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Environmental Scoping Assessment for the Proposed Mineral Exploration Activities on Exclusive Prospecting License (EPL) No. 8747 located Northeast of Otjiwarongo in Otjozondjupa Region

ECC Application Reference No.: APP-0680

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EXECUTIVE SUMMARY

Okakwa Investment CC (hereinafter referred to as The Proponent) has applied to the Ministry of Mines and Energy (MME) for the Exclusive Prospecting License (EPL) No. 8747 on 24 January 2022. However, the approval and granting of the EPL requires an Environmental Clearance Certificate, before any proposed prospecting and exploration work may occur.

EPL 8747 is located about 70 km northeast of Otjiwarongo in the Otjozondjupa Region (Figure 1) and covers area of 39341.2688 ha in size. The EPL covers (overlies) Farm Wittenberg No. 90, Klein Okaputa No. 381, Vuura No. 89, Nassau No. 91, Vlakpan No. 85, Heilbronn No. 84, Boshoek No. 81, Luckenwalde No. 83, Maxwell No. 82, Stark No. 565, Fisher No. 564, Lardner No. 563, Hester No. 562, Embla No. 561and Tiro No. 560.

The target commodities for prospecting and exploration are Base and Rare Metals, Dimension stones, Industrial Minerals and Precious Metals.

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

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

Brief Project Description

Planned Activities: Proposed Exploration Methods

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

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

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

Public Consultation

Public Consultation Activities

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

- A Background Information Document (BID) containing brief information about the proposed project was compiled and delivered upon request to all new registered Interested and Affected parties (I&APs).
- Project Environmental Assessment notices were published in The Namibian and New Era newspapers (26 October 2022 and 02 November 2022) 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 farmers (landowners) on the 07th of November 2022 at Khoi Khoi guest house at 12H00.

- The issues and concerns raised were noted and used to form the basis for the ESA Report and EMP.

Potential Impacts identified

The following potential impacts are anticipated:

- **Positive impacts**: Socio-economic development through employment creation (primary, secondary, and tertiary employment) and skills transfer; Opens up other investment opportunities and infrastructure-related development benefits; Produces a trained workforce and small businesses that can serve communities and may initiate related businesses; Boosts the local economic growth and regional economic development and; Increased support for local businesses through the procurement of consumable items such as Personal Protective Equipment (PPE), machinery spare parts, lubricants, etc.
- **Negative impacts**: Potential disturbance of existing pastoral systems; Physical land/soil disturbance; Impact on local biodiversity (fauna and flora); Habitat disturbance and potential illegal wildlife in the area; Potential impact on water resources and soils particularly due to pollution; Air quality issue: potential dust generated from the project; Potential occupational health and safety risks, Vehicular traffic safety and impact on services infrastructures such as local roads, Vibrations, and noise associated with drilling activities may be a nuisance to locals; Environmental pollution (solid waste and wastewater), Archaeological and heritage impact and Potential social nuisance and conflicts (theft, damage to properties, etc.).

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

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

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

The public was consulted as required by the EMA and its 2012 EIA Regulations (Section 21 to 24). This was done via the two newspapers (New Era and The Namibian) used for this

environmental assessment. A face-to-face consultation meeting was held with the directly affected farmers (landowners) at khoi khoi guest house conference room, whereby they raised comments and concerns on the proposed project activities.

The issues and concerns raised by the registered I&APs formed the basis for this report and the Draft EMP. The issues were addressed and incorporated into this report whereby mitigation measures have been provided thereof to avoid and/or minimize their significance on the environmental and social components. Most of the potential impacts were found to be of medium rating significance. The effective implementation of the recommended management and mitigation measures will particularly see a reduction in the significance of adverse impacts that cannot be avoided completely (from high/medium rating to a low). To maintain the desirable rating, the implementation of management and mitigation measures should be monitored by the Proponent directly, or their Environmental Control Officer (ECO) is highly recommended. The monitoring of this implementation will not only be done to maintain the impacts' rating or maintain a low rating butalso to ensure that all potential impacts identified in this study and other impacts that might arise during implementation are properly identified in time and addressed right away too.

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

Recommendations

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

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

- All the management and mitigation measures provided herein are effectively and progressively implemented.

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

Disclaimer

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

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

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LIST OF ABBREVIATIONS

Abbreviation	Meaning
BID	Background Information Document
CV	Curriculum Vitae
DEAF	Department of Environmental Affairs and Forestry
EA	Environmental Assessment
EAP	Environmental Assessment Practitioner

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

KEY TERMS

Terms	Definition
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.

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

Terms	Definition
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 an activity; and (b) any organ of state that may have jurisdiction over any aspect of the activity. Mitigate - practical measures to reduce adverse impacts. Proponent – as defined in the Environmental Management Act, a person who proposes to undertake a listed activity. Significant impact - means an impact that by its magnitude, duration, intensity or probability of occurrence may have a notable effect on one or more aspects of the environment.
Fauna and Flora	All the animals and plants found in an 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).
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	Definition
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

- Okakwa Investment CC (The Proponent) has applied to the Ministry of Mines and Energy (MME) for the Exclusive Prospecting License (EPL) No. 8747 on the 24 January 2022. The approval and granting of the EPL requires an Environmental Clearance Certificate, before any proposed prospecting and exploration works may occur.
- EPL 8747 is located about 70 km northeast of Otjiwarongo in the Otjozondjupa Region (**Figure 1**) and covers area of 39341.2688 ha in size. The EPL covers (overlies) Farms Wittenberg No. 90, Klein Okaputa No. 381, Vuura No. 89, Nassau No. 91, Vlakpan No. 85, Heilbronn No. 84, Boshoek No. 81, Luckenwalde No. 83, Maxwell No. 82, Stark No. 565, Fisher No. 564, Lardner No. 563, Hester No. 562, Embla No. 561, and Tiro No. 560. **See Figure 2.**
- The target commodities for prospecting and exploration are Base and Rare Metals, Dimension stones, Industrial Minerals and Precious Metals.
- Section 27 (1) of the Environmental Management Act (EMA) (No. 7 of 2007) and its 2012 Environmental Impact Assessment (EIA) Regulations provides a list of activities that may not be carried out without an Environmental Impact Assessment (EIA) undertaken and an Environmental Clearance Certificate (ECC) issued. Exploration activities are listed among the activities that may not occur without an ECC. Therefore, individuals or organizations may not carry out exploration activities among those listed, without an EIA undertaken and an ECC awarded.
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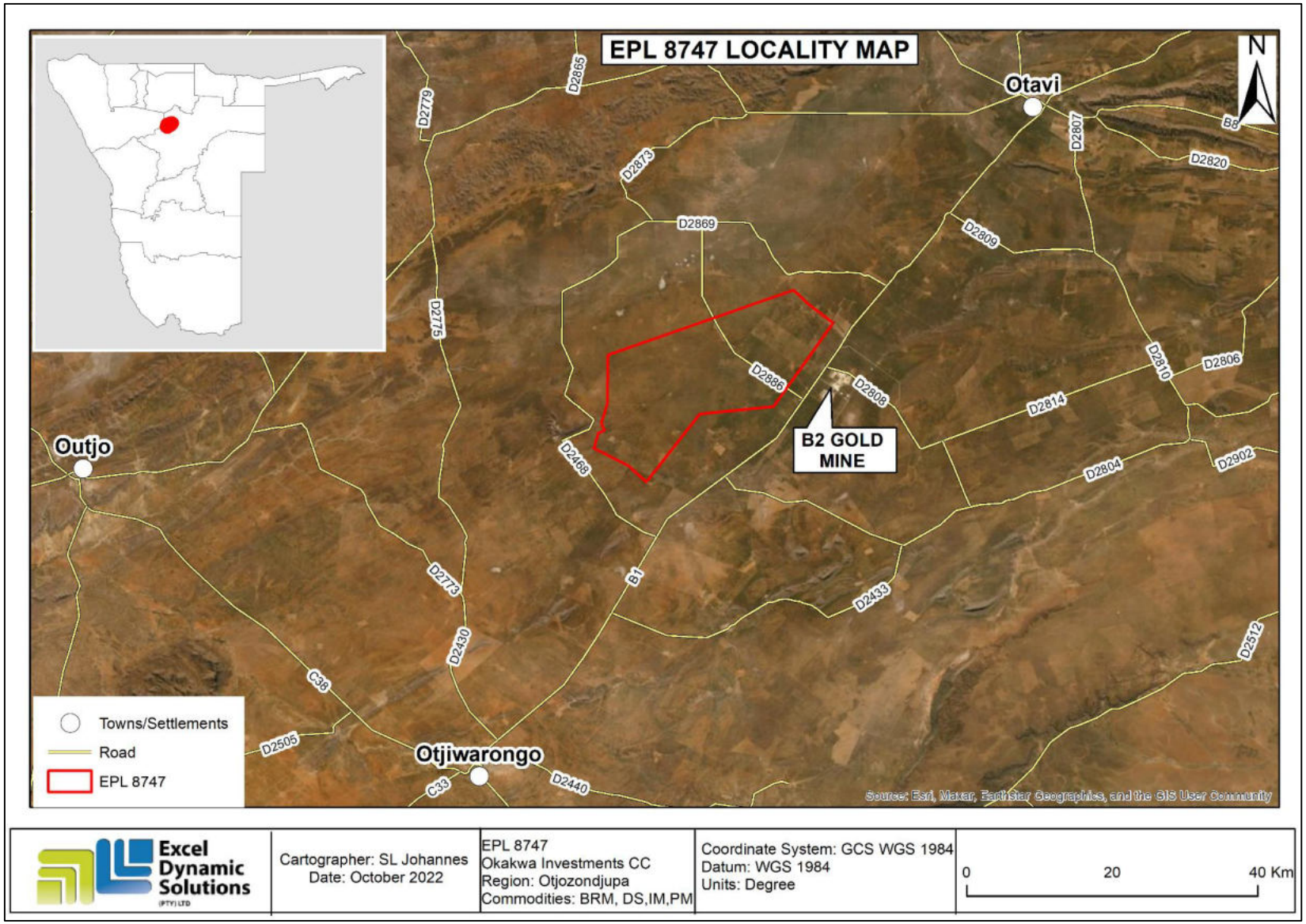

Figure 1: Locality map of EPL 8747

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

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

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

The EIA project is headed by Mr. Nerson Tjelos, a qualified and experienced Geoscientist and experienced EAP. Consultation and reporting were done by Mr. Stefanus Johannes and reviewed by Ms. Rose Mtuleni. The CV of Mr. Tjelos is presented in **Appendix C.**

1.3 Motivation for the Proposed Project

The mining industry is one of the largest contributors to the Namibian economy. It contributes to the improvement of livelihoods. In Namibia, exploration for minerals is carried out mainly by the private sector. Exploration activities have a great potential to enhance and contribute to the development of other sectors and its activities do provide temporary employment, and taxes that fund social infrastructural development. The minerals sector yields foreign exchange and accounts for a significant portion of gross domestic product (GDP). Additionally, the industry produces a trained workforce and small businesses that can serve communities and may initiate related businesses. Exploration activity fosters several associated activities such as manufacturing of exploration and mining equipment, and provision of engineering and environmental services. The mining sector forms a vital aspect of some of Namibia's development plans, namely: Vision 2030, National Development Plan 5 (NDP5), and Harambee Prosperity

Plans (HPPs) I and II. Thus, mining is essential to the development goals of Namibia in contributing to meeting the ever-increasing global demand for minerals, and for national prosperity. Successful exploration on EPL No. 8747 would lead to the mining of targeted commodities, which could contribute towards achieving the goals of the national development plans.

