ENVIRONMAENTAL IMPACT ASSESMENT STUDY FOR MINERAL EXPLORATION ATITIVIES ON EPLNO: 8777 HANTIES BAAI ERONGO REGION.

NOVEMBER 2022 PREPARED

FORTESS ENGENEERING CC

PREPARED BY:

NAMIB – ENVIRO CONSULTANTS

EXECUTIVE SUMMARY

Introduction

Overview

Exploration aims to discover deposits of minerals and rocks that can be used to meet the resource needs of society, such as industrial raw materials (limestone, sulphur), ores (copper, iron and zinc), gemstones (diamonds), and solid fuels (oil, coal and uranium) (White, 2005). Tess engineering cc (proponent), would like to explore in the in a withdrawn area in hanties bay erongo region. The proponent appointed Namib – Enviro Consultants to undertake the environmental impact assessment in order to obtain an Environmental Clearance Certificate for the activities listed from the office of Environmental Commissioner in the Ministry of Environment, Forestry and Tourism. This project will provide employment and contribute to the Namibian economy through foreign currency exchange.

Project location

The site area lies in along the skeleton coast ,40 km which extends from the Ugab River in the south for 500 km to the Kunene Riverin the north and about 38 km inland, alongside the C35 road drive. The proposed site is located within the areas of hanties baai C35road (figure 1), its geographical coordinates are latitude-22.0336 and 14.43333 longitude.

Environmental Assessment Requirements

Any large-scale project must undergo an Environmental Impact Assessment in accordance with the Environmental Management Act, Act 7 of 2007, the Environmental Impact Assessment Regulation (Government Gazette No. 30 February 2012), and Namibia's environmental assessment policy of 1995. As a result, in compliance with regulation 6 of the 2012 environmental regulations, an environmental clearance certificate must be requested for. The environmental consultant shall perform a public consultation process, create an environmental scoping study, and submit an Environmental Management Plan for the planned mineral exploration activities in accordance with regulation 21 of the 2012 environmental procedure.

Project alternatives

As an alternative to the projected mineral exploration activity, the area could be used for other revenue-generating industries such as tourism. Locals from adjacent towns and communities will be employed exclusively for the proposed project.

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1. Introduction

1.1 Project background

Exploration aims to discover deposits of minerals and rocks that can be used to meet the resource needs of society, such as industrial raw materials (limestone, Sulphur), ores (copper, iron and zinc), gemstones (diamonds), and solid fuels (oil, coal and uranium) (White, 2005). Tess engineering cc (proponent), would like to explore the site located in hanties baai in Erongo region. The proponent appointed Namib – Enviro Consultants to undertake the environmental impact assessment in order to obtain an Environmental Clearance Certificate for the activities listed from the office of Environmental Commissioner in the Ministry of Environment, Forestry and Tourism. This project will provide employment and contribute to the Namibian economy through foreign currency exchange.

1.1.2 Environmental consultant

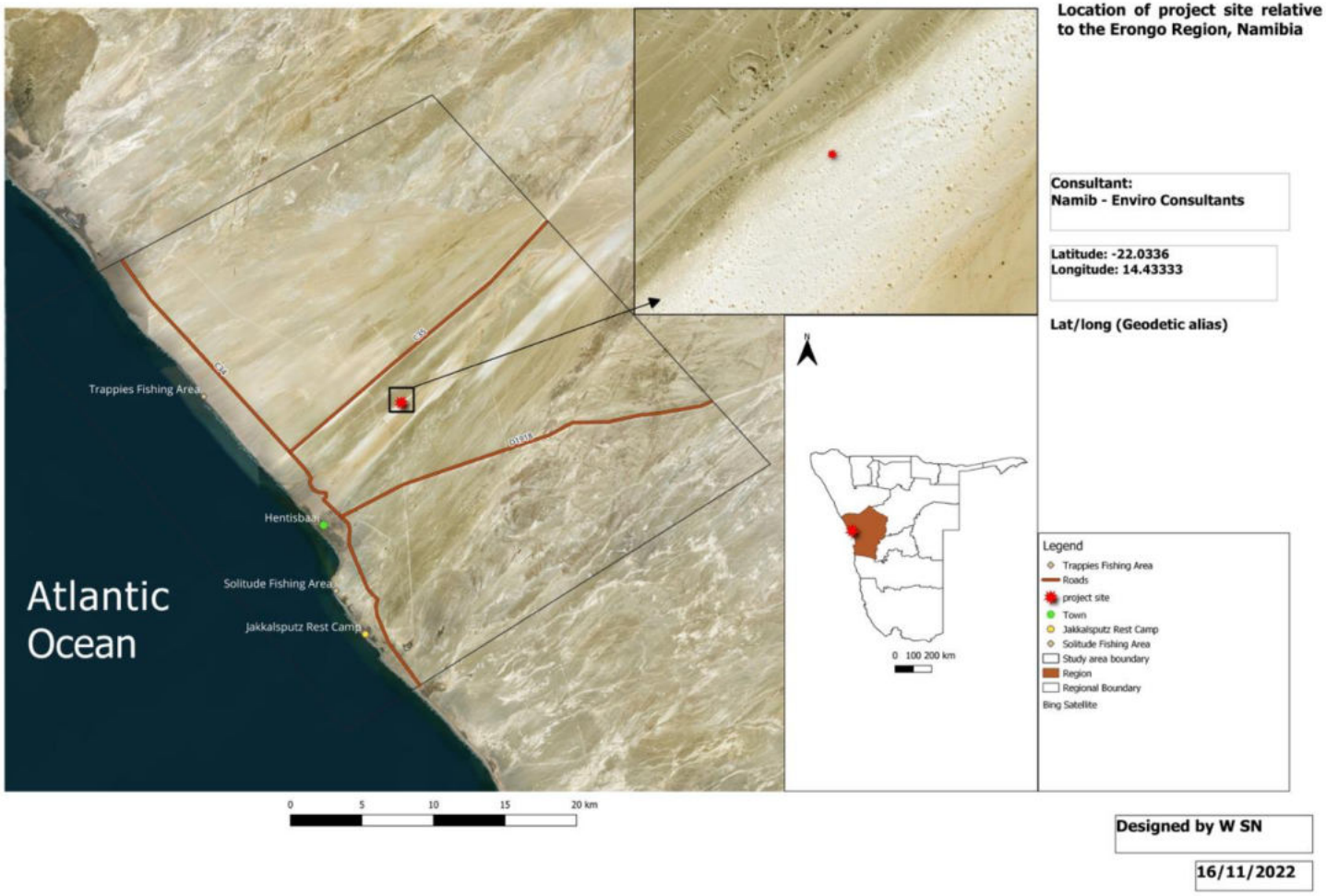
The proponent appointed Namib – Enviro Consultants to undertake the environmental impact assessment in order to obtain an Environmental Clearance Certificate for the activities from the office of Environmental Commissioner in the Ministry of Environment, Forestry and Tourism.

1.1.3 Proponent of the proposed project

The proposed of exploration activities Exclusive Prospecting License 8777 belongs to Tess engineering cc the site lies alongside the skeleton coast area.

1.2 Project location

The site is located in a withdrawn area in hanties bay erongo region, the EPL 8777 lies west of omaruru game park and east of national west coast tourism recreational area. the site covers.



Location of project site relative to the Erongo Region, Namibia

Consultant:
Namib - Enviro Consultants

Latitude: -22.0336
Longitude: 14.43333

Lat/long (Geodetic alias)

Designed by W SN

16/11/2022

Figure 1 Location of EPL 8777

1.3 Infrastructure and services

1.3.1 Electricity

Exploration process normally require less power, therefore the power required to undertake the activities will be catered by the proponents own generator /solar.

1.3.2 Water supply

The project's water requirements are minor. Water will be sourced from a borehole in the project's close surroundings. The water will primarily be utilized for drinking and cleaning.

1.3.3 Roads

The suitable road identified currently leading to the site is C34.

1.3.4 Storage of lubrication and consumables

All of the hydrocarbons will be stored in portable tanks/containers in a delineated section of one of the temporary waste storage areas, and they will be removed off the site on a regular basis to guarantee that the temporary tanks do not become overflowing.

1.3.5 Buildings

The proponent will erect temporary facilities and precautions will be taken to prevent the spreading of generated wastes of all kinds on and from the camping site.

1.3.6 Refuse and waste removal

Generated wastes will be stored in containers and collected on a regular basis and disposed of at a recognized disposal facility. In addition, temporary sanitary facilities will be provided by the proponent, and remove all generated wastes from the exploration site.

1.3.7 Security and fencing

No provision has been made for fencing although strict access to and from the exploration site will be facilitated by personnel.

1.3.8 IT systems and communication

Telephones or other form of electronic communications will be made available on site in case of emergencies, and for effective communication.

1.3.9 Fire fighters and emergencies

Connections to emergencies facilities like ambulance and municipality fire fighters will be provided on site in case of injuries.

1.4 Environmental impact assessment requirements

Any large-scale project must undergo an Environmental Impact Assessment in accordance with the Environmental Management Act, Act 7 of 2007, the Environmental Impact Assessment Regulation (Government Gazette No. 30 February 2012), and Namibia's environmental assessment policy of 1995. As a result, in compliance with regulation 6 of the 2012 environmental regulations, an environmental clearance certificate must be requested for. The environmental proponent shall perform a public consultation process, create an environmental scoping study, and submit an Environmental Management Plan for the planned mineral exploration activities in accordance with regulation 21 of the 2012 environmental procedure.

1.5 Purpose of the scoping report

The project's scope is confined to conducting an Environmental Impacts Assessment and filing for an Environmental Clearance Certificate for the exploration activities to be conducted. The scoping process identifies the issues that are likely to be most important during the EIA and eliminates those that are of little concern. The scoping process shall be concluded with the establishment of terms of reference for the preparation of an EIA, as set out by the Ministry of Environment and tourism. The purpose of this scoping report is to:

- Identify any important environmental issues to be considered before commencing with mineral exploration activities on the proposed mineral exploration sites.
- To identify appropriate time and space boundaries of the EIA study.
- To identify information required for decision-making.

As such, the key objectives of this scoping study are to:

- Inform the public about the proposed mineral exploration activities.
- Identify the main stakeholders, their comments and concerns.
- Define reasonable and practical alternatives to the proposal.
- To establish the terms of reference for an EIA study.

