverse Circulation. The required water for exploration is about 4,000 litres per month. This water will be used for drilling purposes, as well as such cooling and washing of equipment, drinking and other domestic purposes. Given the low to medium groundwater potential of some project site areas, the Proponent may consider carting some of the water volumes from outside the area and stored in industry standard water reservoirs/tanks on site. The exact amounts of water required for proposed operations would be dependent on the duration of the exploration works and number of exploration boreholes required to make reliable interpretation on the commodities explored for. The exploration period is temporally limited, therefore, the impact will only last for the duration of the exploration activities, and ceases upon their completion.

Without the implementation of any mitigation measures, the impact can be rated as medium to high, but upon effective implementation of the recommended measures, the impact significance would be reduced to medium as presented in the Table 7-6 below.

Table 7-6: Assessment of the project impact on water resource use and availability

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	M - 3	M/H - 4	L/M - 4	M/H - 4	M - 44
Post mitigation	L - 1	L - 1	L - 2	L/M - 2	L - 8

7.3.5 Soil and Water Resources Pollution

The proposed exploration activities are associated with a variety of potential pollution sources (i.e., lubricants, fuel, and wastewater) that may contaminate/pollute soils, and eventually, groundwater and surface water. The anticipated potential source of pollution to water resources from the project activities would be hydrocarbons (oil) from project vehicles, machinery, and equipment as well as potential wastewater/effluent from exploration related activities.

The spills (depending on volumes spilled on the soils) from machinery, vehicles and equipment could infiltrate into the ground and pollute the fractured or faulted aquifers on site, and with time reach further groundwater systems in the area. However, it should be noted that the scale and extent/footprint of the activities where potential sources of pollution will be handled is relatively small. Therefore, the impact will be moderately low.

Pre-mitigation measure implementation, the impact significance is low to moderate and upon implementation, the significance will be reduced to low. The impact is assessed in Table 7-7 below.

Table 7-7: Assessment of the project impact on soils and water resources (pollution)

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	M - 4	M/H - 3	M - 6	M - 4	M - 52
Post mitigation	L - 2	M - 3	L - 3	L/M - 3	L - 24

7.3.6 Waste Generation

During the prospecting and exploration phase, domestic and general waste is produced on site. If the generated waste is not disposed of in a responsible way, land pollution may occur on the EPLs or around the sites. The EPLs are in an area of moderate sensitivity to pollution. Improper handling, storage and disposal of hydrocarbon products and hazardous materials at the site may lead to soil and groundwater contamination, in case of spills and leakages. Without any mitigation measures, the general impact of waste generation has a medium significance. The impact will reduce to low significance, upon implementing the mitigation measures. The assessment of this impact is given in Table 7-8.

Table 7-8: Assessment of waste generation impact

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	L/M - 2	L/M - 2	M - 4	M - 4	M - 32
Post mitigation	L - 1	L - 1	L - 2	L/M - 2	L - 8

7.3.7 Occupational Health and Safety Risks

Project personnel (workers) involved in the exploration activities may be exposed to health and safety risks such as accidents from heavy machinery or vehicles as well as mishandling of hazardous material. The heavy vehicle, equipment and fuel storage area should be properly secured to prevent any harm or injury to the Proponent's personnel or local domestic animals.

The use of heavy equipment, especially during drilling and the presence of hydrocarbons on sites may result in accidental fire outbreaks. This could pose a safety risk to the project personnel and equipment and vehicles too. If machinery and equipment are not properly stored and packed, the safety risk may be a concern for project workers and local residents.

The impact is probable and has a medium significance rating. However, with adequate mitigation measures, the impact rating will be reduced to low. This impact is assessed in Table 7-9 below and mitigation measures provided.

Table 7-9: Assessment of the impacts of exploration on health and safety

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	M - 3	M/L - 2	M - 6	M/H - 4	M - 44
Post mitigation	L/M - 2	L/M - 2	L - 2	L/M - 2	L - 12

7.3.8 Vehicular Traffic Use and Safety

The EPLs are accessible via the main B1 road that is connected to the M29, M0029, M0032 and M0033 roads from Keetmanshoop and Mariental. These are some of the main transportation routes for all vehicular movement in the area and provide access to the EPLs and connect the project area to other towns. Traffic volume will therefore increase on these district roads during exploration as the project would need a delivery of supplies and services on site.