2 PROJECT DESCRIPTION: PROPOSED PROSPECTING, EXPLORATION ACTIVITIES

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

2.1 Prospecting Phase

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

2.1.1 Desktop Study: Geological mapping

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

2.1.2 Geophysical surveys

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

2.1.3 Lithology geochemical surveys

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

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

2.2 Exploration (Drilling, Sampling and Analysis) Phase

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

No explosives will be used during the exploration phase.

2.2.1 Detailed Exploration Drilling (Invasive Technique)

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

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

Other aspects of the exploration operations include:

2.2.2 Accessibility to Site

The EPL is accessible via the D2886 road, which diverges off the B1 road about 70 km northeast of Otjiwarongo see figure 1. The Proponent may need to do some upgrades on the site access road to ensure that it is fit to accommodate project-related vehicles, such as heavy trucks.

2.2.3 Material and Equipment

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

2.2.4 Services and Infrastructure

Water: Water for the exploration operations on the EPL will be obtained from the nearest existing boreholes around Otjiwarongo, or the proponent will drill boreholes on the farms upon obtaining necessary permits and signing agreements with the farmers (landowners). Estimated monthly water consumptions are at 4000 litres, but will not exceed 80 000 litres, which includes water for drinking, sanitation, cooking, dust control, drilling, as well as washing of equipment.

Power supply: Power required during the operation phase will be provided from the diesel generators. About 2000 litres of diesel will be used per day, and a bunded diesel bowser which will be on site will be filled ass regularly as necessary.

Fuel (diesel for generators and other equipment): The fuel (diesel) required for exploration equipment will be stored in a tank mounted on a mobile trailer, and drip trays will be readily available to ensure that accidental fuel spills are cleaned up as soon as they have been detected/observed. Fuel may also be stored in jerry cans placed on plastic sheeting to avoid unnecessary contamination of the ground.

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 weekly or monthly and taken to the nearest certified landfill site. An agreement will need to be reached with different waste management facility operators/owners and authorization or

permits will be obtained prior to utilizing these facilities, in the case of the production ofhazardous waste.

Sanitation and human waste: Portable ablution facilities will be used and the sewage will be disposed, according to the approved disposal or treatment methods of the waste products.

Hazardous waste: Drip trays and spill control kits will be available on-site to ensure that oil/fuel spills and leaks from vehicles and equipment are captured on time and contained correctly before polluting the site.

2.2.6 Health and safety

Adequate and appropriate Personal Protective Equipment (PPE) will be provided to every project personnel while working at the site. A minimum of two first aid kits will be readily available on-site to attend to potential minor injuries.

2.2.7 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: A minimum of basic firefighting equipment, i.e., two fire extinguishers will be readily available in vehicles, at the working sites and camps.

On-site Workers' Safety: Adequate and appropriate Personal Protective Equipment (PPE) will be provided to every project personnel while working at the site. A minimum of two first aid kits will be readily available on-site to attend to potential minor injuries.

2.2.8 Accommodation

The exploration crew will be accommodated in a campsite that will be set up for them near the exploration sites. If the accommodation camp is to be set up on a farm, necessary arrangements will be made with the farm owner/s. Exploration activities will take place during the day only and staff will commute to the exploration site(s) from their place of accommodation.

2.3 Decommissioning and Rehabilitation Phase

Once the exploration activities on the EPL come to an end, the Proponent will need to put site rehabilitation measures in place. Decommissioning and rehabilitation are primarily reinforced

through a decommissioning and rehabilitation plan, which consists of safety, health, environmental, and contingency aspects. An unfavorable economic situation or unconvincing exploration results might force the Proponent to cease the exploration program before predicted closure.

3 PROJECT ALTERNATIVES

Alternatives are defined as "*different means of meeting the general purpose and requirements of the activity*" (EMA, 2007). This section will highlight the different ways in which the project can be undertaken and identify the alternative that will be the most practical, but least damaging to the environment .

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

- What alternatives are technically and economically feasible?
- What are the environmental effects associated with the feasible alternatives?
- What is the rationale for selecting the preferred alternative?
    - The alternatives considered for the proposed development are discussed in the following subsections.
    -

3.1 Types of Alternatives Considered

3.1.1 The "No-go" Alternative

The "no action" alternative implies that the status quo remains, and the proposed activities do not occur. Should the proposal for exploration activities on the EPL, be discontinued, none of the potential impacts (positive and negative) identified would occur. If the proposed project is discontinued, the current land use for the proposed site will remain unchanged.

This option was considered and a comparative assessment of the environmental and socio-economic impacts of the "no action" alternative was 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 the following:

- Loss of foreign direct investment.
- The proposed 5-10 temporary job opportunities for community members will not come to realization.
- No realization of local businesses supporting each other through the procurement of consumable items such as Personal Protective Equipment (PPE), machinery spare parts, lubricants, etc.

- Loss of potential income to local and national government through land lease fees, license lease fees and various tax structures.
- Improved geological understanding of the site area regarding the targeted commodities.
- Socio-economic benefits such as skills acquisition to local community members would be not realized.

Considering the above losses, identifying the whole EPL as a "no-action/go zone" is not 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 are area-specific, which means exploration targets are primarily determined by the geology (host rocks) and the tectonic environment of the site (an ore-forming mechanism). The tenement has sufficient surface area for future related facilities should an economic mineral deposit be defined.

Furthermore, the national mineral resources' potential locations are also mapped and categorized by the Ministry of Mines and Energy in exclusive prospecting licenses, mining licenses and claims, mineral deposit retention licences, reconnaissance licenses and exclusive reconnaissance licenses. Available information on EPL 8747 **(Figure 2)** and other licenses are available on the Namibia Mining Cadastral Map here https://maps.landfolio.com/Namibia/

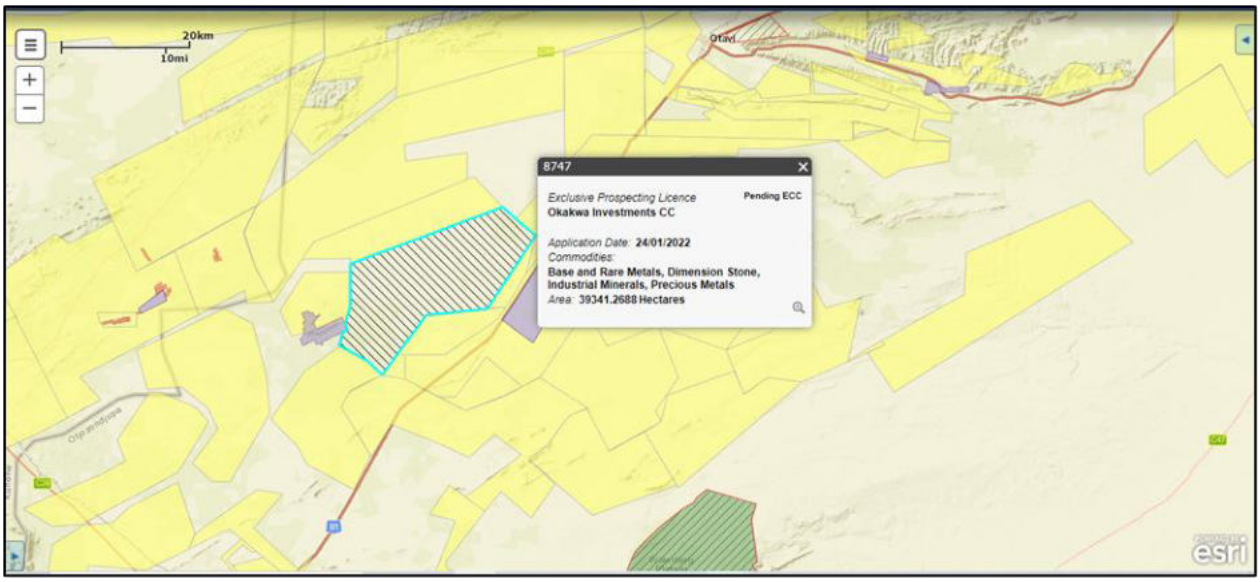

Figure 2: The location of EPL 8747 on the National Mining Cadastre

3.1.3 Exploration Methods

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

4 LEGAL FRAMEWORK: LEGISLATION, POLICIES AND GUIDELINES

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

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

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

The EMA has stipulated requirements for completing the required documentation to obtain an Environmental Clearance Certificate (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 activity that requires a license, right, or other forms of authorization, as defined by the Minerals (Prospecting and Mining Act, 1992), as well as the renewal of a license, right, or other form of authorization.
- 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 No. 8747 and related activities are presented in **Table 1.**

Table 1: Applicable local, national, and international standards, policies and guidelines governing the proposed prospecting and exploration activities

Legislation/Policy/ Guideline	Relevant Provisions	Implications for this project
The Constitution of the Republic of Namibia, 1990 as amended	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-utilisation of living natural resources, the irrational exploitation of non-renewable resources, the degradation and destruction of ecosystems and failure to protect the beauty and character of Namibia…" 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."	By implementing the environmental management plan, the establishment will be in conformant to the constitution in terms of environmental management and sustainability. Ecological sustainability will be main priority for the proposed development.

Legislation/Policy/ Guideline	Relevant Provisions	Implications for this project
Nature Conservation Amendment Act, No. 3 of 2017	National Parks are established and gazetted in accordance with the Nature Conservation Ordinance, 1975 (4 of 1975), as amended. The Ordinance provides a legal framework with regards to the permission of entering a state protected area, as well as requirements for individuals damaging objects (geological, ethnological, archaeological and historical) within a protected area. Though the Ordinance does not specifically refer to mining as an activity within a protected area (PA) or recreational area (RA), it does restrict access to PA's and prohibits certain acts therein as well as the purposes for which permission to enter game parks and nature reserves may be granted.	The Proponent will be required to enhance the conservation of biodiversity and the maintenance of the ecological integrity of protected areas and other state land.
The Parks and Wildlife Management Bill of 2008	Aims to provide a regulatory framework for the protection, conservation, and rehabilitation of species and ecosystems, the sustainable use and sustainable management of indigenous biological resources, and the management of protected areas, to conserve biodiversity and contribute to national development.	

Legislation/Policy/ Guideline	Relevant Provisions	Implications for this project
Minerals (Prospecting and Mining) Act (No. 33 of 1992)	Section 52 requires mineral license holders to enter into a written agreement with affected landowners before exercising rights conferred upon the license holder. Section 52(1) states that mineral licence holder may not exercise hisher rights in any town or village, on or in a proclaimed road, land utilised for cultivation, within 100m of any water resource (borehole, dam, spring, drinking trough etc.) and boreholes, or no operations in municipal areas, etc.), which should individually be checked to ensure compliance. Section 54 requires 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 that the proposed prospecting operations may have on the environment and the proposed steps to be taken to prevent or minimize any such effect.	The Proponent should enter into a written agreement with landowners before carrying out exploration on their land. The Proponent should carry out an assessment of the impact on the receiving environment. The Proponent should include as part of their application for the EPL, measures by which they will rehabilitate the areas 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.

Legislation/Policy/ Guideline	Relevant Provisions	Implications for this project
	Section 91 requires that rehabilitation measures should be included in an application for a mineral license.	
Mine Health & Safety Regulations, 10th Draft	Makes provision for the health and safety of persons employed or otherwise present in the mineral licensing area. These deal with among other matters; clothing and devices; design, use, operation, supervision, and control of machinery; fencing and guards; and safety measures during repairs and maintenance.	The Proponent should comply with all these regulations with respect to their employees.
Petroleum Products and Energy Act (No. 13 of 1990) Regulations (2001)	According to regulation 3(2)(b), states "no person shall possess [sic] or store any fuel except under authority of a licence or a certificate, excluding a person who possesses or stores such fuel in a quantity of 600 litres or less in any container kept at a place outside a local authority area"	The Proponent should obtain the necessary authorisation from the MME for the storage of fuel on-site.