1.6 Terms of reference

The approach and methodology will be guided by the Environmental Regulations of 2012 and the Terms of Reference (ToR) which are provided by the proponent:

- Determine all laws and regulations that pertain to the planned project.
- Determine the area's environmental sensitivity by identifying existing environmental conditions (both biophysical and socioeconomic).
- Provide details of the proposed development to Interested and Affected Parties (I&APs) and relevant authorities, as well as a reasonable chance for them to participate in the process.
- Evaluate the development's possible environmental and social implications, as well as the significance of those impacts.
- Submit the final scoping report to the appropriate authority as well as the Environmental Commissioner.
- A Scoping Report that outlines all detected concerns and their consequences, as well as the path forward and any specialist investigations that may be required.

1.6.1 Environmental approach and methodology

The Environmental Impact Assessment (EIA) Regulations No. 30 of 2012, gazette under the Environmental Management Act (EMA), 2007, (Act No. 7 of 2007), and in accordance with the provisions of the Cabinet approved Environmental Assessment Policy for Sustainable Development and Environmental Conservation of 1995, govern the environmental assessment process in Namibia.

This report has taken into account all of the procedures for preparing all supporting documentation and filing an application for an Environmental Clearance Certificate with the Ministry of Environment and Tourism's Environmental Commissioner (EC), Department of Environmental Affairs (DEA) (MET).

The Scoping Phase's goal was to communicate the proposed project's scope to Interested and Affected Parties (I&APs), consider project alternatives, identify environmental (and social) aspects and potential impacts for further investigation and assessment, and develop terms of reference for specialist studies to be conducted in the Impact Assessment Phase if needed. The following are the steps conducted during the Scoping Phase.

1.6.1.1 Project Initiation and Screening

The project registered on the online ECC portal (eia.met.gov.na) to give notice of the start of the EIA process and to get clarification on the steps to take.

1.6.1.2 Initial Scoping Public Participation Process

The aim of the public scoping process was to ensure that interested and affected parties (I&Aps) were informed about the planned project, and that they were given a reasonable opportunity to register on the project database and offer initial comments. I&APs list was compiled using the contact details provided by the proponent. Over two weeks, advertisements promoting the planned project, public meetings, and I&APs registration / comment period appeared in two locally informative newspapers.

1.6.2 List of specialist studies undertaken

It is a norm to disclose all the tasks to be undertaken as part of the assessment process, including any specialist to be included if need be as stipulated in section 9(a) of the environmental regulations of 2012. At this juncture, the exploration project has not commenced yet, this implies that currently no field specific specialist studies were commissioned by the proponent, however a full environmental impact assessment will be conducted out with appropriate site-specific specialist studies on groundwater, air-quality, fauna, flora, archaeology and avifauna as exploration commences.

1.7 Need and desirability

1.7.1 Need of the exploration project

The exploration project could help Namibia achieve some of the objectives outlined in National Development Plans including the Fifth National Development Plan (NDP5) and the Harambee Prosperity Plan (HPP). The project will employ individuals from the local towns and

communities throughout the exploratory phase. If the exploratory project results in the finding of a commercially viable mineral deposit, a mine could be built in the area. A mine can make a substantial contribution to the social and economic development of the town.

2. Summary of applicable legislation

Table 1 A summary of some Legislation applicable to the proposed development

Legislation/Policies	Relevant Provisions
The Constitution of the Republic of Namibia as Amended	Article 91 (c) provides for duty to guard against "the degradation and destruction of ecosystems and failure to protect the beauty and character of Namibia." Article 95(l) deals with the "maintenance of ecosystems, essential ecological processes and biological diversity" and sustainable use of the country's natural resources.
Environmental Management Act No. 7 of 2007 (EMA)	Section 2 outlines the objective of the Act and the means to achieve that. Section 3 details the principle of Environmental Management
The Minerals Prospecting and Mining Act of 1992	The Minerals Prospecting and Mining Act No.33 of 1992 approves and regulates mineral rights in relation to exploration, reconnaissance, prospecting, small scalemining, mineral exploration, large-scale mining and transfers of mineral licenses.
EIA Regulations GN 28, 29, and 30 of EMA (2012)	GN 29 Identifies and lists certain activities that cannot be undertaken without an environmental clearance certificate. GN 30 provides the regulations governing the environmental assessment (EA) process.
Nature conservation ordinance, ordinance No. 4 of 1975	The Nature Ordinance 4 of 1975 covers game parks and nature reserves, the hunting and protection of wild animals (including reptiles and wild birds), problem animals, fish, and the protection of indigenous plants.
National Heritage Act, 2004 (Act No. 27 of 2004)	Act provides 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.
Water Act No. 54 of 1956	Section 23(1) deals with the prohibition of pollution of underground and surface water bodies.

Labour Act no 11 of 2007	Chapter 2 details the fundamental rights and protections. Chapter 3 deals with the basic conditions of employment.

3. Description of the proposed exploration project

3.1 Introduction

Mineral exploitation in Namibia is a substantial industry that employs a huge number of people and contributes significantly to the national economy. When it comes to minerals, Namibia is well-diversified. Because mineral rights are vested in the state, the government of Namibia is the regulating agency for all minerals being exploited (Mansfeld, 2006). In Namibia, there are various alternatives for exploration or mining, and several application channels must be followed in order to comply with the legislation (MIT, 2003).

After South Africa, Ghana, Tanzania, Zimbabwe, and Zambia, Namibia's mining sector is the sixth largest in Africa. Minerals account for roughly 15% of Namibia's GDP, the sector is the largest contributor to the country's GDP, and mining products account for up to 50% of Namibia's yearly export revenues. The mining industry directly employs about 10,000 people (Bendi, 2003). The project will not only improve the community's livelihoods, but the proponent will also depend on the revenue that will be generated.

3.2 Techniques for mineral exploration

According to Hentschel, Hruschka, & Priester (2002), several approaches can be used by geoscientists during the exploration process to discover acceptable areas and assess the depth and shape of the ore deposit. Among them are:

- Creating and reviewing geological maps. Geologic maps show the locations of different types of bedrock (bedrock is the rock that is closest to the surface), give exploration geologists hints as to what geologic processes acted in a given area and suggest how rocks are distributed at depth. Maps help geologists compare an area with other sites that have yielded highly concentrated ores in the past.
- Visiting a potential mine site and completing field studies, which might entail additional geological mapping, surface rock sampling, and/or chemical analyses of rock, soil, and water samples.
- Performing "non-invasive" studies to obtain underground information. These studies are similar to someone using a metal detector to find discarded coins on a beach. The larger-scale geophysical studies used by mining companies may include seismic, gravity, magnetic, or other surveys.
- Drilling down through the surface to obtain samples at depth. Hollow drills are used that bring cores (long cylinders of rock) to the surface.

For this project exploitations techniques are yet to be identified.

4. Description of the current environment

4.1 Introduction

This subsection tries to describe the current state of the environment, the potential impact of planned modifications, and ongoing monitoring to detect environmental changes. Minerals abundant in the central desert connected to namib coastal area, including diamonds and other gems. The Atlantic Ocean, with sandy and pebble beaches, sand dunes, ephemeral riverbeds and canyonsto rugged canyons with walls of richly coloured volcanic rock and extensive mountain ranges (Hutton & Palfi, 2003).

From north to south, communal conservancies Marienfluss, Orupembe, Sanitatas, Okondjombo, Puros, Sesfontein, Torra, Doro!nawas, and the Palmwag tourism concession area share the park's whole eastern border. The land to the east of the park is zoned and maintained to protect animals. The costal area and neighbouring national parks area the major section of this magnificent complex of protected areas, comprising ecological and geographical characteristics of the Northern Namib Desert. The park has a high level of biodiversity that is important on a national,regional, and worldwide scale. The Northern Sand Sea, other dune fields of the park, and the littoral zone have high levels of speciation and endemism in lichens and vascular plants, a highly diverse avifauna and an unusual assemblage of large mammals for such a hyper-arid park, and unique invertebrate diversity, but there are a number of other species or groups of species that are also very important (MEFT, 2021).

The site location is along side The Skeleton Coast National Park which is bordered on the west by the Atlantic Ocean, with the coldBenguela current bringing a wealth of marine life. Most tourists are unable to access the shoreline, which is littered with shipwrecks. The desert ecosystem is sustained by natural springs, whereas the huge Kunene River is an annual river that defines the northern boundary with Angola. In the park, the Hoarusib, Ugab, and Uniab rivers are also major living systems (MET, 2007).

4.2 Climate conditions

4.2.1 Temperature

According to MEFT (2021), the Namib Desert's coastal climate is mostly affected by the cold Benguela Current and the South Atlantic Anticyclone. Temperatures are generally moderate (average minimum and maximum temperatures reflect a range of around 7 to 32 ˚C during the coldest and hottest months, respectively), and fog is common (about 125 days per year on the coast dropping to about 40 days per year 80 km inland).June is the coldest month of the year,

with an average night time temperature of 20°C. Khorixas, which is close to the project area, has various seasons with varying temperatures throughout the year.

4.2.2 Precipitation

The park as a whole falls below the 100 mm isohyet, and much of it falls below the 50 mm isohyet. Aside from the unusually low yearly rainfall, the rainfall is also exceedingly erratic, with annual coefficients of variation ranging from 80 percent to over 100 percent on average. The park has an average water deficit of roughly 2 m per year due to high evaporation rates and minimal rainfall. The rainy season is from January through March. In the Namib Desert, the importance of fog as a source of water is well-known, and many species rely on and have evolved to fog water usage and harvesting.