Depending on the project needs, trucks, medium and small vehicles will frequent the area to and from exploration sites on the EPLs. This would potentially increase slow moving heavy vehicular

traffic along these roads, and add additional pressure on the roads. However, transportation of materials and equipment is expected to occur on a limited schedule and only for the duration of the project. Therefore, the risk is anticipated to be short-term, not frequent, and therefore of medium significance. Pre-mitigation, the impact can be rated medium and with the implementation of mitigation measures, the significance will be low as assessed in Table 7-10.

Table 7-10: Assessment of the impacts of exploration on road use (vehicular traffic)

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	M - 4	M/H - 3	L/M - 4	M/H - 5	M - 55
Post mitigation	L/M - 2	L/M - 2	L - 2	L/M - 2	L - 12

7.3.9 Noise and vibrations

Prospecting and exploration work (especially drilling) may be a nuisance to surrounding communities due to the noise produced by the activity. Excess noise and vibrations can be a health risk to workers on site. The exploration equipment used for drilling on site is of medium size and the noise level is bound to be limited to the site only, therefore, the impact likelihood is minimal. Without any mitigation, the impact is rated as of medium significance. To change the impact significance from the pre-mitigation significance to low rating, the mitigation measures should be implemented. This impact is assessed in Table 7-11 below.

Table 7-11: Assessment of the impacts of noise and vibrations from exploration

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	L/M - 2	L/M - 2	M - 6	M/H - 3	M - 30
Post mitigation	L - 1	L/M - 2	L - 2	L/M - 2	L - 10

7.3.10 Disturbance to Archaeological and Heritage Resources

The proposed prospecting and exploration area contain some archaeological significances, therefore, the project indicates that some sections within the boundaries of the proposed project site area are highly sensitive and archaeologically significant in terms of heritage resources that characterizes the need of a detailed investigation of any other existing archaeological/cultural materials in the areas, and they should be protected either by fencing them off or demarcation for preservation purposes or excluded from any development i.e., no exploration activities should be conducted near these recorded areas through establishment of 500 m to 1.5 km buffer zones.

Therefore, this impact can be rated as medium significance if there are no mitigation measures in place. Upon implementation of the necessary measures, the impact significance will be reduced to a lower rating. The impact is assessed in Table 7-12.

Table 7-12: Assessment of the impacts of exploration on archaeological & heritage resources

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	M - 3	M/H - 4	M - 6	M/H - 4	M – 52
Post mitigation	L/M - 2	L/M - 2	L - 2	L/M - 2	L - 12

7.3.11 Impact on Local Roads/Routes

Exploration projects are usually associated with frequent movement of heavy trucks and equipment or machinery on local roads. Heavy trucks travelling on the local roads exert pressure on the roads, and heavy vehicles may make the roads difficult to use. This will be a concern if maintenance and care is not taken during the exploration phase. The impact would be short-term (during exploration only) and therefore, manageable.

Without any management and or mitigation measures, the impact can be rated as medium and to reduce this rating to low, the measures will need to be effectively implemented. The assessment of this impact is presented in Table 7-13.

Table 7-13: Assessment of exploration on local services (roads and water)

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	M/H - 4	M - 3	M - 6	M - 3	M – 39
Post mitigation	L - 1	L - 1	M/L - 4	M/L - 2	L - 12

7.3.12 Social Nuisance: Local Property intrusion and Disturbance/Damage

The presence of some non-resident workers may lead to social annoyance to the local community. This could particularly be a concern if they enter or damage local private property. The private properties of the locals may include houses, fences, vegetation, livestock and wildlife, or any properties of economic or cultural value to the farm/landowners or users of the land. The damage or disturbance to properties may not only be private but local public properties. The unpermitted and unauthorized entry to private property may cause clashes between the affected property (land) owners and the Proponent.