Legislation/Policy/ Guideline	Relevant Provisions	Implications for this project
The Regional Councils Act (No. 22 of 1992)	This Act sets out the conditions under which regional councils must be elected and administer each delineated region. From a land use and project planning point of view, their duties include, as described in Section 28 undertaking the planning of the development of the region for which it has been established with a view to physical, social and economic characteristics, urbanisation patterns, natural resources, economic development potential, infrastructure, land utilisation patterns and sensitivity of the natural environment.	The relevant regional councils are I&APs and must be consulted during the Environmental Assessment (EA) process. The project site falls under the Otjozondjupa Regional Council; therefore, the Regional Council must be consulted.
Water Act 54 of 1956	The Water Resources Management Act 11 of 2013 is presently without regulations; therefore, the Water Act No 54 of 1956 is still in force: Prohibits the pollution of water and implements the principle that a person disposing of effluent or waste has a duly of care to prevent pollution (S3 (k)). Provides for control and protection of groundwater (S66 (1), (d (ii)). Liability of clean-up costs after closure/abandonment of an activity (S3 (l)). (l)).	The protection (both quality and quantity/abstraction) of water resources must be a priority.

Legislation/Policy/ Guideline	Relevant Provisions	Implications for this project
Water Resources Management Act (No 11 of 2013)	The Act provides for the management, protection, development, use and conservation of water resources; and provides for the regulation and monitoring of water services and to provide for incidental matters. The objects of this Act are to: 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) provides for preventing the contamination of the aquifer and water pollution control (Section 68).	
National Heritage Act No. 27 of 2004	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 these Acts requirements. The necessary management measures and related permitting requirements must be taken. This is done by consulting with the National Heritage Council of Namibia.
The National Monuments Act (No. 28 of 1969)	The Act enables the proclamation of national monuments and protects archaeological sites.	

Legislation/Policy/ Guideline	Relevant Provisions	Implications for this project
Soil Conservation Act (No 76 of 1969)	Through directives declared by the Minister, the Act makes provisions for the prevention and control of soil erosion and the protection, improvement, and conservation of soil, vegetation, and water supply sources and resources.	A 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	The Act provides for the management and use of forests and forest products. Section 22. (1) states that "unless otherwise authorised by this Act or by a licence issued under subsection (3), no person shall, on any land that 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 that is on a sand dune or drifting sand, or on a gully, unless the cutting, destruction, or removal is done	The Proponent will apply for the relevant permit under this Act if it becomes necessary.
Public Health Act (No. 36 of 1919)	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)	Details various requirements regarding health and safety of labourers.	

Legislation/Policy/ Guideline	Relevant Provisions	Implications for this project
Atmospheric Pollution Prevention Ordinance (1976)	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	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 not explicitly stated, the ordinance provides for the importing, storage, and handling.	The Proponent should handle and manage the storage and use of hazardous substances on site so that they do not harm or compromise the site environment
Road Traffic and Transport Act, No. 22 of 1999	The Act provides for the establishment of the Transportation Commission of Namibia; the control of traffic on public roads, the licensing of drivers, the registration and licensing of vehicles, the control and regulation of road transport across Namibia's borders; and for matters incidental thereto. Should the Proponent wish to undertake activities involving road transportation or access onto existing roads, the relevant permits will be required.	Mitigation measures should be provided for, if the roads and traffic impact cannot be avoided, the relevant permits must be applied for.

Legislation/Policy/ Guideline	Relevant Provisions	Implications for this project
Labour Act (No. 6 of 1992)	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 insures 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.

4.2 International Policies, Principles, Standards, Treaties and Conventions

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

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

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

Statute	Provisions	Project Implications
	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 **Principle 8:** Covenants **Principle 9:** Independent Monitoring and Reporting **Principle 10:** Reporting and Transparency	management practices with a minimum negative impact on project-affected ecosystems and community-based upliftment and empowering interactions.'
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	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

Statute	Provisions	Project Implications
	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 a 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 **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	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 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.

Statute	Provisions	Project Implications
	Undeserved 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-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 objective is to forge a global partnership to reverse and prevent desertification andland degradation and mitigate the effects of drought in affected areas to support poverty reduction and environmental sustainability United Nation Convention	The project activities should not be such that they contribute to desertification.

Statute	Provisions	Project Implications
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, 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 minimised.
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.

5 ENVIRONMENTAL BASELINE

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

Biophysical Environment

5.1 Climate

The Otjiwarongo area has relatively constant temperatures for most of the year. Seasons and temperature vary during the year. The months of October and November are the warmest with an average temperature range of 24.7 ^{0}C to 24.5 ^{0}C.

The highest rainfall around the project area is usually experienced in January and February which may reach an average of approximately 122 mm. From May to September, there is little to no rainfall, with an average of 0-5 mm The amount of rain received in the region is not deemed high enough to bring exploration work to a complete standstill.

The relative humidity during the least humid months of the year, i.e. August to September arearound 20 % and 16 %, respectively. Namibia has a generally low humidity, and the lack of moisture in the air has a significant impact on its climate, reducing cloud cover and increasing evaporation (Mendelsohn, 2002). **Figure 3** below shows the climate conditions around the project area.

	January	February	March	April	May	June	July	August	September	October	November	December
Avg. Temperature °C	23.5 °C	22.8 °C	21.9 °C	20.7 °C	18.6 °C	15.7 °C	15.6 °C	18.7 °C	22.4 °C	24.7 °C	24.5 °C	24.2 °C
(°F)	(74.3) °F	(73) °F	(71.5) °F	(69.2) °F	(65.5) °F	(60.3) °F	(60.1) °F	(65.6) °F	(72.3) °F	(76.5) °F	(76.1) °F	(75.5) °F
Min. Temperature °C (°F)	17.6 °C	17.3 °C	16.8 °C	15.1 °C	12.3 °C	9.1 °C	8.9 °C	11 °C	14.3 °C	17 °C	17.1 °C	17.3 °C
	(63.7) °F	(63.1) °F	(62.3) °F	(59.1) °F	(54.1) °F	(48.4) °F	(47.9) °F	(51.7) °F	(57.7) °F	(62.6) °F	(62.8) °F	(63.2) °F
Max. Temperature °C	29.9 °C	28.9 °C	27.8 °C	26.9 °C	25.6 °C	23.4 °C	23.4 °C	26.9 °C	30.8 °C	32.6 °C	32 °C	31.3 °C
(°F)	(85.9) °F	(84) °F	(82.1) °F	(80.4) °F	(78) °F	(74.1) °F	(74) °F	(80.5) °F	(87.4) °F	(90.6) °F	(89.6) °F	(88.3) °F
Precipitation / Rainfall	128	118	90	31	2	0	0	0	5	20	45	84
mm (in)	(5)	(4)	(3)	(1)	(0)	(0)	(0)	(0)	(0)	(0)	(1)	(3)
Humidity(%)	49%	54%	56%	47%	34%	30%	27%	20%	16%	20%	29%	37%
Rainy days (d)	11	10	10	5	0	0	0	0	1	3	6	8
avg. Sun hours (hours)	10.6	9.9	9.4	9.7	10.0	9.8	9.9	10.3	10.8	11.2	11.5	11.4

Figure 3: Shows the climate condition around the project area (source: climate-data, 2022)

5.2 Topography

- The EPL mainly lies in the central-western landscape which is characterized by dissection and erosional cutbacks. The EPL lies at an elevation that ranges from 11032 - 1248 m. **Figure 4** shows the elevation map for the project area.

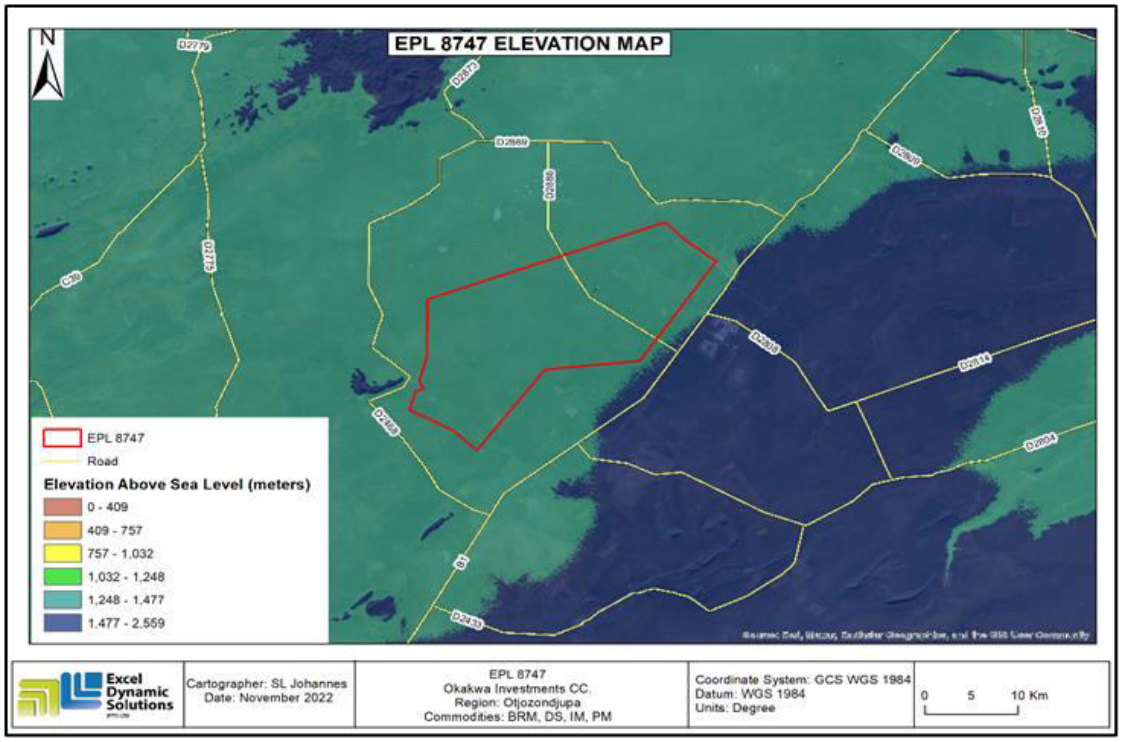

Figure 4: Shows the elevation map for the project area

5.3 Geology

Geologically, EPL 8747 lies within the Swakop suppergroup and Gariep complex division (Mendelsohn *et al*, 2008). The EPLs rock type is of the swakop group mainly composing of Alluvium, Sand, Gravel, Calcrete, Quartzite, Otho-amphibolite, Calc-silicate, conglomerate, schist, marble and graphite schist.