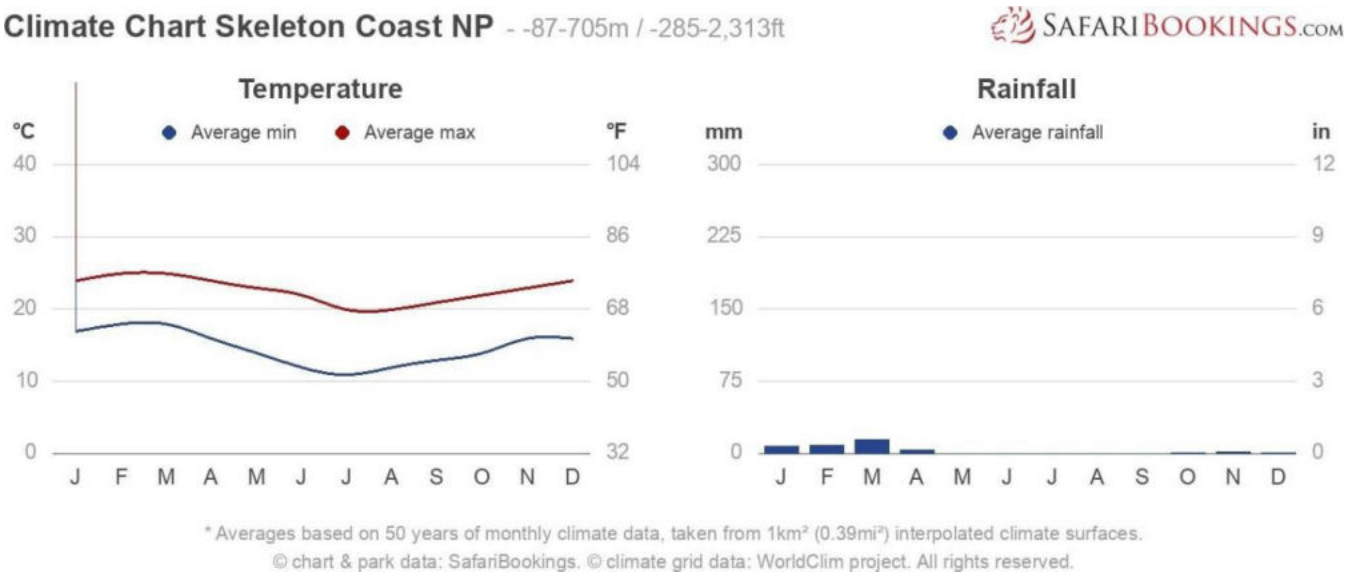


Figure 2 Weather chart in the skeleton coast park

4.2.3 Wind

The wind blows almost continuously. The southwest wind blows an average of 300 days/annum at up to 60 km/h, and peaks in the early summer months from October to December. Due to the hilly terrain, the Khorixas area is vulnerable to unpredictable winds andsignificant variations despite short distances. These winds push the Benguela Current northward, transporting sand from the beach to nearby land and causing upwelling along the coast, bringing nutrient-rich waters to the surface.

4.2.4 Humidity

The humidity is observed to be >80% during most months, and is significantly lower at 75% during the summer months. Because the cool, dry air cannot rise high enough over the coast to

produce genuine rain clouds, precipitation frequently condenses primarily as fog and low clouds. Fog occurs 75 to 100 days per year with mornings and evenings being the most common times. The Kunene shore gets about 5 to 6 hours of sun every day on average.

4.3 Air quality

Emissions and dust from automobiles traveling on gravel roads, and wind erosion from exposed places are all possible sources of air pollution in the area. It was observed that the air quality in proposed area is good.

4.4 Geology

The geology is clearly apparent. Time and nature have fashioned a sand and rock dreamscape. Mica schists, gneiss, and granites date back over a billion years. The SCNP's Damara Super group granites and gneisses form the deep root zone of a north-south-trending Alpine-type mountain belt that formed 550 million years ago during continental collision and amalgamation, resulting in the formation of Gondwana, the southwestern part of the old supercontinent Pangaea. Terrace Bay still has the remnants of previous lava flows. Today, roaring dunes, clay castles, and beaches gleam with wind-polished stones can be found.

(Special study)

PRELIMINARY REPORT ON THE CAPE CROSS - UIS PEGMATITE FIELD

Numerous Sn- and Nb-Ta-rich pegmatite bodies are present in a NE-trending, approximately 20 km wide zone, consisting of schistose Damara metasediments and granites, in the area between Cape Cross and Uis. Structural analysis led to the recognition of the Cape Cross - Uis pegmatite field as a graben structure. Emplacement of stanniferous pegmatite bodies was structurally controlled by graben-related, en echelon Riedel-fractures. Three major pegmatite swarms, Uis, Strathmore and Karlowa, are located in clearly defined N-S trending, fracture-bounded zones. Significant Sn, Nb and Ta mineralization occurs in replacement units showing intensive albitization and greisenization.

Detailed mapping and structural analysis suggests a younger age than previously postulated for the mineral- ized pegmatites. A possible Jurassic - Cretaceous age of mineralization is discussed.

INTRODUCTION

The “Northern Tin Belt” of SWA/Namibia, as defined by Gevers and Frommurze (1929), forms a NE-trending zone extending from Cape Cross to an area north of Uis, near the Brandberg complex (Fig. 1). This area is more accurately described as the Cape Cross - Uis pegmatite field. This report presents some preliminary observa- tions on the field relationships and structural setting of economically interesting stanniferous pegmatites in this area.

North-east of Henties Bay, highly metamorphosed rocks of the Tsaun Formation, Nosib Group, are exposed. Metasediments of Damaran age, belonging to upper and lower Swakop Group, consist of biotite-muscovite schist, quartz-feldspar schist, knotenschiefer, quartzite, calc-silicate, marble and tourmalinite.
This succession is of eugeosynclinal character (Martin, 1980; for the plate tectonic setting see Miller, 1983) and the present lithotypes originated from regional metamorphism dur-ing the Pan-African.

Three major folding phases were active (Botha *et al.*, 1974c). The metasediments were intruded by a suite of granites, representing syn- and late- to post-tectonic phases of igneous activity. Various types of granitoid rocks occur, but most are generally muscovite poor/bi-otite rich. Most of these granitoids belong to the Salem granite suite of Miller (1973) and Botha *et al.*, (1974a). Predominant rock types are foliated biotite granites, two mica granites, tourmaline-garnet granites and unfo-liated leucogranites. In addition a red biotite granite of the Sorris-Sorris type, as described by Martin (1965), is also recognized.

A wide range of syn- and post-tectonic pegmatites in-truded the Damara sediments. These pegmatites have been prospected for Sn, Nb, Ta, Li, Be and REE since the early years of this country.
Two tin mines are situ- ated in the Northern Tin Belt: the Uis mine and the de-funct Strathmore mine.
During late Jurassic to early Cretaceous the Damara metasediments were intruded by swarms of dolerite dykes and a dolerite cone sheet which occurs some 10 km north of Uis.
Igneous activity during the early Cretaceous is at- tested to by the alkaline to peralkaline granitic and gab-broic ring complexes of Brandberg, Messum and Cape Cross

1. STRATIGRAPHY

Rocks of the Nosib and Swakop Groups occur in the area investigated. Descriptions of the stratigraphy are given by Gunter (1970), Koornhof (1970), Tordiffe (1970), Van Reenen (1970) and Botha *et al.* (1974b and c).

1.1 Nosib Group

Rocks of the Nosib Group occur in an area some 50 km ENE of Cape Cross (Fig. 1) and consist of a quartz-feldspar gneiss sequence with subordinate amphibolite and biotite-cordierite schist, granulite and conglom- erate (Botha *et al.*, 1974b). This sequence has been named the Tsaun Formation; it is characterized by high grade regional metamorphism of cordierite-amphibolite facies (Botha *et al.*, 1974b). It is difficult to determine the exact stratigraphic position of the Tsaun Forma- tion and Botha *et al.* correlated it with the Abbabis and Huab Complexes. A Nosib age of the Tsaun Formation (Botha, 1978) and correlation with the Khan and Naau-wpoort Formations was suggested by Jacob and Kröner (1977). Structural investigations and detailed mapping show that the northern contact between Tsaun Forma- tion

and Khomas schist (including intrusive Damara granites) is of a tectonic nature. At the western contact Khomas schist and granites are downthrown against rocks of the Tsaun Formation by a significant N-S strik-ing fault, along which intense brecciation occurred. Thin, concordant marble horizons are limited to the south-western portion of the Tsaun formation

Swakop Group

Marbles of the Karibib Formation are usually ex- posed in inselbergs, that occur on the southern side of a NE-trending fault extending between Uis and the At-lantic Ocean.

Sediments of the Khomas Subgroup are widespread in the Cape Cross-Uis pegmatite field, and are highly de- formed and metamorphosed (upper greenschist facies, Botha *et al.*, 1974c). The Kuiseb Formation consists of a monotonous, schistose-quartzitic succession with interbedded marbles, calc-silicates and tourmalinites. The schistose sequence contains biotite schist, quartz- feldspar schist, muscovite schist and knotted schist (knotenschiefer). Botha *et al.* (1974c) estimated a total thickness of about 2 000 m for the Khomas sediments in this part of the Damara Orogen. Khomas schist oc- curs in a zone extending from NE of Uis to the Atlantic coast around Cape Cross (Fig. 1). Exposure is good in the north-eastern portion of this zone, but the rocks are increasingly covered by sand and calcrete towards the south-west.

Karoo Sediments

A small occurrence of greyish siltstone, located some 10 km south of Uis, is a relict of formerly more exten- sive Karoo sediments. north-east trending lineation parallel to the Cape Cross

- Uis pegmatite field (Fig. 1). The Cape Cross and Mes- sum complexes are respectively gabbroic and alkaline intrusions. The Brandberg complex consists of horn- blende, aegirine, and arfvedsonite granites (Cloos and Chudoba, 1931).

1.3 Karoo dolerites

Karoo to post-Karoo intrusives also include numer- ous dykes of basaltic composition. These dolerite dykes are regarded as fracture fillings and feeders for basalt lava flows. The dykes have preferentially intruded N-S and NE-SW orientated faults and fracture zones, cross-cutting the fabric of sedimentary rocks. Olivine-, augite- and quartz-dole rites can be distinguished pet- rographically. A conspicuous cone-sheet, with sill-like portions, is present north of Uis. This is interpreted as a ring fracture (that was subsequently injected with doler-itic magma), indicative of a deepseated igneous body.

Due to the preferred northerly orientation of dolerite dykes a relationship between Gondwanaland breakup and dolerite intrusion is postulated by Botha and Hodg-son (1976).

2. STRUCTURAL GEOLOGY OF THE CAPE CROSS-UIS PEGMATITE FIELD

From detailed field investigations and use of Land- sat imagery and aerial photographs the Cape Cross-Uis pegmatite field is interpreted as a graben structure, with typical wedge-block subsidence. Shoulder uplift is dis-tinctly recognisable along a NE-trending lineament, representing the southern graben fault. In the central portion of the study area the southern graben fault cuts a reverse fault and downthrows Khomas schist against Karibib marble. Movement on the southern graben shoulder increases towards the SE, where Kho-mas schist is downthrown against metasediments of the Tsaun Formation. An isolated occurrence of Nosib metasediments and volcanics in this part of the Damara orogen is considered as an uplifted horst block. In the sand covered areas near the Atlantic Ocean, shoulder uplift of the graben is delineated by the outcrop of mar-ble and a distinctive magnetic anomaly.

The northern graben fault is clearly recognisable only in the area NW of Uis, where the fault is marked by a highly weathered and kaolinized mylonite-zone in late tectonic granite, accompanied by a NE-striking and SE-dipping granite dyke. Recognition of the north-ern graben fault is complicated by lack of outcrop, but an indication of its position is given by a NE-trending drainage system.