The impact is rated as of medium significance. However, upon mitigation (post-mitigation), the significance will change from medium to low rating. The impact is assessed below Table 7-14).

Table 7-14: Assessment of social impact of community property damage or disturbance

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	M - 2	M - 3	M - 4	M/H - 3	M – 27
Post mitigation	L - 1	L - 1	M/L - 4	M/L - 2	L - 12

7.4 Cumulative Impacts Associated with Proposed Exploration

According to the International Finance Corporation (2013), cumulative impacts are defined as “impacts that result from the successive, incremental, and/or combined effects of an action, project, or activity (collectively referred to in this document as “developments”) when added to other existing, planned, and/or reasonably anticipated future impacts”.

Similar to many other exploration projects, some cumulative impacts to which the proposed project and associated activities potentially contribute, are the:

- **Impact on road infrastructure:** The proposed exploration activity contributes cumulatively to various activities such as farming activities and travelling associated with tourism and local daily routines. The contribution of the proposed project to this cumulative impact is however not considered significant, given the short duration, and spatial extent of the intended mineral exploration activities.
- **The use of water:** While the contribution of this project will not be significant, mitigation measures to reduce water consumption during exploration are essential.

7.5 Mitigations and Recommendations for Rehabilitation

The rehabilitation of explored (disturbed) sites will include but not be limited to the following:

- Backfilling of trenches and or pits in such a way that subsoil is replaced first, and topsoil replaced last.
- Closing off and capping of all exploration drilling boreholes. The boreholes should not only be filled with sand alone, as wind may scour the sand and re-establish the holes.
- Carrying away all waste generated from the site.

- Transporting all machinery and equipment as well as vehicles to designated offsite storage facilities.

8 RECOMMENDATIONS AND CONCLUSION

8.1 Recommendations

The potential positive and negative impacts of the proposed exploration activities on EPLs No. 8273, 8274, 8274, 8275, 8276, 8277, 8278, 8279, and 8280 were identified, assessed and appropriate management and mitigation measures (to negative impacts) made thereof for implementation by the Proponent, their contractors and project related employees.

Mitigation measures to identified issues have been provided, thereof, to avoid and/or minimize their significance of impacts on the environmental and social components. Most of the potential impacts were found to be of medium rating significance. With effective implementation of the recommended management and mitigation measures, a reduced rating in the significance of adverse impacts is expected from Medium to Low. To maintain the desirable rating, the implementation of management and mitigation measures should be monitored by the Proponent directly, or their Environmental Control Officer (ECO). The monitoring of this implementation will not only be done to maintain low rating, but also to ensure that all potential impacts identified in this study and other impacts that might arise during implementation are properly identified in time and addressed right away.

The Environmental Consultant is confident that the potential negative impacts associated with the proposed project activities can be managed and mitigated by the effective implementation of the recommended management and mitigation measures and with more effort and commitment put on monitoring the implementation of these measures.

It is therefore, recommended that the proposed prospecting and exploration activities may be granted an Environmental Clearance Certificate, provided that:

- All the management and mitigation measures provided herein are effectively and progressively implemented.
- All required permits, licenses and approvals for the proposed activities should be obtained as required. These include permits and licenses for land use access agreements to explore and ensuring compliance with these specific legal requirements.

- The Proponent and all project workers and contractors must comply with the legal requirements governing the project and ensure that all required permits and or approvals are obtained and renewed as stipulated by the issuing authorities.
- Site areas where exploration activities have ceased are rehabilitated, as far as practicable, to their pre-exploration state.

8.2 Conclusion

It is crucial for the Proponent and their contractors to effectively implement the recommended management and mitigation measures to protect the biophysical and social environment throughout the project duration. This would be done with the aim of promoting environmental sustainability, while ensuring a smooth and harmonious existence and purpose of the project activities in the community and environment at large. It is also to ensure that all potential impacts identified in this study and other impacts that might arise during implementation are properly identified in time and addressed accordingly. Lastly, should the ECC be issued, the Proponent will be expected to be compliant with the ECC conditions as well as legal requirements governing the mineral exploration and related activities.

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