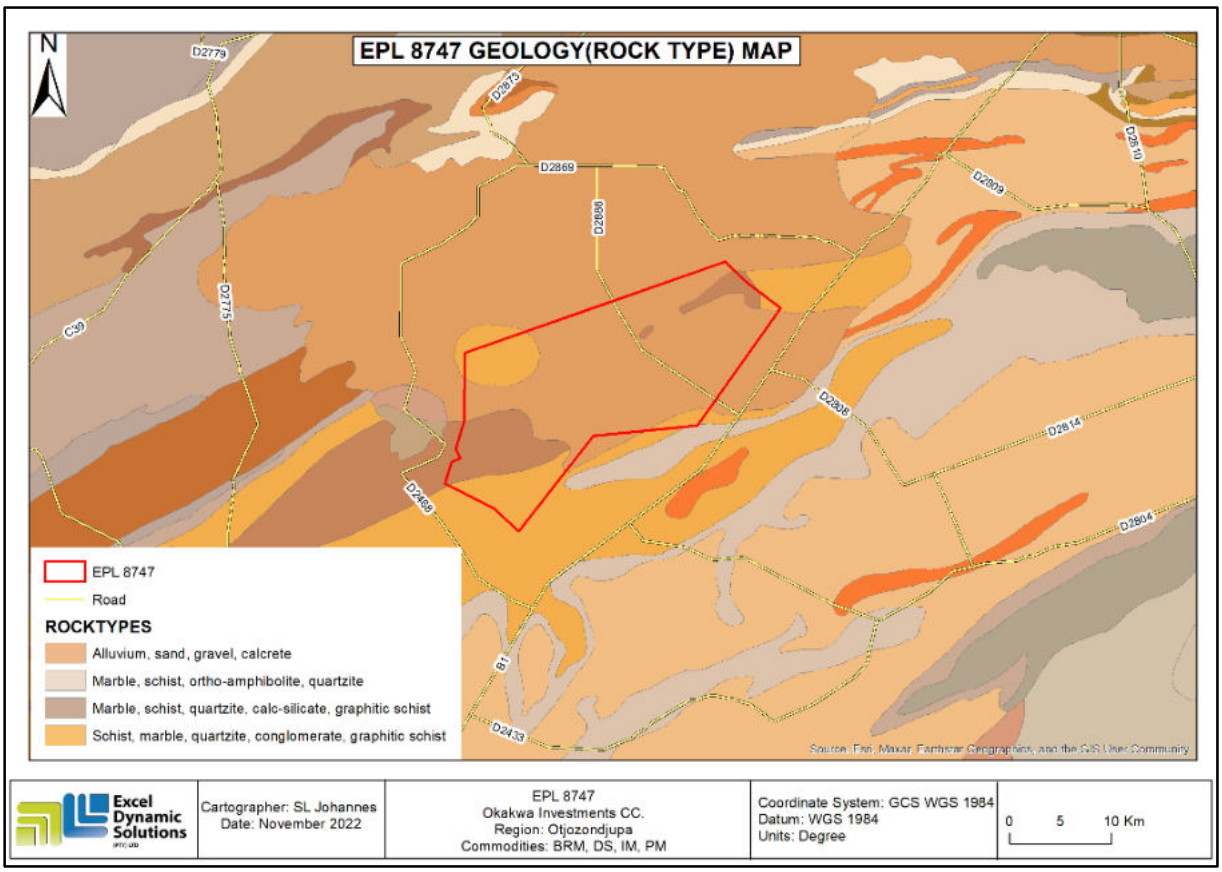

Figure 5: The geology of the EPL

5.4 Soil

The EPL area is covered by the Chromic Cambisols and by Mollic Leptosols soil. These are recently formed soils from medium and fine textured parent materials that deposited during sporadic flooding, and are characterized as of a good fertility due to the water holding capacity and internal drainage, (Mendelsohn, 2003). **Figure 6** shows the soils map for the EPL.

Leptosols are coarse textured soil characterized by their limited depth caused by the presence of a continuous hard rock highly calcareous or cemented layer within 30cm of the surface, they are the shallowest soil in Namibia and contain gravel, (Mendelsohn, 2003).

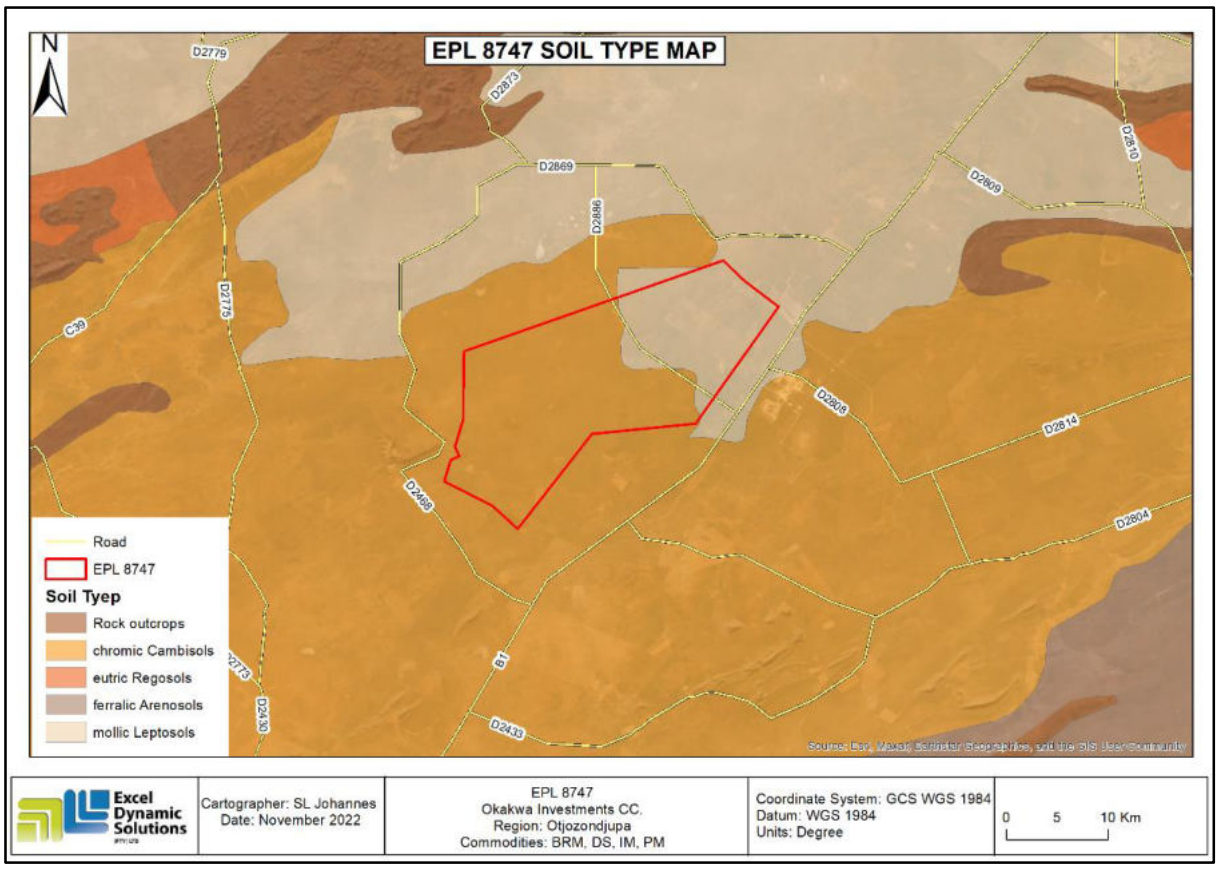

Figure 6: The soils of the EPL

5.5 Groundwater and Groundwater pollution

The EPL is dominantly covered by Porous aquifers and minor sections of fractured, fissured or karstified aquifers and rock bodies with little groundwater potential. Due to the nature of the Porous aquifer bodies, the groundwater pollution vulnerability of the EPL is characterized as moderate **(Figures 7 and 8)**. The regulations stipulated in the Water Act 54 of 1956 with respect to the water abstraction should be highly adhered to, whereby over-abstraction will not be recommended during the exploration phase.

The are no rivers running through the EPL, but several boreholes are present within the EPL. **Figure 7** below shows the hydrology map for the project area.