The fabric of faults and joints related to graben for- mation during the Damara has been modified by later tectonic activity. In post-Damaran times the region was subjected to intensive block faulting, and NW-SE striking faults have displaced the graben into many seg- ments. Moreover, the entire graben fault system was re-activated in Karoo and post-Karoo times. Post-tectonic Damaran granites which had intruded along zones of weakness were sheared and affected by temporary re- activation of the deep-seated faults. Open fractures and faults were filled by dolerite magmas and used as feeder dykes for lava flows.

The latest tectonic event, of Jurassic-Cretaceous age, resulted in N-S striking deep-seated tensional faults, some of which were subsequently intruded by dolerite. Faults with vertical movement are usually downthrown to the west, and may display brecciation. Strong move-ment took place along a prominent N-S trending fault in the Strathmore area, where Khomas schist and late- tectonic Damara granites were downthrown against the Tsaun Formation. Gossans and silicified breccias, with AI and Mn mineralization, are associated with these vertical faults. It is suggested that these faults are deep-seated and, consequently, enabled hydrothermal con- vection in post-Karoo times.

3. PEGMATITES

3.1 Genera

Numerous pegmatites, of varying composition, occur within the schistose zone (approximately 120 x 20 km) of the Cape Cross - Uis pegmatite field.

Four types of pegmatite can be distinguished min- eralogically. A preliminary classification based on their index minerals/rare metal content is as follows:

(i) Cassiterite pegmatites

(ii) Niobium-tantalum-rich pegmatites (tantalite, co-lumbite)

(iii) Lithium-rich pegmatites (amblygonite-spo-dumene-petalite)

(iv) Simple, quartz-feldspar-schorl pegmatites.

Types (i) and (ii) occur either as single, narrow (0.3 m - 3 m wide), dyke-like bodies with a north-easterly strike, or as swarms of large pegmatite bodies with an east-north-easterly strike.

Types (i) and (ii) are unzoned. (The pegmatite mined at Uis is "typical of type (i)).

The majority of the cassiterite and niobium-tantalum-rich (Nb-Ta) pegmatites displays the effects of a char- acteristic phase of Li-Na-K mineralization (Von Knor-ring, 1985) and varying degrees of feldspar replacement by saccharoidal albite. Many albitized portions of the pegmatite bodies carry significant Sn and Nb-Ta miner-alization. In pegmatite that is intensively albitized cas- siterite and columbite-tantalite occur patchily as dark- brown to black grains, 0.1 - 0.5 cm in diameter.

Greisenized pegmatite occurs sporadically, forming distinct bands or schlieren of fine-grained altered rock with no preferential orientation. Within these greisens cassiterite may occur as bands up to 1 cm wide, with associated secondary, fine-grained quartz.

Type (iii): Many of the pegmatites of the Cape Cross

- Uis pegmatite field contain significant amounts of lith- ium minerals. These may be classified as amblygonite, spodumene and petalite pegmatites in accordance with London and Burt (1982). Li-rich pegmatites, with well developed zoning and quartz cores, are exposed in the Strathmore area (e.g., Petalite Mine) and occur together with cassiterite pegmatites in a N-S trending swarm. Li-rich pegmatites, with spodumene as the dominant Li- mineral, are present in the central part of the study area (e.g., Karlowa claims).

Nb-Ta mineralization may occur in Li-rich pegma- tites, concentrated in greisenized and albitized units. The Uis pegmatite swarm contains only a few distinct Li-rich pegmatites, but accessory petalite does occur in many of the cassiterite pegmatites.

Type (iv): In the Cape Cross-Uis pegmatite field small, schlieren-like, foliated, non-stanniferous pegma- tite bodies are the most widespread. These are less frac-tionated than the other pegmatite types

and consist of quartz, feldspar and schorl, with very small amounts of muscovite. Such pegmatites usually occur within Damaran granites and near their contacts with Khomas schist. In a few cases they are associated with second- ary copper mineralization.

Another type of non-stanniferous pegmatite occurs as discordant arid concordant bodies in metasediments of the Tsaun Formation. The discordant pegmatite bodies are reddish in colour, unfoliated and consist essentially of quartz and microcline with accessory albite, musco- vite (in many dykes also biotite), and magnetite. Cas- siterite and Nb-Ta-rich pegmatites have not been found in the Tsaun Formation.

4. Structural Analysis of the Cassiterite and Nb-Ta-rich Pegmatites

Detailed mapping and structural investigations indi- cate that the occurrence of cassiterite and Nb-Ta-rich pegmatites is limited to a schistose, NE-trending graben zone from Cape Cross to Uis. Three main pegmatite swarms, viz. Uis, Strathmore and Karlowa (Fig. 2 and 3), have intruded pre-existing zones of weakness result-ing from intensive block-faulting and shearing. Struc- tural analysis of the pegmatite swarms illustrate the tec-tonic structure, especially in terrains of predominantly schistose rocks to be typical en *echelon* Riedel frac- tures. These occur in N-S striking zones and apparently acted as traps for pegmatitic melts. However, a number of isolated pegmatite bodies are situated parallel to the NE-trending tectonic fabric and dip towards the graben centre. These bodies cut across both the fabric and the foliation of the metasediments. North of the Karlowa swarm some pegmatite bodies have intruded anticlinal structures.

Structural analysis demonstrates that pegmatite swarms are located in significant, N-S orientated, frac- ture-bounded zones, within which pegmatite emplace- ment has been controlled by ENE-trending Riedel frac-tures.

With one exception, limited movement occurred along the N-S fractures, and it is suspected that they are of tensional origin. Many N-S fractures transgress dolerite dykes, indicating a post-Karoo age.

One N-S striking fault in the Strathmore area has a major vertical displacement. Khomas schist, on the western side of this fault, has been downthrown against older sediments of the Nosib Group. This fault also displaced dolerite dykes, thus attesting to post-Karoo movement

4.1 Age of Pegmatites and Sn-Nb-Ta Mineralization Cassiterite and Nb-Ta-rich pegmatites in the Cape Cross-Uis pegmatite field have been related to late- and post-tectonic Damaran granites by Koornhof (1970), Gunter (1970), Van Reenen (1970), Tordiff(19m

andothers.

Many of the cassiterite, Nb-Ta-rich and Li-rich pegm-atites investigated in this study, specifically those well exposed in the Strathmore swarm, display mutuallycross-cutting relationships with dolerite dykes.

Where dolerite transgresses a mineralized pegmatite body, the massive dolerite is completely altered and ka- olinized to a soft, brownish mass, whereas dolerite em- placed in schist or in Damaran granites is fresh and un- altered. The contact between calc-silicate horizons and pegmatites may also exhibit intense alteration. There are three possible interpretations for these features:

(i) Dolerite emplacement took place during consoli- dation of the pegmatites.

(ii) The pegmatite was emplaced after the dolerite, consequently reaction between the wallrocks and the pegmatitic liquids (melt) resulted in alteration of dolerite.

(iii) A late (hydrothermal?) phase has affected both in-trusive rocks.

The first two interpretations would implify a Jurassicto Cretaceous age of the cassiterite, Nb-Ta-rich and Li-rich pegmatites, and would refute a genetic rela- tionship with the late to post-tectonic Salem granitoid suite. The third interpretation suggests that post-Karoo (hydrothermal?) fluids, controlled by the N-S trending tectonic features, were responsible for late replacementprocesses in pre-existing pegmatites.

In a postulated case of a Jurassic-Cretaceous age the post-Karoo alkaline granites are most suitable as a pos-sible source for cassiterite and Nb-Ta-rich pegmatites with well developed Li-Na-K phases. These post-Ka- roo alkaline granites exhibit A-type affinities, and Gins- burg *et al.* (1979) observed that many Li and Y, Nb, Be, F-enriched pegmatites occur in areas of anorogenicalkaline fractionation. Concerning the third hypothesis,Černý (1982) pointed out that the problem of an open or closed system of pegmatite crystallization is still un-der discussion, with alternatives ranging from strictly closed to open for late generation of mineralizing flu- ids. Finally, samples of different pegmatite bodies havebeen collected for age determination.

4.5 Hydrogeology and water resources

Several springs provide vital water to skeleton coast allowing large creatures to travel further west than they might otherwise. The majority of springs are generated by water being forced to the surface along faults in the underlying rock formations, although other springs are formedby water being driven to the surface along faults in the underlying rock formations. The Kunene River's mouth provides a critical habitat for a variety of birds, fish, turtles, and other species.

4.6 Fauna

The fauna of the skeleton coast has become specially adapted to the unique and severe

physiographical characteristics of the area. Whilst some species are endangered or even on the Red Date Species list and that reason are protected, all species in the park deserve full protection as they have managed to adapt to this extremely hostile environment.

4.6.1 Invertebrates and vertebrates

It is known that the dune fields in the skeleton coast park hold a number of endemic *Tenebrionid* beetles, scorpions and arachnids. Regarding reptiles, the desert plated lizard *Gerrhosaurus skoogi* deserves special mention. Endemic to the Northern Namib this species is the dominant lizard species inhabiting the dune systems of the Northern Namib and dune slip faces in particular. Mammals in the fog zone of the Namib Desert include permanent residents such as the conspicuous oryx (*Oryx gazella*), springbok (*Antidorcas marsupialis*), black-backed jackal

(*Canis mesomelas*), brown hyena (*Hyaena brunnea*), and the Cape fur seal (*Arctocephalus*

Common name	Scientific name	Red Data Status
Jackass Penguin	*Spheniscus demersus*	Critically endangered
Great Crested Grebe	*Podiceps cristatus*	Critically endangered
White Pelican	*Pelecamus onocrotalus*	Endangered
Cape Gannet	*Morus capensis*	Endangered
Crowned Cormorant	*Phalacrocorax coronatus*	Endangered
Black Stock	*Ciconia nigra*	Endangered
Marabou Stork	*Leptoptilos crumeniferus*	Vulnerable
Glossy Ibis	*Plegadis falcinellus*	Vulnerable
Greater Flamingo	*Phoenicopterus ruber*	Endangered
Lesser Flamingo	*Phoeniconaias minor*	Endangered
Egyptian Vulture	*Neophron percnopterus*	Critically endangered
Tawny Eagle	*Aquila rapax*	Vulnerable
Bateleur	*Terathopius ecaudatus*	Endangered
African Fish Eagle	*Haliaeetus vocifer*	Vulnerable
Martial Eagle	*Polemaetus bellicosus*	Vulnerable
African Black Oystercatcher	*Haematopus moquini*	Vulnerable
Chestnut Banded Plover	*Charadrius pallidus*	Vulnerable

pusillus), in addition to the several small burrowing mammals such as gerbils (*Gerbillus* spp.) and whistling rats. The other mammal species are largely seasonal or occasional residents. The park supports a small population of African lions (*Panthera leo*) that are adapted to the harsh hyper-arid conditions.

