Excel Dynamic Solutions (Pty) Ltd

ENVIRONMENTAL SCOPING ASSESSMENT (ESA) FOR THE PROPOSED EXPLORATION ACTIVITIES ON EXCLUSIVE PROSPECTING LICENSE (EPL) No. 9813 LOCATED SOUTH-EAST OF OTAVI IN THE OTJOZONDJUPA REGION, NAMIBIA

ENVIRONMENTAL ASSESSMENT REPORT : FINAL

ECC APPLICATION NUMBER: APP- 005443

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EAP SIGNATURE

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PROPONENT SIGNATURE

JULY 2025

EXECUTIVE SUMMARY

Libra Seventy One Investments (Pty) Ltd (The Proponent) applied to be granted an Exclusive Prospecting Licence (EPL) No. 9813 by the Ministry of Industry, Mines and Energy (MIME).

The EPL covers a total surface area of 19837.2915 hectares (ha), located about 30 km South-East of Kombat in Otjozondjupa region. The EPL covers (overlies) Farms such as **Esere No.150, Esere No.151, Rotenfels No.145, Odusa No.146 and Breitenbach No.1257.**

The Proponent is interested in conducting exploration activities for **Base and Rare Metals**, **Dimension Stones**, **Industrial Minerals**, **Nuclear Fuels**, and **Precious Metals**.

Prospecting and exploration related activities are among the listed activities that may not be undertaken without an ECC, under the Environmental Impact Assessment (EIA) Regulations, Therefore, to ensure that the proposed activities are 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.

PROJECT DESCRIPTION

Planned Activities: Proposed Exploration Methods

The Proponent intends to adopt a systematic prospecting and exploration approach to the project as follows:

1. **Non-invasive Techniques:** Mainly include existing data desktop reviews, ground geological mapping, lithology geochemical surveys and geophysical surveys.
2. **Invasive Techniques:** Include soil sampling, stream sampling, trenching, and exploration drilling.

PUBLIC CONSULTATION

The public consultation process assists the Environmental Consultant in identifying all potential impacts and aid in the process of identifying possible mitigation measures and alternatives to certain project activities. The communication with Interested and Affected Parties (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 exploration works was compiled and emailed to pre-identified I&APs, and upon request to all new registered I&APs;
- Notices for the Environmental Scoping Assessment of the proposed exploration project were published in The Namibian and New Era newspapers on the **10th and 17th January 2025**, respectively, briefly explaining the activity and its locality, inviting members of the public to register as I&APs and submit their comments/concerns.
- A consultation meeting was scheduled and held with the affected landowners on the **12th of May 2025 at Farm Esere No.151, Grootfontein at 11h00.**

Issues or concerns raised during the public consultation meeting, and information obtained from the site visit and existing litrature were integrated in the ESA Report and EMP.

Potential Impacts identified.

The following potential impacts are anticipated:

- **Positive impacts**: Socio-economic development through employment creation, women empowerment 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 and regional economic development and; Increased support for local businesses through the procurement of consumable items such as Personal Protective Equipment (PPE), equipment, lubricants and basic consumables.
- **Negative impacts**: Potential disturbance of grazing land; Physical land/soil disturbance; Impact on local biodiversity (fauna and flora); Habitat disturbance ; Potential impact on water resources and soil (pollution); Air quality issues: potential dust generation; 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; Archaeological and heritage impact and Potential social nuisance and conflicts.

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

RECOMMENDATIONS

The Environmental Consultant is confident that the potential negative impacts associated with the proposed project activities can be adequately managed and mitigated by the effective implementation of the recommended management and mitigation measures. Proper monitoring and adherence to these measures will further ensure that the proposed project activities are sustainable and environmentally responsible.

It is, therefore, recommended that the proposed prospecting and exploration activities be granted an ECC, 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 ensure 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 to undertake specific site activities are obtained and renewed as stipulated by the issuing authorities.
- Sites, 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 DEAF Portal as per the provision made on the MEFT/DEAF's portal.

Disclaimer

Excel Dynamic Solutions (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 EIA 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 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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LIST OF ABBREVIATIONS

Abbreviation	Meaning
AMSL	Above Mean Sea Level
BID	Background Information Document
CV	Curriculum Vitae
DEAF	Department of Environmental Affairs and Forestry
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 the 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 km2 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.
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

Libra Seventy One Investments (Pty) Ltd (The Proponent) applied to be granted an Exclusive Prospecting Licence (EPL) No. 9813 by the Ministry of Industry, Mines and Energy (MIME).

The EPL covers a total surface area of 19837.2915 hectares (ha), located about 30 km South-East of Kombat in Otjozondjupa region (**Figure 1**). The EPL covers (overlies) Farms such as **Esere No.150, Esere No.151, Rotenfels No.145, Odusa No.146 and Breitenbach No.1257**.

The Proponent is interested in conducting exploration activities for **Base and Rare Metals**, **Dimension Stones**, **Industrial Minerals**, **Nuclear Fuels**, 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 EIA undertaken and an ECC obtained. Exploration activities are listed among activities that may not occur without an ECC. Therefore, no individuals or organizations may carry out exploration activities without an ECC awarded.

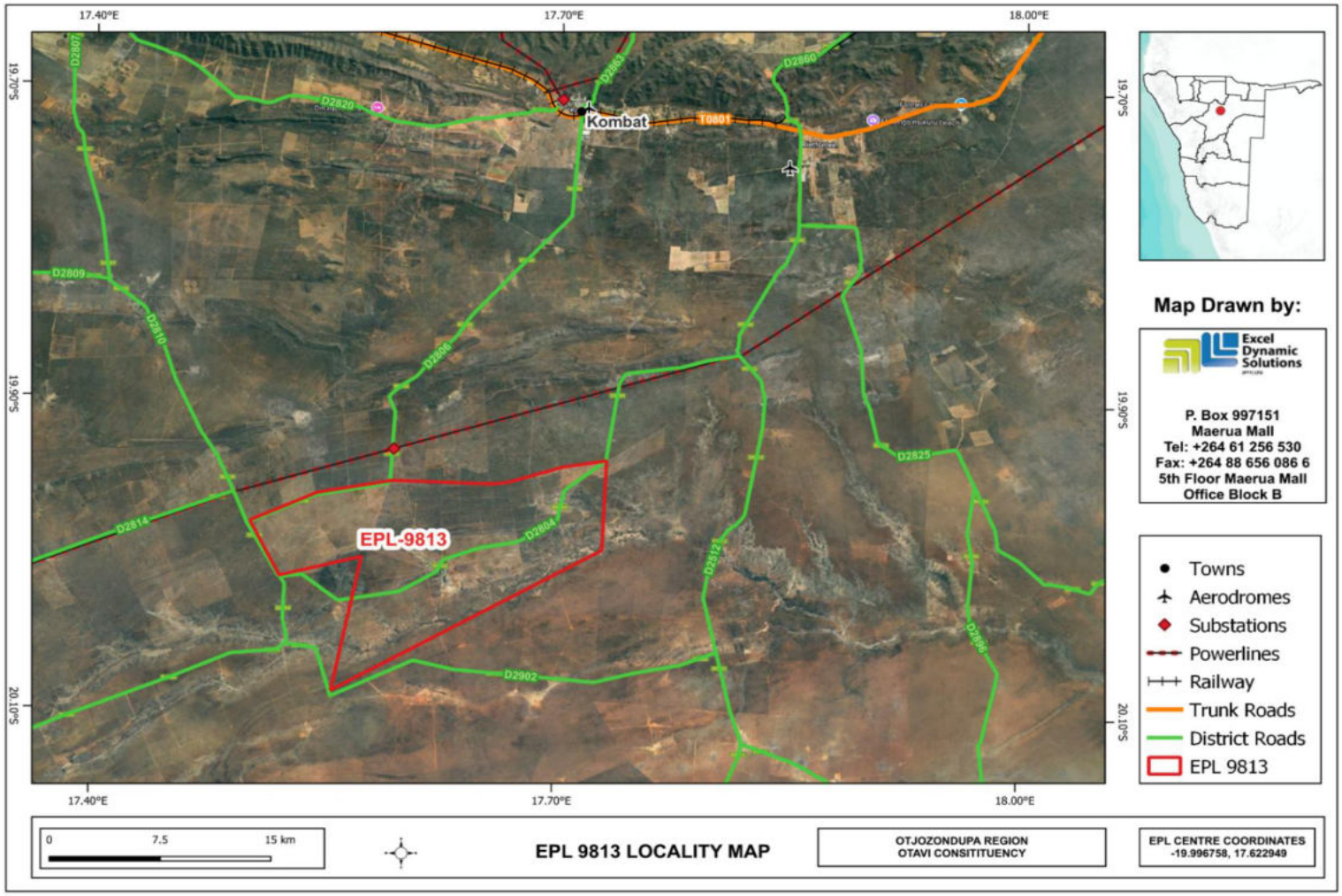

Figure 1: Locality Map For EPL 9813

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

To satisfy the requirements of the EMA and its 2012 EIA Regulations, the Proponent appointed Excel Dynamic Solution Pty Ltd (EDS) to conduct the required EA process on their (Proponent's) behalf, 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 EIA Regulations (GN. No. 30 of 2012) to conduct the study.

The application for the ECC (**Appendix A**) is compiled and submitted to the Ministry of Environment, Forestry and Tourism (MEFT), 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 MEFT, Department of Environmental Affairs and Forestry (DEAF).

The EIA project is headed by Mr. Nerson Tjelos and Mr Mandume Leonard, a qualified and experienced Geoscientist and experienced EAP. The consultation and reporting process for the exploration activities was carried out by Ms. Vistolina Augustus, with review conducted by Mr. Nerson Tjelos. The professional qualifications of Mr. Tjelos and Ms. Augustus are detailed in Appendix C, which provides a comprehensive overview of their experience and expertise.

1.3 Motivation for the Proposed Project

The mining sector is one of the largest contributors to the Namibian economy. It contributes considerably to the improvement of local livelihoods. In Namibia, exploration for minerals is conducted mainly by the private sector. Exploration activities have a great potential to enhance and contribute to the development of other sectors, and its activities provide temporary to permanent employment and eventually contribute to generation of taxes that fund social infrastructure development. The mineral sector yields considerable revenue and accounts for a significant portion of gross domestic product (GDP). Additionally, the industry produces a trained workforce and uplifts local small businesses in communities and may initiate related businesses. Exploration fosters several associated activities such as manufacturing of exploration and mining equipment, provision of engineering and environmental services, upgrade of basic services and

infrastructure including roads, rails,water supply and medicals. Moreover, the mining sector forms a vital part of some of Namibia's development plans - Vision 2030, National Development Plan 5 (NDP5), and Harambee Prosperity Plans (HPPs) I and II. Mining is essential to the development goals of Namibia in contributing to meeting the ever-increasing global demand for minerals, and for national prosperity. It is thus that the successful exploration of target minerals on EPL 9813 could lead to mining activities and contribute to the fulfillment of national development goals. This outcome would bring positive changes to the community, both in the short and long term.

2 PROJECT DESCRIPTION: PROPOSED EXPLORATION ACTIVITY

Prospecting and exploration for minerals are the first components of any potential mining project. These are carried out 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: prospecting, exploration, and the decommissioning of works.