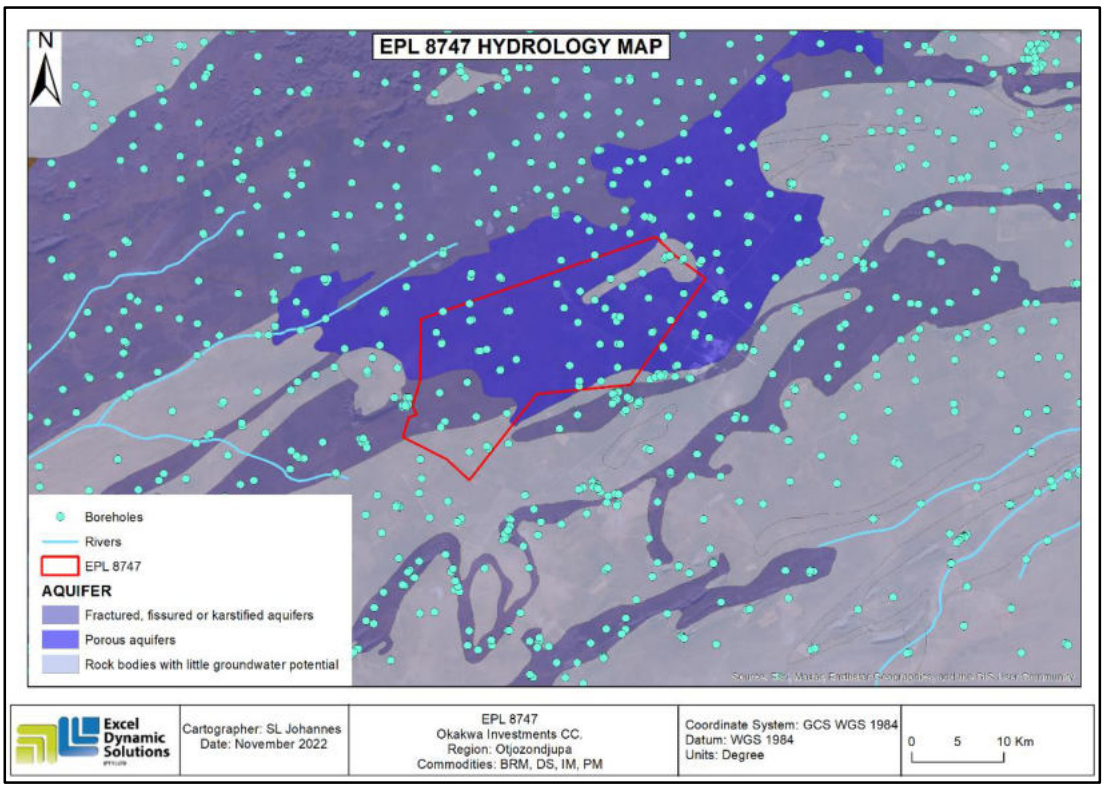

Figure 7: Shows the hydrology map for the EPL

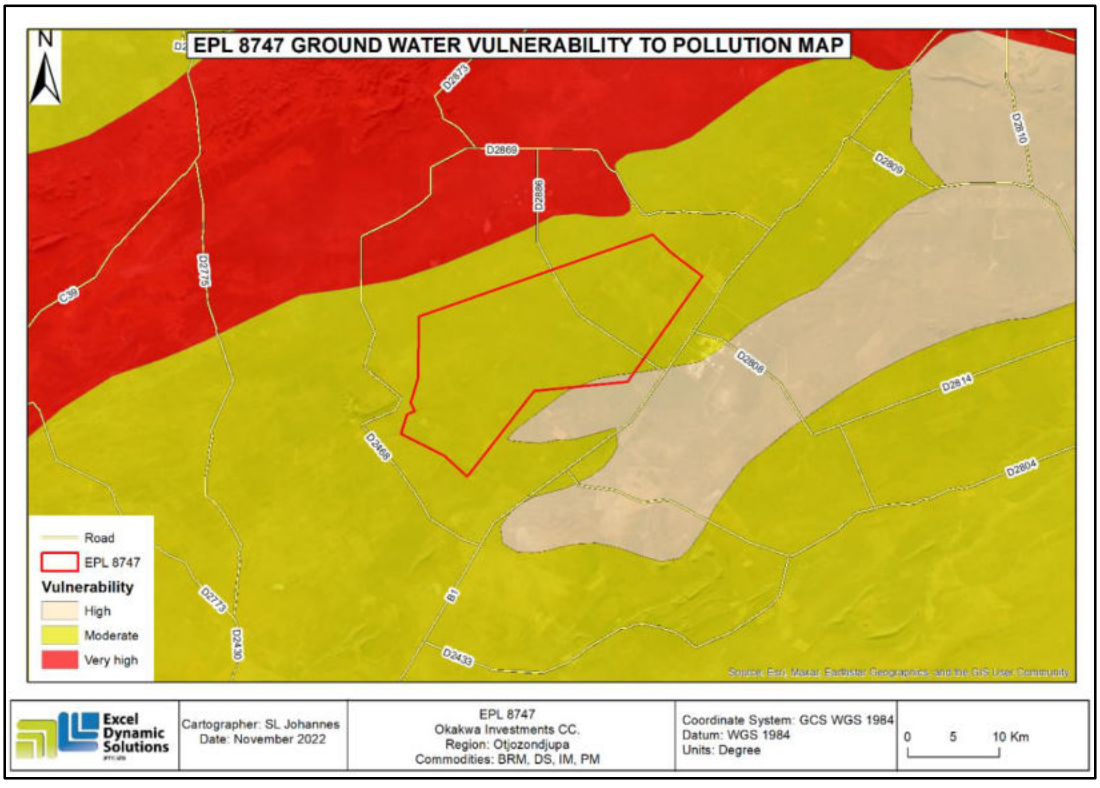

Figure 8: Shows the groundwater vulnerability map for the EPL

5.6 Flora and Fauna

5.6.1 Flora

The EPL falls within a dense shrub land. The EPL is dominated by Blackthorn (*Senegalia Mellifera*) and few other acacia species. In terms of grass species, the EPL is dominated by annual grasses which sometimes grow up to 45cm high. This type of grass grows on mountainous and rocky areas. **Figure 9** shows the dominant plant species (Blackthorn (*Senegalia Mellifera*)) covering the EPL area.

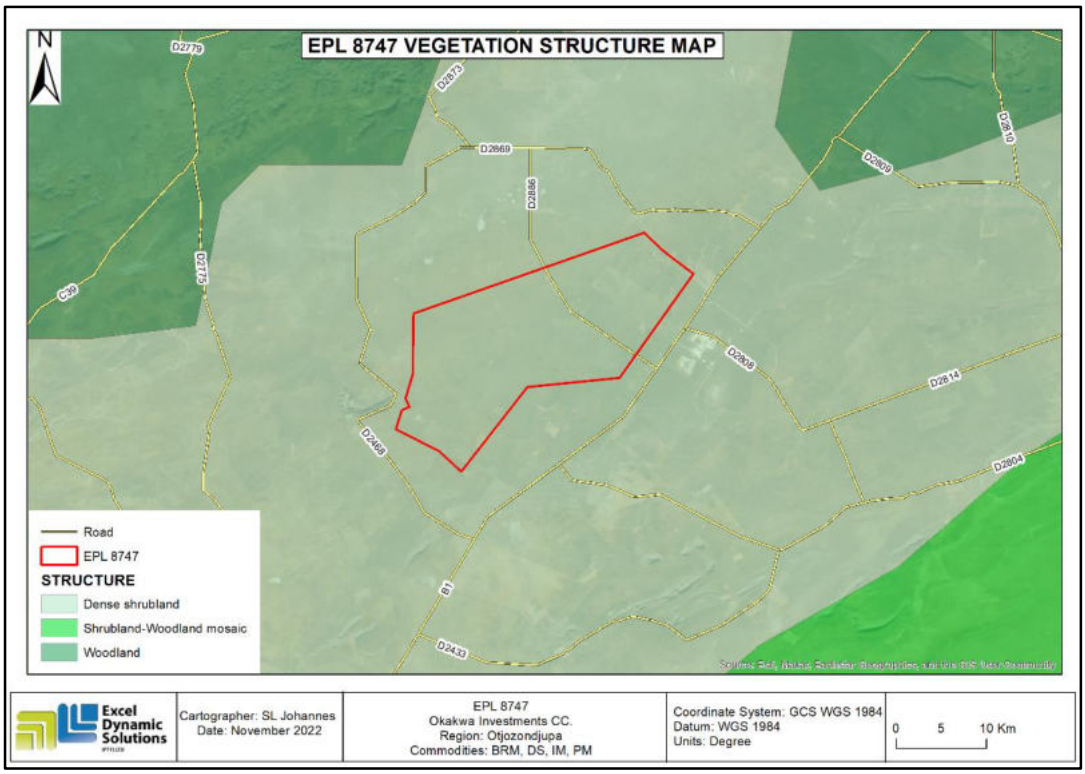

Figure 9: Vegetation Cover map for EPL 8747

Figure 10 : Blackthorn (*Senegalia Mellifera*) on EPL 8747

5.6.2 Fauna

The following animals (**Table 3**) are expected to be found in the vicinity of the project area.

Table 3 : Shows animals species found within and around the EPL with their concern (source: Emmanuel, 2022)

Animals	Concern
Springbok	Least Concern
Hyena	Endangered
Leopard	Endangered
Greater Kudu	Least Concern
Reptiles	None
Oryx	Least Concern
Livestock	None
Kirk dik dik	Least concern
Common warthog	Least concern
Baboon	Least concern

Giraffe	Least concern
Steenbok	Least concern
Black backed jackal	Least concern
Gemsbok	Least concern
Brown hyaena	Endangered
Ground squirrel	Least concern
Impala	Least concern
Cheetah	Vulnerable
Leopard	Endangered
Tortoise	Critically endangered
Rock hyrax	Least concern
Mongoose	Least concern
Hartebeest	Least concern
Ostrich	Least concern
Eland	Least concern
Antelope	Near Threatened

5.7 Archaeology and Heritage

Archaeological remains in Namibia are protected under the National Heritage Act (27 of 2004), which makes provision for archaeological impact assessments for proposed projects, as necessary. Modern humans and their ancestors have lived in Namibia for more than one million years (Kinahan 2011), and there are fossil remains of lineal hominin ancestors as early as the Miocene Epoch (Conroy *et al.* 1992). Namibia has a relatively complete sequence covering the mid-Pleistocene to Recent Holocene period, represented by thousands of archaeological sites mainly concentrated in the central highlands, escarpment and Namib Desert.

The Otjozondupa Region is one of the regions in the country, endowed with several archaeological sites that are of national and international significance. There are about 14 declared sites within the region. The closet monument is found within Farm Oasis, which is Khorab- Denkmal, farm oasis is 2.6 km north of Otavi, Namibia, hosted a monument commemorating negotiations between South African and German troops fighting in World War I.

These led to the surrender of around 4,000 German soldiers in what was known as the Treaty of Khorab. The monument was dedicated on September 28, 1973.

Site visit:

A detailed inspection of the site was carried out on 7th November, 2022. The site surveys were mainly undertaken on foot on the farms. This exercise involved direct observation of archaeological or cultural sites, whose positions were fixed by hand-held GPS *etrex 32,* documented and plotted on topographic maps. All archaeological sites are assessed as to their significance and vulnerability, using two independent parallel scales devised for archaeological assessment in Namibia. In general, no trace of any significant archaeological or historical remains of national significance, and as relevant to the National Heritage Act 27 of 2004, were found in surveyed area. However, at the localized level, the recorded sites/artifacts/ or features, which are of low significance are illustrated herein in figures and presented in table 4 below. These were located in different areas within the EPL 8747 boundaries.

Table 4 : Findings of the Archaeological and Heritage sites on EPL 8086– Description of Sites

Waypoint	Location	Description of the findings	Heritage Significance	Grading
EDS 190	S 19º 55' 21.49'' E 17º 05' 52.48''	**Old graves site:** This site consists of ten or more graves, as some of them have collapsed in due not being well maintained (Figure 12, 13).	Considerably High	4
EDS 191	S 19º 55' 20.63'' E 17º 05' 53.59''	**Old bottle:** This types of bottle represent an old era in the Namibia history.	Little	1

Figure 11: Old graves as recorded during the site survey

Figure 12 : Some old graves recorded within the farms.

Figure 13 : Old bottle

5.8 Surrounding Land Uses

The EPL falls within commercial farmland as shown in **Figure 10**. The Proponent is required to secure a signed agreement from the affected landowners and farmers 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 mineral licence shall not exercise any rights conferred upon such holder by this Act or under any terms and conditions of such mineral licence –*

    (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 waked any right to such compensation and has submitted a copy of such agreement or waiver to the Commissioner.

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

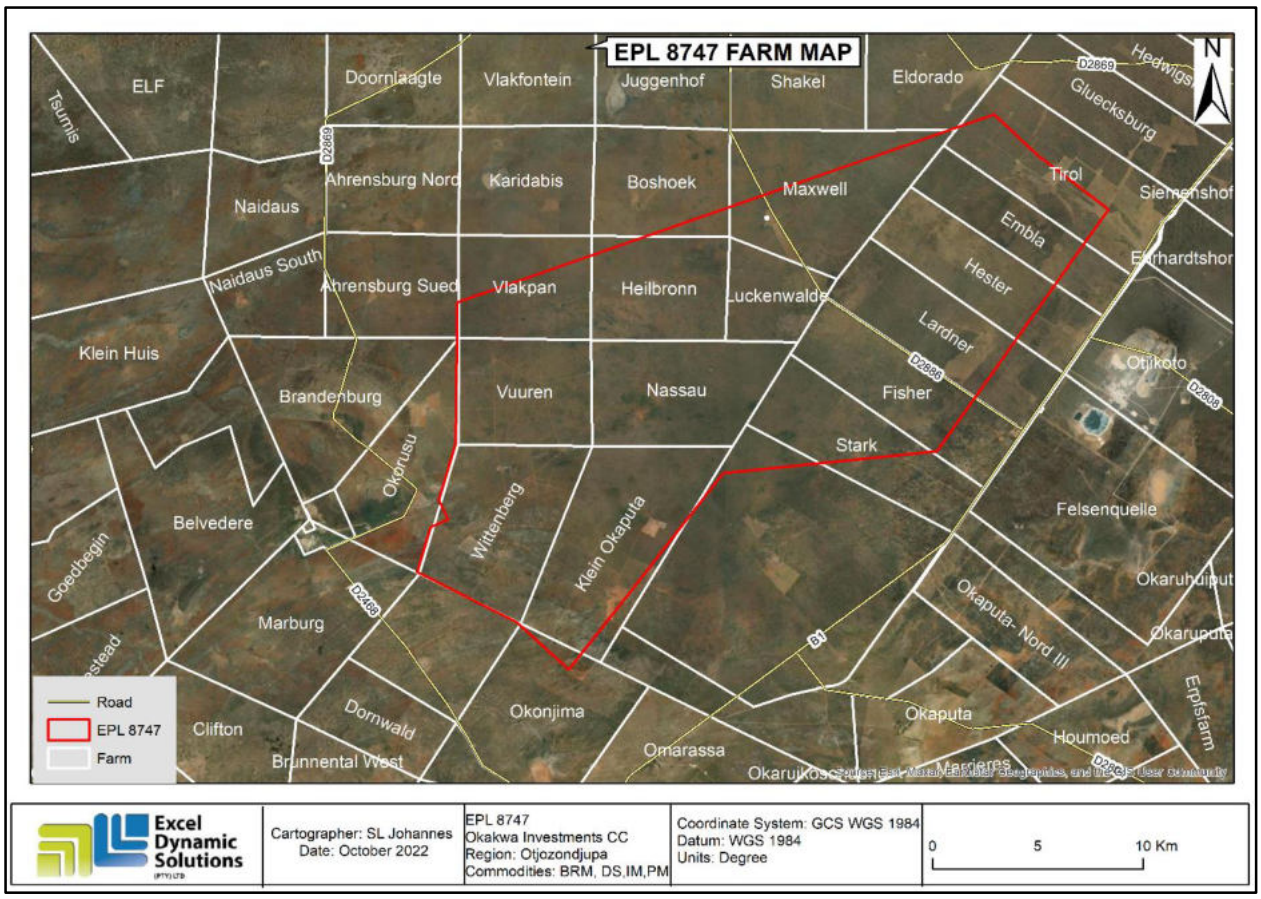

Figure 14: Land Use Map (EPL 8747)

5.9 Socio-Economic Status of Otjiwarongo

Otjiwarongo is a town in the Otjozondjupa Region of Namibia. It is the district capital of the Otjiwarongo electoral constituency and the regional capital of the vast Otjozondjupa region; and hence, serves as a major business and shopping hub for a number of smaller towns and the surrounding commercial farming community. It is the biggest business centre for the Otjozondjupa Region. The town offers a stable, efficient, and helpful local government, endless potential for investors, both in the industrial and commercial sectors as well as attractive residential areas, excellent schools, and modern medical facilities. It is one of Namibia's fast-growing towns, with a neat and peaceful environment and wide range excellent amenities such as supermarkets, banks, lodges, and hotels.