4.6.2 Avifauna

In total, 314 bird species have been recorded in the park, accounting for 46.7 percent of Namibia's total number of indigenous bird species. The condition of the Damara Tern, which is essentially endemic to Namibia and breeds in summer on broad sandy or gravel plains, inter-dune valleys, and salt pans, is of special concern among the park's bird species. There are 21 red Data Species among them. As shown in Table 2, three of those species are highly endangered, while the remaining ten are vulnerable.

Table 2 Red Data Species occurring in the coastal area(including the neighbouring parks) *(MEFT,*

Hartlaub's Gull	*Larus hartlaubii*	Vulnerable
Caspian Tern	*Hydroprogne caspia*	Vulnerable
Swift Tern	*Sterna bergii*	Vulnerable
Damara Tern	*Sterna balaenarum*	Endangered

4.7 Flora

The site is located in the skeeton coast Plants in the area have adapted to survive by acquiring, retaining, and storing atmospheric moisture through a variety of creative adaptations. Succulents, grasses riverine growth, and lichens are among them, as are colonies of *Welwitschia mirabilis*, whose distribution in Namibia is centered in the southern part of the area; *Acanthosicyos horridus* (! Nara); and succulents, grasses riverine growth, and lichens.

The park thus holds 32.2% of the 174 known lichen species recorded in Namibia. *W. mirabilis* is one of the few endemic and also keystone plant species that has been extensively mapped in the park. Another important Namib Desert plant endemic is the !nara *Acanthosicyos horridus* that is never very abundant but widely distributed in skeleton coast along dry riverbeds and dune fields including the Kunene Sand Sea.

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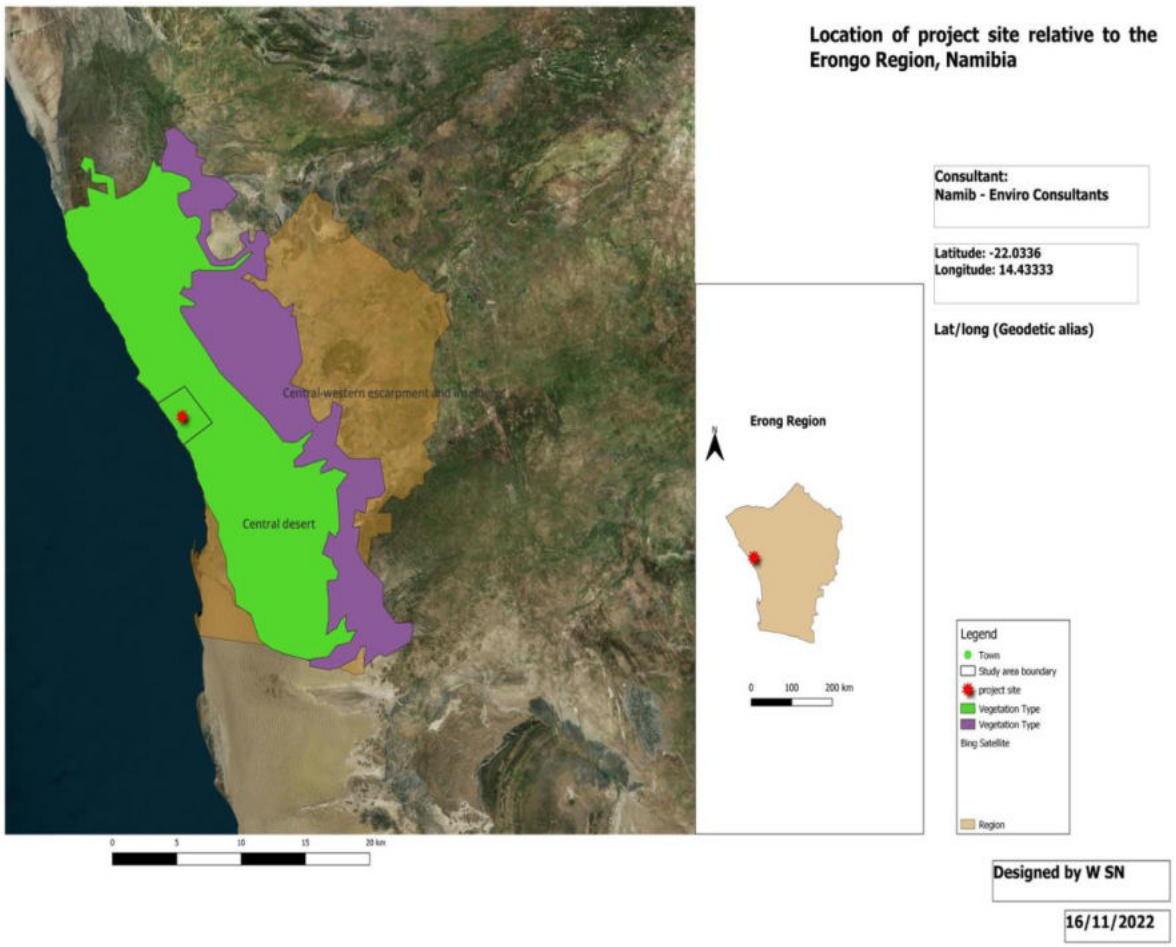
Location of project site relative to the Erongo Region, Namibia
Consultant:
Namib - Enviro Consultants
Latitude: -22.0336
Longitude: 14.43333
Lat/long (Geodetic alias)
Central-western escarpment and inselberg
Central desert
Erong Region
0 100 200 km
Legend
Town
Study area boundary
project site
Vegetation Type
Vegetation Type
Bing Satellite
Region
0 5 10 15 20 km
Designed by W SN
16/11/2022

Table 3 A table showing some plant species which occur in the

Endemic to the area
Hermbstaedtia spathulifolia
Euphorbia pergracilis
Euphorbia rimireptans
Indigofera anabibensis
Asystasia welwitschia
Blepharis ferox
Crassothonna agaatbergensis
Acanthosicyos horridus
Welwitschia mirabilis
Acanthosicyos horridus
Protected species
Acacia erioloba

Sterculia Africana
Boscia albitrunca
Albizia anthelmintica
Other notable species
Sarcocaulon mossamendense
Adenia pechuelii
Arthraerua leubnitziae
Salsola nollothensis
Stipagrotis ramulosa
Eragrotis cyperoides
Brachiaria psammophila
Tamarix usneoides
Colophospermum mopane
Combretum imberbe
Salvado persica
Faidherbia albida
Balantines welwitschii
Typha capensis
Phragnmites australis
Schoenopletus littoralis
Teloschistes capensis
Santessonia hereroensis
Caloplca indurata
Xanthoparmelia spp.
Parmelia hueana

Figure 3 Vegetation type of the dominant species at the proposed site

4.8 Archaeology and heritage sites

While many archaeological sites have been discovered along the Namibian coast, some of which provide evidence of long-term coastal occupation, many of these are regarded as "lucky finds," because the chances of artefacts surviving long enough to be discovered are extremely poor (Raison, 2016). As a result, there are just a few known archaeological sites with exceedingly old artefacts. At this time, it is unknown whether the exploration will yield any significant archaeological finds; however, an incidental find strategy may be required. Work must be suspended immediately if any heritage or culturally significant artefacts are discovered during construction, and the Namibian National Heritage Council must be notified.

4.9 Socio-economic environment

Currently accounts for a significant amount of Namibia's GDP, and tourism is only second in terms of economic importance to mining. However, tourism generates a small amount of revenue along the Kunene coast. Coastal Kunene could undoubtedly earn much more with smart, bold planning, enhancing the livelihoods of people in the region while also preserving the coast's stunning and pristine ecosystem (Mendelsohn, Jarvis, Roger, & Roberstson,

2012).Agriculture is unviable due to insufficient water and soil fertility. Because of the high-energy character of the coast, aquaculture has limited potential, and considerable development of recreational line fishing would be unsustainable because these coastal waters serve as breeding sites for many species that eventually migrate as adults to other parts of Namibia's coast.

4.10 Soils

The presence of three types of very fragile soil surface layers or crusts, which cover a substantial portion of the park and are very vulnerable to disturbance, is one factor to note here that is of high value to park management.

1.10.1 Abiotic soil crusts

Abiotic soil crusts result from evaporation exceeding precipitation in arid environments. Gypsum on the plains and salt on the pans and at water seepages are the two most common soil crusts in the park (and generally saline soils with variable degrees of salt crust formation in many places in the Central Namib).

1.10.2 Biological soil crusts

Lichens, mosses, green algae, micro-fungi, and cyanobacteria form biological soil crusts, which combine soil particles into a crust. Small crustose lichens and algae are connected withcoarse sand and gravels in large portions of the park, although biological soil crusts are not known to be present in the form of the more thick and defined lichen fields found in central desret. On alluvial fan deposits next to the Hoarusib, Khumib, and SechumibRivers and their historic tributaries, and on hillsides along the eastern edge of the Skeleton Coast Park, lichen-dominated soil crusts ranging from thick and diversified communities can be found.

1.10.3 Desert pavement

A large portion of the area is made up of gravel plains that represent an ancient Pleistocene erosion platform that hasn't been altered by anything other than in-situ wind erosion and chemical accretion and deposition, mostly from marine and fog sources, and in fact several successive erosion platforms. The third extremely sensitive feature of the skeleton coat substrates are ancient gravel and pebble13 deposits that represent an ancient landscape of Pleistocene age (up to 2.7 million years old) and represent an ancient landscape of Pleistocene age (up to 2.7 million years).

5. Assessment of impacts

The goal of this section on impact assessments is to identify and examine the most important environmental implications from mineral exploration activities on EPL 8777, as well as feasible mitigation actions. If mineral exploration activities are discontinued in the future, an EIA will be required to address the resulting environmental impacts. This section also includesmitigation measures for the identified impacts. A checklist was used as an assessment methodology to examine each impact identified.

Table 4 A checklist for the identified impacts

Impacts	Negative		Positive		No impact
	Short term	Long term	Short term	Long tem	
Flora and fauna and avifauna	☑				
Noise pollution	☑				
Air quality	☑				
Health and safety	☑				
Roads					☑
Underground water					☑
Surface water quality	☑				
Socio-economic			☑		

☑ = Impacts

5.1 Overall socio-economic benefits and issues

Table 5 A summary of socio-economic benefits and issues

Impacts	Benefits and issues
Socio-economic benefits	The project has great potential to improve livelihoods and contribute to sustainable development within the surrounding community.
Potential Direct Benefits	- Capital investment - Training programs offered by the proponent will permanently benefit staff members.

