ENVIRONMENTAL IMPACT ASSESMENT (EIA) & ENVIRONMENTAL MANAGEMENT PLAN (EMP)

EPL 9845

EAP:

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PROJECT DETAILS

TITLE: Environmental Impact Assessment and Environmental Management Plan for the proposed mineral exploration (Base & Rare metals, Industrial Minerals, Precious Metals, Non Nuclear Fuels, Nuclear Fuels, Precious stones) in HAMBELELA KASHINASHA ANYOLO EPL 9845 Windhoek / Rehoboth Districts, Khomas / Hardarp Regions, Namibia.

EAP:

- Mr Siyambango Mulife (Centre for Geosciences Research cc)

Proponent:

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NAME	Mulife Siyambango
RESPONSIBILITY	Director of Centre for Geosciences Research cc
QUALIFICATIONS	B. Sc. in analytical, inorganic and physical chemistry, M. Sc. in Industrial Rocks and Minerals, MBA in Banking, Accounting and Strategic Management.
PROFESSIONAL REGISTRATION	ACSM
EXPERIENCE	Mr Siyambango is the director and founder of Centre for Geosciences Research cc Mr Siyambango is a qualified geologist, and specialist in industrial minerals and rocks. Obtained an **MSc in Industrial Rocks and Minerals** with majors in Mineral Resource Assessment & Estimation; Mineral Extraction & Management Marketing of Industrial Rocks and Minerals, Geology and Technology of Industrial Rocks and Minerals. **Mr Siyambango** is a fully trained and qualified Chemist with a **BSc in analytical, inorganic and physical chemistry**. Extensively trained and experienced in analytical instruments that are essential for mineral exploration and mineral processing. Academically and experienced trained Manager, with an **MBA in Banking, Accounting and Strategic Management**. The qualification supplements the economic assessment of commerciality of mineral resources for assessment of the bankability.

Contents

Declaration of authorship

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Position..... Consultant

Company ..... Centre for Geosciences Research

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ABBREVIATIONS AND ACRONYMS

EMP	Environmental Management Plan
EIA	Environmental Impact Assessment
EC	Environmental Commissioner
SADC	Southern African Democratic Country
RSA	Republic of South Africa
MME	Ministry of Mines and Energy
MET	Ministry of Environment and Tourism
MAWF	Ministry of Agriculture Water and Forestry
DWA	Department of Water Affairs
EPL	Exclusive Prospecting License
DEA	Department of Environmental Affairs
SM	Site Manager
ENC	Environmental Coordinator
SF	Site Foreman
PS	Project Staff
PP	Project Proponent
EIA-C	Environmental Impact Assessment Consultant
I&Aps	Interested and Affected Parties
EAs	Environmental Assessments

PART I: ENVIRONMENTAL IMPACTASSESSMENT (EIA) REPORT

1. Introduction

1.1. Project Background

The proponent HAMBELELA KASHINASHA ANYOLO holds an EPL 9845 located in the district of rural Windhoek, Khomas / Hardarp Regions. The EPL is licenced to explore for: Dimension stones, Base and Rare Metals, Precious Metals, Precious Stones, industrial Minerals, Non Nuclear Fuels and Nuclear Fuels.. The proponent intends to undertake exploration activities to ascertain the potential commercial mineralization within the EPL.

Within this area, literature review indicate the presence of base metals mineralisation that are vein hosted, specifically copper mineralization and industrial mminerals such as quartz in the licence. Centre for Geoscience Research is appointed by the proponent to undertake an Environmental Assessment (EA) and Environmental Management Plan (EMP) for the mineral exploration projects.

(a) HAMBELELA KASHINASHA ANYOLO EPL 9845

In line with the provisions of the Environmental Management Act (2007) and EIA Regulations (2012) an Environmental Impact Assessment (EIA) is required for “Exploration Prospecting Activities”.

In that regard CENTRE FOR GEOSCIENCES RESEARCH has been appointed to conduct an Environmental Impact Assessment (EIA) and develop an Environmental Management Plan (EMP) for the proposed mineral exploration. Mulife Siyambango (is the Environmental Assessment Practitioner that conducted the EIA, and the CV is attached in **Appendix A**).

1.2. The objectives of the Environmental Assessment Process

The study will involve the investigation and assessment of likely short and long-term positive and negative environmental impacts of the activities related to the proposed possible project with the following objectives:

- To prepare an Environmental Impact Assessment (EIA) report including details of the proposed exploration;
- Develop an Environmental Management Plan (EMP) based on the

outcomes of this study in support of the environmental management of the proposed exploration.

1.3. Terms of Reference

Terms of reference" means a document which forms part of an EIA report and sets out how an assessment must be carried out. The term of reference for the proposed project was set out based on the requirement by the Environmental Management Act (2007) and its Regulation (2012). The steps which were followed are described as follows:

a) a description of all tasks to be undertaken as part of the assessment process, including any specialist to be included if needed;
b) an indication of the stages at which the Environmental Commissioner is to be consulted;
c) a description of the proposed method of assessing the environmental issues and alternatives; and
d) The nature and extent of the public consultation processes to be conducted during the assessment process.

1.4. Scope of the Environmental Impact Assessment (EIA)

The particular objectives of the EIA in line with the Terms of Reference are to:

- Comply with Namibia's Environmental Assessment Policy, Environmental Management Act (2007) and its Regulations (2012).
- Confirm the justification of the project and to consider all alternatives that would meet the need;
- Consult all Interested and Affected Parties (I&APs) to ensure that their inputs are taken into account;
- Review the legal and policy framework and their relevant requirements for this project;
- Describe the biophysical and socio-economic environment of the project and determine the associated sensitivities to and suitability of the prospecting, exploration, and transportation activities.
- Identify and assess impacts related to the construction, operation and decommissioning of the exploration and to propose suitable mitigation strategies;
- Compile an Environmental Management Plan for the construction; operation and decommissioning of the proposed exploration.

1.5. Location of EPL 9845

The EPL 9845 is located 80 km in rural South West of Windhoek (fig 1) and covers farmlands:

1. Kornkrantz 21
2. Isabs 939
3. Gamsberg 23
4. Doornboom 316
5. Gelschaus 930

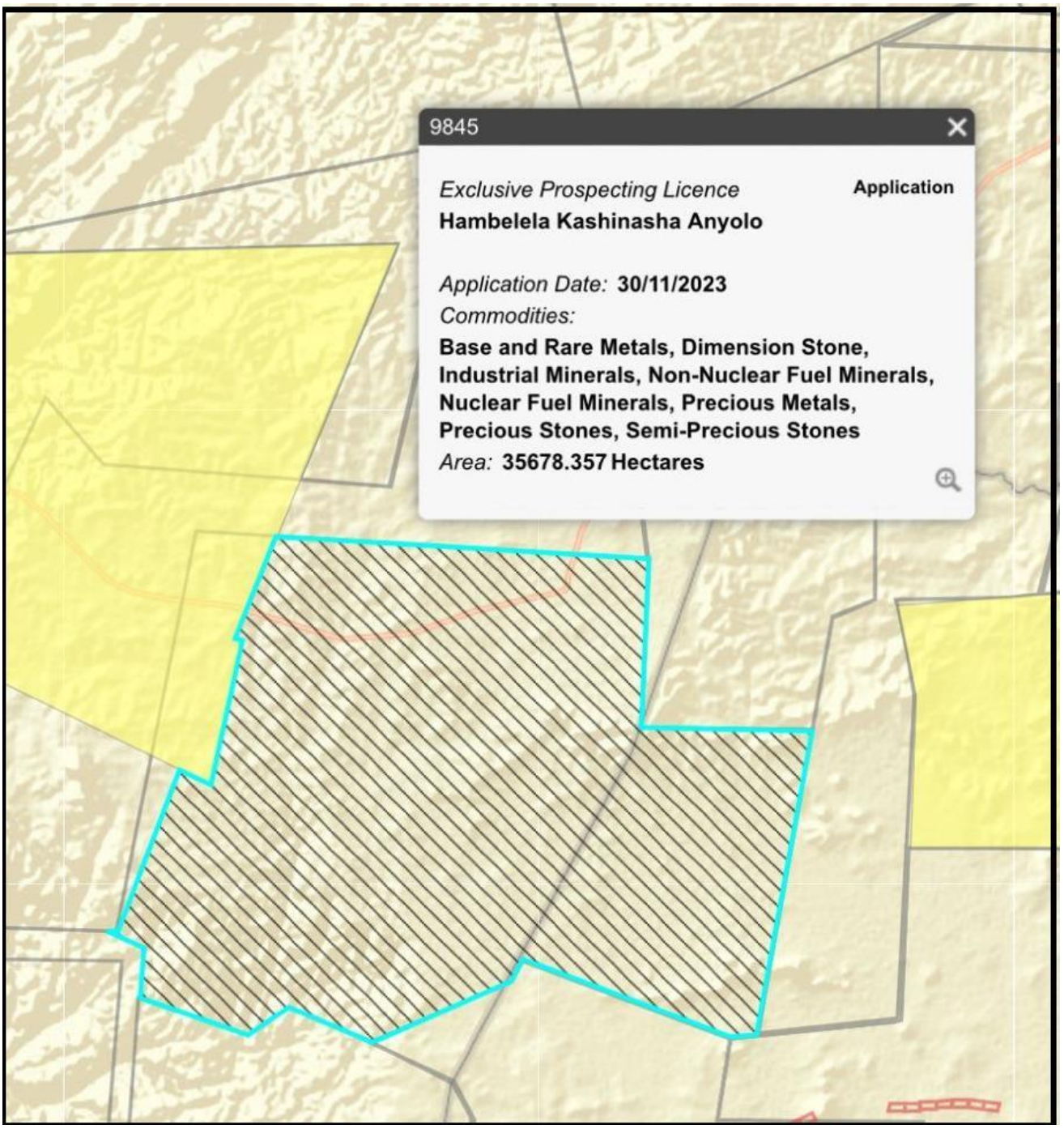

Fig 1, showing the locality of EPL 9845, in the districts of Windhoek / Rehoboth

The proponent, HAMBELELA KASHINASHA ANYOLO, holds to EPL 9845 issued by the Ministry of Mines and Energy located in Windhoek districts comprising of farm lands .

The proponent intends to undertake extensive exploration specifically the identified potential of Base and Rare metals that had been identified from literature review.

