



Environmental Scoping Assessment (ESA) Report for Exclusive Prospecting License (EPL) No. 7587 Located Southeast of Aus in the //Karas Region, Namibia

REPORT VERSION: FINAL

EDS Project Number: APP-003296

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EXECUTIVE SUMMARY

Africa Big Oryx Mining (Pty) Ltd (The Proponent) has been granted with Exclusive Prospecting Licenses (EPL) No. 7587 by the Ministry of Mines and Energy. The tenure of this license is from 02 June 2020 to 01 June 2023. The EPL cover an area prospecting for five commodity groups namely: Base and Rare Metals, Dimension Stones, Precious Metals, Semi-Precious Stones and, Industrial Minerals. The tenement is situated approximately 45.987 km southeast of Aus Settlement in the Karas Region, and cover a combined surface area of 18313.81ha.

Project Description

The objective of the planned prospecting and exploration is to identify geological features and lithostratigraphic entities within the area, and to delineate the mineral deposits, in order to determine whether the deposits are economically viable. The scoping process identifies sensitive environmental features that could be affected by the proposed prospecting and exploration activities. It is anticipated that both invasive and non-invasive exploration activities are expected to occur upon issuance of an ECC. The Proponent plans to conduct a staged exploration approach with three phases including the Pre-development Phase, Operation and Maintenance Phase, and the Decommissioning and Rehabilitation Phase.

The pre-development phase involves literature and map reviews, as well as fieldwork to determine targets for test drilling. The operational and maintenance phase is the phase during which the exploration program will be operational. The target areas within the EPL boundaries, identified during the pre-development phase will undergo exploration drilling. RC Drilling is the preferred technique for the planned exploration work. A pit may be dug for sampling and the size of the samples may be adjusted depending on the nature of mineralization observed from drilling. No explosives will be used during the exploration phase. The decommissioning and rehabilitation phase is primarily reinforced through a decommissioning and rehabilitation plan, which consists of safety, health, environmental and contingency aspects. Uncertain or unstable economic situations or unconvincing exploration results may force the Proponent to eventually cease with the exploration program. Therefore, it is of best practice for the Proponent to ensure that they have a rehabilitation plan for the site in anticipation of closure of operations.

Logistical aspects of the exploration operations include:

Accessibility: The EPL is located about 46 km southeast of the Aus Settlement, and can be accessed directly from the C13 road, which runs through the EPL.

Material and Equipment: Material and equipment requirements for the exploration program include; two 4X4 vehicles, drilling machines, truck, generators, water tanks and excavator. Equipment and vehicles will be stored at a designated area near accommodation site or a storage site within the EPL area.

Water & Power Supply: Water for the exploration operations will be obtained from the nearest existing boreholes and/or off-site municipal source or any other approved water sources, through water abstraction permits. Estimated monthly water consumptions are at 30 000 – 50 000 liters, which includes water for drinking, sanitation, cooking, dust control, as well as washing equipment. Power required during the operation phase will be provided from diesel generators.

Waste Management: General mineral and non-mineral Waste will be sorted and collected on a weekly or monthly basis, and taken to the nearest landfill site. Chemical toilets and/or sealed septic tanks will be used as ablution facilities and the sewerage waste taken to the nearest treatment facility. Wastewater disposal will be strictly controlled.

Security: Temporary storage areas for project material, machines and equipment will be necessary at the camp. Therefore, security will be supplied on a 24-hour basis at the storage and/or camp site and exploration camp. A temporary support fence surrounding the storage/camp site will be constructed to ensure that the exploration team and domestic animals are not put at risk.

Human Resources and Accommodation: The exploration project will employ about 10 skilled and semi-skilled workers. Exploration staff will be accommodated in Aus or at Rosh Pinah. If the accommodation camp is to be set up on a farm, necessary arrangements will be made with the farm owner/s. Exploration activity will only take place during the day and the exploration team will be commuting to the work site from their place of accommodation.

Timeframe: The planned ground geophysical surveys will be done in stages on different parts of the properties. A 9 to 12 months' exploration period is anticipated.

Impacts Assessment and Mitigations

The key potential impacts associated with prospecting, drilling and sampling and decommissioning phases of the project were identified and assessed. In order to avoid and minimize (where impacts cannot be avoided) the identified project impacts, mitigation measures were recommended. The significant identified impacts for the project phases are summarized below. These impacts can be reduced or minimized by implementing the mitigation measures provided in the impact assessment, and the management actions plan provided in the Draft EMP.

- **Loss of Biodiversity:** Exploration activity causes land degradation, which, depending on the severity, could have a catastrophic impact on the biodiversity of the area, and lead to habitat loss for a diversity of flora and fauna. It is, therefore, important to identify and understand existing species and minimize impact upon them with operational management guidelines. Under the current status quo, the impact can be considered to be of a medium significance rating. With the implementation of appropriate mitigation measures, the rating will significantly be reduced to low.
- **Generation of Dust:** Dust from transportation and exploration activity on site may compromise the air quality in the area. The hot and dry environment, loose and sandy nature of the substrate and medium to low vegetation cover, leads to moderate to high dust levels. The medium significance of this impact can be reduced by properly implementing mitigation measures. Therefore, the Proponent should adhere to the standard, where the particulate matter (PM2.5) should not exceed 65 µg/m³.
- **Waste Generation:** Generation of waste during the prospecting and exploration phase may cause land and water pollution on site if waste is not disposed in a responsible way. Precautions should be taken to prevent any spreading of refuse. Waste containers should be covered with mesh to prevent access by animals. With mitigation measures, the impact will be reduced from medium significance to low significance.
- **Visual Impact (Scars) on Landscape:** Exploration activities leave scars on the landscape, causing a visual impact. If the exploration sites are located near tourist routes, landscape scars may contrast surrounding landscapes and this can potentially cause visual nuisance to the tourism industry. Landscape protection measures will need to be considered in carrying out exploration activity. The visual impact on site is of medium significance, and may be reduced to low significance, upon effectively implementing the mitigation measures.

- **Potential Health and Safety Risks:** Inappropriate handling of material and equipment may cause health and safety risks such as injuries to workers. The impact is probable and has a medium significance rating. However, with adequate mitigation measures, the impact rating will be reduced to low.
- **Surrounding Soils:** The site has medium vegetation cover, therefore, planned exploration activity could potentially disturb the soil structure on site, leaving the already exposed site soils vulnerable to erosion resulting into creation of gullies. The impact can be rated as medium. However, with the implementation of mitigation measures, the impact will reduce to a low impact.
- **Archaeological Impact:** Historical resources may be impacted through unintentional destruction or damage during exploration activities. No information about known heritage sites of cultural monuments within the sites or in the vicinity was found during this assessment. Therefore, this impact can be rated as Medium to Low, and can be reduce to a lower impact upon implementation of the mitigation measures provided.
- **Noise and Vibrations:** Noise pollution created by drilling machines during exploration could be a nuisance to neighbours. Extreme noise pollution can cause health risks and hearing issues to workers on the site. This impact is rated as of medium significance, and can be reduced to low significance.

Conclusions

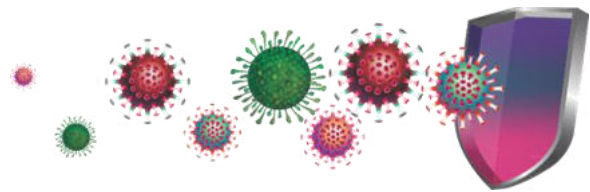
The potential positive and negative impacts of the proposed prospecting and exploration activities on EPL 7587 and associated activities were identified, assessed and mitigation measures made thereof. The mitigation measures and recommendations provided in this EA report and the management action plans provided in the draft EMP, can be deemed sufficient to avoid and/or reduce (where impact avoidance is impossible) the risks to acceptable levels. EDS is, therefore, confident that these measures are sufficient and issuance of an ECC to the Proponent to enable exploration works on EPL 7587 would be appropriate under the mitigation measures suggested herein. However, the ECC should be issued on a condition that the provided management measures and action plans are effectively implemented on site and monitored. Should the ECC be issued, the Proponent will be expected to be compliant with the ECC conditions as well as legal requirements governing the mineral exploration and related activities.

Limitations

EDS warrants that the findings and conclusions contained herein were accomplished in accordance with the methodologies set forth in the Scope of Work and EMA, 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. EDS believes that the information obtained from the record review and during the public consultation process concerning the subject property is reliable. However, EDS cannot and does not warrant or guarantee that the information provided by these 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, community meetings 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.

COVID-19 Influences



Covid -19 has changed the way the world thinks, acts and does business. The pandemic has forced a comprehensive review of business practices, a higher level of engagement with technology to offset the constraints due to social distancing, restrictive travel, and a focus on social responsibility. The constraints had to change very little in the way we operate and provide public consultation services.

Although the Consultant operated with limited travel during the environmental assessment to comply with the measures and regulations put in place to curb the spread of Covid-19, various other platforms were used to communicate the project information. These platforms included emails, registered mails, notices, newspaper adverts, and telephonic communication.

The Consultant practices included but are not limited to:

- Social distancing was strictly enforced when on project site
- Face masks worn by members during site assessment visits

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

Appendix D: Background Information Document (BID)

Appendix E: List of Interested and Affected Parties (I&APs)

Appendix F: EIA Notification in the newspapers (*New Era* and *Namibian*)

Appendix G: Public Meeting Minutes (23 January 2021)

Appendix H: Public Meeting Attendance Register

Appendix I: Registered mail sent to farmers

Appendix J: Copy of Mineral Licenses Certificates from MME

LIST OF ABBREVIATIONS

Abbreviation	Meaning
AMSL	Above Mean Sea Level
BID	Background Information Document
CV	Curriculum Vitae
DEA	Department of Environmental Affairs
EA	Environmental Assessment
EAP	Environmental Assessment Practitioner
ECC	Environmental Clearance Certificate
EDS	Excel Dynamic Solutions
EIA	Environmental Impact Assessment
EMA	Environmental Management Act
EMP	Environmental Management Plan
EPL	Exclusive Prospecting License
KRC	Khomas Regional Council
KRDP	Khomas Regional Development Profile
GG	Government Gazette
GN	Government Notice
I&APs	Interested and Affected Parties
MEFT	Ministry of Environment, Forestry and Tourism
Reg	Regulation
S	Section
TOR	Terms of Reference

Key Terms

Alternative	A possible course of action, in place of another that would meet the same purpose and need of the proposal.
Baseline	Work done to collect and interpret information on the condition/trends of the existing environment.
Biophysical	That part of the environment that does not originate with human activities (e.g. biological, physical and chemical processes).
Cumulative Impacts/Effects Assessment	In relation to an activity, means the impact of an activity that in it may not be significant but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area.
Decision-maker	The person(s) entrusted with the responsibility for allocating resources or granting approval to a proposal.
Ecological Processes	Processes which play an essential part in maintaining ecosystem integrity. Four fundamental ecological processes are the cycling of water, the cycling of nutrients, the flow of energy and biological diversity (as an expression of evolution).
Environment	As defined in Environmental Management Act - the complex of natural and anthropogenic factors and elements that are mutually interrelated and affect the ecological equilibrium and the quality of life, including – (a) the natural environment that is land, water and air; all organic and inorganic matter and living organisms and (b) the human environment that is the landscape and natural, cultural, historical, aesthetic, economic and social heritage and values.
Environmental Management Plan	As defined in the EIA Regulations (Section 8(j)), a plan that describes how activities that may have significant environments effects are to be mitigated, controlled and monitored.

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	All of the animals found in a given area/region, habitat or geological period.
Flora	All of the plants found in a given area/region, habitat or geological period.
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.
Scoping	An early and open activity to identify the impacts that are most likely to be significant and require specialized investigation during the EIA work. Can, also be used to identify alternative project designs/sites to be assessed, obtain local knowledge of site and surroundings and prepare a plan for public involvement. The results of scoping are frequently used to prepare a Terms of Reference for the specialized input into full EIA.

Terms of Reference (ToR)	Written requirements governing full EIA input and implementation, consultations to be held, data to be produced and form/contents of the EIA report. Often produced as an output from scoping.
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1 INTRODUCTION

1.1 Project Background

Africa Big Oryx Mining (Pty) Ltd (hereinafter referred to as The Proponent), a holder of the Exclusive Prospecting License (EPL) No. 7587, granted by the Ministry of Mines and Energy (MME), intends to conduct prospecting and exploration activities on EPL 7587. The Proponent focuses on acquisition, exploration and development of Dimension Stone on the EPL. The EPL is located about 45 km southeast of the Aus Settlement in the //Karas Region, and it covers an area of 18313.81 ha (**Figure 1**).

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) obtained (*refer to Section 4.1 of this report*). Exploration activities are listed among activities that may not occur without an ECC. Therefore, individuals or organizations may not carry out exploration activities without an EIA undertaken and an ECC awarded.

1.2 Appointed Environmental Assessment Practitioner

In order to satisfy the requirements of the EMA and its 2012 EIA Regulations, the Proponent has appointed Excel Dynamic Solutions (Pty) Ltd (EDS, Consultant or Environmental Assessment Practitioner (EAP)), to conduct the required Environmental Assessment (EA) process on their (Proponent's) behalf. The findings of the EIA process are incorporated into this report and a draft EMP - (**Appendix B**). These documents will be submitted as part of an application for an ECC to the Environmental Commissioner at the Department of Environmental Affairs and Forestry (DEAF), MEFT. The ESA project is headed by Mr. Nerson Tjelos, a qualified and experienced Geoscientist and experienced EAP. The CV for Mr. Tjelos is presented in **Appendix C**.

1.3 Terms of Reference and Scope of Works

Excel Dynamic Solutions (Pty) Ltd (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.

It should be noted that this document has been solely prepared for the environmental assessment (EA) of **prospecting and exploration** phase activities on EPLs 7989 - 7995 as described under Chapter 2. This EA is not for **subsequent potential** phases **such as** mine development and **mining (if exploration yields favourable results for the Proponent, i.e., a verified economic feasibility on certain site areas of the EPL)**. Should selected site areas of the EPLs provide results of economic value and the EPL converted into a mining license by MME, a separate and detailed environmental assessment (full EIA) will need to be undertaken for this phase and a separate ECC applied for and obtained from the DEAF.