2.1 Prospecting Phase (Non- Invasive Techniques)

2.1.1 Desktop Study

This mainly entails a desktop review of historical geological work done on the EPL, including regional mapping of the targeted district, acquisition of existing geophysical and geochemical data sets, familiarization with past studies of the project area and creating relationships with landowners and local authorities for land access.

2.1.2 Geophysical surveys

Geophysical surveys entail data collection of the substrata by air or ground, through sensors such as radar, magnetic and/or electromagnetic sensors, to detect and ascertain possible 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-borne 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 at analytical chemistry laboratories to determine the existence, the grade (concentration) and the regional extent of mineralization on the EPL. Additionally, trenches or pits may be dug depending on the commodity (in a controlled environment e.g., fencing off and labeling activity sites), using either manual techniques (jack hammers) or excavators to further investigate the mineral potential.

Soil sampling entails digging of small, about 30 cm deep pits along survey lines, where 1kg of sample material is extracted and sieved for finer grain-size to collect about 50g of very fine soil from it, representing the entire sample. As necessary, and to ensure adequate risk mitigation, all major excavations will be 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 Phase (Invasive Techniques)

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

*No explosives will be used during the exploration phase**.***

2.2.1 Detailed Exploration (Drilling)

Should analyses by an analytical laboratory yield positive results, drilling targets are defined, drilled and subsurface samples collected for further analysis. This determines the depth of the potential mineralization. If necessary, new access tracks to the drill sites will be created and drill pads at which to set up the rig will be cleared. Two widely used drilling options may be adopted - the Reverse Circulation (RC) drilling method and/or the Diamond (Core) drilling method. The RC drilling method uses a pneumatic hammer, which drives a rotating tungsten-steel bit. RC Drilling produces an uncontaminated large volume sample, which comprises 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, for better geological interpretation and to perform processing trials.

A typical RC drilling team is made up of 4-5 people (rig operator and assistants), a drilling rig carrying a compressor, a support truck with the drill pipes, 2-3 4x4 vehicles, and a water bowser. All geological samples and drill cores will be stored temporarily at the driller's field camp. This camp may also be used as a place to park and maintain field vehicles and includes storage facilities for fuel and lubricants.

Other aspects of the proposed exploration operations include:

2.2.2 Accessibility to Site

The proposed project site is easily is accessible via D2804 and D2806 road that goes through the EPL. All project-related vehicles will use existing roads to access the EPL.

As far as practicable, all site particularly the basecamp and driling sites shall be accessed through existing tracks. However, given that the project area is covered by vegetation, it is likely that new, but few tracks will be created to ensure easy access to drilling sites and/or exploration target areas. Additionally, it is highly recommended that motorized access is minimized as much as practically possible, especially during geological mapping, sampling, and geophysical surveys. Overall, all roads/track accessed by exploration vehicles must be limited to 5 vehicles when using existing tracks. All new access routes to the drilling sites should be identified, and agreed upon with the relevant stakeholders.

2.2.3 Material and Equipment

The requirements of the exploration program in terms of vehicles and equipment include 4X4 vehicles, a drill rig, a drill pipe truck, water tanks, a diesel tank, a power generator, and a tented camp to accommodate the crew. Equipment and vehicles will be stored at a designated area near the accommodation site or a storage site established within the EPL area.

2.2.4 Services and Infrastructure

- **Water:** The exploration phase typically involves minimal water use, mostly for **dust suppression and drilling** and the estimated monthly water consumption for the proposed project is approximately 3000 litres. Libra Seventy One Investments Company will source water from approved and sustainable sources and no abstraction of groundwater from farms will occur without obtaining necessary permits and signed agreements with the landowners in the area. The company will adhere to the Water Resources Management Act, 2013 to ensure responsible use of water resources.
- **Power supply:** Power required during the operation phase will be provided by diesel generators. About 1500 liters of diesel will be used per day.

- **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. Drip trays will be readily available 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 a bunded diesel bowser on site, and in jerry cans placed on plastic sheeting to avoid unnecessary contamination of soils.

2.2.5 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 as regularly as possible 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 the production of any hazardous waste.

- **Sanitation and human waste**: Appropriate portable ablution facilities will be provided, and the sewage waste will be disposed of according to the approved disposal or treatment methods of the facility manufacturer.
- **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 timeously and contained correctly before polluting the site.

Waste produced on-site can also be categorized as mineral or non-mineral waste:

- **Mineral Waste:** Consists of solid products of exploration and mineral concentration to acquire the targeted minerals. Mineral waste will potentially be produced throughout the exploration phase. This waste will be stripped and dumped in allocated areas as stipulated in the EMP.
- **Non-mineral Waste:** Consists primarily of auxiliary materials that will support the exploration phase. This includes but is not limited to items such as empty containers, plastic, etc., and other domestic waste. This waste will be collected, sorted, and taken to the dumpsite as regularly as necessary.

2.2.6 Safety and Security

- **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:** Basic firefighting equipment, i.e., fire extinguishers, will be readily available in vehicles, at the working sites and camps. The exploration crew is required to have the contact details of the nearest fire station at hand in case of a larger scale of fires at the site, in particular "veld" or bush fires, which can spread rapidly over large areas. The exploration team will have a trained personnel with basic fire fighting.
- **Health and Safety**: Adequate and appropriate Personal Protective Equipment (PPE) will be provided to every project personnel while working at the site. A first aid kit will be readily available on-site to attend to potential injuries.

2.2.7 Accommodation

The exploration crew/project personnel will be accommodated in a camp site, which will consist of tents, caravans, and/or make-shift buildings and temporary ablution facilities. This campsite will be set up near the exploration sites on the EPL. If the accommodation camp is to be set up on a farm, necessary arrangements will be made with the farm/landowner(s). Exploration activities will take place during daytime only and staff will commute between the exploration site(s) and their place of accommodation.

2.3 Decommissioning and Rehabilitation Phase

Once the exploration activities on the EPL 9813 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 the predicted closure. Therefore, it is best practice for the Proponent to ensure that the project activities cease in an environmentally friendly manner and the sites are rehabilitated.

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?

3.1 Types of Alternatives Considered

3.1.1 The "No-go" Alternative

The “no action” alternative implies that the status quo remains. Should the proposal of exploration activities on the EPL 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 would remain unchanged.

This no-go option is 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 support through the procurement of consumable items such as Personal Protective Equipment (PPE), machinery spare parts, lubricants, accommodation and catering services, etc.

- Loss of potential income to the local and national government through land lease fees, license fees, and various tax structures.
- No improved geological understanding of the site area regarding the targeted commodities.
- Socio-economic benefits such as skills acquisition for local community members would not be realized.

Considering the above losses, the “no-action/go” alternative may not necessarily be considered a viable option for this project, although, in the case where parts of the project site are considered environmentally sensitive and/or protected, one or several sections of the site may be identified as no-go zones.

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 EPL 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, and 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 Industry, Mines and Energy on exclusive prospecting licenses, mining licenses and claims, mineral deposit retention licenses, reconnaissance licenses, and exclusive reconnaissance licenses. Available information on EPL 9813 (**Figure 2)**, and other licenses are available on the Namibia Mines and Energy Cadastre Map Portal at https://maps.landfolio.com/Namibia/.

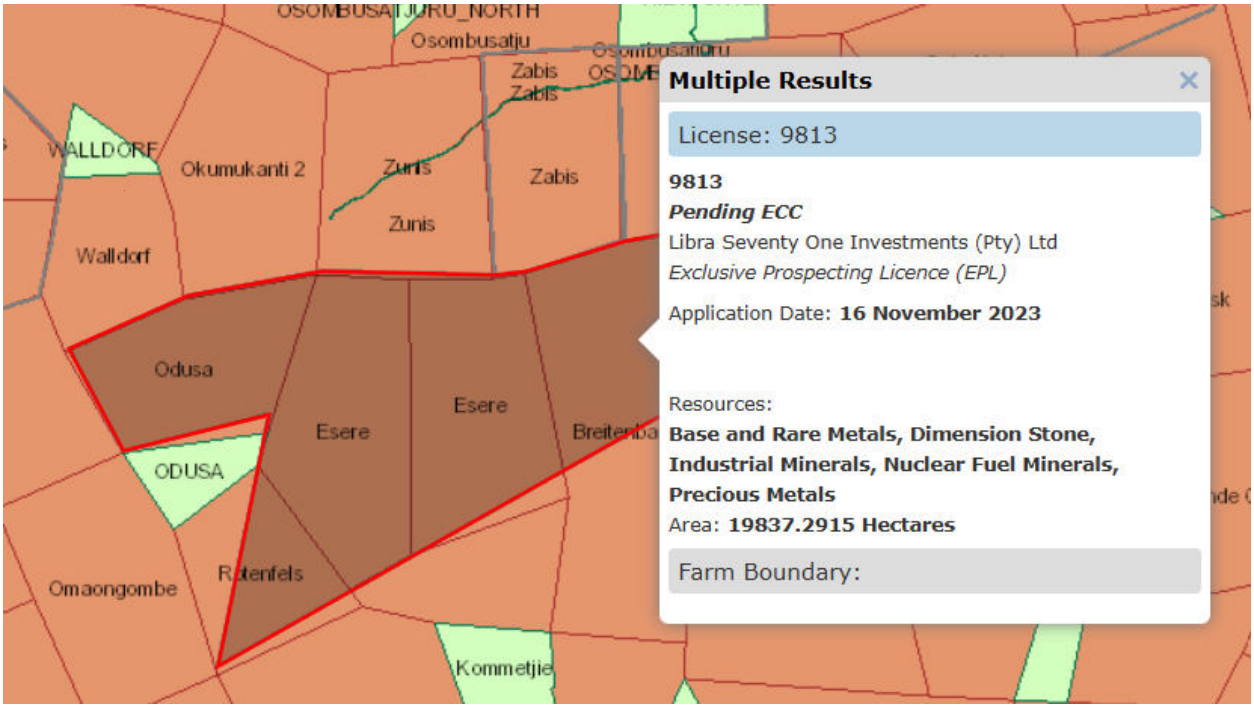

Figure 2: Location of EPL 9813 (National Mining Cadastre (https://maps.landfolio.com/Namibia/))

3.1.3 Exploration Methods

Invasive and non-invasive exploration techniques are expected to be used for exploration works. If an economically viable discovery is made, the project will proceed to the mining phase upon approval of a mining ECC 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, they can be implemented. **Table 1** shows the exploration methods that will be employed during the exploration phase.

Table 1: Alternatives (Exploration Methods)

Invasive Exploration Method (Alternatives Considered)	Process	Advantages
Pitting and trenching	-Pits and trenches can be a quick, cheap way of obtaining lithological and structural information in areas of shallow cover. -Pitting is usually employed to test shallow, extensive, flat-lying bodies of mineralization such as a buried heavy mineral placer. -The main advantage of pitting over a pattern-drill programme on the same deposit is that pits can provide a very large volume sample. Large sample sizes are necessary to overcome problems of variable grade distribution, which are a characteristic feature of such deposits.	- Quick, cheap way of obtaining lithological and structural information in areas of shallow cover. -Pits can provide a very large volume sample. Large sample sizes are necessary to overcome problems of variable grade distribution, which are a characteristic feature of such deposits. -Trenches are an excellent adjunct to RC drilling programs, where the structural data from trench mapping are needed to complement the lithological information obtained from the drill cuttings (Marjoribanks, 1997).