Although Mineral exploration mining is costly, environmentally friendly mineral exploration is a cornerstone, yet the mineral exploration process must never be at the expense of people or the environment.

HAMBELELA KASHINASHA ANYOLO believes that social and environmental responsibility is a prerequisite for providing a conducive environment for mineral exploration activities. Centre for Geoscience Research was appointed by the proponent to undertake an Environmental Assessment (EA) and Environmental Management Plan (EMP) for the exploration projects.

1.6. Receiving environment

The HAMBELELA KASHINASHA ANYOLO EPL 9845 is located near Windhoek city. The distance to HAMBELELA KASHINASHA ANYOLO EPL 9845 from Windhoek is about 80km in the southwestern direction. From the C28 road, distance to HAMBELELA KASHINASHA ANYOLO EPL 9845 is 80km south west.. Windhoek is the major city found nearby the Licence; furthermore, HAMBELELA KASHINASHA ANYOLO EPL 9845 is outside the National Park (**Figure 2**). The licence fall within farm land comprising of:

a. Kornkrantz 21
b. Isabs 939
c. Gamsberg 23
d. Doornboom 316
e. Gelschaus 930

The farms currently used for livestock farming.

2.0 Geology of the area

The EPL9845 falls within the Rehoboth Sequence is limited to the area along the southern margin of the Damara Orogen. It overlies the Elim Formation unconformably and is intruded by granitic and basic rocks ranging from approximately 1 670 to 1 420 million years in age. The Marienhof Formation at the base is followed unconformably by the Billstein Formation. The Gaub Valley Formation occurs further west and is not in contact with either of the other units (Schalk, 1988). The Marienhof Formation consists of greyish quartzite and sericitic quartzite which alternate with layers and zones of quartz-sericite phyllite, amygdaloidal basic lava, acid volcanic rocks and rudaceous metasediments that range from coarse boulder conglomerate to gravel-bearing-quartzite (Schalk, 1988).

In the Billstein Formation, grey quartzite and sericitic phyllite are the dominant rock types. Conglomerate is also present as well as numerous layers of basic lava and some quartz porphyry. Much of the Billstein Formation occurs in thrust wedges of Damaran age and in nappes overlying Damaran rocks (Schalk, 1988). Characteristic brown quartzite is the main rock type in the Guab Valley Formation but with it are intercalated ferruginous quartzite with heavy mineral laminae, phyllite, thick conglomerates, brownish limestone, calcareous phyllite and many layers of sheared acid and basic igneous rocks. The formation is intruded by a conspicuous basic dyke

swarm (Schalk, 1988). Both phyllites and basic lavas in the Marienhof Formation show copper staining on bedding-parallel shear planes and probably warrant careful attention. gold is present in shear zones. Heavy mineral laminae in the Gaub Valley quartzites suggest that the associated basal conglomerates may be loci for placer mineralisation.

Fig 2 Massive quartz porphyry outcrop in the licence area.

In the Rehoboth area, these include the Naub Diorite, the Swartmodder Granite, the metamorphosed Alberta and Doornboom Basic Complexes and related intrusions, as well as the Piksteel Granodiorite and the Weener Quartz Diorite which intrude the basic rocks. In the Awasib Mountain terrain (Hoal, 1990), the Kairab Complex and the Aunis Tonalite Gneiss belong to this period of crustal evolution. The Naub Diorite is an intensely foliated hornblende-biotite gneiss containing rafts of the Elim Formation and inclusions of hornblendite and metagabbro. A pre- to early syntectonic relationship to the Elim Formation is suggested by foliation which is common to both these units. The diorite has an age of 1 725 +52 million years (Reid et al., 1988).

The Swartmodder Granite is leucocratic, variably foliated and difficult to distinguish from other granites in this region because of low-grade alteration and saussuritisation associated with deformation. It has an age of 1 639 +25 million years and is intruded by the Piksteel Granodiorite (Reid et al., 1988; Schalk, 1988). The Alberta Basic Complex consisted originally of a zoned sequence of layered gabbroic rocks containing layers of hyperite and banded serpentinite. The gabbroic rocks are now largely amphibolite. The layered rocks are intruded by dykes, plugs and sills of pegmatoid amphibolite, coarse-grained amphibole fels and serpentinite. The latter also forms a prominent cone sheet (de Waal, 1966). It intrudes the Elim Formation and is in turn intruded by the Piksteel Granodiorite. The age is 1 442 +32 million years (Reid et al., 1988). The Doornboom Basic Complex is located within the southern Damara thrust belt and is more intensely sheared and metamorphosed than the Alberta Complex. An early intrusive phase in which a layering is still preserved in places consists of various gneissic and schistose amphibolites which have been altered to chlorite-epidote-biotite- amphibole schist in shear zones. Plugs, dykes and sills of amphibole fels, pegmatoid amphibolite and serpentinite intruded the amphibolitic phase and the country rocks and appear to be less strongly altered than rocks of the earlier phase (Schalk, 1988). A large number of small, similar intrusives occur in pre-Sinclair rocks between Windhoek (2217) and Helmeringhausen (2517). The ultrabasic rocks are difficult to distinguish from Damaran serpentinites exposed along the southern margin of that orogen. The Weener Quartz Diorite is generally a greyish, brownish or greenish medium-granined rock containing numerous basic xenoliths. Biotite and green hornblende each make up as much as 10% of the rock. Within the Damara thrust belt the rock can be intensely sheared (Schalk, 1988). It intrudes the Gaub Valley Formation and is intruded by the Piksteel Granodiorite. Age determinations vary between 1 207 +170 million years (Reid et al., 1988) and 1 871 +143 million years (Seifert, 1986). The Piksteel Granodiorite and related rocks are the youngest of this group of intrusives and underlie a large area around Rehoboth and west thereof. Generally it is a greyish to greenish medium- to coarse-grained porphyritic biotite bearing rock but textural variations are numerous. These include medium-grained, non porphyritic rocks, weakly foliated to strongly sheared types, tonalitic rocks and rocks with a patchy distribution of potash feldspar (Schalk, 1988). The Piksteel Granodiorite is overlain by equivalents of the Sinclair Sequence and is intruded by the Gamsberg Granitic Suite. The age is 1 170 +20 million years (Reid et al., 1988). The three-fold subdivision of the Khairab Complex of the Awasib Mountain terrain (2515) comprises (i) an undifferentiated basement consisting of numerous ortho- and paragneisses, metasedimentary rocks and various magnesian metamorphites, (ii) a bimodal metavolcanic succession up to 4 000 m thick consisting of high-alumina, pillow-bearing basalts and high silica rhyolites and ignimbrites with minor volcaniclastic sediments, and (iii) a metamorphosed intrusive

suite of gabbro, diorite, minor peridotite, and metafelsite (Hoal, 1990). These rocks are intruded by the Aunis Tonalite Gneiss and the Khorasib Granite Gneiss, the latter being a suite of foliated tonalitic, granodioritic and granitic rocks of which the granites clearly post-date the Aunis Gneiss. The Khairab high-alumina basalts have an age of ca. 1 460 million years and the Aunis Gneiss an age of 1 271 +62 million years (Hoal, 1990). The Houmoed Granodiorite forms the pre- Sinclair basement in the Helmeringhausen area (von Brunn, 1969).

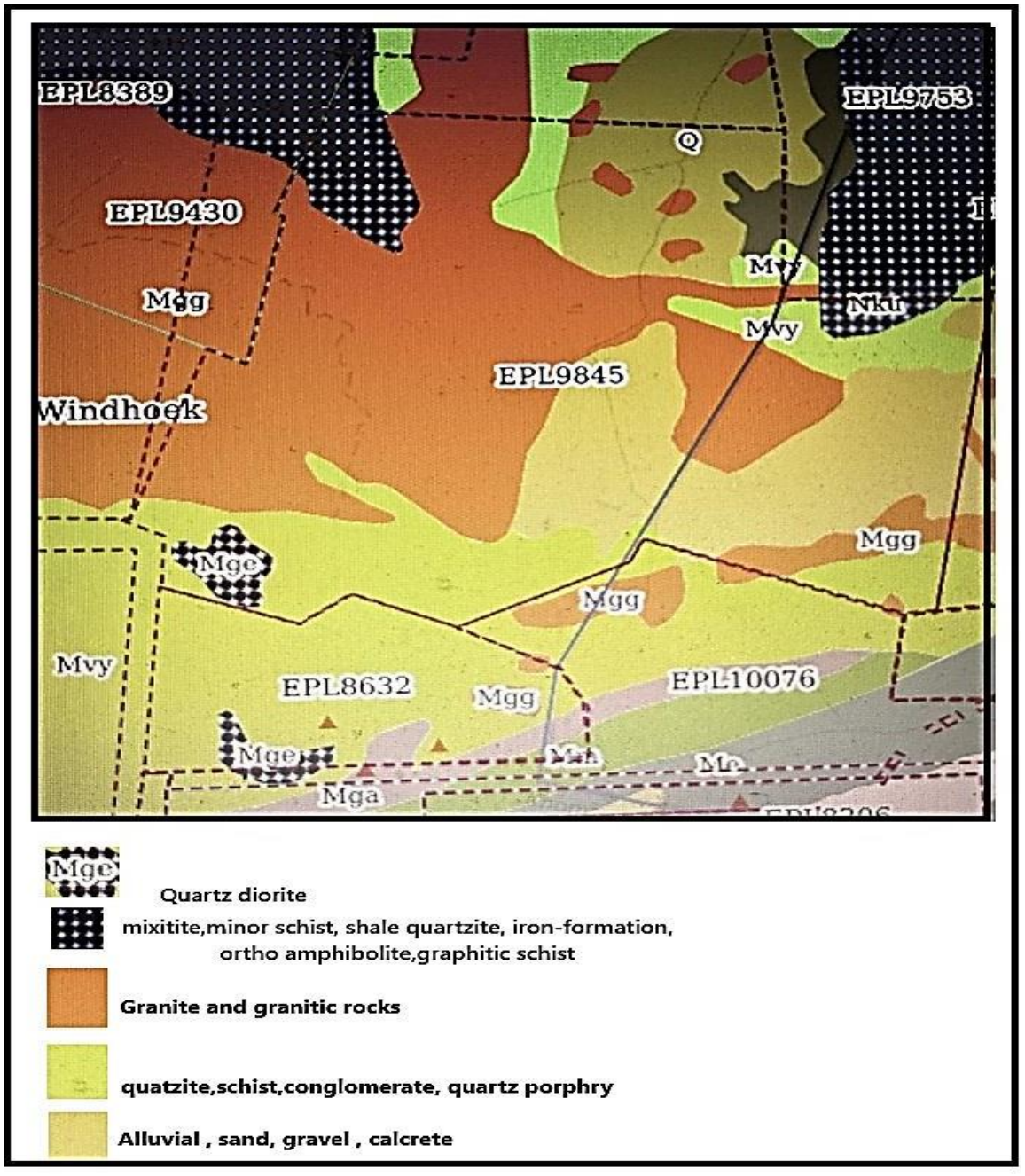

Figure 3: Geology of HAMBELELA KASHINASHA ANYOLO EPL 9845

3.0 Climate

The annual precipitation average of the last 20 years for Windhoek is **370 mm**. Of this 296 mm of rain were received from January until May, 5.2 mm from June to September and 76 mm from October to December. Annual precipitation in the project area ranges from 150mm to 300mm. The average temperature for HAMBELELA KASHINASHA ANYOLO EPL 9845 site is *January* is the hottest month in Khomas with an average temperature of 24°C (75°F) and the coldest is *July* at 14°C (57°F) with the most daily sunshine hours at 12 in September.