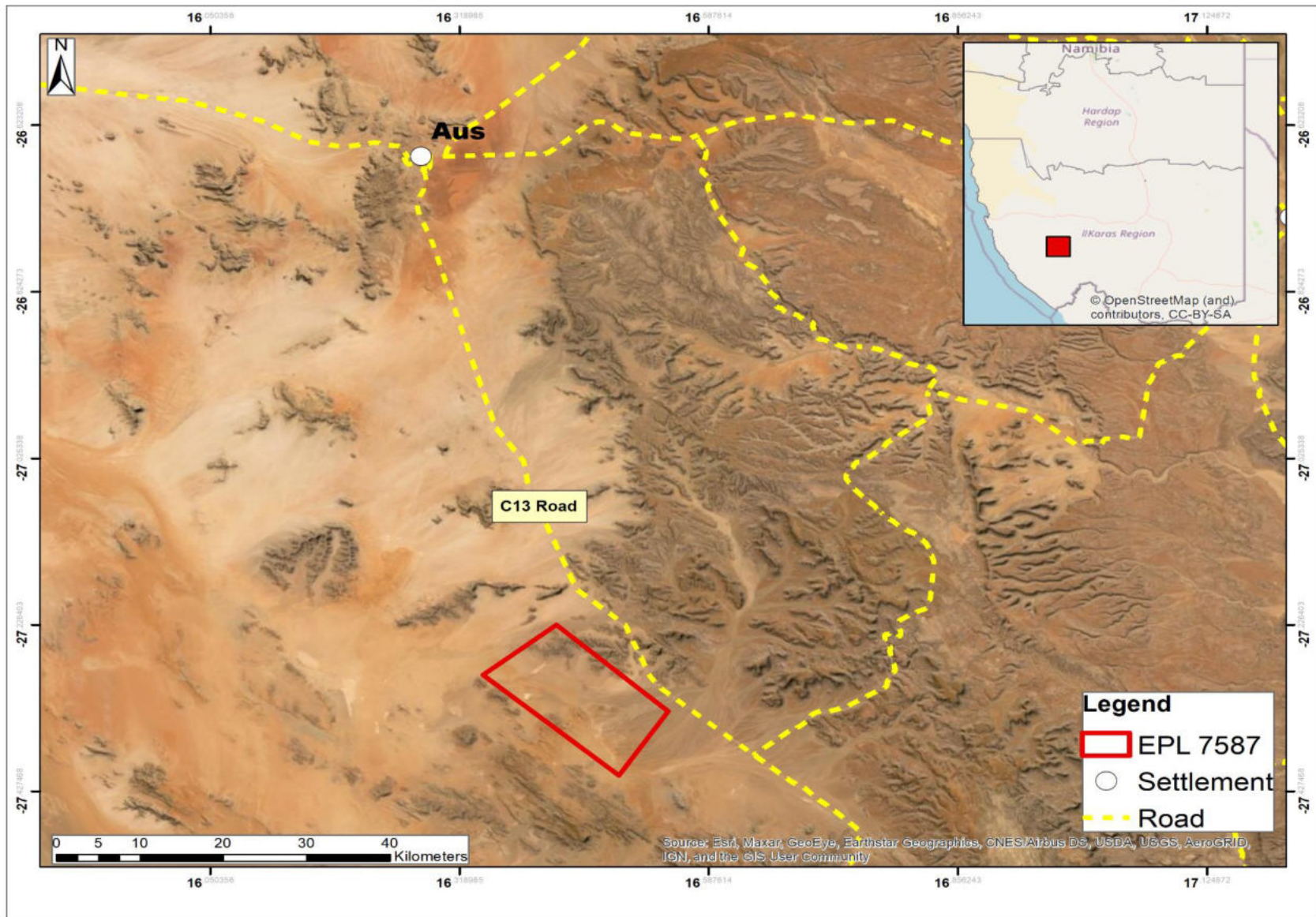


Figure 1: Location of the EPL No. 7587 near Aus, in the //Karas Region

1.4 The Need for the Proposed Project

Mining is a source of mineral commodities that many countries find essential for maintaining and improving their standards of living. Mining is the largest contributor to the Namibian economy. It contributes 25% to the country's income. The Proponent's exploration programme represents a valuable opportunity to contribute to infrastructure minerals development, which is a key component in the development of Namibia and the nation's economy. Exploration activities provide employment, dividends, and taxes that fund social infrastructure. The minerals sector yields foreign exchange and accounts for a significant portion of gross domestic product. In addition, the industry produces a trained workforce and small businesses that can service communities and may initiate related businesses.

A number of associated activities such as manufacturing of exploration and mining equipment, and provision of engineering and environment services, occur and expand because of exploration activity. Successful exploration work can lead to mining activities on the EPL, which would feed into the national development plans such as NDP5 and Vision 2030. The project is expected to generate full time medium to long term direct employment for at least 8-10 workers. The majority of workers to be employed on the proposed exploration project are expected to be skilled and/or semi-skilled (general labourers and operators). A geologist (s) and site manager will also be employed during the exploration programme. This project would contribute towards the socio-economic development of the //Karas region. The potential creation of employment to the local community and contribution to the country's GDP necessitates the proposed exploration works on the EPL, to enable future mining works.

2 PROJECT DESCRIPTION: PROPOSED EXPLORATION ACTIVITY

Prospecting and exploration of minerals is the first component of any potential mining project (development and eventual mining). The planned exploration activities are aimed at delineating the mineral deposits and determine whether the deposits are economically feasible mining resources. Successful exploration results could lead to development of a mine for extraction of the target mineral in market rate quantities, and to the eventual closure of mining. The exploration project activities only commence after issuance of the ECC. The proposed prospecting and exploration phase on EPL 7587 is expected to last for about three years. The primary target commodity for this exploration is Dimension Stone.

Due to the iterative, results-driven, and phased nature of mineral exploration programmes, it is not possible at an early stage of exploration to earmark the exact areas for future drilling or an exact duration of the exploration activities. According to Resilient Environmental Solutions (2019), soil sampling programmes may last from between one week to one month at a time over specific areas until an area has been fully explored. Drilling programmes may initially range from two weeks to a month at a time, depending on the planned programme or based on the results of the programme. In general terms, mineral exploration activities can take up to a maximum of seven years, with different projects at various stages of the exploration phase.

The Proponent will commit to work with all relevant stakeholders to keep them informed of exploration progress to facilitate site visits and access to ongoing field exploration programmes.

The project is developed in stages (**Figure 2**), which can be summarized as three main phases: the Pre-Development Phase, the Exploration Phase, and the Decommissioning and Rehabilitation Phase



Figure 2: The Mineral Exploration Cycle (Source: Dept. Energy & Mining – Government of South Australia, 2021)

2.1 Pre-Development (Prospecting) Phase

Before carrying out activities that require the Proponent or their employees and or contractors to be onsite, the following need to be undertaken: *Consultation, Land access permission, and a Health and Safety Induction for workers.*

2.1.1 Consultation (Liaison) with Landowners and/or Authority for Permitting

Consultations with all the landowners, users and community and government stakeholders will commence to introduce the Proponent, to explain the purpose and stage of the proposed exploration, determine any current operating procedures and nature conservation regulations of the area, and to develop land access and operational agreements with the governing authorities and land users.

2.1.2 The Minerals Act: Land Use and Permitting

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

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

2.1.3 Induction on Health and Safety

Before any work is carried out all workers (including fully employed, contracted, and casual) will be inducted on the Proponent's Environmental, Health and Safety policy and procedures and processes to follow while conducting the work.

2.1.4 Prospecting Works

The project will include a variety of prospecting and exploration techniques. The early phase, regional exploration, normally comprises a mixture of non-invasive techniques such as soil sampling and ground geophysics and invasive drilling techniques. From the early stage of the exploration phase, all the Proponent's employees and contractors will employ industry standard best practice techniques and will incorporate photographic evidence of progress. This photographic record will be included in annual environmental monitoring reports to show the impact and environmental best practice that is adopted by the Proponent and all sub-contractors, as well as provide a record for the Department of Environmental Affairs and Forestry (DEAF).

The systematic prospecting approaches to be adopted by the Proponent are, exploration using:

- **Non-invasive techniques:** Geological mapping, remote sensing (satellite imagery), reviewing of existing geological maps and historical drilling data, Field evaluation and sampling; and
- **Invasive techniques:** Soil and rock sampling, pitting and detailed exploration by Reverse Circulation (RC) and infill drilling

2.1.4.1 Prospecting Work: Non-Invasive

During the prospecting and exploration phase, reviewing of existing reports and composite stratigraphic, lithological-geochemical maps of the targeted areas to identify prospective lithostratigraphic packages will be vital. In addition to 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 license area through detailed geological mapping, geophysical and geochemical surveys, supported where necessary by geophysical surveys, with a view to define targets for test drilling. Upon issuing of the ECC, the exploration program will commence with ground geophysical surveys

2.2 Exploration (Invasive): Drilling, Sampling and Analysis Phase

This is the operational phase of the exploration program. The Proponent has highlighted that both invasive and non-invasive exploration activities are expected to take place upon issuance of an ECC. The preferred drilling technique for this exploration programme is Diamond (Core) drilling, and less likely Pitting, Reverse Circulation (RC) drilling or In-fill drilling, as the primary commodity of interest is Dimension Stone.

Diamond (Core Drilling): There are two main types of core drilling: soft and hard coring. This refers to the type of lithology each method is suited for. Soft coring is used when taking a core sample of unconsolidated material and can reach depths of 152.5 m (or more—but this is what is typical for environmental industry projects). Soft coring uses a punch core system. This involves using two containers, one nested inside the other. The inner container is pushed out in front to capture the core sample, then the outer container is extended to provide casing, so the hole does not collapse (Cascade, 2021). This method protects the integrity of the sample from the air or fluid used when progressing the outer container. Hard coring is used when the subsurface consists of materials as hard as or harder than sandstone. Much greater depths can be reached with this type of coring; depths up to 1524 m reached. Hard coring also uses two nested containers, but the outer container is extended before the inner container. This means the sample is washed with the drilling fluid or air, but because the core sample is of competent rock, there is no danger in it being disturbed or contaminated. Hard coring is sometimes referred to as diamond coring, as drill bits with small diamonds embedded are used in difficult lithology to cut through rock (Cascade, 2021).

Pitting: Pitting is usually employed to test shallow, extensive, flat-lying bodies of mineralization such as a buried heavy mineral placer. The main advantage of pitting over a pattern-drill programme on the same deposit is that pits can provide a very large volume sample. Large sample sizes are necessary to overcome problems of variable grade distribution, which are a characteristic feature of such deposits (Marjoribanks, 1997). In areas where the ground is wet, or labour is expensive, pits are best dug with a mechanical excavator. Pits dug to depths of 3–4 m are common and with large equipment excavation to 6 m can be achieved. In wet, soft ground any pit deeper than 1 m is dangerous. Diggers excavate rapidly and pits 3–4 m deep can be dug, logged, sampled, and re-filled within an hour. In cooler and moister weather conditions, thick lateritic soil forms ideal conditions for pitting (Geology Hub, 2021).

Reverse circulation (RC) drilling is achieved by blowing compressed air down the annulus of a drill rod; the differential pressure creates air lift pushing water and cuttings up the inner tube that is inside each rod. The drill cuttings travel up the inside of the drill rod and are collected in a sample bag on the surface. Samples are collected every metre and the number of samples is therefore dictated by the depth of the hole. Generally, a RC drilling program will see multiple holes drilled at 60-90° inclination and can range from 60 to 500m in depth. RC drilling does not require a significant amount of water, as compared to diamond core drilling. For RC drilling, water is often required and used down the hole to cool the drill bit and reduce dust, and assist with the transportation of sample bits to the surface.

In-fill drilling: The results of in-fill drilling are intended to support an update to a higher classification of the Mineral Resource estimate. The metallurgical test-work results will improve understanding of blending designs in the exploration schedules for the product offtake specifications (Canyon Resources, 2021).

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

Other aspects and resource requirements of the exploration operations include:

2.2.1 Accessibility of Site

The EPL is located about 45 km southeast of Aus Settlement. It can be accessed from Aus via the C13 road. Access to the exploration site will be organised along the existing roads as far as possible. Any tracks for new access routes that may be required during the exploration stage are to be assessed for any environmental sensitivity.

2.2.2 Material and Equipment

The input required for the exploration program in terms of vehicles and equipment include; two (4X4) vehicles, drilling machines, truck, generators, water tanks and excavator. The exploration will require about 8-10 people to be on site, which includes a site manager, a driver, drilling personnel, and sampling workers. Equipment and vehicles will be stored at a designated area near accommodation site or a storage site established within the EPL.

2.2.3 Human Resources

The Project will employ about 10 (semi-skilled and skilled) workers, including a site manager, geologist(s), driver, drilling personnel, and sampling workers.

2.2.4 Accommodation

Exploration staff will be accommodated in or within the vicinity of Aus. A temporary campsite may be set up for the exploration crew. If the accommodation camp is to be set up on a farm, necessary arrangements will be made with the farm/land owner/s. The temporary site camps will only be set up upon reaching signed agreement with and signed by the landowners/local authority and or occupiers of land. Therefore, agreements will need to be reached between the two parties (Proponent and affected landowners/occupiers of land or authorities) prior to the setting up of accommodation structures. Exploration activity will take place during daytime only and the exploration team will be commuting to the work site from their place of accommodation.

2.2.5 Services and Infrastructure

Water: No water will be abstracted from site water resources. The required water will be bought from the nearest source such as the Aus Village Council source, or from any other approved water sources (upon reaching a supply agreement with the Proponent). Water supply for exploration works such as drilling and associated activities are best augmented with carted water from elsewhere outside the project area to ensure that less pressure is put on local supplies. The required water from the suppliers will be stored on site in trailer-mounted industry standard water reservoirs. The estimated monthly water consumption amounts for exploration and associated activities are at ±13, 000 litres.