Invasive Exploration Method (Alternatives Considered)	Process	Advantages
	-Trenches are usually employed to expose steep dipping bedrock buried below shallow overburden and are normally dug across the strike of the rocks or mineral zone being tested (Marjoribanks, 1997).	
Reverse Circulation (RC) Drilling	-Crushed rock is collected in the form of drill chips and powdered samples, brought to surface through the drilling rods by compressed air. This is in contrast to conventional drilling (Rotary Air Blow Drilling) that puts the air inside the rods and the cuttings outside. Here the air passes downwards through the annular space between the inner shaft and the outer tube. -Water is often used down the hole to cool the drill bit and reduce dust as well as	-Compared to diamond drilling, RC requires less water. Therefore, RC drilling will put less pressure on water supply and use. The major differences between RC and diamond drilling are in the rate of penetration and cost per meter. RC drilling is much faster than diamond core drilling, and much less expensive. -Unlike diamond drilling, this process creates rock chips that can be analysed, rather than a solid, cylindrical piece of rock. -Some types of information, such as structural details, are not possible to obtain in the absence of solid rock. Despite this disadvantage, much valuable information

Invasive Exploration Method (Alternatives Considered)	Process	Advantages
	assisting with the transportation of sample bits to the surface. -RC drilling is designed for drilling through and crushing hard rock. -RC drilling is fundamentally different from diamond drilling, both in terms of equipment and sampling. One major difference is that RC drilling creates small rock chips instead of solid core. The RC method: -Allows full recovery of samples continuously -Quick installation -There is no contact between the walls and cuttings taken at the bottom.	can still be obtained from the rock chips. For example, the chips are much easier to examine under a microscope. Testing of fluorescence and effervescence are easily accomplished (Earth Science Australia, 2020). It is for these reasons that RC will be the most preferred method and is mainly used. However, RC drilling would be combined with Diamond drilling where necessary for more reliable data collection and analysis. Diamond drilling would be more applicable where deeper holes are required than is possible using RC drilling. In-fill drilling would also be applied to support an update to a higher classification of the Mineral Resources estimate.

Invasive Exploration Method (Alternatives Considered)	Process	Advantages
	-The penetration rate is fast (Technidrill, 2020)	
Infill drilling	The progress of an exploration project mostly depends on the result of the primary boreholes. Therefore, primary exploration boreholes must intersect high-grade mineralization zones with considerable thickness. On the other hand, the infill boreholes are designed based on obtained results from the primary boreholes (Fatehi, *et al.,* 2017). Therefore, infill drilling is intended to support an update to a higher classification of the Mineral	

Invasive Exploration Method (Alternatives Considered)	Process	Advantages
	Resource estimate. The metallurgical test-work results will improve understanding of blending designs in the exploration schedules for the product offtake specifications (Canyon Resources, 2021).	
Diamond (Core) drilling	-Diamond drilling uses a diamond bit, which rotates at the end of a drill rod (or pipe). The opening at the end of the diamond bit allows a solid column of rock to move up into the drill pipe and be recovered at the surface. -The diamond bit is rotated slowly with gentle pressure while being lubricated with water ("mud circulation") to prevent overheating. As a result, this drilling method is known to use a huge amount of water compared to RC,	Diamond drilling provide more information including orientationof structures compared to RC drilling. Diamond drilling is accurate with less deviation when comparing to RC and can achieve deeper depth of drilling. Diamond drills are usually small and dust free.

Invasive Exploration Method (Alternatives Considered)	Process	Advantages
	thus may put pressure on water supply sources. - Drill cuttings obtained with RC drilling can be analysed directly to provide a limited amount of information, and their locations are less precise. Core samples, on the other hand, will identify actual veins of materials and give you their precise location (BG Drilling, 2016). Therefore, for accuracy's sake, diamond drilling would provide better result. In other words, RC results are reliable but may not be accurate. - As diamond is one of the strongest materials in the world, it has no trouble drilling through most surfaces. Therefore, it works well across a wider range of ground types and conditions.	

Invasive Exploration Method (Alternatives Considered)	Process	Advantages
	-Time-consuming and more effort is required to obtain the drill core. Low initial investment, but generally more expensive to meters drilled because of the limitation of the speed.	

The final drilling technique would be determined by the mineralization type. However, based on the information presented in the Table above regarding the detailed exploration methods, it was found that the combination of Reverse Circulation (RC) and Diamond (DD) drilling is preferrable as much as possible. RC will give quick information regarding the grade and depth of intersection which will be later be infilled by DD for structural and geotechnical interpretation. This will have a reduction in cost and timeframe to make informed decision. 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 policies and Namibian legislation, policies, and guidelines for the proposed development is given in this section (**Table 2**). This summary serves to inform the project Proponent, I&APs, 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.

3.2 The Environmental Management Act (No. 7 of 2007)

This EIA is 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 that 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 EPL 9813 and related activities are presented in **Table 2.**

Table 2: Applicable Legal Standards, Policies and Guidelines

Legislation / Policy / Guideline: Custodian	**Relevant Provisions**	**Implications for this project**
The Constitution of the Republic of Namibia, 1990 as amended: **Government of the Republic of Namibia**	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: "…the duty to investigate complaints concerning the over-utilization of living	By implementing the environmental management plan, the establishment will be conformant to the constitution in terms of environmental management and sustainability.

Legislation / Policy / Guideline: Custodian	Relevant Provisions	Implications for this project
	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…" Article 95(l) commits the state to actively promoting and maintaining the welfare of the people by adopting policies aimed at the: "…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."	Ecological sustainability will be the main priority for the proposed development.
Minerals (Prospecting and Mining) Act (No. 33 of 1992): **Ministry of Industry, Mines and Energy (MIME)**	Section 52 requires mineral license holders to enter into a written agreement with affected landowners before exercising rights conferred upon the license holder. Section 52(1) clarifies that a 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	The Proponent should enter into a written agreement with landowners before carrying out exploration on their land. An assessment of the impact on the receiving environment should be carried out. The Proponent should include as part of their application for the EPL, measures by which they will rehabilitate the areas

Legislation / Policy / Guideline: Custodian	Relevant Provisions	Implications for this project
	no operations in municipal areas, etc.), which should individually be checked to ensure compliance. Section 54 requires a written notice to be submitted to the Mining Commissioner if the holder of a mineral license intends to abandon the mineral license area. Section 68 stipulates that an application for an exclusive prospecting license (EPL) 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 measures to be taken to prevent or minimize any such effect. Section 91 requires that rehabilitation measures should be included in an application for a mineral license.	where they intend to carry out mineral exploration activities. The Proponent may not carry out exploration activities within the areas limited by Section 52 (1) of this Act.
Nature Conservation Amendment Act, No. 3 of 2017: **Ministry of**	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 regard	The Proponent will be required to enhance the conservation of biodiversity and the maintenance of the ecological integrity of

Legislation / Policy / Guideline: Custodian	Relevant Provisions	Implications for this project
Environment, Forestry and Tourism (MEFT)	to the permission to enter 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.	protected areas and other State land in the Project Site area.
The Parks and Wildlife Management Bill of 2008**: Ministry of Environment, Forestry and Tourism (MEFT)**	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, to conserve biodiversity and contribute to national development.	
Mine Health & Safety Regulations, 10th Draft**: Ministry of Health and Social Services (MHSS)**	Makes provision for the health and safety of persons employed or otherwise present in mineral license areas. These deal with among other matters; clothing and devices; design, use, operation, supervision, and control	The Proponent should comply with all relevant regulations with respect to their employees.

Legislation / Policy / Guideline: Custodian	Relevant Provisions	Implications for this project
	of machinery; fencing and guards; and safety measures during repairs and maintenance.	
Petroleum Products and Energy Act (No. 13 of 1990) Regulations (2001)**: Ministry of Mines and Energy (MME)**	Regulation 3(2)(b) states that "No person shall possess [sic] or store any fuel except under the authority of a license or a certificate, excluding a person who possesses or stores such fuel in a quantity of 600 liters or less in any container kept at a place outside a local authority area"	The Proponent should obtain the necessary authorization from the MIME for the storage of fuel on-site.
The Regional Councils Act (No. 22 of 1992)**: Ministry of Urban and Rural Development (MURD)**	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 perspective, 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, urbanization patterns, natural resources, economic development potential, infrastructure, land utilization pattern and sensitivity of the natural environment.	The relevant Regional Councils are IAPs and must be consulted during the Environmental Assessment (EA) process. The project site falls under the Otjozondjupa Regional Council; therefore, they should be consulted.
Water Act 54 of 1956**: Ministry of**	The Water Resources Management Act 11 of 2013 is presently without	

Legislation / Policy / Guideline: Custodian	Relevant Provisions	Implications for this project
Agriculture, Water and Land Reform (MAWLR)	regulations; therefore, the Water Act No 54 of 1956 is still in force: It 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)). The Act provides for the control and protection of groundwater (S66 (1), (d (ii)). It also regulates liability for clean-up costs after closure/abandonment of an activity (S3 (l)). (l)).	The protection (quality and quantity/abstraction) of water resources should be a priority. The permits and license required thereto should be obtained from MAWLR's relevant Departments (these permits include Borehole Drilling Permits, Groundwater Abstraction & Use Permits, and when required, Wastewater / Effluent Discharge Permits).
Water Resources Management Act (No 11 of 2013)**: Ministry of Agriculture, Water and Land Reform (MAWLR)**	The Act provides for the management, protection, development, use, and conservation of water resources; provides for the regulation and monitoring of water services, and provides for incidental matters. The objects of this Act are to: 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	

Legislation / Policy / Guideline: Custodian	Relevant Provisions	Implications for this project
	aquifer and water pollution control (S68).	
National Heritage Act No. 27 of 2004**: Ministry of Education, Arts and Culture (MEAC)**	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.	The Proponent should ensure compliance with this act's requirements. The necessary management measures and related permitting requirements must be taken. This is to be done by consulting with the National Heritage Council (NHC) of Namibia. The management measures should be incorporated into the Draft EMP.
The National Monuments Act (No. 28 of 1969)**: Ministry of Education, Arts and Culture (MEAC)**	The Act enables the proclamation of national monuments and protects archaeological sites.	
Soil Conservation Act (No 76 of 1969)**: Ministry of Agriculture, Water and Land Reform (MAWLR)**	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.	Duty of care must be applied to soil conservation and management measures must be included in the EMP.
Forestry Act (Act No. 12 of 2001**: Ministry of**	The Act provides for the management and use of forests and forest products.	The proponent will apply for the relevant permit under this Act if it becomes necessary.

Legislation / Policy / Guideline: Custodian	Relevant Provisions	Implications for this project
Environment, Forestry and Tourism (MEFT)	Section 22. (1) provides: "Unless otherwise authorized by this Act, or by a license issued under subsection (3), no person shall on any land which is not part of a surveyed erven of a local authority area as defined in section 1 of the Local Authorities Act, 1992 (Act No. 23 of 1992) cut, destroy or remove - (a) vegetation which is on a sand dune or drifting sand or a gully unless the cutting, destruction or removal is done for the purpose of stabilizing the sand or gully; or (b) any living tree, bush or shrub growing within 100 m of a river, stream or watercourse."	
Public Health Act (No. 36 of 1919)**: Ministry of Health and Social Services (MHSS)**	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."	The Proponent and all its employees should ensure compliance with the provisions of these legal instruments.
Health and Safety Regulations GN 156/1997 (GG 1617)**: Ministry of Health and Social Services (MHSS)**	Details various requirements regarding the health and safety of labourers.	