The wide-area hourly average wind vector (speed and direction) at *10 meters* above the ground. The wind experienced at any given location is highly dependent on local topography and other factors, and instantaneous wind speed and direction vary more widely than hourly averages.

The average hourly wind speed in Windhoek experiences *significant* seasonal variation over the course of the year.

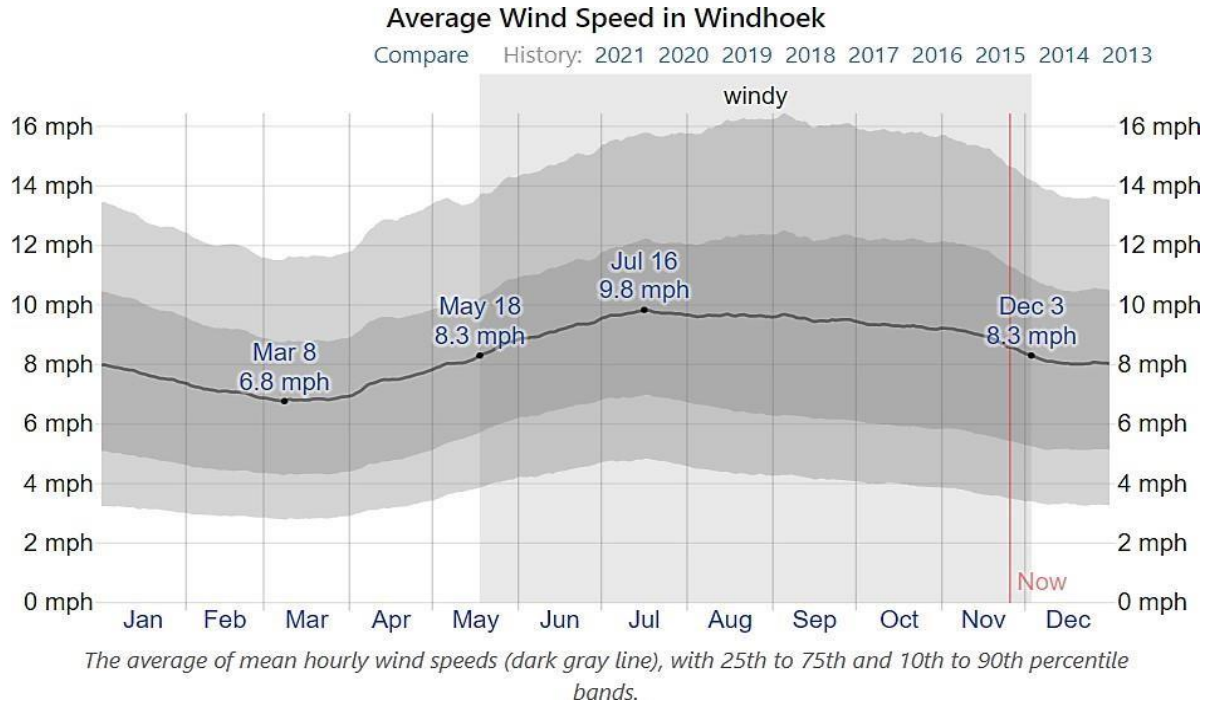

Fig 5, Showing the average wind speed in Khomas/hadarp Region for EPL 9845

The *windier* part of the year lasts for *6.5 months*, from *May 18* to *December 3*, with average wind speeds of more than *8.3 miles per hour*. The *windiest* month of the year in Windhoek is *July*, with an average hourly wind speed of *9.7 miles per hour*.

The *calmer* time of year lasts for *5.5 months*, from *December 3* to *May 18*. The *calmest* month of the year in Windhoek is *March*, with an average hourly wind speed of *6.8 miles per hour*.

3.1 Infrastructure and exploration equipment's requirement for Exploration project

In the early exploration phase contractor vehicles and equipment will comprise:

- 4x4 vehicles for personnel and field equipment; Field equipment including tents, mobile toilets and ablution facilities, spades, axes, soil sampling equipment such as sieves, sample bags, surveying apparatus;
- Portable or semi-portable geophysical equipment such as magnetometers, electromagnetic or Induced Polarization apparatus (all passive and non-invasive).
- In the ensuing phases drilling is envisioned. The equipment requirements would therefore be an RAB/ Aircore Drill rig initially then followed by diamond core drilling.
- The collected bulk samples will be ship to the Republic of South Africa (RSA) for mineral tests.

Further exploration will include the acquisition of magnetic data that will be bought from Geological Survey of Namibia's regional data. The data set will be used to interpret the geological structures that are essential to pin point the target for geological coincidence. Instruments such as a magnetometer to be used.

Table 4 below shows a summary of machines/equipment that will be used during the exploration.

Table 1: List of machines/equipment and quantity to be used during the exploration process

Item	Quantity
RC drill rig	2
Jack Hummer	2
Water jet	1
Diamond Wire Saw	1
Generator	1
Front End Loader	1
Water Tank	1
Diesel Tank	1

3.2 On site Infrastructure requirements

a. Waste disposal infrastructure

Bins will be provided, and all litter will be disposed of at the nearest municipal dumping site (i.e. Windhoek Municipality Dumping site). Industrial waste will be mainly wire, cable, drill bits, these items will be collected and removed from the sites. No unused machines, part will remain on site. Chemical Toilets (Mobi Loo) will be erected on sites for the use of the workers.

b. Electrical requirements

The area or sites have access to the main electrical grid. Although the exploration will use its diesel generator as a source of power. The diesel to be used on site will be purchased from the nearby town Windhoek.

c. Road proposed

The C28 will be used for transportation of equipments to and from the site and also the bulk samples collected for testing. To get to the site small stretches of roads will have to be made from the main road to the Licence site. The road length will be about +-20km long to HAMBELELA KASHINASHA ANYOLO EPL 9845 .

3.3 Concluding remark on this section

In this section information on the rationale for the project, project location, geology of the project location, and climate of the area were provided. Moreover, infrastructure that will be needed for the project, and types and quantity of exploration equipments were also described in this section. Human waste from the chemical toilets (Mobi loo) will be dumped at Windhoek Municipality Dumping site.

4. Legal and regulatory framework review

The national regulations governing mineral prospecting and mining activities in Namibia fall within the jurisdiction of the Ministry of Mines and Energy (MME). The Minerals (Prospecting and Mining) Act (No 33 of 1992) is the most important legal instrument governing the mining and prospecting industry in Namibia.

The Minerals (Prospecting and Mining) Act (No 33 of 1992) regulates reconnaissance license, prospecting license and mining of minerals. The Act details reporting requirements for monitoring of activities and compliance to environmental performance, such as disposal methods and rehabilitation. The Mining Commissioner, appointed by the Minister, is responsible for implementing the provisions of this Act as well as the associated regulations such as the Health and Safety Regulations. Several explicit references to the environment and its protection are contained in the Minerals Act, which provides for environmental impact assessments, rehabilitation of prospecting and mining areas and minimizing or preventing pollution.

4.1. Mineral Act of 1992 and the types of license it regulates

Below is an outline of the Mineral Act, linking the type of license it regulates, project activities at every license stage and the environmental requirements are (**Table 5**).

Table 2: Types of license regulated by the Mineral Act of 1992, activities and environmental requirements

Types of license	Activities	Environmental Requirements
Exclusive Reconnaissance License (ERL)	1. Project Identification, 2. Reconnaissance	None Complete Environmental Questionnaire
Exclusive Prospecting License	Exploration based on the following steps: Desktop study, Detailed Mapping, Geophysical Methods, Drilling and Bulk Sampling, Test a quarrying	Scoping Report, Environmental Impact Assessment (EIA)
Mining License	Preconstruction and Construction, Operation and, Ongoing Monitoring, Decommissioning, Closure, Restoration and Aftercare	Full Environmental Assessment ,covering, Scoping, Environmental Impact Assessment(EIA) and the development of and Environmental Management Plan (EMP)covering the complete project lifecycle including preconstruction, construction operation and ongoing, decommissioning and aftercare. Aspects of the Environmental Management Plan are usually incorporated into an Environmental Management Systems

4.2. Legal instrument relevant to this project

There are various legal instruments that advocates for the effects of exploration on the environment. Table 6 below shows the summaries of the legislation that are relevant to this project:

Table 4: Legal instruments relevant to this project

Topic	Legislation	Provisions	Regulatory Authority
Small scale Mining	Mineral (Prospecting and Mining) Act of 1992	The Minerals Act of 1990 governs minerals prospecting and mining. The Act provides for the reconnaissance license, prospecting license and mining for, and disposal of, and the exercise of control over minerals in Namibia. Provides list of activities that require an	Ministry of Mines and Energy
Environmental Impact Assessment	Environmental Management Act of 2007 and EIA regulation of 2012	environmental assessment, including: Mining and Quarrying. Activities such as exploration or prospecting for minerals, mining for minerals. The Act also provides procedures foradequate public participation during the environmental assessment process for the interested and affected parties to voice and register their opinions and concern about a project.	Ministry of Environment and Tourism
Water Supply and Effluent Discharge	Water Resources Management Act 2004	This Act provides provisions for the control, conservation and use of water for domestic, agricultural, urban and industrial purposes. The Act states that a license or permit is required to abstract and use water, and also discharge effluent. In accordance with the Act, and due to the nature of the project, abstraction and use permits won't be required for this project as on site water tank (500L) will be used. The capacity of the onsite tank is less than 20000m3 bench mark for water work permit. Effluent (i.e. Human Waste) from the mobile toilet will be discharge at the Windhoek. Municipality sewerage system. No effluent will be discharge in an water course. Waste water from dust suppression will be minimal and the water is expected to evaporate faster than it infiltrate. Therefore, no effluent discharge permits will be required for this project	Ministry of Agriculture Water and Forestry

Topic	Legislation	Provisions	Regulatory Authority
Hazardous Substance such as used oil which (e.g. diesel)	Hazardous Substance Ordinance 14 of 1974	The Act provides for the control of substances which may cause injury or ill-health to or death of human beings by reason of their toxic, corrosive, irritant, strongly sensitizing or flammable nature or the generation of pressure thereby in certain circumstances; to provide for the prohibition and control of the importation, sale, use, operation, application, modification, disposal or dumping of such substance; and to provide for matters connected therewith"	Ministry of Health and Social Services
Fauna and flora	The Nature Conservation Ordinance, Ordinance of 1975,	In the course of the Mine's activities, care must be taken to ensure that protected plant species and the eggs of protected and game bird species are not disturbed or destroyed. If such destruction or disturbance is inevitable, a permit must be obtained in this regard from the Minister of Environment and Tourism. For this project, due to it areal extend and location outside a protected area a permit will not be required. .	Ministry of Environment and Tourism (MET)

Topic	Legislation	Provisions	Regulatory Authority
Used oil	Petroleum Products and Energy Act 13 of 1990	The Act provides provisions for the any certificate holder or other person in control of activities related to any petroleum product is obliged to report any major petroleum product spill (defined as a spill of more than 200ℓ per spill) to the Minister. Such person is also obliged to take all steps as may be necessary in accordance with good petroleum industry practices to clean up the spill. Should this obligation not be met, the Minister is empowered to take steps to clean up the spill and to recover the costs thereof from the person. Used oil from this project will disposed at the Walvis Bay Municipality Hazardous Waste Site. Permission will be required from the facility owner prior to the dumping of the used oil.	Ministry of Mines and Energy
Employees	The Labour Act, 2007 (Act No. 11 of 2007)	The Labour Act gives effect to the constitutional commitment of Article 95 (11), to promote and maintain the welfare of the people. This Act is aimed at establishing a comprehensive labour law for all employees; to entrench fundamental labour rights and protections; to regulate basic terms and conditions of employment; to ensure the health, safety and welfare of employees	Ministry of Labour and social welfare
Archaeological Sites	National Heritage Act 27 of 2004 Ministry of Youth	This Act provides provisions for the protection and conservation of places and objects of heritage significance and the registration of such places and objects. The proposed exploration project will ensure that if any archaeological or paleontological objects, as described in the Act, are found in the course of its construction, mining operations or closure that such find be reported to the Ministry immediately. If necessary, the relevant permits must be obtained before disturbing or destroying any heritage.	National Service, Sport and Culture
Desertification	United Nation Convention to Combat Desertification 1992	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 in order to support poverty reduction and environmental sustainability	United Nation Convention

Topic	Legislation	Provisions	Regulatory Authority
Biodiversity	Convention on Biological Diversity (CBD) 1992	This convention advocates for the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources.	United Nation Convention

4.3. Regulatory authorities and permitting

The environmental regulatory authorities responsible for environmental protection and management in relation to the proposed mineral exploration project including their role in regulating environmental protection are listed in Table 7. Table 7 below shows an extract from the legal instruments of the regulating authorities with respect to the relevant permits/ licenses required for the proposed mineral exploration project.

Table 5: The regulatory authority and permitting

Activities list	Applicable Legislation	Permitting Authority	Current Status
Small Scale Mining Programme	Minerals (Prospecting and Mining) Act, 1992	Ministry of Mines and Energy	Field Work to follow on issue of Environmental Clearance
EIA Clearance for Exploration	Environmental Policy and Environmental Management Act, (Act No. 7 of 2007)	Ministry of Environment and Tourism (MET)	To be applied on completion of this EIA and EMP Report for Exploration
EIA Clearance for Mining	Environmental Policy and Environmental Management Act, (Act No. 7 of 2007)	Ministry of Mines and Energy	To apply if Economic Resources are Discovered and Project Advances to Feasibility and if the Feasibility Proves Positive

Activities list	Applicable Legislation	Permitting Authority	Current Status
Construction, alteration of waterworks with capacity to hold in excess of 20,000L. Abstraction of water other than that provided by Nam Water. Discharge of effluents or construction of effluent facility or disposal site	Water Resources Management Act, 2004 (No. 284 of 2004).	Ministry of Agriculture, Water and Forestry	To Apply when Required
Removal, disturbances or destruction of bird eggs	Nature Conservation Ordinance 4, 1975.	Nature Conservation Ordinance 4, 1975.	To Apply when Required
Removal, destruction of indigenous trees, bushes or plants within 100 yards of stream or watercourse	Forestry Act, 12 of 2001	Ministry of Water Affairs and Forestry (MWAF)	
Discarding or disposing of used oil	Petroleum Products and Energy Act 13 of 1990	Ministry of Mines and Energy (MME).	
Construction of waste Disposal sites.	Environmental Policy and Environmental Management Act, (Act No. 7 of 2007)	Ministry of Environment and Tourism (MET)	
License to Purchase, store and use of Explosive	Explosives Act 26 of 1956 (as amended in SA to	Ministry of Safety and Security in consultation with Ministry of Mines and	
Magazines for Blasting	April 1978),	Energy (MME).	

4.4. Concluding r mark on this sectio

In this section information on the relevant legislation to the project, the type of licenses required and the permits were presented. The regulatory authorities relevant to the project were also mentioned in this section.

5. Affected environment

5.1. General description of the project

The proposed project under HAMBELELA KASHINASHA ANYOLO EPL 9845 involves undertaking a mineral exploration for base, rare metals, industrial minerals and precious metals, base and rare metals. The overall aim of the project is to evaluate for possible mineral resource that can be proven as commercial and how the exploration may affect the environment. The mineral groups that are targeted in this Licence are Base, Rare Metals and precious metals.

5.2. Social environment and archaeology

5.2.1. Social environment

Khomas / Hardarp Regions has the combined population density with over 601,285 heads counted during the 2023 census period. The regional growth rate indicates that Khomas / Hardarp Regions population have rapidly increased. In the last decade, Khomas had a population of 250,262 in 2001 escalating to 494 605 by 2023 , while hardarp region grew from 68,249 in 2001 to 106,680 heads count (National Statistics Agency (NSA) (2014a and 2014b, 2023). Khomas / Hardarp Regions is considered as one of the fast developing and equipped regions in terms of infrastructural development, a well-developed economic, financial, and trade sectors, home to most government ministries, institutions and other private company headquarters (Khomas / Hardarp Regions Council, 2015 and 2017).

The Khomas / Hardarp Regions economy is predominantly well developed, so investment can be made in any sector, but also in many specific others where opportunities abound. Other sectors like Agro processing industries can further be established to add value to all kinds of agricultural products locally, in line with the country's "Growth at Home Strategy" under Namibia's Industrial Policy. Diversification of the economy can be achieved by introducing numerous other value addition projects. Indeed, there are so any areas where the returns on investment look ever and ever very promising.

Its anticipated that this project will have little adversely negative impacts on the communities living in rural Khomas, and nearby farms. Instead, the project poses a significantly positive impact to the people living in the rural Khomas. The positive impacts are mainly, job creation, support to local retailers and payment of export tax and VAT to the government of Namibia. The little negative impacts identified are on the issues of health and safety of the employees, and the potential spread of HIV/AIDS by the employees. Mitigation measures for the negatives impacts and enhancement measures for positive impacts are all addressed in Section 7.4 of this document and in the EMP.

5.2.2. Archaeology

There are no archaeological sites within and outside the boundary of the Exploration Licence. Rock arts are of historical importance to the people it belongs to and the nation at large. These arts are protected by laws in Namibia such as the National Heritage Act of 27 of 2004, hosted under the Ministry of Youth. It's widely spread that every project operating within an area where there are lots of archeological sites is obliged not to destroy or temper with the sites. Therefore, should their be existing rock arts located in the boundary where this project will be operating should not be destroyed or tempered with during the duration of the project. The mitigations measures for the protection of archeological sites are addressed in Sub-section 7.4.3 of this document and the EMP.

5.3. Biophysical Environment

5.3.1. Geology

The EPL9845 falls within Khomas complex. The Kuiseb Formation in the rest of the orogen was deposited only during spreading and continental separation, the “Kuiseb” Formation in the SZ consists both of spreading phase sediments (Kuiseb Formation) and syntectonic sediments (Hureb Formation) deposited in the forearc and trench zones as well as on the southern passive margin during subduction and closure of the Khomas Sea.

Thus, the schist succession of the SZ contains passive margin sediments deposited in deep water on both northern (Congo Craton) and southern (Kalahari Craton) passive margins (Kuiseb metagreywackes/schists), as well as deep water, active margin sediments (Hureb metagreywackes/schists). Within the Khomas Sea, during the transition from spreading to subduction and ocean closure, the SZ was the deepest part of this ocean. Deposition must, therefore, have been continuous throughout the transition phase and continued until ocean closure. The southern part of the SZ forms the suture zone between the Congo and Kalahari Cratons.

Because of the structural complexity and resulting difficulty to distinguish the spreading phase and active margin schists, Hoffmann *et al.* (2004) refer to the fill of the SZ as the Khomas Complex, in which they include the Matchless Amphibolite Suite, representing the mid-oceanic ridge of the Khomas Sea. Other local developments within the Khomas Complex are the quartzitic Kleine Kuppe Formation of the Windhoek area and the Fahlwater Formation schist of the Okahandja Lineament Zone (De Kock, 1989).