Electricity: Power required during the operation phase will be provided from diesel generators.

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

2.2.6 Waste Management

The site will be equipped with secured waste bins for each waste type (i.e. domestic, hazardous and recyclable). Depending on the amount generated, waste will be sorted and collected as necessary for disposal at the nearest waste disposal/landfill site. In the case of production of any hazardous waste, an agreement would need to be reached for authorization to dispose of such waste at the designated waste management facility.

Sanitation and human waste: The working site will be equipped with ablution facilities that will include portable/mobile chemical toilets fitted with sealed septic tanks. The sewage will be handled on site and periodically be taken to the nearest treatment facility either by the Proponent themselves or an independent appointed wastewater removal service provider.

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. Any hazardous waste handled and produced on site will be transported for disposal to the nearest appropriate and authorized hazardous waste management facilities.

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

Mineral Waste: Consists of solid products of exploration and mineral concentration to acquire the targeted minerals. Mineral waste will potentially be produced throughout the project exploration phase. This waste will be stripped and dumped in allocated areas as stipulated in the EMP.

Non-mineral Waste: Consists primarily of auxiliary materials that will support the exploration phase. This includes but is not limited to items such as empty containers, plastic and other domestic waste. This waste will be collected, sorted and taken to the dumpsite regularly, depending on the amount of waste generated.

2.2.7 Safety and Security

Storage Site: Temporary storage areas for exploration material, equipment and machinery will be set up at working/exploration sites on the EPLs. Security will be supplied on a 24-hour basis at the delegated sites for storage if there is a need for certain equipment to be left at site overnight on some days.

Accidental 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.

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

2.2.8 Timeframe

The planned ground geophysical surveys may last several weeks and will be done in stages on different parts of the EPL. The planned exploration works are estimated to last for a total of about three (3) years.

2.3 Decommissioning and Rehabilitation Phase

Once the exploration activities on EPL 7587 come to an end, the Proponent will need to put site rehabilitation measures in place. Concluding of exploration activity on the EPLs occurs once the planned exploration activities are completed, or may be discontinued before planned closure due to unfavourable economic situations or unconvincing exploration results. Decommissioning and rehabilitation are primarily reinforced through a decommissioning and rehabilitation plan, consisting of safety, health, environmental and contingency aspects. It is, therefore, of best practice for the Proponent to ensure that the project is finalized in an environmentally friendly manner, and the sites are rehabilitated

3 PROJECT ALTERNATIVES

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

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

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

3.1 Types of Alternatives Considered

3.1.1 The "No-go" Alternative

The “No-Go” alternative is the option of not proceeding with the activity, on the entirety of the project area, which typically implies a continuation of the status quo. The No-Go alternative may also be considered as the option of not proceeding with the activity or on selected parts of the project area, which may be deemed environmentally unsuitable for the proposed activity. Should the proposed works of the prospecting and exploration plan not be implemented, none of the potential impacts (positive and negative) identified would occur, and the current land use for the proposed site remain unchanged. In overall consideration, the proposed project area has been identified by the Directorate of Mines for mineral exploration because of the potential it carries to contribute to the economic development of the area and its vicinity, and the region at large.

3.1.2 Exploration Location

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

Given the fact that the EPL or its future exploration targets cannot be relocated, it will be of utmost importance to reduce the project footprints within the actual active sites of the EPL by ensuring that exploration works and related activities on the EPL are limited to specific sites only.

3.1.3 Exploration Methods

Both invasive and non-invasive exploration activities are expected to take place. The combination of prospecting methods (non-invasive techniques) has no alternatives therefore, these will be implemented as presented. This section rather focuses on the invasive technique (drilling). Drilling provides most of the information for the final evaluation of a prospect and will ultimately determine if the prospect is mineable.

Commonly in mineral exploration drilling, two methods are utilized. These are reverse circulation (RC) drilling and Diamond (Core) drilling, depending on the type of mineral sought after.

Table 1 below presents the differences between the two commonly used drilling methods in mineral exploration.

Table 1: Commonly used Drilling Methods

Invasive exploration Method (Alternatives Considered)	Short Description	Justification for selected option
Reverse Circulation (RC)	<p>-Crushed rock is collected in the form of cuttings samples called back within stems contrast to conventional drilling that puts the air inside the stems and cuttings outside. Here the air passes downwards through the annular space between the inner shaft and the outer tube.</p> <p>-Water is often used down the hole to cool the drill bit and reduce dust as well as assisting with the transportation of sample bits to the surface.</p> <p>-RC drilling is designed for drilling through and crushing hard rock.</p> <p>-RC is fundamentally different from diamond core drilling, both in terms of equipment and sampling. One major difference is that RVC drilling creates small rock chips instead of solid core.</p> <p>Furthermore, according to Technidril (2020), the RC method:</p> <ul style="list-style-type: none"> -Allows full recovery of samples continuously -Quick installation -There is no contact between the walls and cuttings taken at the bottom. -The penetration rate is fast (Technidril, 2020) 	<p>- Diamond (Core) drilling methods provide more reliable data collection and analysis. Core Drilling can penetrate deeper than RC Drilling, and is required in dimension stone drilling, in order to give a full picture of colour variation and textural variations as well as micro-discontinuities and weathering.</p>
Diamond (Core) drilling	<p>-Diamond core drilling uses a diamond bit, which rotates at the end of drill rod (or pipe). The opening at the end of the diamond bit allows a solid column of rock to move up into the drill pipe and be recovered at the surface.</p> <p>-The diamond bit is rotated slowly with gentle pressure while being lubricated with water to prevent overheating. As a result, this drilling method is known to use a huge amount of water compared to RC, thus may put pressure on water supply sources.</p> <p>-While the drill cuttings obtained with RC drilling can be analysed to provide a limited amount of information, the scope of these tests is limited, and their locations are less precise. Core samples, on the other hand, will identify actual veins of materials and give</p>	

Invasive exploration Method (Alternatives Considered)	Short Description	Justification for selected option
	<p>you their precise location (BG Drilling, 2016). Therefore, for accuracy's sake, diamond drilling would provide better result. In other words, RC results are reliable but may not be accurate.</p> <ul style="list-style-type: none"> - As diamond is one of the hardest/strongest materials in the world, it has no trouble drilling through most surfaces. Therefore, it works well across a wider range of ground types and conditions. -Time-consuming and more effort is required to obtain the drill core. -Low initial investment, but generally more expensive to meters drilled because of the limitation of the speed. 	

The drilling technique would be determined by the mineralization type. However, based on the information presented in the Table above regarding the detailed exploration methods (drilling), it was pre-determined that Diamond (Core) drilling would be preferable given that it is the most appropriate drilling method for exploration of Dimension Stone as the primary target commodity.

Although RC drilling is known to have its shortcomings, particularly lack of solid drill recovery and inaccuracy, it is usually combined with Diamond drilling for the exploration of some minerals, if the borehole(s) needs to be deeper than what RC Drilling can reach

3.1.4 Accommodation

Alternatives for accommodation include tented campsite, and accommodation on the already existing established facilities (lodges). Both alternatives are viable depending on season and/or duration of exploration, considering the health and safety of the exploration crew. Therefore, if possible, the workers could alternate between tented campsite and existing accommodation facilities.

4 LEGAL FRAMEWORK: LEGISLATION, POLICIES AND GUIDELINES

The exploration activities have legal implications associated to certain applicable legal standards. A summary of applicable and relevant International policies and Namibian legislation, policies and guidelines to the proposed development are given in this section. This summary serves to inform the project Proponent, Interested and Affected Parties and the decision makers at the DEAF, of the requirements and expectations, as laid out in terms of these instruments, to be fulfilled to establish the proposed prospecting and exploration activities.

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

This ESA is carried out according to the Environmental Management Act (EMA) and its Environmental Impact Assessment (EIA) Regulations (GG No. 4878 GN No. 30). The EMA has stipulated requirements to complete the required documentation in order to obtain an ECC for permission to undertake certain listed activities. These activities are listed under the following Regulations:

3.1 The construction of facilities for any process or activities which requires a license, right of other forms of authorization, and the renewal of a license, right or other form of authorization, in terms of the Minerals (Prospecting and Mining Act, 1992).

3.2 other forms of mining or extraction of any natural resources whether regulated by law or not.

3.3 Resource extraction, manipulation, conservation and related activities.

- 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).
- Part 2 of the Act sets out 12 principles of environmental management, summarized as follows
 - *Community involvement in natural resources management, must be promoted and facilitated.*

- *The participation of all I&APs must be promoted and decisions must consider the interest, needs and values of I&APs.*
- *Equitable access to environmental resources must be promoted and the functional integrity of ecological systems must be considered to ensure sustainable systems.*
- *Assessments must be undertaken for activities which may have significant effects on the environment or the use of natural resources.*
- *Sustainable development must be promoted in all aspects relating to the environment.*
- *Namibia's cultural and natural heritage including, its biological diversity, must be protected and respected.*
- *The option that provides the most benefit or causes the least damage to the environment, at a cost acceptable to society must be adopted to reduce the generation of waste and polluting substances at source.*
- *The reduction, re-use and recycling of waste must be promoted.*
- *A person who causes damage to the environment must pay the costs associated with rehabilitation of damage to the environment and to human health caused by the pollution.*
- *Damage to the environment must be prevented and activities which cause such damage must be reduced, limited, or controlled.*

Other legal obligations that are relevant to the proposed activities of EPL 7587 is presented in **Table 2.**

Table 2: Applicable local, regional and national legislation, policies and guidelines governing the proposed exploration works and related activities

Legislation/Policy/ Guideline	Relevant Provisions	Implications for this project
<p>The Constitution of the Republic of Namibia, 1990 as amended</p> <p>- addresses matters relating to environmental protection and sustainable development.</p>	<p>Article 91(c) defines the functions of the Ombudsman to include:</p> <p><i>“...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...”</i></p> <p>Article 95(l) commits the state to actively promoting and maintaining the welfare of the people by adopting policies aimed at the:</p> <p><i>“...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.”</i></p>	<p>By implementing the environmental management plan, the establishment will be in conformant to the constitution in terms of environmental management and sustainability.</p> <p>Ecological sustainability will be the main priority for the proposed development.</p>
<p>Minerals (Prospecting and Mining Act) No. 33 of 1992</p>	<p><i>Section 52(1)</i> A mineral license holder may not exercise his/her rights in any town or village, on or in a proclaimed road, land utilised for cultivation, within 100m of any water resource (dam, spring, drinking trough etc.) and boreholes, or no operations in municipal areas, etc.), which should individually be checked to ensure compliance.</p> <p><i>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 –</i></p>	<p>The Proponent should enter into a written agreement with landowners/affected parties before carrying out exploration as per the Section 52 of the Minerals (Prospecting and Mining) Act No. 33 of 1992 and Section 2.2.3 of the Draft Minerals Policy of Namibia:</p>

Legislation/Policy/ Guideline	Relevant Provisions	Implications for this project
	<p><i>(b) 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.</i></p> <p><i>Section 2.2.3 of the Draft Minerals Policy of Namibia states that the Licence Holder and/or mineral explorers currently have to negotiate a contract with landowners to gain access for exploration or mining purposes.</i></p> <p><i>Section 68 stipulates that an application for an exclusive prospecting license (EPL) shall contain the particulars of the condition of, and any existing damage to, the environment in the area to which the application relates and an estimate of the effect which the proposed prospecting operations may have on the environment and the proposed steps to be taken to prevent or minimize any such effect</i></p> <p><i>Section 91 requires that rehabilitation measures should be included in an application for a mineral license</i></p>	
Nature Conservation Amendment Act, No. 3 of 2017	provides for a proper administrative, legal and procedural framework for tourism concessions in protected areas and other State land; to control the import and export of live game or animal, and to increase the penalties; and to provide for incidental matters.	Though the Act does not specifically refer to exploration/mining activity within a protected area (PA) or recreational area (RA), it does restrict access to PAs and prohibits certain acts therein as well as the purposes for which permission to enter game parks and nature reserves may be granted.

Legislation/Policy/ Guideline	Relevant Provisions	Implications for this project
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 in order to contribute to national development.	The Proponent is required to sustain the conservation of biodiversity and the maintenance of ecological integrity of Protected Areas and other State land, and ensure rehabilitation of species and ecosystems affected or threatened by exploration works.
The Regional Councils Act (No. 22 of 1992)	The main objective of this Act is to initiate, supervise, manage and evaluate regional development. This Act sets out the conditions under which Regional Councils must be elected and administer each delineated region. Their duties include, as described in section 28 “to undertake the planning of the development of the region for which it has been established with a view to physical, social and economic characteristics, urbanisation patterns, natural resources, economic development potential, infrastructure, land utilisation pattern and sensitivity of the natural environment.”	The relevant Regional Councils are considered to be I&APs and must be consulted during the Environmental Assessment (EA) process. The project site falls under the Karas Regional Council, therefore they should be consulted.
Local Authorities Act No. 23 of 1992	To provide for the determination, for purposes of local government, of local authority councils; the establishment of such local authority councils; and to define the powers, duties and functions of local authority councils; and to provide for incidental matters.	The Aus Settlement Council and Constituency is the responsible Local Authority of the area therefore they should be consulted in local public consultation matters regarding this project.
Water Act 54 of 1956	<p>The Water Resources Management Act 11 of 2013 is presently without regulations; therefore, the Water Act No. 54 of 1956 is still in force:</p> <ul style="list-style-type: none"> • Prohibits the pollution of water and implements the principle that a person disposing of effluent or waste has a duty of care to prevent pollution (S3 (k)). • Provides for control and protection of groundwater (S66 (1), (d (ii))). 	The protection (both quality and quantity/abstraction) of water resources should be a priority.