Legislation / Policy / Guideline: Custodian	Relevant Provisions	Implications for this project
Public and Environmental Health Act No. 1 of 2015**: Ministry of Health and Social Services (MHSS)**	The Act serves to protect the public from nuisance and states that no person shall cause a nuisance or shall suffer to exist on any land or premises owned or occupied by him or of which he is in charge any nuisance or other condition liable to be injurious or dangerous to health.	The Proponent should ensure that the project infrastructure, vehicles, equipment, and machinery are designed and operated in a way that is safe, or not injurious or dangerous to public health, and that the noise and dust emissions which could be considered a nuisance remain at acceptable levels. Public and environmental health should be preserved and remain uncompromised.
Atmospheric Pollution Prevention Ordinance (1976)**: Ministry of Health and Social Services (MHSS)**	This ordinance provides for the prevention of air pollution and is affected by the Health Act 21 of 1988. Under this ordinance, the entire area of Namibia, apart from East Caprivi, is proclaimed as a controlled area for the purposes of section 4(1) (a) of the ordinance.	The proposed project and related activities should be undertaken in such a way that they do not pollute or compromise the surrounding air quality. Mitigation measures should be put in place and implemented on-site.
Hazardous Substance Ordinance, No. 14 of 1974**: Ministry of Health and**	The ordinance provides for the control of toxic substances. It covers manufacture, sale, use, disposal, and dumping as well as import and export. Although the environmental aspects are	The Proponent should handle and manage the storage and use of hazardous substances on site so that they do not

Legislation / Policy / Guideline: Custodian	Relevant Provisions	Implications for this project
Social Services (MHSS)	not explicitly stated, the ordinance provides for the importing, storage, and handling.	harm or compromise the site environment.
Road Traffic and Transport Act, No. 22 of 1999**: Ministry of Works and Transport (Roads Authority of Namibia)**	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 to 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 necessary permits must be applied for.
Labour Act (No. 6 of 1992)**: Ministry of Labour, Industrial Relations and Employment Creation (MLIREC)**	Ministry of Labour, Industrial Relations and Employment Creation is aimed at ensuring harmonious labour relations through promoting social justice, occupational health and safety, and enhanced labour market services for the benefit of all Namibians. This ministry ensures effective implementation of the Labour Act No. 6 of 1992.	The Proponent should ensure that the prospecting and exploration activities do not compromise the safety and welfare of workers.

3.3 International Policies, Principles, Standards, Treaties and Conventions

The international policies, principles, standards, treaties, and conventions applicable to the project are listed in **Table 3** below.

Table 3: International Policies, and Principles

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 which companies must comply to apply for approved funding by Equator Principles Financial Institutions (EPFIs). The principles apply to all new project financings globally across all sectors. Principle 1: Review and Categorization Principle 2: Environmental and Social Assessment Principle 3: Applicable Environmental and Social Standards Principle 4: Environmental and Social Management System and Equator Principles Action Plan Principle 5: Stakeholder Engagement Principle 6: Grievance Mechanism Principle 7: Independent Review	These principles are an attempt to: '…encourage the development of socially responsible projects, which subscribe to appropriately responsible environmental management practices with a minimum negative impact on project-affected ecosystems and community-based upliftment and empowering interactions.'

	Principle 8: Covenants Principle 9: Independent Monitoring and Reporting Principle 10: Reporting and Transparency	
The International Finance Corporation (IFC) Performance Standards	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, roles, and responsibilities related to environmental and social sustainability. As of 28 October 2018, there are ten (10) Performance Standards (Performance Standards on Environmental and Social Sustainability) that the IFC requires project Proponents to meet throughout the life of an investment. These standard requirements are briefly described below. Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts	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 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

	Performance Standard 2: Labour and Working Conditions Performance Standard 3: Resource Efficient and Pollution Prevention and Management Performance Standard 4: Community Health and Safety Performance Standard 5: Land Acquisition, Restrictions on Land Use, and Involuntary Resettlement Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources Performance Standard 7: Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities Performance Standard 8: Cultural Heritage Performance Standard 9: Financial Intermediaries (FIs) Performance Standard 10: Stakeholder Engagement and Information A full description of the IFC Standards can be obtained from http://www.worldbank.org/en/projects-operations/environmental-and-social-framework/brief/environmental-and-	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.

	social-standards?cq_ck=1522164538151#ess1	
The United Nations Convention to Combat Desertification (UNCCD) 1992	Addresses land degradation in arid regions with the purpose of contributing to the conservation and sustainable use of biodiversity and the mitigation of climate change. The convention's 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 Nations Convention).	The project activities should not be such that they contribute to desertification.
Convention on Biological Diversity 1992	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. Promote the protection of ecosystems, and natural habitats, and the maintenance of viable populations of species in natural surroundings.	Removal of vegetation cover and destruction of natural habitats should be avoided and where not possible minimized.
Stockholm Declaration on the Human Environment, Stockholm (1972)	It recognizes the need for: “a common outlook and common principles to inspire and guide the people of the world in the preservation and enhancement of the human environment.	Protection of natural resources and prevention of any form of pollution.

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.

4 ENVIRONMENTAL BASELINE

The proposed exploration program will be undertaken in specific environmental and social conditions. Understanding the pre-project conditions of the environment will aid in providing background "information" on the status quo and future projections of environmental conditions after proposed works on the EPL. 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 within the area of Otjozondjupa Region. Further information was obtained by the consultant during the site visit.

4.1 Biophysical Environment

4.1.1 Climate

To optimize the prospects of success for the proposed exploration activities, it is vital to consider the local climate patterns in the study area. By selecting favorable weather conditions, any adverse effects caused by extreme temperatures or heavy rainfall can be minimized, ensuring safe and efficient exploration operations.

The study area, with its semiarid climate, experiences a strong seasonality in rainfall, with the highest precipitation typically occurring in February. The summer months of October to January have consistent minimum temperatures ranging from 17.9°C to 18.6°C, while the months of September to November, traditionally the warmest of the year, are characterized by high temperatures, regularly surpassing 30°C and occasionally peaking at 32.7°C. **Figure 3** illustrates climatic conditions in the project area for the 30-year period from 1991 to 2021, providing a longer-term view of the region's climate. While the data may not reflect current climate conditions, this historical record offers a crucial foundation for understanding potential trends and variability in the project area's climate.

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	January	February	March	April	May	June	July	August	September	October	November	December
Avg. Temperature °C (°F)	23.5 °C (74.3) °F	22.7 °C (72.9) °F	22 °C (71.5) °F	20.7 °C (69.2) °F	18.6 °C (65.5) °F	15.7 °C (60.2) °F	15.3 °C (59.6) °F	18.9 °C (66) °F	22.9 °C (73.2) °F	25.5 °C (77.8) °F	25 °C (77) °F	24.2 °C (75.6) °F
Min. Temperature °C (°F)	18.6 °C (65.4) °F	18 °C (64.3) °F	17.3 °C (63.1) °F	15.1 °C (59.2) °F	12.1 °C (53.7) °F	8.8 °C (47.8) °F	8.1 °C (46.6) °F	10.9 °C (51.7) °F	14.4 °C (58) °F	17.9 °C (64.3) °F	18.5 °C (65.3) °F	18.6 °C (65.5) °F
Max. Temperature °C (°F)	28.9 °C (84.1) °F	28 °C (82.5) °F	27.2 °C (80.9) °F	26.5 °C (79.7) °F	25.3 °C (77.6) °F	22.9 °C (73.2) °F	22.8 °C (73) °F	26.8 °C (80.2) °F	30.7 °C (87.3) °F	32.7 °C (90.8) °F	31.6 °C (88.9) °F	30.2 °C (86.4) °F
Precipitation / Rainfall mm (in)	171 (6)	148 (5)	119 (4)	35 (1)	1 (0)	0 (0)	0 (0)	0 (0)	5 (0)	26 (1)	73 (2)	123 (4)
Humidity(%)	56%	61%	62%	51%	37%	35%	31%	23%	18%	22%	35%	49%
Rainy days (d)	12	12	11	5	0	0	0	0	1	4	9	11
avg. Sun hours (hours)	9.7	9.0	8.5	9.3	10.0	9.8	9.9	10.3	10.7	11.1	11.1	10.7

(source: https://en.climate-data.org)

Figure 3: Shows Climate patterns of the project area for the project area

5.1.2 Landscape and Topography

The proposed project site falls within the Central Western Plains landscape and Kalahari Sandveld. The Western Plains landscape is where the terrain is largely defined by vast open plains punctuated by sparse vegetation. These arid grasslands and shrub lands are home to hardy plant species. It has long been a crucial area for agricultural and ranching activities, which have had a significant impact on the local landscape. The plain is punctuated by many inselbergs, most of which are small granite hills, but it also encompasses the large granitic Erongo and Paresis mountains and the Brandberg and Spitzkoppe. Rock formations surrounding the inselbergs are mainly metamorphosed products of ocean sediments that were forced up during the formation of Gondwana (Atlas,O.N.T, 2022).

The Kalahari Sandveld, where the study area is located is considered the Namibian part of the Kalahari Basin comprising a large lowland area in Southern Africa (Jones et al. 2013). The surface topography of the region is characterised by aeolian sand accumulations, geomorphologically referred to as dune landscape, and locally outcropping bedrock (Wahl 2000; Klock 2001). The sands have been moulded into dunes in many areas where they form long lines across the landscape. Dunes in the more arid areas are sparsely vegetated and more active, their shapes and sizes being moulded slowly by wind. Dunes in higher-rainfall areas of the north and northeast that were once arid are now covered in trees and shrubs (Atlas,O.N.T, 2022).

Watercourses that originate within the Kalahari Sandveld are normally dry because rain rapidly infiltrates the sands, and the many small pans scattered across the landscape only collect and hold water for short periods following thunderstorm deluges (Atlas,O.N.T, 2022).

The topography of the region has an average elevation of approximately 1,580 meters above sea level. A topographic map of the proposed site is shown below in **Figure 4**, highlighting the location and surrounding features.