The basement gneisses are highly deformed, faulted, and are intruded by the Fransfontein Granite Suite which is characterized by sheared granites and granodiorite cataclasites of the Kheisian Formation . The Palaeoproterozoic gneisses are also intruded by quartz porphyries which occurs as continuous elongated and lineated silica bodies. Copper mineralization is structurally controlled by the sheared zones and is possibly hosted in the quartz (or quartzite) porphyries.

5.3.2. Biodiversity (fauna and flora)

Summary of the Fauna Diversity

Reptiles

The high percentage of endemic reptile species (41.3%) associated with the general area underscores the importance of this area without formal state protection. The most important reptiles in the area are viewed as those classified as vulnerable and protected game under Namibian legislation – i.e. *Stigmochelys pardalis*, *Psammobates oculiferus*, *Psammobates tentorius verroxii* and *Varanus albigularis*. Tortoises – e.g. *Stigmochelys pardalis*, *Psammobates oculiferus*, *Psammobates tentorius verroxii* – are viewed as the group of reptiles most under threat in Namibia. Tortoises, snakes and monitor lizards are routinely killed for food or as perceived threats.

Amphibians

The most important amphibian from the general area is viewed as *Pyxicephalus adspersus* with population trends decreasing (IUCN 2017). With the exception of the ephemeral pans in the immediate area, temporary pools after showers and farm dams and reservoirs, no permanent surface water exists in the development area. Large numbers of *Pyxicephalus adspersus* are associated with the ephemeral pans throughout the general area after the influx of water. The Nossob and Olifants Ephemeral Rivers often with permanent pools and the Hardap Dam, to the southwest, are the closest suitable all year round amphibian habitat. However, the overall lack of suitable habitat is expected to negatively affect the presence of most amphibians.

Mammals

The most important species from the general area are probably all those classified as rare (*Cistugo seabrae*, *Zeltomys woosnami*, *Felis nigripes*) under Namibian legislation and vulnerable (*Smutsia temminckii Acinonyx jubatus*, *Panthera pardus*, *Felis nigripes*) and near threatened (*Eidolon helvum*, *Hyaena brunnea*) by the IUCN (2017). Some species such as cheetah, leopard and brown hyena do not necessarily occur in the area permanently but rather pass through from occasionally dependent on environmental conditions, etc.

Birds

Species viewed as the most important potentially occurring in the general area are those listed as endangered (white-backed vulture, tawny eagle, martial eagle, bateleur, black harrier, black stork, Ludwig's bustard), vulnerable (secretary bird), lappet-faced vulture, white- headed vulture, African fish- eagle) and near threatened (marabou stork, Verreaux's eagle, peregrine falcon, kori bustard) by Simmons *et al.* (2015) in Namibia as well as those species classified as critically endangered (white- backed vulture, white-headed vulture), endangered (lapped-faced vulture, black harrier, Ludwig's bustard), vulnerable (secretary bird, martial eagle) and near threatened (bateleur, kori bustard) by the IUCN (2017). Other important aquatic species, etc. – are maccoa duck (Near Threatened-NT), Cape vulture (Critically Endangered-CE), black-necked grebe (Near Threatened-NT), greater flamingo (Vulnerable-V), lesser flamingo (Vulnerable - V), great white pelican (Vulnerable-V) and saddle-billed stork (Endemic-E) (Simmons *et al.* 2015).

Summary of the Flora Diversity

Trees/shrubs and Grasses

The most important species are the endemic – *Tetragonia schenckii* – and near endemic species as well as those with some form of formal protection – i.e. Forestry, Nature Conservation and CITES species. The endemic/near endemic grasses (*Anthephora argentea*, *Eragrostis lehmanniana*, *Eragrostis truncata*, *Panicum kalaharense* and *Stipagrostis amabilis*) are viewed as the most important species potentially occurring in the general area (Van Rooyen 2001).

Aloes

Aloes potentially occur in the general area, and also viewed as important are *Aloe hereroensis* and *A. zebrina* (Rothmann 2004).

Commiphora

Many endemic Commiphora species are found throughout Namibia with Steyn (2003) indicating that *Commiphora africana*, *C. glaucescens*, *C. tenuipetiolata* and *C. crenato-serrata* potentially also occurring in the general area.

Lithops

Lithops species – all protected (See Nature Conservation Ordinance No. 4 of 1975) – are

also known to occur in the general area and often difficult to observe, especially during the dry season when their aboveground structures wither. The closest species are currently only known to occur to the northwest and southeast of Kalkrand – i.e. *Lithops pseudotruncatella* subsp. *groendrayensis* and *Lithops vallis- mariae*, respectively (Cole and Cole 2005).

Ferns

At least 64 species of ferns, of which 13 species being endemic, occur throughout Namibia. Ferns in the general area include at least 1 endemic species (Marsilea burchellii) and 12 indigenous species (*Actiniopteris radiata*, *Adiantum capillus-veneris*, *Cheilanthes marlothii*, *Marselia coromandelina*, *M. aegyptiaca*, *M. ephippiocarpa*, *M. farinosa*, *M. macrocarpa*, *M. unicornis*, *M. vera*, *Ophioglossum polyphyllum* and *Pellaea calomelanos*) (Crouch *et al.* 2011). The general area is under collected with more species probably occurring in the general area.

Lichens

The overall diversity of lichens is poorly known from Namibia, especially the coastal areas and statistics on endemicity is even sparser (Craven 1998). More than 100 species are expected to occur in the Namib Desert with the majority being uniquely related to the coastal fog belt (Wirth 2010). Lichen diversity is related to air humidity and generally decreases inland form the Namibian coast (Schults and Rambold 2007). Off road driving is the biggest threat to these lichens which are often rare and unique to Namibia. To indicate how poorly known lichens are from Namibia, the recent publication by Schultz *et al.* (2009) indicating that 37 of the 39 lichen species collected during BIOTA surveys in the early/mid 2000's was new to science (i.e., new species), is a case in point.

Other species

Other species with commercial potential that could occur in the general area include *Harpagophytum procumbens* (Devil's claw) – harvested for medicinal purposes and often over-exploited – and *Citrullus lanatus* (Tsamma melon) which potentially has a huge economic benefit (Mendelsohn *et al.* 2002).

5.3.3. Groundwater and surface water hydrogeology

The HAMBELELA KASHINASHA ANYOLO EPL is geologically situated on rocks of the Khomas complex of the Damara orogen. The central Namibia is characteristics of ephemeral revivers and low annual rainfall. Hence, most towns in the western Central Region are situated on or near rivers is a reflection of ground water availability in the area. Sufficient water for larger settlements can only be obtained by surface water storage in dams or from alluvial aquifers, while the potential of bedrock aquifers is very limited.

This is partly due to the low rainfall and lack of recharge, and partly to the generally un favourable aquifer properties of Damara Sequence rocks. Only the quartzite aquifer in the Windhoek area can be classified as high yielding. The Windhoek aquifer is developed in an area that exhibits numerous north to north-west striking faults and extensive jointing. The high yields of the Auas quartzites are due to secondary porosity derived from brittle deformation, while the interbedded schist layers were more susceptible to plastic deformation.

The primary porosity and hydraulic conductivity of both quartzite and schist are negligible. The faults associated with the development of the Windhoek graben are generally north-south subvertical tension faults. They form the major water conductors in the Windhoek area and extend as a zone of moderate potential northward towards Okahandja. Equally moderate yields are found in the Auas quartzites south-west and northeast of Windhoek.

5.4. Potential impact identified

5.4.1. Positive impacts

- Employment creation
- Support to local retailers shops
- Export taxes and VAT payment

5.4.2. Negatives impacts

- Effect of oil spillage on groundwater and surface water
- Solid waste: wires, drill bites, and human waste
- Land and soil disturbance: on site and the proposed road
- Loss of biodiversity: fauna and flora
- Effect of dust that will be generated on-site
- Effect of the spread of HIV/AIDS /COVID -19

5.5. Concluding remark on this section

In this section the affected environment was described. The social and the biophysical environmental information were provided and also the potential positive and negative impacts of the project were identified.

6. Public consultation process

6.1. Legal and policy requirement

6.1.1. Environmental management act (2007) and it EIA regulations (2012)

Public consultation is a crucial part of the EIA process. This provides an opportunity to stakeholders or interested member of the public to find out more about what is being proposed, and to raise any issues or concerns. The Environmental Management Act 2007 and its EIA regulations of 2012 are the key documents governing environmental impact assessment in Namibia.

One of the key objectives of the Act is to prevent and mitigate the significant effects of activities on the environment by:
Ensuring that there are opportunities for timeous participation of interested and affected parties throughout the assessment process; and ensuring that the findings of an assessment are taken into account before any decision is made in respect of activities."

The key principle of the Environmental Management Act 2007 advocates for public participation. The principles states that *"the participation of all interested and affected parties must be promoted and decisions must take into account, the interest, needs and values of interested and affected parties*".

Section 21 of the EIA Regulations outlines procedure on public participation process as follows:
"(2).The person conducting a public consultation process must give notice to all potential interested and affected parties of the application which is subjected to public consultation by:

a) Fixing a notice board at a place conspicuous to the public at the boundary or on the fence of the site where the activity to which the application relates is or is to be undertaken;
b) Giving written notice to:

i. The owners and occupiers of land adjacent to the site where the activity is or is to be undertaken or to any alternative site;

ii. The local authority council, regional council and traditional authority, as the case may be, in which the site or alternative site is situated;

iii. Any other organ of state having jurisdiction in respect of any aspect of the activity; and

c) Advertising the application once a week for two consecutive weeks in at least two newspapers circulated widely in Namibia.

(3) A notice, notice board or advertisement referred to in sub regulation (2) must -

a) Give details of the application which is subjected to public consultation; and

b) State:

i. That the application is to be submitted to the Environmental Commissioner in terms of these regulations;

ii. The nature and location of the activity to which the application relates;

iii. Where further information on the application or activity can he obtained: and

c) The manner in which and the person to whom representations in respect of the application may be made.

(6) When complying with this regulation, the person conducting the public consultation process must ensure that a) information containing all relevant facts in respect of the application is made available to potential interested and affected parties; and b) consultation by potential interested and affected parties is facilitated in such a manner that all potential interested and affected parties are provided with a reasonable opportunity to comment on the application.