Otjiwarongo is strategically located on the B1 Road, and serves as a gateway to other parts of the country, such as Okahandja and Windhoek, the Golden Triangle of Otavi, Tsumeb and Grootfontein, and the Etosha National Park.

Economy and infrastructure

Otjiwarongo has a well-developed road network as well as an air strip, Otjiwarongo Airport. The Roads in the town are well-maintained, making Otjiwarongo one of the few Namibian towns that has tarred roads even in the townships. The Trans-Caprivi Highway passes through Otjiwarongo. Otjiwarongo is also connected to the national railway grid, connecting Otavi, and Kranzberg to Outjo.

Mining

The B2Gold mine, an open-pit gold mine established in 2014 and owned by B2Gold, is located approximately 70 km (43 mi) northwest Otjiwarongo. The Okorusu fluorspar mine is 48 km (30 mi) the north of Otjiwarongo. It is a source of fluorite specimens, and a potential resource for rare-earth elements. Together, mining accounts for 20% of the town's economy.

Health and Education facilities

The Otjiwarongo District State Hospital is the biggest hospital in the town. A number of private clinics and hospitals are also present. There are about 15 schools in Otjiwarongo - three private schools and twelve public schools. The town also has a community library, a number of institution for higher education in the town, vocational training centres and a convent. The University of Namibia and the Namibia University of Science and Technology have satellite campuses in Otjiwarongo.

Tourism

The main attraction for tourists is Otjiwarongo's proximity to the Waterberg Plateau Park. Otjiwarongo is home to the Cheetah Conservation Fund, an internationally recognized organization dedicated to ensuring the long-term survival of the cheetah through research, conservation and education. Also about 80 kilometers from Otjiwarongo is Okonjima, the home of the Africat Foundation, a cheetah and leopard rehabilitation centre. On the edge of town is the Crocodile Ranch, one of the few captive breeding programs for the Nile crocodile. The Omatjenne Dam, built 15 kilometres outside of town, provides artificial recharge of local groundwater.

Table 5: Demographics of Otjozondjupa and Otjiwarongo - Selected Indicators, 2011

Indicators		Values	
		Otjozondjupa	Otjiwarongo
Population Size	Males:	73 902	15, 538
	Females:	70 001	16, 275
Sex ratio: Males per 100 females		106	95
	Under 5 years	14	13

Age composition, %	5 – 14 years	22	21
	15 – 59 years	58	61
	60+ years	6	5
Literacy rate, 15+ years, %		83	90
Education, 15+ years, %	Never attended school	18	11
	Currently at school	26	28
	Left school	52	58
Labour force, 15+ years, %	In labour force	71	72
	Employed	63	60
	Unemployed	37	40
	Outside labour force	19	22
Main source of income, %	Farming	10	2
	Wages & Salaries	60	66
	Cash remittance	6	8
	Business, non-farming	10	13
	Pension	9	8
Housing conditions, % Households with	Safe water	95	98
	No toilet facility	39	20
	Electricity for lighting	56	73
	Wood/charcoal for cooking	56	43

Source: Namibia Statistics Agency (NSA) Census Indicators 2011

6 PUBLIC CONSULTATION PROCESS

Public consultation is an important component of the 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 the extent to which further investigations are necessary. Public consultation can also aid in the process of identifying possible mitigation measures. Public consultation for this project has been done under the EMA and its EIA Regulations.

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

Relevant and applicable national, regional, and local authorities, local leaders, and other interested members of the public were identified. Pre-identified I&APs were contacted directly, while other parties who contacted the consultant after seeing project advertisement notices in the newspapers, were registered as I&APs upon their request. The proposed exploration activities were advertised in two widely circulated national newspapers in the region (the Namibian Newspaper and the New Era Newspaper).The project advertisement/announcement ran for two consecutive weeks inviting members of the public to register as I&APs and submit their comments. The summary of pre-identified and registered I&APs is listed in **Table 3** below and the complete list of I&APs is provided in **Appendix D**.

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

National (Ministries and State-Owned Enterprises)
Ministry of Environment, Forestry and Tourism
Ministry of Mines and Energy
Ministry of Health and Social Services
Regional, Local and Traditional Authorities
Otjozondjupa Regional Council
Municipality Of Otjiwarongo
General Public
Land owners /Interested members of the public

Namibia Community Based Tourism Association

6.2 Communication with I&APs

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

- A Background Information Document (BID) containing brief information about the proposed facility was compiled **(Appendix E)** and delivered upon request to all new registered Interested and Affected parties (I&APs).
- Project Environmental Assessment notices were published in New Era and The Namibian Newspaper (26 October 2022 and 02 November 2022) (**Appendix F)**, briefly explaining the activity and its locality, and inviting members of the public to register as I&APs.
- A consultation meeting was scheduled and held with the I&APs on the **07 November 2022** at Khoi khoi guest house conference room 12:00 as shown in **Figure 15.**

Figure 15: Consultation meeting at Khoi Khoi guest house conference room

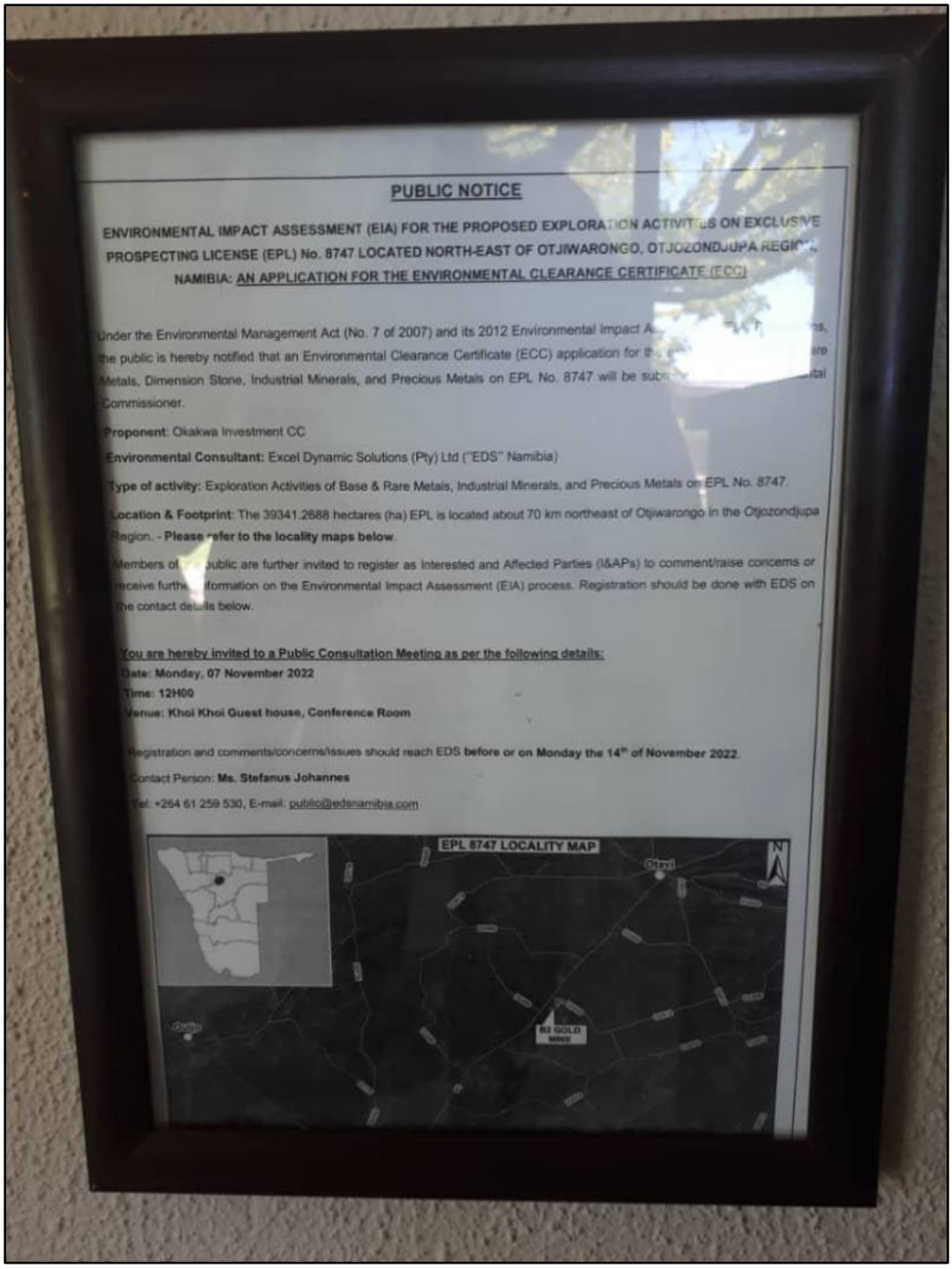

Figure 16: Site notice placed at the Khoi khoi Guest House entrance

6.3 Feedback from Interested and Affected Parties

Issues raised by I&APs during the consultation meeting have been recorded and incorporated in the assessment. The summary of the key issues is presented in **Table 7** below. The full record of issues raised and responses by EDS are attached under **Appendix H**.

Table 7: Summary of main issues and comments received during the public meeting

Issues	Concern
Water Shortage	Underground water is starting to be an issue as groundwater levels keep dropping, and can only cater for livestock and domestic use.
Land Ownership	What will happen to the portion of the farmland (in terms of ownership) where the Proponent finds good mineral deposits for mining?
Poaching	Animal poaching is a concern, what are the mitigation measures put in place to minimize the likelihood of poaching in the area?

7 IMPACT IDENTIFICATION, ASSESSMENT AND MITIGATION MEASURES

7.1 Impact Identification

Proposed developments or activities are usually associated with different potential positive and/or negative impacts. In an environmental assessment, the focus is 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 project activities. The identified potential positive and negative impacts of the prospecting activities are listed as follows:

Positive:

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

Negative:

- Potential disturbance of grazing land areas,
- Physical land / soil disturbance,
- Impact on local biodiversity (fauna and flora) and habitat disturbance and potential illegal wildlife hunting (poaching) in the area,
- Potential impact on water resources and soils particularly due to pollution,
- Air quality issue: potential dust generated from the project,
- Potential occupational health and safety risks,
- Vehicular traffic safety and impact on services infrastructure such as local roads,
- Vibrations and noise associated with drilling activities may be a nuisance to locals,

- Environmental pollution (solid waste and wastewater),
- Archaeological and heritage resources impact,
- Potential social nuisance and conflicts (theft, damage to properties, etc).