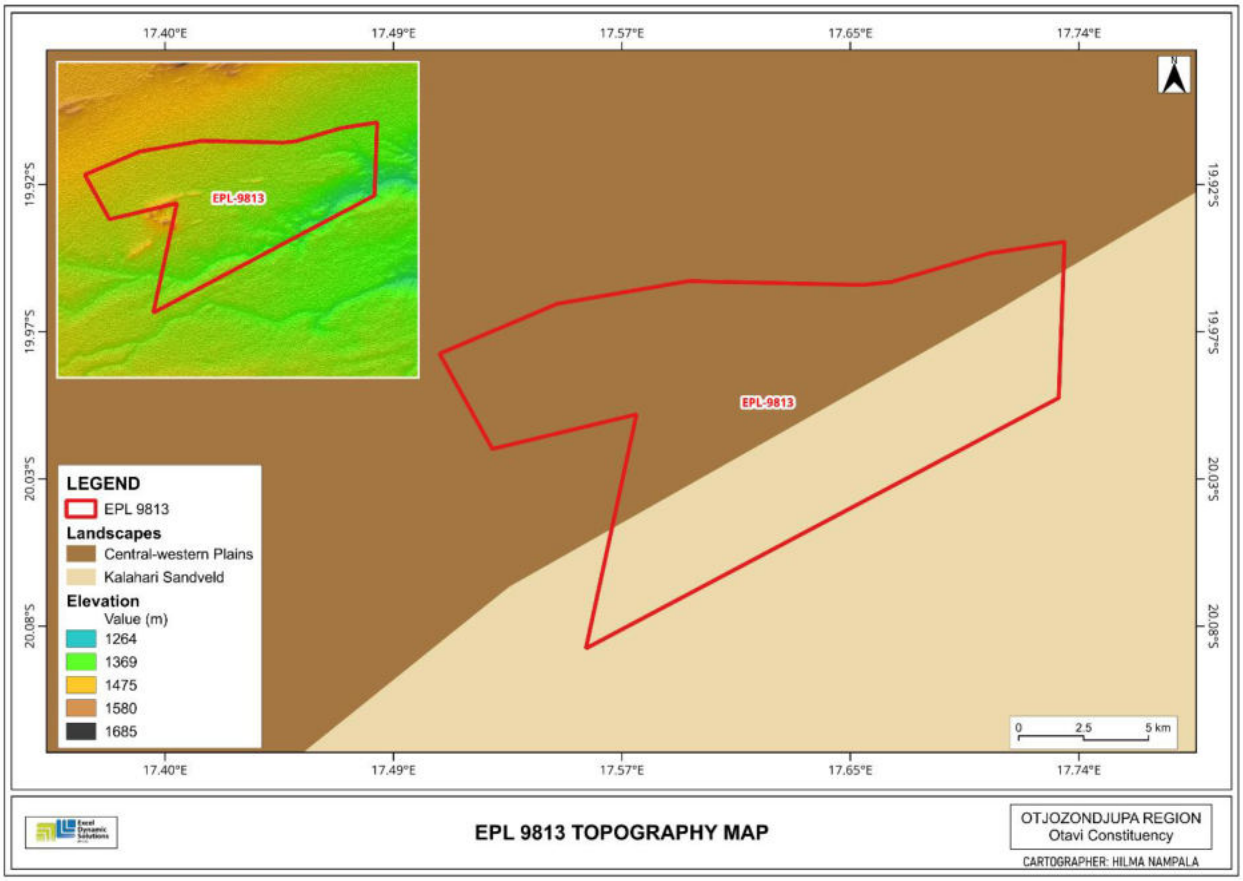

Figure 4: The topographic map of the project area

4.1.3 Geology

Locally, the geology is diverse, with dominant rock types including quartzite, schist, marble, conglomerate, limestone, Aeolian sandstone and ortho-amphibolite. The geology comprises a mix of sedimentary, volcanic, and metamorphic rocks, with major lithologies including dolomites, limestones, shales and quartzites to the southern side of the licence, schists, marble, quartzite, conglomerate and graphitic schist outcropping in the northern part and marble, schist, ortho-amphibolite and quartzite covering the north-western side of the EPL. The presence of thrust faults suggests a tectonically active history, which may have influenced mineralization.

A geological map of the project area is presented in **Figure 5**.

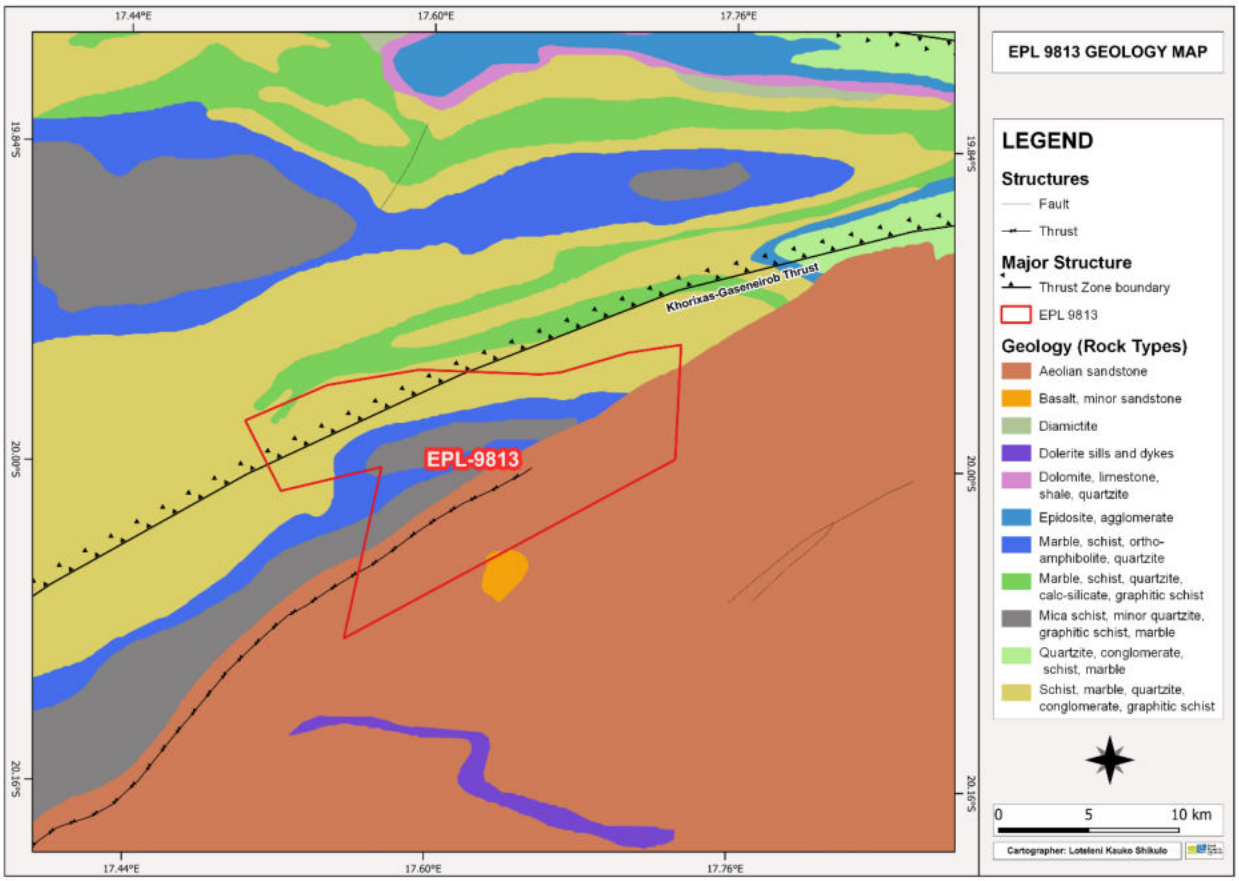

Figure 5: Geological map of the project area

4.1.3 Soil

The study area is composed of a diverse array of soil types that reflect the unique geomorphological and climatic conditions of the region. The predominant soil type in the study area is Chromic Cambisols. Cambisols mainly occur on steep slopes and mountainous landscape positions. In the early classifications, these soils were classified as intrazonal or azonal since they can be found in any climatic zone (Bridges, 1997). According to (Khresat, 2005) moderately deep Chromic Cambisols are suitable for trees and some cultivated field crops. Shallow Chromic Cambisols are often used for fruit trees.

Mollic Leptosols, is characterized by a clear transition between horizons (Arias-Navarro et al., 2024).Their shallow nature and gravelly texture limit their water retention capacity, rendering them unsuitable for agriculture.

Leptosols are extremely stony or very shallow soils over a continuous rock surface. They are prevalent in hilly areas where the rate of erosion exceeds the rates of soil formation or sediment accumulation (Atlas,O.N.T, 2022). Despite being highly fertile, Mollic Leptosols are restricted in usage due to their shallow depth and rocky nature. The presence of a petro-calcic horizon further restricts soil depth. This results in a limited agricultural potential, despite the rich soil fertility.

Among the varied soil types observed in the study area, two notable types are Ferrallic Arenosols and Eutric Fluvisols.Ferrallic arenosols are generally sandy soils developed from the weathering of old rock, i.e., quartz or recently deposited sands in dry desert-like conditions or beaches with a loamy sand or sandy texture (Nadir et al.,2024). They are found where soil formation has been inhibited by arid conditions or interrupted by erosion or recent deposition of sediments. They are normally medium to finely textured unconsolidated materials common in young sediments.

Eutric Fluvisol is a soil developed on river deposits, showing alluvial stratification. It is widely distributed along river valleys and belongs to one of the most important groups for food crops (Djingova et al.,2005).

These geologic features play an important role in the regional landscape, influencing soil formation, local habitats, and potentially creating geohazards.

The distribution and extent of Chromic Cambisols, Mollic Leptosols, Eutric Fluvisols and Ferralic Arenosols within the project area can be seen in **Figure 6** below and **Figure 7 and 8** displays the on-site soil observed during the study of the project area.

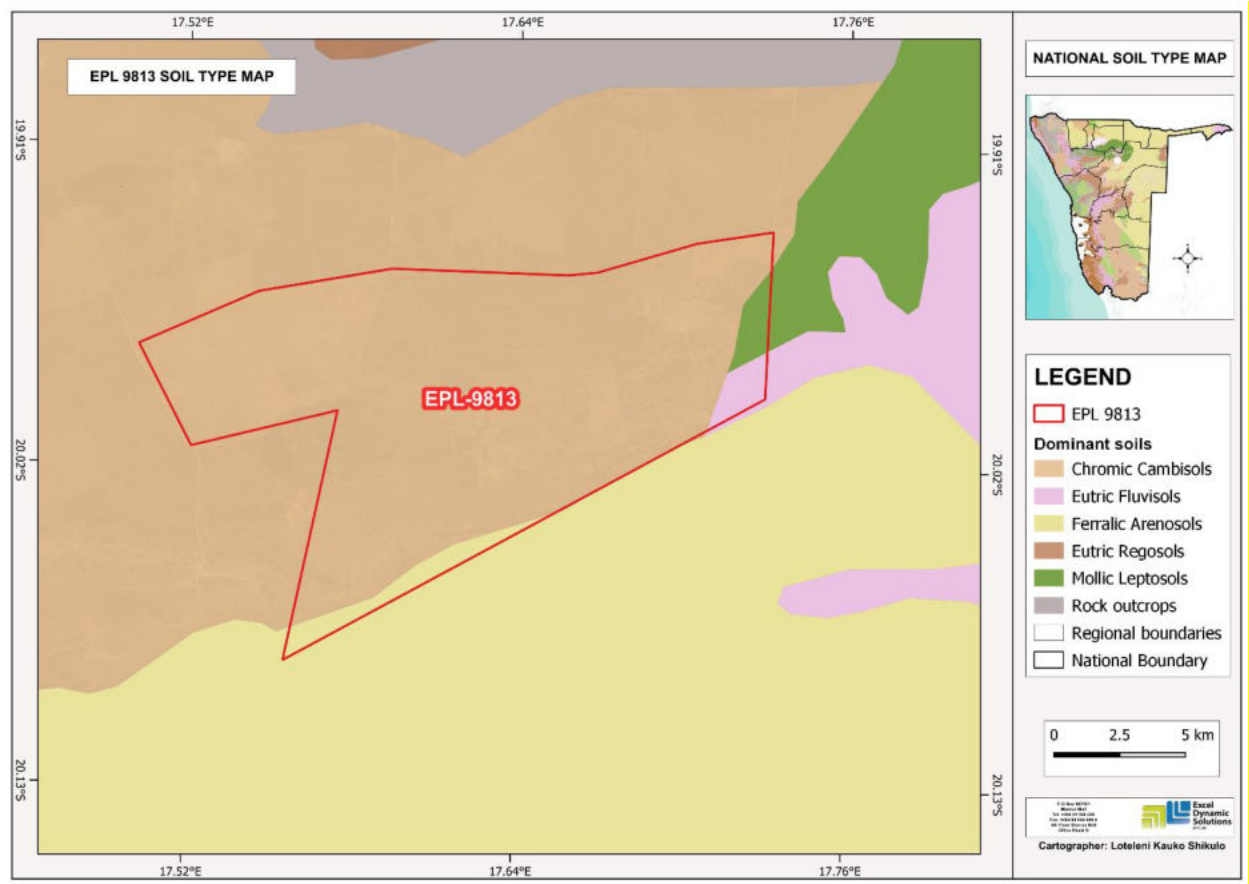

Figure 6: Map of soil distribution in the project area

Figure 7: rocks, formed by the deposition and cementation of sediment, revealing the geological history of the region.