	- The surrounding community will benefit from the project during the on-going phase through employment.
Potential Indirect Benefits	General enhancement of the health conditions and quality of life for a few people in the surrounding settlements.
General socio-economic concerns	- As the number of employees and contractors moving in and out of the area expands, so does the chance of COVID-19 and HIV/AIDS spreading. - Increased migration of individuals to the area in search of job possibilities during the mineral exploration project's target generation and drilling phase; and - Increased informal settlement and accompanying difficulties.

5.2 Mineral Exploration phases and associated issues

Table 6 Mineral exploration phases and its impacts

Exploration phases	Associated issues
Mapping and Geochemical Sampling Phase of the Project	
Dust	Fall out dust settling on vegetation is likely to cause local disruptions in herbivorous and predatory complexes and should be minimized as far as possible
Noise	Disturbs or scare animals that inhabited in the proposed exploration surrounding areas
Safety and Security	Possibility of injuries during mapping and sampling
Visual	Accidental diversion off of routes and aesthetic damage to the landscape
Drilling Phase of the Project	
Air quality	Vehicle movement may cause less dust. However, when appropriately controlled, will be likely to have little effects.
Fire and Explosion Hazard	Long term environmental impacts
Generation of Waste	Littering the surrounding areas if wastes are not appropriately disposed.
Health and Safety	Can cause serious health and safety risks to workers on site.
Fauna	Disturbances to the environment will result in the loss or change in behaviour of fauna
Vegetation	Disturbances to the environment will result in the loss or change in behaviour of flora
Avifauna	Causes immigration of endemic birds
Heritage Impacts	All archaeological remains are protected under the National Heritage Act (2004) and will not be destroyed, disturbed, or removed.

Groundwater Impacts	- Exploration activities may affect the availability of water and the quality thereof - Surface water for animals may be affected as well

6. Environmental management plan

6.1 Overview

Conducting an environmental assessment prior to engaging in an activity such as mining or exploration is one means of anticipating future environmental repercussions and creating ways to avoid or minimize them. Prior to prospecting or mining a specific location, it is usual practice to have an environmental management plan in place. It's crucial to have a well-structured, all-encompassing plan in place, as well as an environmental management system put up by a certified environmental consultant to assist management in making responsible and realistic decisions. Each on-site employee should be given a simplified explanation of the EMP's needs at the start of exploratory activities. Employees must be informed that they are required to follow this plan when this paper is issued.

6.2 Environmental management principles

Everyone will be expected to conduct all of their activities in an environmentally and socially responsible manner. This includes all consultants, contractors, and subcontractors, as well as transport drivers, visitors, and anybody else involved in the mineral exploration project who enters the exploration regions.

Protect project staff and the general public's health and safety from the project's potential consequences. This covers road safety, on-site protection from natural risks, and radiation concerns. Environmental resource management and conservation that takes into account the needs of current and future generations Prevent contamination of the air, water, and soil, and conserve biodiversity.

6.3 Impacts on the bio-physical environment

Table 7 Possible effects on the bio-physical environment, mitigation measures, and their monitoring methods

Impacts	Mitigation measures	Monitoring methods
Impacts on Archaeological Sites	- Buffer zones will be created around the sites. - Adhere to practical guidelines provided by an archaeologist to reduce the archaeological impact of	An archaeologist will inspect any identified archaeological sites before commencing with the mineral exploration activities.

	mineral exploration activities. - All archaeological sites to be identified and protected before further exploration commences. - Notices/information boards will be placed on sites. - Training employees regarding the protection of these sites.	
Impacts on Fauna	- Some habitat areas such as trees of the riverbeds and tunnels outcrops will be avoided wherever possible. - A fauna survey will be conducted to determine the effect of fragmented habitat on game species should the need arise. - No animals shall be killed, captured or harmed in any way. - No foodstuff will be left lying around as these will attract animals which might result in human-animal conflict. - Care will be taken to ensure that no litter is lying around as these may end up being ingested by wild animals	Regular monitoring of any unusual signs of animal habitat.

	- No animals shall be fed. This allows animals to lose their natural fear of humans, which may result in dangerous encounters.	
Impact on Vegetation	- Environmental considerations will always be adhered to before clearing roads, trenching and excavating. - Paths and roads will be aligned to avoid root zones. Permeable materials will be used wherever possible. - The movement of vehicles in riverbeds, rocky outcrops and vegetation sensitive areas will be avoided. - The movement of vehicles will be restricted to certain tracks only. - Areas with species of concern will be avoided. - Ministry of Environment and Tourism will be informed of any protected species which will be transplanted in consultation with MET.	Environmental education awareness, and regular monitoring of any unusual signs of animal habitat.
Impacts on Socio-Economic	- The population change can be mitigated by employing people from the local community and encouraging	Public meetings will be held by the proponent whenever necessary

	the contractors to employ local individuals. - The perception of risks will be mitigated by putting up safety signs wherever possible and ensuring that all employees and visitors to the site undergo a safety induction course.	
Visual Impacts	Environmental considerations will be adhered to at all times before clearing roads, trenching and excavating.	Employees will be trained on the importance of minimizing visual impacts.
Generation of Solid Waste	Commit to the management of solid waste life cycle by all the employees and contractors of the site.	Transportation of solid waste to a registered site for disposal.
Noise	Disturbance to fauna that roam the area will be minimized by training the employees on ways to minimize noise.	Restriction duration of noise pollution.
Air quality	- All staff on should be equipped with dosimeters that measure exposure levels to radiation. - All staff must be made aware of the health risk and obliged to wear dust masks.	
Use of Natural Resources	The bulk of the power supply to the exploration site will be sourced from the proponent's own generator. The proponent will drill a borehole as a water source.	The proponent will use water efficiently and recycle wherever possible.

6.4 Table 8 Summary of Environmental Management Plan during the phases of the project

CONSTRUCTION PHASE			
Environmental impacts	**Proposed mitigation measures**	**Responsibility**	**Monitoring plan**
Solid waste	- Any debris should be collected by a waste collection company - If trenches are dug, waste should be re-used or backfilled. - The site should have waste receptacles with bulk storage facilities at convenient points to prevent littering during exploration.	Management	Presence of well-Maintained receptacles and central collection point.
Oil leaks and spills	- Vehicles and equipment should be well maintained to prevent oil leaks. - Contractor should have a designated area where maintenance is carried out and that is protected from rainwater.	Proponent	No oil spills and leaks on the site
Visual	- Environmental considerations will be adhered to at all times before clearing roads, trenching and excavating.	Management	Employees will be trained on the importance of minimizing visual impacts.
Archaeological Sites	- Adhere to practical guidelines provided by an archaeologist to reduce the archaeological impact of mineral exploration activities. - All archaeological sites to be identified and protected before further exploration commences.	Management	
Air pollution	- Maintenance of vehicles and equipment. - Control speed and operation of construction vehicles. - Prohibit idling of vehicles. - Workers should be provided with dust masks if working in sensitive areas.	Site manager	Control amount of dust produced
Noise pollution	- Field work should only be carried out only during daytime at a specific time. - Workers should wear earmuffs if working in noisy section.	Proponent and management	Control amount of noise

	- Management to ensure that noise is kept within reasonable levels.		
Soil pollution	- Clearly mark/demarcate vehicle routes. - No worker should ever drive off road, but to stick to the demarcated routes.	Project coordinator Management and park warden	Proper planning and management
Flora	- Care should be taken to avoid/minimize destruction of endemic and Red Data Species. - A geologist should be consulted with respect to the viability of moving the trench to avoid destruction of fragile species.	Management and proponent	Warning signs on site and restored vegetation
Fauna	- Some habitat areas such as trees of the riverbeds and tunnels outcrops will be avoided wherever possible. - A fauna survey will be conducted to determine the effect of fragmented habitat on game species should the need arise. - No animals shall be killed, captured or harmed in any way. - No food will be left lying around as these will attract animals which might result in human-animal conflict	Management	Regular monitoring of any unusual signs of animal habitat.
Occupational Health and Safety	- Provide Personal Protective Equipment Train workers on personal safety and how to handle equipment and machines. - A well-stocked first aid kit shall be maintained by qualified personnel. - Provide sufficient and suitable sanitary conveniences which should be kept clean.	Proponent	- Workers using protective equipment. - Presence of Well stocked first aid kit. - Clean sanitary facilities.
OPERATIONAL PHASE			
Oil leaks and spills	- Impervious PVC sheets should be deployed as flooring and covered with sand to absorb spillages - Should spillages occur, contaminated sand needs to be removed and stored in a drum, to	Proponent	No oil spills and leaks on the site.

	be later removed to an approved disposal site		
Solid waste	- Under no conditions should any waste be buried or burned at the site - Minimize solid waste generated on site. - Waste to be deposited at a demarcated waste site in the park or if it needs to be removed to designated sites outside the park	Proponent Management	Presence of well-Maintained receptacles and central collection point.
Visual	- Environmental considerations will be adhered to at all times before clearing roads, trenching and excavating. - Siting of roads should avoid the traversing of tops of ridges and always use of existed roads rather than creating new ones. - Erected infrastructure should be sited in depressions not on hill tops or rises and should not be visible from any major tourist roads lookout points.	Park wardens and Management	Employees will be trained on the importance of minimizing visual impacts.
Archaeological Sites	- Adhere to practical guidelines provided by an archaeologist to reduce the archaeological impact of mineral exploration activities. - Should any item of interest be located, all activities need to cease immediately at that location, and notify the National Monuments Council.	Management	Update Register of all archaeological sites identified.
Noise pollution	- Workers to wear earmuffs if working in noisy section - Management to ensure that noise is kept within reasonable levels.	Proponent Management	Control amount of noise
Soil pollution	- The top soil needs to be removed and stockpiled - Stockpiled soil must be covered to prevent it from being windblown within three months - All hydro-carbon products need to be stored in a bunded area, to avoid any accidental spillages.	Project coordinator Management and park warden	Proper planning and management
Flora	- Care should be taken to avoid/minimize destruction of endemic and Red Data Species.	Management and contractor	Warning signs on site and restored vegetation