7.2 Impact Assessment Methodology

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

The identified impacts were assessed in terms of scale/extent (spatial scale), duration (temporal scale), magnitude (severity) and probability (likelihood of occurring), as presented in **Table 8, Table** 9**, Table** 10 and **Table** 11, respectively.

Each rating scale is assigned a numerical value to facilitate a scientific approach to determining environmental significance.. 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:

7.2.1 Extent (spatial scale)

Extent is an indication of the physical and spatial scale of the impact. **Table 8** shows rating of impact in terms of extent of spatial scale.

Table 8: Extent or 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

7.2.2 Duration

Duration refers to the timeframe over which the impact is expected to occur, measured in relation to the lifetime of the project. **Table 9** shows the rating of impact in terms of duration.

Table 9: 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

7.2.3 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 the alteration can either be positive or negative. These ratings were also taken into consideration during the assessment of severity. **Table 10** shows the rating of impact in terms of intensity, magnitude, or severity.

Table 10: 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	Substantial deterioration, death, illness or injury, loss of habitat /	Moderate deterioration, discomfort, partial loss of habitat /	Low deterioration, slight noticeable alteration in	Minor deterioration, nuisance or irritation, minor change in

Type of criteria	Negative				
	H- (10)	M/H- (8)	M- (6)	M/L- (4)	L- (2)
	/ total loss of habitat, total alteration of ecological processes, extinction of rare species	diversity or resource, severe alteration or disturbance of important processes	biodiversity or resource, moderate alteration	habitat and biodiversity. Little loss in species numbers	species / habitat / diversity or resource, no or very little quality deterioration.

7.2.4 Probability of occurrence

The Probability describes the likelihood of the impacts occurring. This determination is based on previous experience with similar projects and/or on professional judgment. **Table 11** shows impact rating in terms of probability of occurrence.

Table 11: Probability of occurrence impact 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.

7.2.5 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 8, Table 9, Table 10** and **Table 11**) have been ranked for each potential impact, the 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 12**).

Table 12: Significance rating scale

Significance	*Environmental Significance Points*	*Colour Code*
High (positive)	>60	H
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. Monitoring for a period of time is recommended to confirm the significance of the impact as low or medium and under control in order to maintain a low or medium significance rating.

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 first to , 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, prospecting, exploration, and decommissioning. The potential negative impacts of the EPL's proposed activities are described, assessed, and mitigation measures are provided. Further mitigation measures in a form of management action plans are provided in the Draft Environmental Management Plan.

7.3 Assessment of Potential Negative (Adverse) Impacts

The significant negative impacts potentially associated with the proposed prospecting and exploration of Base and Rare Metals, Industrial Minerals, Precious Metals, and Semi-Precious Stones are assessed below:

7.3.1 Disturbance to the grazing areas

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

The effect of exploration work on the land (when done over a wider spatial extent), if not mitigated, may hinder animal husbandry in the area and its surrounding. The project area might experience loss of its pastoral system over time, which minimizes the number of animals on the farms and overall farming activity in the area, and lead to the loss of livelihoods. Under the status, the impact can have a low significance rating. With the implementation of appropriate mitigation measures, the rating will be reduced to a lower significance. The impact is assessed in **Table 13** below.

Table 13: Assessment of the impacts of exploration on grazing areas

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

Post mitigation	L/M: -2	L/M: -2	L/M: -4	L/M: 2	L: -16

Mitigations and recommendations to lower the possibility of disturbance and loss of the Pastoral system:

- Any unnecessary removal or destruction of grazing land, due to exploration activities must be avoided
- Vegetation found on the site, but not in the targeted exploration areas must not be removed but left to preserve biodiversity and grazing land.
- Workers must refrain from driving off road and creating unnecessary tracks that may contribute to the loss of grazing land.
- Environmental awareness on the importance of the preservation of grazing land for local livestock should be provided to the workers.

7.3.2 Land Degradation and Loss of Biodiversity

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

The presence and the movement of the exploration workforce and operation of project equipment and heavy vehicles would disturb livestock and wildlife present on farms. The proposed activities may also carry the risk of potential illegal hunting of local wildlife. This could lead to a reduction of specific faunal species, which may limit tourism (sightseeing and safari) activity in the area.

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

Flora: Direct impacts on flora and vegetation communities will mainly occur through clearing for the exploration access roads and associated infrastructure. The dust emissions from drilling may have an effect surrounding vegetation through the fall of dust. Some loss of vegetation is an inevitable consequence of the development. However, given the abundance of the shrubs and site-specific areas of exploration on the EPL, the impact will be localized, therefore manageable.

Under the status, the impact can be of a medium significance rating. With the implementation of appropriate mitigation measures, the rating will be reduced to a low significance rating. The impact is assessed in **Table 14** below.

Table 14: Assessment of the impacts of exploration on biodiversity

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	M: -3	M: -3	M: -6	M/H: 4	M: -48
Post mitigation	L/M: -2	L/M: -2	L/M: -4	L/M: 2	L: -16

Mitigations and recommendations to minimize the loss of biodiversity:

- The Proponent must avoid unnecessary removal of vegetation, in order to promote a balance between biodiversity and their operations.
- Vegetation found on the site, but not in the targeted exploration site areas should not be removed but left to preserve biodiversity on the site.
- Shrubs or trees found along trenching, drilling, or sampling spots on sites must not be unnecessarily removed.
- Movement of vehicle and machinery should be restricted to existing roads and tracks to prevent unnecessary damage to the vegetation.
- No onsite vegetation must be cut or used for firewood related to the project's operations. The Proponent should provide firewood for his onsite camp workers from an authorized firewood producer or seller.
- Design access roads appropriately in a manner that disturbs as little land as possible.
- Vegetation clearing to be kept to a minimum. The vegetation of the site is largely low and open and therefore whole-sale vegetation clearing should only be applied where necessary and within the EPL footprint.
- Formulate and implement suitable and appropriate operational management guidelines for the cleared areas. The progressive rehabilitation measures are included in the guidelines.These should be considered:
- Workers must refrain from disturbing, killing or stealing farm animals and killing small soil and rock outcrops' species found on sites.
- Poaching (illegal hunting) of wildlife from the area is strictly prohibited.
- Environmental awareness on the importance of biodiversity preservation must be provided to the workers.

7.3.3 Generation of Dust (Air Quality)

Dust emanating from site access roads when transporting exploration equipment and supplies to and from site may compromise the air quality in the area. Vehicular movements from heavy vehicles such as trucks would potentially create dust, even though it is anticipated to be low. The hot and dry environment, the loose and sandy nature of the substrate and low vegetation cover causes ambient fugitive dust levels. Additionally, activities carried out as part of the exploration works such as drilling would contribute to the dust levels in the air. The medium significance of this impact can be reduced to a low significance rating by properly implementing mitigation measures. The impact is assessed in **Table 15** below.

Table 15: Assessment of the impacts of exploration on air quality

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

Mitigations and recommendations to minimize dust:

- Exploration vehicles must not drive at a speed more than 40 km/h to avoid dust generation around the area.
- The Proponent must ensure that the exploration schedule is limited to the given number of days of the week, and not every day. This will keep the vehicle-related dust level minimal in the area.
- Reasonable amount of water should be used on gravel roads, using regular water sprays on gravel routes and near exploration sites to suppress the dust that may be emanating from certain exploration areas on the EPL, in cases of excessive generation of dust.

7.3.4 Water Resources Use

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

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

The impact of the project activities on the resources would be dependent on the water volumes required by each project activity. Exploration activities use a lot of water, mainly for drilling.

However, this depends on the type of drilling methods employed (e.g. diamond drilling is more water-consuming compared to drilling methods such as reverse circulation) and the type of mineral being explored for.

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

Without the implementation of any mitigation measures, the impact can be rated as medium, but upon effective implementation of the recommended measures, the impact significance would be reduced to low as presented in the **16** below.

Table 16: Assessment of the project impact on water resource use and availability

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

Mitigations and recommendations to manage water use:

- Drinking water extracted from boreholes or delivered by cart should be used efficiently, and recycling and reusing water on specific site activities should be encouraged where necessary and feasible.
- The Proponent should consider carting water for drilling from elsewhere if the existing boreholes are not sustainable. Agreements of water supply should be made between the farmer / landowner and the Proponent.
- Water reuse/recycling methods must be implemented as far as practicable, e.g. the water used to cool off exploration equipment may be captured and used for the cleaning of project equipment, if possible.

- Water storage tanks must be inspected daily to ensure that there is no leakage.
- Water conservation awareness and saving measures training should be provided to all the project workers in both phases so that they understand the importance of conserving water and therefore be held accountable.

7.3.5 Soil and Water Resources Pollution

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

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

Pre-mitigation measure implementation, the impact significance is low to moderate and upon implementation, the significance will be reduced to low. The impact is assessed in 1**7** below.

Table 17: Assessment of the project impact on soils and water resources (pollution)

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	M - 3	M/H - 4	M - 6	M - 3	M - 39
Post mitigation	L - 1	L - 1	L - 2	L/M - 2	L - 8

Mitigations and recommendations to manage soil and water pollution:

- Spill control preventive measures must be in place on site to management soil contamination, thus preventing and or minimizing the contamination from reaching water resources bodies. Some of the soil control preventive measures that can be implemented include:
    - Identification of oil storage and use locations on site and allocate drip trays and polluted soil removal tools suitable for that specific surface (soil or hard rock cover) on the sites.
    - Maintain equipment and fuel storage tanks to ensure that they are in good condition thus preventing leaks and spills.

  - The oil storage and use locations should be visually inspected for container or tank condition and spills.
- All project employees must be sensitized to impacts of soil pollution and advised to follow appropriate fuel delivery and handling procedures.
- The Proponent should develop and prepare countermeasures to contain, clean up, and mitigate the effects of an oil spill. This includes keeping spill response procedures and a well-stocked cache of supplies easily accessible.
- Ensure employees receive basic Spill Prevention, Control, and Countermeasure (SPCC) Plan training and mentor new workers as they get hired.
- Project machines and equipment must be equipped with drip trays to contain possible oil spills when operated on site.
- Polluted soil must be removed immediately and put in a designate waste type container for later disposal.
- Drip trays must be readily available and monitored to ensure that accidental fuel spills along the tank trailer path/route around the exploration sites are cleaned on time (soon after the spill has happened).
- Polluted soil must be collected and transported away from the site to an approved and appropriately classified hazardous waste treatment facility.
- Washing of equipment contaminated hydrocarbons, as well as the washing and servicing of vehicles should take place at a dedicated area, where contaminants are prevented from contaminating soil or water resources.
- Toilet waste must be emptied before reaching capacity and transported to a wastewater treatment facility.

7.3.6 Waste Generation

During the prospecting and exploration phase, domestic and general waste are produced on site. If the generated waste is not disposed of in a responsible way, land pollution may occur on the EPL or around the site. The EPL is in an area of moderate sensitivity to pollution. Improper handling, storage and disposal of hydrocarbon products and hazardous materials at the site may lead to soil and groundwater contamination, in the case of spills and leakages. Therefore, the exploration programme needs to have appropriate waste management for the site. To prevent these issues, biodegradable and non-biodegradable wastes must be stored in separate containers and collected regularly for disposal at a recognized landfill or dump site. Any hazardous waste that may have an impact on the animals, vegetation, water resources and the

general environment should be handled cautiously. 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 18**.