Legislation/Policy/ Guideline	Relevant Provisions	Implications for this project
	Liability of clean-up costs after closure/abandonment of an activity (S3 (l)).	
Water Resources Management Act (No 11 of 2013)	<p>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:</p> <p>Ensure that the water resources of Namibia are managed, developed, used, conserved and protected in a manner consistent with, or conducive to, the fundamental principles set out in Section 66 - protection of aquifers, Subsection 1 (d) (iii) provide for preventing the contamination of the aquifer and water pollution control (Section 68).</p>	
Petroleum Products and Energy Act (No. 13 of 1990) Regulations (2001)	Regulation 3(2)(b) states that “No person shall possess [sic] or store any fuel except under authority of a 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.
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 this Acts' requirement. The necessary management measures and related permitting requirements must be taken. This 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.	
Soil Conservation Act (Act 76 of 1969)	The Act makes provision for the prevention and control of soil erosion and the protection, improvement and conservation of soil, vegetation and water supply sources and resources, through directives declared by the Minister.	Duty of care must be applied to soil conservation and management measures must be included in the EMP.

Legislation/Policy/ Guideline	Relevant Provisions	Implications for this project
Forest Act (Act 12 of 2001)	<p>The Act provides for the management and use of forests and forest products.</p> <p>Section 22. (1) provides: "Unless otherwise authorised by this Act, or by a licence issued under subsection (3), no person shall on any land which is not part of a surveyed erven of a local authority area as defined in section 1 of the Local Authorities Act, 1992 (Act No. 23 of 1992) cut, destroy or remove -</p> <p>(a) vegetation which is on a sand dune or drifting sand or on a gully unless the cutting, destruction or removal is done for the purpose of stabilising the sand or gully; or (b) any living tree, bush or shrub growing within 100 m of a river, stream or watercourse."</p>	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.	
Mine Health & Safety Regulations, 10th Draft	Makes provision for the health and safety of persons employed or otherwise present in mineral licenses area. These deal with among other matters; clothing and devices; design, use, operation, supervision and control of machinery; fencing and guards; and safety measures during repairs and maintenance	The Proponent should comply with all these regulations with respect to their employees.
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.

Legislation/Policy/ Guideline	Relevant Provisions	Implications for this project
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; for the control of traffic on public roads, the licensing of drivers, the registration and licensing of vehicles, the control and regulation of road transport across Namibia's borders; and for matters incidental thereto. Should the Proponent wish to undertake activities involving road transportation or access onto existing roads, the relevant permits will be required.	Mitigation measures should be provided for, if the roads and traffic impact cannot be avoided. The relevant permits must therefore be applied for.
Labour Act (No. 6 of 1992)	Ministry of Labour (MOL) 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 relevant/applicable to the project are as summarized in Table 3 below.

Table 3: International Policies, Principles, Standards, Treaties and Conventions

STATUTE	PROVISIONS	PROJECT IMPLICATIONS
Equator Principles	A financial industry benchmark for determining, assessing, and managing environmental and social risk in projects	These principles are an attempt to: '...encourage the development of socially

STATUTE	PROVISIONS	PROJECT IMPLICATIONS
	<p>(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 by Equator Principles Financial Institutions (EPFIs). The principles apply to all new project financings globally across all sectors.</p> <p>Principle 1: Review and Categorization</p> <p>Principle 2: Environmental and Social Assessment</p> <p>Principle 3: Applicable Environmental and Social Standards</p> <p>Principle 4: Environmental and Social Management System and Equator Principles Action Plan</p> <p>Principle 5: Stakeholder Engagement</p> <p>Principle 6: Grievance Mechanism</p> <p>Principle 7: Independent Review</p> <p>Principle 8: Covenants</p> <p>Principle 9: Independent Monitoring and Reporting</p> <p>Principle 10: Reporting and Transparency</p>	<p>responsible projects, which subscribe to appropriately responsible environmental management practices with a minimum negative impact on project-affected ecosystems and community-based upliftment and empowering interactions.'</p>
<p>The International Finance Corporation (IFC) Performance Standards</p>	<p>The International Finance Corporation's (IFC) Sustainability Framework articulates the Corporation's strategic commitment to sustainable development and is an integral part of IFC's approach to risk management. The Sustainability Framework comprises IFC's Policy and Performance Standards on Environmental and Social Sustainability, and</p>	<p>The Performance Standards are directed towards clients, providing guidance on how to identify risks and impacts, and are designed to help avoid, mitigate, and manage risks and impacts as a way of doing business in a</p>

STATUTE	PROVISIONS	PROJECT IMPLICATIONS
	<p>IFC's Access to Information Policy. The Policy on Environmental and Social Sustainability describes IFC's commitments, roles, and responsibilities related to environmental and social sustainability.</p> <p>As of 28 October 2018, there are ten (10) Performance Standards (Performance Standards on Environmental and Social Sustainability) that the IFC requires a project Proponents to meet throughout the life of an investment. These standard requirements are briefly described below.</p> <p>Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts</p> <p>Performance Standard 2: Labour and Working Conditions</p> <p>Performance Standard 3: Resource Efficient and Pollution Prevention and Management</p> <p>Performance Standard 4: Community Health and Safety</p> <p>Performance Standard 5: Land Acquisition, Restrictions on Land Use, and Involuntary Resettlement</p> <p>Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources</p> <p>Performance Standard 7: Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities</p> <p>Performance Standard 8: Cultural Heritage</p>	<p>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.</p>

STATUTE	PROVISIONS	PROJECT IMPLICATIONS
	<p>Performance Standard 9: Financial Intermediaries (FIs)</p> <p>Performance Standard 10: Stakeholder Engagement and Information</p> <p>A full description of the IFC Standards can be obtained from</p> <p>http://www.worldbank.org/en/projects-operations/environmental-and-social-framework/brief/environmental-and-social-standards?cq_ck=1522164538151#ess1</p>	
The United Nations Convention to Combat Desertification (UNCCD) 1992	<p>Addresses land degradation in arid regions with the purpose to contribute to the conservation and sustainable use of biodiversity and the mitigation of climate change.</p> <p>The convention objective is to forge a global partnership to reverse and prevent desertification/land degradation and to mitigate the effects of drought in affected areas to support poverty reduction and environmental sustainability United Nation Convention</p>	The project activities should not be such that they contribute to desertification.
Convention on Biological Diversity 1992	<p>Regulate or manage biological resources important for the conservation of biological diversity whether within or outside protected areas, with a view to ensuring their conservation and sustainable use.</p> <p>Promote the protection of ecosystems, natural habitats, and the maintenance of viable populations of species in natural surroundings</p>	Removal of vegetation cover and destruction of natural habitats should be avoided and where not possible minimised

STATUTE	PROVISIONS	PROJECT IMPLICATIONS
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.

Other relevant international Treaties and Protocols ratified by the Namibian Government

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

5 ENVIRONMENTAL BASELINE

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

The baseline information summary presented below has been sourced from a variety of sources including reports of studies conducted in the Region (at large) as well those done in the Aus area. Further information is obtained by the Environmental Consultant, during site visit conducted in January 2021.

5.1 Climate

Climate has a major influence on the exploration activities on the EPLs. Climatic conditions determine the appropriate and/or inappropriate times to conduct exploration activity. The climate of the project area is generally known as cold desert climate. The Aus area, receives relatively low, highly variable, and unreliable rainfall throughout the year. The Aus area experiences rainfall mainly during the summer months of December to April experienced as short-lived sporadic thunderstorms. All the streams within the area are ephemeral, but can flow very strongly after summer rainfall (Domptail et al, 2010). However, about 29% of rainfall in the Aus area occurs between May and August. The average monthly rainfall for Aus is 57mm, and average annual rainfall is 86mm (SASSCAL, 2021).

At Aus, the mean daily maximum temperature is 30°C in summer and a low 4°C in winter. The lowest average monthly temperatures of 2020 were recorded in the Aus area August at 14.8 °C, while highest average monthly temperatures were recorded in January at 28.6 °C. According to 2020 data from SASSCAL, the strongest wind speeds in the Aus area are experienced in July, at an average wind speed of 2.8 km/h. The weakest wind speeds in the project area are experienced in March, at an average wind speed of 0.8 km/h. The most humid month of the year at the project area is usually February, with an average relative humidity of 38.3 % due to the rains, while the least humid month is usually October, with an average relative humidity of 17%

5.2 Topography and Drainage

5.2.1 Topography

The EPL No. 7587 falls within the region of the Namib Plains and the Nama-karoo Basin. The Namib Plain is characterized with sand-drifts and prominent inselbergs largely of mid palaeozoic age. The Nama-karoo Basin is characterized by flat lying plateau underlain by Nama and Karoo sediments, locally developed karst in Nama limestones and on surficial Calcrete; dolomites sills locally weather to large rounded boulders. **Figure 8** below shows the landscape covered by the EPL.

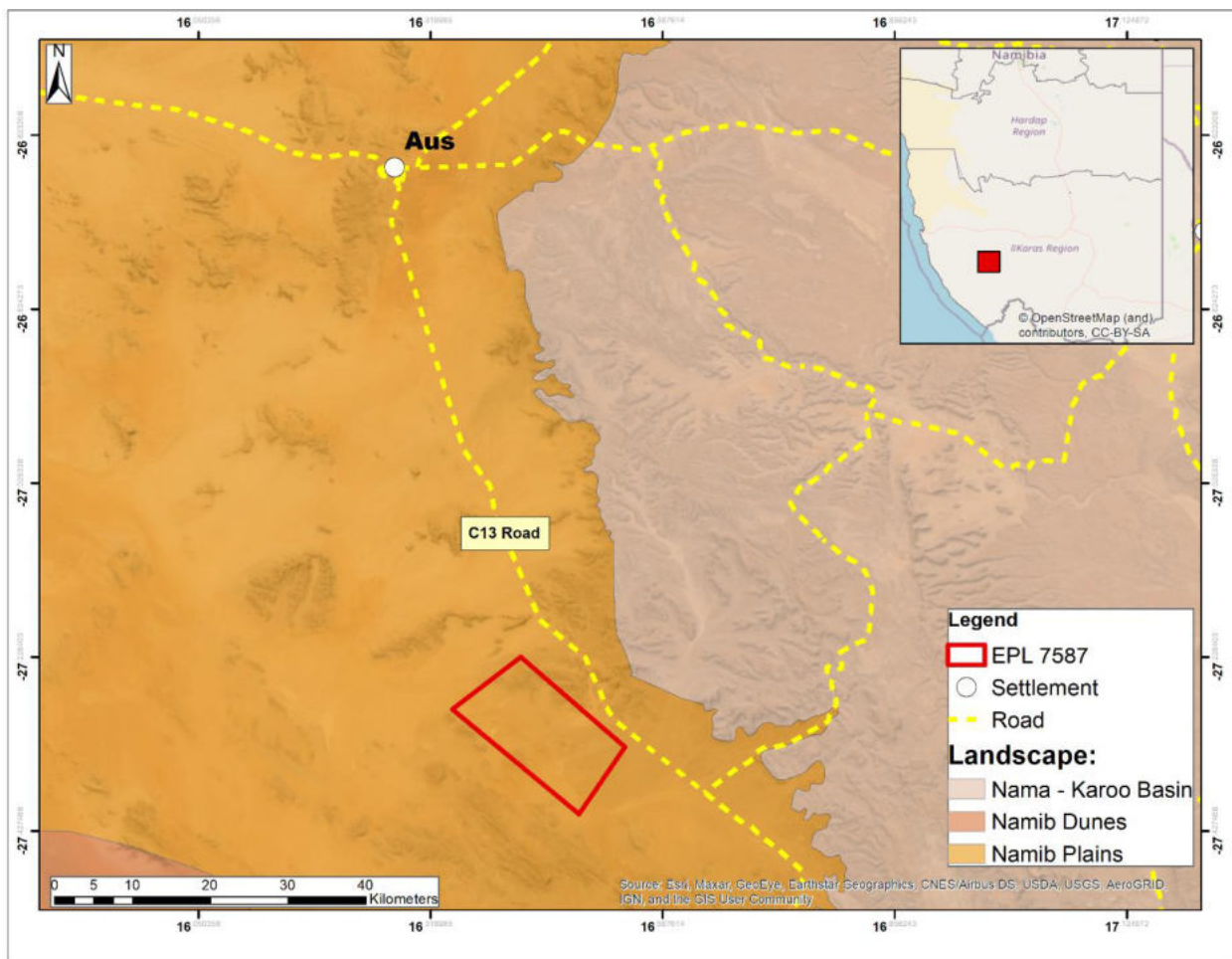


Figure 3: EPL 7587 Landscape Map

The EPL is found at elevation levels ranging from 55 – 2,559 m. An elevation model was created with data from the Shuttle Radar Topography Mission (SRTM) 30 metres image for the project site obtained from RCMRD Servir-Africa and National Aeronautics and Space Administration (NASA). The elevation model was used to determine the elevation through cross section, which run from west to east across the project area. **Figures 4** below show the elevation model and cross section Graph, respectively.