For the purpose of the Act and these regulations a notice is given to a person or a person is informed of a decision, if a document to that effect is:

(a) Delivered personally to that person;

(b) Sent by registered post to the persons last known address;

(c) Left with an adult individual apparently residing at or occupying or employed at the person's last known address; or

(d) In the case of a business-

(i) Delivered to the public officer of the business;

(ii) Left with an adult individual apparently residing at or occupying or employed at its registered address;

(iii) Sent by registered post addressed to the business or its public officer at their last known addresses; or

(iv) Transmitted by means of a facsimile transmission to the person concerned at the registered office of the business."

6.2. Consultation process followed during the EIA process

Communication with stakeholders about the proposed mineral exploration project was facilitated through the following ways

- Identification of stakeholders
- Newspaper adverts
- Written notices
- Notice boards
- Information documents
- Stakeholder meetings
- Reasonable opportunity for the public to register and comment on the project

Table 9, below explains how the communication process was facilitate using the above mentioned ways.

Table 6: Public consultation process

Steps	Description of the process	Time allowed
Identification of stakeholders **Newspapers adverts**	Keys stakeholders were identified and included in the register. Contact details for I&APs were obtained from their offices. (**Appendix B**) Notices were placed in the press, briefly explaining the development and its locality, inviting the public to register as stakeholders and informing them of the time and venue of the public meeting (**Appendix C**).	The registration process was maintained throughout the EIA process On the 31 january 2025 in Confidente and NewEra on 4 & 20 february 2025
Written Notices:	authority such the Farm owners . **Appendix D**	Most farms are absent landlord
Background Information Documents	A Background Information Document (BID) was compiled. The BID contained the information of the project (**Appendix F**). The BID was forwarded to all	

The following factors limited the public participation process:

- Delivery of letters, Notice Board Posters and BID by hand is timing consuming.
- Most people were on leave and sometimes not reachable on the contact numbers when the CENTRE FOR GEOSCIENCES RESEARCH was contacting them.
- Some stakeholders don't have access to email.

6.4. The interested and affected parties (I & AP's)

There I&APs for this project were identified using information from the existing CENTRE FOR GEOSCIENCES RESEARCH stakeholder database. Notices were placed in various newspapers inviting the public to register as interested and affected parties. Organizations were also selected whom the consultant considered to be interested in or affected by this particular project. An I&APS can be defined as '(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.

6.5. Outcome of the public engagement

The main issue that is drawn from the public participation is that the public were interested in the project regardless of its magnitude, duration and the number of people to be employed.

6.6. Key issues identified during the public engagement process

During the public participation process the following keys issues were identified:

- Rehabilitation of the site after mineral exploration
- Number of people to be employed in the project
- The duration of the EIA process
- The start of the test mining
- Management of waste both solid and liquid waste
- Safety measures in place for employees

The identified keys issues during the public participation process together with the issues identified in section 5.5 above were assess for potential impacts in section 7 below.

6.7. Concluding remark on this section

In this section, issues on public participation process such as steps or methods that were followed, process, the outcome of the public participation process, and key issues identified were presented. Moreover the legality patterning to public participation was also presented.

7. Impact assessment

7.1. Identification of key issues

Potentially significant impact identified from the baseline conditions, legal requirement, and public participation process were screened to obtain issues that require further investigation or assessment and those that doesn't required further investigation. The process shown in the flow chart below was used for the screening of potential issues. Table 12 below, shows the screening of the identified impact using the flow chart.

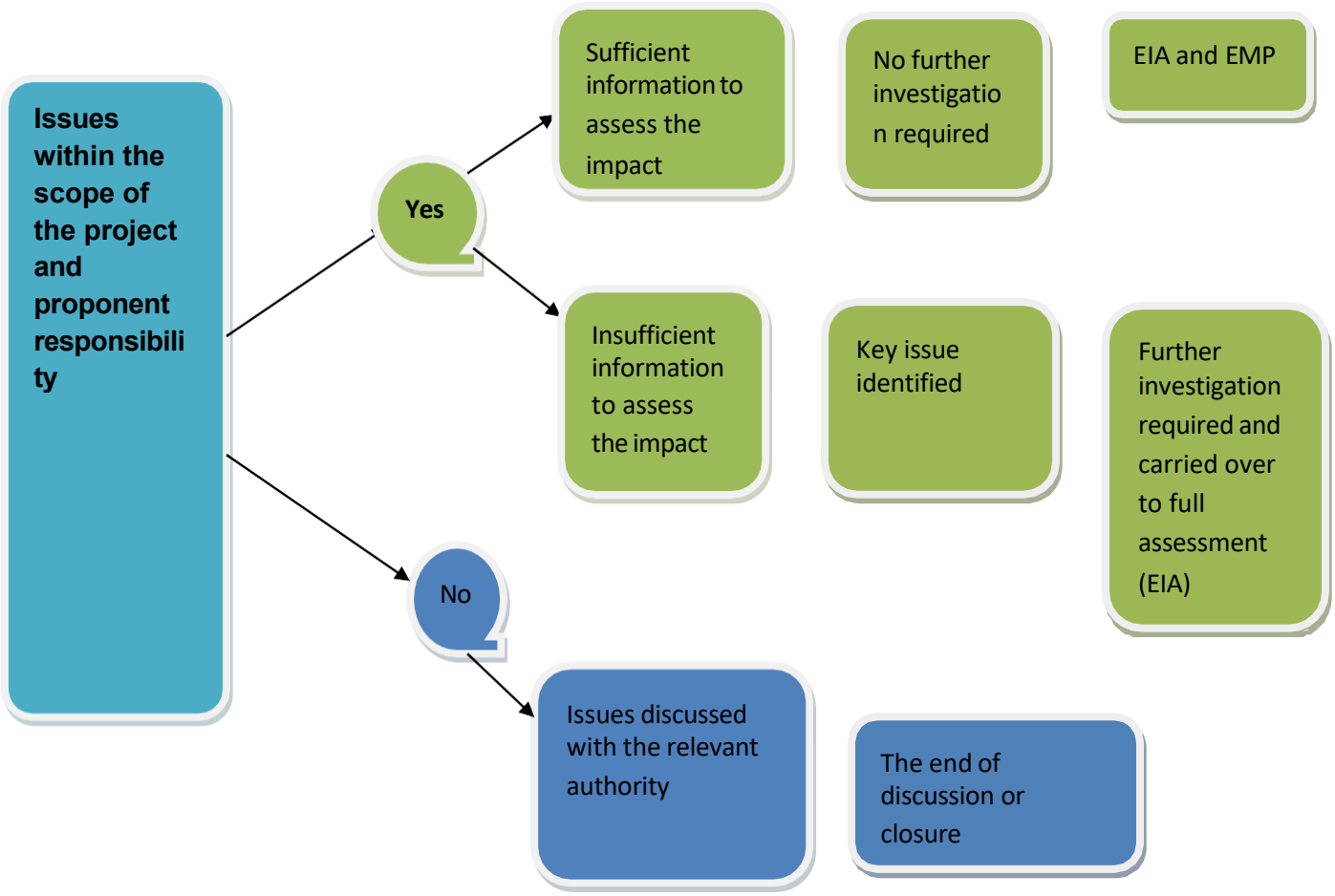

Table 7: Process of determining the key impacts resulting from certain aspects of the proposed mineral exploration.

Environmental feature	Potential impacts of project feature	Key impact	Degree of sensitivity	Issue addressed in
Surface water and ground water	Contaminants of construction process (e.g. oil spills etc)	Deterioration of groundwater quality	Medium sensitivity	Addressed in sub-section:7.3.1. and EMP
	Effluent discharge from mobile toilet		Low sensitivity	Addressed in EMP
	Contaminants resulting from the presence of construction workers		Low sensitivity	Addressed in EMP
Fauna	Destruction of flora (vegetation) could result in the loss of faunal biodiversity	Loss of faunal biodiversity	Medium to Low sensitivity	Addressed in sub-section:7.3.2. and EMP
Flora	Removal or damage to vegetation could result in loss of biodiversity and habitat destruction	Loss of biodiversity Habitat destruction	Medium to Low sensitivity	Addressed in sub-section:7.3.2. and EMP
	Damage or destruction of protected or high use value trees, shrubs or	Loss of protected or high use value flora	Medium to Low sensitivity	Addressed in sub-section:7.3.2. and EMP

Environmental feature	Potential impacts of project feature	Key impact	Degree of sensitivity	Issue addressed in
	bushes.			
Social Economic Environment	Employment or job creation	Permanent job creation for local people	Medium sensitivity	Addressed in sub-section:7.4.1. and EMP
	Support to local retailers shops and Export taxes and VAT payment	Contribute to the Windhoek Town economic growth and the nation at large	Low sensitivity	Addressed in sub-section:7.4.1. and EMP
	Potential spread of HIV/AIDS	Spread	High sensitivity	Addressed in sub-section:7.4.2. and EMP
Archaeology	Disturbance or destruction of archaeological sites as a result of earthmoving operations (construction) and accelerated soil erosion (operation).	Damage to existing or undiscovered archaeological sites in the area	High sensitivity	Addressed in sub-section:7.4.3. and EMP
Solid waste	During mining solid waste such as drill bites, plastic, and wire will be generated on site	Damage to the surrounding environment	Medium sensitivity	Addressed in sub-section:7.5 and EMP
Dust on site and gravel road	During drilling dust will be generated	Effect the employees and wellbeing	Medium sensitivity	Addressed in sub-section:7.3.3 and EMP

Environmental feature	Potential impacts of project feature	Key impact	Degree of sensitivity	Issue addressed in
Disturbance on soil or land	During sampling top soil will be removed	Losses of top soil that support vegetation growth	High sensitivity	Addressed in sub-section:7.6. and EMP

7.2. Methodology used or adopted for the impact assessment

The assessment process that was developed by CENTRE FOR GEOSCIENCES RESEARCH was formulated based on the collection and interpretation of the available literature pertaining to the base rare and precious metal exploration. The process included the review of previous EIA's and EMP's done in the surrounding areas and those on base , rare and precious metals in the vicinity in Khomas / Hardarp Regions. Other relevant documents were identified and collected including:

- Environmental regulations covering environment, water, energy, health and safety as well as all the related policies and guidelines;
- Mining regulations and all the related introductory information obtained from the Office of the Mining Commissioner in the Ministry of Mines and Energy;
- Topographic maps, information and data sets about the location and characteristics of EPL.
- Information and data sets about the environmental regulation, biodiversity, social economic and natural environment around the in HAMBELELA KASHINASHA ANYOLO EPL 9845 obtained from the Directorate of Environmental Affairs in the Ministry of Environment and Tourism; Namibia Statistic agency.
- Information and data sets about the regional and local geology, geological maps and all the related data sets, published materials and open file documents have all been located in the Directorate of the Geological Survey in the Ministry of Mines and Energy;

The following methods were used by all specialists to determine the significance rating of impacts identified:

7.2.1. Description of Impact

The specialists identified potential impacts of the proposed project on the receiving environment. They were tasked to consider the following:

- The type of effect that the proposed activity will have on the environment;
- What will be affected; and
- How will it be affected?