Figure 8: The soil type observed within the the project area

4.1.5 Hydrology, Groundwater Vulnerability to Pollution, and Water Resources

The hydrology of the EPL 9813 map depicts the Ondanguara River, an ephemeral watercourse that flows within the project area during certain times of the year. It is usually dry and may appear as sand rivers. In addition to its hydrological significance, the Ondanguara River is an ephemeral watercourse, which may experience occasional flooding. These floods, if they occur, can recharge the aquifer, reshape the river channel, and influence the ecology of the riparian trees (Friedman & Lee, 2002). Therefore, the presence and behavior of the Ondanguara River should be taken into account when assessing the hydrological characteristics of the EPL 9813 project area.

The map of the study area reveals that the geological formations in the project area are predominantly composed of rock bodies with little groundwater potential. This suggests that the groundwater availability in the area may be limited. These hydrological characteristics are important considerations for understanding the water resources in the area.

Given the moderate groundwater vulnerability and the presence of the ephemeral Ondangaura river in the EPL area, it is crucial to carefully consider the potential impacts of exploration activities as well as on the surrounding environment and communities. While the proposed project may bring significant benefits to the region, it is crucial to ensure that these benefits are balanced against any possible risks to the groundwater resources and aquifers in the area. Sustainable management of water resources should be a primary concern in the project planning and implementation.

Figure 9 below illustrates the hydrologic features of the project area.

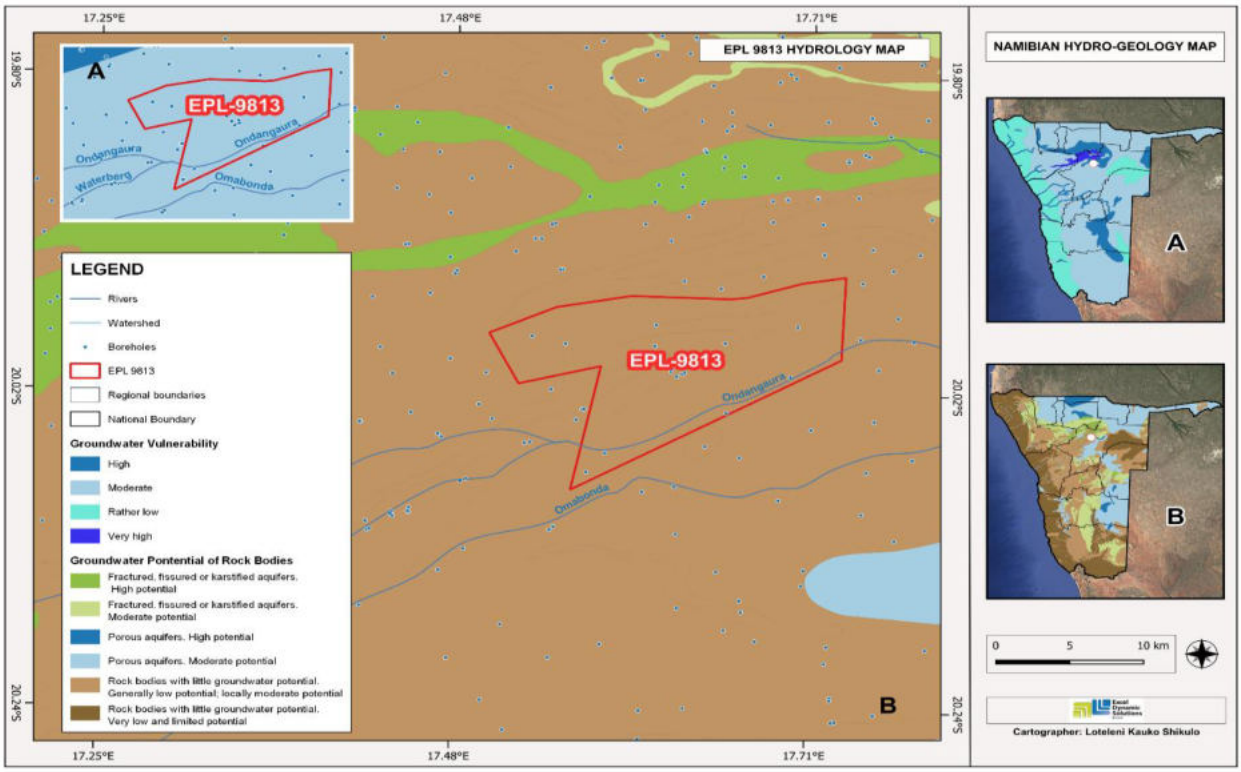

Figure 9: The hydrologic map of the project area

Figure 10: The ephemeral Ondanguara river observed within the proposed project area during site visit.

4.1.6 Flora and Fauna

4.1.6.2 Flora

The project area falls within the Thornbrush shrubland vegetation type, a unique ecosystem characterized by the co-dominance of contrasting plant life forms. It is characterised by highly mountainous areas approximately 80% of the study area is covered by vegetation, mainly shrubland. The dominant vegetation structure of the study area can be described as dense shrubland in the west and shrubland-woodland mosaic in the east (Mendelsohn et al., 2002). Data from the Digital Atlas of Namibia indicates that the vegetation cover in the Thornbush Shrubland of the study area includes 26-50% trees and shrubs, 2-10% dwarf shrubs, and 51-75% grasses. The study area is characterised by various grass species making up the grassland interspersed with trees and shrubs mostly used as cattle rangeland. The grass species vary widely in their palatability and abundance (Mendelsohn et al., 2002). The grass species in the study area are generally indicated as palatable and nutritious which is associated with a good grazing potential (Mendelsohn et al. 2002 in Digital Atlas of Namibia).

The vegetation of the area is classified as northern Kalahari bush savannah (Mendelsohn et al. 2002) and is characterised by dense stands of edible bush covering the dunes.
Trees and shrubs play a critical role in the savanna ecosystem, regulating water distribution through canopy interception, evaporation, throughfall, and stemflow (Vetaas, 1992). Trees and shrubs also improve nutrient status in their surrounding areas (Garcia-Mayo and Mckell, 1970) and large savanna trees have been found to modify soil nutrient conditions (Treydte *et al.*, 2007). In summary, the unique vegetation of the site contributes to the ecological and socio-economic importance of the region.

The recommadation measures/ mitigation measures stipulated in the EMP must be adhered to, regarding the removal of protected plants on site. Deemed they fall under the exploration target points.

Figure 11 illustrates the vegetation distribution around the project area, providing a broader perspective of the regional vegetation patterns and **Figure 12** displays the plant types that were observed during the site visit, providing a more detailed and localized perspective.

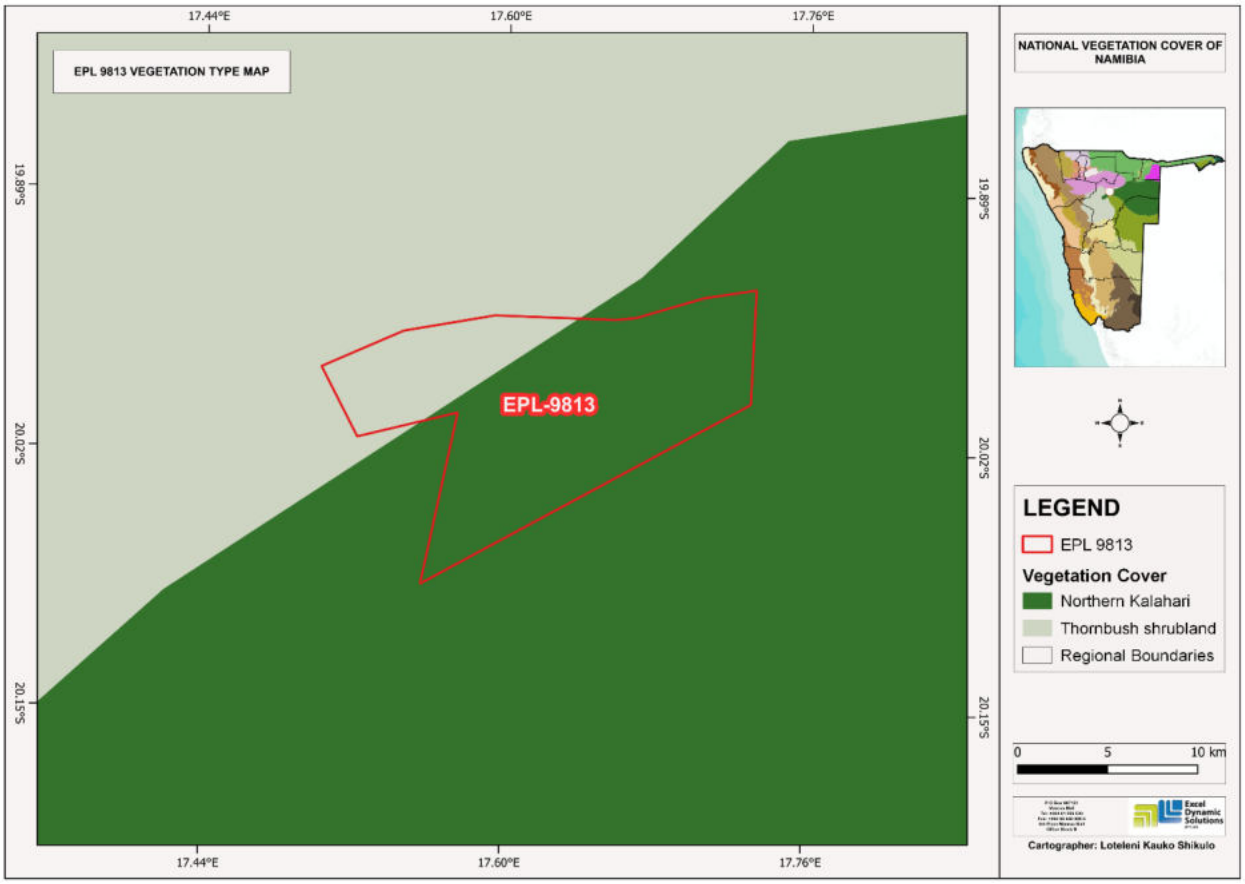

Figure 11 : Vegetation Cover Map of the Project Area

Figure 12 : Native plant species in the project area

4.1.6.2 Fauna

The study area is known for a diverse array of wildlife, including a wide range of domesticated animals and numerous native species. This unique combination underscores the ecological richness of the region and emphasizes the importance of preserving its biodiversity for the health and stability of the environment. In the Otjozondjupa Region cattle ranching is the predominant farming system and a large proportion of Namibia's freehold cattle is kept there (Mendelsohn et al. 2002).The cattle ranching practices in the Otjozondjupa Region are largely driven by the region's favorable climate and topography, which provide suitable grazing conditions for livestock. The region is home to many large-scale commercial cattle ranches, as well as smaller-scale family farms, with many farmers specializing in breeds such as the Afrikaner and the Brahman. Cattle ranching has long been a significant contributor to the local economy and has shaped the culture and livelihoods of many communities in the region. The proposed exploration activities on the EPL need to take these impacts into account and incorporate measures to avoid or mitigate potential negative effects on the local fauna.