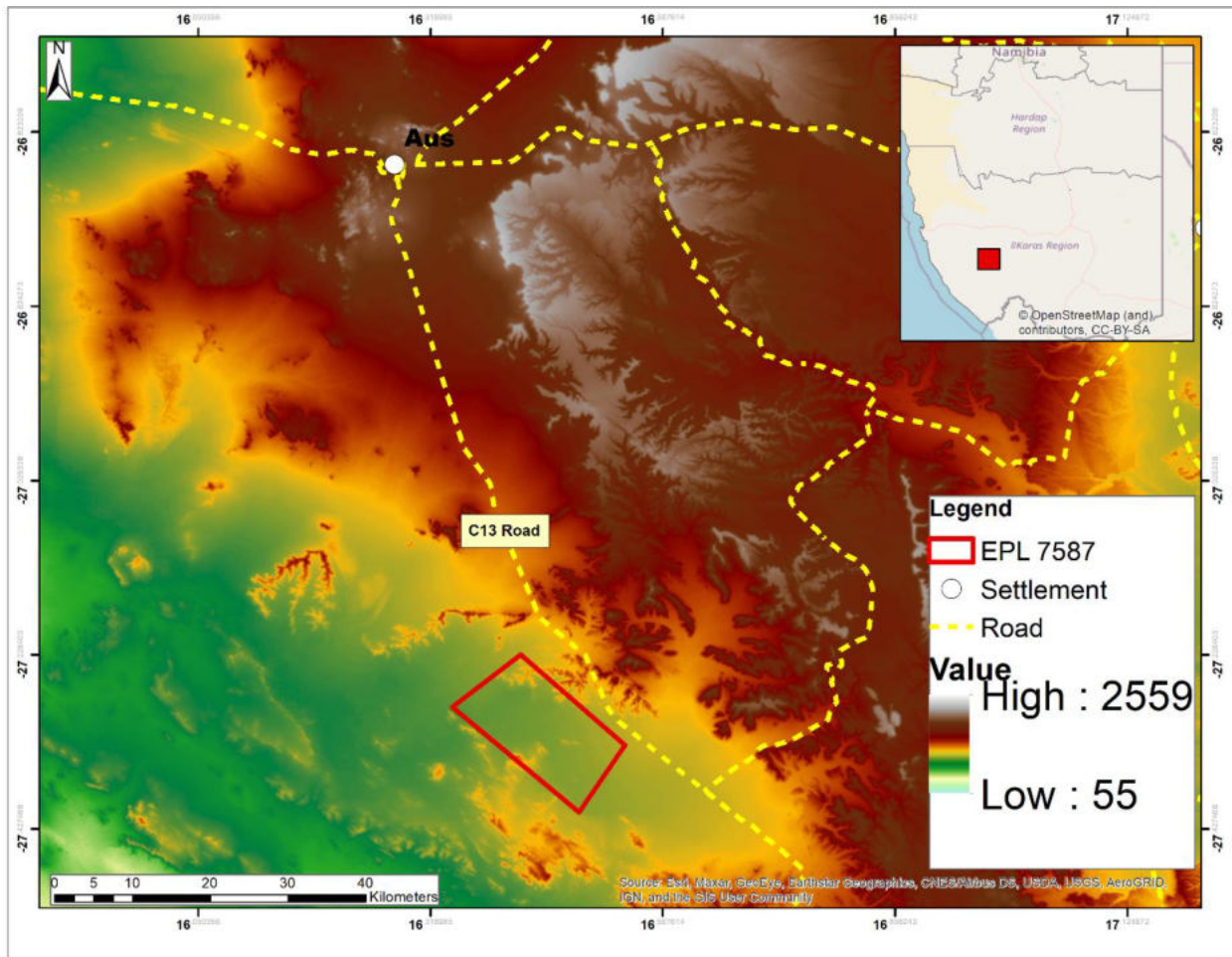


Figure 4: Map showing the elevation model of the EPL

5.2.2 Water Resources: Hydrology and Hydrogeology

Hydrologically, the EPLs fall within an area of very low and limited groundwater potential. There is an ephemeral river (Nuab) running across and through the EPL. Groundwater resources in this

part of Namibia are very limited, that extraction would easily exceed recharge in the event of exploitation of the available groundwater resources, considering that the low average annual rainfall provides little groundwater recharge (Christelis et al, 2011). The scarce water resources in the area have generally limited the development and expansion of the Aus Settlement too.

Exploration activity has the potential to affect the quantity and quality of surface and groundwater. Therefore, any potential contamination and alteration of surface and groundwater, during the project phase, would require close monitoring, in accordance with the presence of surface and groundwater within the EPLs. This could involve the setting up of monitoring stations at an early stage to designate possible sources of contamination and possible flow charges of the rivers. Potential water pollution on rivers and other waterbodies needs to be prevented, through identifying incidental sources of pollution such as accidental spillage, chemicals or hydrocarbons (ECC, 2019). **Figure 5** shows the hydrology of the project area.

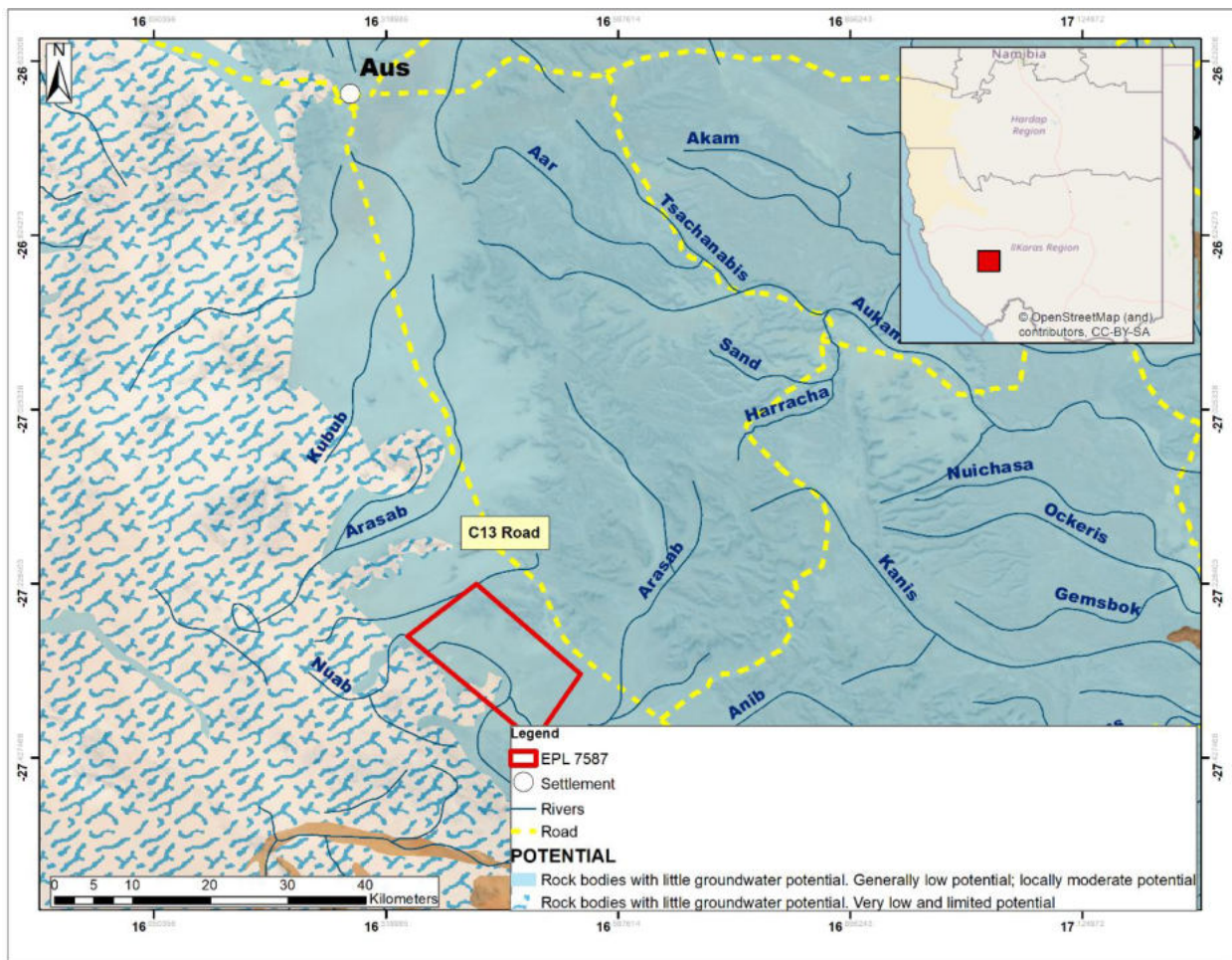


Figure 5: Hydrology of the EPL 7587

Exploration activity has the potential to affect the quantity and quality of surface and groundwater, depending on the quantity of groundwater. Therefore, in the case of significant groundwater quantities, potential contamination and alteration of surface and groundwater, during the project phase, might require close monitoring, in accordance with the presence of surface and groundwater within the EPL. This could involve the setting up of monitoring stations at an early stage to designate possible sources of contamination and possible flow charges of the rivers. An effective water quality monitoring program, which includes water quality sampling and analysis is a desirable tool for surface and groundwater protection. Potential water pollution on rivers and other waterbodies needs to be prevented by all means, through identifying incidental sources of pollution such as accidental spillage, chemicals or hydrocarbons (ECC, 2019).

5.3 Soils

The EPL No. 7587 is dominated by two different types of soils: The Eutric Regosols and Lithic Leptosols. The Eutric Regosols are characterized by medium- or fine- textured soils of actively eroding landscapes, the thin layers lying directly above the rock surfaces from which they formed. These soils never reach depths of more than 50 cm. Lithic Leptosols typically form in actively eroding landscapes, especially in the slightly hilly or undulating areas at the edge of the EPL area. These coarse-textured soils are characterized by their limited depth caused by the presence of a continuous hard rock, with a highly calcareous or cemented layer within 30 cm of the surface. Petric Calcisols are found in depressions or low-lying areas of the landscape, and typically contain accumulations of calcium carbonate, often in a cemented form called Calcrete. Large white blocks of Calcrete are often visible on the surface. Calcrete is generally formed beneath the surface and is also often present in a soft powdery form (Mendelsohn, 2003). **Figure 11** below shows the soil types in the project area.

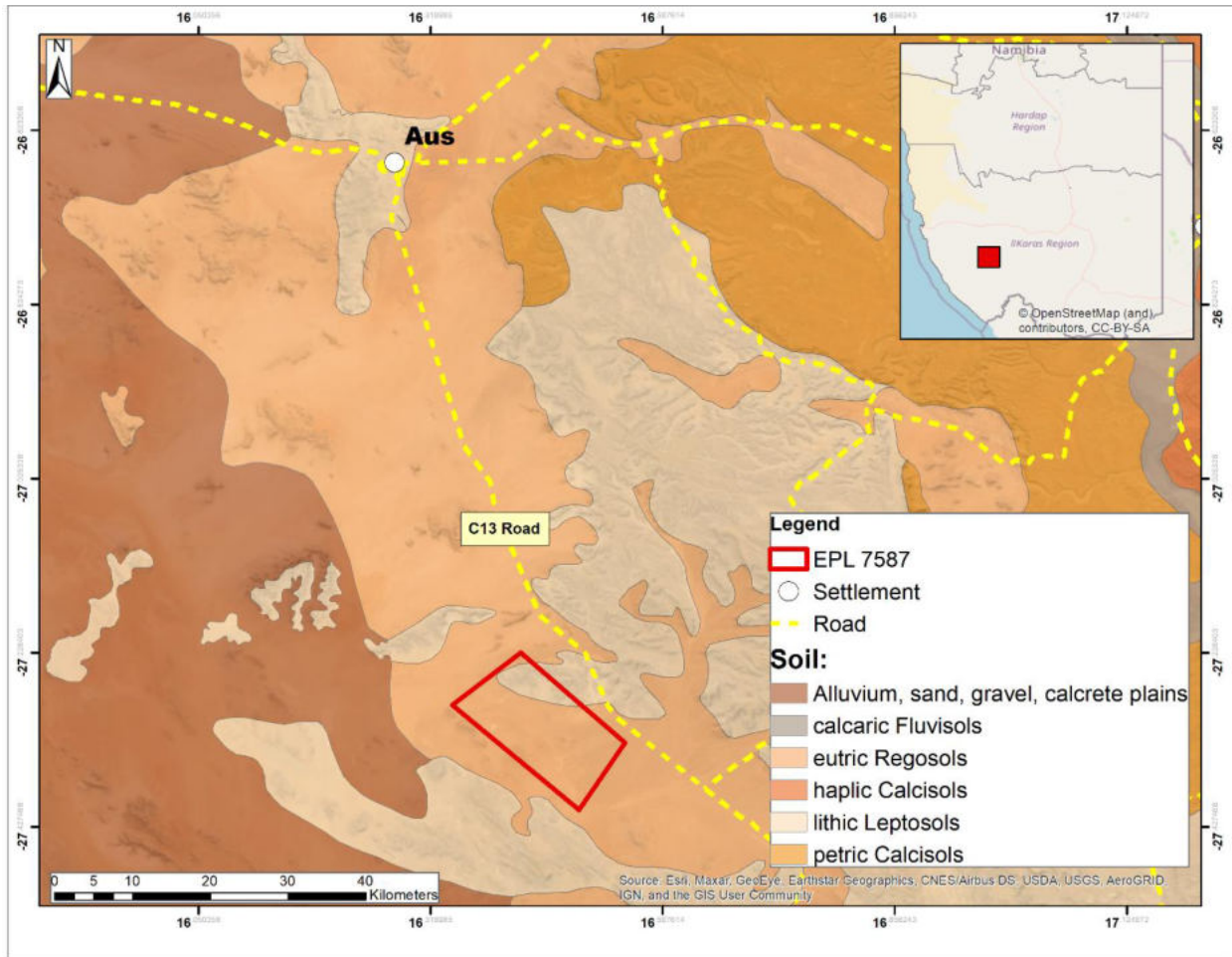


Figure 6: Soil types on the EPL 7587

5.4 Geology

The EPL 7587 is dominantly represent the lower part of the Kuibis Group, an early foreland basin succession comprising of shallow-water fine siliciclastics and carbonates. Two sequences (K1 and K2) exist in the Kuibis Subgroup. Sequence K1 mainly comprises the lower part of Dabis Formation, which non-conformably overlies crystalline basement. K1 consists of a basal unit of coarse, tabular-bedded sandstones (Kanies Member) overlain by fine-grained, irregularly laminated dolostone and limestone. Sequence K1 is extremely thin around the EPL area, but thicker to the southern part of the EPL. K2 consists of transgressive gray-green shale and siltstone with sporadic interbeds of very fine to fine-grained centimetre-scale sandstone event beds that are laterally discontinuous over decameter scales. Sandstone event beds are erosionally based (Rich, 2016). The geology of the project area is presented in **Figure 7**.