	- A geologist should be consulted with respect to the viability of moving the trench to avoid destruction of fragile species.		
Fauna	- Strict employee's code of conduct including prohibition of hunting or trapping or interfering in any manner with any wild animals. - No feeding of wild animals should be allowed. - Litter should be prevented and adequately disposed of to prevent attracting scavenging wild animals.	Management	Regular monitoring of any unusual signs of wild animal habitat.
Environment Health and Safety	- Train workers on personal safety and disaster preparedness. - A well-stocked first aid kit shall be maintained by qualified personnel. - Report any accidents / incidences and treat and compensate affected workers. - Provide sufficient and suitable sanitary conveniences which should be kept clean. - Conduct Annual Health and Safety Audits.	Management	Provide sanitary facilities.
Fire preparedness	- Firefighting emergency response plan. - Ensure all firefighting equipment are regularly maintained, serviced and inspected. - Fire hazard signs and directions to emergency exit, route to follow and assembly point in case of any fire incidence.	Management	- Proof of inspection on firefighting equipment - Fire Signs put up in strategic places. - Availability of firefighting equipment.
DECOMMISSIONING PHASE			
Solid waste	- Solid waste should be collected by a contracted waste collection company - Excavation waste should be re-used or backfilled.	Proponent and Management	Amount of waste on Site. Presence of well-maintained receptacles and

			central collection point
Noise & Air pollution	- Maintain plant equipment. - Decommissioning works to be carried out only during daytime. - Workers working in noisy section to wear earmuffs. - Workers should be provided with dust masks.	Proponent and Management	Amount of noise
Soil pollution	- The contaminated soil needs to be treated either by adding bacteria which break down spilled hydro-carbon, or by simply distributing the soil thinly in direct sunlight to naturally break down the hydro-carbons.	Proponent	
Disturbed Physical environment	- Undertake a complete environmental restoration program and introducing appropriate vegetation	Management	Management
Occupational Health and Safety	- Provide Personal Protective Equipment. - Train workers on personal safety and how to handle equipment and machines. - A well-stocked first aid kit shall be maintained by qualified personnel. - Demarcate area under decommissioning.	Proponent	- Workers using Protective Equipment. - Presence of a First Aid Box.
Visual pollution	- Rake the track or drag tyres to smooth tracks - Removal of all construction equipment, surplus material and temporary structures, fences and works of every kind, and everything that was brought at the site.		Rehabilitation of every foreign material at the site

6.5 Monitoring, Auditing and Reporting

6.5.1 Inspections and Audits

Performance against the EMP commitments will need to be reviewed throughout the project's life cycle, with corrective action implemented as needed, to guarantee compliance with the EMP and any Enviro-legal obligations. This will include conducting both the internal

inspections/audits and external audits, documentation, reporting, establishing an environmental management systems, adhere to the drafted environmental policy, maintain the impact aspect register, drafting procedures and method statements by the relevant responsible mineral exploration staff and contractors, determining the relevant roles and responsibilities, and others.

Internal compliance monitoring will be implemented in the following manner:

a) All contractors will be subjected to project kick-off and close-out audits. This applies to all phases of the process, including drilling contract work:
- Before a contractor begins work, the applicable phase site manager will perform an audit to confirm that the EMP commitments are reflected in the contractor's standard operating procedures (SOPs) and method statements.
- After a contractor's work is completed, the applicable phase site manager will conduct a final close-out audit of the contractor's performance against the EMP commitments.

b) During the construction/initial and decommissioning phases, monthly internal EMP performance audits will be conducted.

6.5.2 Roles and responsibilities for environmental management

6.5.2.1 Communication between Parties

Emphasis will be put towards open communication between all parties, in order to reach a proactive approach towards potential environmental issues deriving from the project. This approach should guarantee that environmental impacts are anticipated and prevented, or minimised, rather than adopting a negative "policing" approach after negative impacts have already occurred. The importance of a proactive approach cannot be overemphasised, particularly in relation to preventing unnecessary tracks, and damage to vegetation (i.e. protected and endemic species) as these impacts cannot easily be remedied.

6.5.2.2 The Operating Company

The company is ultimately responsibility for all stages of the project and the impacts resulting from those activities. The responsible persons will be the company's Environmental Control Officer (ECO) and Managing Director to ensure that:

- The EMP and its environmental specifications are included in contractual documents and it is required that contractors, and subcontractors, consultants etc. do meet the EMP requirements;

- The company and all its subcontractors, consultants etc. comply with all Namibian legislation and policies and any relevant International Conventions;
- Compliance with the environmental specifications are enforced on a day-to-day basis;
- Environmental audits are conducted periodically by a suitably qualified ECO to confirm that the environmental requirements are properly understood and effectively implemented;
- Sufficient budget is provided to implement those measures that have cost implications;
- The site manager must commission tree surveys well in advance of planned road construction or drill pad preparation so that the necessary site visits by forestry personnel and forestry permits are acquired; and,
- Open an effective communication between all parties concerning environmental management on the project.

6.5.2.3 Site managers

Day-to-day responsibility for environmental management will be assigned to the ECO and Manager Field Operations site manager for the duration of all operational activities to:

- Be familiar with the contents of the EMP and applicable sections of the EIA and the measures recommended therein;
- Monitor compliance with the environmental specifications on a daily basis and enforce the environmental compliance on site by communicating the ECO's directions to all personnel involved;
- In the event of any infringements leading to environmental damage, personnel need to consult with the ECO and seek advice on any remedial measures to limit or rectify the damage;
- Maintain a record (photographic and written) of "before-and-after" conditions on site;
- Facilitate communication between all role players in the interests of effective environmental management

6.5.2.4 Environmental Control Officer (ECO*)*

Tess engineering cc must appoint a suitably qualified ECO who is responsible to:

- Undertake environmental audits of overall compliance with the environmental specifications. This should be done at least bi-annually for the warehouse.
- Submit a site inspection report to the Managing Director and MFO;

- Advise the MFO on interpretation and implementation of the environmental specifications as required; and,
- Make recommendations for remedial action in cases of non-compliance with the environmental specifications.

6. 5.3 Environmental Management System Framework

The proponent and its contractors will create and implement an Environmental Management System (EMS) in order to apply Environmental Management Practices. The structure for compiling a project EMS is established in this section. All environmental management paperwork will be kept in a paper and/or electronic system by the applicable exploration

EMP. These may include, but are not limited to:

- Standard operating procedures for the implementation of the environmental action plan and management program.
- Procedures for dealing with incidents and emergencies.
- Procedures for auditing, monitoring, and reporting, as well as
- EMP compliance method statements for ad hoc actions not explicitly covered in the EMP action plans.

e) Register of Roles and Responsibilities

Relevant roles and duties will be identified during project planning and risk assessments. All environmental commitment duties and obligations must be documented in a register. The register must include pertinent contact information and be updated as needed.

f) Site Map

It is essential to keep an up-to-date map of the exploration site that shows all project activities. The following detail, in addition to the project layout, must be depicted:

- Material handling and storage
- Waste management (collection, storage, and transfer, among other things);
- Areas with a high level of sensitivity;
- The location of the incident and emergency equipment; and the location of the accountable parties.

g) Environmental Management Schedule

The applicable phase site managers and/or relevant Contractors must keep a schedule of environmental control actions. The exploration manager is responsible for keeping a master schedule of all such activities up to date. Environmental risk assessments, environmental management meetings, and other scheduled environmental actions include, but are not limited to:

- Handling, managing, and rehabilitating soils
- Waste removal
- Inspection and repair of incident and emergency response equipment
- Environmental education
- Participation of stakeholders; environmental inspections; and
- Auditing, monitoring, and reporting are all part of the auditing, monitoring, and reporting process.

h) Change Management

The EMS must have a change management procedure in place. In this regard, environmental documentation, procedures and method statements, action plants, and other related documents will be updated and revised as needed to account for the following scenarios:

Changes in standard operating procedures (SOPs), scope changes, ad hoc activities, project phase changes, and duties or roles changes

6.6 Closure Plan

The proposed project's closing plan is to develop a secure, stable, and non-polluting post-prospecting landscape that may support integrated, self-sustaining, and value-generating activities, leaving a positive legacy in the process. The closure plan's goals are to:

- Prioritizing the creation of a functional post-prospecting environment that allows for self-sustaining agricultural operations whenever possible.
- To promote the restoration of terrestrial and aquatic wetland biodiversity, when appropriate.

6.6.1 Alternatives Considered

Because this is an exploration project, the proposed project is not complicated, and the hazards associated with prospecting are well understood and may be mitigated once the project is completed. There are few alternatives for closure. There are just two activity possibilities for the closure plan that have been considered:

First alternative:

Closure or backfill of boreholes with overburden removed during drilling (best option).

Second alternative:

Leaving boreholes open to allow for groundwater recharge from surface run-off.

6.6.2 Preferred Alternative: Rehabilitation/ Backfill of boreholes

The restoration of a disturbed environment that has been deteriorated as a result of operations such as mining, road construction, or waste disposal to a land use similar to that which existed before the activity began is known as rehabilitation. This involves aesthetic concerns, so that a disturbed region does not stand out from the surrounding surroundings. Backfilling boreholes with overburden removed during development and covering with growth medium to produce vegetation is the preferred technique for preserving physical, chemical, and biological ecosystem functions in degraded environments. This option provides a number of benefits, which are listed below:

Benefits:

- The site will be pleasing to the eye
- The location will blend in with the surroundings
- The site will be a suitable habitat for fauna and flora again
- The site will be safe and pollution-free

Option 1, which is to leave boreholes unbackfilled, carries the risk of these boreholes filling with water, which could attract wildlife and communities, resulting in drowning and the possibility of getting trapped in the declines. Backfilling is required to reduce these dangers.

6.6.3 Closure Assumptions

This closure plan was created using the minimal information available, including environmental data. During the operational phase, some of the already accessible data may need to be enhanced. To construct the suggested closure actions, numerous assumptions were made about general conditions, as well as the closure and rehabilitation of the site's facilities. These assumptions will be examined and amended as more information becomes available during operations.

The following are some of the assumptions that were utilized to create this plan:

- Once the last intended weight of minerals has been removed from the site for laboratory testing, the closing period will begin.

- The recommended prospecting sites will be followed to the letter in order to minimize potential consequences.
- Vegetation will be established in accordance with the native vegetation of the project area.
- Water management infrastructure constructed during the operational period will be kept for closure / end of project life if needed.
- There are few chances to build infrastructure on site, and any infrastructure that is created will be of minimal utility to the community. As a result, all structures will be demolished.
- All hazardous and household garbage will be carried offsite to licensed landfills for disposal.
- Existing roads will be utilized to the greatest extent practicable. Where access tracks have been built in the absence of roads, they will be restored and closed as part of the standard closure process.

6.6.4 Closure and Rehabilitation Activities

The remediation procedures that will be conducted when the projected prospecting activities reach the end of their life cycle are explained below:

6.6.4.1 Infrastructure

All infrastructure will be decommissioned, and the footprints will be repaired so that vegetation can grow. To minimize any surplus materials at closure, material inventories will be maintained at the end of prospecting activities. Equipment and materials of value that aren't needed for post-closure operations will be sold or removed from the site as much as possible. Scrap and salvageable equipment will be removed from the site and sold to recyclers.