Table 18: Assessment of waste generation impact

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	L/M - 2	L/M - 2	M – 6	M - 3	M – 30
Post mitigation	L - 1	L - 1	L – 2	L/M - 2	L - 8

Mitigations and recommendations to waste management:

- Workers must be sensitized to dispose of waste in a responsible manner
- No littering permitted on site.
- After each daily works, the Proponent should ensure that there is no waste left on the sites.
- All domestic and general operational waste produced daily should be contained onsite until such that time it will be transported to designated waste sites.
- No waste may be buried or burned on site or anywhere else.
- The exploration site should be equipped with separate waste bins for hazardous and general/domestic waste.
- Sewage waste must be stored and disposed of as per the facilities' manufacturer's instructions.
- Oil spills must be taken care of by removing and treating soils affected by the spill.
- A penalty system for irresponsible disposal of waste on site and anywhere in the area should be implemented.
- Careful storage and handling of hydrocarbons on site is essential.
- Potential contaminants such as hydrocarbons and wastewater should be contained on site and disposed of in accordance with municipal wastewater discharge standards so that they do not contaminate surrounding soils and eventually groundwater.
- An emergency plan should be available for major/minor spills at the site during operation activities (with consideration of air, groundwater, soil, and surface water) and during the transportation of the product(s) to the sites.

7.3.7 Occupational Health and Safety Risks

Project personnel (workers) involved in the exploration activities may be exposed to health and safety risks. These are in terms of accidental injury, owing to either minor (i.e., superficial physical injury) or major (i.e., involving heavy machinery or vehicles) accidents. The site safety of all personnel will be 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). The heavy vehicle, equipment and fuel storage area should be properly secured to prevent any harm or injury to the Proponent's personnel or local domestic animals.

The use of heavy equipment, especially during drilling and the presence of hydrocarbons on sites may result in accidental fire outbreaks. This could pose a safety risk to the project personnel and equipment and vehicles too.

If machinery and equipment are not properly stored and packed, the safety risk may be a concern for project workers and local residents.

The impact is probable and has a medium significance rating. However, with adequate mitigation measures, the impact rating will be reduced to low. This impact is assessed in **Table 19** below and mitigation measures are provided.

Table 19: Assessment of the impacts of exploration on health and safety

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	M - 3	M - 3	M - 6	M/H - 4	M – 48
Post mitigation	L/M - 2	L/M - 2	L - 2	L/M - 2	L - 12

Mitigations and recommendations to minimize health and safety issues:

- The Labour Act's Health and Safety Regulations should be complied with.
- The Proponent must commit to and make provision for medical check-ups for all the workers onsite to monitor the impact of project related activities on the workers.
- As part of their induction, the project workers must be provided with awareness training on the risks of mishandling equipment and materials on site as well as the health and safety risks associated with their respective jobs.
- When working on site, employees must be properly equipped with adequate personal protective equipment (PPE) such as coveralls, gloves, safety boots, earplugs, dust masks, safety glasses, and hard hats.

- Heavy vehicle, equipment and fuel storage site should be properly secured, and appropriate warning signage should be placed where visible.
- Drilled boreholes that will no longer be in use or will be used later after being drilled must be properly marked for visibility and cappedor closed off.
- Ensure that after completion of exploration holes and trenches, drill cuttings are put back into the hole and the holes filled and levelled, and trenches backfilled respectively.
- An emergency preparedness plan must be compiled, and all personnel appropriately trained.
- Workers must not be allowed to consume any intoxicants prior to and during working hours, and must not be allowed on site when under the influence of any intoxicants as this may lead to mishandling of equipment which results into injuries and other health and safety risks.
- The site areas that are considered temporary risks should be equipped with cautionary signs.

7.3.8 Vehicular Traffic Use and Safety

The district road D2886 is the main transportation route for all vehicular movement in the area and provides access to the EPL which connects the project area to the B1 road. Traffic volume will, therefore, increase on these district roads during exploration as the project would need deliveries of supplies and services on site.

Depending on the project needs, trucks, medium and small vehicles will frequent the area to and from exploration sites on the EPL. This would potentially increase slow moving heavy vehicular traffic along these roads, and add additional pressure on the roads. However, transportation of materials and equipment is expected to occur on a limited schedule and only for the duration of the project. Therefore, the risk is anticipated to be short-term, not frequent, and therefore of medium significance. Pre-mitigation, the impact can be rated medium and with the implementation of mitigation measures, the significance will be low as assessed in **Table 20** below.

Table 20: Assessment of the impacts of exploration on road use (vehicular traffic)

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

Mitigations and recommendations to minimize impact on road safety and vehicular traffic issues:

- Transportation of exploration material, equipment and machinery must be limited, to reduce pressure on local roads.
- Heavy truck loads must comply with the maximum allowed speed limit for respective vehicles while transporting materials and equipment/machinery on the public and access road.
- The potential carting of water to the site must be done minimally, in containers that can supply and store water for relatively long periods, in order to reduce the number of water-carting trucks on the road.
- Drivers of all project vehicles must be in possession of valid and appropriate driving licenses and adhere to the road safety rules.
- Drivers must drive slowly (40 km/hr or less) and be on the lookout for livestock and wildlife as well as residents/travelers.
- The Proponent must ensure that the site access roads are well equipped with temporary road signs to cater for vehicles travelling to and from the site throughout the project cycle.
- Project vehicles must be in road worthy condition and serviced regularly to avoid accidents due to mechanical faults.
- Vehicle drivers must only make use of the designated site access roads provided, as agreed.
- Vehicle drivers are not allowed to operate vehicles while under the influence of alcohol.
- No heavy trucks or project related vehicles may be parked outside the project site boundary or demarcated areas for such purposes.
- To control traffic movement on site, deliveries from and to site must be carefully scheduled. This would ideally be during the weekdays and between the hours of 8am and 5pm.
- The site access road(s) must be upgraded to an acceptable standard to be able to accommodate project related vehicles as well as farm vehicles.

7.3.9 Noise and vibrations

Prospecting and exploration works (especially drilling) may be a nuisance to surrounding communities due to the noise produced by the activity. Excessive noise and vibrations can be a health risk to workers on site. The exploration equipment used for drilling on site is of medium size and the noise level is bound to be limited to the site only, therefore, the impact likelihood is

minimal. Without any mitigation, the impact is rated as of medium significance. Mitigation measures should be implemented to reduce the impact significance from the pre-mitigation significance to a low rating.This impact is assessed in **Table 21** below.

Table 21: Assessment of the impacts of noise and vibrations from exploration

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

Mitigations and recommendations to minimize noise:

- Noise levels from on-site operation vehicles and equipment should be kept to an acceptable level.
- Exploration operational times should be set so that no exploration activity occurs at night or very early in the morning.
- Exploration hours must be limited to between 8:00 and 17:00, or at the times agreed upon by the proponent and land owners, to avoid noise and vibrations generated by exploration equipment, as well as vehicle movement at inconvenient times.
- .
- When operating the drilling machinery onsite, workers should be equipped with personal protective equipment (PPE) such as earplugs to reduce exposure to excessive noise.

7.3.10 Disturbance to Archaeological and Heritage Resources

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

Therefore, this impact can be rated as medium significance if there are no mitigation measures in place.Upon implementation of the necessary measures, the significance of the impact will be reduced to a lower rating.. The impact is assessed in **Table 22**.

Table 22: Assessment of the impacts of exploration on archaeological & heritage resources

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	M - 3	M - 3	M - 6	M/H - 4	M – 48
Post mitigation	L/M - 2	L/M - 2	L - 2	L/M - 2	L - 12

Mitigations and recommendations to minimize impact on archaeological and heritage resources:

- On-site workers and contractor crews must be trained to recognise and exercise "chance finds heritage" while at work
- During the prospecting and exploration works, it is important to take note of and recognize any significant material being unearthed and make the correct judgement on which actions are to be taken.
- The footprint of the impact of the activities on site must be kept to a minimum, in order to limit the possibility of encountering chance finds within the EPL boundaries. A 500-meter buffer must be maintained on all archaeological and cultural sites observed within the project site and wider area during their stay (duration of their presence) in the area..
- A landscape approach to site management must consider culture and heritage features in the overall planning of exploration infrastructure within and beyond the licence boundaries.
- The Proponent and contractors must adhere to the provisions of Section 55 of the National Heritage Act in event significant heritage and culture features are discovered while conducting exploration works.
- Subject to the implementation of the mitigation measures and the adoption of the project Archaeological Management Plan (AMP) or Environmental Management Plan (EMP),
- An archaeologist or heritage specialist should be on call or on standby to monitor all significant earthmoving activities that may be implemented as part of the proposed project activities in any archaeologically sensitive areas.
- .
- The site should be monitored for subsurface archaeological materials by a qualified archaeologist, during excavation near archaeologically sensitive areas.
- Show overall commitment and compliance by adapting a “minimalistic or zero damage approach”.
- There must be controlled movement of the contractor, exploration crews, equipment, and all parties involved in the exploration activities, to limit the creation of informal pathways,

gully erosion and disturbance to surface and sub-surface artifacts such as stone tools and other buried materials etc.

7.3.11 Impact on Local Roads

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

Without any management or mitigation measures, the impact can be rated as medium and to reduce this rating to low, the measures will need to be effectively implemented. The assessment of this impact is presented in **Table 23**.

Table 23: Assessment of exploration on local services (roads and water)

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

Mitigations and recommendations to minimize the impact on local services:

- Heavy trucks transporting materials and services to the site must be kept on a limited schedule, to avoid daily travel to the site, except in cases of emergencies.
- The Proponent must consider frequent maintenance of local roads on the farms to ensure that the roads are in good condition for local road users.

7.3.12 Social Nuisance: Local Property Intrusion and Vandalism

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

The impact is rated with medium significance. However, upon mitigation (post-mitigation), the significance will change from medium to low rating. The impact is assessed below **(Table 24)**.

Table 24: Assessment of social impact of community property damage or disturbance

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 - 1	M/L - 4	M/L -2	L - 12

Mitigations and recommendations to minimize the issue intrusion or vandalism of private property:

- Intrusion and vandalism on private property are strictly prohibited.
- Any workers or site employees found guilty of intruding on private property should be dealt with as per their employer' (Proponent)'s code of employment conduct.
- The project workers should be advised to respect the community and local private property, values, and norms.
- No worker should be allowed to wander or loiter on private property without permission.
- Project workers are not allowed to kill or in any way disturb local livestock and wildlife on farms.
- The cutting down or damaging vegetation belonging to the affected farmers or neighbouring farms is strictly prohibited.

7.4 Cumulative Impacts Associated with Proposed Exploration

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

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

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

7.5 Mitigations and Recommendations for Rehabilitation

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

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

8 RECOMMENDATIONS AND CONCLUSION

8.1 Recommendations

The potential positive and negative impacts of the proposed exploration activities on EPL No. 8747 were identified, assessed and appropriate management and mitigation measures (to mitigate negative impacts) made for implementation by the Proponent, their contractors and project related employees.

Mitigation measures to identified issues have been provided, thereof, to avoid and/or minimize their significance of impacts on the environmental and social components. Most of the potential impacts were found to be of medium rating significance. With effective implementation of the recommended management and mitigation measures, a reduced rating in the significance of adverse impacts is expected from Medium to a Low. To maintain the desirable rating, the

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

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

It is, therefore, recommended that if an ECC is to be issued, it may be granted under the conditions below:

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

8.2 Conclusion

It is crucial for the Proponent and their contractors to effectively implement the recommended management and mitigation measures, 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 the legal requirements governing the mineral exploration and related activities.

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