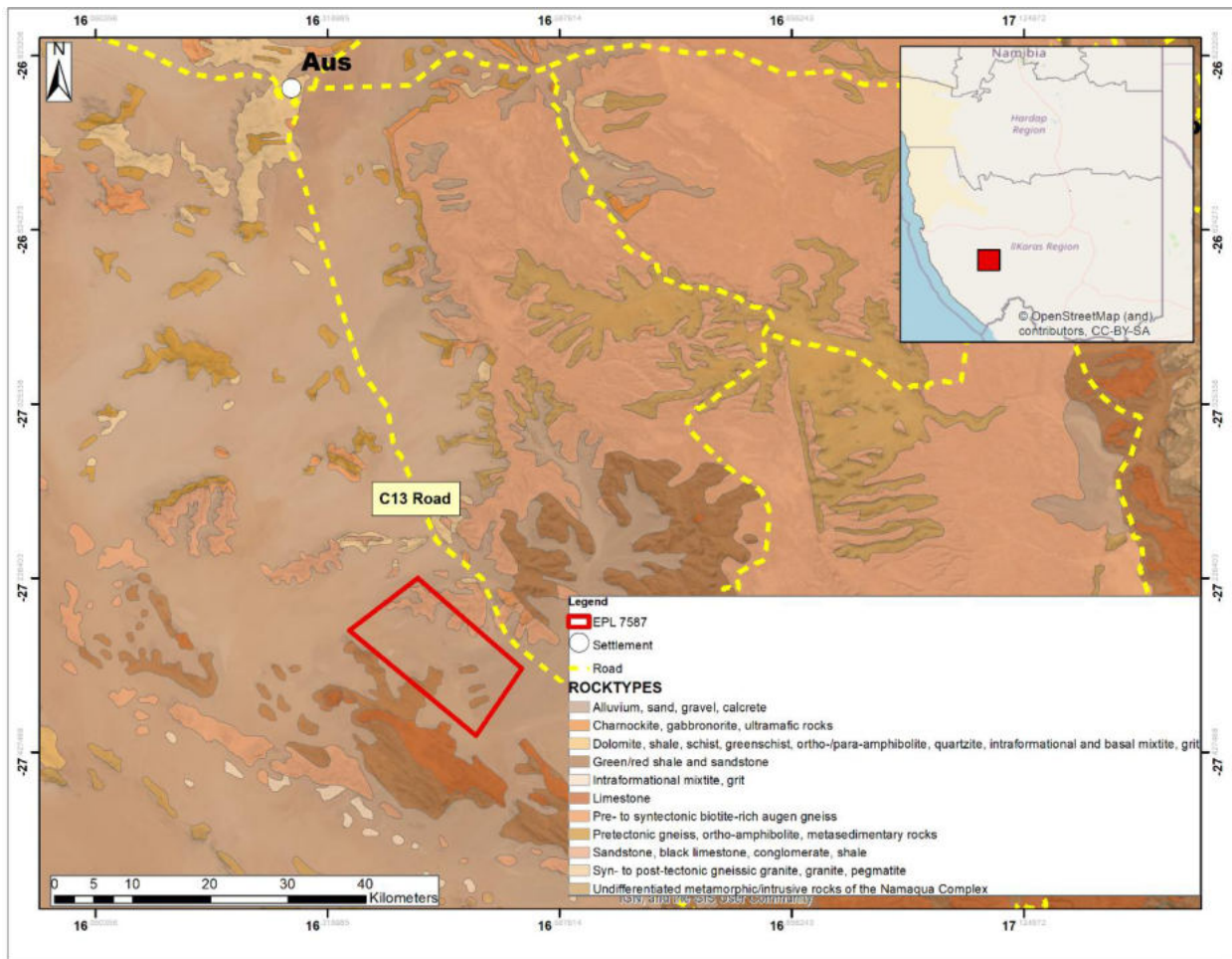


Figure 7: Geology of the EPL 7587

5.5 Fauna and Flora

Due to the desert conditions in the Aus area, few animals are found in the project areas. Animals found in and around the project area include feral horses, ostrich and oryx. Feral horses, in particular, are capable of going without water for up to five days, and are able to survive the harsh conditions on the edge of the Namibia Desert. The ostrich and oryx are endemic to this area (Aus Namibia Living edge, 2020).

The project area is largely dominated by *Brownanthus arenosus* and extremely diverse vegetation cover. The extremely diverse vegetation cover consists mainly of desert/dwarf shrub transitions, which belong to the Nama-Karoo, with heights ranging from 2-5 m. Some few parts of the project areas are covered by the *Acacia hereroensis* vegetation types. *Brownanthus Arenosus* cover is made up of by Southern Desert vegetation types, which belong to the desert biome. *Acacia hereroensis* is dominated by the Dwarf shrub savannah vegetation types and it belongs to the Nama-karoo biome. **Figure 8** below shows the vegetation map in the project area and **Figure 9** shows type of vegetation found on the EPL.

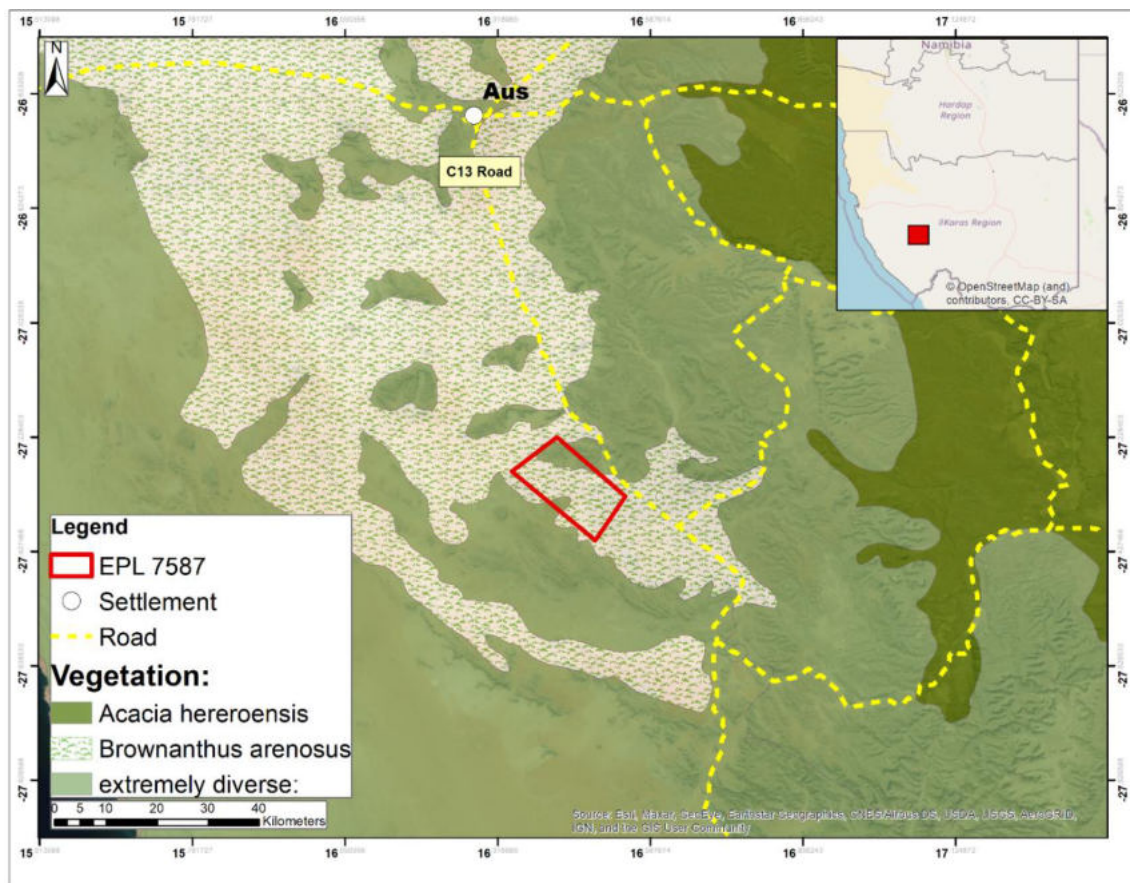


Figure 8: Vegetation Map of EPL 7587



Figure 9: Vegetation observed on part of EPL 7587

5.6 Archaeology and Heritage

The //Karas Region archaeological record is reported to have evidence of human occupation dating to the Pleistocene and Holocene periods, roughly in the last 800 000 years to 2000 BP (Kinahan, 2012). Such evidence is reflected in materials records such as surface scatters of stone artefacts, rock shelters with evidence of occupation, including rock art, graves, stone features such as hunting blinds and huts. Among the rock art finds in //Karas region is the well-established rock art site in the Hun Mountains along the Nuob River; the Apollo 11 Cave. The site hosts some rare typologies of rock painting and the only examples of African figurative art securely dated to the late Pleistocene Period (Riaan et al., 2015).

The Heritage and Archaeological Impact Assessment associated with this study yielded no significant heritage resources within the precinct of EPL7587. The areas to be affected by proposed explorations and mining activities within EPL do not contain any significant nor sensitive heritage and archaeological sites that fall directly within the areas. Thus it is at present safe to assume that the proposed prospection of dimension stones will not have a cumulative adverse effect on the Namibian heritage resource base. Additionally, no landforms were considered to be significant in terms of possibly being a habitat in which archaeological artefacts could be found

and therefore require special mitigation measures. The EMP should therefore adopt the Chance-Find Procedure devised for exploration and mining projects in these areas.

5.7 Surrounding Land Uses

The EPL No. 7587 falls within 100% of farmland (**Figure 18**). 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 the Section 52 of the Minerals (Prospecting and Mining) Act No. 33 of 1992 and Section 2.2.3 of the Minerals Policy of Namibia.

2. *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 –*

(c) 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.

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

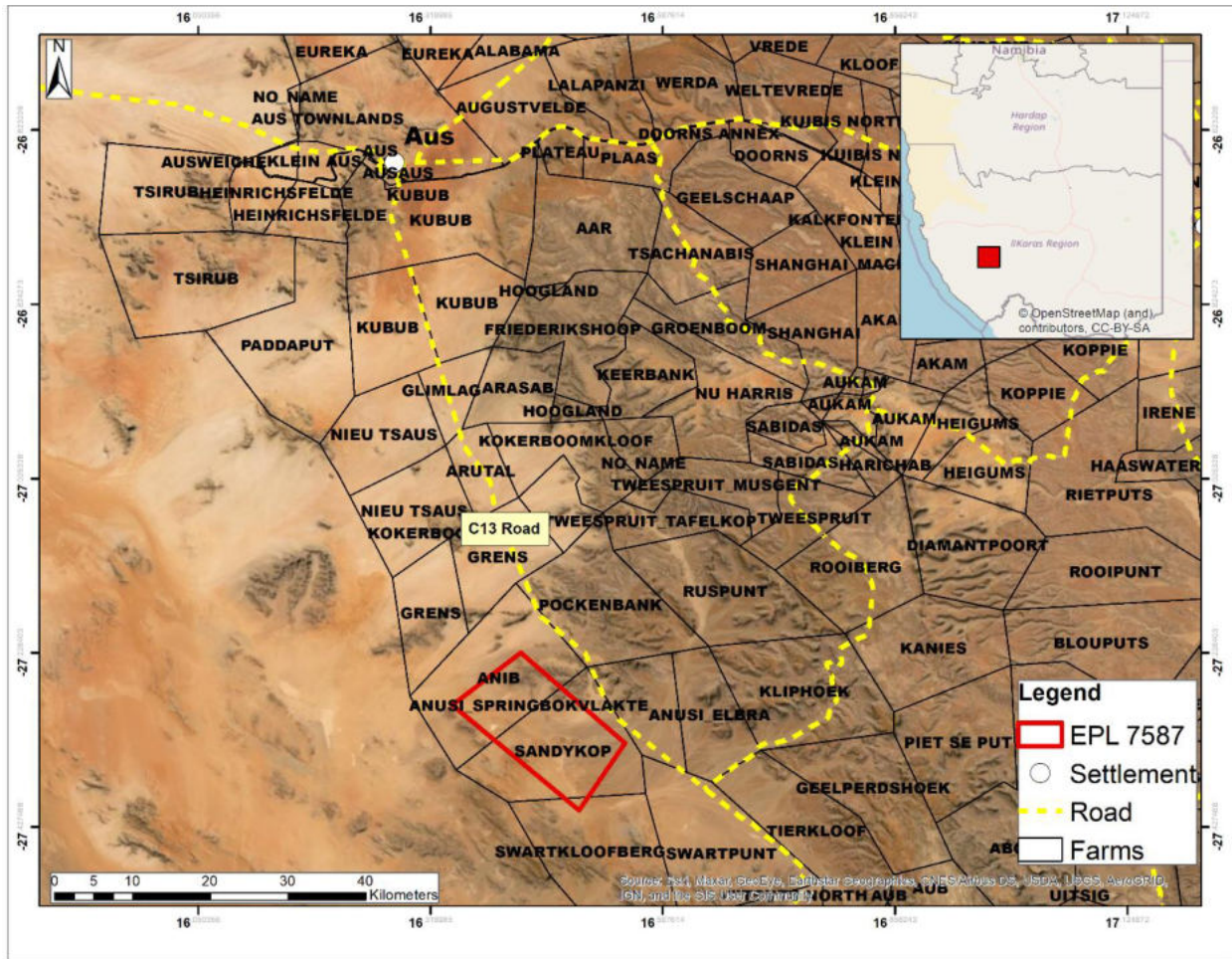


Figure 10: EPL 7587 Land Use Map

5.8 Economic Activity

Tourism

The //Karas Region is home to some of Namibia’s popular tourist attractions, such as the Fish River Canyon, the Tsau //Khaeb National Park, Kolmanskop and Diaz Point in Lüderitz, to mention but a few. The Aus Settlement is popular for pit-stop for tourists traveling southwest of Namibia. The most unique feature of Aus and surrounding areas is the resident wild horses that tourists often marvel at. A hide has been erected at Garub Pan, where the tourists are able to view the wild horses at the water hole (Aus Namibia Living edge, 2020).

Aus provides an intersection of routes leading to Keetmanshoop, Rosh Pinah, Oranjemund and South Africa, and to the coastal town of Lüderitz. The sand dunes, grasslands and rolling hills render the Southern Namibian landscape an attraction on its own.