Figure 13 displays the on-site animals observed during the study of the project area.

Figure 13: The team documented native species of mammals within the EPL area, highlighting the diverse ecological community in the region.

4.2 Heritage and Archaeology

5.2.1 Local Level and Archaeological Findings

There are two periods in Grootfontein's history. The pre-colonial period was marked by the arrival of the Ovaherero people in the region. Later, in the middle of the nineteenth century, South African Boers known as the Dorsland Trekkers began to settle in the region as part of their quest to reach Angola. However, when the Portuguese took control of Angola, the trekkers made an unsuccessful attempt to establish the Republic Upingtonia in Grootfontein. In 1896, the town built a German Schutztruppe stronghold, which now serves as a museum showcasing local history. Other features within Grootfonetin include the Hoba Meteorite which is the largest Meteorite in Earth. (Green and Herbold, 2025)

Most of the archaeological features identified and recorded within the EPL comprised of graves, caves featuring landmarkings and bones. While the presence of graves highlights the cultural significance of the area, the discovery of caves with landmarkings and bones also provides valuable information about the region's history and heritage. These findings underscore the importance of ensuring that exploration and mining activities do not damage or disturb significant cultural and natural features. It is important to note that vegetation was an obstruction that affected visibility of certain archaeological features.

Figure 14 below shows archeological features which were observed on site.

Figure 14: Archeological features observed within the project area

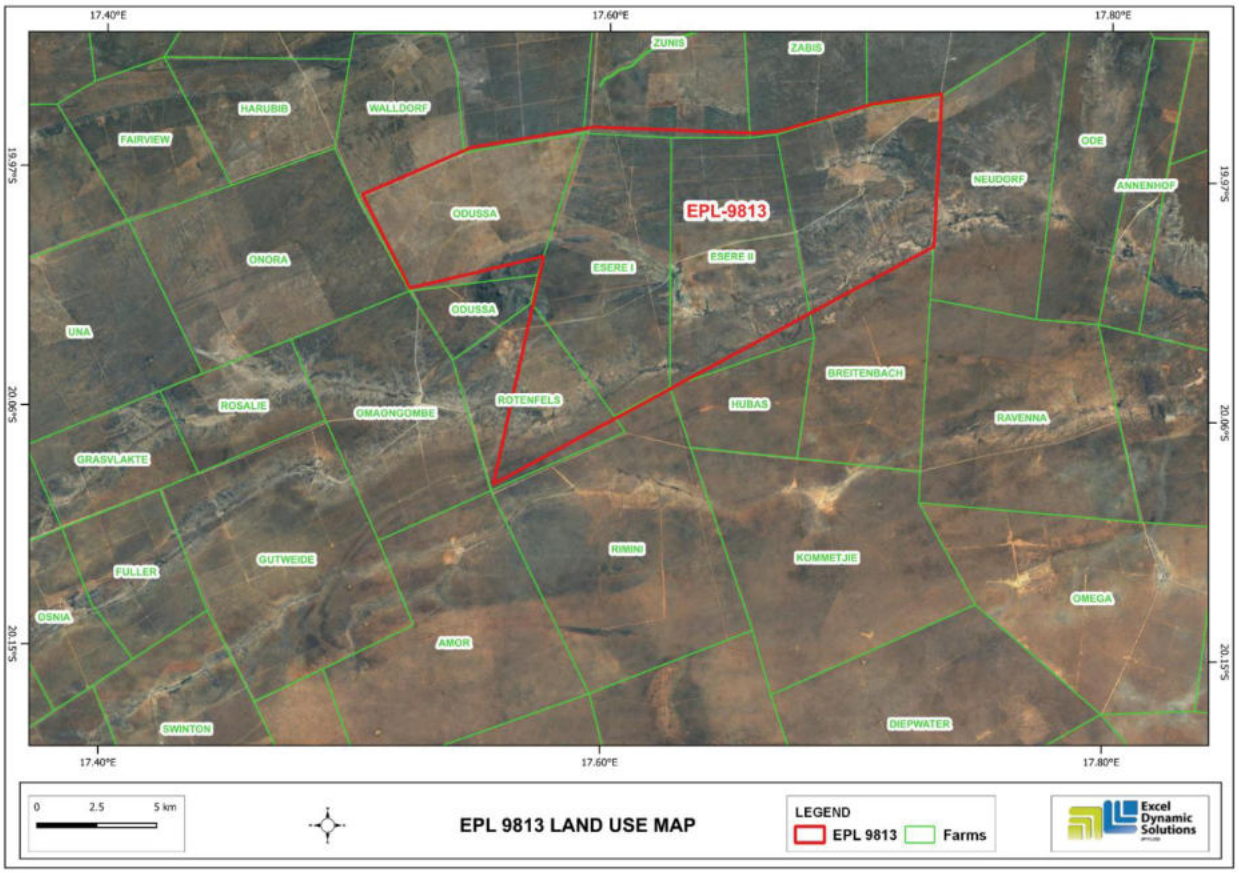

Figure 15: Farms covering the EPL and the surrounding

6 PUBLIC CONSULTATION PROCESS

Public consultation is 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 what extent further investigations are necessary. Public consultation can also aid in the process of identifying possible mitigation measures. Public consultation for this scoping study has been done in accordance with the EMA and its EIA Regulations.

The Proponent is required to secure a signed agreement from the affected landowners/farmers, and managements to gain access to the areas of interest for prospecting and exploration investigations as per Section 52 of the Minerals (Prospecting and Mining) Act No. 33 of 1992 and Section 2.2.3 of the Minerals Policy of Namibia.

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

    (a) *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 License Holder and/or mineral explorers currently have to negotiate a contract with landowners to gain access for exploration purposes.

5.1 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. The summary of pre-identified and

registered I&APs is listed in **Table 4** below and the complete list of I&APs is provided in **Appendix D**.

Table 4: Summary of Interested and Affected Parties

National (Ministries and State-Owned Enterprises)
Ministry of Environment, Forestry and Tourism
Ministry of Industry, Mines and Energy
Ministry of Agriculture, Water and Forestry
Regional, Local and Traditional Authorities
Otjozondjupa Regional Council
Otavi Town Council
General Public
Landowners /Interested members of the public

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 regard 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 emailed to pre-identified I&APs, and upon request to all new registered I&APs;
- Notices for the Environmental Scoping Assessment of the proposed exploration project were published in **The Namibian and New Era newspapers 10th and 17th January 2025** respectively, briefly explaining the activity and its locality, inviting members of the public to register as I&APs and submit their comments/concerns.
- A consultation meeting was scheduled and held with the affected landowners on the **12th of May 2025 at Farm Esere No.151, Grootfontein at 11h00** (**Figure 14**).

Figure 16: illustrates a scene from a public consultation meeting, which is underway at farm Esere No.15 and a site notice prominently displayed at the location.

Table 5: Summary of main issues raised, and comments received during public meeting engagements.

Issues	Concerns
Timeline for Negotiation and Signing of Access Agreement	When should affected parties expect to receive and sign the access agreement with the Proponent?
Potential Impacts of Mining Operations on Water Resources	Concerned about the effect that the mining operations may have on the water supply.
Development and Implementation of a Comprehensive Management Assessment Plan Addressing Stakeholder Concern	Whether the consultancy will be preparing a comprehensive Management Assessment Plan
Establishing Independent Monitoring Mechanisms to Ensure Compliance with Regulations	Whether stakeholders can appoint a representative to oversee and monitor the compliance with the regulations?

6 IMPACT IDENTIFICATION, ASSESSMENT AND MITIGATION MEASURES

Impact Identification

Proposed developments/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 jobs
- Production of a trained workforce
- Boosting of the local and regional economic development.
- Opens up other investment opportunities and infrastructure-related development benefits

Negative impacts:

- Disturbance to grazing land
- Land degradation and Biodiversity Loss
- Generation of dust
- Impact on water resources
- Pollution of soil & water resources
- 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
- Impacts associated with closure and decommissioning of exploration works

6.1 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 6**, **Table 7**, **Table 8** and **Table 9**, respectively.

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:

6.1.1 Extent (spatial scale)

Extent is an indication of the physical and spatial scale of the impact. **Table 6** shows rating of impact in terms of extent of spatial scale.

Table 6: Extent / Spatial Impact rating

Low (1)	Low/Medium (2)	Medium (3)	Medium/High (4)	High (5)
Impact is localized 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

6.1.2 Duration

Duration refers to the timeframe over which the impact is expected to occur, measured in relation to the lifetime of the project. **Table 7** shows the rating of impact in terms of duration.

Table 7: Duration Impact rating

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

6.1.3 Intensity, Magnitude / severity

Intensity refers to the degree or magnitude to which the impact alters the functioning of an element of the environment. The magnitude of alteration can either be positive or negative. These ratings were also taken into consideration during the assessment of severity. **Table 8** shows the rating of impact in terms of intensity, magnitude or severity.

Table 8: Intensity, magnitude or severity impact rating

Type of criteria	Negative				
	H- (10)	M/H- (8)	M- (6)	M/L- (4)	L- (2)
Qualitative	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.

6.1.4 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. **Table 9** shows impact rating in terms of probability of occurrence.

Table 9: Probability of occurrence rating

Low (1)	Medium/Low (2)	Medium (3)	Medium/High (4)	High (5)
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.

6.1.5 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 6**, **Table 7**, **Table 8** and **Table 9**) have been ranked for each potential impact, the impact significance of each is assessed using the following formula:

SIGNIFICANCE POINTS (SP) = (MAGNITUDE + DURATION + SCALE) X 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 10**).

Table 10: Significance rating scale

Significance	***Environmental Significance Points***	***Colour Code***
High (positive)	>60	H

Significance	*Environmental Significance Points*	*Colour Code*
Medium (positive)	30 to 60	M
Low (positive)	1 to 30	L
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 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 of the EPL are described, assessed and mitigation measures provided thereof. Further mitigation measures in a form of management action plans are provided in the Draft Environmental Management Plan.

6.2 Assessment of Potential Negative Impacts

The main potential negative impacts associated with the operation and maintenance phase are identified and assessed below:

6.2.1 Disturbance to the grazing land

Exploration activities such as site clearing, trenching, and drilling can result in the disruption and degradation of grazing land, which forms a vital source of food for wildlife and livestock in the region. This could lead to decreased forage availability and reduced vegetation cover, affecting the habitat and food sources of both wildlife and livestock. These disturbances could have detrimental consequences on the overall health and survival of these animals, which rely on this fragile ecosystem for sustenance.