The sources of risk are, where possible, based on accepted scientific techniques. Failing this, the specialists made a professional judgment based on expertise and experience. All potential impacts that result from the proposed project have been evaluated for the full life-cycle of the project, namely, construction, operations, and decommissioning phases.

The impact assessment methodology is contained in table 11 below:

Table 8: Definition of criteria for assessing significant impact

Criteria	Description
Nature	Reviews the type of effect that the proposed activity will have on the relevant component of the environment and includes "what will be affected and how?"
Extent	Indicates whether the impact will be site specific; local (limited to within 15 Km of the area); regional (limited to ~100 Km of the area); national (limited to the coastline of Namibia); or international (extending beyond Namibia's borders).
Duration	Reviews the lifetime of the impact, as being short (days, <1 month), medium (months, <1 year), long (years, <10 years), or permanent (generations, or >10 years).
Intensity	Establishes whether the magnitude of the impact is destructive or innocuous and whether or not it exceeds set standards, and is described as none (no impact); low (where natural/ social environmental functions and processes are negligibly affected); medium (where the environment continues to function but in a noticeably modified manner); or high (where environmental functions and processes are altered such that they temporarily or permanently cease and/or exceed legal standards/requirements).
Probability	Considers the likelihood of the impact occurring and is described as improbable (low likelihood), probable (distinct possibility), highly probable (most likely) or definite (impact will occur regardless of prevention measures).
Degree of Confidence in Predictions	Is based on the availability of specialist knowledge and other information.

The application of the above criteria (Table 11) to determine the significance of potential impacts uses a balanced combination of nature, extent, duration, and intensity/magnitude, modified by probability, cumulative effects, and confidence. Significance is described as follows as shown in table 12.

7.2.2. Sensitivity of the Affected Environment

In the description of the affected environment, specialists provided an indication of the sensitivity of the affected environment. Sensitivity, in this instance, refers to the 'ability' of an affected environment to tolerate disturbance (given existing cumulative impacts). For example, if very little disturbance results in the permanent loss of the biodiversity of a habitat, the affected environment could be categorized as having a low tolerance to disturbance and can consequently be described as being a 'high sensitivity' habitat. If, on the other hand, a habitat is able to withstand significant disturbance without a marked impact on its biodiversity the affected environment could be categorized as having a high tolerance to disturbance (i.e. 'low sensitivity' habitat).

Based on the above considerations, the specialists provided an overall evaluation of the significance of the potential impact, which is described as follows

Table 9: Definitions of various significant rating or sensitivity

SIGNIFICANCE RATING	CRITERIA
Low	Where the impact will have a negligible influence on the environment and no modifications or mitigations are necessary for the given development description. This would be allocated to impacts of any severity/ magnitude, if at a local scale/ extent and of temporary duration/time.
Medium	Where the impact could have an influence on the environment, which will require modification of the development design and/or alternative mitigation. This would be allocated to impacts of moderate severity/magnitude, locally to regionally, and in the short term.
High	Where the impact could have a significant influence on the environment and, in the event of a negative impact the activity(i.e.) causing it, should not be permitted (i.e. there could be a 'no-go' implication for the development, regardless of any possible mitigation). This would be allocated to impacts of high magnitude, locally for longer than a month, and/or of high magnitude regionally and beyond.

7.2.3. Mitigation and Enhancement Measures

Where negative impacts are identified, mitigation objectives have been set, and practical, attainable mitigation measures must be recommended that will minimise or eliminate the impacts. Where mitigation is not feasible, this has been stated and reasons given. In the case of positive impacts, enhancement measures are recommended for optimizing the benefit to be derived.

7.2.4. Monitoring

Monitoring requirements with quantifiable standards to assess the effectiveness of mitigation actions have been recommended where appropriate. These must indicate what actions are required, by whom, and the timing and frequency thereof. If further investigations must be undertaken and monitoring programmes implemented before, during and after operations, these have been recommended.

7.3. Biophysical Environment

7.3.1. Impact of oil spills on groundwater aquifer and surface water streams

7.3.1.1. Description

The mining industry is a clean industry from a pollution point of view. Various environmental impact assessments conducted identified petrochemical pollution emanating from this industry as the most serious threat in this regard, and in order to maintain the record as a clean industry, this threat is taken very seriously.

There are various waste disposal methods used worldwide in mining industry. Management of used oil at a large scale is reported to be a challenge as more significant maintenance is required to minimise the losses of the oil into the environment (Richards, 2009). Used oil once it spill, it causes

detrimental effect to both living and none living things and more especially to groundwater because it's chemical constituents are poisonous. The oil coats and clings to every rock and grain of sand. Sometimes if the oil washes into coastal marshes, mangrove forests or other wetlands, fibrous plants and grasses absorb the oil, which can damage the plants and make the whole area unsuitable as wildlife habitat.

7.3.1.2. Sensitivity of the affected environment

Table 10: Expected significance of the project on liquid waste

Criteria	Impact of oil spills on groundwater aquifer and surface water streams
Extent	*local*
Duration	*permanent*
Intensity	*high*
Probability	*definite*
Significance before mitigation	*High*
Significance after mitigation	*Medium*
Degree of confidence in predictions	*high*

7.3.1.3. Mitigation and enhancement measures

- Train and supervise staff to ensure minimal spillage of oil.
- Routine inspections before the start of every work schedule involving potential spillage.
- Old oil is collected and stored, and is sold to recycling companies.
- Equip the quarry site with emergency petrochemical spillage kits which are used such events as hydraulic pipes bursting in service and spilling oil.
- Bio-remediate contaminated soil using proprietary products kept on sites for the purpose. The process of bio-remediation involves loosening the

contaminated soil to allow for oxygen penetration. Transported contaminated soil to a specific impervious site for treatment to avoid compaction during the process, and adding agricultural fertilizer and the proprietary products containing appropriate microbes to break down the hydrocarbons.

7.3.1.4. Monitoring

- Daily visual monitoring by site manager.
- Weekly spot checks by environmental manager

7.3.2. Loss of Fauna and Flora diversity

7.3.2.1. Description

Biodiversity (i.e. fauna and flora) is likely to be affected by the project during the mining or quarrying process. But due to the size and duration of the project, the impact is manageable.

The types of vegetation found in this area are classified in medium value category. In addition to vegetation various invertebrates also host the area. Regardless of the low value of the existing vegetation on site and along the road, activities that will be undertaken during the mining process is likely to have an effect on the vegetation and the invertebrates thereof. Therefore management measures will be considered to minimize the above impacts.

7.3.2.2. Sensitivity of the affected environment

Table 11: Expected significance of the project on Biodiversity: fauna and flora

Criteria	Biodiversity: fauna and flora
Extent	*local*
Duration	*long*
Intensity	*medium*
Probability	*definite*
Significance before mitigation	*high*
Significance after mitigation	*medium*
Degree of confidence in predictions	*high*

7.3.2.3. Mitigation and enhancement measures

- Avoid damage to protected or high use value trees during mining and usage of heavy machines.
- Disturbance of marginal vegetation at the mountains should be limited.
- Avoid disturbance on invertebrate on site and along the gravel road stretch.
- During operation avoid the creation of multiples roads strips, which could result in the disturbance of breading sites for various mammals.

7.3.2.4. Monitoring

An ENC for HAMBELELA KASHINASHA ANYOLO should accompany drivers or heavy machine operator so that the avoidance of trees and vegetation can be optimized. Other rules in the EMP to avoid vegetation destruction should be monitored monthly.

7.3.3. Dust generation on site

7.3.3.1. Description

During the exploration process dust will be generated onsite by earth moving equipment and also on the gravel road by trucks and vehicles. On site, drilled samples will be packed into smaller bags. During the RC drilling, process about 1% the dust will be generated. In addition, the dust, which is suspended in the air could be inhaled by the

workers if they are not well protected. Epidemiological studies indicates that workers exposed to dust from mining stand an increased risk of suffering from asthmasymptoms, chronic bronchitis, nasal inflammation and impairment of lung function (Camici et al., 1978; Angotzi et al., 2005; Leikin et al., 2009). In their study they found out that, the affected workers were having body problems like headache, backache and stressed due tounder- payment (Dagli et al., 2008). Individuals who were having papilloma have faced problem at work like noise, dust or fumes and poor maintenance of equipment (Dagli et al., 2008). Moreover, their data also demonstrated that long periodof chronic exposure to dust induced progressive atrophic changes in the alveoli (Gammal et al, 2011). Therefore, there are some potential risk of mineral exploration on the environmental, which requires attention, mitigations, and management to protect the existing human and animal health.

It is globally known that the generated dust during mining operations may affect human, plant and animal growth at the surrounding environment (Kirjoitettu, 2014). Exposure between 10 and 15 years is associated with the long term complication, while the short term complication can cause difficulty in breathing" (Kirjoitettu, 2014). The reaction depends on the particle inhaled, as the lung is too exposed to expel particles beyond 10 micro meters (Haruna, 2014). With the inherent natural mechanism of its defence, the lung is supposed to be able to expel such amount of particles but sizes below one to 10 millimeter (mm) can go down to the terminal end of the lung and the macrophages may not be able to expel that (Haruna, 2014). To avoid respiratory or other problems caused by exposure to dust, engineering control methods such as those highlighted in the mitigation measures below and the use of tools that minimized the generation of dust should be introduced.