Stock Farming

Stock farming at subsistence and commercial levels in the region and the Aus area occurs as farming of sheep, goats and cattle. In recent years, the region has experienced a growth in commercial ostrich and game farming. (NEPRU, 1998).

Mining Industry

The Karas Region is an important mining region in Namibia, contributing a significant portion to the national Gross Domestic Product (GDP). The development of the Karas Region is economically tied to its rich mineral deposits that provide mining opportunities and development. Minerals mined in the Karas Region include diamonds, zinc, copper, tin, lead, silver, marble and gemstones. (NEPRU, 1998). Some of the mining activity in the region include the Rosh Pinah Zinc Mine in Rosh Pinah, the NamDeb diamond mine in Oranjemund, as well as De Beers Marine offshore diamond mining off the coast of Lüderitz.

Infrastructure and Services

The Project area is located near the settlement of Aus, which has access to power supply and water networks, as well as post and telecommunications systems that link villages/settlements and towns with the rest of the country. Aus has access to electrical and water reticulation systems. Water is sourced from the Orange River, which is the only permanent water source in the area, and supplies water in the area for towns, agriculture and mining activity, through the Aus water pipes and Aus water supply Scheme. (Aus Namibia Living edge, 2020). The Aus area is supplied with electricity from Keetmanshoop, by NamPower. The project area has a good transportation network of roads that provide connection between towns and villages/settlements, and link Namibia to South Africa and Botswana (NEPRU, 1998), as well as to mining operations within the region.

6 PUBLIC CONSULTATION

Public consultation forms an important component of an Environmental Assessment (EA) process. It provides potential Interested and Affected Parties (I&APs) with an opportunity to comment on and raise any issues relevant to the project for consideration as part of the assessment process. The public consultation process assists the Environmental Assessment Practitioner (EAP) in identifying all potential impacts and the extent to which any 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 in accordance with the EMA and its EIA Regulations.

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

EDS identified relevant and applicable national, regional and local authorities, local leaders and other interested members of the public. Pre-identified I&APs were contacted directly, while other parties who contacted the Consultant after advertisement notices in the newspapers were registered as I&APs upon their request. Registered mail was sent to some pre-identified farm owners (**Appendix I**). Newspaper advertisements of the proposed exploration activities were placed in two widely read national newspapers in the region (*The Namibian* and *New Era* newspapers). 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 4** below and the complete list of I&APs is provided in **Appendix E**.

Table 4: Summary of Interested and Affected Parties (I&APs)

National (Ministries and State Owned Enterprises)
Ministry of Environment and Tourism
Ministry of Urban and Rural Development
Ministry of Labour, Industrial Relations and Employment Creation
Ministry of Health and Social Services
Ministry of Agriculture, Water and Forestry
Ministry of Mines and Energy
Roads Authority

Regional & Local
//Karas Regional Council
Aus Rural Constituency
General Public
Interested members of the public and Farmers

6.2 Communication with I&APs

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. Communication with I&APs about 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 D**) and sent out to all pre-identified affected parties and upon request to all new registered Interested and Affected parties (I&APs);
- Project Environmental Assessment notices were placed in *The Namibian* and *New Era* newspapers (**Appendix F**) dated **14 December 2020** and **21 December 2020 (08 January 2021, New Era)**, briefly explaining the activity and its locality, and inviting interested members of the public to register as I&APs and submit comment;
- Registered mail was sent to pre-identified farm owners (**Appendix I**).
- Public notices were placed at frequented places (**Figure 11**) in Aus to inform members of the public of the Environmental Assessment process and register as I&APs as well as submit comments; and
- A public meeting was scheduled and held on **23 January 2021** on farm Rooiberg (**Figure 12**).

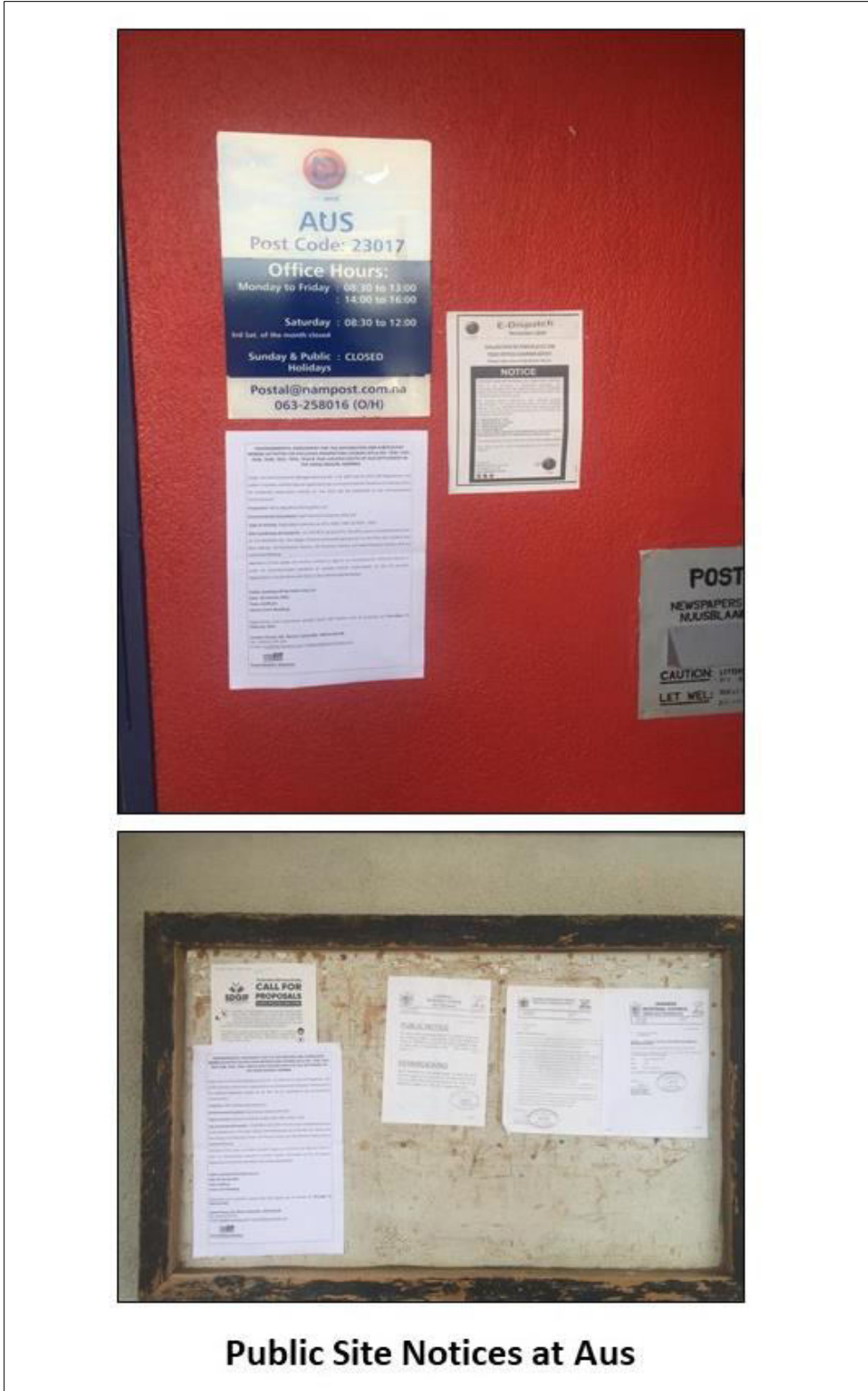


Figure 11: Public Site notices at Aus



Figure 12: Project Public meeting

Issues raised during the ESA process and all communication from I&APs has been recorded; all responses provide are fully presented in the meeting minutes in **Appendix G** and incorporated in the ESA report and EMP. The summarized issues raised in the meeting are presented in **Table 5** below. The issues raised and responses (by EDS) are attached under **Appendix G**.

Table 5: Summary of main issues and comments received during the first public site engagement

Issue	Concern/Comment
Access	Agreements need to be reached before the exploration activities commencement
Exploration Hotspot	The EPL area has a history of exploration activities for other commodities such as Tin and Graphite
Exploration programme	Detailed information is needed to give a clear picture of the project scope

6.2.1 Public Feedback

Apart from issues raised during the (first) public meeting, there was no other comment received by EDS either via email or any other mode of communication after the EIA advertisement in the newspapers or upon placing public notices in Aus.

The Draft EIA report together with all its appendices will be circulated to all I&APs for review for a period not less than 7 days. Should there be any comments, these will be documented in a Comments and Response Trail Document (**Appendix G**) and incorporated into the Final Report, which will be submitted to the Department of Environmental Affairs (DEA) for evaluation and consideration for an ECC.

7 IMPACT IDENTIFICATION, ASSESSMENT AND MITIGATION MEASURES

7.1 Impact Identification

Proposed developments/activities are usually associated with various potential positive and/or negative impacts. For an environmental assessment, the focus is placed mainly on the identified negative impacts. This is done to ensure that these impacts are addressed by providing adequate mitigation measures such that an impact's significance is brought under control, while maximizing the positive impacts of the development. The potential positive and negative impacts that have been identified for the prospecting and exploration activities on EPL 7587 are listed as follow:

Positive impacts:

- Creation of jobs to the locals (primary, secondary and tertiary employment),
- 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
- Improved geological understanding of the area, and
- Boosting other investment opportunities and infrastructure-related development benefits

Negative impacts:

- Land degradation and Biodiversity Loss
- Impact on Water Resources
- Generation of dust,
- Generation of waste,
- Visual impacts (scars) on landscape,

- Potential occupational health and safety risks,
- Land Pollution/Soil Contamination
- Possible disturbance to heritage/archaeological resources,
- Vibrations and noise from exploration works, and
- Vehicular traffic safety
- Impacts associate with closure and decommissioning of exploration works.

7.2 Impact Assessment Methodology

The Environmental Assessment is primarily a process used to ensure 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 probability (likelihood of occurring), scale/extent (spatial scale), magnitude (severity) and duration (temporal scale) as presented in **Table 6**, **Table 7**, **Table 8** and **Table 9**.

In order to enable a scientific approach to the determination of the environmental significance, a numerical value is linked to each rating scale. This methodology ensures uniformity and allows potential impacts to be addressed in a standard manner so that a wide range of impacts is comparable. It is assumed that an assessment of the significance of a potential impact is a good indicator of the risks 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 are 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 6** shows rating of impact in terms of extent of spatial scale.

Table 6: Extent or spatial impact rating

Low (1)	Low/Medium (2)	Medium (3)	Medium/High (4)	High (5)
Impact is localised within the site boundary: Site only	Impact is beyond the site boundary: Local	Impacts felt within adjacent biophysical and social environments: Regional	Impact widespread far beyond site boundary: Regional	Impact extend National or over international boundaries

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 6** shows the rating of impact in terms of duration.

Table 7: Duration impact rating

Low (1)	Low/Medium (2)	Medium (3)	Medium/High (4)	High (5)
Immediate mitigating measures, immediate progress	Impact is quickly reversible, short term impacts (0-5 years)	Reversible over time; medium term (5-15 years)	Impact is long-term	Long term; beyond closure; permanent; irreplaceable or irretrievable commitment of resources

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 alteration can either be positive or negative. These ratings are also taken into consideration during assessment of severity. **Table 8** shows the rating of impact in terms of intensity, magnitude or severity.

Table 8: Intensity, magnitude or severity impact rating

Type of criteria	Negative				
	H- (10)	M/H- (8)	M- (6)	M/L- (4)	L- (2)
Qualitative	Very high deterioration,	Substantial deterioration,	Moderate deterioration,	Low deterioration,	Minor deterioration,

Type of criteria	Negative				
	H- (10)	M/H- (8)	M- (6)	M/L- (4)	L- (2)
	high quantity of deaths, injury of illness / total loss of habitat, total alteration of ecological processes, extinction of rare species	death, illness or injury, loss of habitat / diversity or resource, severe alteration or disturbance of important processes	discomfort, partial loss of habitat / biodiversity or resource, moderate alteration	slight noticeable alteration in habitat and biodiversity. Little loss in species numbers	nuisance or irritation, minor change in species / habitat / diversity or resource, no or very little quality deterioration.

7.2.4 Probability of occurrence

Probability describes the likelihood of the impacts actually occurring. This determination is based on previous experience with similar projects and/or based on professional judgment. **Table 8** shows impact rating in terms of probability of occurrence.

Table 9: 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 chapter, for this assessment, the significance of the impact without prescribed mitigation actions was measured.

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

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

The maximum value per potential impact is 100 significance points (SP). Potential impacts are rated as high, moderate or low significance, based on the following significance rating scale (Table 10).

Table 10: Significance rating scale

Significance	Environmental Significance Points	Colour Code
High (positive)	>60	H
Medium (positive)	30 to 60	M
Low (positive)	<30	L
Neutral	0	N
Low (negative)	>-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 medium (-ve) or low (-ve) significance rating, provided that the impact with a medium significance rating can be sufficiently controlled with the recommended mitigation measures. To maintain a low or medium significance rating, monitoring is recommended for a period of time to enable the confirmation of the significance of the impact as low or medium and under control.

The assessment of the exploration phases is done for both 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.*

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

This ESA focuses on the three project phases namely; the prospecting, drilling, sampling (and possible analysis) and decommissioning. The potential negative impacts stemming from the proposed activities are described, assessed, and mitigation measures provided thereof. Further mitigation measures in a form of management action plans are provided in the Draft Environmental Management Plan.

7.3 Assessment of Potential Negative Impacts: Surveys, Drilling, Sampling Phases

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

7.3.1 Loss of Biodiversity and Land Degradation

The drilling activities and earthworks done to expose the mineral bearing rock units could potentially result in land degradation, which leads to the destruction of habitat for the local diversity of flora and fauna, ranging from microorganisms that may be encountered underneath the soils and rocks, to large animals, shrubs and trees. In order to enable the exploration operations, some site vegetation within the footprint of the exploration area would be removed. This might lead to the destruction of any protected plant species on the site, resulting in the loss of such species and eventual loss of biodiversity in the area. Endemic species would be most severely affected since even the slightest disruption in their habitat can result in extinction or put them at high risk of being wiped out. The Consultant advises the Proponent to avoid unnecessary removal of vegetation, in order to promote a balance between biodiversity and their operations. Under the current status, the impact can be considered to be of a medium significance rating. With the implementation of appropriate mitigation measures, the rating will significantly be reduced to low. The impact is assessed in **Table 11** below.