The effects of exploration work on a wider spatial extent can significantly hinder grazing areas, negatively impacting local agriculture and potentially disrupting livestock husbandry practices. While this impact is considered medium in significance without mitigation measures, appropriate strategies can effectively reduce its severity to a lower significance. The impact is assessed in **Table 11** below.

Table 11: Assessment of impacts of exploration on grazing land

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	M: -3	L/M: -2	M: -6	M/H: -4	M: -44
Post mitigation	L/M: -2	L/M: -2	L/M: -4	L/M:-2	L: -16

6.2.2 Land Degradation and Loss of Biodiversity

Exploration activities can degrade the local ecosystem by removing vegetation, damaging plant life through the movement of vehicles and machinery, and causing disturbance of native species.

This can create gaps in the ecosystem that invasive species can exploit, outcompeting native species and altering the environment. Breeding areas of local fauna can be disrupted, reducing food and shelter availability and potentially forcing animals to relocate to less suitable areas. Over time, these impacts can accumulate, threatening the survival and reproductive success of native species. The proposed activities may also carry the risk of potential illegal hunting of local wildlife and livestock and this could lead to reduction of specific faunal species.

Without mitigation measures in place, the impact on local flora and fauna, would be rated as medium significance. However, implementation of the proposed mitigation measures can reduce this impact to low significance. The impact is assessed in **Table 12** below.

Table 12: Assessment of impacts of exploration on biodiversity

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	M: -4	M: -3	M/H: -8	M/H: -4	M: -60
Post mitigation	L/M: -2	L/M: -2	L/M: -4	L/M: -3	L: -24

6.2.3 Generation of Dust (Air Quality)

Air pollution is a significant risk associated with exploration activities, as the generation of dust during excavation and transportation can have widespread consequences. This makes it essential to integrate effective dust control measures into the planning and execution of exploration activities. Such measures should aim not only to protect the local environment but also the workers on-site, who are particularly vulnerable to the health hazards posed by dust exposure. The implementation of comprehensive dust management strategies can ensure the protection of both the environment and human health. 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 13** below.

Table 13: Assessment of Impacts of exploration on air quality

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	M: -3	M: -3	M: -6	M/H: -4	M: -48

Post mitigation	L - 1	L/M - 2	L- 4	L - 1	L - 7

6.2.4 Water Resources Use

The exploration of minerals has the potential to significantly impact water resources, either through contamination (water quality) or over-exploitation (water quantity) as aquifers are susceptible to pollution due to changes in the physical environment caused by human activities such as mining and these disruptions can compromise groundwater dynamics, potentially exacerbating the vulnerability of aquifers to pollution and depletion. (Mulyadi et al., 2020).

This threat to water resources is heightened in areas where groundwater is already scarce and vulnerable to depletion, which can compromise the livelihoods of local communities and their agricultural activities, as well as livestock and the sustainability of the region's ecosystem.

The water requirements and impacts of mineral exploration methods vary depending on the target mineral. The Ephemeral Ondanguara River is a valuable water resource that could be negatively affected by mineral exploration activities if proper measures are not put in place. Though the exploration phase is finite, it is crucial to implement effective measures which must be taken during mineral exploration to protect water resources from pollution and depletion.

According to **Figure 9**, the groundwater vulnerability in the study area is moderate. This could potentially lead to a medium impact, but through the effective implementation of the proposed mitigation measures, the impact can be reduced to a low significance level, as illustrated in **Table 14.**

Table 14: Assessment of impacts of exploration on water resources

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	M/H - 2	M - 2	M/H - 6	M/H - 4	M - 40
Post mitigation	L/M - 1	L/M - 2	L/M - 4	L/M - 3	L - 21

6.2.5 Soil and Water Resources Pollution

The proposed exploration activities present a range of pollution risks, including the introduction of lubricants, fuel, and wastewater that can cause direct contamination of the surrounding soil, as well as indirect contamination of groundwater through infiltration.

The main sources of potential water pollution include hydrocarbons (oil) from exploration vehicles, machinery, and equipment, as well as wastewater generated during exploration-related activities.

Furthermore, the spills and associated contamination can have profound impacts on the broader ecosystem. Soil contamination can negatively affect plant growth and soil microorganisms, reducing biodiversity and potentially impacting agriculture and food security. Contaminated groundwater can jeopardize human health, particularly if used for drinking or irrigation purposes.

Without proper management, these impacts could be long-lasting, compromising the environment.

Without the implementation of any mitigation measures, the impact can be rated as high, but upon effective implementation of the recommended measures, the impact significance would be reduced to low as presented in **Table 15** below.

Table 15: Assessment of impacts of exploration on soils and water (pollution)

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	M/H - 2	M - 2	M/L - 6	M - 4	M - 40
Post mitigation	L/M- 2	L/M - 3	L/M - 4	L/M - 2	L - 18

6.2.6 Waste Generation

The operation of an exploration activity on site can generate various forms of waste, including litter from workers, waste that ends up buried on site, hazardous waste from equipment, and oil spills from the machinery. If not handled properly, these wastes can potentially pollute the site and the surrounding environment. This can result in soil contamination, water pollution, and negative impacts on livestock and local wildlife.

In addition to these immediate concerns, poor waste management can cause long-term consequences, including soil degradation and reduced fertility, groundwater contamination and

diminished water quality, and even the accumulation of toxins in animal and human food chains. The mishandling of hazardous waste can be particularly dangerous, posing a threat to human health and the environment if not disposed of appropriately.

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 16**.

Table 16: Assessment of impacts of exploration on waste generation

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	L/M - 2	L/M - 2	M - 6	H - 5	M – 50
Post mitigation	L - 1	L - 1	L - 2	L/M - 2	L - 8

6.2.7 Occupational Health and Safety Risks

A number of factors, including improper handling of materials and equipment, lack of proper PPE, insufficient safety signage, and alcohol consumption, could comprise workers safety during exploration activities. These hazards increase the likelihood of accidents, injuries, and even fatalities, emphasizing the necessity of strict safety regulations, regular monitoring, and effective training to safeguard workers on site. The site safety of all personnel is the Proponent's responsibility and should be adhered to as per the requirements of the Labour Act (No. 11 of 2007) and the Public Health Act (No. 36 of 1919).

Worker's safety is paramount in exploration activities, and the Proponent must strive to reduce the risks associated with improper handling of equipment, inadequate safety signage, and alcohol consumption. Effective safety regulations, ongoing monitoring, and effective training are fundamental aspects of a comprehensive safety plan.

Without mitigation measures in place, potential health and safety risks associated impacts with the sand mining activity would be rated as medium significance. However, by implementing the

mitigation measures, the significance of the impact can be reduced to low. The impact assessment and mitigation measures are given in **table 17** below.

Table 17: Assessment of impacts of exploration on health & safety

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	L/M – 2	M/L - 2	M - 6	M/H - 4	M – 44
Post mitigation	L- 1	L-1	L - 2	L/M - 2	L - 8

6.2.8 Noise and vibrations

Prospecting and exploration work may be a nuisance to surrounding communities due to the noise produced by the activity (especially drilling). Excess noise and vibrations can be a health risk to workers on site.

To mitigate these effects, working hours for the equipment may need to be limited to reduce the overall noise pollution. Workers operating or working in close proximity to the mining equipment and machinery may need to be provided with appropriate personal protective equipment (PPE), such as earplugs or earmuffs, to protect their hearing.

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. By implementing appropriate noise mitigation measures, the associated impact can be reduced from medium to low significance. This impact is assessed in **Table 18** below.

Table 18: Assessment of the impacts of noise and vibrations

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	L/M - 3	L/M - 2	M - 6	M/H - 4	M – 36
Post mitigation	L - 1	L/M - 2	L - 2	L/M -2	L - 10

6.2.9 Disturbance to Archaeological and Heritage resources

Most of the archaeological features identified and recorded within the EPL area, compromised of graves, national monuments (John Alphons Pandeni), ruins and old water channels.

The archaeological features identified must be protected either by fencing them off or demarcation for preservation purposes, or excluding them from any development. No exploration activities should be conducted near these recorded areas through establishment of buffer zones.

The failure to implement proper measures to protect identified archaeological sites can result in significant damage and impact to these cultural sites, resulting in a medium significance rating.

However, by adopting effective protection and avoidance measures, such as the establishment of buffer zones around the sites, the impact can be reduced to a lower significance rating. The impact is assessed in **Table 19**.

Table 19: Assessment of impacts of exploration on archaeology & heritage resources

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	M - 4	M/H - 4	M/H- 4	M/H - 4	M – 48
Post mitigation	L/M - 2	L/M - 2	L - 2	L/M - 2	L - 12

6.2.10 Impact on Local Roads/Routes

Exploration projects are usually associated with movements of heavy trucks and equipment or machinery that use local roads. Heavy vehicles travelling on local roads exert pressure on the roads and 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.

However, with effective management, these impacts can be minimized. By implementing regular road maintenance, enforcing traffic regulations, and adopting alternative transport methods where feasible, exploration activities can coexist with local communities, minimizing disruption while ensuring the safety and accessibility of the road network.

If no mitigation measures are implemented, the impact of increased vehicular traffic will be rated medium significance. However, by implementing the mitigation measures, the significance of the

impact can be reduced to low significance. The assessment of this impact is presented in **Table 20**.

Table 20: Assessment of impacts of exploration on local roads

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	M/H - 4	M - 3	M/H - 8	M/H - 4	M – 60
Post mitigation	L - 1	L - 1	M/L - 4	M/L - 2	L - 12

6.2.11 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 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/land owners or land users. Unpermitted and unauthorized entry to private property may cause clashes between the affected property (land) owners and the Proponent.

To mitigate such risks, the Proponent must take proactive steps to educate its employees on cultural sensitivity, ensure strict policies to protect private property rights, and prioritize communication with local landowners to address any grievances or concerns that arise.

Without the implementation of any mitigation measures, the impact can be rated as medium, but upon effective implementation of the recommended measures, the impact significance would be reduced to low as presented in **Table 21** below.

Table 21: Assessment of social impacts of exploration

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	M - 2	M - 3	M/H- 8	M/H – 4	M – 52
Post mitigation	L - 1	L - 1	M/L - 4	M/L -2	L - 12

7 RECOMMENDATIONS AND CONCLUSION

7.1 Recommendations

The potential impacts of the proposed project activities were identified and assessed, and appropriate mitigation measures were recommended for implementation by the Proponent, their contractors, and project-related employees for significant adverse (negative) impacts rated as medium. These mitigation measures aim to reduce the impact severity to an acceptable level and prevent or minimize any negative effects on the environment, local communities, and cultural resources.

The concerns raised by registered Interested and Affected Parties (I&APs) were carefully considered, incorporated into this report, and addressed through the recommended management and mitigation measures. Most potential impacts were rated as medium in significance, but the effective implementation of these measures will minimize their severity, reducing the rating to low. To ensure this outcome and maintain low impact ratings, the Proponent, or their appointed Environmental Control Officer (ECO), should monitor the implementation of the proposed management and mitigation measures.

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

It is, therefore, recommended that in the case of ECC issuance for this project, the proposed prospecting and exploration activities may be granted an ECC, provided that:

- All the management and mitigation measures provided in the EMP are effectively and progressively implemented.
- All required permits, licenses and approvals for the proposed activities should be obtained as required.
- 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.

Conclusion

It is crucial for the proponent and their contractors to effectively implement the recommended management and mitigation measures, in order 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 mineral exploration and related activities.

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