Following the completion of demolition activities, a soil contamination investigation will be carried out. The goal is to identify potential contaminated locations and then create and implement appropriate remediation methods to ensure that soil contaminants are removed. The following actions will be taken to bring the situation to a close:

- Prior to undertaking any decommissioning work, all power and water services will be disconnected and certified as safe
- All remaining inert equipment and decommissioning waste will be disposed of at the nearest licensed general waste disposal facility
- Salvageable equipment will be removed and transported offsite prior to and during decommissioning
- All tanks, pipes, and sumps containing hydrocarbons will be flushed or emptied prior to removal to ensure no hydrocarbon/c is present

6.6.4.2 Boreholes

Boreholes will be backfilled with overburden stripped before prospecting activities begin. All overburden should be dumped into the vacuum, and the finished surface should be moulded to match the surrounding terrain while remaining free draining. After backfilling, a growth medium cover will be installed, and vegetation will begin to grow.

6.6.4.3 Roads

Existing roads will be utilized to the greatest extent practicable. • All signage, fences, and shade structures, as well as traffic barriers, will be removed as part of the road and parking area closure.

- All 'hard top' surfaces, as well as any concrete structures, must be ripped.
- All potentially contaminated soils must be identified and delineated for further treatment
- All haul routes treated with saline dust suppression water must be treated, with the upper surface pulled off and disposed of in authorized contaminated disposal places.

6.6.4.4 Remediation of Contaminated Areas

- All hydrocarbon-containing tanks, pipes, and sumps will be flushed or emptied, and removed soils will be treated according to the nature and amount of the pollution.
- The liquid storage tanks will be drained, the structure will be removed/demolished, and the sub-surface holes will be plugged; and
- All equipment used to store or transport chemicals will be cleaned and disposed of at a proper disposal facility.

6.6.4.5 Vegetation

Using non-invasive plants that meet the habitat's criteria, successful revegetation will help control erosion of soil resources, maintain soil productivity, and reduce sediment loading in streams (e.g. soils, water availability, slope and other appropriate environmental factors). Invasive species will be avoided, and the area will be managed to keep them from spreading. On slopes, naturally occurring grassland species will be planted to combat the effects of erosion. These plants will increase soil holding capacity while also lowering runoff velocity. The flat areas will be re-vegetated with the goal of establishing a long-term ecology. Before vegetation is removed, the presence of protected plant species must be identified, and the necessary licenses for destruction or relocation must be secured.

6.6.4.6 Waste Management

Hazardous waste will be controlled, sorted, and disposed of, while non-hazardous garbage will be disposed of in a nearby permitted landfill site. Scrap and waste steel will be sold to recyclers. Wastes to be contained in animal-proof drums with a solid lid, and drums be in an enclosed

fence, to prevent windblown debris from escaping, and scavenging animals from rummaging through the waste.

7. Public participation

Notification of the proposed activities were advertised in the two widely common newspaper to consult the public as presented in Appendix, to identify and contact as many potential I&APs as possible. The description of the project was presented and opportunity was given for the I&Aps to give their comments and issues. However, currently no stakeholders registered for comment. The registered interested and affected are indicated in the table below:

Table 9 Registered interested and affected parties

Name	Position
Ministry of Environment, Forestry and Tourism	Park Department
Mr Joshua	Chief Warden – Conservation Skeleton Coast National parks
ERONGO REGIONAL OFFICE	

8. Conclusions

The scoping report is prepared for the Environmental Impact Assessment for mineral exploration in on EPL no 8777 erongo region. The proposed site is located 14 km to national west park and 28 km west of omaruru game park., the site is not lacated in a protected area or conservancy.

The approach and methodology will be guided by the Environmental Regulations of 2012 and as per proponent's provisions. The project will employ individuals from the local towns and communities throughout the exploratory phase. If the exploratory project results in the finding of a commercially viable mineral deposit, a mine could be built in the area. A mine can make a substantial contribution to the social and economic development of the town.

On condition that that the relevant mitigation measures are effectively implemented by the proponent, there are no environmental reasons why the proposed project should not be approved. The project will have significant positive economic impacts that would benefit the local, regional and national economy of Namibia.

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APPENDIX

Annexure A Newspaper advertisement in the Confidante newspaper

Classifies

Contact: Mandy
• T: 061 24 6136 • C: 081 895 8296 • E: mandy@confidentenamibia.com

Advanced Environmental Agency

ENVIRONMETAL IMPACT ASSESMENT FOR MINE EXPLORATION ACTIVITIES ON EPL no :8777 IN ERONGO REGION UIS.

Advanced environmental agency cc consultant herewith gives notice in terms of the Environmental Management Act, 7 of 2007 and Regulation 21 of the Environmental impact assessment (EIA) for the mine exploration activity.

PROPONENT: TESS ENGENEERING CC
DESCRIPTION OF ACTIVITY: MINE EXPLORATION
LOCATION: UIS(ERONGO REGION)

Interested and Affected parties (I & AP) are invited to register with advanced environmental agency consultants for comments on the Proposed mine explorations on Epl NO: 8777 activity within 14 days of the advertisement starting from the 11/4/2022.

Registration can be done by requesting of the Background information document provided in the email below. Any persons having any objection to the email below by: **4.NOVEMBER 2022 TO 15 NOVEMBER 2022**

Email: info.advanceenviroment@gmail.com
Cell: 081-4801644

EPIC Environmental Consultancy cc

CALL FOR PUBLIC PARTICIPATION

ENVIRONMENTAL ASSESSMENT FOR PROPOSED EXPLORATION OF BASE AND RARE METALS, INDUSTRIAL MINERALS, PRECIOUS METALS AND PRECIOUS STONES ON EXCLUSIVE PROSPECTING LICENCE (EPL) 8616 KHOMAS REGION.

This notice serves to inform potential interested and affected parties that an application for Environmental Clearance Certificate will be made to the Environmental Commissioner in terms of the Environmental Management Act (Act No. 7 of 2007) and its Regulations of 2012 as follows:

Project: Proposed Exploration of Base and Rare Metals, Industrial Minerals, Precious Metals and Precious Stones.
Location: Exclusive Prospecting Licence (EPL) 8616 is situated approximately 65km outside Windhoek.

Public Participation Meeting information will be communicated to all registered interested and affected parties.

All Interested and Affected Parties (I&APs) are invited to register and submit comments/ suggestions in writing to the below email address by requesting the Background Information Document no later than **25 November 2022**.

Email address: nkenviro.consultancy@gmail.com
Cell: 081 209 7875

MUNICIPALITY OF HENTIES BAY
NOTICE

INTENTION TO ALIENATE ERF 968 (OMDEL EXTENSION 2) ZONED GENERAL BUSINESS TO MESSRS GROW MORE TRADING ERONGO CC

By virtue of Council Resolution C01 1/07/10/2022/08th/2022 and in terms of Section 63 (2)(b) of the Local Authorities Act, (Act 23 of 1992) as amended, read in conjunction with Section 30 (1)(t) of the Local Authorities Act 1992 (Act 23 of 1992) as amended, notice is hereby given that the Municipal Council of Hentiesbaai intends to alienate a Erf 968 Omdel Extension 2 in Henties bay , measuring 2811m² at a purchase price of N$ 231 907,50.00 (Two Hundred & Thirty One Thousand, Nine Hundred & Seven dollars, Fifty Cents), by way of private treaty to Messrs Grow More grading Erongo cc for the purpose of establishing a Supermarket & Small SME stalls.

Further take note that the locality and the layout plan of the property lies open for inspection during offic hoursat the offics of the Municipal Council situated at the corner of Jakkalsputz Road and Nickey Iyambo Avenue.

Any person(s) having objection(s) to the intended alienation of the portion may lodge such objection(s) fully motivated to the undersigned, within fourteen (14) days after the second placement of the advert.

Chief Executive Officr
P O Box 61
Henties Bay

outrun consultants cc

Outrun Consultants cc hereby gives notice to all potential Interested and Affected Parties (I&APs), that an application for Environmental Clearance certificate will be made to the Environmental Commissioner in terms of the Environmental Management Act (No. 7 of 2007) as follows:

Proponent: NamWater
Financier: African Development Bank
Project reference: P-NA-E00-005
Environmental Assessment Practitioner: Outrun Consultants cc

Project Description: NamWater intends to upgrade the water supply network within the Central Northern Water Supply Area (CNWSA). The Ohangwena aquifer is a largely unexploited source with huge potential of supplying potable groundwater to the North of Namibia. This upgrade will oversee the following:

- Omafo-Eenhana Extension
- Omakango – Onambutu-Eenhana Scheme Upgrade

In accordance to the requirements of the Environmental Management Act (No. 7 of 2007) and the Environmental Assessment Regulations No. 12 of 2012, NamWater has appointed Outrun Consultants cc as an Independent Environmental Assessment Practitioner to undertake a detailed Environmental and Social Impact Assessment (ESIA) and to obtain an Environmental Clearance Certificate (ECC) for the envisaged development project.

Project Location: The Project is located in Ohangwena Region (Map is provided in the BID).

Public participation process: A series of public consultation meetings were held between 28 February and 28 July 2022. An Environmental Scoping Report (ESR) and its Environmental & Social Management Plan (ESMP) have been developed and ready for public and Stakeholders review and further comments. Therefore, Interested & Affected Parties (I&APs) are hereby notified that the draft reports are available for comment at the public participation disclosure meeting venues planned as follows:

Date and Time	Activity	Venue/Place
10 November 2022 - 1000hrs	Consultative Meeting	Oshandi (Ondobe Constituency Office Hall)
10 November 2022 - 1430hrs	Consultative Meeting	Ondobe Grant Payout Hall
11 November 2022 - 1000hrs	Consultative Meeting	Onambutu Community Hall
11 November 2022 - 1430hrs	Consultative Meeting	Ohangwena Regional Council

The participation and commenting period are ef fective until 18 November 2022

To register or request for documents submit your details in writing to the Environmental Consultant or alternatively fil the online form, link and contact details given; https://forms.gle/wdrs7mc4unbk2wFH6

Outrun Consultants:
Josiah T. Mukutiri
Phone: +264 812 683 578 Email: outrungreeninfo@gmail.com

outrun consultants cc NAMWATER Namibia Water Corporation Ltd ELEMENT Consulting Engineers

Classifieds

Contact: Fransina
• T: 061 24 6136 • C: 081 231 7332 • E: fransina@confidentenamibia.com

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Phone: +264 812 683 578 Email: outrungreeninfo@gmail.com

outrun consultants cc NAMWATER Namibia Water Corporation Ltd ELEMENT Consulting Engineers

Annexure B Newspaper advertisement in a Republikein newspaper

Annexure C Curriculum Vitae for the proponent