Table 11: Assessment of the impacts of exploration on biodiversity

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	M - 3	M - 3	M - 6	M - 3	M - 36
Post mitigation	L/M - 2	L/M - 2	L/M - 4	L/M - 2	L - 16

Mitigations and recommendation to minimize the loss of biodiversity

- Vegetation found on the site, but not in the targeted exploration areas should not be removed, but left to preserve biodiversity on the site.
- Shrubs or trees found along drilling or sampling spots on sites should not be unnecessarily removed. Care should be taken when extracting mineral species without destroying the vegetation.
- Workers should refrain from killing or snaring animals' species (big or small) that may be found on the site.
- Environmental awareness on the importance of biodiversity preservation should be provided to the workers.

7.3.2 Impact on Water Resources

The state of limited water resources in the area implies that the use of local water resources for a water-demanding activity such as drilling during the proposed exploration activities would be unsustainable and would place too much strain on the water resources in the area. The Consultant advises the Proponent to consider alternative sources of water for activities requiring large amounts of water, rather than the use of locally sourced water, in order to achieve the necessary water requirements for the planned exploration activity. This impact is rated with a Medium Significance, and can be reduced to a Low Significance upon effective implementation of the mitigation measures. The assessment of this impact is presented in **Table 11** below.

Table 12: Impact on Water Resources

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

Mitigations and recommendation to minimize Impact on Water resources

- Due to water scarcity in the area, water supply for exploration works such as drilling and associated activities would be best augmented with carted water from elsewhere outside the project area to ensure that less pressure is put on local water resources.
- The required water from the suppliers should be stored on site in trailer-mounted industry standard water reservoirs.
- Water abstraction permits should be obtained from the Ministry of Agriculture, Water and Land Reform, in the event that the Proponent aspires to access local groundwater resources.
- An effective water quality monitoring program needs to be in place to attain surface and groundwater protection throughout the process

7.3.3 Generation of Dust (Air Quality)

Dust emanating from site access routes when transporting exploration equipment and supply (water) to and from site (time-to-time) may compromise the air quality in the area. Vehicular movements create dust even though it is not always so severe. The hot and dry environment, loose and in some places sandy nature of the substrate, and low vegetation cover causes ambient fugitive dust levels. The Low significance of this impact can be reduced by properly implementing mitigation measures to a lower significance rating. The impact is assessed in **Table 13** below.

Table 13: Assessment of the impacts of exploration on air quality

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	L/M - 2	L/M - 2	L/M- 4	L/M - 2	L - 16
Post mitigation	L - 1	L - 1	L- 2	L - 1	L - 4

Mitigations and recommendation to minimize dust

- The Proponent should ensure that the exploration schedule is limited to the given number of days of the week. This will contribute to keeping the vehicle-related dust levels minimal in the area.

- The project site is in an area with limited vegetation cover and highly exposed soils, therefore, it is highly probable that dust will be generated from exploration drilling and excavation. It is therefore advised that on extremely windy days, a reasonable amount of water should be used to suppress the dust that may be emanating from certain exploration areas on the EPL site.

7.3.4 Waste Generation

Prospecting and exploration activities are usually associated with generation of waste of all kinds (domestic and general). If waste is not disposed of in a responsible manner, it will result in the pollution of the site and the surrounding environment. Precautions should be taken to prevent any refuse from spreading on site. Without any mitigation measures, the impact has a medium significance. The impact will be reduced to low significance upon implementation of the mitigation measures. The assessment of this impact is given in **Table 14**.

Table 14: Assessment of waste generation impact

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 recommendation to waste management

- Workers should be sensitized to dispose of waste in a responsible manner and not to litter.
- After each daily works, the Proponent should ensure that there are no wastes left on the sites.
- All domestic and general operational waste produced daily should be contained 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.

- Hazardous waste, including emptied chemical containers should be safely stored on site where they cannot be accessed and used by locals for personal use. These containers can then be transported to the nearby approved hazardous waste sites for safe disposal. No waste should be improperly disposed of on site or in the surroundings, i.e., on unapproved waste sites.
- Sewage waste should be stored as per the portable chemical toilets supplied on site and regularly disposed of at the nearest treatment facility.
- Oil spills should 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 products(s) to the sites.
- All wastewater and hydrocarbon substances and other potential pollutants associated with the project activities should be contained in designated containers on site and later disposed of at nearby approved waste sites in accordance with MAWLR's Water Environment Division standards on wastewater discharge into the environment. This is to ensure that these hazardous substances do not infiltrate into the ground and affect the local groundwater quality.

7.3.5 Visual Impact (Scars) on Landscape

Visual impact due to exploration works is aesthetic damage to the landscape. Drilling and sampling activities leave scars on the local landscape. If the mining sites are located close to or along tourist routes, these scars in many cases contrasts the surrounding landscape and may potentially become a visual nuisance, especially for the tourism industry. Therefore, during the prospecting phase, certain measures will need to be taken into consideration regarding the visual aspect. Currently, the visual impact is rated as Medium, and can be reduced to low significance upon effective implementation of the mitigation measures. The assessment of this impact is presented in **Table 15**.

Table 15: Assessment of visual impact on landscape

	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	M - 3	M - 3	M - 6	M - 3	M - 36
Post mitigation	L/M - 2	L/M - 2	L/M - 4	L/M - 2	L - 16

Mitigations and recommendation to minimize visual impact

- The Proponent should not create unnecessary routes, which lead to landscape scarring on site
- The Proponent should consider the implementation of continuous rehabilitation programme on site, by using overburden waste rocks to visually maintain the landscape's natural setting.

7.3.6 Occupational Health and Safety Risks

Improper handling of exploration materials and equipment may cause health and safety risks such as injuries to workers. The impact is probable and has a medium significance rating. However, with adequate mitigation measures, the impact rating can be reduced to low. This impact is assessed in **Table 16** below and mitigation measures provided.

Table 16: Assessment of the impacts of exploration on Occupational health and safety

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

Mitigations and recommendation to minimize health and safety issues

- As part of their induction, the workers should be provided with a safety awareness training on the risks of mishandling equipment and materials on site.
- When working on site, employees should be properly equipped with personal protective equipment (PPE) such as coveralls, gloves, safety boots, earplugs, safety glasses, etc.
- Workers should practice safety checks before each task, to ensure they are safe and ready to carry out tasks before they begin.
- No employee should be allowed to consume alcohol or other intoxicants prior to, and during working hours, as this may lead to mishandling of equipment, which results in injuries and other health and safety risks.
- Employees should not be allowed on site if under the influence of alcohol or any intoxicants.

7.3.7 Land Pollution/Soil Contamination Impacts

Exploration works result in soil disturbance which will leave the already exposed site soils vulnerable to erosion. This impact is probable because the proposed site is vacant (bare) with limited vegetation cover. Contamination of soils from sewage and mineral processing, extraction and recovery processes can also affect large areas of land if they occur. The impact can be rated as medium if no mitigation measures are implemented. However, with the implementation of mitigation measures, the impact significance will reduce to low. The impact is assessed in **Table 17** below and mitigation measures are provided below.

Table 17: Assessment of the impacts of exploration on soils/land

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/M - 2	L - 2	L/M - 2	L - 10

Mitigations and recommendation to minimize impact on soil

- Overburden material (if any) should be handled more efficiently during exploration operations to avoid erosion when subjected erosional processes.
- Prevent the creation of huge piles of waste rocks by performing sequential backfilling.

- 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 products(s) to the sites.
- An effective water quality monitoring program needs to be in place to attain surface and groundwater protection throughout the process.
- Potential water pollution needs to be prevented through identification of incidental sources of pollution such as accidental spillage, chemical or hydrocarbons.

7.3.8 Disturbance to Heritage/Archaeological resources

During exploration works, historical resources may be impacted through inadvertent destruction or damage. This may include the hidden or buried archaeological materials such as burial ground, graves or other archaeological/cultural objects. Therefore, it is recommended that Onsite personnel and contractors must be sensitized to recognize “Chance Finds Heritage” in the course of their works. The procedure set out here covers the reporting and management of such finds. The CFP covers the actions to be taken from the discovery of a heritage site or object to its investigation and assessment by a trained archaeologist. The CFP is intended to ensure compliance with the relevant provisions of the National Heritage Act (27 of 2004), especially Section 55 (4): *“a person who discovers any archaeological objects must as soon as possible report the discovery to the council”*.

Therefore, this impact can be rated as Medium to Low, if there are no mitigation measures in place. Upon implementation of the necessary measures, the impact significance would be rated as low. The impact is assessed **Table 18** below.

Table 18: Assessment of the impacts of exploration on archaeological sites

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	M - 3	M - 3	M - 6	M - 3	M – 36
Post mitigation	L/M - 2	L/M- 2	L/M - 4	L/M -2	L - 16

Mitigations and recommendation to minimize impact on archaeological sites

- Contractors working on the site should be made aware of items protected under the National Heritage Act, 2004 (Act No. 27 of 2004).
- Any items protected under the definition of heritage found during exploration works should be reported to the National Heritage Council.
- The Proponent should consider having a qualified archaeologist on standby/call during drilling and sampling phase and as required during the operational phase, to assist in the event of any archaeological discoveries.
- Identified graves or any archaeologically significant objects on the site should not be disturbed, but are to be reported to the project Environmental officer or National Heritage Council.
- The chance finds procedure as outlined in the EMP (**Appendix B**) must be always implemented.
- Detailed field survey should be carried out if suspected archaeological resources or major natural cavities/shelters have been unearthed during the exploration operations.

7.3.9 Noise and Vibrations

Prospecting and Exploration works (especially drilling) may be a nuisance to neighbours. Excessive noise can also be a health risk to site workers. However, the envisaged exploration equipment used for drilling and blasting on site is of medium size and the noise level is bound to be limited to the site only, and therefore, the impact likelihood is minimal. Without any mitigations, the impact is rated as of medium significance. In order to change the impact significance to a low rating, the recommended mitigation measures should be implemented. This impact is assessed in **Table 19** below.

Table 19: Assessment of the impacts of noise from exploration

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/M - 2	L - 2	L/M - 2	L - 10

Mitigations and recommendation to noise

- Noise from operations vehicles and equipment on site should be kept at acceptable levels. Any vehicles producing excessive noise should be taken for service/maintenance.
- The exploration operational times should be set such that, no mining activity is carried out during the night or very early in the mornings.
- Exploration hours should be restricted to between 08h00 and 17h00 to avoid noise generated by exploration equipment and the movement of vehicles before or after hours.
- When operating the drilling machinery onsite, workers should be equipped with personal protective equipment (PPE) such as earplugs to reduce noise exposure.

7.4 Assessment of Potential Negative Impacts: Decommissioning Phase

Impacts pertaining to the closure of the exploration program include loss of employment by workers at the exploration site, and missed opportunity for contribution to the national economy (revenue and royalties' payments). Another concern that stems from exploration program closure is the rehabilitation of the site.

7.4.1 Impacts associated with closure and decommissioning of exploration works

Rehabilitation of the site is a vital step in completing the process of exploration. If no rehabilitation is carried out after operations, the sites would experience detrimental effects. Any biodiversity loss and land degradation experienced on the sites may not be restored and the landscape will remain scarred. The impacts associated with rehabilitation are assessed in **Table 20**.

Table 20: Assessment of the impacts of mining activities closure on employment

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	M - 3	M/H - 4	M - 6	M/H - 4	M - 52
Post mitigation	L/M - 2	L/M - 2	L/M - 4	L/M - 2	L - 16

Mitigations and recommendation to minimize effects of loss of employment

- Dismantling and removal of campsites and associated structures from the project site and area

- Carrying away of exploration equipment and vehicles
- Removal of drilling casting, and/ or concrete plinths
- Cleaning up of areas and transporting the recently generated waste to the nearby approved waste management facility (as per agreement with the facility operator/owner).
- Backfilling of exploration pits and trenches and boreholes
- Levelling of stockpiled topsoil. This will be done to ensure that the disturbed land sites are left close to their pre-exploration state as much as possible.

8 RECOMMENDATIONS AND CONCLUSIONS

8.1 Recommendations

The key potential impacts associated with the proposed exploration program and its associated activities on EPL 7587 were identified and assessed. It is found that most of the identified potential negative impacts are rated with a Medium Significance. Therefore, in order to reduce the general significance of the project from medium to low, it is recommended that the Proponent effectively implements the mitigation measures, and continuously monitors their implementation, in order to attain and maintain an overall low significance. The negative impacts identified in this study can be avoided and minimised (where impacts cannot be avoided) by implementing the mitigation measures given under section 7 of this EA report, as well as those provided in the management action and monitoring plans provided in the Draft EMP.

8.2 Conclusion

The potential positive and negative impacts stemming from the proposed prospecting and exploration activities on the EPL were identified, assessed and mitigation measures made thereof. The mitigation measures and recommendations provided in this Environmental Assessment report and management action plans provided in the draft EMP, can be deemed sufficient to avoid and/or reduce (where impact avoidance is impossible) the risks to acceptable levels.

The Consultant is, therefore, confident that these measures are sufficient, and issuance of an ECC to the Proponent to enable exploration works on EPL 7587 would be appropriate under the suggested mitigation measures. However, the ECC should be issued on condition that the provided management measures and action plans are effectively implemented and monitored on site. Monitoring of the environmental components described in the impact assessment is to be conducted by the Proponent and/or applicable Competent Authority. This is to ensure that all potential impacts identified in this study and other impacts that might arise during the exploration program implementation are properly identified and addressed. Lastly, should the ECC be issued, the Proponent will be expected to be compliant with the ECC conditions as well as legal requirements governing mineral exploration and related activities.

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