7.3.3.2. Sensitivity of the affected environment

Table 12: Expected significance of the project on dust generated on site

Criteria	Soil or land disturbance:
Extent	*local*
Duration	*long to permanent*
Intensity	*medium*
Probability	*definite*
Significance before mitigation	*high*
Significance after mitigation	*medium*
Degree of confidence in predictions	*high*

7.3.3.3. Mitigations and enhancement measures

- Measures such as the use of wet processes enclosure of dust-producing processes under negative air pressure (slight vacuum compared to the air pressure outside the enclosure),
- Exhausting air containing dust through a collection system before emission to the atmosphere, and exhaust ventilation should be used in the workplace.
- Use of personal protective equipment for proper dust control for respiratory protection and should be used only where dust control methods are not yet effective or are inadequate.
- Direct skin contact should be prevented by gloves, wearing respiratory protection during cleanup,
- Educational awareness programs for workers should be instituted about hazard of exposure to mineral dust and on the use and maintenance of exhaust ventilation systems, and the use and maintenance of personal protective equipment to avoid risk of dust and noise.
- All gravel roads in quarry areas should have a speed limit of 60km/h for light vehicles and 30km/h for heavy vehicles in order to minimise the amount of dust generated by vehicles.
- In addition, where available water allows, roads should be sprayed with water on a regular basis in order to prevent dust creation.

7.3.3.4. Monitoring

- Daily inspection by the ENC of the gravel roads and quarry site on possible dust creation that requires attention.

- Daily inspection on site by the ENC to ensure that all workers are wearing their protective clothes at all time during the mining process and the dry skin contact with gloves is prevented.

7.4. Social Economic Environment

7.4.1. Job creation

7.4.1.1. Description

According to the Social Impact Assessment, the employment rate in Khomas has reduced significantly while the unemployment comparing to the Erongo region at large, the Khomas residence has the lowest unemployment rate in the country.

It is clear that unemployment is big challenge in the Khomas / Hardarp Regions; hence the necessity of this project which will employ about 12 to 15 people during the mining phase. The employment will be conducted in the company's offices which will be opened in the City of Windhoek once mining has begun, the local authority will be contacted if assistance is needed during the employment process in order to ensure that the local inhabitants can get the full benefit.

It should be noted that the use of manual labour instead of mechanized construction methods, does pose some advantages and disadvantages:

Advantages:

- If locals are used, housing will be available nearby,
- Contribution to local economy – reducing unemployment,
- Development of local skills,
- Smaller ecological footprint.

Disadvantages:

- It might increase the costs of the project impacting on the affordability of water;
- It will take longer to complete than if the processed in mechanized;
- The safety risk resulting from open trenches will become bigger;
- It will require a greater management of workforce, quality of work.

7.4.1.2. Sensitivity of the affected Environment

By implementing the mining or quarry project the socioeconomic significance of HAMBELELA KASHINASHA ANYOLO can be summarized as follows:

Table 13: Expected significance of the project on social economic implications

Criteria	Social economics implications
Extent	*local*
Duration	*long to permanent*
Intensity	*medium*
Probability	*definite*
Significance before mitigation	*high*
Significance after mitigation	*low*
Degree of confidence in predictions	*high*

7.4.1.3. Mitigation and enhancement measures

- Where unskilled labour can be used, a ‘locals first’ policy should be considered.

- It is proposed that local people, meaning the community members from rural Khomas, should be employed as far as possible, especially where no specific skills are required.
- The Windhoek rural constituency Councilor could be requested to assist with the recruitment of construction workers.
- Both men and women should be granted the opportunity to be employed by this project.

7.4.1.4. Monitoring

It is recommended that HAMBELELA KASHINASHA ANYOLO Mining Manager should employee workers to be obtained from the potentially affected communities in particular rural Windhoek. HAMBELELA KASHINASHA ANYOLO in consultation with the Windhoek constituency Councilor will then be responsible to supervise the employment process when implementing this 'local's first' recommendation.

7.4.2. Potential spread of HIV/AIDS

7.4.2.1. Description

In the proposed project area, it is estimated that one out of every four people are HIV positive. (Anna, 2014) Previous experience has shown that construction workers or mining workers residing in a construction camp may engage in risky sexual behaviour with members of the community. This can contribute to the spread of HIV both in the project area and beyond to other region.

7.4.2.2. Sensitivity of the affected environment

Table 14: Expected significance of the project on the spread of HIV/AIDS & COVID-19

Criteria	Contribution to the spread of HIV/AIDS
Extent	*national*
Duration	*permanent*
Intensity	*serious effect*
Probability	*definite*
Significance before mitigation	*high*
Significance after mitigation	*medium*
Degree of confidence in predictions	*high*

7.4.2.3. Mitigation and enhancement measures

HAMBELELA KASHINASHA ANYOLO, ENC should sensitize the risks of sexual behaviour, and also the effects of HIV/AIDS to its employees. Workers should be prohibited to engage in such activities with especially minors. Mitigation measures as outlined in the EMP should be adhered to. In terms of covid-19 employees to adhere to COVID protocols as prescribed by Namibian Government.

7.4.2.4. Monitoring

The ENC should report back to HAMBELELA KASHINASHA ANYOLO as to when and how the workers received HIV training. Also, how workers were informed about the mitigation measures of the EMP.

7.4.3. Disturbance or destruction of archaeological sites

7.4.3.1. Descriptions

The mining activities may partially or completely destroy some small archaeological sites found within and outside the boundary of the mining are.

These archaeological sites are rock arts and are associated with the sun people tribe. Their archaeological significance is low to medium. It is also likely that some damage will occur outside the immediate project area through the establishment of access roads and contractor's lay-down areas. Some cumulative impacts can be expected during operation and decommissioning.

7.4.3.2. Sensitivity of the affected environment

Table 15: Expected significance of the project on archaeological sites

Criteria	Contribution to the spread of HIV/AIDS
Extent	*local*
Duration	*permanent*
Intensity	*serious effect*
Probability	*definite*
Significance before mitigation	*medium*
Significance after mitigation	*Low*
Degree of confidence in predictions	*high*

7.4.3.3. Mitigation and enhancement measures

- The records obtained during this fieldwork are considered adequate and no further work is needed.

7.5. Solid waste: wires, drill bits, and human waste

7.5.1. Descriptions

Solid waste management is a problem in the mining industry or quarrying industry, and sometimes this problems extent beyond the mining industry. In the mining industry or exploration industry, different types of solid waste are generated and some of these wastes contain toxic substance that can affect

living and non-living things. Therefore proper handling and management of these wastes is critical for the protection of the environment.

Solid waste that will be generated from this project if not managed will have an effect on the environment. The effect will mainly be at the project site. Human waste that will be generated during the exploration process, if not managed will have an effect on the environment although at a small scale exploration exercise.

7.5.2. Sensitivity of the affected environment

The significance of the identified problem to the study can summarise as follows:

Table 16: Expected significance of the project on solid waste

Criteria	Solid waste :
Extent	*local*
Duration	*short*
Intensity	*low*
Probability	*definite*
Significance before mitigation	*medium*
Significance after mitigation	*low*
Degree of confidence in predictions	*high*

7.5.3. Mitigation and enhancement measures

Waste disposal sites should established on site were paper, plastic and wire should be kept. The collected solid waste should be dispose at the City of Windhoek soil waste disposal site. For human waste, mobile toilet should be made available on site for workers and once these facilities are full, the collected human waste should be disposed at the City of Windhoek human waste disposal site. Prior to the disposal of the above mentioned wastes HAMBELELA KASHINASHA ANYOLO must entered into agreement with the City of Windhoek Municipality for permission to use their facility.

7.5.4. Monitoring

- Weekly inspection by the ENC, to collect and empty the plastic bag that are full and also the mobile toilet.

7.6. Land or soil disturbance: on site and the proposed 23km stretch road

7.6.1. Descriptions

During the exploration process, land or soil will be disturb both on site and along the proposed stretch road of about 23km linking the project site to the C28 road. Top soil will be removed on the surface rocks during the drilling to recover the slabs needed for testing. The removed top soil during drilling if not properly management will affect the growth of vegetation and the development biodiversity hiding or resting spots.

7.6.2. Sensitivity of the affected environment

The significance of the identified problem to the study can summarize as follows:

Table 17: Expected significance of the project on soil or land disturbance

Criteria	Soil or land disturbance:
Extent	*local*
Duration	*permanent*
Intensity	*serious affected*
Probability	*definite*
Significance before mitigation	*high*
Significance after mitigation	*medium*
Degree of confidence in predictions	*high*

7.6.3. Mitigation and enhancement measures

The top soil from 0 to 30cm to removed and stockpile and to be used during the rehabilitation process. The stockpile will seeded with seeds of grasses and shrubs to keep organic activity alive, as well as ensure a fertile seed bank in the topsoil when it is finally used. It is recommended that top soil to be removed

down to the subsoil, where it is significantly thicker than 0.5m, as topsoil is always a scarce resource, and even if this lower material does not contain seed and is poorer in soil organisms, it has been found to be useful in reclamation. Where top soil is less than 150mm thick the unconsolidated material beneath should also be removed and treated as topsoil.

7.6.4. Monitoring

- Daily inspection by ENC to ensure that top soil is removed and stock pile on site.

7.7. Concluding remark on this section

In this section the identified impact were screened and assessed. The mitigation measures of the identified impact will be addressed in the Environmental Management Plan (EMP) report.

8. Conclusion and recommendations

8.1. Conclusion

The HAMBELELA KASHINASHA ANYOLO EPL 9845 is in the Windhoek District in Khomas / Hardarp Regions. The Licence lies outside the National Park. The implementation of the proposed mineral exploration project by HAMBELELA KASHINASHA ANYOLO will be undertaken with provisions of the EIA regulation of 2012. Based on the assessment of both negative and positive impacts undertaken for the proposed mineral exploration project, a number of high positive and negative impacts have been identified. Overall, positive impacts of the proposed mineral exploration project activities outweigh the negative ones at local, regional, nation and global levels.

It is therefore concluded that all significant impacts identified during this Environmental Impact Assessment can be mitigated through management actions implemented during construction and operation. It is important that the Environmental Management Plan developed for the project be implemented during construction and operation otherwise the impacts identified will remain unacceptable.

8.2. Recommendations

Based on the findings of this Environmental Assessment Study, it is recommended that the proposed mineral exploration project receive an Environmental Clearance provided that an Environmental Plan be implemented.

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